




# III. INTERNATIONAL EURASIAN AGRICULTURE AND NATURAL SCIENCES CONGRESS

TURKEY - 17 - 20 OCTOBER 2019



**BOOK OF  
ABSTRACTS**





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**USING MULTI-CRITERIA DECISION-MAKING METHOD AND VISIBILITY ANALYSIS  
BASED APPROACH IN LOCATING FOREST FIRE LOOKOUT TOWERS, NW IRAN.**

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**Abstract:**

The present study aimed to locating forest fire lookout towers in northwest of Iran with an area of 27328.36 hectare. For this purpose, the following criteria were selected for lookout towers mapping: elevation, slope, distance from previous burned areas, and distance from residential areas. Using Analytical Hierarchy Process method, influence of each factor on the locating was compared pairwise and weights were assigned to them. Then, initial locating map was created using the weighted linear combination approach, and it was reclassified in four classes to prepare a suitability map: totally unsuitable, unsuitable, fairly suitable and totally suitable classes. After defining four specific-zones, the high-elevated ridges were selected separately for each suitable class and zone with constraints of 10 and 15 meter height of the towers and 10000 meter radius. By selecting four points with the highest visibility based on an comprehensive spatial visibility analysis and maximum spatial coverage over the region, results revealed that all proposed tower locations with 10 and 15 meter heights are capable to cover spatially about 46.44 and 48.36 percentage of the entire region and nearly 45.90 and 47.3 percentage of areas within high and very high fire risk classes on previously-developed forest fire map, respectively.

**Keywords:** Analytical Hierarchy Process; Fire observation tower; Forest fire; Sardasht

**MODELLING THE RETAIL CHANNEL CHOICE OF HOUSEHOLDS FOR FRESH FRUITS AND VEGETABLES SHOPPING: A SMART CITY APPLICATION**

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**Abstract:**

Smart city applications provide opportunities for municipalities to use resources efficiently, enable smarter city planning, and increase public satisfaction. In this work, we developed an artificial neural network model that can classify households in a region based on their primary retail channel choices for fresh fruit and vegetable shopping. The households were grouped into two classes: one that prefers farmers' markets and another that prefers alternative channels. Among the influencing features for the retail channel choice highlighted in the literature, only the household features that are accessible by government institutions were considered in this work. The data of such features was collected through face-to-face interviews with 153 households in Sakarya, Turkey. Only four features among them were found to be significant and used in the model. These features include the household income, use of cash, vehicle ownership, and distance to the nearest farmers' market. The 5-fold cross-validation method was used to measure the accuracy of the classification. The results showed that 74% of the farmers' markets shoppers and 76% of the alternative channel shoppers were classified correctly. It was also found that, among the four features, the household income is the most influential variable on the shopping channel choice with a rate of 31%. With the assumption of data sharing between institutions, it was concluded that this model can be used to optimize the location of farmers' markets which would result in higher public satisfaction and more effective use of land resources.

**Keywords:** Artificial neural networks, Farmers' markets

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**A DIFFERENT APPROACH IN DETERMINING GRAPE LEAF COLOR**

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**Abstract:**

There are many factors that make up the allure and quality and varies according to the used way in fruit and vegetables. Nowadays, when information technologies are increasing, the issues that can not be evaluated and criticized in the past can now be measured and their changes can be determined. One from the features used in many areas is the color characteristics of the leaves or fruits of the plants. Determining color values and variations of these values have great importance in various researches about horticultural agriculture. Color and color factor used as a criterion to determine quality or maturity are important criteria to determine the post-harvest physiology or the response to various biotic or abiotic stress conditions. Color in plants can be measured by various scales but the accuracy of the measurement can not be ensured sufficiently. Some devices that are produced for the color measurement purpose bring additional cost to the researcher. This study works with the logic evaluated images transferred to digital media with software support. In the analysis, measurements were made using a color image scanned at 1200 dpi and stored in JPEG format. In this study, vine leaves were used since both the its leaf and fruit were consumed and because of the need to determine the color characteristics within the scope of many scientific studies. The measurements were compared with 3 different color measurement methods and presented in a table. With this method, it was aimed that the researchers reached the results they need.

**Keywords:** Grape, Leaf Color, CIE Lab, Photoshop.

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**CONSEQUENCE OF FOREST PROTECTION MANAGEMENT (STUDY AREA: ARASBARAN BIOSPHERE RESERVE IN NORTHWEST IRAN)**

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**Abstract:**

Concurrence of global climate change and the decline in natural resources has led scientists to focus on the sustainable development of forest management. Protection of forests is an important strategy to improve quantitative and qualitative characteristics of forest stands around the World. Arasbaran forest with an area of 146138 hectares is located in a semi-arid zone, Northwest of Iran. Forest protection policy has been implemented in a part of this forest since 1973 (about 77493 hectares, nearly 56 percent of total Arasbaran forests area) and after four years in 1977 was placed by UNESCO in the list of international network of Biosphere Reserves. A comprehensive sampling schedule from both protected and unprotected areas is designed to compare two areas. Finally, about 132 circular sample plots with an area of 300 m<sup>2</sup> were located on the northern aspects of the studied areas (66 sample plot in each one). Quantitative and qualitative characteristics of woody species in each plot were recorded. Results revealed that parameters including diameter at the breast height (DBH), basal area (BA) and proportions of seed-origin stems, total height, crown's height and canopy area were significantly higher in protected area ( $p < 0.05$ ). Proportions of coppiced stems were significantly higher in unprotected area ( $p < 0.05$ ). Also results showed diversity indices for both protected and unprotected areas do not significantly differ between sites. In conclusion, accordingly, forest protection policies integrated with developing appropriate deforestation and degradation indicators for improved forest conservation measures are highly recommended.

**Keywords:** Arasbaran forests, Forest protection, Quantitative and qualitative characteristics



**FRUIT SIZE OF ADVANTAGES AND DISADVANTAGES FOR PRODUCERS IN THE  
CILTOPAK OLİVE VARIETY**

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**Abstract:**

Çiltopak, one of the local olive varieties in the province of Karaman, is a regionally important and economic variety. Morphological, pomological and phenological characteristics of this variety were evaluated according to the identification method which was established in Özdağ (2017) “Determination of Phenological, Morphological and Pomological Properties of Çiltopak Olive Cultivated in Karaman Region”. As a result of our studies; Two years of morphological observations of Çiltopak olive varieties revealed that fruit weight was 6.24 g, fruit length was 25.43 mm and fruit diameter was 21.01 mm. According to UPOV criteria; The weight of the fruit is very large and it provides easy marketability to this large Çiltopak variety. In addition to, Due to the fact that the fruit of the variety has a rounded structure, although it is smaller in caliber than the varieties which are flattened from the equator region, such as Domat, it is more advanced than the sieves where the product is sorted. This makes the product higher than the available unit price.

In addition to the advantages mentioned above, the development of Çiltopak olives from the diameter area and its bulging structure increases its sensitivity to physical contact and impacts. Furthermore, when the Çiltopak olive enters the brine, its sensitivity coefficient increases further. Especially used as table green olives, the varieties of olives can be seen more clearly in wounds in brine water. Although Çiltopak olive varieties have advantages and disadvantages, fruit size makes the product more advantageous in market conditions.

**Keywords:** Çiltopak, Olive, Morphology, Pomology, Phenology

**TÜRKİYE KAYISI ÜRETİM DEĞERİ, YETERLİLİK DÜZEYİ, DIŞ TİCARETİ VE REKABET GÜCÜ ANALİZİ**

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**Abstract:**

Türkiye yaş meyve ve sebze ihracatının yanı sıra kuru meyve ihracatında da söz sahibi ülke konumundadır. Ülkemiz, kurutmalık meyve türlerinden üzüm, incir ve kayısı ihracatında ilk sıralarında yer almaktadır. Kayısı bu meyve türleri içerisinde önemli bir paya sahip, değerli bir üründür. Bu çalışmada, Türkiye'nin kayısı üretim miktarı, yeterlilik düzeyi, dış ticareti ve uluslararası ticaretteki rekabet gücü gibi önemli bazı ekonomik parametreler değerlendirilmiştir.

Türkiye'de 2018 yılında 750.000 ton kayısı üretilmiştir . Bu meyve türünde yeterlilik durumunun 2007 yılında %802,1 olduğu, 2016 yılına gelindiğinde ise bu değer %308,7'ye gerilediği görülmektedir. Türkiye'de 2016 yılında toplam 37.166 ton yaş ve 78.755 ton kuru kayısı ihraç edilmiştir. Bu ihracat değerleri ile 313.103 bin \$ gelir elde edilmiştir. Açıklanmış Karşılaştırmalı Üstünlükler indeksi (AKÜ) hesaplamaları sonucunda, ülkemizin kayısı ihracatında rekabet gücü 'güçlü' olarak belirlenmiştir. Mevcut verilere göre; Türkiye, kayısı üretim ve ihracat değerleri açısından dünyada birinci sırada yer almaktadır. Uzun vadede bu meyve türünün ülkemiz ekonomisine önemli katkılar sağlamaya devam edeceği düşünülmektedir. Alternatif kullanım alanlarının çok olması nedeniyle önemli bir yere sahip olan kayısının meyve suyu, reçel, marmelat gibi katma değeri yüksek ürünlere dönüştürülerek ihraç edilmesi ülke ekonomisine daha büyük katkılar sağlayacaktır. Ayrıca mevcut pazarların yanı sıra, yeni pazarlara ulaşmakta oldukça önemlidir.

