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ABSTRACT BOOK













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Dear colleagues,

Agriculture is the mainstay of the economy of many developing and un der developed countries. Humans cultivated crops and domesticated animals thousand of years ago. Modern agriculture is the cultivation of plants and fungi, and rearing of domestic animals for food, fiber, biofuel, medicinal and other products used to sustain and enhance human life. Promoting scientific and technological progress in the field of agricultural and biological sciences has become the consensus of all the countries in the world.

Besides that other challenges like climate change, environmental pollutions, water scaricity and various animal diseases pose new requirements for sustainable agricultural development. Application of Moleculer Biology and Biotechnology tools in Agriculture also open a new era of "Modern Agriculture" to confer these challenges.

The main objective of this conference is to bring together the scientists, researchers, and students from leading institutes, research stations and universiites to share their experience and research with other researchers in the field of agriculture. Areas of interest include, but are not limited, Agricultural Economics, Animal Science, Biosystems Engineering, Horticulture, Field Crops, Food Science and Technology, Soil Science and Plant Nutrition, Plant Protection, Agricultural Machinery, Farm Structures and Irrigation, Agricultural Biotechnology and Landscape Architecture.

We are honored to announce 4th International Agriculture Congress which will take place at Nevşehir, Turkey commencing from 05-08 July, 2018. Special sessions, poster, and oral presentations will be included to the conference program.

We invite you to submit papers and proposals for special sessions on agriculture sciences and technology.

Best regards,

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ABSTRACT for

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Research for Making Life Better

Researches on 0900 Ziraat cherry cultivar prevent from fruit cracking

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Abstract

The study was carried out on 5 years old 0900 Ziraat sweet cherry cultivar which is grafted on MaxMa 60 rootstock, 5x5m planting distance. The trees were pruned as central leader system and cultivated in Niğde province at an altitude 1480m. The aim of this study is preventing from fruit cracking. The treatment's specified for this purpose were applied; 0.5% Calcium Nitrate, 20ppm GA_3, 100lt/ 300cc Green Miracle, 100lt/ 400gr Green Steem, water (control). In this research all applications were made in the same period. Pomological analyzes were carried out in order to determine the fruit quality criteria in the study where standard fertilization and irrigation programs were applied. Cracking indices were calculated in order to determine the effect of these applications on the resistance to cracking. According to the results obtained fruit weight was found to be higher in all treatments compared to control and it was obtained with Green Steem at the highest of 9.87 g. Fruit flesh hardness was measured with the highest Green Steem (72.65 Shore), Green Miracle (72.16 shore) and Calcium Nitrate (69.77 shore). According to the cracking index results, the lowest value was determined as 37.6 in Green Steem application and the highest value was measured in GA_3 application (44.0) and control (Water) (45.2). The best results were obtained from the Green Steem application in terms of prevent fruit cracking ratio, on the other hand all applications reduced the cracking of the fruit. We are thankful to financial support of the Scientific Research Projects Unit of Çukurova University (Project No: FBA-2017-7391)

Keywords: Cherry, Cracking, Treatments, Fruit quality

Determination of malondialdehyde, phenolics, hydrogen peroxide levels and lignin and callose deposition in a Phytoplasma-infected local grapevine cultivar

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Abstract

Phytoplasmas are dangerous plant pathogens that cause several diseases in many crop plants including grapevine, apple, sesame, and pear. Although these pathogens can severely result in yield loss, there is no effective strategy to reduce the incidence of phytoplasma in vineyards. However, the possibility of finding tolerant or resistant varieties is of great importance in management of such pathogens. Determination of physiological and biochemical responses can play significant roles in selection for tolerant varieties for phytoplasma disease resistance. This study was conducted to determine the localization of hydrogen peroxide (H_2O_2), malondialdehyde (MDA), phenolics, lignin and callose deposition in healthy and naturally phytoplasma-infected grapevine plants (Hönüsü cultivar) in Sanliurfa province. Phytoplasma-infected leaves showed clearly distinct pattern as compared to healthy plants. Infected plants exhibited approximately 14-fold, five-fold, and three-fold increase in the amount of MDA, total phenolic compounds, and H_2O_2, respectively as compared to healthy plants ($p<0.05$). Callose (with aniline blue dye method) and lignin staining (with phloroglucinol/HCl dye method) results have also showed significant differences between infected and healthy grapevine leaves. The present study showed for the first time that the effect of phytoplasma-infection on MDA, total phenolic compounds, and H_2O_2 contents in leaves of local grapevine cultivar named as "Hönüsü" during the vegetation. The physiology of interactions between phytoplasma and its plant hosts may provide new sustainable approaches to control these pathogens and significant insights for better understanding the mechanisms of different plant responses.

Keywords: *Vitis vinifera*, Phytoplasma, MDA, Hydrogen peroxide, Lignin, Callose

Comparative Analysis of Fruit Flavor and Aroma Compounds in "Finike Oranges"

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Abstract
Ecology of Finike is very suitable high quality orange production, yet Washington Navel oranges produced in Finike became a brand product and sold as quite high valued crop. Consequently, beside the fact that "Finike Orange" has a Geographical Indication, it has been selected from a competition as the best eating quality orange in world by University of California. In this study, along with pomological parameters, flavor and aroma compounds found in "Finike Oranges" were evaluated in comparison with oranges grown in two other districts. Washington Navel oranges from orchards in three districts (Finike, Kumluca and Serik) were collected and analyzed. The experiment was conducted with three replications with five plants each. Ten oranges per tree were collected in three times with 30 days apart for analysis. Pomological analysis were carried on in Akdeniz University Labs while biochemical analysis were carried on in Canakkale 18 March University Labs. Pomological parameters analyzed were including; width, height, diameter, weight, Juice amount, peel color of fruit and Ph, titratable acidity and soluble solute content of fruit Juice. Biochemical analysis for flavor and aroma compounds were carried using gas spectrophotometer. The results of pomological analysis showed that while the smallest numbers were obtained from Finike oranges (Kumluca> Serik> Finike) for; peel thickness, fruit size and weight, the largest numbers were obtained for soluble solutes and fruit juice (Finike> Serik > Kumluca). There were 27, 16, and 18 flavor and aroma compounds determined from Finike, Kumluca, Serik, respectively. There were more compound determined from Finike oranges compared to the others. Main compounds found in Finike oranges were l-limonene (%93.7), beta myrcene (%1.89), alfa pinene (%0.47) and linalool (%0.46). It is concluded that Finike orange specific flavor and aroma compounds may have been the reason for the extraordinary flavor of the "Finike Oranges".

Keywords: Orange flavor and aroma compounds, Finike Orange, Washington Navel

EVALUATION OF EXPERIMENTAL SEEDED TYPE BERMUDAGRASSES AS INFLUENCED BY MOWING HEIGHT AND SIMULATED TRAFFIC UNDER MEDITERRANEAN CLIMATE

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Abstract
Bermudagrass [*Cynodon dactylon* (L.) Pers.] is a warm-season grass species grown at tropic and subtropic regions of the world. The objective of the study was to evaluate the traffic tolerance of three experimental and three commercially available bermudagrass varieties maintained under two mowing heights. The three synthetic cultivars (A4-4, B3-12, and C12) developed at the Akdeniz University and commercial checks (Princess, Riviera and Tifway) were established at the Alata Horticultural Research Station, Mersin in July 2016. Experimental design was randomized complete block, a split-strip plot, with three replications. Brinkman traffic simulator was used to apply two traffic applications per week from 11 Aug. to 2 Oct. 2017. Turfgrass quality, percentage of bermudagrass cover, relative chlorophyll index, surface hardness and shear strength were measured. Riviera along with 'A4-4' produced the best turfgrass quality at both mowing heights after six weeks of simulated traffic. Under low mowing height, 'C12-133' and 'B3-6' had turfgrass quality comparable to Tifway and Princess. The higher mowing height under traffic decreased surface hardness. Experimental cultivar 'A4-4' outperformed the 'Tifway', and 'C12-133' exhibits traffic tolerance similar to 'Tifway'. The 'A4-4' and 'C12-133' may offer new alternatives for use on bermudagrass athletic fields due to their superior traffic tolerance and turfgrass performance.

Keywords: Cynodon dactylon, turfgrass, shear strength, surface hardness

Breeding of self-compatible and late flowering cultivars in almond

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Abstract

Almond is one of the important fruit species in Turkey, and it is being imported. Domestic almond cultivars do not take any attention of the market, as a result nurserymen prefer new foreign cultivars. In 2009, through our project, supported by TUBITAK, "Self-compatible and late flowering almond breeding by crossing" an Almond Breeding Program has been started. In the first part of the breeding program, in 2009 self-compatible foreign almond cultivars Lauranne, Guara and Moncayo were crossed with the local cultivars Gulcan 1, Gulcan 2, Akbadem and Nurlu and F1 plants containing self-compatible allele (S_f) were determined by PCR method, and these plants were planted in Pistachio Research Institute in 2011. In addition, the F1 individuals obtained from the 'Gulcan 2' x 'Penta' and 'Gulcan 2' x 'A2-198' crossing made in 2011 were also planted in F1 plot in 2012. Thus, for the first time in our country, an almond population has been created, which is candidate for self-compatible and late flowering. Total 1.870 F1 individuals in this population has been used as material of the project.
Seventeen F1 individuals were selected, and transported to the Selection II plots both in Sanliurfa and Gaziantep.

Keywords: Almond, breeding, late flowering, self-compatibility.

Contribution of Grafting to Growth and Development of Potato (*Solanum tuberosum*) Cultivars Under Various N Levels

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Abstract

The objective of the current study was to determine shoot and root characters that play important role in N efficiency by reciprocal grafting of two contrasting potato cultivars. In previous screening experiments two potato cultivars were characterized contrastingly as N-efficient (Van Gogh) and N-inefficient based on various growth and development parameters. However, N efficiency characters of these cultivars were not clearly known whether these characters are controlling and relating directly with shoot or root traits. A climate chamber experiment (25/22 °C day/night temp. 60-80% rh., 16/8 h of light/dark period) was carried out at the plant physiology laboratory of Agriculture Faculty, Erciyes University, in Kayseri Turkey. To produce homogenous plantlets for grafting process, tubers of two different potato cultivars (Van Gogh and Agria) were pre-cultured in a peat-perlit growth medium. Thereafter, homogenously produced potato plantlets were carefully cut and freed from the tubers with no root damage and then grafted with each other as a reciprocal. The non-grafted potato plantlets were used as control plants. When grafting process completed, plants were healed and acclimatized in the tunnel covered with double-layered plastic film and shade cloth in the climate chamber for one week. After the end of healing and acclimatization, grafted plants were transplanted to plastic pots for four weeks, after roots were washed. Each pot was filled with 8 L Hoagland solution that was aerated by an air pump. Solution were changed completely every week in the first two weeks and subsequently every 7th day. Between complete renewals of the nutrient solution (7 days intervals) all nutrients were replaced when the N concentration of the nutrient solution in the 3.0 mM N rate pots fell below 0.5 mM, as measured daily with nitrate test strips (Merck, Darmstadt, Germany) by using a NitracheckTM reflectometer. The experiment was in a completely randomized block design with three replications and six plants in each replication. Two different nitrogen concentrations (Low-N: 0.5 mM N, High-N: 3.0 mM N) was supplied and $Ca(NO_3)_2$ was used as N source. The nutrient solution had the following composition (µM): K_2SO_4 (500); KH_2PO_4 (250); $CaSO_4$ (1000); $MgSO_4$ (325); NaCl (50); H_3BO_3 (8); $MnSO_4$ (0.4); $ZnSO_4$ (0.4); $CuSO_4$ (0.4); $MoNa_2O_4$ (0.4); Fe-EDDHA (80). The results showed that significant differences were found between N levels in shoot growth (shoot fresh and dry matter, leaf area), though not in root growth (fresh and dry matter) of reciprocal grafted plants. Potato cultivars varied significantly in shoot and root growth, however, no cultivar x nitrogen interaction was found. Interestingly, previously characterized N-efficient potato cultivar Van Gogh showed lower growth performance compared to N-inefficient cultivar Agria without grafting. But, maximum growth performance was observed, when cv. Van Gogh was grafted onto potato cultivar of Agria. On the other hand, Agria produced much lower growth performance, when it was grafted onto Van Gogh compared to non grafted Agria. All these showed that root morphological traits are contributing more than shoot traits to N-efficiency in potato cultivars.

Keywords: *Solanum tuberosum,* Cultivar, N-efficiency, Reciprocal grafting, Root morphology

Grafting with Commercial Gourd Rootstocks to Improve Alkalinity Tolerance in Melon

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Abstract

The aim of the present study was to determine whether alkalinity tolerance could be improved by grafting of melon onto gourd rootstocks and to examine the grafted plants based on the physiological and morphological response mechanisms under different pH levels. The climate chamber experiment was carried out to determine stem length, total leaf area, photosynthesis, leaf chlorophyll content (SPAD), fresh and dry weight of shoot (stem+leaf), fresh and dry weight of root, concentration of P^{-3}, K^{+}, Na^{+-}, Ca^{++}, Mg^{++}, Fe^{++}, Cu^{+}, Mn^{++} ve Zn^{++} in the leaves, electrolyte leakage of leaf and root, proline content, and rate of lipid peroxidation. Under climate chamber conditions, two melon cultivars [galia type (Çıtırex F1) and Kırkağaç Manisa Altınbaş (PI-169303 standard type)] were grafted onto two different commercial *Cucurbita maxima x C. moschata* hybrid rootstocks (Kardosa and Nun 9075) and grown in 8 L pots filled continuously aerated nutrient solution under two different pH levels (7 and 9) with three replications. The results indicated that grafted and non-grafted plants were significantly ($P<0.001$) affected by different pH levels. Grafted plants had better growth performance than non-grafted plants under both control and high pH conditions. Shoot fresh and dry matter, shoot/root ratio of the non-grafted and grafted plants significantly decreased as pH level increased, whereas root fresh and dry matter of the non-grafted and grafted plants significantly increased under high pH level. Total leaf area, side branch number and concentration of P^{-3}, K^{+}, Na^{+-}, Ca^{++}, Mg^{++}, Fe^{++}, Cu^{+}, Mn^{++} ve Zn^{++} in the leaves were significantly ($P<0.001$) affected by grafting combinations and different pH levels. Photosynthesis, and leaf chlorophyll content (SPAD) of the non-grafted and grafted plants significantly decreased as pH level increased, whereas total leaf area, side branch number, proline content, leaf and root of the electrolyte leakage and lipid peroxidation of the grafted plants significantly increased under high pH level. These results suggest that the use of *Cucurbita maxima* x *C. moschata* hybrid rootstocks can improve crop performance in melon plants under high pH level.

Keywords: Commercial rootstocks, pH, Alkalinity, Nutrient solution, Grafting, Melon

Acknowledgement: The authors would like to thank the Scientific Research Projects Coordination Unit (BAP) of the Erciyes University for the financial support to the project of FYL-2017-7454.

Comparison of organically and conventionally produced Batavia type lettuce stored in modified atmosphere packaging for postharvest quality and nutritional parameters

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Abstract
The impacts of organic and conventional production systems on postharvest life and quality parameters of Batavia type 'Caipira' lettuce heads (*Lactuca sativa* L.) were investigated. Harvested lettuce heads grown in two different productions systems were stored at 0 °C temperature with 95-98% RH for 20 days in modified atmosphere packaging. The lowest weight loss, the highest ascorbic acid content and antioxidant activity were obtained from organic production system (Org-2). The conventional production system had higher total soluble solids, titratable acidity, and total phenolic contents. During shelf life period at 20 °C, the weight losses of lettuce heads grown conventionally were higher than the other production system. Conventionally grown heads had higher titratable acidity and total phenolic contents than organically grown heads. The highest titratable acidity and *h*° values were obtained from the plants grown under conventional and organic production system (Org-2), while the highest Chroma value and antioxidant activity were detected from the control treatment. The highest ascorbic acid content was detected in the control treatment but, the effects of control, organic production system (Org-2) and conventional production systems on ascorbic acid content were not statistically significant. The results indicated that the organic production system (Org-2) was the most effective treatment in prolonging postharvest life and protecting the quality of Batavia type 'Caipira' lettuce heads stored in modified atmosphere packaging.

Keywords: *Lactuca sativa*, organic fertilizers, antioxidant activity, total phenolics, storage

Thinning Efficiency of Ammonium Thiosulfate and Hydrogen Cyanamid on "Golden Reinders" Apple

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Abstract

Efficacy of ammonium thiosulfate and hydrogen cyanamid on the fruit quality and return bloom in 'Golden Reinders' apple grafted on the M9 rootstock was evaluated in this experiment. Studies were conducted at the Eğirdir Fruit Research Institute for two years on same trees. Three different doses of ammonium thiosulfate (ATS) (1%, 2%, and 3%) and hydrogen cyanamid (0.25%, 0.5%, and 0.75%) (Dormex) were used as the flower thinners at the full bloom period. To compare chemical applications, hand fruit thinning (HFT) at the producer level was performed after June drop. The effect of thinning practices on the fruit quality and yield was found the different year to year. Percentage of large fruit (75-85 mm diameter) increased by hand thinning and ATS 2% in the first year of the study. In the second year, the majority of fruits were into 75-85 mm size category and fruit yield with high commercial value was higher in 3% ATS and 0.75% Dormex. 2%, 3% ATS and 0.75% Dormex were effective applications to partially or even reduce alternate bearing compared to other applications. However, fruit thinning was not effective in reducing biennial bearing severity.

Keywords: *Malus x Domestica*, crop load, flower thinning, alternate bearing

Effect of enriched CO_2 treatment on decay development of fresh fig fruit during cold storage

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Abstract

Fresh fig is one of the most important export fruits for Turkey. However, fresh figs are extremely prone to decay after harvest and have very short postharvest life. During storage control of decay development by using non-chemical methods is getting more important due to the hazardous effects of chemicals. In this study, the effects of enriched CO2 levels in storage atmosphere on decay development of fresh fig fruit were studied. For this purpose, fruits were stored at 0°C temperature with 90-95% relative humidity under three different CO2 levels namely 10, 15 and 20% CO2 in palliflex storage system for 28 days. The O2 level in all treatments was kept constant at 6%. During cold storage and shelf-life period, fungal and bacterial growth, percentage of decayed fruit and decay severity were evaluated. In tested CO2 levels, 15% CO2 was the most effective treatment in reducing fungal and bacterial growth during cold storage and shelf-life period. The highest fruit decay percentage was in the figs treated with 20% CO2 during the cold storage. However, there were no differences between 15 and 20% CO2 treatment during shelf-life period. In terms of the disease severity, 15 and 20% CO2 treatment gave the lowest value during the cold storage but 20% CO2 treatment was more effective at shelf life. In can be concluded that 6% O2 + 15% CO2 treatment effectively controlled postharvest decay of fresh fig fruits (“cv. Bursa Siyahi”) during the cold storage and shelf life.

Keywords: Fresh fig, Bursa Siyahi, decay control, high CO2, storage, palliflex

Obtain By Selection Pomologic Characterictis Some Of The Types Of Figs In Province Kastamonu

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Abstract

This resarch was carried out in Kastamonu region of Turkey on fig types (Ficus carica L.) in 2013-2014 years under the project of " The Selection of Fig in the Black Sea Region. Some pomological characteristics of figs were investigated in this study to select the best genotypes for growing. The fruit weight and index, TSS, the ostiol distance, the color of fruit peel and the peeling condition has been examined. This research included types of 8 has been selected in Kastamonu.
The averege fruit weight, the fruit index, the ostiol distance and the soluable dry matter in the water of the types which were selected have been found as 47.20 g, 1.00 mm, 3.20 mm and %14 respectively. The fruit peel takes place in the colours of purple and yellow- green and in the three groups of easy, middle and hard peeled ones. These types can be consumed as fresh and processed in jam.

Keywords: Fig, *Ficus carica*, selection, TSS, fruit weight, ostiole

An Investıgatıon on Bıoecology of *Leptinotarsa decemlineata* (Insecta: Coleoptera) in Nevşehir Provınce & Envıronment

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Abstract

In this study, *Leptinotarsa decelineata* species Say 1824 (Arthropoda: Insecta: Coloeptera: Chrysomelidae) has been analysed both on land and in laboratory conditions, which has a life starting as an egg, then have some relations between their consecutive developmental stages and their bioecological features including nutrition, with the choice and the amount of food they consume that live around Mazı; Nevsehir province in Cappadocia region. *L. decemlineata* is known as the Colorado potato beetle that is one of the most destructive and widespread pests of cultivated potato. According to this study, it was realized that adult individuals of *L. decelineata* species got out of winter period in the first week of May. It has also been determined that *L. decemlineata* laid nearly 25-26 eggs in groups on generally bottom part of leaves after a very short while from mating ritual that happens after winter period. When their larva and pupa development period were analysed in an environment in which temperature is nearly 24 ^{o}C and the amount of moisture is % 43.6, it was observed that 1st term larva got developed in 3-10 days, 2nd term larva in 2-5 days, 3rd term larva in 3-4 days and 4th term larva in 4-9 days and also they became adults after a 8-13 days of pupa period.
Keywords: Insecta, *L. decemlineata,* Bioecology, Agriculture, Nevsehir, Mazı Locality

Studies on the determination of diseases, pests and weeds in leafy vegetables in Eastern Mediterranean Region**

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Abstract

The aim of this project is to detect and control the fungal diseases, pest, plant virus, weeds and nematodes that mainly damage the production of lettuce, parsley, mint, dill, arugula, cress and purslane. This study, performed for the first time in Eastern Mediterranean Region, will reveal the incidence and prevalence of diseases and pest of mentioned leafy vegetables. Survey studies carried out in Adana, Mersin, Hatay, Kahramanmaraş ve Osmaniye province in 2015-2017. Survey conducted in terms of fungal factors in the region; 3-11% of the lettuce areas were found to be contaminated with white rot fungus (*Sclerotinia sclerotiorum*). In terms of viral agents, three viral diseases in the region were found in *Lettuce mosaic potyvirus*, *Miraflori lettuce big vein*, *Tomato spotted wiltt tospovirus* in lettuce plants. All of the production areas were determined to have snail damage on the leafy vegetables. It was determined that snail samples belonged to *Eobania vermiculata* (O.F. Müller, 1774) (Pulmanata: *Helicidae*) species in the diagnoses made from snail samples. As a result of surveys carried out in the region that might pose a problem in economic terms these products are plant parasitic nematodes, bacteria and weeds were not encountered. This project results showed the extent of fungal, pest diseases and weeds of mentioned leafy vegetables. Studies results, that will be performed to develop suitable control measures for the diseases, pests and weeds which are found to be significant, will prevent unconscious pesticide applications.

Keywords: Plant diseases, pests, virus, weeds, leafy vegetables

**** This study was supported by General Directorate of Agricultural Research and Policies, project number TAGEM-BS-15/09-10/02-08 (04).**

Determination of distribution, population change, infestation and damage situation of Olive Moth, *Prays oleae* (Bern.) (Lepidoptera: Hyponomeutidae) causing damage in olive orchards in Mardin province

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Abstract

This study carried out in 2016 and 2017 to determine adult population change, infestation rate and damage of *Prays oleae* Bern (Lepidoptera: Hyponomeutidae) generations which are in leaves, flowers and fruits which causes damage in olive orchards of Dara village and Derik district depend on Mardin province. In the study, the samples were taken from three different orchards containing 30-40 olive trees. Samplings were done weekly by pheromone traps, visual inspection and shoot methods.
As a result of study, it was determined that Olive moth had three peak points in a year, such as in early May, second week of June and in early October. It was determined that it had three generations in a year and adults appeared in April and until November in Mardin province. Depending on the years and the gardens, it was determined that the damage rate was between 12-21% in leaf generations, 2-5% in flower generations, and between 0.8-5% in fruit generations.

Keywords: Olive, *Prays oleae,* Population change, Damage rate, Mardin

Aflatoxin biosynthesis genes and aflatoxin production by *Aspergillus flavus*

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Abstract

Aflatoxins, which are produced by *Aspergillus flavus* and *Aspergillus parasiticus*. are highly toxic and carcinogenic to humans, livestock, and pets. *A. flavus* produces aflatoxins B_1 (AFB_1) and B_2 (AFB_2) whereas *A. parasiticus* produces aflatoxins G_1 (AFG_1) and G_2 (AFG_2) in addition to B_1 and B_2. The *Aspergillus* section *flavi* strains isolated from soil, air, and infected peanut plants were identified using the Intergenic Spacer Gene (IGS) fragments for aflatoxin biosynthesis with Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) in Adana in 2016 in this study. A total of 173 samples were isolated from soil, air, and infected peanut plants. Subsequently, a total of 121 *Aspergillus* strains were identified as *A. flavus,* in which all the isolates were positive to the IGS for targeting the regulatory genes *aflR-aflJ*. Furthermore, Immunoaffinity Chromatography-Reversed-Phase High-Performance Liquid Chromatography (IAC-HPLC) was performed to confirm the biosynthesis of aflatoxin in PCR-RFLP positive *A. flavus* isolates. All 121 PCR positive *A. flavus* isolates produced AFB_1 and AFB_2, when analyzed by IAC-HPLC ranged from 1.55 to 5735.00 µg/L. As a result of this study, it was also demonstrated that positive *A. flavus* isolates were able to produce aflatoxin in soil and infected peanut plants, and it could be considered that aflatoxin-producing strains can be prevented during planting stages.

Keywords: *Aspergillus flavus, aflJ, aflR,* aflatoxin, peanut

*This study was supported by TUBITAK (The Scientific and Technological Research Council of Turkey) within 115O007 project.

P450 Monooxygenase Activity and Gene Expression levels in Acetamiprid Susceptible and Resistant Strains of the Cotton Aphid *Aphis gossypii(Glover)* (Hemiptera:Aphididae)

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Abstract

Neonicotinoid insecticides act on nicotinic acetylcholine receptor and are particularly effective against sucking pests. They are widely used in crops protection to fight against aphids in Çukurova region, Adana. In the present study we evaluated the susceptibility of the cotton aphid Aphis gossypii to the commonly used neonicotinoid insecticide acetamiprid (ACE) with bioassay and molecular methods. The resistant strain exhibited highly resistance to neonicotinoid based on comparison LC50 values with the susceptible strain in cotton aphids. The levels of gene expression for monooxygenase of both resistant and susceptible strains were determined by real-time quantitative PCRs. It has been seen that the resistant strain have too much relative transcription levels and gene copy numbers of the monooxygenase compared with the susceptible strain. These results indicated that the increased expression of the monooxygenase resulted from the increased transcription levels of monooxygenase mRNA was related to neonicotinoid resistance in cotton aphids.

Keywords: Acetamiprid, resistance, *Aphis gossypii*, Gene expression

Evaluation of Antifungal Activity of Organic and Inorganic salts against *Penicillium digitatum*, the causal Agent of Citrus Green Mould

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Abstract

Green mould caused by *Penicillium digitatum* is one of the most economically important postharvest disease of citrus fruits in almost all citrus growing regions of the world. Thresent study evaluated the efficacy of some ammonium, potassium, and sodium salts as possible alternatives to synthetic fungicides for the control of *P. digitatum*. In vitro studies showed that ammonium bicarbonate, ammonium carbonate, potassium bicarbonate, potassium carbonate, potassium metabisulphite, sodium benzoate, sodium bicarbonate, sodium carbonate and sodium metabisulphite completely inhibited the mycelial growth of the fungus at 2% (w/v), whereas potassium benzoate reduced the mycelial growth by 5.4% at the same concentration; however, the difference between the inhibitory effects of the nine salts was not statistically significant ($P<0.05$). With the exception of potassium benzoate, the above-mentioned salts showed a similar effect on conidial germination of the fungus. Among the salts used in the study only potassium metabisulphite and sodium metabisulphite were toxic to the fungus at a concentration of 0.1%. In vivo studies indicated that potassium metabisulphite, sodium benzoate and sodium metabisulphite significantly reduce the severity of green mold in both curative and protective applications, whereas potassium benzoate and ammonium bicarbonate are only curative or protective; however, the difference between the first and the effects of the second group of salts are not statistically significant ($P<0.05$). The results of this study demonstrate that selected salts may be used in controlling of green mold on citrus.

Keywords: Citrus green mould, salts, protective and curative applications, alternative control

In Vitro Bulbous Formation and Acclimatization of *Pancratium maritimum*

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Abstract
Sea daffodil (Pancratium maritimum L. Amaryllidaceae family), is bulbous plants which grown in sandy areas. Bulbs of *Pancratium maritimum* is surrounded by brown tunicate and referred as toxic. Sea daffodil is defined as threatened because of increasing tourism and urbanization activities. So, development of bulbous formation and acclimatization protocols in *in vitro* is important issue. In the study, it was purposed *in vitro* bulbous formation of plantlets and acclimatization. Special thanks are due to the Çukurova University, Scientific Research Projects Coordinating Office (Project No: FBA - 2015 - 4083) for supporting the present study. It was used medium which containing sucrose (20, 40 and 80 gl-1), BA (6-benzylaminopurine) (0, 1 and 2 mgl^{-1}) and 2,4-D (2,4 Dichlorphenoxyacetic acid) (0, 0.1 and 0.2 mgl^{-1}) for bulbous formation. The effects of modified medium on bulb formation and development, length and diameter of bulb, root and leaf length, root and leaf thickness, leaf number, bulb and plant fresh weight were investigated in this study. In terms number of plants that formed bulbous and bulb formation rate, all medium has been successful. Diameter of bulb increased with high sucrose (80 gl^{-1}) in growth medium. In terms of bulb weight, effect of plant growth regulators has been more pronounced in nutrient medium which containing low sucrose (20 gl^{-1}). After plant formation, plantlets were transferred three different media for acclimatization: sand, peat:sand (1:1) peat. Bulb diameter and length, root length, length and thickness of leaf were evaluated after acclimatization. All acclimatization media was successful, but media significantly affected to root and leaf length. In this respect, peat was better medium for initial of acclimatization. Therefore, more efficient protocols to bulb formation and acclimatization were predicted for *P. maritimum* in this study.

Keywords: acclimatization, BAP, bulb, sucrose, tissue culture, 2,4 D

The Effects of Salinity on Plant Growth and Physiology of Ornamental Cabbage

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Abstract

Salinity in soils is one of the major problems for growing ornamental plants and this problem reduce plant growth and visual quality. Ornamental cabbage is used as bedding plants for color and landscape contrast. They can be planted for creating dynamics effects in the landscape. This study was conducted to determine the effects of salt stress on plant growth and physiology of ornamental cabbage. For this purpose, three ornamental cabbage cultivars (Kamome Pink, Pigeon Purple and Pigeon Victoria) were exposed to five different salinity levels (0, 25, 50, 100, 200, 400 mM NaCl). In this study, plant height, plant canopy width, root length, root collar diameter, stem diameter, number of leaves, fresh and dry weights of plants, ratio of root to shoot, visual scale, compactness were determined as plant growth parameters. Leaf chlorophyll concentration (SPAD readings), PSII and moisture content on wet basis were investigated as physiological parameters. According to the results there are statistically differences interaction of salinity treatments and cultivars. Plant growth parameters were negatively affected in 200 and 400 mM NaCl treatments. In parallel, physiological parameters generally decreased by increasing salinity levels depend on ornamental cabbage cultivars. Special thanks are due to the Çukurova University, Scientific Research Projects Coordinating Office (Project No: FBA-2016-6999) for supporting the present study.

Keywords: Bedding plant, Plant growth, PSII, Salt stress, SPAD

Primarily Evaluation of Hernandina Mutant Population Derived By Gamma Irradiation

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Abstract

The presence of a large number of seeds in citrus fruits is a big hindrance in consumer acceptability even if fruit posses high organolaptic properties. Therefore seedlessness became an important breeding objective of most citrus variety improvement programs. Irradiation, used principally to reduce the seed content of normally seedy varieties, represents a more rapid method of achieving seedlessness than hybridization in citrus. Several citrus varieties have been developed by irradiation programs in order to obtain seedlessness. In the present study Hernandina mutant population was evaluated in terms of fruit quality traits. Mutant population was derived by irradiating budwoods of Hernandina mandarin variety by a ^{60}Co gamma source with 50Gy. A total of 363 M_1V_3 plants were obtained and planted in the field as a result of the mutation breeding program. Among the mutant population, 89 plants had fruit set in the first year of plantation and these plants were evaluated in terms of 20 fruit quality traits. Data obtained from the pomological analysis were subjected to distrubition analyses for evaluation of the results. Fruit diameter of the population ranged between 43.63-69.11 mm and fruit weights were between 40-154 g. Seed number of the population ranged between 0-11 seeds per fruit. 53% of the evaluated genotypes had been described as low seeded and one of them was completely seedless. The stability of mutations detected is being evaluated and new commercial field trials will be established with these materials.

Keywords: mutation breeding, irradiation, seedlessness, mandarin, citrus

Genetic Control of Flowering in Pea (*Pisum sativu*m L.)

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Abstract

The time of flowering is one of the main adaptive traits in the survival strategy of flowering plants. This trait is an important factor of crop adaptation and yield. The studies on the genetic control of pea flowering time have been made since quite a long time ago. When theoretical studies are carried out on the pea flowering time, the short day (SD) and long day (LD) conditions of growing season are taken into consideration. In the same way, the flowering time and the first node position (NFI) of the flower are directly related. Over 20 loci related to flowering time and inflorescence development have been identified in pea. Four of these have emerged as natural mutations: Lf, E, Sn, and Hr. These are the major loci for pea flowering and photoperiod. Genotypes owning dominant alleles of these loci tend to flowering under long day conditions. In this review, genetic control of flowering in pea has beensummarizedin a format relevant for application to pea breeding.

Keywords: *Pisum*, Flowering, Breeding

The Quality of Fresh-Cut Green Onions Treated with Different Application Times of Ultrasound.

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Abstract

This study was conducted to determine the effect of ultrasound treated at different duration on posharvest quality of onions. In the study, the onions were pulled, cleaned, sorted and washed. Then they are divided into two part as green and white. After this, they were subjected to 52 dB ultrasound in water at the temperature of 24±1°C for 2, 5, 10 and 15 minutes . Onions not applied were evaluated as control. In addition, as the application was made in water, it was used as a second control in onions kept in water for 5 minutes. After the applications, the onions were dried and placed in the foam dishes (200 g onion per dish), and is wrapped polyethylene stretch film, and then were stored in a cold room containing 4 ± 1 °C temperature and 85-90% relative humidity. At the beginning of the research and at the five days intervals; color (*L*, a*, b**), total soluble solids (%), chlorophyll (SPAD), axle length (mm), axle diameter (mm) and weight loss measurements were performed in white and green parts of onion. According to the results of the experiment, 5 minutes of ultrasound application was decreased the amount of elongation and weight loss, increased brightness of white part (L * value), reduce yellowing (b * value), and slowed the progression of TSS in the white part. However, the amount of chlorophyll (SPAD) in the green part was reduced in all ultrasound applications. For this reason, 5 minutes of ultrasound application may be recommended as the best practice for quality preservation.

Keywords: Green onion, Ultrasound, Treatment duration, Postharvest, Quality.

The Effects of Irrigation on Some Physiological Response of Pomegranate Varieties

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Abstract

Pomegranate (*Punica granatum* L.) is a characteristic species of the Mediterranean area whose use and culture are of longstanding tradition. It is an important horticultural crop for both domestic and export markets in Turkey. It adapts to all kinds of climate and soil and it can tolerate long periods of drought once the plant is established but regular irrigation is mandatory in commercial production. We investigated the effect of different irrigation water amounts on nutrient uptake and content of leaf pigments of 10-year old pomegranate trees two consecutive years. Three different irrigation water quantities were applied by drip irrigation system. First leaf samples were taken a week before starting the irrigation treatments and continued until the end of the harvest season with four weeks interval. Results showed that leaf content of phosphorus, potassium, calcium, iron, and zinc was affected with quantity of irrigation water in the first year. But in the second year, only phosphorus content changed by the irrigation levels.

Keywords: *Punica granatum* L, Pomegranate, deficit irrigation, leaf content, chlorophyll

Effects of Various N Forms on Growth, Physiology and Root Morphology of Pepino . (*Solanum Muricatum*) in Hydroponic System

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Abstract

Generally, plants perform best on mixtures of both nitrogen (N) forms compared to sole nitrate (NO_3^-) or ammonium (NH_4^+). The aim of this study was to determine the effects of different N forms on shoot growth and root morphological development of pepino (*Solanum muricatum*) in hydroponic growth system. The experiment was conducted in a controlled growth chamber (25/22 °C day/night temperature, the was 65-70% relative humidity, 350 µmol m^{-2} S^{-1} photon flux) situated in the Plant Physiology Laboratory of Erciyes University, Faculty of Agriculture. Plants were grown in a 8 L vessel filled continuously aerated nutrient solution (modified Hoagland) containing 1000 µM N as sole nitrate ($Ca(NO_3)_2$), 1000 µM N sole ammonium ($(NH_4)_2SO_4$) or 50% mixed of both N forms (Mix1: 2000 µM N, Mix2: 4000 µM N). The hydroponic experiment was arranged in a completely randomized block design with four replications. Two plants per pot were harvested 35 days after treatment (DAT) by separating into shoot and roots. The results indicated that shoot growth (fresh and dry matter), leaf physiological development (leaf area, SPAD value, photosynthesis) and root morphology (root fresh and dry matter, root length, root volume) growth significantly ($P<0.001$) affected by different N forms. A lowest performance under sole NH_4^+ supply was achieved, since it severely reduced shoot and root growth as compared to sole NO_3^-, Mix1 and Mix2 treatments. Best growth performance in shoot growth (fresh and dry matter) was achieved under Mix2 supply, while root growth (root length and volume, root/shoot ratio) and leaf physiological development (leaf area and photosynthesis) significantly improved under sole NO_3^- supply. All these clearly indicate that application of sole ammonium (1000 µM N) is detrimentally toxic for hydroponically grown pepino. On the other hand, a 50% mixed of ammonium with nitrate even at a higher doses (2000 µM ammonium N) can be more advantageous for the plant growth and development if the both N forms are evenly distributed in the nutrient solution.

Keywords: *Solanum Muricatum,* Nitrogen, Ammonium toxicity, Root morphology

ESTIMATION OF SOIL LOSSES IN ÇELİKLİ BASIN THROUGH WEPP HILLSLOPE MODEL

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Soil erosion is considered as a very serious danger in terms of both environmental and economic aspects in our day. Particularly, it is very important to evaluate the soil losses that occur in agricultural land due to soil treatment. There are many models used in the numerical evaluation of erosion processes. One of these models, the WEPP Hillslope model is widely used in the world while it is not commonly used in Turkey. The data inputs of the model include 4 files being the climate file including daily climate characteristics, the slope and length of the land, the soil characteristics and engagement practices.

In this study, soil losses occurring in agricultural land under wheat-fallow rotation in Celikli Basin were estimated using WEPP Hillslope model. To this end, the effect of soil treatment on soil erosion was evaluated in two separate periods, being the years 1993-2002 and 2003-2012.

Keywords: Çelikli Basin, WEPP Hillslope model, Soil losses

The effects of *Azotobacter chrococcum* inoculation on some microbiological characteristics in soils with different organic waste added

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Abstract

In this study analyzed, with a greenhouse test, the impact of *Azotobacter chroococcum* indigenous isolate inoculation on the microbial respiration and microbial biomass C content of soils with different organic waste added. For this purpose, wheat straw, rice straw, tobacco waste, soybean stem was used as organic waste while RK49 race was used as the indigenous *A.chroococcum* isolate. 5% over dry weight doses of organic wastes was added to loamy soil within pots of 5 kg, and afterwards, the soils were inoculated adding 10 ml of *A.chroococcum* isolate from liquid culture (10^9 CFU/ml). The seeds of wheat (*Triticum aestivum*) were planted manually to each pot (15 pieces/pot). The test lasted for 124 days. The microbial respiration (BSR) and microbial biomass C (Cmic) contents of soil samples obtained from each pot was determined at the end of harvest, and changes in microbiological characteristics of soils caused by the applications were analyzed. At the end of the experiment, it was determined that the BSR and Cmic content of the soils increased considerably as a result of the application of different organic materials. It was also determined that the BSR and Cmic content increase of the soils inoculated with *A.chroococcum* RK49 isolate besides different organic wastes was higher than that of soils without inoculation. While the highest BSR content was attained in tobacco waste application in soils without *A.chroococcum* RK49 isolate inoculation, the highest Cmic content was determined where *A.chroococcum* RK49 was inoculated with tobacco waste.

Keywords: Organic waste, *Azotobacter chroococcum*, soil, inoculation, soil respiration, microbial biomass

Effects of Pyrochars Obtained from Different Organic Wastes on Soil Enzyme Activities

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Abstract

The aim of this study was to determine the effects of different pyrochars on a series of soil enzyme activities in vitro conditions. Pyrochars derived from sewage sludge (SS), poultry manure (PM) and pomace (P) were mixed with soil at the rates of (2.5, 5.0 and 10.0 $t.da^{-1}$) and incubated at 25°C for 120 days. Urease (U), alkaline phosphatase (AP) and β-glucosidase (BG) enzyme activities were determined in the soil at the beginning (T0) and 120 days (T120) of incubation. Our findings showed that under SS and PM pyrochar applications, the enzyme activity of U decreased as the application dose increased at T120. However, P pyrochar according to U enzyme activity was observed in the reverse direction of the two other pyrochars at T120. At the T0, U enzyme activity did not show significant difference between application dose and time. Under SS, PM and P pyrochar applications, AP enzyme activity of SS, PM and P pyrochars showed the highest activity at the T0, but BG enzyme activity of these pyrochars showed the highest activity at the T120. The regression coefficient for the relationship between these enzyme activities and SS, PM, and P pyrochars were 0.94, 0.70 and 0.28 for U; 0.43, 0.77 and 0.69 for AP; 0.53, 0.77 and 0.98 for BG, respectively. Generally, there was clear relationship between SS, PM and P pyrochars in terms of U, AP and BG enzyme activities at T0 and T120 and three applications dose.

Keywords: Alkaline Phosphatase, Urease, β-Glycosidase, Pyrolysis, Pyrochar.

Fertilization practices under intensive agricature in an irrigated area: Survey study

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Abstract

Soil nitrogen (N) is one of the essential elements for plant growth. Since nitrogen is one of the essential elements for agriculture, observing and surveying nitrate and other nitrogen forms is a matter of vital importance for the environment. Establishing local fertilizer programs and doses in crop production is very important to maintain sustainability of economic and environmental conditions. The research area Akarsu Irrigation District (AID, 9495 ha) is located in the Mediterranean coastal region comprising the most intensively cropped and irrigated area of southern Turkey near Adana. For this study, field trips for surveying were conducted, and fertilizer types, rates and dates were recorded for each crop during face to face interviews with farmers. While surveying, the irrigation types, dates and frequency were also recorded for the survey. Survey studies were carried out in two different times, 2014 and 2016. Survey results showed that there is no standard application dose of fertilizers, including N, neither for each type of crop nor individual farmer. The applied average amount of N for citrus, corn, wheat and soybean are 335, 385, 230 and 120 kg N per hectar, respectively. As a result of this survey differences in farming habits were observed. Among these differences: Different hybrid seed types, applied fertilizers and application methods differing according to climate are the most striking ones. For this reason, survey studies need to be carried out regularly in the areas where intensive farming is a common practice.