**Keywords:** Kayısı, Üretim, Yeterlilik düzeyi, Rekabet gücü

FERTILIZING AND PROTEIN STATUES IN CHICKPEA

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**Abstract:**

Legumes are consumed for nutrition of more than 2 billion people over the world. Although legumes take the second place in production of field crops, consumption by per person is quite low. In Turkey, chickpea is the most produced legume. As a legume, chickpea presents valuable nutritional components especially welded by higher protein and dietary fiber that is resistant to enzymatic digestion in human body besides including non-polymeric starch components which is an important healthy food source while most of the ingredients are formed by cellulose, hemi-cellulose and pectin. The mentioned contents are associated with prevention of some important diseases such as hearth, diabetes, obesity, some of the cancer types, decreasing of blood cholesterol, normalization of glucose and insulin ratio. Konya City is one the most chickpea producer in Turkey. In recent years, application of humic acid based fertilizer is increased considerably. In the present research, a total of 4 humic acid applications (from dose 1 to dose 4: 0, 6, 9 and 12 kg da<sup>-1</sup> respectively) were applied by 2 equal part (pre-sowing and pre-flowering periods) to the “Çağatay” chickpea variety in Konya ecology by randomized blocks design with 3 replications. According to the results, protein ratio was detected between 20.56% (dose 4) and 25.89% (dose 3) while protein yield was ranged from 39.77 (dose 1) to 63.56 (dose 3) values. In the study, 9 kg da<sup>-1</sup> humic acid application presented the highest values for protein ratio and protein yield. Deep and long terms studies should evaluate more stable

**Keywords:** *Cicer arietinum*, balanced nutrition, humic acid,

NUTRITIONAL CHANGES BY FERTILIZING IN CHICKPEA

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**Abstract:**

Chickpea is one of the most important food sources to provide the increasing necessity for human nutrition over the world welded by higher protein content (18-31%) and its digestibility (76-78%), biological value and nutritional elements depending on genetic diversity, ecology and cultural practices. On the other hand, it is a drought tolerant legume crop that is why it is grown in a wide area in the world while has the first place for production of legumes in Turkey. Commonly, it is not irrigated in the country besides grown as a summer crop. Additionally, chickpea is preferred to increase the soil quality and allows to second crop. Konya City has the highest field area in Turkey while it is also an important chickpea producer. Farmers in Konya usually prefer the “Çağatay” variety especially due to easy cultivation and marketing as well. In the last decade, humic acid application is quite spread. Therefore, a field trial in Konya ecological conditions was set up according to randomized blocks design by 3 replicates in addition to 4 doses of humic acids (from dose 1 to dose 4: 0, 6, 9 and 12 kg da-1 respectively) on the Çağatay variety to determine changes in some of the macro mineral compounds. Results of the present research presented the following ranges (unit: ppm): 1574 (dose 2) – 3249 (dose 4) for P, 8060 (dose 1) – 9465 (dose 4) for K, 635 (dose 1) – 710 (dose 4) for Ca, 987 (dose 3) – 1577 (dose 4)

**Keywords:** *Cicer arietinum*, functional food, healthy nutrition,

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**ROOTSTOCK EFFECTS ON GRAFT SUCCESS AND SUBSEQUENT SCION GROWTH UNDER VINEYARD CONDITION**

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**Abstract:**

The present study was conducted to investigate the effects of different rootstocks on graft success and scion growth under vineyard condition in Konya Province. The green softwood shoots of ‘Prima’ table grape cultivar were grafted on the fresh summer shoots of four different rootstocks (44-53 M, Rupestris du Lot, 99 R and 41 B) by modified cleft green-grafting technique in early summer in 2019. One year old rootstock varieties, transplanted with a rectangular configuration 3.00x1.25 m, were used as the stock material when the summer shoot were about 8.0 mm thick. Rootstocks differently affected the length and diameter of the scion shoots. Graft survival rate was also significantly affected by the rootstocks used. Therefore, rootstocks effects on the graft success and subsequent vegetative development should be considered when field grafting is considered to perform in vineyard.

**Keywords:** Green grafting, grapevine rootstock, field grafting, modified cleft.

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**VEJETATIVE DEVELOPMENT OF HYBRID GRAPEVINE PROGENIES GENERATED FROM THE CROSSING BETWEEN ‘ALPHONSE LAVALLÉE’ AND THREE DIFFERENT CULTIVARS**

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**Abstract:**

Breeding in grapevine genotypes has been performed for years to improve agronomic features of cultivars and rootstocks. In such studies, pollinizer genotypes significantly modify the berry, seed and early development of new hybrid materials. In this study, effects of pollinizers cultivars on vegetative development of hybrid grapevine progenies generated from the crossing between ‘Alphonse Lavallée’ and three different Turkish national cultivars (‘Trakya Ilkeren’, ‘Pembe Çekirdeksiz’ and ‘Tarsus Beyazı’). The study was carried out in soilless culture under glasshouse condition. The hybrid plants were cultivated with single summer shoot to ensure logical comparison for growth characteristics. Certain features such as shoot length shoot diameter and leaf area displayed variation between the crosses depending on the pollinizer cultivars. This imply that the time duration for cultivar breeding may show differences according to the parental aptitude since the new canopy configuration could affect the agronomic and biochemical composition of the hybrid genotype.

**Keywords:** Green grafting, grapevine rootstock, field grafting, modified cleft.

SUSTAINABLE LAND MANAGEMENT: EFFECT OF AMENDMENTS ON SOIL QUALITY AND EROSION

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**Abstract:**

Sustainable land management can mitigate land degradation problem in Ethiopia. Improving quality of agricultural lands by traditional methods may take decades, and use of soil amendments may accelerate the processes. The aim of the study were (i) laboratory testing an effects of polyacrylamide (PAM) concentration (0 to 200 mg/L) on water retention and physical quality of clayey soils, (ii) filed plot investigation of PAM (20-40 kg/ka) in combination with other amendments (lime - 4t/ha, gypsum - 4t/ha, biochar - 8 t/ha, manure -5t/ha) on soil (physical) quality, runoff and erosion, and (iii) relations between soil physical quality indices and erosion. The high energy moisture characteristics (HEMC) method was used to evaluate the contribution of amendments on aggregate-structure stability. The water retention curves of samples were characterized by a van Genuchten model that yields (i) the parameters  $\alpha$  and  $n$ , and (ii) a soil structural stability (SI). Application of amendments considerable increased soil organic carbon and yield of cereal crop, altered soil physico-chemical properties, and runoff generation and soil loss, associated with modified soil macro-aggregate and macro-pore size distribution (increased  $\alpha$  or decreased  $n > 1.2$  times), and infiltration capacity and soil quality. Relative to control (i) soil treated with PAM yielded 2-3 times larger SI, and (ii) application of PAM in combination with amendments increased SI ( $> 2$  times) and reduced soil loss  $> 50\%$ . Exponential relations existed between SI and soil loss, PAM rate and water retention model parameter, allowing to evaluate the suitability of the conservation measures for improving soil (physical) quality, linked to the sustainable land management in these region. Mechanisms of treatments on soil quality induces and water retention model parameters, and erosion, and the relationship between them is discussed in the paper.

**Keywords:** soil quality, water retention, aggregate-structure stability, erosion, soil conservation, amendments, PAM, tillage.

**ORAL PRESENTATIONS / III. International Eurasian Agriculture And Natural Sciences Congress**

**ANTIOXIDANT ACTIVITY OF SOME MOSTLY COMSUMED HERBAL TEAS; TEA IS THE MOST EXCLUSIVE**

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**Abstract:**

Herbal teas take an indispensable part of our daily life. Tea is one of the most widely consumed beverages worldwide, second only to water. Tea has powerful antioxidant properties thus could be a useful agent against some diseases thanks to its phenolic acids and flavonoids within. We determined antioxidant activity of black tea (with bergamot flavored, with lemon, tea bags and infusion tea), green tea, linden, sage, rosehip, mint, thyme, rosemary, chamomile which are the mostly consumed herbal teas, via utilizing superoxide (SO) radical scavenging activity (RSA) and by determining total phenolic content (TPC). Infusion tea (85,23 % inhibition) had the highest SO RSA and tea with lemon had the highest TPC (0,635 mg/ml) (gallic acid equivalent). Most researchers support our opinion that tea has a particular place in our daily life. Other herbal infusions also make good beverages for health because they also both antioxidant and other bioactive properties. Recent years one of the most popular teas are fermented teas. For example, kombucha is both delicious and useful as such a beverage prepared by inoculation of sugared black tea with kombu culture (contains some bacteria and yeasts). Further predictable fermented teas prepared with other infusions could take part in beverages world as delicious and useful drinks.

**Keywords:** antioxidant, herbal infusions, tea



**CONSUMERS' AWARENESS AND WILLINGNESS-TO-PAY FOR HACCP CERTIFIED  
PRODUCE**

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**Abstract:**

Foodborne diseases from fruits and vegetables in the United States lead to the development minimum standards for safe growing, harvesting, packing, and holding fruits and vegetables grown for human consumption through the Produce Safety Rule under the Food Safety and Modernization Act in 2016. Under the Produce Safety Rule, fruit and vegetable growers are to develop food safety preventive strategies, such as a Hazard Analysis Critical Control Point (HACCP) plan. Developing a HACCP plan and complying with this plan increase the cost of production for fruit and vegetable growers. It is important to know if consumers' willingness-to-pay for HACCP certified produce to know how consumers will respond to price increases due to increased costs to producers. It is also important for small producers who are not regulated under the Produce Safety Rule to see, if consumers are willing to pay a price premium for HACCP certified produce to bear the cost of complying with the Produce Safety Rule voluntarily and market their produce accordingly. Using a consumer survey conducted across the different regions in the United States, this study analyzes consumers' awareness and willingness-to-pay (WTP) for HACCP certified produce. The results of the current study show that consumers' awareness of HACCP certification and WTP for HACCP certified produce is low. On average 20% consumers are aware of HACCP certification and average WTP for HACPP certified produce is estimated to be a 12% price premium over the price of regular produce. Hence, it is important to develop educational programs and educate consumers on the importance of safely grown produce.

**Keywords:** HACCP, Willingness-to-Pay, Foodborne Diseases, Consumer Preferences

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**PHYLOGENETIC ANALYSIS OF *GRACILIBACILLUS* SP. SB15406 ISOLATED FROM THE SUNGURLU BONCUK SALTEN**

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**Abstract:**

The genus *Gracilibacillus* is one of the moderate halophilic genera belonging to the family *Bacillaceae* (Hirota et al., 2014). The aim of this study is to carry out phylogenetic analysis of *Gracilibacillus* sp. SB15406 isolated from the Sungurlu Boncuk Saltern located near Çorum province. *Gracilibacillus* sp. SB15406, was picked after 4 weeks of incubation at 28°C on Starch-Casein Agar containing 15 % (w/v) NaCl. Genomic DNA isolation was performed by Pitcher et al. (1989). The 16S rRNA gene was amplified by PCR using universal primers 27f and 1525r. Phylogenetic analyses were performed by using three different algorithms with MEGA 7 software. SB15406 shared the highest 16S rRNA gene sequence similarity with *Gracilibacillus thailandensis* TP2-8T (98.79 %). When the polyphasic taxonomic analyses were completed, *Gracilibacillus* sp. SB15406 isolate may be introduced into the literature as a new species of the genus *Gracilibacillus*. This study was supported by Hitit University (ODMYO19001.17.001). I would like to extend our gratitude to Prof. Dr. Nevzat Şahin (Faculty of Art and Science, Department of Molecular Biology and Genetics, Ondokuz Mayıs University) for his contributions to the study.

**Keywords:** Taxonomy, Phylogenetic Analysis, 16S rRNA gene,

EFFECT OF SULPHUR APPLICATION ON THE AGGREGATE STABILITY OF A CLAY SOIL

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**Abstract:**

In order to make better use of plant nutrients in soils with a high pH value, sulfur addition to soils is preferred in recent years. The effect of sulfur addition on the chemical properties of soils has been studied by several researchers. However, nowadays, the physical properties of the soil that can be positive and negative affected by the addition of sulfur have not been investigated. For this reason, in this study, the effect of increasing sulfur doses added to soils on aggregate stability of soils was investigated. In the incubation experiment of 180 days, 0, 0.08, 0.16 and 0.32% sulfur were added to a clay texture soil. Besides, the effects of organic matter and sulfur addition were evaluated by using different sources of organic matter (Stable manure, chicken manure and vermicompost). At the end of the incubation period, the soil aggregate stability measurements were determined using artificial rainfall simulator. Aggregate stability values of experimental soils varied between 11.70 – 25.25% and statistically significant difference was found between applications ( $p < 0.05$ ). The highest aggregate stability value was obtained at the highest sulfur dose (%0.32) of chicken manure application.

**Keywords:** Aggregate stability, Elementel sulfur, Clay soil,

**EFFECT OF BULK DENSITY ON LEAST LIMITING WATER RANGE OF A CLAY SOIL**

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**Abstract:**

One of the most common problems encountered in agricultural practices today is soil compaction seen in agricultural techniques. Bulk density is one of the most important indicators of soil compaction and significantly changes the total porosity, pore size distribution and penetration resistance, and thus affects the Least Limiting Water Range (LLWR) of the soil. LLWR, as a new parameter, explains the aeration capacity of the plant root environment, plant root development and water use of the plant, so it has been widely used in recent years. In this study, a soil with high clay content was compacted at different bulk densities (1.05, 1.15, 1.25, 1.35 and 1.45 g cm<sup>-3</sup>) and total porosity, pore size distribution, available water content, penetration resistance were measured and thus the LLWR of the studied soil was determined from these measured values. According to the results obtained, soil aeration problem did not occur at the value of 1.05 and 1.15 g cm<sup>-3</sup> bulk density, and likewise the results at 1.25 g cm<sup>-3</sup> bulk density were similar. However, we found that the 2 MPa penetration resistance limit value was approached where plant root growth started to be prevented. Also, we observed that no aeration problem occurred at the upper limit of the LLWR at the value of 1.05, 1.15, 1.25 g cm<sup>-3</sup> bulk density, which is the limitation of the aeration of plant roots. On the other hand, the results showed that aeration problem occurred at the bulk density of 1.35 and 1.45 g cm<sup>-3</sup>.

**Keywords:** Bulk density, LLWR, Penetration Resistance

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**SOME MELON BREEDING GENOTYPES DETERMINATION OF RESISTANCE LEVELS  
TO FUSARIUM OXYSPORUM BY MOLECULAR METHODS AND DETERMINATION  
LEVELS OF HOMOGENEITY**

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**Abstract:**

*Fusarium oxysporum f. sp. melonis* (FOM) is one of the leading disease factors limiting melon cultivation. *Fusarium oxysporum f. sp. melonis* (FOM) is a soil-borne disease with four races FOM 0, 1, 2, 1-2 and all of them are seen in our country. But the most common races are 1 and 2. In this study, we have 87 melon accessories *Fusarium oxysporum f. sp. melonis* resistance levels to Fom 1 and Fom 2 races and homogeneity testing levels of genotypes were tested. As a result of the study, when the resistance between the genotypes for two races was examined, *Fusarium oxysporum f. sp. for melonis* (Fom 1 and Fom 2) strains, 23 genotypes were found to have homozygous resistance alleles against both races, while for Fom 1 there were 46 allele resistance lines in total, and 30 genotypes had homozygous resistance alleles, 16 of them had heterozygous resistance alleles. This situation for Fom 2, it was found that there were 75 allele resistant alleles and 69 genotypes had homozygous allele and 16 genotypes had heterozygous allele. Regarding homogeneity among genotypes, it was observed that the homogeneity level of 29 genotypes was between 85-95%.

**Keywords:** Melon, *fusarium oxysporum f. sp. melonis*, resistance, homogeneity

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**DETERMINATION OF SOME MORPHOLOGICAL CHARACTERISTICS OF SUMMER SQUASH GENOTYPES**

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**Abstract:**

Summer squash is a kind of vegetable that is widely used in production and consumption in Turkey as in many countries in the world. This study was conducted with University- industry cooperation; it is aimed to determine some morphological characteristics of these genotypes and seed reproduction of approximately 2000 summer squash genotypes in the gene pool of the company. In this context, the study was started with seed cultivation of five plants from each genotype; it was evaluated with eight parameters like degree of arm throwing and arm throwing in the plant, presence of neck on immature fruit, color number on immature fruit, main color and density of the main color on immature fruit, general shape of immature fruit and the main color of mature fruit. In accordance with these data, pre-selection has been made in order to compose a qualified breeding pool.

**Keywords:** *Cucurbita pepo*, genotype, morphological characterization, selection

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**DETERMINATION OF NUTRITIONAL AND MINERAL CONTENTS, AND PHYSICAL PROPERTIES OF KIDNEY BEANS (*PHASEOLUS VULGARIS*) SEEDS GROWING IN THE TALAS REGION OF KYRGYZSTAN**

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**Abstract:**

In this study, nutrient contents and some physical properties of kidney beans (*Phaseolus vulgaris*) cv. Yupka grown in the Talas region of Kyrgyzstan were determined. The physical properties were evaluated as functions of moisture content in the moisture range from 8.4 to 30% d.b. for the rewetted kidney bean seed. As a result, the average length, width, thickness, the geometric mean diameter, arithmetic mean diameter, were 14.2, 9.5, 7.3, 9.9 mm, 10.3 mm, respectively. The bulk density decreased from 694.9 to 628.7 kg/m<sup>3</sup>, true density decreased from 1244.8 to 1187.8 kg/m<sup>3</sup>, porosity decreased from 44.2 to 47.1%, projected area increased from 1.23 to 1.70 cm<sup>2</sup>, terminal velocity increased from 7.7 to 6.6 m/s, the rupture strength of kidney bean seed decreased from 35.2 to 7.84 N/mm<sup>2</sup>, the sphericity of kidney bean seed decreased from 70.4 to 68.1 % while the moisture content of kidney bean seed increased from 8.4 to 30% d.b.. Some Nutrient contents of kidney bean seeds including moisture, crude cellulose, crude protein, ash and lower heating value were determined; 8.4%, 3.8%, 14.4%, , 3.86 % and 18.67 MJ/kg cal/g, respectively. Mineral contents of kidney bean seeds including; B, Cu, Fe, Mn, Zn, K, P, Ca, S and Mg were determined; 53.5 ppm, 6.9 ppm, 66.9 ppm, 18.6 ppm, 25.06 ppm, 1.5 %, 0.4 %, 0.2%, 0.02% and 0.19%, respectively.