Keywords: Fertilizers, Nitrogen management, Surveys

Species of The Pest and Beneficial Insects in the Cabbage Fields of Muş, Bitlis and Van Provinces

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Abstract

Cabbage is one of the vegetables that grows in cold regions and is important for human nutrition at the same time. There are some pest species that cause damage to cabbage plants and cause economic loss, and it has been determined in recent years that the use of pesticides against the pest species is increasing. This study was carried out in 6 locations in order to determine the pest and beneficial insect species in the cabbage fields of Muş, Bitlis and Van provinces in 2017. In this study, sweep net, visual control and cultural methods were applied. Pieris rapae (L.) and Pieris brassicae (L.) (Lepidoptera: Pieridae) were identified as the main pest species of Pieridae that fed on the leaves as a result of surveys in the first year of the work. Plutella xylostella (Linnaeus) (Lepidoptera: Plutellidae), Brevicoryne brassicae Linnaeus (Hemiptera: Aphididae), Aleyrodes proletella (L.) (Hemiptera: Aleyrodidae) and Sphrageidus melania species have also been identified. Two species of the larva parasititon Microgastrinea (Hymenoptera: Braconidae) and Cotesia glomerata (Linnaeus, 1758) (Hymenoptera: Braconidae) of Pieris brassica and Pieris rapae L. (Lepidoptera: Pieridae) were identified at the same time when Polistes gallicus was determined as a predator. As a result, P. brassicae and P. rapae may be potentially pest in these areas, so it is necessary to control the fields at certain intervals with the cultivation of the cabbage. it is suggested that the most appropriate decision should be made for the struggle with pestisite according to the density state of the parasitoids and the closeness of the plant to the harvesting period.

Keywords: cabbage, lepidoptera species, parasitoids, pest

Muş, Bitlis ve Van İlleri Lahana Ekim Alanlarında Bulunan Zararlı ve Faydalı Böcek Türleri

Abstract

Lahana soğuk bölgelerde yetişebilen, aynı zamanda insan beslenmesi yönünden önem taşıyan sebzelerden birisidir. Lahana bitkilerinde zarar yapan ve ekonomik kayba neden olan bazı zararlı türler bulunmakta ve son yıllarda bölgede zararlı türlerine karşı pesitisit kullanımının da giderek arttığı belirlenmiştir. Bu çalışma 2017 yılında Muş, Bitlis ve Van illeri lahana ekim alanlarındaki zararlı ve faydalı böcek türlerin belirlenmesi amacıyla 6 lokasyonda yürütülmüştür. Bu çalışma kapsamında atrap, gözle kontrol ve kültüre alma yöntemleri uygulanmıştır. Çalışmanın ilk yılında yapılan sürveyler sonucunda ana zararlı olarak yapraklarda beslenerek zarar yapan Pieridae familyasından Pieris rapae (L.) ve Pieris brassicae (L.) (Lepidoptera: Pieridae) belirlenirken Plutella xylostella (Linnaeus) (Lepidoptera: Plutellidae), Brevicoryne brassicae Linnaeus (Hemiptera: Aphididae), Aleyrodes proletella (L.) (Hemiptera: Aleyrodidae) ve Sphrageidus melania türleri de tespit edilmiştir. Predatör olarak Polistes gallicus belirlenirken Pieris brassica ve Pieris rapae L. (Lepidoptera: Pieridae)'nin iki larva parazitoiti Microgastrinea (Hymenoptera: Braconidae) ve Cotesia glomerata (Linnaeus, 1758) (Hymenoptera: Braconidae) türleri de aynı zamanda belirlenmiştir. Sonuç olarak P. brassicae ve P. rapae'nin potansiyel bir zararlı olabileceğinden lahanaların tarlaya ekimiyle birlikte belirli aralıklarla tarlaların kontrolünün yapılması ve ilaçlı mücadele için parazitoitlerinin yoğunluk durumuna ve bitkinin hasat dönemine yakınlığına göre en doğru kararın verilmesi gerektiği önerilmektedir.

Anahtar Kelimeler: lahana, lepidopter türler, parazitoitler, zararlı

Organic Plant Production in Kocaeli /Turkey and Proposals for Growth of Organic Plant Farming

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Abstract

Organic agricultural production is targeted to be 8% in Turkey in 2020. In this context there are governmental supports for organic agricultural producers such as direct income support, product based support and support for the producers who enter the Protection of Agricultural Land for Environmental Purposes Programme. Although Kocaeli is mostly known as an industrial province, the province has considerable potencial for agricultural plant production via temperate climate and generous land. In the city there are total of 93852.1 ha cultivated area consisted of vegetable plantation, fruit orchards and crops fields. The increase of organic agricultural plantations in the city will help protection of agricultural land, water and soil resources. In addition, agricultural-based pollution will be reduced through the legal control of inputs in organic farming. According to the data of the year 2017, there are totally 9 registered organic plant producer farmers in Kocaeli. 2 of them are certified organic plant producers , the other 2 of them are in both organic and transition period and the remaining 5 farmers are only in the status of transition period. The 9 registered organic plant farmers carried out their plant production in 9 different villages in Kandıra, Gebze, Karamürsel, Gölcük, Körfez and İzmit districts in Kocaeli. They produce different kind of crop, vegetables and fruit on a commercial scales. In this study some suggestions are made for the increase of organic plant production for the city by considering the latest organic plant production data obtained from Kocaeli Provincial Directorate of Ministry of Food Agriculture and Livestock.

Keywords: Organic farming, Kocaeli, Turkey, 2017

DETERMINATION OF HCN CONTENT IN SOME SILAGE SORGHUM GENOTYPES

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Abstract

The experiment was carried out at Field Crop Department of Bati Akdeniz Agricultural Research Institute, in Antalya,in Turkey in 2017. The experiment was consisted of forty seven genotypes of silage sorghum. The study was laid out in a completely block design with three replications. After harvesting, the seed samples were analyzed to determine the amount of HCN. The collected data were analyzed and the means were done multiple range test at 1% level of probability by Duncan's. Among the genotypes, showed significantly differences with regard to HCN content. The HCN ratio in sorghum genotypes were varied between 8.2 and 58. The highest HCN content were detected in 3, 17, 111, 157, 168 and 214 genotypes. As a result of the trial, it can be said that the HCN content may be used breeding criteria.

Keywords: Sorghum genotypes; Breeding criteria; HCN content,

The Effect of Gibberellic Acid Applications on Some Germination Parameters in Oats Under Salt Stress

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Abstract

This study was conducted to determine the effect of gibberellic acid applied to various salt concentrations on some germination properties of oats. The experiment was established in randomized parcels with 3 replications according to the factorial regulations. 5 doses of GA3 (0, 60, 120, 240 and 480 mM) and 4 doses of salt (0, 75, 150 and 225 ml) were used in the experiment. The germination rate, radicula and plumula length, radicula and plumula dry weight were calculated. The effects of increased salt concentrations on germination rate, radicala length and plumula length were found to be very important. The parameters we studied at concentrations of 150 and 225 mM over the 75 mM salt concentration were greatly affected. In oats, the salt concentration of 225 mM is excessive. Another consequence of our research is that we can not fully see the effects of GA3 applications. The reasons for this are; It is thought that the oat flour is not able to produce results such as the GA3 doses are not sufficient and GA3 concentrations can be extended a little longer.

Keywords: Salinity, Gibberellic Acid, Germination, Oat

The Investigation of Biodiesel Production Techniques

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Abstract

Today, increasing energy demand and consequent environmental pollution have made the search for alternative fuels compulsory. Biodiesel, which is one of the alternative fuels, can be produced from waste oils, vegetable oils and animal fats, and it is preferred since it is a clean fuel.
In the production of biodiesel, the plants such as canola, sunflower, safflower, soy, cotton seed, poppy seed, flax seed and ground nuts; the fruits with high oil ratio such as nuts, olives, almonds, walnuts; animal oil and some algaes are made use of. Taken into account the advantages and disadvantages, it seems biodiesel will be an indispensable fuel for the future with some legal regulations.
In this study, the methods of biodiesel production are discussed. The method used in the production of biodiesel has five types: Dilution Method, Micro-Emulsion Method, Pyrolysis Method, Transesterification Method and Super Critical Method.
Generally, the most commonly used method is transesterification method since its production cost is low, it decreases the viscosity of vegetable oils best, and the biodiesel obtained through this method has closest features to diesel fuel.

Keywords: *Biodiesel, Biodiesel production methods, Methyl ester, Transesterification.*

Determination of a microsatellite marker set to distinguish tobacco genotypes grown in Turkey

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Abstract
Tobacco cultivars grown in Turkey are old cultivars or landraces. Seeds of the landraces are maintained by farmers. The seed exchange between farmers results in production of the same varieties under different names in different regions. Thus, an efficient variety identification system is needed. This study was conducted to determine a marker set to distinguish tobacco genotypes grown in Turkey. A total of 15 genotypes from different tobacco types were screened with 21 good quality microsatellite (SSR) markers. Eight of the genotypes were landraces (Tombeki, Delitutun1, Delitutun2, Delitutun3, Delitutun4, Gurs, Kultik and Celikhan) and seven were cultivars (Sarıbaglar, Karabaglar, Ozbas, Nail, Canik, Xanthi-81 and NC-55). Of the 21 SSR markers examined, 17 produced polymorphic bands on genotypes used. Markers had an average of 3.38 alleles. The PIC values ranged from 0.00 to 0.741. According to dendrogram based on SSR marker data, there were three groups. The first group had genotypes of Virginia or semi-oriental tobaccos, while the second group had oriental and the third group had Mahorka type of tobaccos. Microsatellite fingerprint analysis clearly classified tobacco genotypes similar to their type of use. A set of ten SSR markers was enough for a fast and reliable determination of the type of unknown tobacco specimens.
Keywords: Diversity, microsatellite markers, polymorphism**,** *Nicotiana tabacum*

Determination of Leaching Water Norm by Mathematical Modelling in Reclamation of Boron Soils

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Abstract
A considerable part of study area has boron-sodic and saline properties. In this study, in reclamation of boron soils were used water and sulfur (S). Empirical models were used in determining of leach water norm in the reclamation. Analytical expressions of these models are hyperbolic, force, exponential and logarithmic. At the same time, by choosing the most appropriate from these models, will use these models in large-scale leaches. Nine (2x2m) parcels were used to obtain the necessary data to construct these models. Soil samples were taken from the parcels at depths of 0-25, 25-50, 50-75, 75-100 cm and leach water norm models were established with the obtained values. The parcels; sulfur in the amounts of control (S_0), 4 (S_1) and 8 kg (S_2) were applied into the soil. Model selection criteria were applied to determine suitability of models. The following values were obtained for each application after the comparison of the eligibility criteria of the obtained models: For S_0;Correlation Index (η) 65.3172, Root Mean Square Error (σ) 0.0547, Agreement Index (D) 0.7698 and Akaike Information Criterion (AICc) -5.6368 with the force model, for S_1; the Logarithmic model with η: 77.8010, σ: 0,0958, D: 0.8655 and AICc: -4.5163 and the exponential model with η: 71.4723, σ: 0.0688, D: 0.8159 and AICc: -5.1790 reflected the most appropriate of the test data.

Keywords: Boron, Boron soils, Leaching Water Norm, Modelling

Effects of Organic Conditioner Applications on Microbial Biomass Carbon Content in Soils Having Different pH Levels

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Abstract

This study was carried out to determine the effects of rice husk compost, town waste compost and tobacco waste applications on soil microbial biomass carbon content in soils having different pH levels under greenhouse conditions. Soil samples used in this study were taken from (0-20 cm) depth of soil surface of the fields around Samsun. Used as organic conditioner; town waste compost was provided from İstanbul Metropolitan Municipality Kemerburgaz separation unit, tobacco waste was provided from Samsun-Ballıca tobacco factory, rice husk compost was provided from Ondokuz Mayıs University Faculty of Agriculture. In the study carried out in split plot experimental design, rice husk compost, town waste compost and tobacco waste were applied into soils at four doses (0, 2.5, 5.0 and 7.5%) with two replications. After a month of incubation period, plants were grown in prepared media. According to analyses and evaluation of the results, it was determined that generally applications of rice husk compost, town waste compost and tobacco waste into acidic (Tepecik), neutral (Kampüs) and alkaline (Çetinkaya) soils increased microbial biomass carbon content of soils. Acidic soils (Tepecik) have maximum increase with rice husk compost's 3. doses, neutral reactive soils (Kampüs) have maximum increase with rice husk compost's 2. doses and alkaline reactive soils (Çetinkaya) have maximum increase with tobacco waste's 3. doses. Also tobacco waste's 3. doses and rice husk compost's 3. doses applications were reduced microbial biomass carbon content in neutral reactive soils.

Keywords: Soil, Microbial Biomass, organic waste, pH

PUMPKIN SEED (*Cucurbita pepo* L.) PRODUCTION UNDER DIFFERENT NITROGEN DOSES

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Abstract
Middle Anatolian Region especially Kayseri and Nevşehir provinces produce 68 percent of total pumpkin production of Turkey. This study was conducted in Kayseri to determine different nitrogen doses on Develi population pumpkin plant (*Cucurbita pepo* L.) irrigated with drip system in Erciyes University Agricultural Research and Training Center. Three nitrogen doses N_9= 90 kg ha^{-1}, N_{12}= 120 kg ha^{-1} and N_{14}= 140 kg ha^{-1} were applied during pumpkin seed sowing as a base fertilizer by 15-15-15 compose mineral fertilizer. Additional 5 kg ha^{-1} nitrogen were applied to all the treatments during fruit enlargement period by KNO_3 fertilizer. Root zone soil moisture was monitored by Neutron moisture meter and depleted water applied by drip irrigation system. Each nitrogen treatment was replicated three times in the experiment designed according to completely randomized plots in blocks. Pumpkin plant consumed nearly 390 mm water under drip irrigation during growing season. Pumpkin seed yields were 1036, 899 and 947 kg per hectare and fruit yields 45.89, 41.74 and 47.28 tons per hectare for N_9, N_{12} and N_{14} treatments, respectively. Higher nitrogen application treatments were not caused significant differences in mean fruit weight, fruit number per plant, fruit sizes, fruit yield, seed yield, 1000-seed weight and seed percent above 9 mm, 8 mm and below 8 mm sieve sizes. N_9 treatment look likes sufficient to supply nitrogen needs of Develi population pumpkin under drip irrigation system.

Keywords: Pumpkin seed, nitrogen doses, drip irrigation, Develi population

Morphological Characterization of *Polygonum* Species Collected From the Central Black Sea Region

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In this study collection and characterization of *Polygonum* species naturally grown in the Central Black Sea Region and consumed in different forms by public was aimed. Surveys and field studies were carried out in Samsun, Ordu, Amasya and Tokat where these species were intense. Thirty-seven *Polygonum* genotypes were collected and these were identified as six different species (*Polygonum arenastrum*, *Polygonum cognatum*, *Polygonum aviculare*, *Polygonum salicifolium*, *Polygonum setosum*, *Polygonum luzuloides*). It was identified as a common feature in the materials that plant grew horizontally and had rhizoma. The highest leaf length and the highest leaf width were determined in *P. setosum* and *P.arenastrum*, respectively. Internode length values ranged from 7.7 to 15.8 mm. Ends of green colored and lance shaped the leaves were pointed. Flowers were small and pink colored in only *Polygonum setosum* species and in others flowers were small and white colored. Flowering began on April 22 and harvest began in April and continued until the first week of May. The most yielding *Polygonum* species was found to be *P.aviculare* (0.514 g). Seeds were black and long-round shaped but amount of seed per plant and 1000 seed weight changed according to the species. The highest seed was determined in *P.arenastrum* and *P.aviculare* species. 1000 seed weight of species varied between 1.3 g and 3.0 g. It has been found in the surveys that, *Polygonum* grows in quite different ecological conditions and this ecological difference results in morphologic variations between species.

Keywords: *Polygonum*, species, morphological characterization, wild plant.

Determination of graft compatibility status of pear cultivars grafted on different rootstocks by using carbohydrate analyses

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Abstract: In modern pear growing, clonal quince and pear rootstocks are used because they are easy to maintain and harvest, to improve dwarf and to obtain high quality fruits according to pear seedling rootstocks. Varieties which are thought to be propagated in modern fruit growing are grafted on rootstocks with different growth and development vigor. However, when grafting practices are made between different species or genera, incompatibility may occur between the grafting patterns. Graft compatibility of scions and rootstocks can be determined by morphological, anatomical, physiological and biochemical investigations. Carbohydrates produced by shoots and leaves are an ideal marker for determining the compatibility between scion and rootstock. Therefore, this study was carried out to determine the graft compatibility status of the 'Deveci' and 'Williams' pear cultivars with different pear and quince rootstocks by carbohydrate analysis in the Samsun, Turkey, ecological conditions during the 2015-2016 years. The amount of starch, sugar and carbohydrate in the 2 cm wood samples taken grafting union, above and below the graft union was determined in the study. Carbohydrate accumulation in the graft union was also observed with iodized potassium iodide (KI) staining. In terms of rootstocks, there were no differences in starch and carbohydrate content, but statistical differences were found in sugar contents. Significant differences were also found between cultivars and graft union in terms of the examined traits. Sugar content was highest in OHF 333 and lowest in seedling. There was no statistical differences in the starch content between the graft unions of the 'Deveci', while starch accumulation was higher above the grafting site than the below and graft union in the 'Williams' cultivar grafted on the quince rootstock. In the study, it was determined that there was more carbohydrate accumulation in the scion and graft union than the below of graft union in 'Williams' grafted on quince rootstock, which was also confirmed by staining with KI. As a result of the study, it was concluded that carbohydrate accumulation could be used in determining the graft compatibility of the pear cultivars with the different quince and pear rootstocks.

Keywords: Pear, starch accumulation, graft compatibility, sugar content, carbohydrate

The Effects of Ultrasound Treatments with Hot Water on Postharvest Quality of Fresh-Cut Green Onion

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Abstract

The fresh onion, which has a short life after harvest, comes to the forefront with its nutritious and appetizing properties. Especially yellowing in the green parts and the elongation of white axle with dulling is known as a significant post-harvest losses of green onion. The aim of this study is to determine the effect of ultrasound treatment at different temperatures on post-harvest quality of onions. In the study, onions were harvested and then cleaned, sorted, washed and cut into two halves. After this, 52 dB ultrasound for fifteen minutes was applied to fresh-cut onions in the ultrasonic bath containing water at 35°C, 40°C and 45°C temperature. Onions that have not been treated with ultrasound are used as controls. After the applications, the onions were dried and placed into the polystyrene foam dishes as it will be 200 g onion in each dish which is then wrapped with polyethylene stretch film. After packaging, the onions were stored in cold room at a temperature of 4 ± 1 ° C and relative humidity of 85-90%. At the beginning of the experiment and at intervals of 5 days; color (*L*, a*, b**), total soluble solids (%), chlorophyll (SPAD), axle length (mm), axle diameter (mm) and weight loss measurements were performed in white and green areas. According to the results of this study, while 45°C temperature treatment decreased weight loss and increased brightness in white part, it accelerated chlorophyll breakdown. It is suggests to continue similar studies because of the positive effect of temperature application on the white part of onion.

Keywords: Green onion, Ultrasound, Hot water, Postharvest, Quality

Effect of Different Osmotic Pressure Levels on Germination Characteristics of Kidney Bean (*Phaseolus vulgaris* L.)

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Abstract
This study was carried out in Gaziantep University, Nurdağı Vocational School in order to determine the germination performances of 2 different kidney bean genotypes (Kınalı and Şelale) at 5 different osmotic pressures (0, -3, -6, -9 and -12 bar). In the study, the characteristics of radicle wet weight, plumule wet weight, radicle dry weight, plumule dry weight, radicle length, plumule length and germination rate were examined. On the research, radicle wet weight, plumule wet weight, radicle dry weight, plumule dry weight, radicle length, plumule length and germination rate varied between 0.161-0.085 g, 0.491-0.229 g, 0.019-0.015 g 0.046-0.024 g 5.215-3.321 cm, 5.279-2.312 cm and 95.00-78.33% respectively According to the results obtained, differences between the varieties in terms of radicle wet weight, plumule dry weight, radicle length and plumule length were statistically significant.

Keywords: Osmotic Pressure, Kidney Bean, *Phaseolus vulgaris* L., Germination

Switch to Organic Tea Production in Rize, Turkey

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Abstract

Tea production can be seen at the zone beginning at the Georgia border of the Black Sea region up to the Fatsa district of Ordu. Tea production areas are present foremostly in Rize, Ordu, Giresun, Trabzon and Artvin. These region represents the top zone tea production areas in the World. The region beginning from the Georgian border up the district Araklı represents the most suitable and primary high yielding tea plantation areas in Turkey. Tea is the most important income resource of people settled in this region. With the switch of the Hemşin district to organic tea production and with future plans to switch also in Rize gradually to organic tea production this have become important. There are no research displaying how to use which organic fertilizers in this tea plantation areas. Preliminary results showed that soil pH could be increased from values of 3.5 up to 4.5 in 9 different trial locations. Green leaf yield was approximately near or over the yield values compared with recıommended chemical fertilizer applications. Presented results will give breif information about the possibilities fort he potential switch to organic tea production in Turkey.

Keywords: *C. sinensis*, tea, organic tea, organic fertilizer

Molecular Characterization of ITS Regions of *Ditylenchus dipsaci* Isolated Fron Garlic

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Abstract

Garlic (Allium sativum) is one of the most important crops in the world and Turkey due to its wide use area. However, there are many biotic stess factors that limit the production of garlic. One of these is Ditylenchus dipsaci nematode, a plant parasite. These nematodes usually live in soil, water, and decaying plant parts. Ditylenchus dipsaci has a broad host spectrum and can infect 500 different plants. Stem and bulb nematode D. dipsaci is one of the most important biotic stresses that cause great damage to farmers by limiting the production of garlic. For this reason, it is very important to determine the type of this nematode that develops in the garlic plant. In this study, the molecular characterization of D. dipsaci nematode with species specific primer sets (DIT5 F - DIT5R, 18S - 26S, H05 - H06) was completed and species identification was performed.

Acknowledges
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Keywords: garlic, stem and bulb nematode, *Ditylenchus dipsaci*, Turkey.

Breeding vegetative turf-type bermudagrass cultivars

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Abstract
Turkey is within the center of diversity for bermudagrass [*Cynodon dactylon* (L.) Pers.]. The objective of this study was to develop triploid bermudagrass hybrids suitable for use as turfgrass. Drought resistant tetraploid C. *dactylon* genotypes collected from Turkey were crossed with a diploid C. *transvaalensis* Burtt-Davy from South Africa. The DNA was extracted from the seedlings, and the hybrids were identified using both SRAP and SSR molecular markers. SRAP and two SSR markers confirmed the hybridity of 170 genotypes. The hybrids were propagated vegetatively and transplanted into the field at the Akdeniz University in Turkey. Experimental design was randomized complete block design with three replications. Hybrids were evaluated for their color, quality, establishment rate and general turfgrass characteristics. Eight weeks after transplanting, the establishment of interspecific hybrids ranged from 1 to 100% (ave. 59%) compared to commercial check 'Tifway' at 55%. Transgressive segregation was evident for faster establishment rate among the hybrid progeny. Turfgrass quality of the hybrids ranged from 1.8 to 8.5 ($\bar{x}$ = 5.5) in summer where quality of Tifway was 6.6. Some of the hybrids provided superior darker green color and higher shoot density than Tifway. Results of three year field evaluation suggest that the best six hybrids with superior turfgrass characteristics to Tifway can be commercialized.

Keywords: *Cynodon dactylon*, *Cynodon transvaalensis*, interspecific hybrids, turfgrass

Auxin signaling pathway as a potential strategy to improve tomato tolerance to salinity and water deficit

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Abstract

Understanding physiological and molecular basis of plant response and tolerance to environmental constraints is important to improve plant survival, crop yield and quality. Auxin controls many aspects of plant growth and development. This phytohormone acts on the transcriptional regulation of target genes, mainly through Auxin Response Factors (ARF). However, its role in stress responses remains so far poorly studied. The current study provide clues on the involvement of many ARF genes as mediators of the auxin action in abiotic stress responses in tomato. *In silico* analysis of SlARFs 5' regulatory regions indicated the presence of several abiotic stress-responsive *cis*-elements. Expression analysis reveals that many *SlARFs* were regulated by salt or drought stresses. Among them, *SlARF4* expression was significantly modified by salinity and water deficit. Using a reverse genetic approach, we found that the down-regulation of *SlARF4* improves tomato tolerance to salt and drought stress by promoting root development and density, increasing soluble sugars content and maintaining chlorophyll content at high levels in stress conditions. Besides that, ARF4 down-regulated plants displayed a leaf curl phenotype, a low stomatal conductance coupled with an increase in leaf relative water content and ABA content under normal and stressful conditions. This increase in ABA content was correlated with the activation of ABA biosynthesis genes and the repression of ABA catabolism genes. Our results bring new elements on auxin involvement in stress response and underline the role of *ARF4* in salt and drought tolerance. These provide new insights into tomato selection and breeding for environmental stress-tolerant.

Keywords: Auxin, ARFs, tolerance, tomato, stress

Analysing the viroid-nematode interactions on plant growth using molecular and screening assay

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Abstract
Viroids consist of a short strand of circular, single-stranded RNA without protein coat, infectious agents of plants that they are inhabitants of higher plants and cause diseases. *Citrus exocortis viroid* (CEVd) is one of the most damaging viroid disease agent. Root knot nematodes are important nematode group that cause crop losses in many plant species. They also interact with many organisms including viroid. Nematode and viroid interactions may cause devastating effect on plants. However, the effect of both pathogen interactions on plants have not been fully understood. Therefore, this study was conducted to determine the nematode and viroid effects on a plant, *Gynura aurantiaca* using molecular and screening assay. For this aim, *Meloidogyne incognita* with CEVd viroid was inoculated to *Gynura aurantiaca* to determine the interactions among them. The experiment was set up as the infection of nematode, CEVd, nematode+CEVd and non-nematode in an indicator plant, *Gynura aurantiaca,* for CEVd. RNA extraction and screening assay were performed following the mechanical inoculation, and specific primers were used for the detection of viroid. Results revealed that the replication of circular RNA of viroid in all infected plants were detected in CEVd, nematode+CEVd samples apart from non-nematode and solely nematode infected plants. Decreased level of plant growth parameters including plant height, fresh weight, dry weight, shoot width and node number were observed in both nematode and viroid inoculated plants, and molecular and screening results showed parallelism. Results of this study indicate that this study is a leading research on nematode- viroid interactions in *Gynura aurantiaca* that may provide a significant source for future researches.
Keywords: *Citrus exocortis viroid, Melodiogyne incognita*, *Gynura aurantiaca*, viroid-nematode interactions

Pectobacterium carotovorum subsp. carotovorum is an important risk factor on potato plants in Turkey

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Abstract

Blackleg and soft rot complex is a bacterial disease caused by several species of *Pectobacterium* that results in losses to potato production in all around the world. Globally widespread strains of *P. carotovorum* subsp. *carotovorum* are heterogeneous for virulence ability, genomic and biochemical analysis. In 2016 summer, potato plantations were surveyed for occurance of blackleg and soft rot disease caused by *P. carotovorum* subsp. *carotovorum* in Samsun, Ordu, Çorum, Amasya and Tokat provinces of Turkey. Isolated strains were gram-negative oxidase negative, facultatively anaerobic, able to degrade potato tuber slices, sensitive to erythromycin except three of them, unable to produce acid from α-methyl-glucoside, negative for phosphatase activity and indol production. 28 strains produced the 550 bp spesific PCR amplicon with EXPCCF/R primers. Their further confirmation was followed by recA gene sequencing of 15 strains. Performed blastN search and maximum likelihood phylogenetic tree ascertained the taxonomic positions of strains that belonged to *P. carotovorum* subsp. *carotovorum*. In the generated tree, strains placed in seperate subclusters indicated that the population was diverse and may come from different origin of source. This research revealed that *P. carotovorum* subsp. *carotovorum* contained the largest portion of all isolated blackleg-soft rot strains and strongly underlines the pathogen is a crucial risk factor in the surveyed region for many plant specimen. Therefore control measures should be undertaken in the region to prevent the spread of pathogen and it is especially important to pay attention to seed health care for imported potato tubers from Europe, not to deliver the pathogen on disease free lands.

Keywords: *Pectobacterium carotovorum* subsp. *carotovorum,* potato, blackleg-soft rot

*This work was supported by project grant from OMU-PYO. ZRT. 1901.15.011.

Distribution, host plants, parasitoids and predators of Cotton Mealybug, *Phenacoccus solenopsis* Tinsley (Hemiptera: Coccomorpha: Pseudococcidae) from the East Mediterranean Region of Turkey

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Abstract

An invasive mealybug, *Phenacoccus solenopsis* Tinsley (Hemiptera: Pseudococcidae), cotton or solenopsis mealybug, has a new world origin. This mealybug is reported in Australasian, Afrotropical, Nearctic, Oriental and Neotropical Regions on 202 host plants from 55 families. It has been recorded in Cyprus, Egypt, France, Iran, Israel, Japan, and recently in Turkey from Palaearctic Region. In addition, *P. solenopsis* is known as an important pest on ornamental plants and some vegetable crops, such as *Hibiscus rosa-sinensis* L., *H. syriacus* L. (Malvaceae), *Lantana camara* L. (Verbenaceae), and *Solanum esculentum* Lam., *S. melongena* L. and *Capsicum annuum* L. (Solanaceae).

In this study, *P. solenopsis* was detected whole Eastern Mediterranean Region and was founded on 72 host plants from 55 families. Four parasitoids, one of hyperparasitoid and associate parasitoid were recorded on this invasive mealybug, in Turkey: *Anagyrus aligarhensis* Agarwal & Alam, *Aenasius arizonensis* (Girault) (Çalışkan et al., 2018 –in press), *Anagyrus* sp. near *dactylopii* (Howard), *Leptomastix epona* (Walker) as a parasitoid. *Prochiloneurus uyguni* Hayat sp. n. as a hyperparasitoid and *Homalotylus hemipterinus* (De Stefani) as an associate parasitoid. *L. epona* and *H. hemipterinus* are new records for the fauna of Encyrtidae of Turkey (Çalışkan et al. 2016). In addition, Neuroptera and Coleoptera predators were determined during this study. This neuropteran species: *Chrysoperla carnea* (Stephens); *Chrysoperla mutata* (Mc Lachlan); *Sympherobius elegans* (Stephens); *Sympherobius fallax* Navàs. Coleopteran species: *Exochomus nigromaculatus* (Goeze), *Nephus (Sidis) hiekei* (Fürsch); *Nephus nigricans* Weise; *Nephus includes* Kirsch.; *Nephus (Sidis) kreissli* Fürsch&Uygun; *Scymnus (Pullus) subvillosus* (Goeze); *Scymnus bivulnerus* Capra; *Chilocorus bipustulatus* (L.); *Hypearspis polita* Weise; *Oenopia (Synharmonia)conglobata* (L.) and *Cheilomenes propingua* spp. *nilotica* (Mulsant).

Keywords: Invasive, Mealybug, Distribution, Parasitoits, Host Plants

Use of various *Bacillus* isolates as microbial fertilizers for the cultivation of organic vine saplings (Sultani Çekirdeksiz)

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Abstract

Viticulture is an important agricultural sector in terms of income to the coverage area and for the economy of our country which has an important place in world viticulture. With the progress of viticulture, organic and certified saplings production is important in terms of both production and quality as well as for increasing our competitiveness in foreign markets. With the aim to contribute in "organic grapevine sapling" cultivation, this project was jointly carried out by Department of Bioengineering, Ege University and Viticulture Research Institute of Republic of Turkey, Ministry of Food, Agriculture and Livestock. The biopreparations of indigenous strains (*Bacillus subtilis* EGE-B-24.4i, *Bacillus megaterium* EGE-B-42.3, *Bacillus subtilis* EGE-B-3.P.5) selected as potential biofertilizers on the basis of quantitative data of our previous studies were used as biofertilizers for Sultani Çekirdeksiz grape variety grafted on 41B and 1103 P (Paulsen) grapevine rootstocks. This study was carried out in greenhouse with tube saplings to determine the effects of biopreparations on the development and rooting of grapevine saplings and the mineral composition of the soil where the saplings are grown. When the saplings reached the planting stage, the growth parameters including " adventive shoot length, number of nodes, root wet weight, root dry weight, shoot wet weight, shoot dry weight, rooting rate" were measured. In addition, the content of the macro-micro nutrients of the top part of the saplings (shoot) and sapling root were determined and the soil in which the saplings were planted was analyzed. At the end of the study, the differences between the applications of the two grapevine saplings were statistically significant. For all the examined parameters, the values were quantitatively higher for all three strains separately and for their mixture as compared to the control groups of each experiment. The best results in the sapling growth parameters were obtained for the 1103 P grapevine rootstock while using the biopreparate of all three strain in a mixture form and the best saplings growth for 41 B grapevine rootstock was obtained with the applications of *B. subtilis* EGE-B-24.4i biopreparate.

Key words: Biofertilizer, *Bacillus* spp., Potted grapevine sapling, 41 B and 1103 P grapevine rootstocks, Organic farming

Fumigant Effect of Oxygenated Monoterterpenes on adults of *Tribolium castaneum* (Herbst, 1797) (Coleoptera: Tenebrionidae)

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Abstract
The Red flour beetle, *Tribolium castaneum* (Herbst, 1797) (Coleoptera: Tenebrionidae) is a common insect that attacks stored grains and foods. This insect has a world wide distribution. In this study, fumigant effect of oxygenated monoterpenes (Geranyl acetate, Bornyl acetate, Neryl acetate) was investigated on adults of *T.castaneum*. The differences of applications were found statistically significant ($P \leq 0.05$). Results show that Neryl acetate had highest fumigant effect on adults of *T.castaneum*, compared with the negative control. Mortality rate of *T. castaneum* adults was increased significantly, depending on the concentration levels and exposure times. At 72, 96 hours and 20 (µl/petri) concentration, the highest mortality rates of Neryl acetate, Geranyl acetate and Bornyl acetate were determinated 70% and 96%, 40% and 83%, 31% and 53%, respectively. Mortality rate of positive control (DDVP) had 100% at least concentration and exposure time. LC_{50} and LC_{90} values of Geranyl acetate and Bornyl acetate were calculated as 0.808-1.522, 1.155-2.391 and 1.804-8.794(µl/petri) after 96 hours, respectively. Research results suggested that Neryl acetate from the monoterpenes might have potential to be used as fumigant on adults of *T. castaneum.*
Keywords: *Tribolium castaneum,* Fumigant effect, Oxygenated monoterpenes

Determination Important Weed Species, Density and Frequency of Coincidance in Lettuce Cultivation Areas in Mardin and Şanlıurfa Provinces

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Abstract

This study was carried out to determine the weed species, density and frequency of weeds seen in lettuce production areas of Mardin and Şanlıurfa provinces. For this purpose, surveys were carried out at the randomly selected fields during lettuce growth period of 2015. In survey studies, a 0.25 m^2 frame was used to determine density and frequency of weeds. In these areas, 39 different weed species belonging to 13 families were identified. It was determined that the most of the weeds that cause problems in lettuce areas are belong to Poaceae, Amaranthaceae, Chenopodiaceae and Solanaceae families. *Amaranthus retroflexus* L. (13 plant / m^2), *Portulaca oleraceae* L. (9 plant / m^2), *Convolvulus arvensis* L. (3 plant / m^2) and *Chenopodium album* L. (0.3 plant / m^2) were the most dense weeds in lettuce fields of Mardin province. The most frequent occurrence of species was recorded as *Amaranthus retroflexus* L. (87%), *Convolvulus arvensis* L. (74%) and *Portulaca oleraceae* L. (55%), respectively. *Amaranthus retroflexus* L. (3.6 plant / m2), *Portulaca oleraceae* L. (1.6 plant / m^2), *Physalis* spp. (1.3 plant / m^2) and *Xanthium strumarium* L (0.3 plant / m^2) were the most dense weed species in lettuce fields of Şanlıurfa province. The most frequent occurrence of species was recorded as *Amaranthus retroflexus* (66%), *Physalis* spp. (52%) and *Portulaca oleraceae* L. (50%), respectively. It is considered that the obtained data will provide basic information for afterward studies.

Keywords: Lettuce, Weed, Density, Frequency of weeds,

Determination Parasitism Situation of *Aenasius arizonensis* Girault (Hymenoptera: Encytridae) Against *Phenacoccus solenopsis* Tinsley (Hemiptera: Pseudococcidae) at Different Temperatures

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Abstract

The effectiveness of *Aenaisus arizonensis* against invasive mealybug species, *Phenacoccus solenopsis,* at different temperatures has been studied within this study. Experiments have been conducted at 20±1 °C 25±1 °C, 30±1 °C ve 35±1 °C stable, 25/35±1 °C changeable temperatures, and %65±5 relative humidity in climate rooms with 100 mealybug individuals. 1 female and 2 male individuals have been released on mealybugs for 24 hours for each replication. According to observed results, the number of mean parasitized mealybugs were given as 24±0,58 78±0,31, 61±0,54, 54±0,77 ve 46±0,88 respectively. the number of hatched female / male individuals were determined as 11±0,37 / 5 ±0,26, 45±0,3/ 33±0,3; 30±0,4/ 17±0,3; 30±0,5/ 17±0,4 ve 20±0,5/ 20±0,3 respectively. the number of Parasitized mealybugs at different temperatures were found statistically important ($p<0.05$). Parasitoid generally laid fertilised eggs into its hosts and female hatched from these eggs at stable temperatures. However, the same number of female and male individuals hatched at changeable temperatures. In addition, some individuals cannot hatch from parasitized mealybugs. Death individuals were given from lower to higher temperatures were given as 8, 1, 14, 7 ve 6 respectively and the lowest number of death were seen at 25 °C. Above results show that the most suitable temperature for *Aenaisus arizonensis* to parasite its host is 25°C. Moreover, higher temperatures affect the effectiveness of parasitoid negatively. Consequently, 25°C can be the most suitable temperature for mass-rearing of this parasitoid.

Keywords: Aenasius arizonensis, *Phenacoccus solenopsis*, Parasitoid, Melaybugs Biological Control

Identification of Nitidulidae (Coleoptera) Species in Pomegranate Orchards in Adıyaman and Siirt Provinces

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Abstract

Pomegranate is an important cultural plant for Southeastern Anatolian Region primarily and Turkey. Among the parameters affecting quality and quantity in pomegranate cultivation are the product losses which are caused by the pests of animal origin. This study was carried out for the determination of Nitidulidae species in Adıyaman (Merkez, Kahta and Samsat) and Siirt (Şirvan) provinces, increasing pomegranate growing rapidly, in 2017-2018. Pest sampling was done with visual inspection and cultuvation methods were used in the study. As a result of study, 5 species belonging to 2 genuses of Nitidulidae family was obtained from pomegranate orchards. The species were identified as *Carpophilus nepos* Murray, *Carpophilus mutilatus* Erichson, *Carpophilus hemipterus* (Linnaeus), *Urophorus humeralis* (Fabricius) and *Carpophilus bifenestratus* Murray. The most common species was *Carpophilus nepos,* it is generally found that these species prefer to eat cracked, carob moth, and bird-damaging or mechanically injured fruiting, and detected damage by this species. As a result of the pest feeding on fruit saprophyte diseases agent infected and this fruits were completely decayed. While not damaged pomegranates by Nitidulidae species can be used as pomegranate syrup and fruit juice, damaged fruits were not used and cause economic loss in this situation. Although Nitidulidae species are known as seconder pest, especialy this pests cause important damage on quality of pomegranate after harvesting process. Therefore control strategy should be develop against this pests.

Keywords: Pomegranate, Pests, Nitidulidae, Adıyaman, Siirt

Investigation Of Fauna Of Orthoptera (Insecta) Mardin Province (Turkey)

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Abstract

In this research had been done in April-October terms of years 2015-2017 for total two years. Between these terms 32 land studies were done and 212 samples were collected from lands in towns, where are our study lands of Mardin province. To get the samples which were in different phases, we went to the same biotopes in different times. The definition was given after the picked up samples were identified and identification keys were prepared. On the study land 4 families belong to Orthoptera order and, 23 genus and 30 taxa (species and subspecies) were determined. The most important of this species; *Medecticus assimilis, Decticus albifrons, Platycleis (Platycleis) intermedia, Platycleis (Platycleis) escalerai, Platycleis (Platycleis) escalerai iranica, Conocephalus (Anisoptera) fuscus, Tettigonia viridissima, Tettigonia caudata, Pholidoptera satunini, Saga ephippigera, Gryllotalpa gryllotalpa, Pyrgomorpha (Pyrgomorpha) conica conica, Tropodipola longicornis gracea, Anacridium aegyptium aegyptium, Acrida bicolor, Eyprepocnemis plorans plorans, Calliptamus barbarus cephalotes, Calliptamus tenuicercis tenuicercis, Calliptamus italicus italicus, Heteracris pterosticha, Truxalis robusta robusta, Oedipoda miniata miniata, Oedipoda caerulescens caerulescens, Oedipoda aurea, Sphingonotus(Sphingonotus) pilosus, Aiolopus strepens, Acrotylus insubricus insubricus, Locusta migratoria cinerascens, Dociostaurus (Dociostaurus) maroccanus, Chorthippus (Chorthippus) loratus*. The data obtained were evaluated on the points of zoogeographical, the observations and suggestions for the species, which can be harmful to the cultural plants were expressed.

Keywords: Agriculture harmful, Mardin, Orthoptera.

Investigation into the Control of the Main Pest Insect *Rhagoletis cerasi* (L.,1758) (Diptera: Tephritidae) in Organic Cherry Production

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Abstract
The European cherry fruit fly, *Rhagoletis cerasi* (L.) (Diptera: Tephritidae), is the most important pest of sweet cherries in Turkey. The aim of your experiments was to determine a new, cost-efficient and more eco-friendly methods of control. The study was carried out in two different locations, Pozantı (Adana) and Darboğaz (Ulukışla/Niğde) in 2015-2017. It was investigated the effectiveness of netting trees, textile mulch, mass capture technique, plant-based insecticide against cherry fruit fly control. It was made insecticides application for comparison purposes.
According to the results, in the years when the work had been done in both regions, netting trees had an effect 100%, mass trapping had an effect between 92-94%, textile mulch had an effect between 75-90% and plant-based insecticide had an effect between 53-82% against *R. cerasi.* On the other hand, insecticides application had an effect between 40-79%. Clear statistical differences were observed between the untreated control and the treatments evaluated. The best effective was obtained from with netting in management cherry fruit fly. It was concluded that the other methods evaluated could be useful in organic cherry production.

Keywords: Alternative control, Cherry, Organic farming, *Rhagoletis cerasi,* Turkey

Demographic parameters and biological features of *Phenacoccus madeirensis* Green (Hemiptera: Coccomorpha: Pseudococcidae) on four vegetable plants

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Abstract

Phenacoccus madeirensis was first recorded in 2012 in Çanakkale/ Turkey (Kaydan et al., 2012). This pest is also known as one of the most important invasive mealybug species. This species has been spreading in Solanacae family and cause important damages in our region. The development, reproduction and life table parameters of the madeira mealybug, *Phenacoccus maderiensis* Green (Hemiptera: Coccomorpha: Pseudococcidae) on four vegetable plants (Tomato, Pepper, Eggplant, Pepino), belonging to Solanacae plant family, were investigated under controlled laboratory conditions of 25˚C, 65% ± 10% r.h., and 16 hours daily artificial light. Life table data were analyzed by using an age-stage, two-sex life table. According to result of these experiment, the longevity values of female Eggplant (Anamur) 35.37 days, Tomato (Torry) 43.7 days, Pepino (Miski) 40.23 days, Pepper (Safran) 41.85 days, net reproductive rate (190.65 offspring/individual) and gross reproduction rate (289.49 offspring/individual) and the shortest mean generation times (31.06 d) were obtained when the mealybug population was reared on eggplant. Of the four studied hosts, eggplant was the most suitable host for *P. madeirensis*. This pest may cause more important damage on eggplant more than other vegetable species.