**Keywords:** Kidney bean, physical properties, nutritional contents, mineral contents

**IDENTIFICATION OF SOCIO-ECONOMIC STRUCTURES AND PRODUCTION PROBLEMS OF POMEGRANATE PRODUCERS: SAMPLING OF MANAVGAT, DISTRICT OF ANTALYA**

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**Abstract:**

The aim of the study is to determine socio-economic structures of the enterprises producing pomegranate in Manavgat, District of Antalya, as well as problems encountered by the enterprises in production and marketing, and their consideration on pomegranate production in the future. The core material of the study is the primary data obtained from 73 enterprises producing pomegranate in Manavgat District, who are determined using proportional sampling method.

In the study, it was found that the producers prefer the pomegranate cultivation because of well profit gained initially from the production thereof. It has been assessed that the enterprises participating in the questionnaire study has no storage means for their products, and that they have difficulties due to lack of becoming a cooperative on marketing of products, and they consider that the cooperatives to be established on pomegranate marketing in the production zone would 95.9% come in useful in the product marketing activities.

In accordance with the results obtained from the research, the enterprises in question need to be established producer organization (cooperative) to find a solution to the problems such as marketing of the their pomegranate products, low input cost, operating facility and storage. Summary of master's thesis

**Keywords:** Manavgat, pomegranate production, problems, socio-economic structure



**KAHRAMANMARAŞ'TA YETİŞTİRİCİLİĞİ YAPILAN BAZI İNCİR (*FICUS CARİCA* L.) ÇEŞİT VE GENOTİPLERİN POMOLOJİK ÖZELLİKLERİNİN BELİRLENMESİ**

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**Abstract:**

Bu çalışma Kahramanmaraş Bölgesinde yetiştiriciliği yapılan bazı incir çeşit ve genotiplerin meyve ve kalite özelliklerinin belirlenmesi için yapılmıştır . 2017-2018 yıllarında KSÜ Ziraat Fakültesi Bahçe Bitkileri Bölümüne ait incir parselinde ve Kahramanmaraş 'ın Onikişubat ilçesine bağlı Cüceli Köyünde şahsa ait olan incir bahçesinde yürütülmüştür. Çalışmada Sarılop, Sultan Selim , Bursa Siyahı incir çeşitleri ve Bardak , Sarı, Abbas incir genotipleri kullanılmıştır . Bu çeşit ve genotiplerde meyve kalitesini belirlemek amacıyla pomolojik özelliklerinden meyve ağırlığı, meyve eni, meyve boyu, boyun uzunluğu, sap uzunluğu, ostiolum açıklığı, SÇKM ve pH değeri ile meyve kabuk rengi ve meyve iç rengi ölçümleri (L, a, b değeri olarak ) yapılmıştır . Çalışmada kullanılan çeşit ve genotiplerin meyve ağırlığı 30.47-76.19 g, meyve eni 35.73-59.03 mm, meyve boyu 33.64-44.84 mm, boyun uzunluğu 2.51-11.07 mm, sap uzunluğu 0.20-2.74 mm, ostiolum açıklığı 2.91-8.64 mm, SÇKM %18.73-26.56, pH 5.05-5.76 arasında değişim göstermiştir . Bu özelliklere göre meyve ağırlığı, meyve eni, pH değeri bakımından Abbas genotipi, meyve boyu ve sap boyu olarak Bursa Siyahı çeşidi yüksek olurken, ostiolum açıklığı ve SÇKM değeri bakımından ise Sarı genotipi yüksek olmuştur.

**Keywords:** İncir, çeşit, genotip, pomoloji

**EFFECTS OF PRE-STORAGE MALEIC HYDRAZIDE AND ASCORBIC ACID  
APPLICATIONS ON CHEMICAL ATTRIBUTES OF POTATO**

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**Abstract:**

Some chemicals applied to potato tubers before storage are known to be used to prevent physical and chemical changes of potato in recent years. The objective of the present study was to reduce quality deteriorations of potato with the support of maliec hydrazide (MH) and Ascorbic acid (AA) during storage. Maliec hydrazide (MH) (control and 1500 ppm) and ascorbic acid (control, 1000 ppm and 1500 ppm) were surface applied to potato tubers as spray before storage. At the end of 60 day storage time, 1000 ppm MH and 1500 ppm ascorbic acid application reduced increments in the rates of total soluble dry matter, total sugar and reducing sugar by 25.3%, 43.5%, 65,9 %, respectively, compared to the control. Losses of C vitamin was observed as 23.8 % at control group, while this rate was 3.8 % at 1500 ppm MH application. This study suggests that skin application of maliec hydrazide and ascorbic acid can inhibit losses during storage.

**Keywords:** C Vitamin, MH, Solanum tuberosum L., Storage Losses, Sugar Rate

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**THE EFFECT OF NITROGEN AND ZINC FERTILIZER APPLICATIONS ON THE DEVELOPMENT, YIELD AND GRAIN CONTENT OF QUINOA (*CHENOPODIUM QUINOA* WILLD.)**

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**Abstract:**

Quinoa has been cultivated in the Andes region for thousands of years; it provides a high level of nutritious food to poor farmers in this region. The product has a much higher quality nutritional value compared to common cereals, contains less input and is economical. Nutrient requirements of the plant must be met in order to achieve high yields. Cultivation has not yet become widespread in our country. Research studies have begun on this subject recently and continue. In this study, the effects nitrogen and zinc fertilizer applications on vegetative growth, grain yield and some plant nutrient contents (N, P, K, Zn) of quinoa were investigated. For this purpose, K-521 quinoa was used in the research. 5 different doses of nitrogen (0-25-75-225-250 mg / kg) and 4 different doses of zinc (0-0.2-1.0-5.0 mg / kg) fertilizer were applied to the plants. According to the results, the highest thousand grain weight was obtained at 1 mg / kg Zn and 75 mg / kg N application; the lowest value was obtained in 5 mg / kg Zn and 250 mg / kg N application. Plant lengths measured in three periods ranged between 36.00-54.67 cm. Grain yields are between 1.73-5.01 g / pot. After the harvesting mineral yield (N, P, K, Zn) of quinoa plant were determined. The applications of nitrogen and zinc to yield, mineral contents of plants were found statistically significant.

**Keywords:** Nitrogen deficiency, quinoa, mineral concentration, zinc

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**THE EFFECT OF NPK FERTILIZER AND VERMICOMPOST APPLICATION ON PLANT  
GROWTH AND THE NUTRIENT CONTENTS OF RADISH (*RAPHANUS SATIVUS* L. )**

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**Abstract:**

Vermicompost production and applications are increasing in our country recently. There are also many commercial products on the market. Vermicompost may act both as soil conditions and organic fertilizer. In addition to the effect of this product on improving the physical properties of the soil; the effect of plant growth on different plants should be studied. In this study conducted for this purpose; commercially produced radish (*Raphanus sativus* L.) cv. 'Cherry Belle' was planted in growing medium mixed with different doses of vermicompost (0 - 2.5 – 5 - 10%). In order to determine NPK and NPK + Fe.Zn fertilizer needs of the plants, these element contained fertilizers were applied. According to the pot experiment results, important increases in some element contents and fresh root weights of radish plant were determined with increasing vermicompost applications. The average fresh root weight changed between 47.89-77.70 g / pot. The average N content of in leaves and in roots changed between % 3.09-4.69 and % 1.19-2.67, respectively. The K content of in leaves and in roots changed between % 1.27-1.46 and % 1.39-2.13, respectively, and the P content of in leaves and in roots changed between 4633-4961 mg/kg and 3588-4476 mg/kg, respectively. Application of vermicompost had statistically significant effect on growth of radish ( $p < 0.05$  and  $P < 0.01$ ).

**Keywords:** Radish, vermicompost, fertilizer, element content

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**CAPABILITY OF USING CAPERS AND THYME PLANTS FOR THE EVALUATION OF  
MARGINAL AREAS**

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**Abstract:**

For centuries medicinal and aromatic plants have been used for food, spices, medicine and therapeutic purposes. After the 1990s, the utilization potential of medicinal and aromatic plants increased as a result of the utilization of different usage areas and the increase in demand for natural products. One of these uses is the evaluation of marginal agricultural areas that cannot be used. In this context, considering the natural distribution areas of medicinal and aromatic plants, the diversity of biological diversity and genetic resources can be considered as an opportunity for capers and thyme. The importance of these plants in exports and their growing in marginal areas increase the interest and production gradually.

The buds of Capers (*Capparis* sp.) can be used for headache and hemorrhoid treatment. Growing on sloped and sandy soils, having a widespread root system and its trunk spread over the soil surface increases the importance of both the prevention of erosion and the utilization of marginal areas.

In Turkey "Thyme" Although there are many aromatic plant species belonging to Lamiaceae family, defined as, in particular essential oils carvacrol and type containing thymol 'thyme' is accepted as (*Thymus*, *Origanum*, *Satureja*, *Thymbra* and *Coridothymus* species). Flower and leaves are processed and thyme oil, thyme juice products are used for medical purposes. It is also widely used in spices, but also in the pharmaceutical and perfumery industries. Cold resistance, sloping, clay ground and alkaline character can be grown easily in the soils can be used in the evaluation of marginal areas or shows that it is used.

**Keywords:** Marginal area, capers, thyme, healing, medical

CONSUMER HABITS TOWARDS MEDICINAL AND AROMATIC PLANTS IN  
ERZURUM PROVINCE

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**Abstract:**

Turkey is a country where there are around 12.000 plant species whose 1/3 is endemic and 30% of this rate is aromatic. Among rich variety of plants, medicinal and aromatic herbs have a significant place and it is known that in Turkey about 500 plant species are used as medicine by the general public. Today, although the aromatic herbs and spices are confused with each other and considered to be the same, there are critical differences between those. In the literature scans, there were different studies that did not consume spice consumption but there were no studies that directly examined medicinal and aromatic plant consumption. 384 questionnaires were conducted with the aim of determining the habits of the consumers on the information and consumption of medicinal and aromatic plants. The main material of the study was the data obtained by the questionnaire survey made with the consumers and the obtained data were analyzed by using the appropriate statistics. Consumers data obtained from the survey have been statistics analyzed with descriptive statics logit model.

**Keywords:** Medicinal and aromatic plants, costumer, habits, biological diversity, Erzurum

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ESSENTIAL OIL CHARACTERIZATION OF *Smyrniium connatum* Boiss. & Kotschy FROM VARIOUS GEOGRAPHICAL LOCATIONS IN LAKES REGION, TURKEY

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**Abstract:**

The fruits of *Smyrniium connatum* Boiss. & Kotschy growing wild in Lakes Region in Turkey, were collected at seed maturing stage from 4 different localities to study the essential oil composition. The essential oils of fruits were obtained by hydro distillation and components of the oils were identified by GC and GC-MS. The oil yields on a dry weight basis ranged from 1.75% to 5.00 %. The number of essential oil components ranged from 43 to 72 based on locations and a total of 85 compounds were identified. Major qualitative and quantitative variations of some compounds were determined with respect to localities of collection. The major components were Curzerene (25.45%-15.56%),  $\beta$ - Elemene (10.63%-4.83%), Germacrene B (9.14%-4.32%), Germacrene D (11.78%-7.78%), and Procerin (6.69%-5.23%). Results showed that considering the major components, the localities were represented by different chemotypes.

**Keywords:** essential oil content and composition, location

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**DETERMINATION OF THE EXISTING VINEYARDS WITH GEOGRAPHIC  
INFORMATION SYSTEMS IN HIZAN DISTRICT OF BITLIS PROVINCE**

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**Abstract:**

In this study, the existing vineyards of Gayda, Akşar and Harmandöven villages, where the intensively viticulture, were determined by Geographical Information Systems (GIS) in Hizan province of Bitlis. The 1/25 000 scaled topography maps ,numbered of L48c2 and L49d1, obtained from General Command of Mapping was used as a base map in the study area. ArcGIS 10 software was used to transfer the images into the computer and 3D Analyst Tools, which is a sub-unit of ArcGIS, was used to create the desired analysis and maps. Magellan brand GPS instrument with meter scaled was used to determine the coordinates of the existing vineyards. 204.539 da in Gayda village, 84.864 da Akşar and 44.409 da in Harmandöven village were determined as a vineyard area. According to evaluation results, it was determined that villages are located generally very steep slope and steep terrain. As a result of aspect analyses, it was determined that the vineyards in Gayda and Harmandöven villages are located with South, South-East aspects, while North aspects in Akşar village. As a result of climate analysis (temperature, rainfall, sunshine, frost), roughly, climatic values were found to be problematic for viticulture in villages. As a result of interviews for villages, it was understood that the cultural processes were not performed on time.

**Keywords:** Climate, Geographic information systems, Topography



USE OF TECHNOLOGY IN CUT FLOWER INDUSTRY

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**Abstract:**

41.9% of worldwide trade value of ornamental plants (\$ 18 billion 279 million over \$ 43 billion 619 million) belongs to cut flower market. Cut flower production had progressed in developed countries till 1960's after that it had been widespread to developing countries where the climate is suitable, and workforces are relatively cheaper. Globalization has caused important developments and changes in cut flower sector as in many other sectors. International competition has become increasingly important with globalization and competitive power has been the most important indicator of success in the international arena. Developed countries has aimed to get highest production volume from unit land area by using high technology and digitalization in all processes like production and marketing in order to increase their competitiveness against developing countries that have advantageous in terms of climactic conditions and workforce in cut flower market. Increase in productivity and quality are obtained with usage of high technology in many steps of total supply chain like planting, seedling, sapling, harvesting, transportation, packing, additional lightening, darkening, irrigating, fertilization, controlling diseases and pests etc. and it has also been led to an increase in competitiveness in domestic and international market. In this study, information have been given about greenhouse technologies, intelligent agricultural systems, robots used in sowing-planting-dismantling-harvesting-sorting and packaging, automation in irrigation and fertilization, disinfection and reuse methods of waste water methods, mobile reproduction and growing tables, LED technology and logistics systems which are used in the cut flower sector under the influence of Agriculture 4.0.

**Keywords:** cut flower, technology, industry 4.0, agriculture 4.0, robotic technologies, LEDs, rolling-bench.

COMPARISON OF SEED VIABILITY WITH SEED VIGOR AND STRESS TESTS IN CHENOPODIACEAE SPECIES

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**Abstract:**

Because of the seeds which belongs to *Chenopodiaceae* family have prickly, amorphous, polygerm and hard seed and fruit shells, there are big problems in machine planting and germination (heterogeneous). Successful production is inevitable in the cultivation of these species with the use of quality seeds. Seed vigor and stress tests are used to determine quality seeds. Our study was carried out with *Spinacia oleracea*, *Beta vulgaris* var. *cruenta*, *Beta vulgaris* var. *cicla* seeds belonging to the *Chenopodiaceae* family in the research laboratory of Uşak University Faculty of Agriculture and Natural Sciences between 2018-2019. The analyzes applied in the study; moisture determination (2×1 g seed, 130 °C 1h), germination test (4x50 seed, 20 and 5 0C, 14 days), emergence test (4x50 seed, 20 0C, 21 days), control deterioration test (4×50 seed, 48 h, 20% humidity and 20 0C, 14 days germination), EC (4x50 seeds, 20 0C, 24-48h in the dark), mechanical stress (10x2 cm row spacing / above 5-10 cm planting depth, with 4×50 seeds sowing to land conditions), salt stress (irrigation with 200 mM salinity level, 3×25 seeds, 32×20×8 cm in size, 4 cm depth sowing), protein analysis (2×2 gr milled seed). When the results were examined, viability ranking according to EC test; spinach >chard >beet seeds, while for protein content; spinach >beet> chard seeds. At 5 0C, chard and beet seed germination was not observed, while 98% germination was determined in spinach. However, this vitality was lost with the controlled deterioration test. Seedling emergence, salt and mechanical stress tests

**Keywords:** *Chenopodiaceae*, seed vigor, stress tests, protein analysis

CLASSIFICATION OF LEGUMES REVISITED

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**Abstract:**

The family *Fabaceae* or *Leguminosae* is reported to be the third largest family after *Orchidaceae* and *Asteraceae* (syn *Compositae*) with about 751 genera and 19 000 species. *Fabaceae* was divided into three subfamilies such as *Caesalpinioideae*, *Mimosoideae*, and *Papilionoideae*. In International Legumes Conference to be held in Sendai, Japan in 2018, additional new have been put into the family *Fabaceae*: Order: Fabales

Family: *Fabaceae* or *Leguminosae* (Baklagiller)

Subfamily: 1.*Caesalpinioideae* DC.

2.*Cercidoideae* LPWG

3.*Detarioideae* Burmeister.

4.*Dialioideae* LPWG

5.*Duparquetioideae* LPWG

6.*Faboideae* Rudd (syn. *Papilionoideae* DC.)

The genera and known species in *Fabaceae* have been indicated about 800 and 20 0000, respectively. *Fabaceae* is known as the second important family after *Poaceae* in the world. Members of *Fabaceae* possess legume, called pod, while pulses are called dried seeds of family. They are used as food, feed, ornamental, timber, industrial, medicinal and landscape plants. It is also divided into Old World, Classical World, Asian and African and New World Food Legumes according to their origin centers. Most important legumes species are listed in the subfamily *Fabaoideae* Rudd. Six species of the respected genera have been listed in books on pulses in Turkey, while more than 50 species have been grown for food legumes. In this review, we aimed to insight into recent knowledge on classification of legumes.