Keywords: *Phenacoccus maderiensis*, Life table, vegetable, Solanacae, Turkey

Determination of germination temperatures of *Sinapis arvensis* L. and *Avena sterilis* L.

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Abstract

Weeds are important with regard to causing significant yield losses among the problems of plant protection in wheat cultivation in the Southeastern Anatolia Region. According to the surveys in Sanliurfa province in 2015-2016, it was determined that wheat fields were covered with 11.4 % *Avena sterilis* and 16.1% *Sinapis arvensis*. In Sanliurfa province, it was reported that herbicide applications in 2,200,000 decares wheat areas were carried out in 2016. In Sanlıurfa, 47.9 tone of herbicide were used to control of these weeds. Observations indicated that the desired outcomes did not take place. In order to form the control strategies of *S. arvensis* and *A. sterilis*, it was necessary to determine the germination temperatures of the seeds of both species. For this purpose, *A. sterilis* and *S. arvensis* seeds were collected in wheat areas of Batman and Şanlıurfa provinces in 2015. Germination experiments were carried out in petri-dishes in laboratory conditions, in 2016. According to results, minimum, optimum and maximum temperatures required for seeds germination were 5 °C, 15 °C and 30-35 °C for *A. sterilis*; 5 °C, 15-25 °C and 35 °C for *S. arvensis*, respectively. According to these results, germination rates of *A. sterilis* seeds began to decrease over 15°C temperatures while *S. arvensis* seeds were germinated optimum the temperatures at 15-25 °C. Consequently, it is recommended that the time of control should be determined correctly by taking into account the economic threshold of both species and the temperature demands of the seeds.

Keywords: *Sinapis arvensis, Avena sterilis,* seed, germination temperature, wheat

Antifungal activity of leaf extract of *Ceratonia siliqua* L. plant against plant pathogenic fungi

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Abstract

Antifungal substances obtained from naturally grown plants are among the preferred products because they have a sensitive effect on the environment and on humans. In this study, the antifungal activity of the methanol extract acquired from leaves of *Ceratonia siliqua* plant collected from Demre district of Antalya province was determined. Activity studies have been carried out pathogens of *Fusarium oxysproum f.sp. cucumerium* (FOC) and *Monillia fructigena* plants which cause disease in cucumber and apple plants. Doses of 0.1, 0.5, 1, 2, 5 mg/ml of extract were applied against plant pathogens. Activity studies of test pathogens were carried out using the agar plate method. Mycelial growth, Mycelial growth inhibition, and Lethal dose values (LD_{50-90}) were determined in the experiments for fungi against extracts. *M. fructigena* is more susceptible to the FOC pathogen. MGI ratios of 20% at 0.1 mg/ml and 92% at 5 mg/ml against *M. fuctictigena* were observed. Similarly, these ratios were found at 0.1 mg and 0.5 mg/ml at FOC as 11% and %79 respectively. Lethal dose rates were calculated for LD_{50} = 0.74 mg/ml and LD_{90} = 7.082 for *M. fructigena* and LD_{50} = 1.41 mg/ml and LD_{90} = 19.83 for FOC. According to these results, it has been determined that the extract of the *C. siliqua* has a high level of biological activity against the tested pathogens. Effective results of bio-antifungal substances obtained from the nature are also observed in this study.

Keywords: Antifungal activity, Plant extract, *Ceratonia siliqua*, *Fusarium oxysproum f.sp. cucumerium*, *Monillia fructigena*

SRAP MARKER BASED COMPARIATION WITH YAMULA EGGPLANT GENOTYPES AND SOME OTHER EGGPLANT VARIETIES

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Abstract

Turkey have rich local vegetable varieties such as Urfa pepper, Manisa eggplant and Kırkagac melon. One of local vegetable varieties is Yamula eggplant cultivar which grown central Anatolia that forefront with specific striped structure and hard fruit flesh, especially it was consumed by have lived people at its growing regions as fresh, dried and pickled. Uniform fruit, disease resistance and high yielded genotypes are the most important factor for marketable products. But, it is inevitable genetic differences because of producing with obtained seeds yourself. In this study, 28 adet Yamula eggplant genotypes were compared with 1 Manisa eggplant and 3 Kemer eggplant genotypes using SRAP molecular markers to understand genetic differences/similarity. As obtained results, genetic similartiy was 0,68-0,99 and with two cluster. The geneticialy closest genotypes were ERU 3014-ERU 949 which were yamula eggplant genotypes. Results showed that there are diffrerences between yamula eggplant genotypes and other eggplant genotypes, also within yamula eggplant genotypes.

Keywords: Eggplant, SRAP, molecular markers

Postharvest quality of different types of tomatoes as affected by ethylene treatment

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Abstract

In this study the beefsteak, heirloom and cluster type of tomatoes were harvested at the breaker stage. Fruits were divided into two groups where first group was treated with 150 ppm of ethylene at 20°C and second group remained untreated that were considered as control in the experiment. Both groups of tomatoes were stored at 12°C temperature with 90±5% relative humidity for 35 days. Ethylene treatment had significantly affected weight loss, lightness (L^*), hue angle ($h°$), titratable acidity (TA), fruit firmness, chlorophyll content, lycopene content and amount of unmarketable fruits. However, non-significant effects were noticed for chroma (C^*) values and total soluble solids (TSS) content during storage. The highest L^*, $h°$ and fruit firmness was recorded in beefsteak type of tomatoes while the lowest weight losses, amount of unmarketable fruit, maximal titratable acidity and chlorophyll content were found in heirloom type of tomatoes. In terms of overall quality beefsteak and heirloom type of tomatoes generally performed better comparing to cluster type of tomatoes. Therefore, it can be concluded that the beefsteak and heirloom type of tomatoes can be commercially stored for 35 days with maximum postharvest quality when compared with cluster type of tomatoes.

Keywords: Tomatoes, ethylene, cold storage, shelf-life, postharvest.

A study on determination of high temperature stress application method in three vine types grown in *in vitro* conditions

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Abstact

Increasing temperatures as a result of global warming cause climate change with precipitation regime. The drought, which is felt by the increasing effects of these factors, is among the most important threats limiting the development of plants. In recent years, research on the impact of global warming has been intensified. In vitro studies are one of the most effective methods used in the world in response to stress applications in a short time. In vitro studies should first develop the appropriate method depending on the plant type. In the literature review, no standard method of high temperature stress was found in vitro. Therefore, in this study, temperature grades and exposure times to stresses in plants belonging to some vine varieties grown in vitro conditions (Çalkarası, Öküzgözü and Narince) were determined. As a result of the study, 36 hours at 35˚C and 12 hours at 40˚C did not lose the vitality of the plants but seriously entered the stress.

Keywords: Grape, Abiotic Stress, Proline, *In Vitro*, Global Warming

MOLECULAR CHARACTERIZATION OF *ELAEAGNUS ANGUSTIFOLIA* L. GENOTYPES COLLECTED FROM DIFFERENT PART OF TURKEY

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Abstract

Molecular markers are commonly used in determination of genetic similarities and differences in many species and varieties. In this research Inter-Simple Sequence Repeat (ISSR) markers were used to distinguish twenty-five elaeagnus (*Elaeagnus angustifolia* L.) genotypes which were collected from various parts of Turkey in accordance with specific morphologic criteria. Eleven ISSR primers produced a total of 92 fragments and 23 of them were polymorphic. The mean polymorphism information content (PIC) was 0.25. The unweighted pair group method arithmetic average (UPGMA) analysis demonstrated that the accessions had a similarity range from 0.63 to 1.00. Relatively genetic variation was detected among genotypes. Apart from the two genotypes, all other genotypes are separated. 'Genotype 72' is the most distant genotype. The remaining 24 genotypes were collected under three main groups. On the other hand, some of the genotypes are grouped according to their geographical distribution. The study showed that there is variation among genetic resources and that could be used in breeding programmes.

Keywords: *Elaeagnus angustifolia* L., molecular characterization, ISSR

The effects of Mycorrhiza Treatments on Nursery Plant Development in Meyer Lemons Grafted on Sour Orange Rootstocks

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Abstract
The effects of different Michoriza species to nursery plant performances of Meyer lemon plants grafted on sour orange rootstock were investigated. Air pruning technique was applied to roots to produce soil born pests free nursery plants. Ferti-irrigation with specially formulated soilless nutrient solution was applied to air pruning suitable pots to produce plants with free from root circling, vigorous and can compete with well-developed conventional nursery plants that have soil penetrated roots. The study was conducted in greenhouse that are belongs to Akdeniz University Agricultural Faculty and have light intensity between 303,00-1988.85 lx completed in greenhouse during April to November of 2017. The research was conducted with three replications each of which had five plants. Growing media was the 3:1 mixture of peat moss and pumice. Experimented Michoriza mixture was consist of *Glomus spp.: G.mosseae, G.etunicatium, G.clarium, G.intraradices, G.caledonium, G.macrocarpium, G.margarita, G.fasciculatum* species and provided by Çukurova University, Agricultural Faculty, Soil Science Department. The dose of Michoriza mixture was 500 spores/plant (50 g of Michoriza). Measurements were including; rootstock and scion diameters, shoot length, chlorophyll and leaf area indexes, root Michoriza infection ratio (%) and number of spores in rhizosphere (numbers/10 g soil). The results showed that while Michoriza had no effect on rootstock and scion diameters and shoot length, had influence on chlorophyll and leaf area indexes.
Keywords: Air pruning, Root Morphology, Soilless Citrus Nursery plant production, VAM

The Agricultural Products Export Structure of Turkey and Competitive Capacity

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Abstract

Hunger, poverty, extreme consumption, climate change problems are also increasing as the world develops and changes. Together with these issues, circulation and sharing of agricultural products is one of the global agenda items. Agricultural production and sustainability under these pressures are also directly affected by international competition and the rules of this competition, global economic and political crises. The importance of the agricultural sector in the economy also comes from the role of food security in the countries. There is also the importance for Turkey because of the share of the foreign trade (10.7%) and employment rate (19.4%). The United States of America, Japan, EU countries and Canada, which are dominant in world agricultural imports, have been included in China, India, Russia and Mexico since the beginning of the century. In exports, China, Brazil, India and Indonesia joined the USA, Canada and EU countries. Turkey is supplier of agricultural products for the Middle East countries and EU. However, in condition of increasing competition, protecting the market share of exporter countries is becoming increasingly important. For this reason, it is crucial to provide the agricultural product structure of Turkey to be able to determine the competition strategy, competition capacity and Turkey's competition capability compared to the other target markets. This study aims to provide the similarities and differences among the countries that make agricultural product export to the EU, which comprises 30-40% of the total agricultural product export of Turkey. For this purpose, a cluster analysis will be carried out with the relevant countries. The results will be useful for decision-makers and exporting businesses to divide the market into smaller segments and to identify competitors.

Keywords: Turkey export, Agriculture export, Cluster Analysis, Competitive

INFLUENCING FACTORS ON BUYING AGRICULTURAL INSURANCE POLICY ASSOCIATED WITH FARM TYPE, IN SAMSUN PROVINCE

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Abstract

The agricultural sector is critical to the nutrition of the world's population, faces many risks and uncertainties which are threatening agricultural production. For this reason, policy makers of many countries, especially, the developed countries have developed and implemented many risk management programs against the risks and uncertainties in agriculture. The current study aimed to determine the insurance rate of farmers associated with farm type, their tendency to have agricultural insurance and exploring the factors affecting the buying agricultural insurance policy. The data was obtained through well designed questionnaire from 223 managers in Samsun. The logit model was used to determine the factors affecting on buying agricultural insurance policy. Based on the results of the study, it was determined that the percentage of farmers having insurance policy was 67%. The highest rate of insurance was observed in aquaculture. Logit analysis results showed that the variables of amount of loss land ownership, state support, income diversity, social participation level index, communication score, agricultural experience and information source positively affected buying agricultural insurance policy. Raising the awareness of farmers on agricultural insurance and providing extension services focusing on confidence may contribute for dissemination of agricultural insurance. In addition, revising the policy contents, reducing the bureaucratic procedure, solving disputes about payments, and expanding the policy coverage considering the negative effects on insurance companies and farmers may accelerate the agricultural insurance.

Keywords: TARSİM, insurance policy, agricultural insurance, Samsun, Turkey

Evaluation of Agritourism and Agrotourism in Terms of AGTOIN (Agriculture-Tourism-Interchange) and its Effect on Rural Development in Uzundere Village

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Özet

Eco-agritourism (agriculture) and eco-agrotourism (farm) has recently gained special significance in rural tourism activities. The most important benefits of these two types of tourism, which are accepted as a solution for agriculture and development problem of rural areas, are support to agricultural production and contribution to development of rural areas in parallel with improvement of tourism. In this context, AGTOIN (Turkish original as TaTuTa) is the abbreviation of the project "Volunteered Interchange of Knowledge and Agricultural Tourism in Ecological Farms", which is conducted by the Wheat Association and which has become widespread nationwide recently. Many institutions and associations supported this project, which began in 2004 by means of United Nations Development Program (UNDP), Global Environmental Fund (GEF), and Small Grants Program (SGP). AGTOIN farms, whose number has increased day by day in our country, has reached a number of 91 today. In the AGTOIN farms, which are operating in two different ways, on the one hand, volunteered individuals are being worked in the farm works for free, and on the other hand, visitors are being accommodated in the farms, which are conspicuous with their natural environment and socio-cultural features, and various kinds of tourism services are provided such as accommodation. In this context, three AGTOIN farms in Uzundere-Tortum Distirct of Erzurum province, were determined as the research items and their effects on rural development were attempted to determine. As the conclusion of field observations and interviews with the owners of the business, it was determined that this project has been highly effective in revival of the rural areas concerning socio-economic aspects, and it was suggested that this project should be spread to wider regions for rural development.

Keywords: Agritourism, Agrotourism, AGTOIN (TaTuTa), Rural Development, Tortum, Uzundere

Evaluation of Agritourism and Agrotourism in Terms of AGTOIN (Agriculture-Tourism-Interchange) and its Effect on Rural Development in Uzundere Village

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Abstract

Eco-agritourism (agriculture) and eco-agrotourism (farm) has recently gained special significance in rural tourism activities. The most important benefits of these two types of tourism, which are accepted as a solution for agriculture and development problem of rural areas, are support to agricultural production and contribution to development of rural areas in parallel with improvement of tourism. Additionally, AGTOIN (Turkish original as *TATUTA*) is the abbreviation of the project "Volunteered Interchange of Knowledge and Agricultural Tourism in Ecological Farms", which is conducted by the Wheat Association and which has become widespread nationwide recently. Many institutions and associations supported this project, which began in 2004 by means of United Nations Development Program (UNDP), Global Environmental Fund (GEF), and Small Grants Program (SGP). AGTOIN farms, whose number has increased day by day in our country, has reached a number of 91 today. In the AGTOIN farms, which are operating in two different ways, on the one hand, volunteered individuals are being worked in the farm works for free, and on the other hand, visitors are being accommodated in the farms, which are conspicuous with their natural environment and socio-cultural features, and various kinds of tourism services are provided such as accommodation. In this context, three AGTOIN farms in Uzundere Sakin City of Erzurum province, were determined as the research items and their effects on rural development were attempted to determine. As the conclusion of field observations and interviews with the owners of the business, it was determined that this project has been highly effective in revival of the rural areas concerning socio-economic aspects, and it was suggested that this project should be spread to wider regions for rural development.

Keywords: Agritourism, Agrotourism, AGTOIN (TATUTA), Rural Development, Uzundere.

The Effects Of Land Consolidation And Farmer Satisfaction: Cases Of Adıyaman Provinces

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Abstract

One of the biggest problems of agriculture in Turkey is small size, scattered and joint-owned agricultural lands. In order to eliminate this problem, on the one hand, legal arrangements have been made and on the other hand, land consolidation projects have been carried out. However, farmers have raised their concerns about some points such that they cannot benefit efficiently from land consolidation activities, parceling, shape, size, etc. problems cannot be solved adequately and such problems have been remained unsolved and also implementations vary from person to person. This research has examined effects of results of land consolidation activities with regard to farmer satisfaction in Adıyaman Provinces. Research data has been obtained from 97 farmers via questionnaire in Adıyaman Provinces where land consolidation activities had been realized in 2017. The effects of consolidation practices on farmers and farmers' satisfaction were analyzed using logistic regression analysis. According to research results, there has been a decrease in total land size, parcel numbers and joint-owned parcel numbers; there has also been an increase in average parcel size and number.

Keywords: Land Consolidation, Lojistic Regresion, Adıyaman

Influence of rose oil processing waste compost media on tomato seedling quality

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Abstract

Seedling growing media play an important role in the production of high quality and healthy seedlings. Seedlings are grown in different growth media. The most commonly used medium in seedling growing is peat. Depletion of peat resources and high peat cost increase interest to cheap and locally materials that easily supplied. Therefore, studies on the use of composts prepared from different wastes in seedling cultivation are being carried out. This study was carried out to determine usability of compost prepared from rose oil processing wastes in tomatoes (*Solanum lycopersicum* cv. Şencan 9) seedling cultivation and the most suitable seedling growing medium. With this aim, seven growing media prepared from the mixtures of the rose oil processing waste compost (RC) with vermicompost (V), soil (S) and peat (P) at the different ratios (100%P, 50%RC+50%P, 25%RC+75%P, 50%RC+25%P+25%V, 50%RC+25%5P+25%S, 50%RC+25%S+25%V and 25%RC+50%P+25%S) were compared. Significant differences were found among the growing media. The highest stomatal conductance (410.94 mmol m^{-2} s^{-1}), root dry weight (0.31 g), leaf dry weight (0.58 g) and total seedling dry weight (1.17 g) were obtained from 25%RC+75%P medium. The highest seedling length (13.27 cm) and leaf area (15.42 cm^2) were determined in 50%RC+25%S+25%P medium. The highest stem dry weight (0.3 g) was obtained from 50%RC+50%P, while the highest chlorophyll content (20.16 CCI) was determined in 100%P medium. It was determined that mixture of 25%RC+75%P had a significant effect on seedling quality.

Keywords: Compost, Rose oil processing waste, Seedling, Tomatoes, Vermicompost

The changing of some physical properties during fruit development on Kağızman's long apple

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Abstract

Kağızman's long apple is one of the important varieties of apples that grown locally with various shape and taste. The long apple is a delicious fruit varieties that matures slowly, as well as endemic. The harvest time is October, when the frost falls on the ground. Fruit trees are generally narrow crown and resemble poplar trees. The fruits are a red-white cheeked and have a cylindrical structure. The aim of this study was to determined physical properties of the long apple cultivar during the growing season. For that reason, after the flowering period completed, the fruit samples were picked every two weeks until maturity as three replicates during 11 weeks. The examples of first fruits were picked on May 29 the last samples were harvested on 16 October. The fruits have begun to mature at tenth week. The length, width and thickness of fruit samples were measured and sphericity values of the fruits were calculated. According to measurement results, it was determined that while the sphericity values of the apples ranged from 70.08% to 89.07%, the fruit weights changed from 2.35 to 84.28 g. The minimum and maximum length, width and thickness values of the mature fruits were determined as 56.15-71.14 mm, 49.70-59.25 mm and 49.01-59.01 mm, respectively.

Keywords: Kağızman apple, physical properties, physical development, growing period

Evaluation Of Some Stone Fruit Rootstocks Against Resistance to Root Knot Nematode (*Meloidogyne incognita*)

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Abstract

Root nematodes have a very broad host range, causing economic losses in many plant species. The clonal rootstocks used in the grafted-stone fruit seedling production were tested for resistance to root knot nematode. The seedlings were transplanted into plastic pots (11 cm diameter, 500 cm3 volume) with 5 replications. Soil structure used in pots was 80% sand, 5% clay and 15% top soil, and disinfected by autoclaving prior to testing. The study was conducted under 25 ± 1 ° C temperature and 60 ± 10% relative humidity conditions. Nematod inoculation was carried out when the rootstocks reached about 15-25 cm in length. Approximately 1500 second-stage jüvenile per plant were placed at 2cm soil depth near the root region. Two months after nematod inoculation, root galling index of rootstocks were determined. The results of galling index in the roots was determined as resistant (0-2) or susceptible (3-5 scale) plants. In this study, Patrones Arda, Garnem, Cadaman, Patrones Toro, Mariana GF 8-1, Myrobalan 29-C rootstocks were identified to be resistant to root knot nematode while Myrobalan B and GF677 rootstocks were detected as sensitive.

Keywords: Root knot nematode, fruit root stocks, resistant

Determination of the suitable sowing time of Black cumin (*Nigellasativa* L.) in Aksaray conditions *

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Abstract

Black cumin an important medicinal and aromatic plant in some locations of our country, which has been cultivated since ancient times and which is being cultivated in increasingly different regions. With this study, it was aimed to determine the appropriate sowing time in Aksaray province. The experiment was arranged in randomized complete block design with four replications at 6 different times between March 2nd and May 17th. In this study, emerge time, flowering time, harvesting time, fertile plant number, plant height and seed yield were evaluated. The average emerge day counts 25, 18, 14, 13, 13 and 13 days; number of flowering 95, 84, 77, 71, 63 and 58 days; number of maturing 131, 120, 110,102, 95 and 88 days; number of plants in the plots 722, 647, 678, 619, 461 and 235; plant height 35, 33, 33, 31, 23, 14 cm; seed yield as average of 62.3, 50.5, 39.7, 26.8, 12.9 and 2.4 kg da^{-1} were measured at the 1st, 2nd, 3rd, 4th, 5th and 6th sowing time respectively. According to results, factors affecting seed yield statistically were emerge time, flowering time, harvesting time and plant height. In all of the mentioned factors, 1 st sowing time, which is the beginning of March, has come to the forefront. Inaddition, the sowing time the seed yield regression equation became important and linear. For this reason, in order to obtain the highest seed yield in Aksaray conditions, Black cumin planting should be done as soon as after the winter season.

Keywords: Black cumin, Sowing time, Aksaray province

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Serological and Molecular Characterization of Potato Virus Y in Pepper Production Areas in Tokat Province

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Abstract

In Tokat Province, pepper is the most widely field-cultivated vegetable after tomatoes in summer period. Potato virus Y (PVY) is a common virus infecting potato and tomato, in addition to pepper, among Solanaceous crops.The aim of present study was to determine the occurrence of PVY in pepper fields of Tokat Province with serological and molecular methods test. For this purpose, the surveys were conducted in the pepper fields and 250 plant samples with virus and virus-like symptoms were collected during the surveys. These samples were tested by double antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA) using PVY spesific antibody. According to DAS-ELISA results, the rate of infected samples with PVY was 12.8 %. These samples were analyzed with two step reverse transcription-polymerase chain reaction (RT-PCR) with spesific primer pairs to PVY. Total RNA was isolated from positive DAS-ELISA samples and RNA's were done RT-PCR using primer pairs spesific to coat protein gene. All samples yielded 480 bp PCR product. In the previous studies, the presence of different viruses like *Tomato spotted wilt virus* (TSWV), *Cucumber mosaic virus* (CMV), *Alfalfa mosaic virus* (AMV), *Pepper mottle mosaic virus* (PMMoV) apart from PVY were reported in Tokat pepper fields. In this study, PVY in pepper were determined by means of molecular tests.

Keywords: Tokat, Pepper, Virus diseases, PVY, RT-PCR

An overview of GNSS technologies in precision agriculture applications

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Abstract

Due to the limited agricultural areas and the growing human population in the world, these areas need to be used effectively, and economically. In order to meet the agricultural needs of people, it is possible to use limited amounts of agricultural areas effectively by using sensitive and intelligent agriculture technologies. In recent years, rapid developments in satellite technologies and researches on navigation solutions have made them possible to use in many areas such as precision agriculture. By using Global Navigation Satellite Systems (GNSS) technology, spatial information of agricultural areas is collected, and these data help to increase production and reduce costs. Nowadays, Real Time Kinematic (RTK) and Continuously Operating Reference Systems (CORS) are used extensively to determine the cm-level position information in precision agriculture applications. But, these methods have some limitations. The main drawbacks of the RTK method are the requirement of at least two GNSS receivers named as reference and rover; and limited range use. The main disadvantage of the CORS method is that the system does not operate outside the coverage area of the GSM line. In recent years, real-time satellite correction services (RTX, OmniSTAR, StarFire, etc.) offer real-time precise location information as an alternative to RTK and NTRK. This study provides detailed information about real-time satellite correction services; and the usability and benefits of these services in precision agriculture applications.

Keywords: Precise agriculture, GNSS, RTX, OmniSTAR, StarFire

Soil Solarization Simulator

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Abstract

Soil solarization is an environmentally friendly physical control method used in plant protection practices. In the method, soil pests, soil-borne disease agents and weeds are successfully controlled with trapping solar radiation to accumulate heat by covering the soil with transparent polyethylene cover before planting. In climatically permissive regions and with vegetatively compatible plants, successful results are obtained by using this method in small to medium-sized fields. Soil solarization can be applied once a year during the warmest months. Temperature, which is the main factor in soil solarization, can be easily adjusted with many devices such as incubators and ovens by fixing constant temperature in laboratory studies. However, temperature changes every minute during soil solarization which take about 40 days in the field. There are serious temperature differences between day and night, and unexpected natural events on some days can cause extreme temperature differences.

In this study, the temperature fluctuation was successfully simulated in the laboratory by using temperature data taken during soil solarization in the field, and the developed system (SolarSim) was found to simulate temperature almost perfectly. To verify the success of the simulation, soil solarization and laboratory simulation were compared to detect population changes of two microbial groups before and after applications, proportionally. For this purpose, Firmicutes (a bacterial phylum) and Fusarium oxysporum (a fungal species) DNA quantities in soil samples taken before and after applications were determined by real-time PCR, and a correlation was found between soil solarization and laboratory simulation, in terms of population changes of tested microorganisms.

By developing this system and simulating soil solarization in the laboratory, it is possible for researchers to perform the preliminary study in laboratory many times before solarization studies in field and also collect data during the solarization simulation. Changing soil chemical/physical structure and microbial population, and effects of unexpected natural events on solarization can be examined. It is also possible to operate simulation with previously collected temperature data at any location, year and/or soil depth. In some cases, it may be necessary to do more than one experiment under the same conditions to prevent experimental variation, and simulation can allow it.

Keywords: solarization, simulation, microbial population, Firmicutes, Fusarium oxysporum

Parasitoids, Predators and Pest Species Determined in the Cabbage Areas of Eastern Anatolia Region

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Abstract

The cabbage that can be grown in cold regions where many vegetables can not be grown is important for human nutrition at the same time. There are many pest species that restrict cabbage production. Because cabbage leaf is an edible vegetable, the use of chemical preparations against cabbage pests is a very important issue for human and animal health. This study was carried out in 2017 with the aim of identifying other harmful and beneficial insect species in the fields of Mus, Bitlis and Van cabbage. In this study, sweep net, visual control and cultural methods were used. As a result of the surveys, from Coleoptera order Coccinellidae, Chantaridae, Lampyridae, Chrysomelide; Tipulidae, Tephritidae, Syrphidae [Metasyrphus corollae F., Episyrphus balteatus De Geer, Melanostoma mellinum (L.), Spherophoria rueppellii L., Spherophoria scripta L., Eristalis arbustorum L.] from the Diptera order; Aleyrodidae, Cicadellidae (Empoasca decipiens), Lygidae, Aphidae, Miridae (Nysius spp., Nysius cymaides, Oxycarenus pallens, Campylomma diversicornis), Nabidae (Nabis spp.); from Hemiptera, Acrididae (Chorthippus parallelus) from the Orthoptera order; Chrysopidae (Chrysoperla carnea Stephens) from the Neuroptera order and Parasitoid species Hecabalodes radialis (Hymenoptera: Braconidae), Chalcidoidae (Hymenoptera), Diaeratiella rapae (Hymenoptera: Braconidae) were detected. As a result, organic agriculture is so important and preferred today that it is thought that the leaves should be kept as far away from chemical spraying as possible and that the struggle should be done in harmony with the integrated pest management principles.

Keywords: Cabbage, Parasitoid, Predator, Pest, Eastern Anatolia region

Doğu Anadolu Bölgesi Lahana Alanlarında Belirlenen Parazitoit, Predatör ve Zararlı Türler

Özet

Birçok sebzenin yetiştirilemediği soğuk bölgelerde yetişebilen lahana, aynı zamanda insan beslenmesi yönünden önemlidir. Lahana üretimini sınırlayan çok sayıda zararlı tür bulunmaktadır. Lahana yaprağı yenen bir sebze olması nedeniyle zararlılara karşı kimyasal preparatların kullanımı insan ve hayvan sağlığı açısından üzerinde durulması gereken bir konudur. Bu çalışma 2017 yılında Muş, Bitlis ve Van illeri lahana ekim alanlarındaki diğer zararlı ve faydalı böcek türlerin belirlenmesi amacıyla yürütülmüştür. Bu çalışmada atrap, gözle kontrol ve kültüre alma yöntemleri uygulanmıştır. Yapılan sürveyler sonucunda Coleoptera takımından Coccinellidae, Chantaridae, Lampyridae, Chrysomelide; Diptera takımından Tipulidae, Tephritidae, Syrphidae [Metasyrphus corollae F., Episyrphus balteatus De Geer, Melanostoma mellinum (L.), Spherophoria rueppellii L., Spherophoria scripta L., Eristalis arbustorum L.]; Hemiptera takımından Aleyrodidae, Cicadellidae (Empoasca decipiens), Lygidae, Aphidae, Miridae (Nysius spp., Nysius cymaides, Oxycarenus pallens, Campylomma diversicornis), Nabidae (Nabis spp.); Orthoptera takımından Acrididae (Chorthippus parallelus); Neuroptera takımından Chrysopidae (Chrysoperla carnea Stephens) belirlenirken parazitoit türlerden Hecabalodes radialis (Hymenoptera: Braconidae), Chalcidoidae (Hymenoptera), Diaeratiella rapae (Hymenoptera: Braconidae) tespit edilmiştir. Sonuç olarak organik tarımın bu kadar önem kazandığı ve tercih edildiği günümüzde, yaprakları doğrudan tüketilen sebzeler olması sebebi ile lahanada kimyasal ilaçlamalardan mümkün olduğunca uzak durulması ve mücadelenin entegre mücadele ilkeleriyle uyumlu yapılması gerektiği düşünülmektedir.

Anahtar kelimeler: Lahana, parazitoit, predatör, zararlı, doğu Anadolu bölgesi

Applications of metallic nanoparticles to fruits and vegetables in postharvest treatment

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Abstract

Due to their nature the fruits and vegetables are perishable foods. Many postharvest treatments were developed to reduce postharvest losses and increase shelf-life of the fresh and minimally processed fruits and vegetables. Many, researchers tried to improve new postharvest treatments which are feasible, efficient and cost effective. Nowadays, attention has been given on nano-sized metallic nanoparticles such as Ag, ZnO, TiO_2, CuO because of their properties such as antimicrobial, ethylene blocker, UV-absorber. These nanoparticles have been applied to fruits and vegetables as a postharvest treatments in different ways. Their ionic or colloidal solution can be sprayed directly on foods and also used as washing water. They are used as a component of edible coating applied on the food surfaces, and as ancillary material such as absorbent pads in packaging system. Another way is incorporation of these nanoparticles into packaging material.
Despite the safety of using metallic nanoparticles on postharvest applications are major concern. The research on use the nanoparticles are continued in postharvest treatments. In this review, antimicrobial properties and reaction mechanisms of the nanoparticles have been discussed. Many examples about applications of metallic nanoparticles to fruit and vegetables as a postharvest treatment have been provided with the aim of opening new horizon for researchers. Food packaging containers including metallic nanoparticles were introduced. Moreover, their benefits and possible negative effects to fruit and vegetable preservation have been discussed.

Keywords: Metallic nanoparticles, Postharvest application, Silver, zinc oxide

Chemical composition of root parts of *Ferula elaeochytris* Korov. and its food-borne effects on growth of Goldfish (*Carassius auratus* L.)

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Abstract

The *Ferula* genus that belongs to Apicaceae has been used in traditional medicine in the Middle East, Central Asia and Mediterranean since its properties such as aphrodisiac, antibacterial, antiviral, antifungal and as well as its positive effects on dyspepsia, arthritis, and diabetes. The present study examined the dietary effects of root parts of *Ferula elaeochytris* on growth of Goldfish (*Carassius auratus*), indicating its chemical composition. For this purpose, fish fed with experimental diets containing five different levels of *F. elaeochytris* (control, 0.5‰, 1 ‰, 0.5 %, 1%,) a period of 60 days. Weight gain (WG), feed conversion ratio (FCR), and specific growth rate %/day (SGR) were calculated. 135 of *C. auratus* individuals in total were used for five treatments in triplicates. The root parts of *F. elaeochytris* were extracted by different methods to determine the protein, carbohydrates and essential oil compositions. The WG, FCR, and SGR values of *C. auratus* have shown significant changes in the treatments with the supplementation of *F. elaeochytris* root to feed ($P<0.05$), comparing to the control. The highest WG and SGR values were found in 0.5 % of *F. elaeochytris* root treatment as 81.99±1.53% and 0.99±0.01 respectively. These values in the control were 58.92±2.56 and 0.79±0.07, respectively. Also, the lowest FCR value, 1.33±0.09, was found in 0.5 % of *F. elaeochytris* root treatment. These results indicated profitable effects of dietary containing 0.5 % of *F. elaeochytris* root on growth parameters of *C. auratus*.

Keywords: *F. elaeochytris*, Chemical composition, *C. auratus*, Growth parameters

Effects of dietary daphne (*Laurus nobilis* L.) and fennel (*Foeniculum vulgare* L.) essential oils on some intestinal bacteria of Black Sea trout (*Salmo labrax*)

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Abstract

Intestinal contents of Black Sea trout (*Salmo labrax*) fed diets containing 50, 100, 200 and 400 mg/kg daphne seed and fennel leaf oils in freshwater (Recirculating Aquaculture System) were obtained at the end of the 90 days. *Escherichia coli* (*E.coli*) and lactic acid bacteria (LAB) were isolated by the classical bacteriological method. Data were analysed after transforming logarithm 10 base. The highest LAB was obtained in group fed diet containing 50 mg/kg daphne seed oil (13.03±0.13). This was followed by control group (11.05±0.08). The lowest LAB was obtained in group fed diet containing 400 mg/kg fennel leaf oils (4.58±0.31). This was followed by 200, 100 and 50 mg/kg fennel leaf oils (5.28±0.26, 5.63±0.18 5.98±0.15) ($P<0.05$). The lowest *E. coli* was obtained in group fed diet containing 50 mg/kg daphne seed oil (4.75±0.35) and 50 mg/kg fennel leaf oils (4.90±0.60) ($P>0.05$). This was followed by control group (5.46±0.26). The highest *E.coli* was obtained in group fed diet containing 400 mg/kg daphne seed oil (8.06±0.13) and 200 mg/kg daphne seed oil (7.59±0.17). This was followed by 200 and 400 mg/kg fennel leaf oils (6.95±0.38, 6.97±0.31) ($P>0.05$). According to results, As the daphne seed oil level in the diet was increased, the number of intestinal *E.coli* was increased. Moreover, there was an inverse relationship between the number of intestinal *E.coli* and LAB in daphne seed oil group. It is thought that diet containing 50 mg/kg daphne seed oil can have probiotic effect for Black Sea trout.

Keywords: *Salmo labrax,* essential oil, intestinal bacteria

The Effect of Addition of Essential Oils on Fatty Acid Profile of Microencapsulated Fish Oil

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Abstract

The addition of different essential oils (orange, mandarin, grapefruit and lemon) on the fatty acid composition of microencapsulated fish oil was investigated. Sodium caseinate and maltodextrin were used as a coating material for microencapsulation of fish oil by using a spray dryer. The control group contained 30% solid content, which was composed of sodium caseinate, maltodextrin and fish oil in the ratios of 1:1:1, respectively. In order to improve the oxidative stability of microencapsulated fish oil, orange, mandarin, grapefruit and lemon essential oils were added at 25% of fish oil. The condition of spray dryer was arranged as the inlet temperature 160 °C; outlet temperature 90 °C, spray flow feed rate 20 ml min-1. The result showed that mystiric acid (C14:0), palmitic acid (C16:0), palmitoleic acid (C16:1n7), stearic acid (C18:0), vaccenic acid (C18:1n-7), oleic acid (C18:1n-9), linoleic acid (C18:2n-6), eicosapentaenoic acid (C20:5n-3) and docosahexaenoic acid (C22:6n-3) were the most important fatty acids in fish oil and microencapsulated with/without essential oil samples. There were significant differences ($P<0.05$) in fatty acid composition of all groups compared with the control and also among the treatments groups. Although the use of heat in spray drying process was applied, PUFA content of fish oil and microencapsulated fish oil with essential oils were not affected severely. The addition of essential oil as a natural antioxidant has a positive effect on microencapsulated fish oil, preventing PUFA from oxidation As a result, microencapsulated of fish oil enhanced with essential oils of orange, mandarin, grapefruit and lemon can be used as food ingredient or additives in food industry.

Keywords: Microencapsulation, Spray drying, Fish Oil, Fatty acid

The Effect of Emamectin Benzoate to Gene Expressions of IL-1β and TNF-α in *Oncorhynchus mykiss*

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Abstract
Emamectin benzoate is used for the control of sea lice, a copepod that parasitizes salmon in fish farms. EB is classified as a second generation avermectin. Avermectines are antiparasitic agents widely used as veterinary drugs for producing animals.
IL-1β and TNF-α, as the pro-inflamatory cytokines have a key roles in regulating inflammation. These genes are expressed at an early stage of infection.
There were 3 experiment and 1 control groups. Experiment and control groups have contained 15 and 3 rainbow trout respectively for each week and 54 of fish were studied totally. Experiment groups had the same procedure and were fed with fodder mixed emamectine benzoate (%0,2 commercial veterinary medicine) at a nominal dose rate of 50 µg kg^{-1} fish day^{-1}. At the end of 7, 14 and 21 days, liver and spleen were taken out under deep clove oil anesthesia.
RNA was extracted using a standard TRI-Reagent procedure and then transcripted into cDNA via a kit. Primers of IL-1β and TNF-α, which were given in literature and genbank, were used. β-actin gene was used as control gene for comparision. In the real time stage, syber green procedure was used.
'Fold change' values were compared. At the end of the first exposure week, IL-1β was induced in the spleen and then repressed in the following weeks. Furthermore, it was repressed in the liver in the all exposure weeks. TNF-α was induced at the end of the first exposure week in both organs but then repressed in the following weeks.

Keywords: Emamectin benzoate, IL-1β, TNF-α, *Oncorhynchus mykiss*, gene expression

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Bacteriophages as Therapeutic Agents in Aquaculture

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Abstract
Antibiotics have been common agents that used in aquaculture to treat bacterial diseases. However, development antibiotic resistance and residues problems can occur by overuse or misuse with regard to human and animal health issues. Therefore, there is a need for alternative strategies for bacterial diseases treatment. Bacteriophages are viruses that infect bacteria. The host is specific and infects only the target bacterium and does not kill any living creatures other than bacteria. Hereby, phage therapy is a method used to treat pathogenic bacterial diseases using bacteriophages. Accordingly there is a growing concern to understand the phages to treat bacterial diseases in aquaculture. In this review, field of use, efficiency, administration routes, advantages and disadvantages of using phages in aquaculture conditions will be discussed for the bacterial treatment in aquaculture.
Keywords: Aquaculture, fish diseases, bacterial diseases, bacteriophages, phage therapy

Comparison of nanoemulsion and essential oils of lemon and grapefruit on inhibition of fish spoilage and foodborne pathogen bacteria

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Abstrac

The aim of the study is to compare the inhibition effect of essential oils and nanoemulsions based on lemon and grapefruit on five fish spoilage bacteria (*Vibrio vulnificus, Photobacterium damselae, Proteus mirabilis, Serratia liquefaciens* and *Pseudomonas luteola*) and four food-borne pathogen (*Staphylococcus aureus*, *Klepsiella pneumoniae*, Salmonella Paratyphi *A*, and *Enterococcus faecalis*). Antimicrobial activity of nanoemulsion and essential oils against fish spoilage and pathogen bacteria was carried out using the disc diffusion method. The highest inhibition effect on *Enterococcus faecalis*, *Photobacterium damselae*, *Serratia liquefaciens*, *and Pseudomonas luteola* was observed by lemon essential oil with diameter zone of 25.0, 24.3, 22.0 and 20.5 mm. Inhibition zones of essential oils and nanoemulsions against other bacteria tested was in range from 13.4 and 14.4 to 19.8 and 19.0 mm, respectively. Grapefruit essential oil and nanoemulsion had lower antimicrobial activity than that of lemon. Inhibition zones of grape essential oil and nanoemulsion were the highest on *Pseudomonas luteola* (14.3 mm) and *Staphylococcus aureus* (7.9 mm). There was no effect of grape essential oil on *Proteus mirabilis* and grape nanoemulsions on *Enterococcus faecalis*, *Vibrio vulnificus*, *Serratia liquefaciens* and *Proteus mirabilis*.

Keyword: nanoemulsion, essential oil, antimicrobial activity, foodborne pathogen, fish spoilage bacteria

DEFICIT IRRIGATION AFFECT ON YIELD PERFORMANCE OF SUNFLOWER PLANT IN SEMI-ARID KONYA REGION, TURKEY

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Abstract

Oils, one of the important nutrients in human being, are one of the major foods for people for their life activities. Sunflower is one of the most important oil sources having 46.7% of total crude oils in Turkey. The aim of the study was to determine the deficit irrigation affect on seed and oil yields of sunflower in Konya plain of Turkey. In research, following four different irrigation levels were applied: F_1: Full irrigation or application of 100% irrigation water requirement of plant, F_2: 75% of that applied water to the F_1 treatment, F_3: 50% of that applied water to the F_1 treatment, and F_0: 0% of that applied water to the F_1 treatment. In results, average applied water varied from 400 to 678 mm. The maximum seed yield of 574 kg/ha as an average of two years was obtained from F_1 treatment. Similarly the highest oil yield of 280.33 kg/ha as an average of two years was obtained from F_1 treatment. In first year, 2013, of research, the reductions in oil contents were 7.1%, 25.3% and 63.8% for F_2, F_3 and F_4 treatments, respectively by comparison to F_1 treatment. In 2014, those reductions were 4.9%, 25.3% and 59.9%, respectively by comparison to F_1 treatment. However, the difference in oil content for F_1 and F_2 treatment was found none significant statistically in 5% significant level. In result, 25% deficiency in irrigation water could be recommended for water scant environment such as Konya Basin of Turkey and obtaining reliable oil yield from sunflower farming.

Keywords: DeficitIrrigation, Oil Yield, Sunflower

The Effects of Water Quality on the Dripper Clogging

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Abstract

The studies were conducted at a drip test bench installed in the research area of Directorate of Agricultural Production Enterprise, Agricultural Extension and In-Service Training Center in Adana between 2015 and 2016 years. The research was carried out at three different saline irrigation treatments considering the salt threshold value of the pepper plant. The first treatment is T_d which has low salt content and ECw value of 1.5 dS/m, the second treatment is T_o which has medium salt content and ECw value of 3.0 dS/m and the third treatment is T_y which has high salt content and ECw value of 5.0 dS/m. Furthermore, the well water was treated as T_k in the experiment. The salt ratios formed were diluted to a certain ratio with the well water of the C_2S_1 class and the desired salt threshold values were reached. The aim of this study was to determine some parameters which are clogging in-line drippers and effect the water distribution in drippers such as ripping variation coefficient (Cv), flow rate coefficient of variation (q_{var}), water distribution uniformity (DU), Christiansen uniform distribution uniformity (UC), adjusted Christiansen uniform distribution uniformity (adjUC), statistical uniformity (Us), dripping water outlet distribution uniformity (EUs) at three different saline irrigation treatments during the two growing periods of the pepper plant. CV values were determined to vary between 1.38 and 2.98%. As a result of this search, it was concluded that the high Cv value was caused by the clogging of the salt water applied. In addition, clogging caused decreases in flow rate. When the dripper performance parameters were evaluated in the study, DU values were determined between 74.89-98.5%, UC values were determined between 68.41 – 97.9, adjUC values were determined between 85.2-98.9% and Us values were also determined between 74.1-98.6%.

Keywords: Water quality, Dripper, Clogging; Distribution uniformity

Screening of some linseed (*Linum usitatissimum* L.) genotypes under salinity stress based on germination and emergence tests

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Abstract

Salinity diminishes germination, inhibits and delays emergence and prevents seedling growth of linseed. Some genotypes or varieties less affected from salinity while the others affected seriously. The aim of this study was to determine the effects of KCl, $CaCl_2$ and $MgCl_2$ levels (0, 10 and 20 dS m^{-1}) on germination and seedling growth of 7 linseed genotypes by screening germination, emergence and seedling characteristics. The results of the germination test showed that all lines germinated. Emergency tests indicated that at 20 dS m^{-1} KCl level line 193 and line 114 did not emerged and at 20 dS m^{-1} $MgCl_2$ level line 104 did not emerged. Furthermore line 194 at 20 dS m^{-1} KCl and 20 dS m^{-1} $CaCl_2$ levels emerged but died after and line 193 and 114 also emerged at 20 dS m^{-1} $CaCl_2$ and 20 dS m^{-1} $MgCl_2$ level respectively and died after. Screening of cultivars under salinity precisely showed the diversity among genotypes and demonstrated that lines 215, 87 and 89 had superiority over others.

Keywords: *Linum usitatissimum* L., KCl, $CaCl_2$, $MgCl_2$, ion content

Determination of yield and quality proporties of different shell colored sesame (*Sesamum indicum* L.) varieties and populations

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Abstract

This investigation was carried out to determination of yield and quality properties of different shell colored sesame (*Sesamum indicum* L.) varieties and populations in the experiment fields of Dicle University Agricultural Faculty Field Crops Department in 2016 growing season in order to determine the yield and quality components of 18 sesame varieties and populations collected from different regions of Turkey. In field experiment implemented through Randomized Block Experimental Design with three replication. The obtained data were subjected to analysis of variance by using the JMP Statistical Package Program. In the experiment; plant height, branc number per plant, capsule number, capsule lenghth, capsule weight, seed number per capsule, seed yield, harvest index, oil content, protein content and fatty acid composition were observed. According to the obtained data; while the highest seed yield observed in the Mardin-Kızıltepe population (134.37 kg/da), thousand seed weight 3.35 g) in Diyarbakır-Yerli-2, harvest index (%26.75) in Mardin-Kızıltepe, oil content (%52.90) in Ege-Manisa and protein content (%25.66) in Adana-Yerli. It was determined that the varieties and populations in dark group; have higher seed yield and higher oil content. There was no effect of the crust color on protein ratio. As a result of this study; Şırnak-Kumçatı-Dergul, Mardin-Kızıltepe, Arslanbey, Diyarbakır-Çermik-1 and Diyarbakır-Çermik-2 varieties and populations were more important than others.

Keywords: Sesame, Yield, Quality components, Varieties, Populations.

Comparing of Varieties, Lines and Landraces Genotypes in terms of Yield and Quality in Durum Wheat*

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Abstract

The Southeastern Anatolia Region is considered as the genetic center of wheat and is of great importance in terms of genetic resources. In this sense, landraces of durum wheat have some superior characteristics and are important genetic resources that have been used in many breeding programs lately and still maintain its importance.

In this study, including 10 varieties, 10 lines and 10 landraces total 30 durum wheat genotypes evaluated in terms of grain yield, vitreousness rate, test weight, thousand kernel weight, protein content, semolina colour and mSDS. The research was performed according to Randomized Blocks Trial Desing with 2 replications in the Diyarbakır and Kızıltepe locations in the 2011-2012 growing season.

At the result of the study, it have been obtained that the highest value of grain yield and semolina color and mSDS from lines; the highest value of test and thousand kernel weight and the lowest value of ash from varieties; the highest value of protein and vitreousness from landraces. Consequently durum wheat landraces are very important germplasm for quality in the breeding programme.

Keywords: Durum wheat, Genetic resource, Landrace

* Bu çalışma, Tübitak tarafından desteklenen 111O246 nolu proje kapsamında yapılmıştır.

Determination of Drought Tolerance at Early stages of Some Local Bread Wheat (*Triticum aestivum* L.) Genotypes under Osmotic Stress

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Abstract

Wheat production is usually done in dry farming areas and drought causes serious problems in wheat production in these areas. The present study was conducted to determine the tolerance of local bread wheat genotypes collected from some provinces of Turkey in early growth stages under osmotic stress. In the research, twenty five local bread wheat genotypes and four registered bread wheat cultivars as standard were used. Genotypes were subjected to -5 bar polyethylene glycol 6000 (PEG 6000) for osmotic stress in the petri dishes (9 cm diameter). In the experiment, germination percentage, radicle length, coleoptile length, shoot length, germination index, root fresh and dry weight, shoot fresh and dry weight was determined in the 7th days. Germination percentage were decreased by 14.7 % in PEG application compared to the control. According to the germination percentages, among the genotypes investigated, TR 53869 and TR 63508 were while TGB 000543, TR 54989 and Cam wheat, were sensitive tolerant to drought stress in early growth stages. When considered germination percentage, radicle length, root fresh and dry weight, TR 53869 and TR 63508 genotypes were prominent in terms of drought tolerance at early stages. It will be important to use these genotypes to develop the cultivars tolerant to drought in the early growth stages.

Keywords: Osmotic stress, PEG, Germination, Bread wheat landrace

Evaluation of Some Physiological and Agronomic Characteristics to Screen Drought Tolerant Spring Rapeseed Genotypes

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Abstract

This study was conducted to recognize some of the physiological and agronomic characteristics related to drought tolerance in spring genotypes of rapeseed.The experiment was carried out in the East Azarbaijan Agriculture and Natural Resources Research and Education Center (46°2¢E, 37°58¢N)during 2015 and 2016 cropping seasons. The experiment was conducted as split plot based on a randomized complete block design with three replications. The experimental factors were drought stress with three levels: non-stressed and drought stress from flowering and pod formation stages and genotype in 5 levels: RGS003, Zafar, Sarigol, Zarfam and Dalgan. Occurring drought from flowering and pod formation stages led to a significant increase in leaf temperature and significant decrease in leaf relative water content, stomatal conductance, leaf chlorophyll index, pod number per plant, grain number per pod, 1000-grains weight, oil percent, grain and oil yields. But the effects of drought from flowering stage were too hard. Therefore, in case of water resource limitation, irrigation during flowering will be more important than pod formation stage. RGS003 genotype with having higher relative water content, stomatal conductance and leaf chlorophyll index and lower leaf temperature, indicated the highest grain and oil yields. Therefore, it could be used to cultivate in areas with limited water resources. The significant correlations among leaf temperatures, relative water content, stomatal conductance and leaf chlorophyll index with each other and grain and oil yields and yield components were seen. It seems that these traits can be used to select drought tolerant spring genotypes of rapeseed.

Keywords: Leaf chlorophyll index, Leaf temperatures, Relative water content, Stomatal conductance.

Determination of the effects of 2,4-dichlorophenoxy acetic acid on hematological parameters in rats given alcohol

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Abstarct

In modern agriculture, many compounds such as pesticides, herbicides and various kinds of fertilizers are frequently used in the fields to increase crop production. However, among these compounds, widespread usage of synthetic herbicides for agricultural purpose has an adverse effect on living organisms and can lead to several hematological and neurological complications in human and animals. Alcohol consumption is one of the potential risk factors in cardiovascular disease. The aim of this study is to investigate the effects of 2,4-dichlorophenoxy acetic acid (2.4-D), used commonly by farmers as a herbicide, on hematological changes in rats given alcohol. Totally 28 Sprague Dawley male rats were randomly divided into four groups containing 7 animals per group. While first group served as a control, experimental groups were as follows; herbicide group (5 mg/kg, 2,4 D, orally), alcohol group (3 mg/kg ethyl alcohol, orally), herbicide plus alcohol group (5 mg/kg 2,4D and 3 mg/kg ethyl alcohol, orally). In the end of experimental period lasted totally 60 days, the blood samples were taken from animals by cardiac puncture under anesthesia. In the blood samples, erythrocyte, leukocyte and platelet counts, hematocrit value, hemoglobin concentration were determined. 2,4D increased the total leukocyte, lymphocyte, monocyte and granulocyte numbers. Alcohol and alcohol plus 2,4D application reduced the erythrocyte numbers, hemoglobin concentration, hematocrit value and trombocyte concentration. The MCH level was increased by alcohol, 2.4 D and alcohol plus 2.4 D treatments. We concluded that 2,4 D application in rats given alcohol leads to changes in hematological parameters.

Keywords: Alcohol, 2,4-Dichlorophenoxyacetic acid, hematological parameters, rat.

Profiles of Cattle Slaughtered in Burdur Province During 18 Months

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Abstract

Study was carried out in order to determine of cattle profiles such as breed, age and sex slaughtered in a private slaughter house (Güçbirliği) in Burdur province during 18 months between years of 2015-2016. In addition to this, data about the farms where animals transfered to a commercial slaughterhouse and hot carcass weight were also detected. When data of nearly 18.000 (17.756 head) cattle with more than 7 diffferent breed was considered, it was seen mostly Holstein cattles (91.73% and 88.55% for 2015 and 2016, respectively) were slaughtered. This was followed by Simmental breed (5.92% and 7.90%) and Brown Swiss with the percentage of 1.95 and 1.32 for 2015 and 2016, respectively. Age of animals were detected more than 2 years old between 776 and 987 day of age. While the number of male cattles were more than females, the percentages were detected as 62.18 and 74.62 for 2015 and 2016, respectively. The relatively higher values for hot carcass weights were obtained from Simmental cattle (276.41 kg and 301.91 kg) than other breeds. The large part of cattles were transfered from Burdur province (77.73% and 83.62%). This was followed by Denizli (13.19% and 6.73%) and nearby provinces. In study, it was seen that the most prominent breed slaughtered is Holstein. It shows that animal material is integrated to meat sector. As a positive contribution to this situation, it was needed to increase beef cattle breeds. At this point, using dairy cattle enterpries with commercial crossing for beef production cyclically can be one the methods. Nevertheless, hot carcass weights are relatively higher than average values of Turkey. This situation might be improved by applying right fattening practices in Burdur province.

Keywords: Cattle, Profile, Slaughter

Microbiological Analysis Of *Spiriluna platensis* Produced İn Poultry Manure Enriched Medium.

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Introduction: *Spirulina platensis* is an interesting source of important protein for both human and animal consumption. Dry chicken manure contains most of elements particularly nitrogen (N) and phosphorus (P) which microalgs need for growth and flourish. In Turkey, about 7 million tons of poultry manure creates environmental problems per year. The aim of study, was to compare the microbiological quality of *Spirulina platensis* cultured in standart medium and dry chicken manure medium.

Material and Methods: *Spirulina platensis* samples were dried at 60°C for 5 hours after they were cultured according to standart medium for control group and poultry manure medium suplemented sodium metabisulphite (5 mg / L) for treatment group. The dried samples were microbiologically tested for the presence of bacteria such as, *Salmonella* spp., *E.coli*, *Campliobacter* spp., *Coliform*, *Enterococcus* spp., *Lactic acid bacteria* spp. Total count of aerobic mesophilic bacteria was also determined. Bacteriological test were by means of standard methods of isolation of individual species of bacteria as reported by ISO requirements.

Results: In the result as *Salmonella, Campliobacter, E.coli, Coliform* bacteria were not found in the both of control and treatment samples. *Enterecoccus* spp. were found 3.91 log 10 cfu/gr for control, and 2.01 log10 CFU/gr for treatment groups respectively. Total count of aerobic mesophilic bacteria were determined 5.53 log10 CFU/gr for control and 2.98 log10 CFU/gr for treatment group respectively.

Discussion: Depending on the growing conditions, *Spirulina platensis* contains crude protein, essential fatty acids, carbohydrates, vitamins, minerals, carotenes, phycocyanins, chlorophyll a. Spirulina, which has been important as ecologically and economically cell protein, is cultivated in poultry manure enriched medium, one of the environmental pollutants, affecting environmental recovery positively. It is important that the grown biomass does not carry microbial contamination of poultry that can cause disease for humans.

Keywords: Spirulina, Dry Chicken Manure , Feed Additive, Microbiological Quality .

Effect of Oregano Essential Oil on Gut Morphology and Digestive Organs Weights in Broiler Chicks

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Abstract

An experiment was conducted to investigate the effect of marjoram essential oil on gut morphology and digestive organs weights in broiler chicks. A total number of 750, day old unsexed broiler chicks were distributed in a completely randomized experimental design in floor pen with five treatments and six replication of 25 chicks each. Five treatments [basal diet (control), basal diet + 100 mg per kg probiotic (Protexin), basal diet + 150 mg per kg of antibiotic (Avilamycin) and two diets containing basal diet + 200 and 400 mg per kg diet marjoram essential oils] were tested in 42 day period. There was not difference in lactobacillus population in jejunum content of birds at 42 day. In male chicks, relative weights of jejunum and ileum between the experimental groups were significant. Relative weight of jejunum in diets included 200 and 400 mg per kg oregano essential oil were same as control and antibiotic groups, but higher than probiotic group. Relative weight of ileum in control group were higher than other experimental treatments.
Body weight, feed conversion ratio and survival rate were not affected by treatments. The results showed that marjoram essential oils at 200 milligrams per kilogram of diets in early, and in the final rearing period can be used in broiler diets according to most cases of positive effect on the performance and gut health, however, further investigation is needed.

Keywords: Oregano essential oil, Broilers, Gut morphology, Digestive organs weights

Animal nutrition and microbiota

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Abstract

This review was planned to determine the relationship between dietary and gastro intestinal truct (GIT) microbiota in animals. Diet is known as a important modulator of the composition and function of GIT microbiota. The composition of GIT microbiota can be influenced by different diet components. The type and amount of protein, fat and carbohydrates present in the diet have been mostly expressed to influence the composition of the GIT microbiota in the host. Probiotics and prebiotics are very important to induce changes in the composition of the GIT microbial populations and offer multiple benefits to the host health in the especially poultry. Antimicrobial supplementation and methane-reducing feed additives and the digestibility of nutrients are determined to be effective on rumen fermentation and microbiota. The changes in the microbiota due to dietary diseases such as obesity influence the development of many diseases in the dog and cat. Further research is needed to fully understand the mechanisms involved in the interactions between diet composition, GIT microbiota and associated diseases in animals.

Keywords: Microbiota, Diet, Animal

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Use of Spline Regressions in Livestock

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Abstract

In this study, piecewise regressions, widely used to investigate the relationships between dependent and independent variables, and its use in animal husbandry were investigated.
It has been found from the data obtained from animal husbandry studies that the spline regression models obtained by determining the appropriate knot points show better agreement with the conventional classical models in terms of sum of mean squares, standard deviation of the model, determination coefficient, adjusted determination coefficient and the Durbin-Watson autocorrelation values . This superiority has been observed more clearly when the point distribution is different from the known one. From this result, it can be said that the use of spline regression models in the field of livestock will be beneficial to the investigator in many ways.
Keywords: Regression, Spline Regression, Farming, Lactation Curve, Growth Curve

Effect of Different Incubation Months on Hatching Performance and Embryonic Mortality in Chukar (*Alectoris chukar*) Partridges

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Abstract
Chukar partridges, the most prevalent partridge breed in Turkey, are raised intensively for both meat production and hunting. The reproductive season of chukars lasts from May to August. Even though there are various reports about hatching performance of them, there is lack of information about which month is more suitable for incubation in the breeding season. In this study it was aimed to investigate the month effect on hatching performance of chukar eggs. 308, 280, 308 eggs were incubated in May, June, July respectively. Hatchability, fertility, hatchability of fertile eggs, embryonic mortality rate were determined. Even though there were found to be any significant differences between incubation months in terms of hatchability of fertile eggs and embryonic mortality; hatchability and fertility rates were started to decrease in June and dropped to below average level in August. It is suggested that incubation should be done carefully in June. Chukar eggs produced in July should be utilized for other purposes rather than incubation.
Keywords: Chukar partridges, Alectoris chukar, hatching performance, incubation months, embryonic mortality

Feed Varieties and Feeding Characteristics Used in Dairy Cattle Farms in Muş Province

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Abstract

This research was carried out in order to determine the feed varieties and feeding characteristics used in dairy cattle farms in Muş province and districts. . For this purpose, a cross-sectional questionnaire was applied to 346 farms using the random sampling method. The obtained data were cross-tabulated using SPSS package program and the relationships between factor-properties was determined by chi-square analysis. According to this, the average age, number of dairy farms, the number of individuals in the farms and the number of animals in farmers are 44.21, 21.22 years, 7.16 and 37.54 heads, respectively. The educational status of the farmers varies from non-literate (9.1%), primary school (51.5%), junior high school (24.6%), high school (13.5%). The types of forage crops used in feeding are alfalfa, meadow grass, sainfoin, wheat straw and small amount of vetch. Although the most intensive fodder crop plantation was in the Bulanık district (97.6%), 87.2% of the farmers reported that they had forage crops, but only 42.2% reported that they had enough knowledge on this subject. The percentage of alfalfa plantation is 24.6%, and it is most concentrated in the Muş centre (43.8%). While 88.9% of roughage produced is fed to animals, only 4.1% is sold. In the farms, feeding is done twice a day (75.3%) and free feeding (1.9%). The rate of concentrate used in the farms is 75.3%. 97.9% of the farmers are bringing their animals to the pastureland. This research is important in terms of providing an important data base relating to dairy farming in Mus province.

Keywords: Muş province, Dairy cattle farms, Feed varieties, Feeding characteristics

YOLK COLOR PARAMETERS IN EGGS OF ATAK-S PARENTS

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Abstract

The present study was conducted to determine the color characteristics of egg yolk in the eggs of layers ATAK-S (Barred Rock I (BAR1) and Rhode Island Red I (RIR1)) parents. Twenty five weeks old ATAK-S layer parents were divided into 7 treatment groups of similar weight (including 60 female and 10 male) in Agricultural Biotechnology Department R&D Poultry House, Ahi Evran University. Parents ATAK-S housed were employed a 16:8 hours light: dark photoperiod. Feed and water were given ad libitum. Layers were fed standard layer diet having 17 g crude protein, 3.8 g calcium and 2800 Kcal ME in each kg. Experiment was carried out 48 weeks (between 25 and 72 weeks) and a total of 4032 egg yolks were analyzed. L* a* b* values were measured with photocolorimetric method of the CIELAB system and E (color difference) value, hue, saturation, Chroma, H° value were calculated. To conclude, overall mean of L*, a*, b*, E, hue, saturation, Chroma and H° value were 68.07+0.060, 25.15+0.097, 34.57+0.068, 80.53+0.057, 0.95+0.002, 42.86+0.068, 1264.79+26.744 and 53.94+0.129, respectively. This work was supported by the Republic of Turkey Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Research and Policies. Project Number: TAGEM-15/AR-GE/28

Keywords: L* a* b* values, E value, hue, saturation, Chroma, H° value

Possibilities of using Rice Bran in Dairy Nutrition

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Nearly 45.000 tonnes rice bran (RB) is produced as by-product of rice production of 550.000 tonnes in Turkey. The RB contains nearly 11.5-15.3% crude protein, 8.4-22.0% crude ash, 7.3-13.4 % crude fiber and 13.3-19.8% depending on variety and production type. The crude fat fraction of RB contains nearly 80% unsaturated fatty acids (40% 18:1 and 40% 18:2). The RB is rich in Metabolisable Energy and also has not an acidosis effect in rumen environment. Also, RB is a source of essential fatty acids and anti-oxidants. This by-product of rice industry contains high levels of digestible protein, thiamin, niacin and trace minerals (Manganese and Zinc). The vitamin E, which is important for immune system, is abundant in RB. Furthermore, he RB has potential to prevent the negative impacts of heat stress on ruminants due to its rich crude fat content. In this review, the possibilities of using RB in dairy cow nutrition will be discussed.

Keywords: Rice bran, fatty acid, dair cow, milk composition.

Organic Small Ruminant Breeding in the Scope of Sustainable Agriculture And Current Status in Turkey

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Abstract

Sustainable agriculture, is a production system based on conservation of natural resources, improve productivity by using environmental friendly agricultural technologies. Organic agriculture, in the concept of sustainable agriculture, is an important production system. Organic agriculture aims protect environment, human health and animal welfare by controlling all phases of production. On the other hand conventional production systems focus on basically increase the productivity. So that some applications can be used for maximizing the efficiency of the animals such as antibiotics, hormones and genetically modified organisms. These practices threaten human health besides being a topic of debate in terms of animal welfare. Turkey with about 41 million has the most number small ruminant presence among European Countries but just about 0,06% of them in organic farming . Sheep and goat, even in inadequate conditions, as species features can give a lot of products such as meat, milk, animal fiber, leather and fertilizer. In addition to this, production is maintained by using traditional method with durable native breeds and forages are mostly suitable for organic production in Turkey. As a consequence, it can be said that Turkey has a significant potential for organic small ruminant breeding. But recent meat production levels and prices showed that not only organic farming but also conventional production should be increased. So it will be the realistic approach to maximize benefit of small ruminant for the solution of this problem. When all these factors taking into consideration, increasing organic small ruminant meat and milk production will be hopeful proceeding both small ruminant breeders and consumers who want to reach healthy and high quality products. The aim of this study is to discuss the importance and suitability of organic small ruminant breeding and reveal current situation in Turkey.

Keywords: Small ruminant, Organic farming, Sustainable agriculture

Determination of Yield And Quality Characteristics of Silage Hybrid Maize Variety Candidates Obtained From Inbred Lines

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This research was carried out with first year 19 candidate species and 4 standard varieties, second year 11 candidates and 4 standart in 2015 and 2016 in order to determine silage yield and quality characteristics of some single hybrid variety candidates and it was carried out according to a randomized trial design of random blocks. Forage yields in the first year of the experiment 4397-5872 kg da-1 in the second year 3780-6621 kg da-1, between dry matter yields the first year 1425-1804 kg da-1 in the second year 1335-2404 kg da-1 showed variation between.
Variation ranges in the quality characteristics variety of candidates and variety used in the experiment % change by weight basis ADF, NDF and crude protein ratio varied between 23,5,1-31,9, 41,2-49,2 and 5,2-9,1, respectively. The content of mineral matter in dry matter (% change by weight basis) % Ca, K, Mg and P ratio in both years, similar results were obtained.

Key words; maize, forage yield, quality, mıneral matter

The Effect of Organic Fertilizer on Yield and Some Yield Components of Durum Wheat

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This study aimed to assess the effects of organic fertilizer applications on yield and some yield components of durum wheat (Triticum durum L.). Field trials were carried out conducted under supplemental irrigated conditions in Harran Plain during the 2014-2015 and 2015-2016 growing seasons. In the experiment, Control+ 6 types of organic fertilizer traitments were tested (ie.1.chicken manure, 2.vermicompost, 3.cattle manure, 4.chicken manure + liquid fertilizer, 5.vermicompost + liquid fertilizer, 6.cattle manure + liquid fertilizer). Combined Anova for two consecutive years indicated that cattle manure+ liquid fertilization traitment increased grain yield significantly. In the control application, the grain yield was 386,381 kg / da while the cattle manure+ liquid fertilizer traitment performed a 605,5476 kg / da grain yield.
Taking into all sources of variation in Anova 'cattle + liquid fertilizer' traitment resulted in the highest grain yield (605,5476 kg/da) Plant height was 94,13cm, spike length, 6,865 cm., and thousand kernel weight, 55,41 g. in same traitment .
It was concluded that various organic fertilizer applications increased grain yield with a 53% more than that of control, plant height, spike length and thousand kernel weight also increased significantly.

Keywords: Durum wheat, yield, plant height, spike length,

Determining some yield performances of some forage grasses and legumes mixtures for pasture establishment under lowland conditions of Igdir

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Abstract

This study was conducted to determine the suitable forage species and mixtures for the pasture establishment under lowland conditions of Igdir between 2014 and 2016. Research was conducted as randomized block design with three replications. In study, plant height, botanical composition according to weight, land equivalence ratio, green herbage and hay yields of pure sowing, and binary and ternary mixtures of alfalfa (A), birdsfoot trefoil (BT), tall fescue (TF), crested wheatgrass (CW) and smooth brome (SB) were investigated. In terms of the characteristics examined, significant differences were observed between the years and the mix-issues. The species heights in the binary and ternary mixtures were generally found lower than pure sowings (except CW). The proportions in the mean botanical composition of A, BT, TF, CW and SB in binary and ternary mixtures were determined as 62.22%, 39.20%, 49.21%, 20.00% and 29.38%, respectively. In terms of effective use of ecological resources, binary (except CW+BT, SB+A and SB+BT) and ternary mixtures were found higher than pure sowings. The highest land equivalence ratio among ternary mixture was obtained from TF+CW+A. The highest green herbage yields were obtained from pure sowing alfalfa and TF+CW+A. The highest hay yields were obtained from pure sowing alfalfa, followed by TF+CW+A and TF+A. Consequently, it was revealed that the ternary mixtures (except CW+SB+A) in which alfalfa was included were the most suitable mixtures for region. It was also determined that the proportion in botanical composition of species in the binary mixtures was higher than the ternary mixtures (except CW+SB+BT).

Keywords: Artificial pasture establishment, Botanical composition, Land equivalence ratio, Mixtures

Determination of Some Agronomıc Traits of Silage Sorghum (*Sorghum vulgare* L.) and Sudangrass (*Sorghum sudanense* [(Piper) Stapf.]) Hybrid Cultivars in Kırşehir Conditions

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Abstract

This study was carried out in 2016-2017 vegetation periods under the ecological conditions of Kırşehir. This experiment was conducted in completely randomized block design with tree replicates to determine the adaptation abilities of some sorghum and Sorghum-Sudangrass hybrid cultivars (Aneto, Greengo, Teide, Gözde 80, Sugar Graze, Early Sumac, Rox, Gardavan, Jumbo) in Kırşehir ecological conditions.

The results showed that the plant height and weight, number of leaves, stem diameter, leaf and steam ratio, herbage yield were determined as 216.4-287.1 cm and 168.2-383.7 gr, 7.1-10.7 pcs/plant, 8.9-16.8 mm, 17.3-27.1 % and 72.4-83.1 %, 3278.1-6745.5 kg/ha respectively. To conclude Greengo and Jumbo were preferable cultivars in Kırşehir ecological conditions.

Keywords: Sorghum, SorghumxSudangrass, Plant Height, Herbage Yield, Agronomic Traits

The effect of ozone on root-knot nematode, *Meloidogyne incognita* populations on tomato and cucumber

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Abstract

Root-knot nematodes are ubiquitous pathogens widely distributed to almost all agricultural regions of the world. *Meloidogyne* species are posing an excessive deleterious threats to over 5500 different plants. In order to control these nematodes damage to the plants, chemical control remains as main option which is a big threat to environment and humans health. Ozone applications is one of the economically and eco-friendly effective new alternative control tactics applied recently to minimize these pathogens damage. In this study, the effect of ozone on *M. incognita* was studied on cucumber (cv. Ak-83) and tomato (cv. Falcon F1). The trails was arranged as 3×3×2×2 factorial randomized complete block design with three nematode inoculums (0 for control, 500 and 1000 eggs or J2s/pot), three ozone levels (10, 20 and 30 mg O_3/L), two-times concentration (10 and 30 minutes) and two host plants, replicated five times. There were a significant effect observed on plant verities, nematode levels and treatment levels on all parameters ($P \leq 0.05$) in both trails. Also, the interaction of nematode levels × treatment levels influenced the root dry weight in two trails. In this study, the highest plant height was recorded for 10 mg ozone in 10 minutes on cucumber (59.70±6.0 cm) at 2nd trail and on tomato (55.79±8.7 cm) at 1st trial. Among applied three ozone levels, 30mgO_3/30min could give the best outcome to control root-knot nematode populations. It was concluded that more field researches needed to investigate to know more about effectiveness of ozone to nematode management.

Keywords: *Meloidogyne incognita*, Ozone, Tomato, Cucumber, Nematode control

Determination of Oil Content and Fatty Acid Composition of Safflower (*Carthamus tinctorius* L.) Genotypes

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Abstract

This Research; Ondokuz Mayıs University, Faculty of Agriculture, Field Crops Department was conducted in 2017-2018. In the study; 28 safflower genotypes and 2 registered safflower varieties (Balcı and Dinçer) were used in 20 different countries selected from the World Safflower Gene Collection. In the study, variations between crude oil ratios and genotypes in terms of palmitic, stearic, oleic, linoleic, linolenic, arachidic and eicosonic fatty acids were investigated and the relationship between crude oil ratio and fatty acid compositions was also investigated.

Research result; it was determined that there is a statistically significant difference between the crude oil ratio and the genotypes in terms of fatty acid compositions. It was determined that the ratio of crude oil as the average of all genotypes evaluated was 29.88%. Among the genotypes examined, 17 genotypes were found to have higher crude oil ratio than average crude oil ratio. Among the genotypes evaluated, the highest crude oil ratio was obtained with genotype number 560175 from USA with 40.87%.

All of the genotypes examined were found to be in the linoleic group (having a linoleic acid content higher than 70%). The ratio of the average linoleic acid was 80.22%, and the ratio of 11 genotype to linoleic acid was higher than the average linoleic ratio among the evaluated genotypes. The highest genotype of Kazakhstan was obtained with the highest linoleic rate of 84.31%.

In selection studies to determine the most suitable safflower genotype for Samsun ecological conditions; it is appropriate to use genotypes that perform better than registered varieties in terms of crude oil ratio and linoleic acid ratio.

Keywords: Safflower, Oil Content, Fatty Acid Composition

Properties of the stevia plant and its utilisation in Turkey

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Abstract

Stevia rebaudiana -also referred as sugar herb in Turkey- is rapidly gaining attention among the world in recent years. The value lies in the fact that it has a calorie value of zero while still providing a feeling of sweetness that is four times more compared to that of normal sugar. It is extensively used by diabetics, especially in the health field. It is argued to be helpful in the treatment of hypertension and obesity as well as diabetes It is forecasted to have a much larger impact in the future among the developing food market. The production of Stevia rebaudiana is limited to certain regions of the province of Rize in Turkey for trial purposes. South American countries such as Paraguay and Brazil on the other hand have organized production fields dedicated to this plant. It is also known that these countries use the plant extensively as a natural sweetener. Once the Stevia plant has undergone a fabrication procedure, it no longer belongs to the weed category. There has been an increasing amount of scientific studies on the Stevia in recent years. It is worth noting that it lacks the research necessary to facilitate the usage of this valuable product in Turkish kitchen. In this review, information about the general characteristics and uses of Stevia plant is presented.

Keywords: diabetes, Stevia rebaudiana, sweet

Determining the Salt Tolerance of Some Alfalfa (*Medicago Sativa* L.) Cultivars in Early Growth Stage

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Abstract

Soil salinity is one of the important stress factors limiting adequate germination in arid and semi-arid areas. The research was conduct to determine the salt tolerance of some alfalfa cultivars grown in Turkey. In the study, eighteen alfalfa cultivars were subjected to salt stress in various concentrations (100 mM, 200 mM and 300 mM) using NaCl in petri dishes. In the experiment, some characters such as germination percentage, radicle length, vigor index, germination rate and germination index was determined in the 7th days. Increased levels of NaCl have been significantly reduced seedling growth. Germination percentage were decreased by 8.9% in 100 mM salt, 28.2% in 200 mM, and 73,8% in 200 mM salinity compared to the control. Cultivars Sabrina, Queen and Frigos were more tolerant to salt than other cultivars investigated in early growth stage, while cultivar Magna 601, Victoria and Sunter were not. When all the characters studied are taken into account, cultivar Sabrina can be considered as the most tolerant to salt. The inclusion of cultivar Sabrina to field experiment to be conducted in the region with salinity problems will contribute to the development of alfalfa production in these regions.

Keywords: *Tolerance to salt*, *radicle lenght, germination rate, NaCl*

Researches on Efficacy of Mating Disruption Method for Management of Leopard Moth *Zeuzera Pyrina* (Lepidoptera:Cossidae) in Olive Orchards in Hatay Province/Turkey

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Abstract
Larvae of Leopard moth, *Zeuzera pyrina* L. (Lepidoptera: Cossidae) cause death of the host tree by boring galleries in thin and thick branches. Most of the olive growers in the region were having difficulties in the chemical control of the pest. The aim of this study was to test the efficacy of an alternative control method - mating distruption (MD) technique- of *Z. pyrina* in olive orchards. *Z. pyrina* dispensers were established to a 50 ha olive orchard with 360 dispensers/ha dosage in Hassa district of Hatay province in the first week of May in 2015 and 2016. To assess the efficacy of MD method, damage symptoms and live larvae in stem and branches were counted in both trial and control orchards. In the first year of the trial, the efficacy of the method was determined as 77.8 %. Efficacy assesment of the second year was done both in 2016 autumn and 2017 spring. The MD method efficacy of the second year was determined as 54.5 % at autumn countings and 60.7 at spring countings. The effect of height on the trapping capability of the pheromone traps were also tested. It was found out that hanging the traps over the top of the tree canopy ensured adults to be captured.

Keywords: Leopard moth, *Zeuzera pyrina*, olive, mating distruption method

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The Most Common Insect Vector of Plant Viruses, *Myzus persicae* Sulz.

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Abstract
One of the most efficient ways of plant viruses for spreading from plant to plant is transmission by insect vectors. Also, transmission by insect vectors is important for surviving of plant viruses, especially absence of host plant. 88 % of plant viruses can be transmitted from one host to another via insect vectors. Aphids transmit a lot of virus species from several groups such as, *Potyvirus*, *Cucumovirus*, and *Luteovirus*. It's called aphid-borne viruses for this kind of viruses. Even, the symptoms which are caused by aphid-borne viruses are variable; the most important one of these symptoms is mosaic. These viral diseases especially, cause yield losses and death on vegetables. Among the vector aphid species, the most naturally efficient one is the green peach or potato aphid (*Myzus persicae*) it can transmit more than 100 different plant virus diseases, in about 30 different families, including many major crops. Persistent viruses transmitted include *Beet western yellows virus*, *Beet yellows virus*, *Beet mild yellowing virus*, *Pea enation mosaic virus*, *Bean leaf roll virus*, *Potato leaf roll virus* and several viruses of tobacco (for example, *Tobacco vein-distorting virus*, *Tobacco yellow net virus*). Many more are transmitted by the non-persistent method, including *Potato virus Y*, *Cucumber mosaic virus*, *Clover yellow vein virus*, *Alfalfa mosaic virus*, *Pepper veinal mottle virus*, *Plum pox virus*, *Lettuce mosaic virus* and *Tobacco vein mottling virus*. *M. persicae* plays an important role in spreading infection between plants; considerable amounts of insecticides are being used regularly to control this vector. In this study, virus transmission mechanism, general biology, and controlling methods of *M. persicae* were summarized.

Keywords: Aphid-borne, *Myzus persicae*, *Potyvirus*, Vector, Virus

Contract Farming in Agricultural Marketing and Contract Models

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Abstract

Businesses have searched for new marketing techniques because of the economic crisis in the world economy in the early 70's and the inadequacy of old marketing techniques in trade . Difficulties in raw material procurement in food industry especially in developed countries, *have* accelerated the development of new marketing techniques.In this period; while marketing choices like producer markets, auction systems, cooperatives, boards have failed to satisfy, new and emerging marketing techniques *has* increased in importance.
Generally, new and emerging marketing identify with contract farming. Excessive price fluctuations in crisis years/periods affect adversely vendors and purchasers, so new methods become crucial. It occurs supply and demand fluctuation as monthly, seasonal, yearly on agricultural products cause of its structure. Excessive fluctuation affects adversely both vendors, purchasers and consumers; therefore it affects the whole of the national economy. Present and future marketing knowhows information underlie the sales policy for every business. Producers honor in accordance with the domestic and foreign terms of sale in their economic avtivities. Nowadays, preparing sale programmes and looking forward are seen as the key parts of the marketing management. From this point of view; contract farming which provides producers hassle-free marketing of product following the harvesting. increasingly become crucial.

Keywords: agricultural marketing, food economics, contrat farming, vertical integration

Environmentally friendly apparel perception of Hitit University academician

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Abstract

The greatest damage to the polluted environment and agricultural land is given by the petroleum industry and the apparel industry. Interest in environmentally friendly textile products has increased in recent years, as the textile industry is responsible for 10% of the world's carbon emissions. The aim of this study is to identify the factors that influence the perception of environmentally friendly apparel. In accordance with this aim, 240 questionnaires were conducted with Hitit University academics in March and April 2018. A previously verified scale was used in the study. The results obtained from the questionnaire were analyzed by exploratory factor analysis through SPSS program. The sample adequacy was tested with the KMO and Bartletts Test, and it was concluded that sampling was sufficient (0.784). According to the explanatory factor analysis result, a 4-factor structure that accounts for 83% of the total variance was obtained. These factors and Cronbach's alpha coefficients according to the order of importance, 'Emotional Value' (0,901), 'Social Value' (0,910), 'Quality' (0,922) and 'Price' (0,933) were determined. As a result of this study, it has been found that environmentally friendly textile products are not economical but preferred because of their quality. Encouragement of the use and production of environmentally friendly textile products is very important in terms of environmental policies.

Keywords: *Environmentally Friendly, Consumer Behaviors, Pollution, Apparel*

Productive Safety Net Program and Its Impact on Food Insecurity in Ethiopia

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Abstract

In Ethiopia chronic food insecurity was the features of extraordinarily poor households living in rural areas. These peoples heavily rely upon rain fed agriculture and thus, in years of poor rainfall, the threat of widespread starvation is high. The policy response to this threat has been a series of ad hoc emergency appeals for food aid and other forms of emergency assistance. Even though these policy measures have succeeded in reducing mass starvation among asset-less households, they were unable to prevent further famine and could not prevent asset depletion of marginally poor households affected by adverse rainfall shocks. Consequently, the second largest safety net program in the continent was implemented to handle the problems of chronic food insecurity and prevent households' asset depletion in the country. The results of review indicate that Ethiopia's PSNP has demonstrated the value and potential of a transition from addressing food insecurity through humanitarian response system to a system that is development-oriented. There is evidence that livelihoods were stabilized and food insecurity is being reduced among beneficiary households. The public works investments in soil and water conservation which is vital to achieve sustainable livelihoods in rural areas resulted in significant improvements in the natural environment. However, graduation process was very low attributed to its complexity requiring regular investments and consequently remained a challenge because of the repeated shocks that have hit the country.

Keywords: Productive safety net program, Food security, Ethiopia

Microbiological Quality of the Peanuts Grown in Osmaniye Province at Harvest

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Abstract

In this study the microbiological quality of the peanuts grown in Osmaniye province has been determined in terms of yeast and mold, total aerobic mesophilic bacteria and, pathogens such as *Salmonella, Listeria* spp, coliform, *E.coli*.

A total of 24 samples taken from harvest were found to be clean in terms of *Salmonella* and *E.coli* O157: H7, but only in 1 of the samples of shelled peanut taken from harvest found *Listeria*. In 8 samples of 12 shelled peanut samples which were taken from harvest, as the range of total aerobic mesophilic bacteria 3.0±0.1 - 8.7±0.1 log CFU/g, coliform group bacteria 9.1->1100EMS/g, *E.coli* Type 1<3->1100 EMS/g, yeast 3.6±0.2 - 8.7±0.2 log CFU/g, mold 2.7±0.3 -5.6±0.2 log CFU/g were found. In 12 peanut samples (without shell) from harvest, total aerobic mesophilic bacteria 3.4±0.1 - 5.6±0.3 log CFU/g in 12 samples, in 11 samples yeast 2.0±0.1 – 5.2±0.1 log CFU/g,and in 9 samples mold 2.6±0.3 – 3.9±0.1 log CFU/g in the range of were found. In order to keep pathogens at a minimum level in the peanuts, it is necessary to follow up with the requirements of good agriculture and hygiene practices such as harvesting the peanuts without damaging and drying them to the desired moisture level.

Keywords: Peanut (*Arachis hypogaea*L.), food safety, microbiology, pathogens

Distillation methods of essential oils

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Abstract

Methods used for obtaining essential oils can be ranged as simple, fractional, vacuum, water-steam distillations and micro-wave assisted hydrodistillisation. Distillation methods are mainly based on the difference of boiling degree or the solvent and transport effect of water-steam. Vacuum can be used for accelerating the process. The success of the methods is related to presence of undesirable compounds such as waxes, flavonoids, coumarin and deterioration rate of active compounds for whatever reason. Low-temperature water-steam distillation can avoid deteriorations but it can not block the presence of the undesirable compounds. Micro-wave assisted hydrodistillation is a new method resulting with the high degree pureness. But this method has not been placed well to commercial production of essential oils. Essential oils having a high potential to be used in medical care and food industry are also used as feed supplement with the antimicrobial and antioxidant effects. It was aimed to discuss about the advantages, disadvantages and some other features of distillation methods in this review.

Keywords: distillation, methods, essential oils

Importance of Emulsifiers in the Poultry Nutrition

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Abstract

Genetic selection of broilers for rapid growth has altered their nutritional requirements leading to substantial changes in diet formulations. Energy is a major dietary cost component for high performing broilers. Due to its high energy density, fats and oils are supplemented to the diet to meet the high energy requirements of fast-growing broilers. On the other hand, the ability to utilise fat and oils of broilers is increased by age. The digestion and absorption of dietary fats and oils in young broilers are fairly limited because of insufficient secretion of bile salts as natural emulsifiers rather than lipase. Young broilers have a low capacity to produce and recirculate bile salts until their digestive system matures. Morever, production of pancreatic lipase is also stimulated by the release of bile salt. Dietary supplementation of bile salt highly improved fats and oils utilization in young chickens, on the other hand, the strategy may not be economically. To overcome this problem, natural emulsifiers such as soy-lecithin, milk derived casein, lysophatidylcholine or lysolecithin, glycerol polyethylene glycol ricinoleate and sodium stearoyl-2-lactylate etc. are being added to broiler diets. As a result of this, the utilisation of fats and oils is improved and the level of metabolisable energy in diet is reduced. In this article, the information about the digestibility of fats and oils in young chicks, the definition of emulsifying agents, hydrophilic-lipophilic balance, the modes of action and the use of natural emulsifiers in poultry diets will be given.