**Keywords:** *Fabaoideae*, *Fabaceae*, taxonomy

IMPACT OF MUTANTS IN FOOD LEGUMES ON FOOD SUPPLY

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**Abstract:**

By 2050, the world population is expected to reach 9 billion people. Many of these people hope to live in the developing countries and have low incomes. Thus, this has led to a steady increase in the demand for food. Under the best of circumstances, the difficulty of meeting this demand in a sustainable manner will be enormous. When one takes into the account the impact of biotic and abiotic effects (drought, higher temperatures, cold, shifting season, salinity, flood, imbalance in plant nutrition, pests and diseases) on food production, the current scenario can be worse than prediction. Sustainability in production requires the effective use of available genetic resources. In particular, mutation techniques in plant breeding allows the expression of many undiscovered alleles. Food legumes are not only important in human nutrition for its high protein content between 20 and 45%, but also alternativeness for sustainable agriculture due to their nitrogen fixing ability from air. However, food legumes are still being cultivated well below potential because of exposure to many biotic and abiotic stresses. The combination of genes conferring to resistance for biotic and abiotic stresses in food legumes plays an important role in enhancing efficacy and sustainability in production. The main aim of the review is to emphasize the impact of mutants in food legumes on food legumes. According to the database of International Atomic Energy Agency (IAEA) and Web of Science (WOS), 3 187 mutant varieties including 431 food legumes have already been registered. Most of the mutagen to

**Keywords:** Mutation, cultivar, food security

**MALATYA YÖRESİNDE YETİŞTİRİLEN SOFRALIK ÜZÜM ÇEŞİTLERİNDE OLGUNLAŞMA SIRASINDA MEYDANA GELEN KİMYASAL DEĞİŞMELER**

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**Abstract:**

Bu araştırma Trakya İlkeren, Barış, Köhnü, Şilfoni, Tekirdağ Çekirdeksiz, İtalya, Cardinal, Banazı Karası, Kızılatım, Kureyş, Amasya, Mazırım, ve Tahannebi üzüm çeşitlerinde olgunlaşma periyodu boyunca tanede meydana gelen biyokimyasal değişimleri belirlemek amacıyla Malatya’da yürütülmüştür. Olgunlaşma periyodu boyunca suda çözünebilir kuru madde miktarı, pH ve toplam antosiyanin miktarlarının arttığı, toplam asitlik, toplam fenolik bileşik miktarı ve antioksidan kapasitede ise azalma olduğu tespit edilmiştir. Olgunlaşma döneminde suda çözünebilir kuru madde miktarının %17.0 (Trakya İlkeren ve Şilfoni) ile %21.6 (Kureyş); toplam asitliğin %0.42 (Tekirdağ Çekirdeksiz) ile %1.26 (Kızılatım) ve pH değerinin 2.58 (Köhnü) ile 3.29 (Trakya İlkeren) arasında değiştiği belirlenmiştir

**Keywords:** Malatya, sofralık üzüm, olgunlaşma periyodu, biyokimyasal değişimler

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**DETERMINATION OF GENETIC VARIATION AMONG DIFFERENT MELON  
ACCESSIONS THROUGH PEROXIDASE GENE MARKERS**

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**Abstract:**

Plant peroxidases belong to multigene family play important roles in many physiological events such as salt tolerance, auxin metabolism, seeding, protection against pathogens and oxidative stress. This study aimed to analyse the genetic diversity and population structure of 45 different melon (*Cucumis melo* L.) genotypes from a variety of regions in Turkey and different countries using peroxidase gene polymorphism markers. For the 45 melon genotypes twelve polymorphic primers were amplified 97 scorable bands. Of these bands, only 62.9% were determined to be polymorphic. While the number of bands per primer ranged from 6 to 11, the average number of bands was 8.08. The lowest and the highest polymorphism information contents (PIC) were 0.49 (Pox 12 FaRa) and 0.99 (Pox 13), respectively. The mean PIC value was 0.75. The lowest genetic similarity was found between CU-365 (conomon) and CU-247 (0.143), conversely the highest genetic similarity was detected between CU-360 (cantalopensis) and CU-389 (cantalopensis) (0.875). Using the STRUCTURE computer program, all melon accessions were separated into two subpopulations. These results showed the POX gene marker system is a useful tool in genetic diversity studies. Also the data obtained are considered to be a guide for other studies to be performed on melons in the future.

**Keywords:** *Cucumis melo*, peroxidase gene markers,

**REDISTRIBUTION OF NEWLY FORMED ORGANIC MATTER BETWEEN DENSIMETRIC FRACTIONS OF LOAM**

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**Abstract:**

Densimetric fractionation of organic-mineral substrates after incubation of loam with plant residues of corn and clover during 6 months under controlled conditions has been performed. Three fractions were isolated: heavy - HF ( $> 2.2 \text{ g/cm}^3$ ) and two light - LF-1 ( $< 1.4 \text{ g/cm}^3$ ) and LF-2 ( $1.4\text{-}2.2 \text{ g/cm}^3$ ). The yield of fractions by mass after 6 months of incubation varied in the series (%): TF (91.4, 80.0)  $\gg$  LF-2 (3.2, 10.2)  $>$  LF-1 (3.0, 0.3) for corn and clover, respectively. The content of Corg, N and the C/N ratio decreased in the series LF-1  $>$  LF-2  $>$  HF with an increase in the density of fractions, mainly due to an increase in the proportion of OM of microbial origin with a higher nitrogen content and formation of more sustainable compounds with mineral components of loam. It is shown that organic-mineral compounds in LF-2 are represented mainly by randomly oriented mass of micro aggregates. In a HF, organic matter is discretely distributed over the surface of large mineral grains in the form of films associated with various dislocations. The scheme describing the mechanisms stabilization of newly formed OM in densimetric fractions of organic-mineral substrate taking into account its composition and properties has been presented. Two oppositely directed processes are occurring in the liquid phase of the soil: mineralization and stabilization of newly formed organic compounds by the mineral matrices. The mechanism of OM stabilization by mineral matrices is a specific selective adsorption depended on their composition and properties. The reported study was funded by RFBR, project № 19-29-05265.

**Keywords:** densimetric fractions, mineral matrix

ALLEVIATION OF SALT-INDUCED STRESS IN *ALLIUM CEPA* L. BY GREEN TEA LEAF EXTRACT TREATMENT

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**Abstract:**

Green tea leaf extract effects on seedling growth (fresh weight, radicle length and radicle number), the seed germination, the mitotic activity, the micronucleus frequency and the chromosomal aberration in *Allium cepa* L. germinated in both stress and normal conditions investigated in this study. In only green tea leaf extract medium, radicle length and radicle number of seeds were partially reduced compared to the control seeds germinated in distilled water medium. While their germination percentage and fresh weight statistically indicate the same values. Besides, mitotic index and chromosomal abnormalities in the root tip meristematic cells of *A. cepa* seeds germinated in alone green tea leaf extract medium increase compared to germinated control seeds in distilled water medium, whereas micronucleus frequency showed statistically the same value compared to the control. Salt stress significantly reduced mitotic index in root tip meristems of seeds and increased number of chromosomal abnormalities and micronucleus frequency. In other words, it can be said that salt stress significantly inhibits seedling growth and seed germination of *A. cepa*. However, inhibitory effects of salt on mitotic activity, seedling growth, seed germination, chromosomal abnormalities and micronucleus frequency significantly decreased with application of green tea leaf extract. There is no study on influences of green tea leaf extract on seedlings growth, seed germination, chromosomal aberrations, mitotic activity and micronucleus frequency under saline and normal conditions. For this reason, this work was designed to investigate the efficiency of green tea leaf extract on these parameters in *A. cepa* L. subject to salt stress.

**Keywords:** Chromosomal aberrations, green tea leaf extract, salt stress, seed germination, seedling growth, mitotic index



THE EFFECTS OF GLYCINE ON CYTOGENETIC AND PHYSIOLOGIC PARAMETERS  
OF *ALLIUM CEPA* L. EXPOSED TO SALINITY

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**Abstract:**

In this study, role of glycine on the mitotic index, the chromosome aberrations, the micronucleus frequency as cytogenetic parameters and on the seed germination, the radicle length, the radicle number, the fresh weight as physiological parameters in *Allium cepa* L. seeds exposed to salinity were studied. In only glycine medium, the germination percentage and radicle length of seeds statistically showed the same values as control seeds germinated in the distilled water medium, their radicle number partly decreased, but the fresh weight partly elevated. Besides, the micronucleus frequency, the chromosomal abnormalities and the mitotic index in dividing root meristematic cells of *A. cepa* seeds germinated in alone glycine medium showed partly increase compared to the control seeds germinated in the distilled water treatment. Salinity showed a significant inhibitory effect on seedling growth and the seed germination of *Allium cepa*. Moreover, salinity reduced significantly mitotic index in *A. cepa* root tip cells and increased number of chromosomal abnormalities and frequency of micronucleus which is the simplest indicator, the most effective of cytological damage. On the other hand, the detrimental effects of salinity on the seed germination, seedling growth, the mitotic activity and the chromosomal aberrations were alleviated flashilly in varying degrees by glycine application, but glycine was ineffective in reducing of salt damage on the micronucleus frequency. There is no literature data on effects of glycine application on physiologic and cytogenetic parameters examined in saline conditions. Therefore, results of this study have been particularly reported for the first time in saline conditions.

**Keywords:** Chromosomal aberrations, glycine, salt stress, seed germination, seedling growth, mitotic index

**BANANA VIRUSES DISEASES AND SITUATION IN TURKEY**

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**Abstract:**

Banana is the primary of fruits rather widely preferred in terms of production and consumption in the world. In the production of bananas, especially being in the first place India, this followed by China and Tanzania countries. While banana is produced vegetatively, it's production has also become widespread in recent years especially with tissue culture. Many abiotic and biotic factors are limiting factors in terms of quality and quantity in the production of banana plants. In particular, viral diseases prevent both the transportation of bananas transnational and cause losses of up to 100% in yield and quality. To date in the world have been determined that It is economically important 8 viral diseases infecting bananas. When they are ranked in order of importance; Cucumber mosaic virus (CMV), Banana bunchy top virus (BBTV), Banana streak virus (BSV), Banana mild mosaic virus (BanMMV), Banana bract mosaic virus (BBrMV), Abaca mosaic virus (AbaMV), Banana die back virus (BDBV) and Banana virus X (BVX). According to the ELISA and PCR analysis results of the samples taken from the banana production areas in our country, the prevalence rate of CMV was found to be 1.5% and that of BSV was 2.8%. In this study, by evaluating the characteristics of viral diseases encountered in banana production in general it's situation in our country will be revealed.