Keywords: Broiler, digestion, emulsifier, fat, metabolizable energy

Encapsulated products in animal nutrition

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Abstract

Encapsulation is a technology based on coating an active compound with one or more coating material and keeping it in the capsule. Encapsulation is a system can be used for increasing stability and bioavailability, protecting the form and controled secretion to target tissues of bioactive compounds. Coating materials are can be ranged as starch, analogs of starch, proteins, gums, lipids or their mixtures. Nowadays, many methods such as spray drying, freeze drying, fluid bed coating, extrusion, cocrystillization and molecular clust have been used for encapsulation practices. This practices are used in fields such as food, pharmacy, medicine, veterinary, biotechnology, textile, industry and agriculture. In recent years, advantages of encapsulation methods for the effiency of feed additives have been asserted. As a matter of fact, lycopene, linoleic acid, conjugated linoleik acid, probiotics and plant extracts can be coated with different materials. In this rewiev, decreasing the negative effects of environment on quality and quantity of additives and encapsulation technology used for increasing stability, advantages and using possibilities of this products in animal nutrition will be discussed.

Keywords: Encapsulation, coating materials, feed additives, coating

The Effect of The Use of Whey Powder on Frozen Yogurt Properties*

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Abstract

In this research, frozen yogurts were produced by using different proportions of milk powder and whey powder (as 6% milk powder, 4% milk powder-2% whey powder, 4% whey powder-2% milk powder, 6% whey powder) in three replications. Frozen yogurts which were produced by using different proportions of milk and whey powder were examined in terms of some physicochemical and sensory properties. According to the results the titration acidity in terms of lactic acid, pH value, total dry matter content and acetaldehyde content were affected by different proportions of milk and whey powders significantly ($p<0.05$). Fat content, tyrosine content, overrun, first drop time, complete melting time and sensory properties weren't found significant by statistically ($p>0.05$). Due to analysis results A, B, C, D frozen yogurts has given respectively pH values 4.96±0.20, 5.60±0.43, 5.03±0.23, 5.10±0.18, titration acidity 0.81±0.06, 0.52±0.12, 0.64±0.08, 0.55±0.08, %dry matter 35.67±3.03, 41.34±2.60, 36.74±2.31, 37.52±1.03, %fat 5.66±1.26, 5.92±0.52, 5.08±0.38, 5.16±1.15, %protein 5.07±0.21, 4.92±0.26, 5.31±0.88, 4.47±0.39, acetaldehyde in ppm 4.20±1.03, 2.65±0.46, 2.90±0.08, 3.41±0.81, tyrosine in ppm 0.40±0.03, 0.39±0.06, 0.37±0.06, 0.38±0.04, %overrun 47.87±14.70, 52.87±5.11, 41.94±6.90, 45.83±8.00, first drop time in minutes 29.86±4.18, 27.53±6.00, 25.70±5.03, 28.24±5.07, complete melting time in minutes 75.43±4.99, 80.14±4.48, 74.30±12.82, 81.16±20.34. Due to sensory analysis, color and appearance, texture-stiffness and flavor properties were taking into consideration 2% milk powder-4% whey powder frozen yogurt were selected the most popular and following respectively 4% milk-2% whey powder, 6% milk powder and 6% whey powder frozen yogurts.

Keywords: Frozen yogurt, Whey powder, Physicochemical properties, Sensory properties

*This article is prepared by using data of "The Effect of The Use of Whey Powder on Frozen Yogurt Properties" Project with the FYL-2015-4553 code which is supported by Cukurova University BAP Departmant.

Artificial Reproduction of Zebrafish *Dania rerio* Under Controlled Laboratory Condition

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Abstract
Zebrafish are considered as model organism and are widely used in biomedical research to study human genes and human diseases. Despite this, the artificial reproduction of zebrafish is poorly described and there is not any standard universally accepted artificial culture protocol. In order to satisfy the scientist working in biomedical area, a standard culture method of zebrafish under controlled laboratory conditions must be developed. This paper investigates artificial culture of zebrafish in the laboratory where culture conditions were maintained. Spawn traps and gravels are not used for spawning of broodstock. Female and male broodstock were selected from our previously cultured stock, based on their swollen abdomens. Mean body lengths for female and male were 3.34±0.40, 2.97±0.3cm and the mean weights were 0.38±0.14, 0.25±0.27g, respectively. First eggs were squeezed from the ovaries then milt was taken from the testes onto the eggs. Fertilization was done artificially by the dry method. The eggs hatched within 4-5 days at 26±1ºC. The mean diameter of eggs and fecundity were measured.
The results of the present study suggests that with the right artificial culture conditions and proper manual stripping, the required number of eggs and embryos for biomedical research can be easily obtained.
Keywords: *Danino rerio*, stripping, egg size, maturation age, fecundity

The Effect of Mating of Hand and Flock on The Season of Fertility and Parturition during The Breeding Season in Middle Anatolia Merino Ewes

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Abstract

In this study; the effect of hand mating and free mating method on fertility and birth season in Central Anatolian Merino sheep were investigated. The study was carried out in Konya/Karapınar Province with two sheep farms under the same environmental conditions. In these farms 2013 and 2014 adjective season and 2014 and 2015 birth season were evaluated. Rams were accompany on both farm at the same date. In the hand mating farm in 2013 (n= 750) 38 days, in 2014 (n=944) for 27 days sheep's found to be oestrus with searching rams and were breed with breeding rams once. In the free mating farm in 2013 (n=400) 38 days, in 2014 (n=500) for 27 days 1 (one) breeding ram for 25 sheep (16 ram in 2013, 20 ram in 2014) were kept in the herd for 60 days. In farms where mating of sheep; number of births, single births, twin births, non-births (infertile) sheep, born lambs and the birth season length in 2013; 712.363; 522.307; 190,56; 38,37; 902,419 lambs and 37,47 days respectively. In the following year, same order 905.418; 777.362; 128.56; 39.82; 1033.474 lambs and 32.56 days respectively.

The rates of giving birth (94.9%, 90.8%, 95.9%, 83.6%), and non-breeding sheep (5.1%, 9.3%, 4.1%, 16.4% was found to be significant in favor of hand mating business (p=0.001). The rate of twin birth sheep's were significant in 2014 (26.7%, 15.4%), but the difference was not significant in terms of birth season length (p≥0.05) in 2015 (14.1%, 13.4%) and single birth (73.3%, 84.6%, 85.9%, 86.6%). Although the length of the birth season is not statistically significant, it is a fact that it is economically meaningful for the enterprise to complete the births in a short time, to obtain work force and one sample lamb. In adjective season, hand mating sustainability of sheep breeding, herd management, reproductive performance, consolidation of births and significant benefits in the workforce.

Keywords: Central Anatolian Merino, Breeding Season, Hand Mating, Fertility

**Tarımsal Araştırmalar ve Plitikalar Genel Müdürlüğü Koordinatörlüğünde yürütülen "Halk Elinde Ülkesel Küçükbaş Hayvan Islahı" projesi kapsamında yapılan uygulamadan elde edilen veriler kullanılmıştır.*

Flight behaviour of stingless bee *Heterotrigona itama* (Hymenoptera : Meliponini) foragers

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Abstract

A study on foraging behavior of *Heterotrigona itama* (Hymenoptera: Meliponini) was conducted in Integrated Farm, Faculty of Agricuture, Universiti Putra Malaysia, Malaysia, with the following objectives: 1) to compare different flight activities within a colony; 2) to compare foraging activities according to different time of the day; 3) to correlate the foraging activities with abiotic factors. Six foraging activities were observed: namely foragers going out, foragers coming back, foragers brings back pollen, brings back nectar, brings back resin and brings out trash. The observation was conducted every 10 minutes per hour from 8am until 6pm. The analysis shows that, the foraging activity of collecting resin was highly significant ($P<0.05$) from behavior of taking out trash. The period of time that the stingless were actively foraging for resources was in the morning period. The analysis shows that at 1000 hrs the foraging frequency was highly significant from the evening period at 1800 hrs. Their foraging behaviors also has a significant correlation with surrounding temperature and relative humidity. The temperature was inversely proportional towards their foraging behaviors. Meanwhile, the relative humidity was directly proportional towards the foraging behaviors.

Keywords: stingless bee, colony, behavior, forager, *Heterotrigona itama*

Water Uptake Test of Citrus trees for Searching of Citrus Blight Disease Possibility in Çukurova Region

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Abstract

The survey was done to investigate the presence of Citrus Blight disease and diagnosis of the disease in different locations and orchards in Adana and Mersin provinces in Çukurova region from 2007 to 2008. Trunks of trees showing CB-like symptoms have been water injected by syringe within 60 seconds and samples from fibrious roots have been collected for molecular analysis. One-hundred and ninty eight trees were water injected by syringe within 60 seconds and water uptake by trunk has been calculated as ml per second. Based on water injection test, 0.0-0.3 ml of water has been uptaken by 81, 0.5-1.5 ml 0f water has been uptaken by 76, over 0.3 ml of water has been uptaken by 12, and over 1.5 ml of water has been uptaken by 29 trees within one minute. It has been concluded that 81 trees out of 198 have been found suspicious for CB based on water uptake test. Forty-five trees out of 81 gave also positive results for the ORF of p12 gene by PCR. These suspicious 45 trees were removed from the orchards and burned for sanitary regulation.

Keywords: PCR, P12, Survey, Syringe test, Water uptake

Acknowledgement: This study was supported by the Foundation of Çukurova University Scientific Research Project Units (Project No: ZF2007YL11 and FBA-2017-8510).

A Study on Viroids Causing Bark Cracking in Citrus Trees in Çukurova Region

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Abstract

This study has been conducted in the years 2015 & 2017 in citrus production areas in Mersin, Adana and Hatay provinces which have significant production potential in Eastern Mediterranean Region. A number of various studies have been conducted on viroids, one of the agents damaging citrus fruits. Presence of 12 viroids in citrus fruits has been reported. As for our study, samples were taken from lemon, orange, mandarin and grapefruit plants showing cracking symptoms in the field. The sampling held on the basis of the shell cracks observation in trunks and branches of citrus trees, a total of 150 plants were examined for the presence of viroids *Citrus exocortis viroid* (CEVd), *Citrus bent leaf viroid* (CBLVd), *Citrus cachexia viroid* (CCaVd), *Citrus dwarfing viroid* (CDVd), *Citrus bark cracking viroid (*CBCVd), *Citrus viroid V* (CVd V) ve *Citrus viroid VI* (CVd VI). As a result of the viroid analysis performed by the RT-PCR method, it was determined that 65 citrus samples were contaminated with CBLVd, 121 with CCaVd, 101 with CDVd, 77 with CBCVd, 88 with CVd-V and 110 with CEVd. It was determined that 150 samples were contaminated with at least 3 viroids. And all of the samples had a mixture of viroids, other than a single viroid. Reported detection of presence for CBCVd in 77 of the samples, and detection of absence in approximately half of the samples led us to conclude that these symptoms are not peculiar to CBCVd agent. In addition, 4-5 viroids were reported to co-exist in plants with high infection severity and severe splits in the body, particularly in lemons. The presence of viroids was detected by two-step RT-PCR applications and confirmed by comparison of sequence analysis results with isolates from the NCBI database.

Keywords: Citrus**,** viroid, CBCVd, CVd IV detection.

Evaluation of the effect of Benzoic acid on some plant pathogenic fungi

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Abstract

The objective of the study was to evaluate in vitro growth inhibition activity of benzoic acid against some pathogenic fungi. The pathogens used in the test were seven species of Fusarium (*F.moniliforme*, *F.oxysporium*, *F.solani*, *F.graminearum*, *F.sambucinum*, *F.equisetum* and *F. semitectum*), *Rhizoctenia solani* and *Verticillium dahliae*.. The rates used were 0.4mg, 0.8mg and 1.2mg/Petri dish of benzoic acid mixed with 1 ml DMSO. PDA+1ml of DMSO were used as a control. All the concentrations of benzoic acid used in the study have shown great inhibition activity in all the fungi. The minimum effect was shown in the lowest concentration which was 0.4mg/Petri dish. However, the inhibition percentage increased with the increase of the acid concentration. The lowest inhibition percentage (37.88%) was shown in the application of 0.4mg/Petri dish with *R.solani,* followed by that of with *F. semitectum* (56.63%) and *Verticillium dahliae* (60.81%). Most susceptible fungus was *F.sambucinum,* in this pathogen 73.94% growth inhibition was observed in 0.4mg/Petri dish, 100% growth inhibition in 0.8mg/Petri dish and 100% inhibition in 1.2mg/Petri dish, whereas the most resistant fungus was *F.moniliforme,* the only pathogen that revealed growth in all the tested acid concentrations. This finding indicated that benzoic acid has the potential to inhibit the growth of some plant pathogenic fungi.

Keywords: Benzoic acid, Pathogenic fungi, inhibition percentage

An Evaluation of Combine Harvester Accidents in Turkey

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Abstract

There are over 17 000 combine harvesters in Turkey harvesting over 10 million ha of cereal, corn, soybean and sunflower crops. No study was found on combine accidents in Turkey; thus, the aim of this study was to examine the combine harvester accidents towards understanding and decreasing the injuries, fatalities, and monetary losses. Accident data were obtained based on accident news and included accident type, place (road, field, region, province), time (month, day), driver age and gender, etc. A total of 194 accidents between 2002 and 2017 were studied. 116 of the incidents (59.8%) occurred on fields while 78 of them (40.2%) were on road traffic. The total number of casualties were 228 (61 killed and 167 injured). Field accidents were more fatal than the road accidents (25.0% vs. 9.0%). The most two common incident types were fires (41.4%) and entanglement of body parts to machinery (25.9%) in field incidents while crash / collision (65.4%) and rollover (16.7%) in road incidents. Incidents were more frequent in Southeast Anatolian (25.9%) region and Central Anatolian (30.8%) region in field and road accidents, respectively. Both field (72.4%) and road (75.6%) accidents occurred dominantly in summer months. In 65.5% of the field accidents and 91.4% of the road accidents, the victims were transferred to the hospitals by ambulances. All operators (100%) were male in both field and road incidents. As most accidents are of human error, safety training and inspection are needed to reduce the incidents.

Keywords: Agriculture, machinery, combine harvester, safety, accident, Turkey

Internet of things (IoT) as a precision agriculture solution for Turkey's agriculture

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Abstract

Digitalization, as one of the most popular trends, is expected to have the highest effect on agriculture in its 10th years of time. Digitalization in agriculture covers a wide angle from precision farming applications to decision support systems and connected agricultural machinery. The digitalization of agriculture and internet use in agriculture is getting wider all around the world despite having some differences between continentals and countries. However, especially in Turkey there are several problems like small and multi-parted agricultural areas, there is a huge potential for using cheaper solutions like Internet of Things (IoT). In this research, readiness of Turkey's agriculture to digitalization, benefits of adaptation to digitalization and use Internet of Things in Turkey's agriculture were explained on the basis of using Internet of Things technology for tractor tracking systems.

Keywords: *Internet of things, Ttractor tracking systems*

Use of Geographical Information System in generating multi-stakeholder dynamic water management model at basin level

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Abstract

Climate changes and environmental impacts threaten water existence. Despite that nowadays every sector that is active needs water at significant levels and in increasing quantities. In this case, climate changes and environmental impacts lead to conflict among other stakeholders such as drinking water and municipal water demand, agriculture water demand, industry water demand , and environmental water demand. Küçük Menderes Basin that located in the southern borders of İzmir province was chosen as a case study. In this project, stakeholders at Küçük Menderes Basin are determined and their water demands are calculated.
Stakeholders are classified into four different groups; municipal water demand, agriculture water demand, industry water demand and environmental water demand. The stakeholders were mapped according to geographic information system in Küçük Menderes Basin Agricultural water demand studied in two sub-topics, including crop and livestock water demands. Wordview 2 and Rapideye satellite images are used to determine crop water demand. In adition to, The locations of the livestock are also mapped by using Wordview 2 and Rapideye satellite images. The region's animal assets were obtained from the Ministry of Food, Agriculture and Livestock. There are two lakes which are considered as environmental demands in Küçük Menderes Basin, and wetlands which are defined as lagoon geomorphological units along the Aegean Sea.
Municiple water demand have been determined by using basin settlements and considering their population. Climate change affect on yearly water in the basin and in this research water distribution consider in decreasing amounts.
In this case, at different levels a dynamic model has been developed to determine the amount of water that can be allocated to stakeholders under water shortage conditions.
In this model, which is developed by using geographic information system software, the use of agricultural land was regarded as the primary variable.

Keywords. Water allocation, climate change, dynamic model, Geographical Information System

Regional Frequency Analysis of 6 h Maximum Rainfall over the Upper Euphrates–Tigris basin, Turkey

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Abstract

Accurately estimating design rainfall or in other words, probable maximum rainfall has a crucial efficiency on fulfilling the expected benefit from any hydraulic structure since the value predicted as design criteria directly influences its planning, management and cost. What amount of a hydro-climatic variable which takes place under the influence of many environmental factors in a given region would be in future time is estimated based on its statistical behaviour. In many efforts corresponding to water resources, the curve (IDF) representing the relationship among intensity, frequency and duration of rainfall is basis for design rainfall amount required in construction of any water-related structure. This emphasizes that the availability of information extracted the curve of IDF substantially depends upon the frequency analysis and reliability of the current data (Adamowski and Bougadis, 2003). The 6 h maximum rainfall amounts from 18 sites in Upper Euphrates–Tigris basin were used as a material for regional frequency analysis based on l-moments approach. The existence of discordant stations was checked with discordancy measure for whole sites in the study area. Under a presumption of a single homogeneous region, the at-site data dealing with Mardin province had discordancy due to its D value (3.10) > D_{critic}=3.0. Therefore, the region should be formed sub-regions until the fulfillment of homogeneity condition for all sub-regions. The Mardin station was ignored because there was discordancy in this at-site in most of alternative sub-region. The study area was divided into two sub-regions. All of the condition related to l-moments approach in these regions were carried out.

Keywords: Euphrates–Tigris basin, maxima rainfall, l-moments.

Determination of Drought Tolerance at Early stages of Some Local Bread Wheat (*Triticum aestivum* L.) Genotypes under Osmotic Stress

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Abstract

Wheat production is usually done in dry farming areas and drought causes serious problems in wheat production in these areas. The present study was conducted to determine the tolerance of local bread wheat genotypes collected from some provinces of Turkey in early growth stages under osmotic stress. In the research, twenty five local bread wheat genotypes and four registered bread wheat cultivars as standard were used. Genotypes were subjected to -5 bar polyethylene glycol 6000 (PEG 6000) for osmotic stress in the petri dishes (9 cm diameter). In the experiment, germination percentage, radicle length, coleoptile length, shoot length, germination index, root fresh and dry weight, shoot fresh and dry weight was determined in the 7th days. Germination percentage were decreased by 14.7 % in PEG application compared to the control. According to the germination percentages, among the genotypes investigated, TR 53869 and TR 63508 were while TGB 000543, TR 54989 and Cam wheat, were sensitive tolerant to drought stress in early growth stages. When considered germination percentage, radicle length, root fresh and dry weight, TR 53869 and TR 63508 genotypes were prominent in terms of drought tolerance at early stages. It will be important to use these genotypes to develop the cultivars tolerant to drought in the early growth stages.

Keywords: Osmotic stress, PEG, Germination, Bread wheat landrace

Maximum entropy (MaxEnt) modeling of future potential geographic distribution of *Pityogenes pennidens* Reitter, 1889 (Col.: Curculionidae, Scolytinae) in the Mediterranean biogeographical region of Turkey

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Abstract

Climate change is one of the most important global problems in present. Biological diversity, fresh water resources and wild life habitats will be affected by this problem. Due to global warming, damages caused by pest insects and other forest pests will increase and unexpected problems can occur in their control. *Pityogenes pennidens* is an important bark beetle species for the Brutian pine (*Pinus brutia* Ten.) forests of Mediterranean and Aegean Regions of Turkey. This study was conducted to model the future (2070) distribution of *P. pennidens* according to two different global climate change scenarios. Occurrence data for collected specimens were recorded during field studies that were conducted between 2006 and 2017. Current and future potential distribution areas of the species have been determined using maximum entropy modeling. RCP4.5 and RCP8.5 emission scenarios reported in IPCC5 were used to model the future potential distribution of the species.

As a result of the study, it is determined that the species distributes on the Brutian pine (*Pinus brutia*) forests throughout the Mediterranean and the Aegean region of Turkey at the present time. The estimated distribution of the species for 2070 shows that the risky situation will persist for the Brutian pine stands. On the other hand, the model showed that there would be a limited contraction of distribution of the pest only in Adana province which is situated in the eastern part of the Mediterranean region of Turkey according to both emission scenarios: RCP4.5 and RCP8.5. Depending on the changing climatic conditions, it can be seen that the future distribution of the this species will pose a risk and it may be a potential pest that causes economic damage for *P. brutia* forests.

Keywords *Pityogenes pennidens*, Maxent, *Pinus brutia*, climate change, future prediction, modeling

Determination of root lesion nematodes (*Pratylenchus* spp.) on dry bean growing areas in Central Kızılırmak Valley

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Abstract

Dry bean contains high fiber, minerals, and vitamins as well as protein. Although it has an important place for human nutrition, dry bean production is gradually decreasing. Biotic and abiotic factors affect dry beans productions. One of the important biotic effects is plant-parasitic nematodes. Each year, plant-parasitic nematodes have been estimated caused damage of 80 billion dollars. Root lesion nematodes are important root parasitic nematodes especially cereal and legumes growing areas. The aim of this study was to determine root lesion nematodes in Central Kızılırmak Valley which is one of the important dry bean growing areas in Turkey. In this study, 144 soil and root samples were collected from dry bean fields of 8 cities. Soil and root samples were extracted by modified baermann funnel method (pedri dish method). The survey result showed that *Pratylenchus* species is widespread in all areas. Most common species was found in *Pratylenchus thornei* (Sher et Allen).

Keywords: Plant-parasitic nematodes, *Pratylenchus*, Dry beans,

Molecular and Morphological Characterization of *Botryosphaeria* spp. Causing Bot Canker and Gummosis on Plum Trees in Çukurova Region

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Abstract

Botryosphaeria spp. are cause dieback, gummosis and bot canker on the branches and trunk of woody plants, under the general stress conditions around the world. In recent years, these fungi have caused serious problems on grapes, pears, peaches as several different hosts, or losses of tree in orchards. During a survey in 2015, infected plant tissue samples were collected from 90 plum orchards showing gummosis and dieback disease symptoms on trees of plum in Çukurova Region. As a result of isolation studies, it was determined that 6.7% of these orchards were infected with *Botryosphaeria* spp. pathogenes and 17 isolates were obtained for these studies. They were identified as *Diplodia seriata* (teleomorph: *Botryosphaeria obtusa*), *Neofusicoccum parvum* (teleomorph: *B. parva*) and *Lasiodiplodia pseudotheobromae* depending on conidial morphology and cultural characteristics, as well as by analyses of nucleotide sequences of two genomic regions: rDNA-ITS regions and a partial sequence of the b-tubulin gene.

Keywords: Characterization, Distribution, PCR, *Prunus salicina,*

Acknowledgement: This study has been supported by the Turkish Scientific and Technical Research Foundation (Project Number: 114O048)

Determination of comparative advantages for Turkish fresh fruit and vegetables export markets

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Abstract

Antalya province is the main center of fresh fruits and vegetables exports of Turkey. Main exportable products of the region are tomato, fresh pepper and pomegranate. However, all other vegetable and fruit production of the region is also on exports market. While main export partners are Russia and European Union members, there are emerging market positions in Far East. In accordance, the political and economic problems encountered with Russia in 2015 leaded to product and financial losses. This situation affected both producers and exporters and other actors involved in fresh fruits and vegetables supply chain seriously. These problems raised the emphasis on new market targeting due to possible future conflicts. In other words, seeking new markets is essential for sustainability of exports.
Due to these facts, it is aimed to determine new markets that Turkey provides fresh fruits and vegetables and has comparative export advantage in the scope of this study. Accordingly, trade and production data of countries that export and import fresh fruits and vegetables all around the world for 2000 and 2017. With the secondary data retrieved it is aimed to undertake econometric analyses in the scope of revealed comparative advantage methodology. It is expected to set forward the potential markets that Turkey have comparative advantage and the country's position in these markets respecting the transportation costs and quality requirements. The findings will be contributory for policy and tool development for actors that take place in fresh fruits and vegetables supply chain.

Keywords: fresh fruits and vegetables, export, revealed comparative advantage, Turkey

Effect of Different Doses of Nitrogen and Potassium Fertilization on Yield and Nutrient Uptake in Grafted Watermelon Growing in Cukurova Region Conditions

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Abstract

Turkey ranks second in watermelon (*Citrullus lunatus* L.) cultivation in the world and Adana takes the first place in the country. Although watermelon is one of the most common crop grown in the Çukurova region, studies on optimal N and K doses in watermelon fertilization are very limited.
This research was conducted to determine the optimum doses of Nitrogen and Potassium fertilization in grafted watermelon (Karain) at open field farmer conditions. For this aim, increasing doses of N (0, 6, 12, 18, 24 kg da-1) and K (0, 6, 12, 18, 24 kg da-1) were applied to soil. Main stem length, main stem diameter, number of nodes on main stem, total branch number, SPAD, total yield, fruit weight, fruit length, fruit diameter, fruit rind thickness and TSS were measured. The N and K concentration in shoot, fruit flesh and fruit rind were also determined.
According to the results it was determined that the effect of N and K applications on the observed parameters were changed depending on the application doses. The effect of different N application doses were significant in all measured plant and fruit parameters except rind thickness. However, different doses of K applications were statistically insignificant in terms of main stem diameter, fruit yield, fruit weight, fruit length and fruit diameter.
Different doses of N application did not change the concentration of K in shoot, fruit rind and fruit flesh. However the increasing doses of N application increased the N concentration in both fruit rind and fruit flesh. Application of K only affected K concentration in fruit rind while the N concentration in fruit rind and fruit flesh found to be statistically different.

Keywords: watermelon, grafting, SPAD, fertilization

Investigation Of Resistant Of Eggplant Genotypes Against Root Knot Nematode (*Meloidogyne incognita* (Kofoid & White, 1919) Chitwood, 1949)

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Abstract

Root-knot nematodes are a very broad host sequence and cause significant crop losses in many plant species with economical prescription. This study was conducted in 2017 at Adana Biological Control Research Institute. In this study, the resistance of genotypes was determined by the classical test method, infected with *M. incognita* as the eggplant seedlings 1000 jüveniles / plant. As an experiment, it was established in the climate chamber to be 25 + 1 0C, with 16 hours of light and 8 hours of darkness. The plants were evaluated according to the galling index of the test roots 60 days after nematode inoculation. According to the 0-5 scale of the galling index in the roots, the galling index in the roots was determined between 0-2 in resistant plants and 3-5 in susceptible plants. In this study is from 8 to 38 pieces of eggplant resistant genotype, 30 were identified as sensitive to Root knot nematode. The difference in gallling index in sensitive varieties is due to the genetic properties of all eggplant genotypes. It is advisable to use resistance genotypes in breeding trials.

Keywords: Root knot nematode, Meloidogyne spp., Resistance, Eggplant

Cyanide poisonings linked to agricultural products

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Abstract

PURPOSE: Cyanide poisoning can occur by oral, respiratory or direct intoxication. It can cause fatal intoxications. Cyanide compounds are found in both the seeds and seeds of almonds, zardarias, apples and apricots. When eating of these plants, especially their kernel of seeds can cause cyanide poisoning within minutes-hours.

MATERIALS and METHODS: Mustafa Kemal University, Faculty of Medicine Hospital between October 2016 and April 2018, the data of the cases of cyanide poisoning in the children's clinic were examined
FINDINGS: 7 of 11 patients were male and 4 patients were female. The average age of the cases was 27 (25-60 months). There was no chronic illness or drug use in the anamnesis of the cases. Percentiles and stages of development were consistent with their age. The first complaints of the cases were consciousness change, abdominal pain, nausea and vomiting. it was learned that they took the apricot kernel before 30 minutes (20-90 minutes).General conditions were moderate, skin was pale-cold, consciousness was restless-confused. Capillary filling time was long, bilateral pupils were mydriatic, direct-indirect pupil reflexes were weak, Glasgow Coma Scale was average 9 (8-12). Saturation with oxygen support was 96%. In laboratory tests; hemogram results were normal. Liver enzymes were slightly elevated. Coagulation parameters were normal. There was lactate elevation in the blood gas. (mean 5.5) Nasogastric catheter was used to lavage the stomach. Pathologic findings both in chest X-ray and cerebral tomography were not detected. Acute cyanide poisoning was observed in the stomach lavage of cases followed up with a lot of raw apricot kernels. Nasogastric tube for drainage and lavage of stomach was used for 36 hours. Repeated doses of active coal were applied. High-flow oxygen with the mask and intravenous fluid treatments were performed. After the average 14th hour of the evaluation, the consciousness was fully recovered(mean: 7-16 hours). Blood lactate levels were normal. With early diagnosis and intervention to patients, it was not necessary to administer 'cyanide elimination antidote kit'. After average of 72 hours of treatment and follow-up of patients were discharged with well-being. (mean: 64-96 hours)

DISCUSSION: Acute Cyanide poisoning; can cause severe clinical symptoms that can range from respiratory distress to coma within minutes. In fact, the primary approach is to raise public awareness about should not consuming cyanogen food. The medical approaches of acute cyanide poisoning are intravenous fluid therapy, oxygen support and cyanide antidote (amyl-nitrite / sodium-nitrite) applications. Agricultural products in our country are rich in cyanide compounds. It is aimed to emphasize the necessity of raising public awareness in terms of should not eating the seeds of the agricultural products containing cyanide compounds (zardari, almond, cherry, peach, apricot seeds).

Keywords: agricultural product, apricot kernel, cyanide poisoning

Needle Fiber Calcite Induced By Biological Activitiesand Organic Matter in Some Semiıarid Soıls of Southern Urmia, Iran

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Abstract

In this study, pedogenic needle fiber calcite (NFC) from the south of Urmia-Iran was investigated micromorphologicaly. This form of calcite is present in horizons near the soil surface or in the upper parts of calcic horizons, but is not the most common form of calcite in these horizons. Needle-fiber calcite forms infillings and coatings on surfaces of large voids, peds, and coarse fragments. According to SEM studies, these needles in our studied soils have 0.5-1µm thick and 5-10µm long and are mainly of MA and occasionally the MB type. In thin sections of our studied soils the NFC coatings were observed in near surface horizons, which contain more organic matter more than deeper horizons. This, together with the presence of decayed organic residues in some voids containing NFC, allow us to conclude that they have formed as a result of decomposition of organic matter. Additionally, biologic (or organic) origin of NFC was confirmed with SEM studies. SEM studies revealed some rounded structures. The rounded structures suggest a biological origin for needle fiber calcite. SEM observations on one needle confirmed that it is calcium carbonate. The needles are most probably of organic origin because they have tubular morphologies, with longitudinal septa.

Keywords: calcium carbonate, micromorphology, needle fiber calcite (NFC), Iran, Urmia

Valorization of essential oil and organic extract of Zizyphus lotus in antibacterial activity

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Abstract

Aromatic and medicinal plants are an important source of bioactive molecules, especially in volatile extracts. In this context and in order to isolate new compounds with potent biological properties we were interested in the extraction of essential oil and tested the efficacy of oil and organic extracts from seeds of specie jujubier (*Zizyphus lotus* L.) against Gram positive bacteria and Gram negative bacteria. The chemical compositions of the oil was analysed by hydrodistilation. Nineteen compounds representing 90.45% of the total oil were identified. The oil was diluted with methanol and extracts of water, ethyl acetate, chloroform and methanol (300µg/disc) of *Z. lotus* displayed a remarkable antibacterial activity against, *Staphylococcus.aureus* (ATCC29737), *Micrococcus.letus*, *Bacillus.subtilis*(ATCC6633) *Kleibseilla.pneumoniae*(ATCC10231) and *Escherichia.coli* (ATCC10536). Values determined for all the susceptible bacteria ranged between 22 mm and 13.4mm. A low activity of essential oil and organic extracts tested was evaluated towards Candida albicans.

Keywords: *Zizyphus lotus*, Essential oil, Antibacterial activity, Gram positive, Gram negative

Hemiptera species determined in almond orchards and potential invasive species *Monosteira unicostata* (Hemiptera:Tingidae) population fluctuation in Mugla and Manisa provinces of Turkey

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Abstract

This study was carried out in the localities of Datça, Fethiye, Seydikemer (Mugla) and Akhisar, Kula (Manisa) where almond plantations are common in Aegean region from 2014 to 2016. During this study, 68 insect species belonging to 18 families from Hemiptera order were found. Among these insects 15 species feed in almond trees. For the first time, *Typhlocyba rosae, Zygina discolor* and *Mustha spinosula* were identified to feed in almond trees in Turkey in this study. T. rosae and Z. discolour feed on and under the leaves this situation lead to leaves turn into whitish. *M. spinosula* especially feed with fresh green almonds so this situation induce squiggly clear resin on almond. It was concluded that *Monosteira unicostata*, which has the highest population density among species, could be an invasive species. During this study, *M. unicostata* was detected throughout the year with the visual inspection and shaking method applied. Furthermore, *M. unicostata* is present in all the almond orchards in Datca and the pest feed under the leaves. Pest population density increase in April and reaches the highest level in July. Because of this insect invasive position from July to August, no other insect species are found in the trees in this time. Although *M. unicostata* was only seen in Datça during this research, it was started to appear in the orchard located in Akhisar (Manisa) and Mugla region between 2015 and 2016. *M. unicostata* eggs, nymphs and adults were found under the leaves of all trees of every orchard in Datca. It causes 90% leaf loss in trees.

Keywords: Hemiptera, *Monosteira unicostata*, Almond pests

Determination of Susceptibility Levels of Some Citrus and Stone Fruit Varieties against Citrus Blast Disease[1]

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Abstract

Citrus blast disease, caused by *Psedomonas syringae* pv *syringae* occasionally rise an epidemic threat on citrus production areas in the Eastern Mediterranean region of Turkey. The pathogenic bacterium can infect both citrus and stone fruit trees. The spread of the pathogen in/around the orchards in Cukurova region has always potential threat due to closely planted citrus and stone fruit trees. In this study, blast disease susceptibility levels of widely cultivated 16 different citrus varieties (cv. Cara Cara, Fukumato, Lane Late, Navelina, Valencia Midknight, Nova, Okitsu, Ortaniue, Robinson, W. Murcott, Clausellina, Meyer, Lisbon, Eureka, Riored, Henderson) and 12 different stone fruit varieties (cv. Flariba N2-17, Gartella, Garofa N2-92, Honey Blush, Flored, Early Fresh, Black Diamond, Black Amber, Black Beauty, Magador, Colorado, Ninfa) were determined. One or two year old citrus and stone fruit seedlings were inoculated by injection of *Pseudomonas syringae* pv. *syringae* strain Yuregir 5 (1x 10^7 cfu ml) using a hypodermic syringe. The citrus blast susceptibility of tested cultivars were ranged from 3.01% to 57.12% in citrus cultivars and from 3.81% to 51.01% in stone fruit cultivars, respectively. All tested citrus and stone fruit varieties were classified between the much less susceptible and susceptible. The less susceptible citrus and stone fruit varieties should be preferred in newly planted orchards.

Keywords: *Pseudomonas syringae* pv. *syringae*, citrus, stone fruit, resistance

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ABSTRACT for

POSTER PRESENTATION

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Micropropagation of Some Citrus Rootstocks with Classical and Next Generation Plant Tissue Culture Tecniques

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Abstract

Citrus are an important fruit group in our country and in the world. Vegetative propagation of plants in the citrus rootstock one of the important issues. It is possible to propagate plants with faster, higher quality and lower costs by using Temporary Immersion Bioreactor Systems, a next generation of tissue culture systems. In this study, 'Tuzcu 3131' and 'C35 Citrange' rootstocks, which are important and widely used for citrus, were carried out in comparative propagation and rooting studies in the plantform system and solid medium. First of all, micropropagation and rooting of citrus rootstocks were evaluated in solid MS and WPM media supplemented with BAP (0, 1.0, 2.0 mg / L), Kinetin (0, 0.5, 1.0 mg / L) and 2IP (0, 1.0, 2.0 mg / L) for micropropagation, in MS, ½ MS and WPM media supplemented with NAA (0, 0.5, 1.0, 2.0 mg / L) and IBA (0, 0.5, 1.0, 2.0 mg / L) for rooting. Based on the solid media, the best results in both genotypes were obtained from MS medium containing 2 mg / L BAP for micropropagation, ½ MS medium containing 0.5 mg / L NAA for rooting. Micropropagation and rooting studies were carried out in the plantform system with the best-defined media content. As a result of the micropropagation and rooting rate (%), multiplication coefficient, plant length (cm), root length (cm) and number of roots were examined. Genetic stability of plants grown and rooted in solid culture and plantform systems was tested by SSR markers. As a result of the study, the micropropagation of 'Tuzcu 3131' genotype was found to be more successful in Plantform system. At the end of the study, it was determined that Plantform could have a good potential for micropropagation and rooting for tissue culture. It was also determined that there was no genetic variability in the plants grown and rooted in the Plantform system.

Keywords: Temporary Immersion Bioreactor Systems, BAP, NAA, MS, Tuzcu 3131 and C35 Citrange

Leaf Physiological and Root Morphological Responses of Some Fruit Bearing Vegetables as Affected by Different Nitrogen Levels

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Abstract

The aim of the present study was to determine plant growth, leaf physiological responses and root morphological performance of some fruit bearing vegetables (eggplant, tomato, watermelon and pumpkin) under three different nitrogen levels under hydroponic growth medium. An experiment was conducted under climate chamber conditions at the Faculty of Agriculture, Erciyes University, during January, in 2018 growing season. The experiment was conducted with three different N levels (Low-N: 0.3 mM, Optimal-N: 1.5 mM and High-N: 3.0 mM N) in a completely randomized block design with four replications and eight plants in each replication. Different species of four different fruit bearing vegetables [eggplant (*Solanum melongena* L.), tomato (*Lycopersicon esculentum*), watermelon (*Citrullus lanatus*) and pumpkin (*Cucurbita pepo*)] were used as plant materials. The seedlings with 2-true-leaves were transplanted into plastic pots after roots were washed and grown for six weeks. Each pot was filled with 8 L modified Hoagland nutrient solution that was aerated by an air pump. The solution was routinely replaced at a 7-day interval. Shoot (stem+leaf) and root fresh-dry weights (g/plant), leaf chlorophyll index (SPAD), photosynthesis, total leaf area (cm^2/plant), plant height (cm/plant), carotenoid content, root/shoot ratio, root length (cm/plant), root diameter (mm/plant) and root volume (cm^3/plant) were determined under three N levels. The results indicated that shoot (stem+leaf fresh and dry matter, total leaf area, plant height) and root (root fresh and dry matter, root length, root volume, root diameter) growth significantly ($P<0.001$) affected by different levels of N supply. Growth response to supplied N, i.e. the interaction between N level and species, was also highly significant ($P<0.001$) in some shoot and root growth parameters. Shoot fresh and dry matter, photosynthesis, plant height, total leaf area significantly decreased as the N concentration in nutrient solution decreased; however root/shoot ratio, root length (except eggplant), root volume (except eggplant), root fresh and dry matter significantly increased as the N concentration in nutrient solution decreased. Shoot fresh and dry weights, photosynthesis, plant height, total leaf area and leaf chlorophyll index (SPAD) were increased significantly under high N levels as compare to optimum N, though root fresh and dry weights, root/shoot ratio, root length (except watermelon), root volume (except watermelon), significantly decreased as the N concentration in nutrient solution increased. Under high and low N levels, among fruit bearing vegetables squash produced significantly higher shoot and root fresh and dry matter, root length, photosynthesis, plant height, total leaf area and carotenoid content. On the other hand, under high and low N levels, among fruit bearing vegetables eggplant produced significantly lower shoot and root fresh and dry matter, root length, leaf chlorophyll index (SPAD), photosynthesis, plant height, and total leaf area.

Keywords: Nitrogen, Root growth, Tomato, Watermelon, Eggplant, Squash

In vitro Salt Tolerance Evaluation of Cultivated Tomato (*Solanumlyco persicum* L.) and Wild Tomato (*Solanum nigrum* L.)

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Abstract

Climate changes have also caused the problem of salinity, one of the abiotic stress factors. The problem of salinity which restricts production has prompted researchers to work on developing salt tolerant plants. It is tried to solve the problem by choosing lines, tolerant to salinity in breeding studies. *In vitro* culture can be used as a tool to obtain salt tolerant plants, but also offer the potential for rapid assessment of salt stress.

Tomatoes in the world is one of the most commonly grown and bred fresh vegetables in the world with an output of about 162 million tons production. It is known that wild species are better adapted to many adverse environmental conditions and survive longer. For this reason, wild species can be used in endurance breeding studies. In present study, tissue culture technique, a rapid evaluation tool, was used to determine the salt tolerance of cultivated and wild tomato seeds.

Keywords; *Solanumlycopersicum* L., *Solanumnigrum* L., salinity, *in vitro* culture

P450 Monooxygenase and Acetylcholinesterase Enymes Activity in Acetamiprid Resistant *Aphis gossypii (Glover)* (Hemiptera:Aphididae) Populations

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Abstract

This research was performed in 2018 to explore the role of the mechanisms in conferringinsecticide resistance of *Aphis gossypii* (Glover) (hemiptera:Aphididae) populations collected from the cotton areas of the Cukurova region at Adana in Turkey using biochemical methods. These populations collected from different fields of Adana and standard *A. gossypi i*populations were used throughout the studies. Acetylcholin esterase and cytochrome P450 monooxygenase activity associated with insecticide resistance was detected using kinetic microplate assay. According to results from the biochemical assays, cotton aphid populations were found to have highest erase and monooxygenase activity. This demonstrated that the level of acetylcholin esterase and cytochrome P450 monooxygenase enzymes in all resistant cotton aphids collected is higher than according to susseptible population. Based on these results, it was concluded that the acetylcholin esterase and monooxygenase of A. gossypii had a role in neonicotinoid resistance as a metabolic enzymes.

Keywords: Acetamiprid, resistance, *Aphis gossypii*, monooxygenase

Effects of Sweet Corn and Tomato Intercropping on Yield and Quality

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Abstract

This study was carried out to determine effects of intercropping (sweet corn and intermediate tomato types) on yield and quality. Merit F1 sweet corn and Alsancak F1, Merkür F1, Çiko F1 tomato varieties were used in the experiment. Seeds were sown on April 20sht, 2017 and seedlings were planted on May 20th 2017. The experiment was designed with 3 replications in randomized plots. Sweet corn harvest was done between the end of July and at the beginning of August. Tomato harvest was completed between July and November. Yield (g/cob) and average cob weight (g) were investigated in sweet corn. Yield (kg/plant and kg/m^2), average fruit weight (g) , pH, soluble solids content (%) and total acidity were determimed in tomato. The highest values were obtained both sweet corn and tomato at control. However, total profit was better in intercropping. Also, there was no stake expences in intercropping.

Keywords: Indeterminate tomato, sweet corn, intercropping, yield, quality

Determination of The Effect of Different Quince and Pear Clone Rootstocks on The Graft Success of Some Pear Varieties

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Abstract

In modern pear growing, quince and pear clone rootstocks are used instead of pear seedlings because they have positive effect on maintenance practices, earliness, easy harvesting and pruning, drought and lime resistance, permitting high density planting, high fruit yield and quality. Rootstocks are effect of graft success on the grafted pear cultivars. This study was aimed to determine the effect of different quince and pear clone rootstocks on the graft success of some pear varieties. In the study, quince (BA 29, Quince A and Quince MC), pear (OHxF 333, Fox 11, Farold 40) clones and pear seedling grafted on two standard (Deveci and Williams) and 11 local (Bardak, Dalkıran, Eşek, İstanbul, Kara, Karga, Karpuz, Kış, Sarıkum, Tefencand YazZiraati) pear varieties were used. In the study, graft take ratio (%), graft sprout ratio (%) and survival ratio (%) were determined. Significant differences were observed in both rootstocks and varieties in terms of graft take, graft sprout and survival ratio in the study.Among the varieties, the highest graft sprouting ratio and graft survival ratio were in Deveci, the lowest in Williams, Bardak and Kış varieties.The highest graft sprouting ratio and graft survival ratio among the rootstocks was determined in Fox 11 and the lowest in Quince MC.

Keywords: Graft sprout ratio (%), Graft survival ratio (%), Pear, Pear varieties, Rootstock,

The Determination of Antioxidant Activity of Different Levels of Grapevine Extract on Chicken Broth

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Abstract

The purpose of this study is to determine the antioxidant properties of the grapevine leaf extract in chicken broth. For this purpose, chicken broth was obtained by boiling the skinned chicken with water at a ratio of 1: 3 in pressure cooker. The grapevine leaf extract obtained with methanol was added to the chicken broth at a ratio of 1, 2, 3% and the antioxidant effect was compared with the chicken broth sample with 200 ppm BHT. All samples were storaged at +4 ºC for 10 days for analysis. Chicken broth was analyzed for pH, colour parameters (L^*, a^*, b^*), thiobarbituric acid (TBA) value and DPPH (2,2-diphenyl-1-picrylhydrazyl hydrate) at 1., 4. ,7. and 10. days. Each parameter was tested in triplicate samples. According to the results of the analysis, it was determined that the TBA values varied between 0.1-0.46 mg malonaldehyde / kg; DPPH activities varied between 0.02% and 64.14%, and it was found that DPPH level is higher than BHT group. It was observed that pH values was increased acidity throughout the storage period in the grapevine group. According to the obtained data, a significant antioxidant effect of the grapevine leaf extract on the chicken broth has been determined and it is suggested to use it as a substitute against to synthetic antioxidants in foods.

Keywords: Grapevine leaf extract, Chicken broth, Natural antioxidant.

Volatile Components of *Stachyscretica* subsp. *anatolica* Rech. F., Ann. in Koçtepe Province of Isparta, Turkey

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Abstract

Turkey is an important gene center in terms of the Lamiaceae family plants, which take the first place among the plant species traded on the world market and have an important role in alternative medicine applications. *Stachys* is one of the important genus of Lamiaceae and represented by approximately 200 taxa. In this study which was conducted in 2017 and 2018, above ground parts of *Stachyscretica* subsp. *anatolica* in flowering period of plant were collected from Koçtepe province of Isparta. Volatile components were determined by gas chromatography mass spectroscopy (GC-MS) after solid phase micro extraction (SPME). Collected samples were placed in paper packages and transported to the laboratory on the same day and dried at room temperature (25°C), after they were subjected to solid phase microextraction (SPME). 2 g of samples were placed into a 10 mL vial. After incubation for 30 min at 60°C, SPME fibre was pushed through the headspace of a sample vial to adsorbed the volatiles, and then inserted directly into the injection port of the GC-MS (Shimadzu 2010 Plus) at a temperature of 250°C for desorption (5 min) of the adsorbed volatile compounds for analysis. As result, 58 volatile components were determined and (E)-2-hexenal (12.58%), germacrene-D (34.56%) and also β-caryophyllene (21.04%) were found as main components. *Stachys* species are becoming increasingly important due to the aromatic compounds and essential oils they contain, as well as being the plants that are used by the public in the treatment of diseases and which are medicinal properties.

Keywords: *Stachyscretica* subsp. *anatolica*, SPME, GC-MS, volatileoil, Isparta

Plant Peststo be Seen in Medicinaland Aromatic Plants

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Abstract

Since ancient times medical plants have been used in medical practice and in pharmacy. As can grow wild in our country are taken in to culture in many areas. With the arrival of modern technology in the economic sense it is also considered as the inner and outer space, as well as ornamental plants important. Among these species belong to *Salvia, Lavandula, Rosmarinus, Calendula, Thymus, Origanum, Echinacea, Mentha, Rosa* and *Artemisia* are widely available medicinal plants in every area. İn other crops as well as in the medicinal plants of the breeding problem is encountered with a plurality of plant protection problems. It is invaded by disease and pest throughout the growing season. Phenolic acids, flavonoids and aromatic compounds (terpenoids, steroids, alkaloids and organic cyanides) do not keep medical plants away from harmful insects and cause degradation of plant parts used (egroot, leaf, fruit, flower, bark), decrease in plant productivity and quality resulting. In general, many species belonging to Orthoptera, Lepitoptera, Hemiptera, Coleoptera, and Diptera are damaging both the soil and the vegetative parts of plants and reducing the quality of the plant.

Keywords: Medicinal plants, pests, biological period

Determination of İzmir Thyme Production Methods in Çumra Region

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Abstract

Traditionally, wheat and sugar beet farming is being done in Çumra district of Konya province. The availability of ecological conditions also makes it possible to grow many medical plants in the area. Among these plants, thyme varieties whose adaptationability varies according to the region conditions are also included. *Origanu monites* (İzmir thyme) has a wide spreading are aamong the thyme species of Aegean and Mediterranean regions, and adapted to Çumra district. İzmir thyme which is fragrant is used in medicine field and as spice. İzmir oregano plant is a perennial plant, culturing can impart to the region as an alternative plants. Production were used to with seeds and vegetative generation and works in trial parcels and green house environment.

Keywords: İzmir Thyme, replication, rooting.

Phytoremediation by Ornamental Plants

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Abstract

Pollution and damages of environment caused by various reasons such as industrial wastes, waste water irrigation, deposition of sewage sludge, vehicle exhaust,salinity is one of the most important problem for environment and all living organisms. Such pollution in soil and water negatively affects the balance of ecosystem.Phytoremediation is called as the use of plants that are specially selected for environmental cleaning without harming the environment. The use of ornamental plants to clean up areas where pollutants has been one of the most interesting topics of recent years. Cleaning the environment via phytoremediation by ornamental plants is not only a cost-effective method, but also attracts attention to the environmentwith their aesthetical appearance. Some ornamental plants can accumulate or degrade pollutants when growing contaminated areas especially urbans.There are various ornamental plants on the world, but most of them have no information about their phytoremediation features. Determining of these features will provide great benefit in terms of cleaning the environment without damage.In this study, it was compiled some informations about phytoremediation features of some ornamental plants could cultivated in contaminated soils and irrigated by waste waters.

Keywords: Aesthetical appearance, ornamental plants, plant quality, pollution

Effects of girdlingtreatments on fruit size, quality and yield of Robinson mandarin

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Abstract

Girdling is one of the cultural practices that improves carbohydrate availability, increase fruit-set and yield. Girdling has also been shown to alter thepartitioning of photosynthates, mineral nutrients and plant growth regulators in citrus. This study was undertaken to investigate the effects of single and double girdling applications on the fruit yield, commercial size and quality of 22-year-old Robinson mandarin (*Citrus reticulata*). Girdling treatments were performed at anthesis (when 60% of the flowers were opened) with approximately 5 mm trunk diameter in 2014. The fruit was harvested in 2014 at the optimum harvest time (in December) for fruit yield, properties and size. It was determined that double girdling was the best application in terms of fruit yield and percentage of marketable fruit. The treatments did not significantly affect fruit internal quality.

Keywords: Citrus, fruit yield, cultural practices, plant nutri-elements

Weed Hosts of Vegetable Viruses

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Abstract

Weeds can be defined as plants growing in cultivated area to the injury of the crop or desired vegetation, or to the disfigurement of the place; an unsightly, useless, or injurious plant. Weeds damage directly to crop plants as competing with them for light, land, water and nutrients also they have indirect harm as being host for diseases and pest. In epidemiology of virus diseases on vegetables, weeds have great importance by acting as reservoirs of various viruses that are transmitted by insects. Several insects transmit different viruses in different crops, but aphids and whiteflies are among the most important virus vectors on vegetable crops. Most of the weed species such as *Solanum nigrum*, *Amaranthus retroflexus*, *Chenopodium album*, *Convolvulus arvensis*, *Datura stramonium*, and *Xanthium strumarium* which grow in and near vegetable gardens, act as primer infection sources for virus diseases. As a result of the several researchs, most of the vegetable viruses such as *Cucumber mosaic Cucumovirus* (CMV), *Tomato spotted wilt Tospovirus* (TSWV), *Zucchini yellow mosaic Potyvirus* (ZYMV), *Watermelon mosaic Potyvirus* (WMV), *Papaya ring spot Potyvirus*-watermelon strain (PRSV-W), *Potato Potyvirus Y* (PVY) infect different weed species and overwinter on them. In this review, virus reservoir weed species and the role of these weeds in epidemiology of virus diseases in vegetable production areas were summarized.

Keywords: *Cucumber mosaic Cucumovirus*, reservoir, vegetable, virus, weed

Effects of Different Treatments on Seed Germination of Cypress Tree

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Abstract

Cypress tree (*Cupressus sempervirens*) is a coniferous evergreen tree that used as ornamental plants in landscaping. Origin of the cypress trees is Europe and Asia, but it commonly associated with Italy due to their widespread landscaping use in the country. The cypress trees are regularly propagated with cuttings and seeds. Environmental factors significantly affect germination processes during propagation with seed. Therefore, effects of cold stratification (4 ℃ for a month), hot water application (tap water as control, 25 and 50 ℃) for 24 h and different gibberellic acid concentration (0, 1000, 2000 and 4000 ppm) on germination rates of cypress tree seeds were determined. According to results, highest germination rates obtained from the applications of 25 ℃ water soaking + 0 ppm gibberellic acid for first week with 13.12%; 25 ℃ water soaking + 2000 ppm gibberellic acid with 24.75% for second week; 25 ℃ water soaking + 0 ppm gibberellic acid for third week with 26.00% and 0 ℃ water soaking + 0 ppm gibberellic acid for fourth week with 30.00%. Overall, results showed that germination can be enhanced and accelerated applying hot water and GA_3 treatments. It may be concluded that germination rates differently resulted depending on independent treatments due to genetic variability and maternal environment which is highly effective on seed germination in coniferous.

Keywords: Cupressus, gibberellic acid, stratification, water soaking

Processoperations in Some Cut Flowers from Production to Consumption

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Abstract

In this study, different applications of some cut flowers from producer to consumer and handling areas of these cut flowers were investigated. Cut flowers are cut when it comes to certain flowers maturity, bunched and uptake water. Then they are presented to the market in the water or dry condition. The storage temperature of the cut flowers and the temperature of transport are close together. The transportation of flowers from the producer to the consumer is being by road, sea and air. Cut flowers are kept in florists in suitable conditions and are offered for sale in a variety of ways. The sale of cut flowers is being arrangement, bouquet and wreath according to the special days of people.

Keywords: Cut flowers, visual quality, vase life, storage, transportation

The Effects of Different Levels of Oxygen on Decay Development of Fresh Fig Fruit during The Storage

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Abstract

Reducing oxygen (O_2) levels in storage atmosphere during fruits and vegetables storage is an effective method for extending storage period as well as reducing decay development. In this study, the effects of different O_2 levels on postharvest decay development and postharvest life of fresh fig fruits (*Ficuscarica* cv. Bursa Siyahi) were studied. For this purpose, 3, 6 and 9% O_2 levels were tested. The carbon dioxide (CO_2) level in the storage atmosphere during entire storage period was kept at 15%.In these atmospheric composition fruits were stored at 0°C temperature with 90-95 % relative humidity in a palliflex storage system for 28 days. The amount of decay and severity of fungus and bacteria development were examined. For decay development, decreasing the O_2levels in storage atmosphere was found to be more effective than the control treatment. However, there wasno statistical difference amongst the O_2levels was detected during cold storage. In shelf life conditions at 20°C, 3 and 6% O_2 levels were found to be more effective for decay control. During cold storage, while 6% O_2 level in storage atmosphere was effective for controlling decay there were no statistical differences between 3 and 6% O_2 levels during shelf life period. In the study, 6% O_2level in storage atmosphere was effective in in controlling decay during storage and shelf-life conditions compared to other O_2 levels. In terms of disease intensity, 3 and 6% O_2 levels in storage atmosphere were the most effective treatment during shelf-life. It can be concluded that 6% O_2+ 15% CO_2 levels in storage atmosphere was found to be the most effective treatment for controlling decay as well as maintaining postharvest fruit quality of fig fruit cv. Bursa Siyahi.

Keywords: Fresh fig, Bursa Siyahi, decay low oxygen, storage, palliflex

Inhibitory Influence of Some Salts against *Fusarium oxysporum* f. sp. *melongenae,* the Causal Agent of Fusarium Wilt

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Abstract

Fusarium wilt caused by *Fusarium oxysporum* (Schlechtend.: Fr.) f. sp. *melongenae* (Fomg) is one of the most important diseases of eggplant (*Solanum melongena* L.) in Turkey. Methods used to control vascular wilt are either not very efficient or are difficult to apply. The efficacy of six salts (ammonium bicarbonate, ammonium carbonate, potassium bicarbonate, potassium carbonate, potassium sorbate, and potassium benzoate) as possible alternatives to synthetic fungicides for the control of *F. oxysporum* f. sp. *melongenae* (Fomg) was evaluated. *In vitro* tests showed that there were significant differences between the inhibitory effects of the salts used on the mycelial growth ($P<0.05$) and 2% (w/v) concentrations of ammonium bicarbonate, ammonium carbonate, potassium sorbate and potassium benzoate completely inhibited mycelial growth of the fungus, while other two potassium salts did not. Potassium sorbate and potassium benzoate had lower pH values than the other salts at 2% (w/v) concentration. The ED_{50}, minimum inhibition concentration (MIC) and minimum fungicidal concentration (MFC) values indicated that both ammonium saltas (bicarbonate and carbonate) was more inhibitory to the fungus compared to potassium salts. The results of pH studies also demonstrated the fungus tested to be capable of growth in both acidic and basic environments, although the growth of the fungus was completely inhibited at the lowest value (pH 2) tested. In soil tests, inhibitory effect of ammonium carbonate and potassium sorbate on the fungus was higher than that of the other four salts, where the both salts completely inhibited mycelial growth at even 1.0% concentration.

Keywords: Eggplant, *Fusarium oxysporum* f. sp. *melongenae*, salts, toxicity, pH, alternative control.

As an Alternative Raw Materıal Source for Animal Nutrıtıon: Quinoa, Buckwheat, Chia and Amaranths

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Abstract

In this study, it was aimed to determine the feed value by determining the amount of raw nutrient values of Quinoa, Buckwheat, Chia and Amaranthsplants. The levels of dry matter (DM), crude protein (CP), ether extracts (EE) and Ash in feed samples were determined by Weende Analysis methods and crude fiber (CF) quantities by Crampton and Maynard's method. Acid detergent fiber (ADF) andnötr detergent fiber (NDF) and acid detergent lignin (ADL) contents were determined by Van Soest analysis. Based on these values, the metabolic energy values were calculated. Quinoa, Buckwheat, Chia and AmaranthsDM values of 97.77, 91.42, 92.54 and 93.75%; EE 3.07, 1.34, 3.30 and 4.95 %; Ash 8.60, 13.85, 6.20 and 12.44%; CP 6.40, 5.43, 3.51 and 8.75 %; CF 43.91, 39.47, 36.25 and 29.22%; ADF and NDF levels were found as 31.80, 42.92, 42.10, 49.52% and 50.79, 49.11, 52.72, 64.81% respectively. The metabolic energy values: 1640.74, 1660.35, 1968.25 and 2148.23 ME (Kcal /kg KM) respectively. These plants have not yet started cultivating in our country, which are with high nutrient content as a green plant that can grow in almost all conditions. An existing nutrient will be further refined to try to identify an alternative plant potential and will also provide an alternative feed plant source to the country's economy. In addition to, there is a need for studies that demonstrate the nutrient digestibility of these plants.

Keywords: Quinoa, buckwheat, chia, amaranths, nutrient value

Application of Soil Solarization in Greenhouse Vegetable Growing

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Abstract

Fumigant and fungicide are widely used in our region in controlling soil-borne pathogens. Because of the fact that Methyl Bromide, an effective soil fumigant for combating soil-borne diseases, has been removed from practice, feasible alternative fighting methods have been needed. Solarization application; It is an economical and easy to apply method that does not contain any non-chemical, toxic material, which is based on heating the soil with solar energy by covering the moist soil with transparent plastic in hot summer months. With solarization, temperatures are reached that are lethal to most disease agents or reduce their populations, and so the soil is pasteurized. When solarization is used alone, it is not effective enough against some soil-borne diseases and nematodes. For this reason, it is necessary to consider the system as a whole and combine combat applications in order to increase the fighting effectiveness against soil-borne diseases and nematodes and to protect the environment. In studies conducted on greenhouse vegetable growing in the region; it is advisable to apply reduced doses of fumigants (metham sodium 60-100 l/da, dazomet 40 kg/da) for 4-8 weeks with solarization during the period when the soil is empty before planting, in combating with soil-borne pathogens, nematodes and weeds. Some diseases, pest and weeds that can be partially or completely struggled with solarization; soil-borne diseases, *Fusarium oxysporum*, *Rhizoctonia solani*, *Phytopthora* spp., *Sclerotinia* spp., *Botrytis cinerea*, *Verticillium* spp., *Pythium* spp. Nematodes; *Meloidogyne* spp., *Pratylenchus* spp., *Ditylenchus* spp. and weeds; *Orobanche* spp., *Chenoodium albüm., Portulaca oleracea, Stellaria media*, *Sonchus oleraceus*.

Keywords: Solarization**,** integrated disease and pest management, greenhouse vegatables

Aflatoxins and Cyclopiazonic Acid in Peanut

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Abstract

The aim of this study was to detect occurence of aflatoxins (AFB and AFG) and cyclopiazonic acid (CPA) from peanut in Adana and Osmaniye in 2016. A total of 102 peanut samples were analyzed by High-Performance Liquid Chromatography using Immunoaffinity Columns (IAC-HPLC) analysis and CPA occurrence in peanut samples analyzed by Thin Layer Chromatography (TLC). Only 86 (84%) peanut samples were produced AFB and AFG but cyclopiazonic acid was not found in any of these samples. It is concluded that, large number of peanuts contaminated with AFs. In addition, these results indicate that a potential risk of aflatoxin production if good practices are not applied.

Keywords: Aflatoxins, cyclopiazonic acid, peanut

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Effects of Simultaneous Stress Factors (Biotic and Abiotic) on Crop Plants: A Case of Plant Pathogen and Heat Stress

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Abstract

Crop plants are subjected to a range of biotic and abiotic stress factors during their vegetation periods. They response to a variety ofstress factors byaltering of their morphological, physiological, biochemical characteristics and regulating their gene expression patterns. With these alterations plants have developed various defence and adaptation strategies against adverse conditions. On the other hand, plant pathogens have also evolved themselves to produce plant hormones and/or tomanipulate host hormone biosynthesis to break the plant defence mechanisms and these eventsare finallyresulted in severely plant diseases. The coevolution of plants and their pathogens is progressing normally under one type of stress condition. However, due to the global climate changes, plants have to cope with the multiple stress factors. The impacts of concurrent stresses are considered more complex and destructive on crop plants. Heat stress will be considered to be one of the most significant stress factors in the next decade. In this concept, interactions between plant pathogens and abiotic stress in terms of heat stress were evaluated. This issue is very current, and few studies have examined the mechanisms of multiple stress on crop plants. This report used observation method and study literature method. Current studies in this subject have been compiled and discussed.

Keywords: Crop, pathogen, stress, heat, simultaneous, yield loss

Effects of different plant spacing on yield and yield components of safflower (*Carthamus tinctorius* L.)

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Abstract

This rsearch was conducted to determine the efficiency of different rows to rows (15,30 and 45 cm) and (5, 10, 15, 20 and 25 cm) plant to plant distance of yield and quality parameters of safflower cultivar of Remzibey-05 under Diyarbakır conditions during growing season of 2013-2014 in the trial area of Field Crops Department, Faculty of Agriculture, University of Dicle. The research was carried out in 3 replications according to the design of "Split plot in Random Blocks". In this study, properties such as plant height, number of branches, number of capitule per plant, diameter of capitulum, number of seedsper capitulum, 1000-seed weight, seed yield, oil content, oil yield and protein content were examined. According to the results of the study, the highest seed yield and oil yield were obtained by applying 45 cm rows to rows and 5 cm plant to plant distance with (581.97 kg/da) and (160.05 kg/da) respectively. The highest oil content was obtained by applying the rows to rows 30 cm and plant to plant distance of 20 cm with (29.34%).

Keywords: Safflower, yield, rows to rows, plant to plant distance, oil and protein content.

Detection of Viruses in Fig Trees with Fig Mosaic Disease-Like Symptoms

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Abstract

Fig (*Ficus carica* L.) has great importance in Turkey's economy. There have been commercial fig orchards although fig is mostly cultivated for family's fresh consumption. In both hoby and commercial fig orchards, some symptoms such as leaf discolorations (chlorotic mottle and spots, vein banding and clearing) and leaf deformations representing fig mosaic disease (FMD)-like looks were seen in many fig trees. FMD is accepted as being the most important disease of fig due to its prevalence and affect in trees. *Fig mosaic virus* (FMV) has been associated with FDM and its etiology is still unknown (Condit and Horne, 1933; Martelli, 2011).

This research was carried out to determine viruses in the family *Closteroviridae* in fig trees having mosaic-like symptoms in Kahramanmaraş province and the experimental fig orchard of the Horticulture Department at Agriculture Faculty. Leaf and fruit samples were collected in july and stored at cold environment until they were processed for virus test. Total nucleic acid (TNA) isolation was made by using silica-capture method (Foissac et al., 2001) and used for reverse transcription with random hexamer. cDNA was synthesized and amplified with degenerate primers for *Closteroviridae* family in PCR Fifty four out of 89 tested samples resulted positive in PCR test and had DNA band 550-650 bp in size. Then they were directly sequenced in both direction and only 49 samples gave clear nucleotide sequences. analysis in both directioSequences were aligned with CLUSTALW and analysed in Bastn for multiple comparison of other isolates in GeneBank. The samples showed nucleotise homology with *Fig leaf mottle associated virus-1* (FLMaV-1) (7 sample), *Fig leaf mottle associated virus-2* (FLMaV-2) (38 samples), *Fig leaf mottle associated virus-3* (FLMaV-3) (3 samples) and *Fig mild mottle associated virus* (FMMaV) (1 sample).

Keywords: *Closterovirus*, fig, RT-PCR

The Role of Agricultural Ethics in Natural Resources Protection

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Abstract

The agricultural sector is a sector engaged in production by usingin puts on natural resources, intertwined with nature. The effect of natural factors directly affects productivity. Therefore, pollution of environment, changes in the structures of natural resources adversely affect the quality and quantity of agricultural products. Ethical responsibility has become inevitable in the present day when human beings have used the natural resources of the world unconsciously. In this context, agricultural ethics can be seen as a set of norms derived from existing philosophical ethics, stating how behavior should be in agricultural activities. This dimension has aspects when it is thought that agriculture is an inevitable ethical dimension. In agricultural activities soil and water are inseparable elements and these activities must be delivered with the least damage to future generations. It is the task of mankind to use limited land and water resources in agriculture most effectively and meet the nutritional needs of an increasingly global population. Farmers and industrialists are obliged to know the destruction of the various chemicals and they must take precautions not to cause it during the iractivities. It is a moral responsibility as much as it is legal. Nowadays, while taking precautions about the sustainability of natural resources, the ethical dimension of work must always be taken in to consideration.

Keywords: Ethics, agricultural ethics, natural resources

Growing Rosemary in Çumra Region

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Abstract

The production of medical and aromatic plants is very limited In Konya, where mostly cereal crops are grown. In general, one of the factors affecting the quality of medical plants collected from natural flora is that they are not always in the same standard. The rising use of medicinal plants in Turkey demonstrate the need to take the cultuvation of these plants.Thus, a certain standard will be created by making a significant contribution to both the quality and the yield of the medical plants.Rosemary (*Rosmarinus officinalis* L.) is one of the medicinal plants that can be cultivated in Çumra region.The growing and production is carried out in two main ways, generative and vegetative.Growth in seed production is generally slow, seed germination problems can occur.In addition, there are large variations in morphologically as well as in the characteristic properties such as volatile oil composition.Therefore, the plant can grow more vegetatively.

Keywords: Rosemary, cultivation, Çumra

Role of Grafting in Growth, Development and Nutrient Status of Melon (*Cucumis Melo*) Grown Under Saline Stress Conditions

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Abstract

The aim of the present study was to find out whether grafting could improve salinity tolerance of melon plants, and whether possible induction of tolerance to salinity was linked with the defense of the photosynthetic apparatus. The climate chamber experiment was carried out to determine plant height, total leaf area, photosynthesis, leaf chlorophyll content (SPAD), carotenoid content, fresh and dry weight of shoot (stem+leaf) and root, concentration of Na^+, Ca^{2+}, K^+ and Cl^- in the leaves, electrolyte leakage of leaf and root, proline content, and rate of lipid peroxidation. Under climate chamber conditions, two melon cultivars [galia type (Çıtırex F1) and standard type (Kırkağaç Manisa Altınbaş)] were grafted onto two different commercial *Cucurbita maxima x C. moschata* hybrid rootstocks (Kardosa and Nun 9075) and grown in 8 L pots filled continuously aerated nutrient solution under two different salt levels (1 and 8 dS m^{-1}) with three replications. The results indicated that grafted and non-grafted plants were significantly ($P<0.001$) affected by different salt levels. Grafted plants had better growth performance than non-grafted plants under both control and saline conditions. Photosynthesis, leaf chlorophyll (SPAD) and carotenoid content, total leaf area, shoot/ root ratio, shoot dry weight of the non-grafted plants significantly decreased as salinity stress increased, while proline content and root dry weight of the grafted plants significantly increased under salinity stress. Under saline conditions, an increasing damage in cell membrane occurred by increasing magnitude of electrolyte leakage, and lipid peroxidation in non-grafted plants as compare to grafted plants. Na^+ and Cl^- content were significantly increased by salt treatment and the degree of increase was dependent on genotype, however K^+ content was significantly decreased by salt treatment and the degree of decrease was dependent on genotype. Ca^{++} concentration in the leaves of all the grafted and non-grafted plants increased in response to salt application. Under saline conditions the highest shoot dry weight, leaf area, photosynthesis, leaf chlorophyll (SPAD) and carotenoid content, leaf K^+ and Ca^{++} were recorded in graft combination 'Çıtırex/ Nun 9075'. However, under saline conditions, the highest lipid peroxidation, leaf Na^+, electrolyte leakage of leaf and root were recorded in ungrafted plants. These results suggest that the use of salt tolerant *Cucurbita maxima x C. moschata* hybrid rootstocks can improve crop performance in melon under salt stress, whereas the appropriate scion/ rootstock combinations under saline conditions will be investigate for fruit yield and quality parameters in further studies.

Keywords: *Cucumis melo*, commercial rootstock, grafting, salinity tolerance, nutrient solution

Impacts of 1-Methylcyclopropene (1-MCP) on Postharvest Quality of Baby Squashes Having Different Fruit Color

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Abstract

The effects of 1-methylcyclopropene (1-MCP) on postharvest quality and storage life of baby squashes (*Cucurbita pepo* L., cv. Soleil F1 and Iskender F1) were investigated. The baby squashes were harvested at commercial maturity stage and squashes treated with 2 different concentrations of 1-MCP (250 ppb and 500 ppb) at 10 °C for 24 h. After 1-MCP treatments, green and yellow colored squashes were kept at 10 °C temperature with 90-95% RH for 14 days. Squash samples were taken at 7 days intervals from cold storage room and various physical and chemical analyses were carried out during the storage. 1-MCP treatments at reduced weight loss and decay incidence in both squash cultivars. 1-MCP treatment retarded the loss of TSS, $h°$ and $C*$ values (especially in the 500 ppb group), total phenolics, total chlorophyll (especially in the 250 ppb group), ascorbic acid and total flavonoids content during the cold storage in yellow squashes. 1-MCP treatment delayed the loss of TA (especially in the 250 ppb group), total chlorophyll, ascorbic acid content of green squashes. Ethyleneemissionwerealsoinhibitedby 1-MCP treatments. The results indicated that the 250 ppb 1-MCP treatment was found to be more effective for prolonging storage life and maintaining the postharvest quality of baby 'Soleil F1' (yellow colored) and 'Iskender F1' (green colored) squashes.

Keywords: 1-methylcyclopropene, baby squash, storage, quality

The Determination of Antioxidant Activity and Viscosity Properties of Iota Carrageenan on Chicken Broth

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Abstract

The aim of this study is to determine the antioxidant and viscosity properties of iota carrageenan, which was added at different rates in chicken broth. In the study, iota carrageenan was added to at 0,5%, 1% and 1,5% ratios the chicken broth obtained by boiling the skinned chicken with water of ratio 1: 3 in pressure cooker. All samples were storaged at +4 ºC for 10 days for the analysis. Chicken broth was analyzed for pH, colour parameters (L^*, a^*, b^*), thiobarbituric acid (TBA) value and DPPH (2,2-diphenyl-1-picrylhydrazyl hydrate) at 1., 4.,7. and 10. days. Each parameter was tested in triplicate samples. As a result of the analysis, it was determined that iota carrageenan had no antioxidant activity and iota carrageenan had a prooxidant effect of 0.5% according to TBA analysis. It was determined that the added iota carrageenans increased the viscosity values of the chicken broths and the highest viscosity value was obtained from the samples with 1.5% iota carrageenan. According to the obtained data, iota carrageenan use can be suggested to obtain more stable product.

Keywords: Iota carrageenan, chicken broth, viscosity

Determination and Pathogenicity of *Pestalotiopsis longisetula* on Strawberry Seedlings in The Eastern Mediterranean Region

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Abstract

Strawberry is one of the most important fruit crops for local consumption and exportation in Turkey the spring season of 2018, fungal isolation was made in the laboratory of strawberry plants from the Silifke of Mersin. More than 50% of the 43 samples were detected to be infected by the agent. Morphological diagnosis of the fungus was found to be *Pestalotiopsis longisetula*. Experiments were carried out in the climate chamber at 25 ± 1 ° C. The Koch'spostulate was verified by inoculating healthy leaves and fruits of strawberry variety using myceliadiscs and conidia. After fungus inoculation on leaves and fruits, the plants were covered with plastic for 48 hours. The plants were used as a control, the one third of them were inoculated with distilled water. Leaves and fruits were inoculated with 5 mm mycelialdiscs of the fungus placed in the middle of the healty leaves and fruits. The other plant leaves and fruits were inoculated with the conidial suspension adjusted to a final concentration of 10^6 conidia. mL^{-1} with sterile distilled water containing. At the same time the inoculum was sprayed onto the plant leaves. The disease severity index on strawberry leaves and fruit sreached. The diseased leaf area and fruits was reisolation after 15 days of inoculation. A similar disease indication was observed in the pathogenicity study with strawberry seedlings. This was *Pestalotiopsis longisetula* showing the capacity to infect strawberry leaves and fruits. it has been detected that *Pestalotiopsis longisetula* obtained as a result of these pathogenicity studies causes disease on strawberry fruits and leaves.By this study, establishing the basis for future studies.

Keywords: Strawberry, *Pestalotiopsis longisetula*, disease

The Effects of Dietary Grape Seed on Growth Performance in Japanese Quails with Different Plumage Colors Exposed to Heat Stress

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Abstract

The aim of this study was to determine the effects of grape seed (GS) supplementation to basal diet on performance in Japanese quails in growth phase with different plumage colors exposed to heat stress. A total of 144 8-day-old Japanese quails including 72 (36 females, 36 males) grey Japanese quails and 72 (36 females, 36 males) golden Japanese quails were used in this study. The quails were kept under heat stress (HS: 16h 34ºC, 8h 22ºC) and thermo-neutral (TN: 24h 22ºC) conditions between 15 and 43 days of age.All quails were fed with basal diet and basal diet supplemented with GS at both 10 g/kg and 20 g/kg ratios as Control, GS1, GS2. Each feeding treatment was repeated 3 times including 4 quails (2 females and 2 males) per replicate.Heat stress considerably decreased the live weight gain on days 29-36 ($P<0.001$), 36-43 ($P<0.05$), and 15-43 ($P<0.05$). Golden quails had higher live weight from the beginning of the trial ($P<0.01$). The increase of live weight on days 15- 43 was higher in golden group than grey group ($P<0.05$). Consequently, it was determined that HS significantly decreased performance of quails and GS added into ration increased feed consumption depending on dose increase.

Keywords: Japanese quail, feed additive, animal breeding, heat stress

The Response of Some Paddy Varieties (*Oryza sativa* L.) to Salinity

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Abstract

In our country, soil salinity is an extremely important problem. In particular, it occurs in regions where poor drainage conditions. It leads to significant yield and quality losses in products. Selection of tolerant plants to salinity is essential in terms of soil improvement and product yield. Paddy is a plant sensitive to salinity.
In this research, the response of seeds was measured in saline concentrations of 14 paddy cultivars at different doses (0 ppm, 500 ppm, 1400 ppm, 1800 ppm, 3600 ppm, 5200 ppm). To applications; germination percentage, grass scabbard length, etc. were investigated. All varieties were taken to study as 3 repetitions. In terms of germination percentage and length of grass scabbard among the varieties studied, statistical data were; 1% and 5% were found to be important.
In this study, the performance of the varieties against salinity was determined and it was determined that Ronaldo, Meco and Vasco varieties could be used for resistance to salinity.

Keywords: Paddy, Variety, Doses, Salinity

A Study on the Determination of BoronValues of Bonded Areas Where Geothermal Resources are Present and Bonded Geothermal Resources

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Abstract

Air, surface waters and underground waters can be contaminated with chemicals in the geothermal fluid. The effects of these chemicals on human life, pets, agricultural products and wild life must be taken into account in particular. Chemical substances can be added to geothermal fluid during research or during geothermal energy production. Caustic soda, Sulfuric acid and many different toxic or corrosive chemicals are used to prevent bacteria formation or precipitation and crusting. In addition, it is necessary to investigate the negative effects of the ion balance change during production on the environment. Plant nutrition and soil are important factors for viticulture. In the Aegean Region, the vast majority of the vine yards are cultivated in sandy-loamy and loamy terrain. In general, the soil is limy, neutral and mild alkaline is reactive, and there is no salt problem. In Alasehir, a large amount of boron was detected in the gardens. The main reason for this is the high boron concentration in underground irrigation waters. In connection with this issue, it has been stated that the water quality of the study in Alasehir region is very bad, so the bonds used for these waters will suffer from this and boron will be accumulated in the soil. As a result of the study, it is observed that boron accumulation in the bond areas where geothermal resources are present and these values vary between 1 and 5ppm and in areas where geothermal resources are not available, boron values are between 0-1 ppm.

Keywords: Geothermalenergy, vineyard, boron, soil.

Determination of the Effect of Conventional and Organic Farming Conditions on Morphological and Agronomic Characteristics in Some Local Bean (Phaseolus vulgaris L.) Genotypes

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Abstract

This research was carried out during the 2016-2017 breeding season at Bayburt University, Food and Agriculture and Livestock Application and Research Center trial site to determine the morphological and agronomic characteristics of organic and conventional agronomic characteristics of some local beans (Phaseolus vulgaris L.) genotypes. In the study, 13 local bean genotypes and 3 registered varieties (Preceding-98, Rooster and Dermason) were used. The study was set up in three replications according to the split parcel trial design in random blocks.
In the genotypes grown on organic and conventional conditions, the plant height was 32.1-44.3 cm, 41.8-58.1 cm, the first pod height was 6.7-11.1 cm, 9.40-16.00 cm, the body thickness was 5.6-8.4 cm, 4.5-5.9 cm, the pod size was 85.9-120.7 mm, 83.7-100.8 mm, pod width 12.5-15.4 mm, 11.2-15.6 mm, number of pods 10.0-24.1 pods / plant, 5-13 pods / plant, number of pods 3.5-5.5 pods / 5,4 pieces / plant, 1000 grain weight 393.7-545.5 g, 340-600 g, the grain yield was 128.3-194.3 kg / da, 135-202 kg / da. It has been determined that there are significant differences in some traits between the local genotypes grown in organic and conventional conditions.

Keywords: *Phaseolus vulgaris* L., yield, yield elements, organic agriculture, conventional agriculture

Malatya İli Su Ürünleri Sektörünün Mevcut Durumu

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Özet

Bu çalışma, Türkiye su ürünleri sektöründe avcılık ve yetiştiricilik üretiminde önemli payı olan Doğu Anadolu Bölgesinde yer alan Malatya İlinin su ürünleri sektörü açısından planlama veya stratejilerinin belirlenmesi amacıyla 2014 yılında yürütülmüştür. Alabalık yetiştiriciliğinde Türkiye'de 5'nci İl konumunda olan Malatya'da 2013 yılı itibariyle 32 adedi havuz ve 45 adedi kafes olmak üzere toplam 77 adet yetiştiricilik işletmesi bulunmaktadır. Bu işletmelerin toplam teorik kapasiteleri 14.154 ton/yıl olmakla birlikte 2013 yılında alabalık üretimi kapasitenin 1/3'i oranında ve 4.500 ton/yıl olarak gerçekleşmiştir.
İlde 1 adet su ürünleri işleme tesisinin bulunduğu belirlenmiştir.
Malatya İli Gıda, Tarım ve Hayvancılık İl Müdürlüğü 2013 yılı verilerine göre günlük av miktarının 380 kg ve avcılığa çıkılan gün sayısının 210-230 arasında değiştiği belirtilmiştir.

Anahtar Kelimeler: Su Ürünleri Sektörü, Malatya, Alabalık, Balıkçılık

The Effects of Antioxidant Activity and Viscosity Properties of Chia Seed Mucilage on Chicken Broth

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Abstract

The aim of this work is determined the antioxidant activity and viscosity properties of the chia seed mucilage. For this purpose, chicken broth was obtained by boiling the skinned chicken with water at a ratio of 1: 3 in pressure cooker. The chia seed mucilage obtained with waterwas added to chicken broth at ratio of 0.5%, 1%, 1.5% and antioxidant effect was compared with the chicken broth sample with 200 ppm BHT. All samples were storaged at +4 ºC for 10 days for analysis. All samples were analyzed at 1., 4., 7. and 10. days. Thiobarbituric acid (TBA) value, DPPH (2,2-difenil-1-pikrilhidrazil hydrate), pH, viscosity, colour parameters (L^*, a^*, b^*) analyses were carried out in each group chicken broth samples. Each parameter was tested in triplicate samples. The average DPPH activity of samples were determined to range between 2,04-9,89%. Adding mucilage to the chicken broth samples were found to have higher levels of DPPH, compared to the control group. While the average TBA values of chia seed mucilage-added chicken broth were ranged between 0.1-0.18 mg malonaldehyde/kg, the lowest TBA values obtained from the chicken broth samples with 1.5% chia seed mucilage. According to the obtained data, chia seed mucilage use can be suggested as a natural thickening agent and natural antioxidant in foods.

Keywords: Chia seed mucilage, chicken broth, viscosity, natural antioxidant, natural thickening agent.

Turfgrass Performance of Experimental Hybrid Bermudagrasses from Akdeniz University

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Abstract

Interspecific hybrid bermudagrasses [*Cynodondactylon* (L.) Pers. x *C. transvaalensis*Burtt-Davy] are sterile triploid ($2n = 3x = 27$) cultivars widely utilized on athletic fieldsdue to improved turf characteristics, including increased wear tolerance, fine leaf texture, and high sod density throughout tropical and subtropical climatesThere is a need for vegetative turf-type bermudagrass with acceptable turfgrass performance suitable for Mediterranean region. The objective of this study was to evaluate new experimental interspecific experimental hybrid (EH) bermudagrassesdeveloped by Akdeniz University for turfgrass performance. The EHsbermudagrasses along with commercial check 'Tifway' transplanted into fieldon July 21, 2016.The experimental design was a randomized complete block with three replications.Turfgrass quality, color, spring green-up and fall color retention were recorded. Three of the EHs (T4-C3, T6-A45 and T6-B9) provided significantly better quality (ave. 6.7) than Tifway(3.5) in late fall. Overall, the EHs presented darker green color in summer and better fall color retention than Tifway. Turfgrass color of the hybrids ranged from 7.8 to 9.0 (ave. 8.3) in June, and 4.5 to 8.3 (ave. 6.6) in December, compared to 7.3, and 5.5 for Tifway. The EHs had earlier spring green-up compared to Tifway. Spring green-up reached as high as 73% among EHs, and ranged from 40 to 73% at the beginning of March while Tifway had 23% green-up. Useful variation exists for fall dormancy and spring green-up in the hybrids that can be utilized to develop cultivars having shorter dormancy than Tifway. Because of the combination of desirable traits from the two species, C. *dactylon* and C. *transvaalensis,* the best hybrids encompassed the superior traits of common bermudagrass (darker green color, greater turf performance,) with the superior turfgrass characteristics of *C. transvaalensis* (fine texture and high turfgrass quality).

Keywords: Cynodondactylon, Cynodontrans vaalensis, triploid, hybrid turfgrass

Antifungal Activity Against Four Different Plant Pathogen Fungi from The Stem Bark Obtained from *Betula pendula* Roth.

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Abstract

The use of antifungal agents obtained from different parts of plants is increasing everyday. In this study, the antifungal activities of methanol extract obtained from the stem bark of the *Betula pendula* Roth. plant were determined against *Sclerotinia sclerotiorum*, *Fusarium oxysporumf. sp. cucumerium* and *Monillia fructigena* plant pathogens under in vitro conditions. Activity studies of 100, 500, 1000, 2000 and 5000 mg/L doses of the *Betula pendula* stem bark extract were carried out. Experiments were conducted in vitro conditions using agar plate method. Mycelial growth, minimal fungicidal concentration, mycelial growth inhibition and lethal dose values (LD_{50-90}) were determined for the pathogens of the extract. Antifungal activity was observed for all pathogens tested. The activity increased as the dose concentration used increased. MGI ratios were found to be 100% for *S. sclerotiorum*at 5000 mg/L, 89% for FOC and 90% for *M. fructigena*. The LD_{50} values for *S. sclerotiorum*, FOC and *M. fructigena* were calculated to be 295, 633, 704 mg/L and LD_{90} values of 1259, 6326 and 5933 mg/L, respectively. According to these results, it was determined that the stem bark extract of *B. pendula* exhibited high antifungal activity. Significant results have been obtained in terms of the direction of research to determine new alternative antifungal agents.

Keywords: *Betula pendula*, plant extract, antifungal activity, lethal dose

Development Stages and Types of Embryos at the 18-21st Days After Pollination with Irradiated Pollen in Cotton (*Gossypium hirsutum* L.)