**Keywords:** Banana, Virus Turkey, CMV, BSV

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**SYNTHETIC SEED PRODUCTION FROM SOMATIC EMBRYOS OF EUCALYPTUS CAMALDULENSIS DEHN.**

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**Abstract:**

*Eucalyptus camaldulensis* Dehn. having heavy, hard and durable wood is the one of most widely planted trees over the World. Their woods are very important industrial source of timber, for pulp and paper production and also for fuel. Their oils are also used in medicine for remedy of different health problems such as migraine headaches, chronic bronchitis, coughing, tuberculosis. Different tissue culture techniques have been developed for in vitro propagation of *Eucalyptus* species. In this study was aimed to develop for efficient in vitro propagation of *E. camaldulensis* by using synthetic seed technology. The results showed that the somatic embryos encapsulated in the calcium alginate beads of *E. camaldulensis* regenerated very easy and they produced healthy shoots after incubation period at standard culture conditions.

**Keywords:** *Eucalyptus camaldulensis* Dehn., Na-alginate, plant biotechnology, synthetic seed technology.

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**MID-TERM CONSERVATION OF SACCHARUM OFFICINARUM L. GERMPLASM USING SLOW-GROWTH CONDITIONS**

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**Abstract:**

Conservation of plant genetic resources has become highly important for food security and crop improvement to reduction natural resources. The tissue culture protocols providing aseptic and standard culture conditions is one of the most important tool for developing of conservation strategies. Because sugarcane is significant industrial crop for different countries over the World, their germplasm is needed to maintain. The sugarcane grown in field genebanks are under the risk of their valuable germplasm loss due to hazards of man and nature exist. Biotechnological approaches such as tissue culture techniques can overcome all of these limitations for germplasm conservation of industrial crops. In the current work aimed to develop an efficient protocol for mid-term conservation of sugarcane germplasm using 3 and 6 six month culture periods at different temperatures. In this incubation periods were analysed for determination best condition for mid-term conservation. The maximum viability rate was 95%, and the regeneration and the rooting rates were 100% after six month incubation at 15 °C.

**Keywords:** MS medium, slow-growth, sugarcane (*Saccharum officinarum* L), temperature

**SUSTAINABLE LAND USE PLANNING MODEL IN RURAL BASINS**

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**Abstract:**

Soil erosion is a common problem that complicates watershed management in Turkey and around the world. The main objective of soil conservation work carried out in basins is to ensure sustainable watershed management. The first operation is to define the current situation in the basin. The initial and fundamental objective of erosion estimation based on existing data is generally deciding how to overcome the problem. However, the treatments carried out in most soil conservation studies are similar to each other. Any common, known, or defined methodology about erosion problems in watersheds has not been improved—until now. Considering this problem, the Sustainable Land Use Planning (SLUP) model was developed to determine soil conservation precautions, to set priorities for decision makers and to produce a common solution for rural watershed in Turkey. While the estimated average soil loss was determined to be 7.66 t ha<sup>-1</sup> per year, some land use changes were proposed and land use management priorities were set in the direction of the model results to gain sustainable management in the Çelikli basin. At the end of the study, it was showed that the soil loss can be reduced about the rate of 91.2% applying the SLUP model.

**Keywords:** land use planning, sustainable management, soilerosion

**MANTAR TÜKETİMİNİ ETKİLEYEN FAKTÖRLERİN DEĞERLENDİRİLMESİ (TOKAT İLİ MERKEZ İLÇE ÖRNEĞİ)**

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**Abstract:**

Bu çalışma, Tokat ili merkez ilçede yaşayanların mantar tüketimini etkileyen faktörlerini değerlendirmek amacı ile yapılmıştır. 2018 yılında gerçekleştirilen çalışmanın materyalini, Tokat ili şehir merkezinde ikamet eden toplam 384 kişi ile yüz yüze görüşme yöntemiyle yapılan anketlerden elde edilen veriler oluşturmaktadır. Bu çalışmada mantar gelişim için elverişli iklim koşullarına sahip olan Tokat ili merkez ilçede yaşayanların mantar tüketim alışkanlıklarını incelerken, ankete katılan tüketicilerin sosyo-demografik özellikler ile mantar tüketimi ilişkilendirilmeye çalışılmıştır. Araştırma sonucunda araştırmaya katılan tüketicilerin %76.30'unun mantar tükettiği belirlenmiştir. Mantar tüketmeyen %23.70'lik grup ise alışkanlıklarının olmamasından (%45.5), tadını sevmediklerinden (%41.76) ve zehirlenme endişesinden dolayı (%38.46) mantar tüketmemektedir. Yapılan ki-kare analizinde evli olanlar ve daha yüksek gelir grubundakiler ile mantar tüketimi arasında pozitif yönde anlamlı ilişki olduğu belirlenmiştir. Ayrıca mantar tüketimi ailedeki birey sayısı arasında %1'lik anlamlı bir ilişki söz konusudur. Yani birey sayısı arttıkça et ya da tavuk alternatifi olabilecek gıdalara olan eğilim de artacaktır. Bu sonuç gerçekte örtüşmektedir. Çalışma sonuçları mantar üreticileri için ürünün talebini ve etkileyen faktörleri ortaya koyarak, üretimlerini yönlendirmelerine açısından da fayda sağlayacaktır.

**Keywords:** Tokat, Mantar, Tüketim Alışkanlıkları

**YAŞ MEYVE VE SEBZE TÜKETİMİNDE GIDA GÜVENLİĞİ ALGISI, TÜKETİCİ ENDİŞESİ VE BİLİNCİ: TOKAT İLİ MERKEZ İLÇE ÖRNEĞİ**

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**Abstract:**

Çalışmanın ana materyalini, Tokat ili merkez ilçede ikamet eden ailelerle yapılan anketlerden elde edilen veriler oluşturmaktadır. Örnek hacmi oransal örnekleme yöntemi kullanılarak belirlenmiş, %90 güven ve %5 sapma ile 270 örnek ile çalışılmasına karar verilmiştir. Anketler hane halkı tüketimine yönelik olup, aile üyelerinden herhangi biri ile yüz yüze görüşmelerle yapılmıştır. Anket sonuçlarına göre, tüketicilerin %52,22'si mevsiminde köylü pazarında bulunan yerli ürünleri ve yine tüketicilerin %47,88'i akraba ve tanıdıkların bahçesinden alınan yerli ürünleri güvenli bulmaktadırlar. Bu noktada sebze meyve üreticisi olan çiftçilerin bilinçlendirilmesi ve denetlenmesi konusu da önem kazanmaktadır. Yine sonuçlar arasında, tüketicilerin %81,85'inin gıda güvenliği kavramını daha önce duyduğu görülmektedir. Tüketicilerin %70,00 gibi önemli oranı, tükettikleri yaş meyve ve sebzeleri içeriğinde olabilecek kalıntı, hormon, katkı vb. maddeleri açısından riskli veya çok riskli bulmaktadır. Bu çalışma ile her mevsimde ve her bölgede birçok meyve ve sebze türünde dünyanın önemli üreticilerinden olan Türkiye'de, önemli sebze ve meyve üretim potansiyeline sahip Tokat İl'i örneğinde konu değerlendirilmiştir. Yaş sebze ve meyvelerin tüketiminde gıda güvenliği konusunda tüketicilerinin ne düşündüğünün ve nasıl davrandığının belirlenmeye çalışılmıştır.

**Keywords:** Tokat, Meyve, Sebze, Gıda Güvenliği

ESTIMATION OF EVAPORATIONSPIRATION BY USING MODIS AND ETM+ IMAGERIES IN ARAK, IRAN

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**Abstract:**

Evaporation and transpiration are the important factors in hydro-cycle and also are the factors in determining equation of surface energy balance whose exact estimation in regional criterion is of crucial importance in the management of crop's water demand, prediction and observation of development of water's sources utilization. Estimation of evaporationspiration and also local transmittance of involved factors in evaporationspiration like the evaporated surface and the local factors that effect on it are some of the items that are possible through remote sensing and show more exact estimation in comparison to spot equation. In the present study, the local distribution of evaporationspiration and its relationship with remote sensing in comparison to lysimeter data as the control group in Arak that is placed in Markazi province of Iran were investigated. 28 images of MODIS and ETM+ during 2000 to 2004 were investigated in estimation of real evaporationspiration based on SEBAL, SSEB and TSEB in the region. Many images of MODIS showed the proper time resolution and also it is a reason for fewer errors in estimation of reference evaporationspiration. In the performed investigations on the three models it was found that SEBAL model was evaluated as 95% of all of the estimated data in both sensors and showed significant difference with the estimated lysimeter. Based on the statistical results of the three under investigation models, SEBAL model was introduced as the top model.

**Keywords:** NDVI, SAVI, MODIS, ETM+, SEBAL



**THE İNFLUENCE OF BOUNDARY CONDİTİONS AT DEPTH İN MODELİNG HEAT TRANSFER İN SOİL**

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**Abstract:**

The study of the effects of boundary conditions on surface and in at depth of soil in natural conditions is an important task of modeling heat transfer in the soil. The objective of this research is to investigate the effects of boundary condition in at depth of soil under natural conditions and to develop methods for determining the soil's thermal diffusivity based on solution to the problems of a heat-transfer equation. Experimental investigations were carried out to establish the effects of boundary conditions on the solution of modeling problems of heat transfer in different depths of soil. Soil temperature was measured by waterproof, portable temperature sensors placed at the soil profile in the field. For this purpose, one soil profile was excavated and the thermal sensors (Temperature recorder Elitech RC-4) were replaced in soil profile with different depths ( $x=0, 5, 10, 15, 20, 40, 60$  cm) to measure soil temperatures depending on time and depth. Based on these data, the thermal diffusivity in soils was calculated using the classical (layered) and proposed (point) methods developed for the case with one and two harmonics, and the calculated characteristics were compared with the experimental results. It was found that the proposed (point) methods are the best reflect the movement of heat in the soil profile.