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Abstract

This study was carried out to investigate the possibility of inducing haploid embryos and plants through irradiated pollen technique to produce doubled haploids in cotton. Two F_1 genotypes were used as the plant material. In 2016, crossing studies were carried out to obtain F_1 generations (ADN 712 / Claudia and ST 468 / Claudia). In 2017 seeds of F_1 generations and pollinator varieties were grown in the field. Parental varieties (ADN 712, ST 468, Claudia) and Carisma were used as pollinator genotypes. 742 emasculated flowers were pollinated with pollens irradiated with 50 Gray gamma ray (^{60}Co). Then 171 bolls (18 and 21 days old) were harvested and 3837 immature seeds were investigated under binocular. The possibly haploid embryos observed at different stages and types (point, globular, heart, arrow, torpedo, cotyledon and different type) were determined. Depending on the embryo stages and types embryo induction rates were found 1.6%, 6.4%, 9.2%, 6.1% 27.5%, 34.0%, 15.1% respectively. In the study 920 possibly haploid embryos were determined and cultured on WV5 medium. Because cotton is a recalcitrant plant *in vitro*, few embryos have been able to turn into healthy rooted plants.

Keywords: *Gossypium hirsutum* L., irradiated pollen, haploid, immature embryo

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Global Warming Effects on the Agricultural Sectorand Solutions

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Abstract

In general, green house gases are increasing as a result of fossil fuels burning, land use change, improper fertilizer applications to achieve high yields in agricultural production, deforestation and a variety of other human activities, and greenhouse gases affect nature negatively. As a result, the increase in greenhouse gases in the atmosphere causes global warming, which is the result of climate change. Depending on the increase in global temperatures, certain change ssuch as hydrological rotation, ice formation, sea level rise are expected to make significant changes that will affect human life, socio economic sectors and ecological systems. Findings from this study support the negative impact of climate change on the agricultural sector.

Keywords: Global warming, climate change, agriculture sector

Study of Hormonal Priming Effect on Lentil Heterotrophic Growth under Salinity Stress Conditions

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Abstract

In order to evaluate the effect of hormonal priming on germination and heterotrophic growth indices of lentils, a study was conducted in 2017 in the Department of Agriculture, Faculty of Agriculture, Urmia University. The treatments consisted of seeds priming with concentrations of 0, 0.5, 1 and 2 mM salicylic acid and salinity levels 0.6, 0.9, 1.2 and 1.5% NaCl. The experimental design was completely randomized with three replications, carried out in a factorial arrangement. Germination indices, seedling growth and seedling growth were evaluated and evaluated. The results showed that hormonal priming with salicylic acid at all concentrations compared to the control resulted in the improvement of seed vigor under salt stress conditions. However, the results indicate that hormonal priming is not fully capable of eliminating damage caused by salt stress. The best results in terms of reducing the drought stress caused by seed priming with 1 mM salicylic acid was obtained. In this treatment, at the highest level of salinity stress, the final percentage of germination, seedling length, mean germination time to 20% germination was 11, 13.1, 23%, as compared to control.

Keywords: Hormonal priming, lentil, salinity stress, germination, seed germination

Wolbachia Infection Detection in *Diplolepis fructuum* (Rübsaamen 1895) (Hymenoptera: Cynipoidea) during Its Developmental Stages of Population in Sivas, Turkey.

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Abstract

Cynipids are known to use several types of reproductive modes, like thelytoky, arrhenotoky and cyclical parthenogenesis. A family of phytophagous, among Cynipidae mostly gall-inducing Hymenoptera. Because of male scarcity, some species of *Diplolepis* genus are considered to be thelytokous. All researches which carry out in Sivas Province in *Diplolepis fructuum* population, only female individuals were detected. This phenomen could be strictly associated with the presence of the intracellular bacteria of the genus *Wolbachia* (Rickettsiales). *Wolbachia* strains are remarkably prevalent in diverse insect taxa, cytoplasmic incompatibility, parthenogenesis induction, also feminization of genetic males. The aim of our research is to detect *Wolbachia* in all development stages of *Diplolepis fructuum* for taking evidence of the feminization effect by using PCR assays. *Wolbachia* identification detected using PCR essay and used 16S-rDNA gene. In this study, 16S-rDNA gene amplified in all *Diplolepis fructuum* development stages and in control *Cephus pygmeus* female, *Wolbachia* specific 16S rDNA gene was not amplified. All individuals of this population were infected by Wolbachia (40 of 40). However, detection of *Wolbachia* in eggs can be explained by transmission within a species vertically through the cytoplasm of eggs. This research provide new insights into parthenogenesis in this species.

Keywords: *Diplolepis fructuum*, *Wolbachia*, thelytoky, gall.

Some *Thymus* L. Species Growing in Konya

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Abstract

Our country has got very rich range of medical plants. Among them, the *Labiatae* family has been represented with 220 genera, 3200 species and in Turkey 45 genera, 546 species. The genus *Thymus* (*Lamiaceae*) is distributed in an area stretching from Mediterranean region. The important genus of this family which is *Thymus* has got 1380 taxa, 90 family, 463 genera and 1304 species in Konya. In addition 409 endemic taxa, 41 families, 148 genera and 392 species have been reported. Among these species *Thymus* L. has grown on stony hills, rocky slopes and which is locally known kekik or Taş kekiği. The selection of the same species of plant samples at different locations will be considered essential oil yield and composition.

Keywords: Konya, Thymus

The Effects of Spermidine and Putrescine on Haploid Embryo Inductionvia Ovule Culture in Cucumbers (*Cucumis sativus* L.)

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Abstract

Haploidization techniques are known as useful in plant breeding. By comparison conventional breeding methods,haploid and double-haploid techniques have many advantages. These techniques allow to produce100% homozygous lines in a short period of time and provide the efficiency.
Polyamines which have low molecular mass,arefound in all living organisms. They play a role in a broad range of biological processes, including growth, development, and stress response.Experiments carried out in which the synthesis of polyamines is impaired, make it clear that these compounds are essential for normal growth and development.
In our study, the effects of spermidine and putrescine on haploid embryo stimulation in ovule culture were investigated in cucumbers.MS (Murashige and Skoog) medium supplemented with 0.04 mg/l TDZ for embryo stimulation was used. To research the effects of polyamines, spermidine and putrescine were used with the concentrations of 40, 80, 120, 160 and 200 µM/L. Furthermore, spermidine and putrescine were used together with mean concentration of 80, 160, 240, 320 and 400 µM/L (1:1, v/v), respectively.5 varieties of cucumber namedSardes F1, Cemre F1, Toros F1, Altay F1 and Langa were chosen for the cultivation. Ovules of Sardes F1, Toros F1have been developed in medium containing spermidine and Langahas been developed in medium containing putrescine. No improvement has been observed in Cemre F1 and Altay F1 during 15 days.

Keywords: *Cucumissativus*L., haploidy, ovul culture, spermidine, putrescine.

Note: This research is supported by Çukurova University Scientific Research Unit, BAP (Project Number: FYL-2017-9681)

Use of Natural Antioxidants As Alternative to Synthetic Antioxidants in Meat and Meat Products

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Abstract

Lipid oxidation is a major deterioration factor in the foods. Oxidation of lipids initiates other changes that affect the nutritional quality, color, texture and flavor of food. Antioxidants are protective substances that prevent oxidative degradation of lipids by its phenolic structures. Antioxidants used in the food industry are divided into natural and synthetic. Although synthetic antioxidants are effective at low doses, relevance of consumers have headed for natural antioxidants because of their toxicological and carcinogenic effects on human health. Much of the recent research has been for the identification of natural antioxidants from various parts of plants. The plants such as rosemary, thyme, sage, clove, black pepper, turmeric and their extracts used in order to give flavor to meat and meat products are used as antioxidants. In this review, the use of natural antioxidants as alternative to synthetic antioxidants has been investigated in order to prevent oxidative degradation in meat and meat products, which is very rather important for human nutrition.

Keywords: Oxidation in meat products, natural antioxidant, lipid oxidation

Effects of Probiotic Bacteria on Growth Performance of Plant

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Abstract

Synthetic fertilizers and chemicals are used extensively in order to produce high yield and quality of plant for agricultural production. The unconscious and excessive use of these substances negatively affects human and environmental health. Therefore, there is a need for eco-friendly and sustainable alternative strategies to increase agricultural productivity. Beneficial bacteria isolated from the environment in which the plants lives improve plant growth and productivity, nutrient management or resistance to microbial pathogens. This review will be discussed the potential beneficial effects of probiotics (as biofertilizer, biostimulants, bioprotectants and biocontrollers) in agricultural production.

Keywords: Plant growth promoters, beneficial bacteria, sustainable agriculture, nutrient management

Morphological and Molecular Characterization of Four Different *Trichoderma* Species in Çukurova Region

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Abstract

Trichoderma species are common in habitants of soil, and are well known for their ability to establish symbiotic relationships with a variety of plant species, especially in association with root tissues, but they are also known as saprophytes and mycoparasites (Brotman et al. 2010; Harman et al. 2004; Wells1988). The ability of *Trichoderma* species to produce a wide array of antifungal secondary metabolites and digestive enzymes reflect an apparentancestral mycoparasitic lifestyle (Druzhinina et al. 2011; Kubicek et al. 2011). These attributes have been exploited for research in plant protection where *Trichoderma* strains have been shown to have the capacity to suppress fungal phytopathogens, induce systemic resistance and stimulate plant growth (Harman et al. 2004). In this study, 4 different *Trichoderma* species were isolated both from leaves and root rhizosfer of faba bean, pea and potato plants. These species were identified based on colony morphology of fungi and alignment of nucleotid sequences of ITS, β-tubulinande longation factor alfa-1 genes of the fungi. *T. virens* and *T. longibriaticum* were isolated from potato and pea root soil respectively while *T. atroviridae* was isoated from pea leaves. Trichoderma harzianum was isolated from all plant leaves and root soil.

Keywords: Alignment, β-tubulin, EF1-alpha, ITS

Acknowledgement:This study was supported by the Foundation of Çukurova University Scientific Research Project Units (Project No: FDK-2017-8499).

A Cut Flower cultivation under Saline Conditions: *C. morifolium* Ramat 'Bacardi'

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Abstract

Chrysanthemum which belongs to Asteraceae is one of the most important ornamental plants in the world. It is worldwide used as cutf lower, potted and outdoor ornamental plant.*Chrysanthemum morifolium* Ramat. 'Bacardi', a species of thisgenus, is very important spraycrysanthem. Salinity in soils and waters is one of the major problems which affect the ornamental aspects and plant growth. It was aimed to determine the effects of salinity on *Chrysanthemum morifolium*by analysing plant growth, flower characters and some physiological traits in this study. Plants were irrigated with seven different levels of salt concentrations (0, 50, 100, 150, 200, 250 and 300 mMNaCl) for 75 days with 3 days intervals in pots under greenhouse conditions. The effects of salinity stress on diameter of flower and disc floret, number of flowers, fresh and dry weights of flower, shoot height,shoot fresh and dry weights, stem thickness, lateral shoot length and number, inter-node length,relative water content and ion leakage, membrane injury were investigated in this study. Consequently, flower and disc floret diameters, number of flowers, shoot height, shoot and flower fresh and dry weights,stem thickness, lateral shoot length and number, inter-node length were drastically decreased, as the salinity increased, especially after 200 mM.On the other hand, ion leakage, membrane injurysignificantly increased when salt concentrations increased. According to results, *C. morifolium*negatively affected from high level salt concentrations and its flowers lost visual and ornamental quality.

Keywords: *Chrysanthemum*, NaCl, ornamental characters, plant growth, salinity

Optimization of lab-scale production of *Bacillus subtilis* EGE-B-24.4i endospores as microbial fertilizer

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Abstract

The nutrient medium formulation in industrial bioprocesses is critical because it directly affects product yield and volumetric productivity. One of the most important point in designing and optimizing a new culture medium and production conditions is screening the effect of each component on the response. The response surface methodology (RSM) was used to optimize the nutrient medium composition aiming to increase the bioprocess biomass yield. As a result of the performance tests carried out with the plants in pot trials, one of the isolate which is a candidate for microbial fertilizer (*Bacillus subtilis* EGE-B-24.4i) was specifically studied to determine the optimum medium and conditions for the production of a high number of endospores in the shaking flasks. In an effort to target high biomass amount (endospor form), it was aimed to find out the use of industrial byproducts and wastes as alternative carbon (glucose, molasses) and nitrogen sources (soya flour, commercial dry yeast, whey powder, corn steep liquor, $(NH_4)_2SO_4$) aiming to develop a production medium that is economical and suitable to use in organic agriculture. The Taguchi approach was used to determine which of the parameters identified in the complex production medium used industrial waste/byproducts for production of the endospor form of the selected *Bacillus* biopreparat. The experimental design required by this method and all related mathematical and statistical analyzes were performed with the Design-Expert 10.0.5. With the optimized production medium obtained as a result of the experiments, the production of spores in *Bacillus subtilis* EGE-B-24.4i was determined as $3.12x10^{11}$ endospore ml^{-1} in flasks.

Keywords: *Bacillus subtilis*, Endospor production, Optimization, Microbial fertilizer

Acknowledgements: This study was supported by Ege University Scientific Research Projects Coordination Unit (Project No: 14MÜH043) and TC Ministry of Development (EGE MATAL, Project No: 2010K120810). EGE-MATAL device infrastructure was used in the study.

Genetic Defects in Turkish Cattle Populations and Genetic Control

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Abstract

Genetic defects including monogenic diseases are one of the most important issues in all animal species. However, the intensive use of individual sires in cattle breeding and the structure of bovine breeding programs make this species especially vulnerable to the effects of undesirable traits. About 150 Mendelian diseases of cattle are thought to be caused by sequence variations in single genes, of which the causal mutations in less than half of them have been elucidated. Bovine leukocyte adhesion deficiency (BLAD), deficiency of uridine monophosphate synthase (DUMPS), complex vertebral malformation (CVM), brachyspina syndrome (BS), cholesterol deficiency (CD) and factor XI deficiency (FXID) are autosomal recessive hereditary disorders, which have had significant economic impact on dairy cattle breeding worldwide. In previous studies, the carriers of BLAD, CVM and FXID were found in Turkish Holstein cattle populations while the DUMPS carrier was absent.It was found that Turkish native cattle breeds were free with regard to these diseases. Until now, there is no any official report about BS and CD in Turkey.Genetic control of diseases that are under the control of single genes such as BLAD, DUMPS, CVM, BS, CD,and FXID is easily achievable. It is strongly advised fast and effective identification of bulls or semen samples by molecular techniques to eliminate these genetic disorders, and therefore, prevent economic loses. Using the DNA-based methods, several of monogenic diseases have been successfully controlled or eliminated from the herds.

Keywords: Genetic defects, Turkish cattle populations, control strategies, PCR-based test

Effects of Salt Stress in Grapevine

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Abstract

In recent years, warming caused by the global climate change has lead both to a decrease in water resources and soil salinization in Turkey, as is the case in the world. Grapevine is very sensitive to salinity compared to many other plant species. The majority of the vineyards are established in regions where the seasonal drought is intense during the growing season. Due to the low water capacity in the soil in these areas and also high evapotranspiration, vines are often exposed to drought and, therefore, to salt stress. Salt stress in the plants, which occurs due to the very high level of accumulation of salt in the soil and water, and its very high toxic effects, is mostly caused by the sodium (Na^+) salts, especially by sodium chloride (NaCl). As Na^+ can be held by the roots, the accumulation of chlorine (Cl^-) in the leaves leads to greater problems compared to Na^+ accumulation. Therefore, grapevine is more susceptible to Cl^- toxicity than Na^+ toxicity. The first symptom of salt toxicity is chlorosis, which starts from the tips of the elderly leaves and advances towards the leaf blade and stem, and then turns into necrosis. This leads to a decrease in the photosynthesis and intake of plant nutrients in the vine, inhibiting the growth and development of the plant. Furthermore, oxidative stress accompanied by salt stress negatively affects many physiological and biochemical properties, resulting in significant decreases in yield and quality of the product. Consequently, photosynthesis, vegetative and generative development and yield decrease as a result of stress. So, it has become increasingly important to develop new genotypes resistant to stress and to identify the mechanisms that play a role in the resistance both in classical breeding studies and in molecular biological studies. The primary method to adopt in line with this objective is the determination of resistant genotypes and comparison of susceptible genotypes in terms of their biochemical characteristics and antioxidant defense mechanisms.

Keywords: Grapevine, salt stress, NaCl

Drosophilidae Fauna in Eastern Mediterranean Region with A New Record from Turkey

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Abstract

The study was conducted on strawberry, peach, nectarine, grapefruit (Star Ruby), orange (Washington navel), mandarin (Okitsu), lemon (Meyer), cherry, loquat tree and persimmon orchards in Pozantı, Karaisalı, Aladağ, Feke, Saimbeyli and Tufanbeyli district of Adana and Tarsus, Erdemli, Silifke district of Mersin province in 2016-2018 in Turkey. Five harmful species were identified as the result of the study. Some of these species have been found to cause economic losses from time to time. In the results, *Drosophila suzukii* (Matsumura), *Zaprionus indianus* (Gupta), *Drosophila melanogaster* (Meig.), *Drosophila subobscura* (Collin) and *Drosophila phalerata* (Meigen) which belong to Drosophilidae species were found to be common. From these species, *Drosophila suzukii* for the Adana cherry fauna and *Zaprionus indianus*, *D. subobscura*, *D. phalerata* species are new records for the Eastern Mediterranean Region and Turkey insect fauna.

Keywords: Adana, Drosophilidae, Fauna, Mersin, Turkey

* This study supported by Çukurova University (Project number: FBA-2016-6528).

Effects of Soil and Foliar Zinc Applications on Plant Growth, Seed Yield and Seed Mineral Composition of Pumpkin (*Cucurbita pepo* L.) Cultivated in Calcareous Soil

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Abstract

A field experiment in 2011 cropping period was carried out to study the responses of plant growth and seed yield of pumpkin (*Cucurbita pepo* L.) to soil and foliar zinc (Zn) fertilization in severely Zn-deficient calcareous soils which are located at the Agricultural Research Station of Erciyes University in Develi distict of Kayseri. The experiment was conducted in a completely randomized block design with four replications. At maturity the plants were harvested manually and for each plot total number of plants, total number of fruits, total fresh fruit weight and total fresh seed weight was determined. Also, seed fresh weight per plant and per fruit was calculated. Moreover, the mineral element composition of seed and shell was analysed separately by using an inductively coupled plasma emission spectrophotometer (ICP). Results indicated that zinc fertilization to soil and foliar had significantly positive effects on fruit and seed yield as compared to non-fertilized control plants. Foliar Zn fertilization was more effective to the pumpkin plants than soil Zn fertilization. An increase in mineral element composition particularly in Ca, Zn and Mn contents in seed and shell was also found.

Keywords: *Cucurbita pepo* L., pumpkin, zinc fertilizer, foliar application

Plant Species Diversity of Karaören Village Rangeland (Eskişehir)

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Abstract

Species diversity is the variety of species within a habitat or a region. Turkey, as a consequence of its exceptionally diverse topographical structure and differing climatic features, is one of the world's richest countries of the world as regards to the diversity of the plant species. The aim in this study, conducted in the rangeland of Karaören Village in Eskişehir which is located in the Central Anatolian Region, between the years of 2016-2017, is to present the plant species diversity of the local rangelands. In the study area, 89 plant taxa, belonging to 49 families and 87 plant genera, were identified; and 10, 8, and 71 of these belonged to the Poaceae, Fabaceae, and other families, respectively. The family that is represented with the most number of taxa, with 10 taxa, is the Poaceae family. It is followed by Fabaceae, Asteraceae, and Apiaceae families, respectively, with 8, 7, and 4 taxa. Among the 89 plant taxa, 30 of the plants are annual; 2 of the plants are biennial; and 57 of them are perennial plants. Among the taxa encountered in the study area, 14 of them were recorded as the element of the Mediterranean Region; 15 taxa were recorded as the element of Irano-Turanian Region; 7 of them were recorded as the element of Euro-Siberian Region; and 53 taxa were recorded as widepspread or belonging to an unknown region. Moreover, 11 plant taxa were endemic and the endemism ratio was identified as 12.35%.

Keywords: Plant species richness, endemic plants, Rangeland, Eskişehir, Turkey

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Importance of Native Animal Genetic Resources

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Abstract

Although the productivity of Turkish native animal breeds is low, they are adapted to especially difficult local environmental conditions such as rough climatic conditions and insufficient food availability. Turkish native animal breeds are potentially endangered because of crossbreeding. Therefore, Turkey has undertaken a national project (TAGEM-95K120250) titled "*In situ* Conservation Program of Livestock Genetic Resources" to conserve the Turkish native livestock breeds. The earliest evidence of animal domestication was found in certain parts of the Near East, with Turkey as an area of major importance. Within the Near East and because of its geographical location at the intersection of Asia and Europe, Anatolia has been a cradle for civilizations since prehistoric times. Data from the numerous Neolithic human settlements found throughout this region strongly point to it as a major domestication center for livestock species, mainly cattle, pig, goats and sheep.Thus, Anatolian (Turkish) native breeds may be the special ones in maintaining very valuable genetic diversity. Therefore, they must be explored with regard to genetic markers. The conservation of native genetic resources is so important because many native breed populations are declining due to many reasons including degraded habitat and hybridization studies. Without conservation, some declining breeds never recover and eventually may become extinct - or no longer in existence. Today, it is difficult to predict which of the production characteristics or genotypes that neglected so far become economically important in the future.For that reason, each country should continue the conservation policies for future generations.

Keywords: Turkish native animal breeds, animal genetic resources, conservationprogram

Determination of Important Viruses in Open Field-Grown Pepperin Mersin Province of Turkey

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Abstract

In 2017 in Mersin province, 294.952 tons of pepper production was realized in total of 50.320 decares area. As pepper variety, green pepper, bell pepper and red peppers are grown and most of the production is greenpepper. One of the important factors limiting pepper production is viruses.The severity of viruses in the pepper varies depending on the strain of the virus, the period of growing the pepper, the environmental conditions and the single or mixed infection. In this study, viruses which are causing diseases in open field pepper cultivation in Mersin province have been investigated. For this purpose, survey works were carried out in 2014 and 2015 and a total of 173 leaf and fruit samples of pepper plants were collected. The prevalence of viruses were determined by using the Double Antibody Sandwich Enzyme-Linked Immunosorbent Assay (DAS-ELISA) and Reverse Transcription Polymerase Chain Reaction (RT-PCR) methods in the collected samples.When the viruses identified in the samples collected from Mersin province were evaluated singly, it was determined that the most common virus was CMV with 23.7%. This was followed by *Tobacco etch virus*-TEV 21.7%, *Pepper veinal mottle virus*-PVMV 20%, *Potato Y virus*-PVY 17.3%, *Tomato spotted wilt virus*-TSWV 9.3%, *Pepper mottle virus*-PepMoV 4.3%, *Pepper mild mottle virus*-PMMoV and *Tomato mosaic virus*-ToMV1.3%. In the tested samples, *Tobacco mosaic virus*-TMV was found to have the lowest infection rate of 1%.

Keywords: Virus, pepper, Mersin

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Influence of Putrescine on Shoot Multiplication and Rooting in Myrobalan Rootstock

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Abstract

Myrobalan is a *Prunus cerasifera* seedling rootstock, suitable for a wide range of soil conditions. It is usually considered a vigorous or semi-vigorous rootstock, producing a tree with a mature height of 4-6 meters. The influence of putrescine on shoot multiplication and rooting was investigated in Myrobalan rootstock in *in vitro* condition. MS (Murashige and Skoog) medium supplemented with 1 mg l^{-1} BAP (benzylamino purine) were used for multiplication, with 1 IBA (Indole-3-butyric acid) mg l^{-1} for rooting. Three different putrescine concentrations (25, 50, 100 µM/l) were used both multiplication and rooting media. At the end of the three subculture, micropropagation rate, average plant length (cm), number of leaf, fresh weight (g) and dry weight (g) were recorded.Shoots coming from micropropagation were moved to MS medium supplemented with same components with multiplication medium except BAP. For rooting 1 mg l^{-1} IBA were used. The cultures were maintained incubated in a growth chamber at 25 ºC under cool white fluorescent light at 16 h photoperiod condition. Six weeks later rooting rate (%), numbers of roots, length of roots and plants (cm) were recorded. The best influence on multiplication was on 100 µM/l putrescine with an average of 5.01. The highest rooting rate (100%) was detected on medium supplemented with 100 µM/l putrescine.

Keywords: BAP, IBA, shoot multiplication, rooting, *in vitro*

Problems and Solutions in Agricultural Sector in Turkey

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Abstract

The agricultural sector economy provides contributions to the population by providing employment opportunities to a significant part of the population, ensuring that the population meets basic food needs and supports income and income. The agricultural sector is the most important sector of the economy in the development process. The growth and welfare increase in the agricultural sector means that it will provide a proportional increase in development welfare too ther sectors as well. Moreover, the importance of the agricultural sector, which plays an important role in the development of countries and societies, is increasing with the effect of globalizing economic system, increasing competition environment and rapidly changing market conditions. Turkey, due to its geopolitical position in which it is found, three sides of the Mediterranean, is surrounded by th eAegean and Black Seas, owned by rivers and large-scale plant should because it has to biodiversity, should have a different significance in terms of animal and need to aquaculture. In this study, information about the agriculture sector is given in our country, the effects of the agriculture sector on economic development and the problems and solutions proposed are discussed.

Keywords: Agriculture, economic development, agriculture in Turkey

Effects of Preharvest Calcium Applications on Fruit Quality during Postharvest Storage

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Abstract

Calcium that is a macro nutrients plays an important role in many biochemical reactions and morphological processes in plants. While calcium plays a role in the formation of calcium pectates in the structure of plant cell walls, it is also used as a cofactor for some enzymatic reactions. It has also been determined in recent years that calcium is required for specific regulation of cellular reactions induced by the calmodulin molecule. Because calcium is involved in the cell wall structure and strengthens the cell wall; when the plant receives sufficient calcium during its development, both the quality of the fruit increases and the susceptibility to the disease in the later period is reduced. Most of the calcium-related diseases in plants are caused by inadequate growing conditions and inadequate calcium in the root zone. In fruits such as apples, kiwi and grapes, calcium is mainly accumulated during the first stages of fruit development, while peaches are storing calcium until the fruit is harvested. Calcium in the fruit is also used in maturation related physiological processes. Therefore, the lack of calcium in the fruit causes diseases such as cracking, vitreous and bitter pit, and thus increasing the amount of postharvest loss. For this reason, calcium applications have been applied both before and after harvesting in order to decrease the physiological and pathological losses due to lack of calcium after harvest in recent years. This review is intended to examine the effects of pre-harvest calcium applications on postharvest fruit quality of horticultural crops.

Keywords: Calcium, fruit, vegetables, preharvest, quality, storage.

The effects of Bacteria Treatments on Nursery Plant Development in Meyer Lemons Grafted on Sour Orange Rootstocks

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Abstract

The effects of different bacteria species to nursery plant performances of Meyer lemon plants grafted on sour orange rootstock were investigated. In order to produce soil born pests free citrus nursery plants, air pruning technique was appliedto roots through special plant production pots. Ferti-irrigation with specially formulated soilless nutrient solution was applied to air pruning suitable pots to produce plants with free from root circling, vigorousand can compete with well-developed conventional nursery plants that have soil penetrated roots.The study was conducted in greenhouse that are belongs to Akdeniz University Agricultural Facultyduring April to November of 2017.Greenhouse light intensity was measured between 303,00-1988.85 lx. The research was conducted with three replications each of which had five plants. Experimented bacteria mixture (bacterial fertilizer) was provided by Yeditepe University, Engineering and Architecture Faculty, Department of Genetics and Bioengineering. Growing media was the 3:1 mixture of peat moss and pumice. Plant roots were treated with three different solution as guided by provider. Measurements were made on rootstockand scion diameters, shoot length, chlorophyll and leaf area indexes, root bacterial infection ratio and number of bacteria in rhizosphere. The results showed that while microbial fertilizer had no effect on rootstock and scion diameters and shoot length, had influence on chlorophyll and leaf area indexes.

Keywords: Bacterial-microbial fertilizer, air pruning, root morphology, soilless citrus nursery plant production.

Grafting Performances of Some Exotic and Uncommon Citrus Species

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Abstract

Citrus is one of the highest economical valued crop among fruits. Grafted nursery trees are used to establish Citrus orchards. "T" budding and micro-grafting are the commonly used grafting techniques. The most common "T" budding used in citrus grafting is fall "T" budding, followed by spring and summer "T" buddings. All "T" buddings require to have bark separation (Phloem separation). Besides these buddings, micro-grafting is also used to produce citrus nursey plants. There is no information on neither grafting nor rootstock performances for exotic citrus species that are new for Turkey. This research was set to examine these performances and search for expansion possibilitiesof grafting techniques used in citrus by including the chip budding used commonly in pome fruits. The research was conducted in Akdeniz University greenhouses in between November 2017-April 2018. Carrizo Citrange (*Citrus sinensis x Poncirus trifoliata*) was used as rootstock andMexican Lime -*Citrus aurantifolia*, Kaffir Lime – *C.hystrix*, Bears Lime-*C. latifolia*, Bergamut – *C. bergamia*, Finger Lime – *Microcitrusaustralasica*, NagamiKumkuat - *FortunellaJaponica*were used as scion. Different grafting techniques ("T" budding, micro-grafting and chip-budding) were practiced in different times to evaluate the grafting performances. Results suggest that chip budding used to expand grafting season was not suitable grafting method for these exotic citrus and its relatives. Micro – grafting was successfully applied to Bears and Kaffir limes. "T" budding on the other hand was successful for all the species.

Keywords: Exotic citrus species, kaffir, bears,bears, finger lime, microcitrus,kumkuat, grafting, budding, chip-budding

Effect of Replacing Barley with Corn Grain in Dairy Cow Ration, on Physiological and Economical Indexes.

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Abstract

Fifteen dairy cows (11days, 36.7±5.55kg, 639±50kg, days after calving ,daily milk production and BW, resp.) in second lactation, were used in a completely randomized design . Cow in experimental group were fed with :24 percent barley and 8 percent corn (No:1), or 16 percent barley and 16 percent corn (No:2), or 8 percent barley and 16 percent corn(No:3), in concentrate part of ration. The concentrate/forage ratio was 40/60. Blood samples were collected via Jagular vein, monthly. There were no significant difference in average Glucose and Urea nitrogen concentration of plasma, between experimental groups ($p < 0/05$(but Beta Hydroxy Butirate concentration was significant between no:1 and no:2 ($p > 0/05$). Open days were lower in No:2 and 3, in comparison with No:1. From economical viewpoint (cost/kg milk production, open days cost more than normal and insemination per conception, cost) No: 3, had the highest benefit on the basis of cost/ benefit ratio method.

Keywords: Dairy cow, barley grain, cost benefit ratio.

Effects of Plantation Systems and Green Manure Treatments on Bioactive Compounds of Tomato Fruits

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Abstract

The study was conducted to determine the effects of different plantation systems (raised bed and flat planting) and green manure treatments [in two stage: flower stage (FS) and stage after harvest (SAH) of faba bean (*Viciafaba* L. cv. Seher)] on total phenolics, total flavonoids and antioxidant activity (both ABTS and DPPH) of organically grown tomato fruits (*Solanum lycopersicum* L. cv. Depar F1). Treatment without green manure was evaluated as control. When the planting system and green manure interactions was examined (p<0.05), the highest values of total phenolics (1549.12 mg GAE 100g^{-1}fw), total flavonoids (822.2 mg QE 100g^{-1}fw) and antioxidant activity (15.49 mmol TE 100 g^{-1}fw for ABTS assay and 8.22 mmol TE 100 g^{-1}fw for DPPH assay) were obtained from control treatment in the raised bed planting system. It was revealed that flat planting has important effects on planting system and that control treatment was important when green manure treatments was examined (p<0.05). As a result, it can be stated that the phenolic contents of the plants grown in the control and flat planting may be caused by high stress conditions

Keywords: Organically grown, phenolic, raised bed, stress

Physicochemical Properties of Some ChickpeaVarieties (*Cicer arietinum* L.) Cultivated in Konya

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Abstract

This study was carried out in order to determine the quality characteristics of some chickpeas cultivated in Konya. Eight differentt ypes of chickpeas were used in the study (Azkan, Gökçe, Çağatay, Yaşa-05, Işık-05, Arjantin, İspanyol, Meksika). Physicochemical properties of chickpea varieties were based on quality parameters such as thous and grain weight, protein content, cook ability, water uptake capacity, hydration coefficient and total defect. Variations were determined in the statistical analyses among the varieties according to the obtained values in terms of thous and grain weight, protein content, cook ability, water uptake capacity, hydration coefficient and total defect properties. This variational so significantly affects the growth conditions of the chickpea grains in terms of genetic structure among varieties. The quality parameters in the study showed differences on the varieties. According to the results obtained from the study, the physicochemical characteristics of some chickpeas cultivated in Konya ecology were statistically significant ($p < 0.01$).

Keywords: Chickpea, quality, physicochemical properties, protein

In Vitro Growth Inhibition of *Diplodia seriata* by Fungicides

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Abstract

In recent years, *Diplodia seriata* has caused serious problems on woody plants and fruit trees such as grapes, pears, apples, plums and peaches or losses of trees in orchards. It infects through wounds and sporulates on fruit, woody stems and green shoots throughout the year, so wound protection is the recommended control strategy. The six fungicides were screened in vitro to evaluate mycelial growth inhibition of *D. seriata* in this study. Fungicides tested for inhibition of *D. seriata* was: 50% Carbendazim, 50% Trifloxystrobin, 25% Tebuconazole, 250g/L Azoxystrobin, 70% Thiophanate methyl, and 60g/L Metconazole. Fungicides were suspended in sterilized water and then the suspension was added to PDA medium (200 g potato, 20 g sucrose, 15 g agar, 1000 mL water) that had been autoclaved and cooled to 50°C. Final concentrations in the medium were 0.0, 0.01, 0.1, 0.5, 1.0, 5.0 and 10.0 µg mL^{-1}. Medium (15 ml) was poured into 9-cm-diameter sterile plastic dishes. A non-amended Petri place of PDA medium without fungicide was included as a control. As a result, it has been observed that 50% Carbendazim inhibited the myelial growth of *D. seriata* at the application dose of 5.0 ppm by 100%, and this fungicide was the most effective in suppressing mycelium growth. In contrast, it has been determined that 50% Trifloxystrobin fungicide was the least effective in preventing mycelial growth of this fungus.

Keywords: Mycelium growth, chemical control, *Botryosphaeria obtusa*

Acknowledgement: This study has been supported by the Turkish Scientific and Technical Research Foundation (Project Number: 114O048)

A Preliminary Study on Seed Sterilization of *Laurus nobilis* L.

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Abstract

Explant surface sterilization procedure in plants is one of the most important stage in establishing *in vitro* tissue culture for many plants. Many loses can occure during to different culture phases due to explant-born microorganism. So preliminary sterilization studies are a necessity for healthy initial culture. In this study, because of importance of *Laurus nobilis* L. as medicinal and aromatic purposes, seeds of the plant were subjected to two mostly used chemical compounds. Before sterilization treatment, *Laurus nobilis* fruits were collected from a certain tree and fruits were kept under room condition for 3 months. After then, dried pericarp and testa were removed manually just one day before treatments. Naked seeds were treated with commercial sodium hypochlorite (NaOCl) and pure ethyl alcohol (EtOH) separately at doses of 20%, 50% or 100% along 30 or 60 minutes. After the step all seed washed with distelled water tree times. Solid MS medium was used for culture establishment. At the end of the 1st, 3rd and 5th week, the data on contamination and death rates were obtained. This study is designed as Completely Randomized Design, replicated thrice and each replicate consisted 6 seeds. Statistical analysis were done by using SPSS 16.0 programme. According to the results, the lowest dose (20%) and the shorter time (30 min.) treatment of NaOCl gave no contamination (0%) and no death rate (0%). The highest dose of EtOH (100%) caused the highest death rate (77.7%) at the end of the 5th week. As a result, EtOH was found as very strong sterilant for the seeds and NaOCl was found more efficient than EtOH for both low contamination and low death rate in *Laurus nobilis* seed sterilization.

Keywords: *Laurus nobilis*, seed, *in vitro*, sterilization

Ethylene Production and Respiration Rate of Different Types of Tomatoes Harvested at Breaker Maturity Stage

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Abstract

In this study, ethylene production and respiration rate of beef steak, heirloom and cluster type of tomatoes harvested at breaker maturity stage were studied. Harvested tomatoes were divided into two groups and first group was treated with 150 ppm ethylene at 20ºC; second group remain untreated and considered as control. The first and second group of tomatoes were stored at 12ºC temperature and 90±5% relative humidity for 35days. Ethylene production and respiration rate were recorded at 7 days intervals. Minimum ethylene production and respiration rates were noted in beefsteak type of tomato eseither treated or untreated with ethylene as compared to heirloom and cluster type of tomatoes. Therefore, they can be stored with maximum postharvest quality for 35 days under cold storage at 12ºC and 90±5% relative humidity.

Keywords: Tomatoes, ethylene production, respiration rate, postharvest quality.

Influence of Periodic Rainfall Variations on Volumetric Growth and Age of Aleppo Pine Wood.

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Abstract

This study incorporates data from periodic radial increments carried out on samples of Alep pine wood and sections from artificial and homogenous reforestation and corresponding rainfall slices at the same time periods. Reports of the relative discrepancies of successive rings (ERC) show a clear regressive trend in young trees. Thus the mean sensitivity (SM) and the inter-dating (SR) coefficients for young trees and the oldest confirm the relatively strong dependence of the former on climatic factors, particularly rainfall. The results of this work show a fairly strong correlation between the periodic radial increase over 5 years and the corresponding rainfall over the same period. Thus, from the analysis of the results obtained it is established that the rainfall variations have a more marked influence on the young subjects. These various observations led us to ask ourselves a certain number of questions relating to the interpretation of the values of the mean sensitivities and the coefficients of inter-dating. Indeed if on the one hand all the samples of the same age have equivalent average sensitivities; It remains to be seen whether there is a definite relationship between mean annual rainfall and annual radial increase. On the other hand, the relation between the periodic rainfall over 5 years and that of the current radial increase of the same periods remains established. On the basis of these results, it seems possible that from these results, confirmed by the values of the correlation coefficients, it is possible to consider placing the dendroclimatology of the Aleppo pine of this Maghreb region in a valid approach to knowledge and The determination of the local Mediterranean climate, particularly the periodic five-year rainfall.

Keywords: Rainfall variations; radial increase; mean sensitivity (SM); inter-dating coefficients (SR); Aleppo pine

The Effect of Washing with Ozonated Water on Postharvest Quality of Garden Cress

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Abstract

In this study, it was aimed to determine the effects of dipped to ozonated water for different duration on postharvest quality of garden cress. In the study carried out, the harvested garden cress plants were cleaned, sorted, washed and their roots shortened. Then the garden cress plants were immersed in ozonated water containing 125 mg / L ozone for 15 min, 30 min, 60 min and 120 min. Untreated garden cress plants were used as controls. After the applications, the garden cress plants were dried and placed in foam dishes to be 100 ± 10 g and wrapped with stretch film. Packaged garden cress plants were stored for 15 days in a cold room set at 1 ± 1°C temperature and 85-90% relative humidity. Color (*L*, a*, b**), total soluble solids (TSS, %), leaf tear resistance (N), chlorophyll (SPAD), chlorophyll a, chlorophyll b, total chlorophyll content, weight loss and electron leakage measurement were done three days intervals both at the beginning and during storage. According to the results, ozone treatment did not cause any change in color and electrolyte leakage, of garden cress leaves. On the contrary, when compared with the control group, ozone treatment decreased the value of TSS while causing increase weight loss, chlorophyll breakdown and leaf tear resistance.

Keywords: Lepidium sativum, ozone, postharvest, quality.

The Relationship of Anogenitale Distance and Semen Characteristics in Rabbit Local Population

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Abstract

The aim of this study is to evaluate the effect of AGD on semen characteristics using CASA system. A total of synthetic rabbits (n = 10), 11 months old and weight ranging from 2.950 to 3.565 Kg were tested. Observations on animals initially focused on the measurement of AGD and territorial marking. Subsequently, the males underwent training for ejaculation in the artificial vagina and finally the harvesting of the semen was carried out for macroscopic and microscopic analysis using CASA system. The mean AGD in the bucks used in our experiments was 12,11 ± 1,66 mm. Number of 50 % of the males had an AGD greater than the mean AGD, whereas 50 % had an AGD lower than the mean AGD. Bucks with large AGD ejaculate faster compared to males with a small AGD (7,32 vs 8,13 (s)) and there is a negative relationship between the AGD and the libido. The results of semen analysis of the ejaculates showed that the first ejaculates of each sample have a larger volume than the second ejaculates. The pH values oscillate between 7 and 8.5. The viability rate remains slightly higher for low AGD compared to high AGD (68% vs 64 %).The mean concentration of spermatozoa is 499,94x10^6 spermatozoa per ml). Rabbit bucks with small AGD showed greater sperm motility compared to those with a high AGD. However, analysis of motility and its derivatives (VCL, VSL, VAP, LIN, STR, WOB, ALH,) and the percentage of live sperm and concentration show that the spermatozoa have the same efficiency in the first and the second ejaculate of the same sample. It can be concluded that the AGD does not influence the quality of the semen.

Keywords: Rabbit, AGD, semen, CASA , behavior.

Important Problems Facing by Kurşunlu Waterfall Nature Park, Antalya

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Abstract

Nature Protected Areas are the natural areas and these ecological habitats are the compulsory conservation due to their biological, geomorphological, archeological and natural landscape characteristics. Nature Parks express the parts of nature that have the characteristic of vegetation and wild life, suitable for the rest of the people in the landscape unity. It provides an efficient environment for people as cultural, economic, aesthetic and function. There are various problems of nature parks of Turkey due to recreation facilites, pollution and transportation. Kurşunlu Waterfall Nature Park is situated in the North-eastern of Antalya city between coordinates of 37° 00′ 48” -37° 00′ 63” N and 30° 81′ 00” - 30° 84′ 05” E. 33 hectares of are waterfalls and picnic areas and a total of 394 hectares has been reserved as a nature park in 1991.Kurşunlu Stream which gives its name to waterfall was formed by the Gelindüşen karstic source, which is located about 2 km away. The waterfall that is the most important resource of nature Park formed with a drop of 13.7 m of water of stream.The picnic areas, hiking trails, children’s parks, viewing terraces, resting places have been made more functional and sheltered places. Kurşunlu Waterfall Nature Park, one of the most popular recreation places of Antalya city families, attracts great interest. This study was carried out in order to reveal the most important problems of Kurşunlu Waterfall Nature Park that is visited by Antalya city public. Important problems were determined as problems with the Gelindüşen Karstic Source, Natural Park Interior Design, park security services, transportation, illegal wood cutting and accommodation activities.

Keywords: Kurşunlu Waterfall Nature Park, natural source, problems, Antalya

The Effects of Different Plant Activators on Fruit and Seed Yield and Quality of Snack Pumpkin

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Abstract

Pumpkin seed (*Cucurbita pepo* L.) is high oil, protein and total unsaturated fatty acids and provides an important source of nutrition. Despite the increase in snack pumpkin production quantities, the amount of product received from the unit area did not reach adequate levels. The effects of PGPR's on yield, fruit quality and vegetative growth is well known. Nusem and Beppo cultivars were used to determine the effects of different plant activators on seed and fruit yield and quality in snack pumpkin. Plant activators used in the research were Crop-set (CR), EM1, ERS, Vitormone-Plus Drip (VIT), *Bacillus subtilis* (OSU 142), *Bacillus megatorium* (M3), *Azospirillum* sp. (SP 245), *Spirulina platensis* (SIP). Ecocompost (EKO), Camlı Botanica liquid organic fertilizer (BOT) and Zincon (ZIN) were also used as organic fertilizer. In the experiment, the plant activators were applied to alone or combination with organic fertilizer. Two separate control groups which are as organic and conventional fertilizer applications have been identified. According to the average of the applications of the two years at the end of this research, the highest value total fruit yield obtained from application ERS+OG (4.54 kg/m2). The highest value in measurement as fruits diameter, fruit length, fruit surroundings were obtained from conventional fertilizer application as control. The highest total seed yield were obtained from application of CR+OG (107.74 g/m2). The highest measurements of seed length and length /width ratio were obtained from application EM1 + OG. Lastly the highest seed width obtained from application OG.

Keywords: Plant activators, pumpkin, yield, quality

In vitro Carrot (*Daucus carota* L.) Regeneration: A Study on the Use of 2,4-D and Activated Charcoal

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Abstract

Regeneration can be provided with *in vitro* techniques in carrot (*Daucus carota* L.), but the response to regeneration depends on a number of factors, such as genotype, explant type, growth media, plant growth regulators and their concentrations. In the present study, seedsof Nanco and Maestro cultivars were germinated. Afterwards three different types of explants (cotyledon, hypocotyl, leaf) were cultured in Murashige& Skoog (MS) media combinations consisted of activated charcoal (1 g/l) and various doses of 2,4-Dichlorophenoxyacetic acid (2,4-D). Results revealed that response of cultivar Nanco to *in vitro* regeneration was better than cultivar Maestro. When different explant types were evaluated, it was observed that hypocotyls and leaves were more responding than cotyledons. In terms of media, MS + 2.0 mg/l 2,4-D + 1.0 g/l activated charcoal was found to be successful.

Keywords: Carrot, *Daucus carota* L., *in vitro*, regeneration, 2,4-D, activated charcoal

Determination of DEET (*N,N-diethyl-m-toluamide*) in Seyhan River in The City of Adana, Turkey

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Abstract
DEET or Diethyltoluamide (*N,N-diethyl-m-toluamide*) is widely used as insectre pellent. DEET was firstly formulated for the U.S. Army in 1946 for protection against bitinginsects and control of disease transmission then it started using by civil population in 1957. DEET interferes with perception sensors of insectsokeeps them away from the skin of its host. It worked but its effects to humans were ignored. Its toxic effects were suspected to be due to antagonistic interactions of DEET with cholinesterase enzyme. Diethyltoluamide was reported to have carcinogenic effect in humannasal cells. Symptoms of poisoningare characterized by tremor, restless-ness, seizures, and coma.
Information on ecological toxicity is limited because DEET was not subjected to an ecological risk assessment. But many studies have shown that DEET enters the aquatic environment via sewage effluent. It is largel yabsorbed and metabolisedafter using.
In our study, the presence of DEET was researched in Seyhan River in the city of Adana for four season in 2017. Water samples were taken from seven sampling stations and a liter of sample was extracted. Chromatographic analysis were performed with LC/MS-MS (Shimadzu 8040) on mode of MRM (Multiple Reaction Monitoring). The mean concentrations of DEET were found as 32.58, 78.3, 81.45 and 171.66 ng L^{-1} in winter, spring, summer and autumn respectively. The lowest and highest concentrations were found as 18,547 and 334.713 ng L^{-1} in winter and autumn respectively. Our results were found lower than those in USA (4700 ng L^{-1} in surface waters) and Europe.

Keywords: DEET,*N,N-diethyl-m-toluamide*, LC/MS-MS, insect repellent.

Effect of Densified Block TMR on Digestibility and Nutritional Behavior of Sheep

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Abstract

This research was conducted to study the physical form of total mixed ration (in Block and Mash form) in sheep nutrition. In a 2×2 change-over design with two treatments and 5 replicates, 10 Shal lambs with average initial weight of about 31 kg were fed for two periods and 22 days per period. An unique ration (to supply fattening lambs) was formulated and prepared in TMR, then it was shared out in two parts where one part processed in Densified Block Ration (DBR) and the other part fed as mash TMR form. Results showed that the dry matter, organic matter and nutrients intake were increased when the animals received DBR compared to the mash TMR ($P< 0.05$). The digestibility of DM, OM, CP, NDF, ADF, EE and gross energy were not affected by the physical form of the diet but nitrogen retention and nitrogen balance were increased when the lambs received DBR ($P< 0.05$). The daily times for eating, rumination, total chewing and resting time were not statistically different when the animals fed DBR or mash TMR whereas the amount of DM, OM and nutrients intake per minute were increased ($P< 0.05$) by feeding of DMR. Feeding of DBR resulted in higher ($P< 0.05$) weight gain and feed conversion ratio in comparison to the mash TMR. It may be concluded that feeding total mixed ration in densified block form could improve animal performance; however more study required finding out the optimum feeding levels of DBR in Iranian lambs.

Keywords: Nutritive value, feed bblock, sheep

Different Organic Pre-treatments Prior to Germination in Carrot (*Daucus carota* L.)

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Abstract

Climate change and use of intensive chemical input, which are the most important problems of today, cause many biotic and abiotic stresses in plants. For this reason, efforts to develop sustainable approaches, aims to reduce the stress factors to the least, improve productivity and quality, have become notable. Unlike chemical fertilizers, organic preparations such as seaweed and microbial fertilizers that dissolve in soil without harming the environment play an important role in increasing the yield and quality of plants. In order to increase the emergence rates and to provide a homogenous and healthy germination, 2 different carrot (*Daucus carota* L.) cultivars' seeds were treated for 12 hours by using 3 different doses of seaweed and microbial fertilizers. In the study, germination percentages of seeds, cotyledon occurrences, leaf emergences, root lengths and numbers were evaluated and recorded.

Keywords: Carrot, *Daucus carota* L., seaweed, microbial fertilizers, germination, seedling development

Effect of Dikegulac and Temporary Immersion System (TIS) on *in vitro* Regeneration of Cotton *(Gossypium hirsutum* L.)

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Abstract

Cotton is defined as a recalcitrant plant in *in vitro* culture. It is important to solve the problems during micropropagation, elongation and rooting stages of *in vitro* culture in order to obtain healthy cotton plantlets. In this study, Dikegulac and a new culture vessel Plantform bioreactor, based on the temporary immersion system, were investigated. For this aim two cotton F_1 genotypes (ADN 712 / Claudia and ST 468 / Claudia), three nutrient media compositions (W, WD, and WDIB) and support plant application were tested. Three Plantform bioreactors divided into four chambers with plastic separators were used. Liquid Westvago WV5 medium was used as basal medium, and three media compositions (W-Control, WD-500 mg/L Dikegulac, and WDIB-500 mg/L Dikegulac + 1 mg/L IAA + 1mg/L BAP) were investigated. Shoot tips and nodal explants were cultured alone and with myrtle explants (4-5 cm) in the same chamber. Myrtle explants were used as support material in order to keep the cotton explants upright. The best results for regeneration and multiplication (2.5 shoot tip-nodes/explant) were obtained from the F_1 genotype of ADN 712 / Claudia cultured alone in the Plantform bioreactor containing WD medium.

Keywords: *Gossypium hirsutum* L., temporary immersion system (TIS), micropropagation, Dikegulac

Acknowledgement: This research was supported by TÜBİTAK-TOVAG (Project Number: 115O396)

Investigation of Micropropagation Performance of Some Citrus Rootstocks in *In Vitro* Drought Stress Conditions

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Abstract

Citrus is a fruit species growing in the tropical and subtropical regions of the world. Growth and development of plants are affected by environmental factors such as salinity and drought. Global climate change will increase water stress risk in the near future. One of the purposes of plant biotechnology is the development of plants tolerant to drought. The response of plants to drought stress is quite complex and is the process of many genetic expressions. In the present study, we investigated of micropropagation performance oftrifoliate orange,sour orange and troyer citrange in *in vitro* drought stress conditions.MS (Murashige and Skoog) medium supplemented with 1 mg l^{-1} BAP (benzylaminopurine) were used for multiplication. Four different PEG (Polyethylene Glycol 8000) concentrations (%1, %2, %4, %6) were used in multiplication media. At the end of the three subculture, micropropagation rate, average plant length (cm), fresh weight (g) and dry weight (g) were recorded. The micropropagation coefficient decreased with the increasing PEG doses in all rootstocks. The highest micropropagation coefficient was detected in sour orange with 4.53 in terms of all media.

Keywords: BAP, citrus, drought, MS, PEG

Acknowledgements
This research was supported by Çukurova University, Scientific Research Project Unit (Project No: FBA-2016-6254), Authors are grateful to University of California Riverside, Citrus Variety Collectionproviding the seed material.

Effects of Spray Applications of Aqueous Plant Extracts on Tomato Bacterial Speck Disease

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Abstract

Tomato (*Solanum lycopersicum*L.) is an economically important vegetable grown in the world and also in Turkey. Bacterial speck disease caused by *Pseudomonas syringae*pv. *tomato* (*Pst*) is one of the most important diseases of tomato. The antibacterial activity of aqueous extracts from twenty-five medical and aromatic plants was investigated by using the paper disc method. Four different plants (Eucalyptus, Garlic, Zinger and Izmir Thyme) extracts were effective for inhibiting the pathogen growth on the petri dishes as*in vitro* experiments. The selected aqueous four plant extracts sprayed on tomato leaves and then pathogenic bacterial suspension (10^8 cell/ml) were sprayed on treated plants. The greenhouse experiment was based on a randomized trial design and 25 tomato seedlings were used for each applications. When disease symptoms appear on positive control plants, the experiments were evaluated with 0 to 5 scalesas disease severity. As a result of this study, four aqueous plant extracts were inhibited bacterial speck disease severity by 96-98%.Thyme (*Origanum onites* cv Izmir), and *Eucalyptus* sp extracts reduced the disease incidence as 98% ratio. Zinger (*Zingiber officinale*) and garlic (*Alium sativum* cv Kastamonu) extracts inhibited of the disease incidence as 97% and 96%, respectively. All aqueous extractswere effective on control of the disease. The research is a part of PhD study and financed by Cukurova University with the project number FDK-2015-4071.

Keywords: *Pseudomonas tomato*, leaves, antibacterial effect, plant extracts, spray inoculation

Aroma Profile Alphonse Lavallèe (*Vitis vinifera* L.) Grape Seed Oil using Purge-Trap Technique and GC-MS

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Abstract

Grape seed oil is edible oil producing from the seeds of grape fruit (*Vitis vinifera* L.) drawing a huge attention of food, cosmetic and nutraceutic industries with its delightful taste and unique aroma. Utilization of this grape seed oil is also contributes to economy of wine and fruit juice industry by the valorization of their grape marc wastes that contain up to 20% oil yield.The present study was designed to investigate oil yield and aroma profile of Alphonse Lavallèe grape seed oil.The seed oil extracted with soxhlet apparatus, one of the well-known oil extraction units.According to revealed data, the oil yield of grape seeds was determined as 15.8% in dry basis. Besides, a total of 23 aroma compounds were found in grape seed oil which composed of mainly volatile alcohols using gas chromatography-mass spectrometry. Among alcohols, 3-hexanol and 2-hexanol were the most abundant volatiles found in Alphonse Lavallèegrape seed oilas a contributor of alcoholic and winey scents respectively. Apart from alcohols, a considerable amounts of esters; methyl oleate, butyl butyrate and hexyl butyrate, aldehydes; hexanal and nonanal, acids, volatile phenols, pyranones and furans were detected. According to data it can be seen that the heat treatment applied during the extraction procedure caused to form some thermal degradation units such as pyridines and furans

Keywords: Alphonse Lavallèe, grape seed oil, aroma, purge& trapextraction

Micropropagation of *Rhododendron smirnovii* Trautv. Via Shoot Bud Cultures

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Abstract

Rhododendron smirnovii Trautv. with its beautiful pink flowers, is an important ornamental plant of Turkey. This research was designed to determine the most effective medium and thereby an effective micropropagation protocol for the production of *R. smirnovii* via shoots cultures. The mature seeds of mother plants which were previously brought from Murgul/Artvin/Eastern Black Sea Region of Turkey were employed as explants. Seeds were planted in Anderson (AND), Murashige&Skoog (MS) and Chu (N6) media after surface sterilization. Shoot bud explants from 2-month-oldwere isolated and used in experiments. The maximum germination rate was observed in the AND medium. Various plant growth regulators (PGRs) as well as their concentrations were employed in the course of shoot formation trials. In shoot multiplication experiments, AND basal medium was then supplemented with stable IAA(0.0 and 0.2 mg/L) and variable N6-[2-isopentenil]adenin (2ip) were applied with various concentrations (1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0 and 8.0 mg/L). The highest shoot height (5.0 cm) and the maximum number of shoots per explant (4 pieces)were observed from the AND basal medium supplemented with 4.0 mg/L 2ip and 0.5 mg/L Indol-3-asetic acit (IAA) combination and was found to be more effective in terms of shoot formation in 6-8 weeks. Regeneration of shoots did not occurred in any nutrient medium containing BAP and TDZ and also leaf and explants from axillary bud. 0.5 mg/L IBA concentration test was ineffective in terms of root formation for *R. smirnovii.* In addition, the shoots were planted in pots after 60 second duration in 1.0 g/L IBA but this was found to be more effective. The last trial for rooting was 3.0 mg/l α-naphthaleneacetic acid (NAA) concentration test was effective in terms of root formation for *R. smirnovii* but it was not in terms of root elongation.

Keywords: *Rhododendron smirnovii* Trautv., micropropagation, shoot bud, 2ip, IAA

Obtain by Selection Pomologic Characterictis Some of The Types of Figs in Province Kastamonu

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Abstract

This resarch was carriedout in Kastamonu region of Turkey on fig types (*Ficus carica* L.) in 2013-2014 years under the project of " TheS election of Fig in the Black Sea Region. Some pomological characteristics of figs were investigated in this study to select the best genotypes for growing. The fruit weight and index, TSS, the ostiol distance, the color of fruit peel and the peeling condition has been examined. This research included types of 8 has been selected in Kastamonu. The averege fruit weight, the fruit index, the ostiol distance and the soluable dry matter in the water of the types which were selected have been found as 37.22 g, 1.00 mm, 3.62 mm and %14 respectively. The fruit peel takes place in the colours of purple and yellow- green and in the three groups of easy, middle and hard peeled ones. These types can be consumed as freshand processed in jam.

Keywords: Fig, *Ficus carica*, selection, TSS, fruit weight, ostiole

Determining the Factors Affecting 305-Day Milk Yield of Dairy Cows: A Graphical Perspective

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Abstract

The purpose of this study was to determine the factors affecting the 305-day milk yield of dairy cows by using Regression Tree Analysis (RTA). The data set of this study consisted of 8 different cow breeds grown in 8 province of Turkey. Breed, Province, Lactation Length, Service Period, Dry Period, Parity, Calving, Calving Year, Calving Age, and Calving Month were used to predict the 305-day milk yield. Results of RTM showed that the usage of this method might be appropriate for determining the important factors that would be able to affect the 305-day milk yield (R2=71.3%). It was seen that the most important factors affecting the 305-day milk yield were the Breed, Lactation Length, Province, and Parity. Therefore, those selected factors were more efficient than the others in predicting the 305-day milk yield. RTA results also indicated that the lowest milk yield were estimated for Jersey, Jersey Crossbred, and Yerli Kara. Among the highest 305-day milk yield cows, the milk yield estimates of the cows in the second, third, fourth, fifth, and the sixth parities were found significantly higher than that of the cows in the first and seventh parities.

Keywords: 305-day milk yield, regression tree, prediction, dairy cows

Determining of the Best Planting Time of Safflower (*Carthamus tinctorius* L.) Spring Safflower in Marginal Areas of Cold and Semi-arid Climates

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Abstract

Determining of the best planting time of spring safflower in marginal areas of cold and semi-arid climates was the goal of this study. The experiment was carried out in the East Azarbaijan Agricultural and Natural Resources Research and Education Center (46°2¢ E, 37°58¢ N, 1347 m a.s.l.) with semi-arid and cold climate according to Koppen climate classification system, during 2014-15. This study was done as a factorial experiment based on a randomized complete block design with three replications in two crop years. The experimental factors, including planting time contained four levels (30 March, 9, 19 and 29 April) and 3 safflower spring cultivars (Sina, Soffeh and Goldasht). The results indicated that the most appropriate time to cultivate spring safflower in marginal areas of semi-arid and cold climate is 30 March and any delay significantly reduced seed and oil yields. Goldasht had a higher seed yield with having the largest capitulum diameter and 1000-seeds weight. The highest performance of oil in the first year of experiment belonged to the Soffeh and in the second year to the Goldasht. There were positive and significant correlations among capitulum diameter, 1000-seeds weight and seed yield. Cultivars of Goldasht and Soffeh provided acceptable performance that was seen as appropriate for cultivation in cold climates and semi-arid areas of marginal lands. In delayed culture, Sina was more stable regarding seed and oil yield. Therefore, cultivation of Sina is recommended to allow a delay in planting time.

Keywords: Planting time, seed oil percent, seed yield, spring safflower

Biology of the Zebrafish *Dania rerio*: A Review

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Abstract

Zebrafish is the most important animal models in biomedical research. Biological parameters need to be well known before conducting any experimental study. The objective of this review is to analyze the most recently published data on the biological parameters of the zebrafish. The review first introduces zebrafish ecology and distribution, and continues with a review of reproductive biology, propagation techniques, life span, nutrition, water quality parameters. Although, some papers have already analyzed the biology of zebrafish, knowledge in this area is still inadequateparticularlywhen compared with other model organisms such as the yeast, drosophila, rat and mouse. Thus, the most recently published data should be frequently analyzed.

Keywords: *Danino rerio*, life span, reproduction,ecological parameters, nutrition,

The effects of Mycorrhiza Treatments on Nursery Plant Development in Meyer Lemons Grafted on Sour Orange Rootstocks

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Abstract

The effects of different Michoriza species to nursery plant performances of Meyer lemon plants grafted on sour orange rootstock were investigated. Air pruning technique was appliedto roots to produce soil born pests free nursery plants. Ferti-irrigation with specially formulated soilless nutrient solution was applied to air pruning suitable pots to produce plants with free from root circling, vigorousand can compete with well-developed conventional nursery plants that have soil penetrated roots. The study was conducted in greenhouse that are belongs to Akdeniz University Agricultural Faculty and have light intensity between 303,00-1988.85 lx completed in greenhouse during April to November of 2017.The research was conducted with three replications each of which had five plants. Growing media was the 3:1 mixture of peat moss and pumice. Experimented Michoriza mixture was consist of *Glomus spp.: G.mosseae, G.etunicatium, G.clarium, G.intraradices, G.caledonium, G.macrocarpium, G.margarita, G.fasciculatum* species and provided by Çukurova University, Agricultural Faculty, Soil Science Department. The dose of Michoriza mixture was 500 spores/plant (50 g of Michoriza). Measurements were including;rootstockand scion diameters, shoot length, chlorophyll and leaf area indexes, root Michoriza infection ratio (%) and number of spores in rhizosphere (numbers/10 g soil). The results showed that while Michorizahad no effect on rootstock and scion diameters and shoot length, had influence on chlorophyll and leaf area indexes.

Keywords: Air pruning, root morphology, soilless citrus nursery plant production, VAM

The Effects of *In Vitro* Drought Stress on Some Biochemical Properties of Two Grape Rootstocks

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Abstract

Rootstocks affect the resistance of the graft to abiotic and biotic stress factors by modulating its physiological and biochemical properties. Usage of rootstocks in viticulture is mainly for their resistance to phylloxerabut also for their tolerance to different soil conditions. Abiotic stress factors like drought, salt, heat, heavy metals etc. stimulate the synthesis of some osmoprotectans in plants. Osmotin and proline are some of these metabolites and their accumulation remarkably increase during stress.

In this study we use 5BB and Ramsey rootstocks to evaluate their tolerance to drought in *in vitro* conditions. MS (Murashige-Skoog) medium was used for culture and four different stress conditions were applied by adding different amount of PEG 8000 (0,2,4,6%) in the media. Proline amounts were measured spectrophotometricallyaccording to Bates et al. (1973)onthe 1st, 3th and the 7ht days following the applications.Osmotin gene expressions were determined by real-time PCR by using *OSM1* gene (Genebankacces. no:Y10992.1). Data were evaluated statistically.

Keywords: Grape rootstock,*in vitro*, drought, proline, osmotin

Wınter Color Retention and Spring Green-Up of Seeded Type Bermudagrass Cultivars in Mediterranean Region of Turkey

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Abstract

Bermudagrass [*Cynodondactylon* (L.) Pers.] is a popular warm-season turfgrass species at subtropical regions of the world due to superior heat and drought tolerance. However, winter dormancy, discoloration and loss of functionality, is the major drawback. The objective of the study was to evaluate the winter color retention and spring green-up of experimental and commercially available bermudagrassvarieties. The three synthetic cultivars (A4-4, B3-12, and C12-133) developed at the Akdeniz University and commercial checks (Princess, Riviera and Tifway) were established at the two location; Akdeniz University, Antalya and Alata Horticultural Research Station, Mersin in July 2016. Experimental design was randomized complete block, with three replications.Mature swards were evaluated during the onset of dormancy and spring green-up period. Relative chlorophyll index, grass index, percentage of green cover, color retention and turfgrass quality were measured. Experimental cultivar 'C12-133' outperformed the commercial cultivars in Antalya and exhibited winter color retention similar to 'Tifway' and 'Riviera' in Mersin location. The 'C12-133' greened up earlier and provided shorter dormancy period than 'Tifway' (industry standard) and may offer new alternatives for use on home lawns and other green spaces to reduce use of cultural practices used to extend the winter color retention of bermudagrass in late fall.

Keywords: Dormancy, Turfgrass, Grass Index, *Cynodondactylon*

Study of Hormonal Priming Effect on Lentil Heterotrophic Growth under Salinity Stress Conditions

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Abstract

In order to evaluate the effect of hormonal priming on germination and heterotrophic growth indices of lentils, a study was conducted in 2017 in the Department of Agriculture, Faculty of Agriculture, Urmia University. The treatments consisted of seeds priming with concentrations of 0, 0.5, 1 and 2 mM salicylic acid and salinity levels 0.6, 0.9, 1.2 and 1.5% NaCl. The experimental design was completely randomized with three replications, carried out in a factorial arrangement. Germination indices, seedling growth and seedling growth were evaluated and evaluated. The results showed that hormonal priming with salicylic acid at all concentrations compared to the control resulted in the improvement of seed vigor under salt stress conditions. However, the results indicate that hormonal priming is not fully capable of eliminating damage caused by salt stress. The best results in terms of reducing the drought stress caused by seed priming with 1 mM salicylic acid was obtained. In this treatment, at the highest level of salinity stress, the final percentage of germination, seedling length, mean germination time to 20% germination was 11, 13.1, 23%, as compared to control.

Keywords: Hormonal priming, lentil, salinity stress, germination, seed germination

The Use of Molecular Markers for Drought Tolerance in Wheat

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Abstract

Stress is a situation that affects or inhibits growth, development, and metabolism in plants. Due to the physiological and biochemical stress effects, gene expression has been modified. For these reason, identification of these genes is the basis for the development of tolerant plants. Drought is a major threat to food safety alone in basic abiotic stres sources (drought, temperature, salinity, metal toxicity). Because of drought influenced by various factors such as growth conditions, physiology, genotype and developmental stage of plant, the drought tolerance mechanism includes various gene expression models and complex signaling systems. Drought tolerance is controlled by a large number of genes, each with minor effects, which can lead to differences in plant physiology that they can be affected by environmental conditions. Some genes related to drought are located in the genome as quantitative character loci (QTLs) with articular and non-articular effects. Recently, some molecular markers, linkaged quantitative character loci (QTLs) have been associated with genes responsible for the drought signaling mechanism, used for molecular plant breeding studies. The aim of this study was to investigate the use of molecular markers that developed by different researchers and associated with drought tolerance to mapped in wheat such as microsatellite (SSR), single nucleotide polymorphisms (SNP), randomly amplified fragment polymorphisms (RAPD).

Keywords: drought, drought tolerance, molecular markers, wheat

Genetic parameters of Simmental Cattle population in Turkey

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Abstract

This study was carried out a total of 4960 lactation records collected from 2004 to 2012 reared at Cattle Breeders Association of Turkey were used to estimate the variance components, breeding values, heritability, repeatability and genetic correlations to 305-day milk yield (305 DMY), lactation length (LL), dry period (DP), service period (SP) and calving interval (CI). Data were analyzed using multiple trait derivative free restricted maximum likelihood (MTDFREML) fitting an animal model. The heritabilities of 305 DMY, LL, DP, SP and CI were estimated as 0.22 (±0,000); 0.14 (±0,035); 0.01 (±0,011); 0,05 (±0,013) and 0.01 (±0,000) respectively. It was found that the milk productions of the cattle in the study can be used as selection criteria for development of effective genetic trend and milk productions in the investigated dairy farms can be improved.

Keywords: Simmental, hertiabilty, variance components, breeding values,

Balance-Sheet Examined To Irrigation Cooperatives In Çumra District In Konya, Turkey

Mithat Direk, Hikmet Erdem

Abstract

This study was prepared to examine the financial status of 25 irrigation cooperatives established in the Çumra District of Konya Province under the Cooperatives Law No. 1163 and operating in the field of agricultural irrigation. In the study, the irrigation areas of the cooperatives were compared with the financial situation and profit / loss direction depending on the number of wells. In the study, it was tried to determine the level of planned use of water and the level of irrigation awareness of the farmers in the cooperative operation and to show the problems. These suggestions will contribute to the implementation of new management strategies when the planning and implementation problems of cooperatives playing an active role in irrigation management are minimized.
The aim of the survey is to increase the diversity of the irrigation association's product design and to obtain data on issues that need new working fields in line with the interests of its partners, as the research has used water resources efficiently, how much profit the partners gain from the union management and the level of consciousness.

Keywords: Çumra, cooperative, balance sheet, financial status

Effects of Increasing Doses of Nitrogen and Different Zinc Application Methods on Dry Matter Yield and Element Concentrations at the Beginning of Flowering Stage of Quinoa Plant

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Abstrtact

This study was conducted to determine the effects of different doses of N (100, 250, 500, 750 and 1000 mg kg^{-1}) and different Zn application methods [non Zn application (Zn0), soil application of Zn (5 mg kg^{-1}), soil + foliar application of Zn (5 mg kg^{-1} + 0.2%)] on shoot dry matter yield, N and Zn concentration of the shoot of quinoa (*Chenopodium quinoa* Willd.) at the beginning of flowering stage. The dry matter yield increased depending on increase in doses of N. These increases were determined as 11%, 16%, 35%, 31% and 20%, respectively, compared to the control application (50 mg N kg^{-1}). The highest yield increase was at the rate of 500 mg kg^{-1} N, which was increased also at the subsequent treatments compared to the control, but insignificant decreases were seen compared to the 500 mg kg^{-1} N application. In parallel with the increase in N dose, the N concentration of the plant has also increased. Nitrogen concentration varied from 1.70 to 4.51% and increased by 31%, 148%, 153%, 161% and 165%, respectively, with increasing N applications. Unlike dry matter yield, the highest increase (88.9%) was determined in the application of 250 mg kg^{-1} N according to the previous application, and lower or close increments (4.5%, 2.3% and 2.2%) were detected in subsequent applications. It was determined that increasing doses of N and different Zn application methods increased Zn concentration in the plant and that the mean concentration varied between 42.2-51.3 mg kg^{-1}. Plant Zn concentrates under all N doses applied were ranged as control<soil application of Zn <foliar application of Zn< soil + foliar application of Zn and the differences between Zn applications compared to control were statistically significant. It has been determined that the most suitable Zn application method was the application of Zn to the soil + leaf and increasing doses of N application and different Zn application methods increased the dry matter yield, N and Zn concentration of the shoot.

Keywords: Quinoa, Nitrogen, Zinc, Yield

Effect of Thorny Saltwort (Noaea mucronata) growing in the wind erosion field on soil's some chemical properties

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Abstrtact

The fertility of the soil, plant diversity and soil coverage rate of the plants is decreased as the topsoil flooding in areas exposed to wind erosion. However, it was known that many such species naturally growing in such areas improved the physical, chemical and biological properties of the soil. Our aim is to reveal the change that Noaea mucronata adapted to the wind erosion region has made on some chemical properties of the soil. The study was established according to the factorial experiment design in randomized blocks with three replications in the Igdir-Aralik wind-erosion district in 2015. Soil samples were taken from the depths of 0-20, 20-40 and 40-60 cm from Thorny Saltwort's canopy inside and outside, and pH, electrical conductivity, lime, organic matter, nitrogen, phosphorus, potassium, calcium, magnesium and sodium contents of soil samples were investigated. The pH, calcium, potassium and magnesium contents of the soils to according inside and outside of canopy, and the calcium and sodium contents to according soil depth showed significant differences. To according outside of canopy, the pH value (7.84), calcium content (4.32%), potassium (0.34%) and magnesium content (0.43%) were found to be high in inside of canopy. On the other hand, the highest calcium contents were found at 0-20 and 20-40 cm soil depth and the highest Na content at 40-60 cm soil depth. In conclusion, N.mucronata has been shown to contribute to soil fertility because the pH and calcium content of soil decreased, and the contents of suitable potassium and magnesium of soil increased.

Keywords: Noaea mucronata, Sampling pattern, Soil depth, Soil fertility

FIRST REPORT OF YELLOW SIGATOKA DISEASE ON BANANA (Musa Spp.) IN TURKEY

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Abstract

Yellow Sigatoka leaf spot disease which is caused by Mycosphaerella musicola is the most important leaf spot disease of banana. During surveys in 2016 more than 3.3% yellow sigatoka disease was detected in 8,300 decar banana greenhouses in the Bozyazı province. This disease has not been previously reported on banana in Turkey. The disease diagnosis was made on the fungus colonies obtained from infected leaves were examined macroscopically (color of colony, pigment formation and growth rate) and microscopically (shape of spores, color, size, number of septa). M. musicola affects all organs of the host in the field and are the major causes of pre-harvest yield reductions, postharvest damage and loss of fruit. its greenhouse cultivation of banana in our country is getting increase day by day. So, the importance of the disease is getting increase. The first symptom of yellow Sigatoka is less than 1 mm long minute yelowish green flecks that usually appear on the third or fourth leaf from the top of the plant. In the following period,the streak continues to enlarge and the centres of the streaks change to brown or rusty red.

Keywords: Mycosphaerella fijiensis, Banana, Black Sigatoka, Mediterranean Region

FIRST REPORT OF BLACK SIGATOKA DISEASE ON BANANA(Musa Spp.) IN TURKEY

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Abstract

Banana (Musa spp.) is an important product and its greenhouse cultivation in our country is getting increase day by day. In survey studies carried out in 2016 more than 5% black sigatoka disease was detected in 35,000 decar banana greenhouses in the Anamur province of the Mediterranean Region in Turkey. The fungus colonies obtained from infected leaves were examined macroscopically (color of colony, pigment formation and growth rate) and microscopically (shape of spores, color, size, number of septa). Mycosphaerella fijiensis Morelet (anamorph Paracercospora fijiensis (Morelet) Deighton) is identified as the agent causing black sigatoka to macroscopic and microscopic features of the fungus and also considering disease symptoms occurred on banana. It is an important fungal disease of banana and it is seen in the areas where banana cultivation is done in the world. The first symptom of black Sigatoka is show chlorotic flecks that appear on the undersurface on the third or fourth leaf. The flecks extend and become to a dark black color on both sides of the leaf. The streaks of leaf upper surface enlarge, becoming fusiform or elliptical and occur yellow halo around the black streak. In the following period, the center of spots surrounding with the yellow halo change to light gray. The presence of Mycosphaerella fijiensis is the first report on banana for Turkey.

Keywords: Mycosphaerella fijiensis, Banana, Black Sigatoka, Mediterranean Region

Effects of No-till (Conservation) Systems and Conventional Tillage Systems on Some Soil Properties

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Abstract

Management practices impact soil quality. To evaluate the effects of management practices on soil quality (SQ), composite soils from 48 conventionally-tilled (CT) and no-till (NT) farmer's fields under sugar beet (*Beta vulgaris*) were sampled, processed, and analyzed for microbial populations, basal respiration (BR), enzyme activity, and chemical properties to calculate SQ indices. Averaged across fields, NT had 13% less bacterial and total microbial populations but 2 times more fungal populations than CT. The NT had 41% less BR than CT. Moreover, NT had 10% higher acid phosphatase, 23% more alkaline phosphatase, and 61% greater dehydrogenase activity than CT. Urease activity was 9% lower in NT over CT. NT had higher TC, TOC, TN, and AP than CT. Among the SQ indices, soil biological quality (SBQ) was 13% higher and chemical quality (SCQ) was 7% higher in NT over CT. Likewise, the overall SQ was 12% higher in NT than in CT. The SBQ significantly accounted for 81% of the variability in the overall SQ. In contrast, the SCQ accounted for 46% of the variability in the SQ. Significantly higher values of biological and chemical properties and soil quality in NT than in CT are due to the surface placement of crop residues, dominance of energy efficient fungal food webs, and cooler, moist, undisturbed soil environment.

Keywords: Farmer's fields, fungal populations, basal respiration, and organic carbon

Frozen Yogurt Properties and Its Production Method

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Abstract

Frozen yogurt is a functional dairy product which has main properties of yogurt and ice cream. It is produced by adding sugar, other ingredients and flavouring agents to milk, inoculating of milk with yogurt culture and freezing of yogurt. It has lighter taste and flavour intention than yogurt because of its low fat content. Frozen yogurt is a special product which is commonly consumed especially in USA and Europe. When it is compared with other countries, frozen yogurt is a new and developing product in Turkey. The most important reasons of frozen yogurt consumption that is a cold dairy dessert are its low energy content, being a healthy choice and its nutritional values. Additionally, the nutritional properties and therapeutic effects of frozen yogurt are not lost when it is processed as ice cream. It draws attention by consumers in terms of its low fat content and probiotic effects of lactic acid bacteria. It is advisable to consume frozen yogurt for people who have lactose intolerance, if it is consumed with appropriate portions. At this research, some properties of frozen yogurt and its production method were evaluated.

Keywords: Frozen yogurt, Properties, Production method

Determination of Lactation Milk Yield Characteristics, Milk Components and Lipid Profiles in Awassi Sheep.

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Abstract

This study aims to research the lactation milk yield, milk components, lipid profiles and effects of some environmental factors such as age and pasture on Awassi sheep at Food and Livestock Application and Research Center of Atatürk University.

Although the lactation milk yield and daily milk yield was observed highest value in 4-6 ages of ewes, it was statistically non-significant. Likewise, the lactation length was non-significant however it was determined that highest value in 7 and over ages.

The effect of the pasture period was highly significant ($p < 0.01$) on fat, density and protein ratio of milk and was significant ($p < 0.05$) on non-fat solid ratio while it wasn't effected on lactose ratio, freeze point and ash ratio of milk. In the otherwise, the effect of age was non-significant on all milk components, statistically.

In the study, it was determined that the ratio of triacylglycerol, free fatty acids and monoacylglycerol were high significantly different between before and during pasture period ($p < 0.01$). The triacylglycerol ratio increased along with the pasture period even though it was low before pasture. On the contrary, the ratio of free fatty acid and monoacylglycerol was decreased with the pasture period. Also, phospholipid ratio was significantly affected ($p < 0.05$) by milking pasture period while cholesterol ratio wasn't affected. The effect of age was significant ($p < 0.05$) on the ratio of free fatty acid and monoacylglycerol but the ratio of triacylglycerol, cholesterol and phospholipid wasn't effected along with age.

Keywords: Awassi, Milk yield, Milk component, lipid profile.

Effects of organic and chemical fertilizer on some soil properties

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Abstract

The objective of this study was to determine the effects of organic (OF) and chemical fertilizers (CF) on some soil properties. Chemical fertilizer as DAP (46% P_2O_5) and TSP (44% P_2O_5) were applied with a rate of 60 kg ha^{-1} P_2O_5, organic fertilizer as farmyard manure ratio of 30 ton ha^{-1} to the planted sugar beet (*Beta vulgaris*) parcels with a size of 4 m x 2.4 m. Fifty kg ha^{-1} K_2O and 50 kg ha^{-1} N were applied to all parcel as basal fertilizer form of potassium sulphate (50.0% K_2O) and urea (45% N), respectively. During the vegetation period, composite soils from parcels fields under sugar beat were sampled, processed, and analyzed for microbial populations, basal respiration (BR), urease, dehydrogenase and acid and alkaline phospotase enzyme activities and some soil chemical properties (total C (TC), total organic C (TOC), total N (TN), and available P (AP)).

Result of this study show that averaged across parcels, CF had less bacterial, fungal and total microbial populations than OF. The CF had more less BR than OF. Moreover, CF had higher acid phosphatase and alkaline phosphatase greater dehydrogenase activity than OF. Urease activity was lower in CF over OF. CF had higher TC, TOC, TN, and AP than CF. There was significant differences between two types of fertilizer in view of some soil properties.

Key words: Organic fertilizer, chemical fertilizer, soil enzyme activities, basal respiration.

Evaluation of mechanical behaviors of soil with different soil texture and aggregate size

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Abtract

The mechanical behavior of the soil against water is present the attitude of the soil in the changing moisture tensions with together the deformation. This research was carried out in order to show evaluation of mechanical behaviors of soil with different soil texture and aggregate size by using characteristic curves. In this research, three different texture (rough, medium and fine texture) were used. The aggregates were separated into three sizes (i.e. 2-1, 1-0.5 and <0.5 mm) by sieving from each soil sample. The soil moisture characteristic curves of soil fractions of soils were obtained using pressure extractor and vapor pressure methods. Soil mechanical behaviors as liquid limit, plastic limit, shrinkage limit, swelling-shrinkage potential were determined from soil fractions. In addition, swelling-shrinkage potential, plastic deformation and structural stability of the soils were evaluated. As a result, moisture characteristic curves of the soils were found different in different soil type and soil fractions. Utilizing these curves, the liquid limit, plastic limit and shrinkage limit values of the soil have been determined. These parameters of the soil samples has been showed changing depending on the aggregate size.

Keywords: Soil texture, Soil aggregate, Soil moisture characteristic curves

Effects of Agryl cover, Bionur Doses and Application Numbers on Yield, Quality and Plant Growth of Crisp Salad

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Abstract

This study was carried out to determine effects of bionur, including organic matter and nitrogen, acidithiobacillus thiooxidan, Acidithiobacillus ferrooxidans bacteria, humic and fulvic acid, doses and application numbers on yield, quality and plant growth of crisp salad in unheated greenhouse conditions. Caipira F1 crispy lettuce cultivar (*Lactuca sativa L. var. Crispy*) was used. Seeds were sown on November 1st, 2014 and seedlings were planted on December 1th 2014. Plants were covered with agryl cover except control. Liquid bionur was applied 6 different doses (0,5, 1, 1.5, 2, 2.5 and 3 ml/ plant) and numbers (1, 2 and 3 times). Harvest was done on March 11, 2015. The experiment was designed with 3 replications in randomized plots. Total and marketable yields (g/ plant), head length and diameter (cm), pH, soluble solids content (%) and total acidity were investigated. Agryl cover Bionur doses and the number of applications affected significantly some parameters. When doses and applications numbers increases, affected parameters were positively increased. Some parameters have been interaction between doses and application number.

Keywords: Bionur, crisp salad, yield, quality, chemical composition

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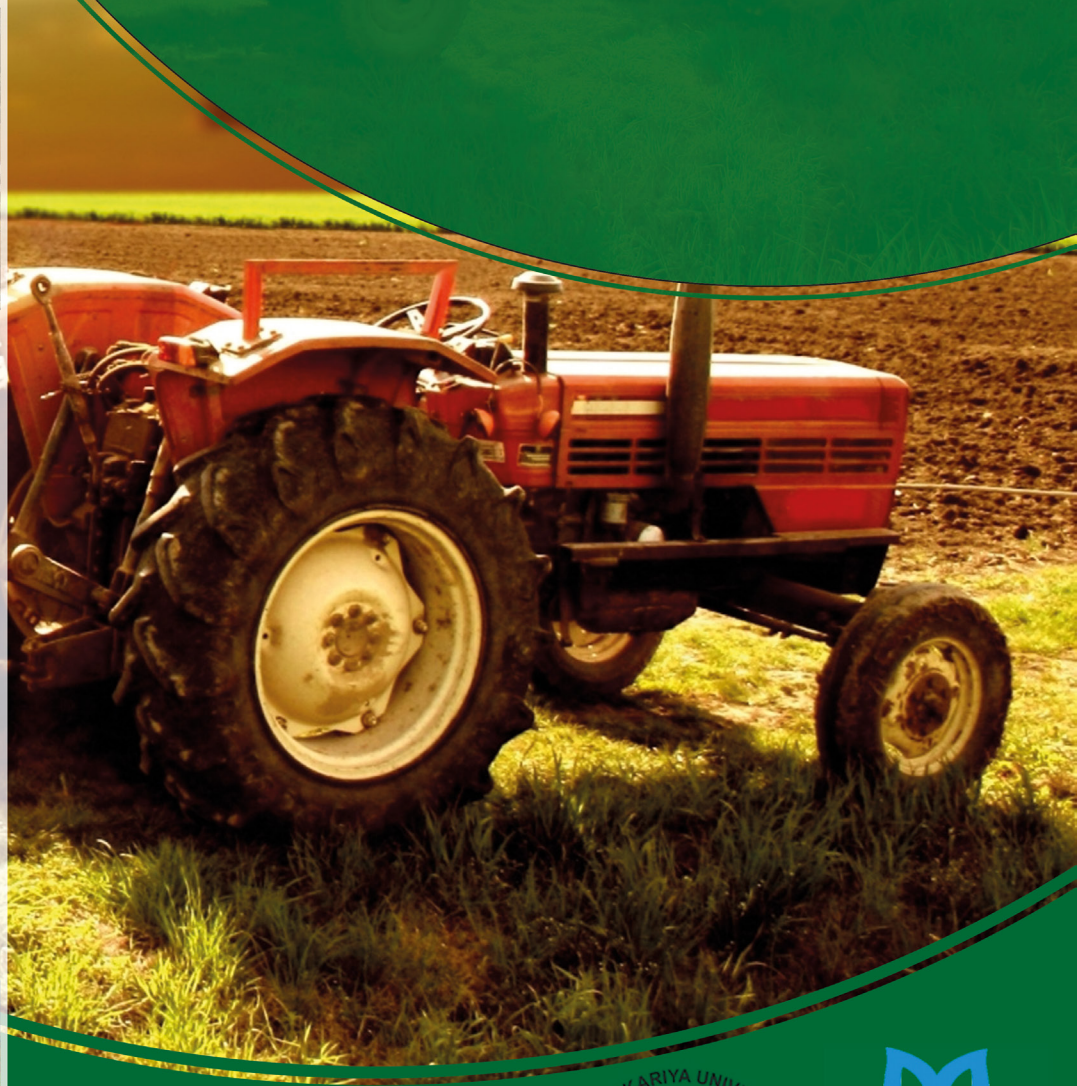












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