**Keywords:** soil, heat, modelling, thermal properties

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**DETERMINATION AND COMPARISON OF APPARENT THERMAL DIFFUSIVITY OF ALLUVIAL CARBONATE SOILS (IGDIR REGION, EASTERN ANATOLIA, TURKEY) BY SIX ALGORITHMS IN**

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**Abstract:**

Soil temperature affects a number of processes and phenomena occurring in the soil, such as: the rate of chemical reactions; the intensity of transfer processes; physiological processes occurring in the living phase of the soil; ecological functions of the soil. In this regard, the study of the thermal properties of soils is of particular interest in the study and exploitation of soil. This study was carried out on the experimental land of İğdir University Agricultural Research and Application Center. In order to calculate the value of apparent thermal diffusivity, physical and chemical analyzes of the soil were performed first. These data were used to examine, evaluate and calculate the thermal properties of soil by theoretical methods. Thermal properties of soil were calculated by using classical and new calculation methods obtained from analytical solutions of heat motion model in soils. For this purpose, thermal sensors (Thermochron iButton DS1921G) have been installed in soil profile to measure soil temperatures at different depths. The thermal properties of the surface area were calculated by using the surface temperature measurement values of the test land soil. The values of the apparent thermal diffusivity ( $\kappa$ ) parameter of the soil were calculated by different methods. Using the found values of these parameters, the soil temperature values were then calculated for different depths and times. The simulated soil temperature values were compared to the observed ones. It was determined that the point methods of these methods best reflect the movement of heat in the profile

**Keywords:** Soil, heat movement, modeling, thermal diffusivity

**COMPARATIVE EVALUATION OF EFFECTIVE MICROORGANISM AND CHEMICAL FERTILIZER ON GRAIN FARMING**

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**Abstract:**

In this study, it is aimed to investigate the effects that usage of EM (Effective Microorganism) on yield increase in grain farming which has an important place in agricultural sector. In the study, an area of 836 m<sup>2</sup> has been selected from Ahiilyas village in the central district of Çorum where grain farming is concentrated. In the application area, three areas that m<sup>2</sup> are equal to each other, including the area where the chemical fertilizer application is applied, the area where the chemical and EM application is not applied (the control group) and the area where the EM application is applied, have been determined. Double row barley cultivated from grain market were applied to these areas. In October 2018, 25 g of seed were planted for each area. 15 g DAP (Di ammonium phosphate) to the chemical fertilizer area, 0.8 ml EM-A to the EM area and 2 kg of compost prepared from the plant's own plant wastes to the control group area were applied. In spring growth, 15 g of 46% Urea was applied to the area where chemical fertilizer was applied. As the weather started to heat up, 0.4 ml EM 5 + 0.4 ml EM FPE mixture was applied to the EM treated area twice. In the area where EM is applied, it was observed that the growth performance, which was initially low, increased due to the warming of the weather and the effect of rainfall. Harvest from selected areas in June 2019, the highest yield was measured in EM treated group with 1.840 g total weight and 840 g spike weight. In the chemical fertilizer group, 1.690 g total weight and 810 g spike weight were measured, whereas in the control group 1.480 g total weight and 610 g spike weight were measured. As a result of this study, it has been concluded that the use of EM (effective microorganism) in grain farming provides an increase in yield and is an ecological biological product that can be used as an alternative to chemical fertilizer. Thus, soil-pollution due to intensive chemical fertilizer use and nitrogen/phosphate-induced water pollution in underground and surface water resources will be prevented to a great extent.

**Keywords:** Grain, Effective Microorganism, chemical fertilizer, harvest yield

DIVERSITY OF EPIPHYTIC ALGAE ON CERATOPHYLLUM DEMERSUM IN MİLİÇ STREAM (SAMSUN-TURKEY)

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**Abstract:**

The diversity and seasonal succession of epiphytic algae on a submerged aquatic plant (*Ceratophyllum demersum*) were studied in Miliç Stream, Samsun (the Central Black Sea Section of Turkey) from October 2017 to September 2018. To determine the epiphytic algae on host plant species in Miliç Stream, *C. demersum* L. samples were taken periodically from the 3rd station. A total of 18 epiphytic taxa were identified belonging to the divisio of Bacillariophyta in the Miliç Stream. Some species were recorded as dominance during most of the study period on host plant species (*C. demersum*), such as *Gomphonema apicatum*, *G. olivaceum*, *Nitzschia fonticola*, *N. amphibia*, *Cocconeis placentula*, and *Pantocsekiella ocellata*. *Nitzschia amphibia*, *Tryblionella apiculata*, *T. hungarica*, *Cymbella cymbiformis*, *Gomphonema gracile*, *Ulnaria ulna*, *Prestauroneis protracta*, *Melosira varians*, and *Cyclotella meneghiniana* species were represented at subdominant level with an abundance of 1-10%. In the research area (station 3), the predominant presence of pollution-tolerant species in water shows that there is pollution pressure in this station. Also, the results showed low abundance and species richness of epiphytic algae in study site.

**Keywords:** Stream, *Ceratophyllum demersum*, Epiphytic Algae, pollution

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**THE EFFECT OF ARBUSCULAR MYCORRHIZAL FUNGUS APPLICATIONS (*Glomus intraradices* and *Gigaspora margarita*) ON PATIENT DEVELOPMENT AND FOOD  
ELEMENT CONTENTS IN**

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**Abstract:**

This study carried out in the research greenhouses and laboratories of Selcuk University Faculty of Agriculture Department of Horticulture to determine the seedling growth parameters and changes in plant nutrients in eggplant grown in different lead (Pb) doses of *Glomus intraradices* (Gi) and *Gigaspora margarita* (Gm) applications. In the study, five different Pb concentrations (0 ppm, 100 ppm, 200 ppm, 400 ppm and 800 ppm) in mycorrhizal (Gi and Gm) and non-mycorrhizal cases were the subjects of the experiment. Seedlings were grown in spring season and applications were made. As a result, the earliest true leaf appearance time of the seedling growth parameters examined was taken from the largest cotyledon and longest cotyledon Gm application. In the other development parameters, the highest values were obtained from Gm-0 ppm application. Increased lead doses were also higher than the 0 and 100 ppm control applications. As expected, due to the toxic effect of lead, the plant could not be taken in Control-800 ppm application. However, the plants continued to develop by tolerating the toxic effect of lead in Pb doses in Gm and Gi applications and especially in 800 ppm lead application. The other criteria that we examined were found to be the intake of important nutrients N, P, K and Ca with mycorrhiza and even in high-dose heavy metal conditions. On the other hand, it was observed that the lead was taken into the plant by mycorrhiza and Pb content in the root had higher value than the lead content in

**Keywords:** *Glomus intraradices*, *Gigaspora margarita*, heavy metal, nutrient content, seedling development, lead.

**BODUR ANAÇLI VE SIK DİKİM BADEM AĞAÇLARINDA BAZI BİTKİSEL VE POMOLOJİK ÖZELLİKLERİN İNCELENMESİ**

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**Abstract:**

Sağladığı bir çok avantaj ile bodur anaçlar ve buna bağlı olarak geliştirilen sık dikim sistemleri modern meyve bahçeleri tesisinde sıklıkla başvurulmuş unsurlardır. Ülkemizde yetiştiriciliği hızla artan bademde de bodur anaç ve sık dikim uygulamaları geliştirilmiştir. Bu bağlamda önemli badem üretim alanlarında söz konusu sistemlerin avantaj ve dezavantajlarının analizi ve buna bağlı olarak uygulamaya aktarılması önem taşımaktadır. Yapılan bu çalışmada son yıllarda badem üretiminde önem kazanan Adıyaman ilinin Besni ilçesinde bulunan ticari bir üretici bahçesinde üç yaşındaki Rootpac-20 anacı üzerine aşılı, 4 metre sıra arası ve 1.2 metre sıra üzeri mesafesi ile dikilmiş olan, Ferragnes ve Ferraduel badem çeşitlerine ait ağaçlar incelenmiştir. Çalışma kapsamında incelenen badem ağaçlarında ağaç boyu, taç yüksekliği, taç çapı, gövde kesit alanı, ana dal çapı, sürgün çapı ve sürgün uzunluğu değerleri ölçülmüştür. Bunun yanında söz konusu ağaçlardan örneklenen meyve örneklerinde kabuklu meyve ve iç badem boyutları, ağırlıkları, iç randımanları ve bir onsa giren iç badem sayısı değerleri incelenmiştir. Sonuçlar uygulanan sistemin bölge ekolojik koşulları için uygun olduğunu, birim alanın etkin bir şekilde kullanıldığını, birim alandan alınan verimin olumsuz etkilenmediğini ancak meyve boyutlarının küçüldüğünü göstermiştir.

**Keywords:** Adıyaman, badem, bodur, pomoloji, sık dikim

EFFECT OF LIGHT INTENSITY AND NITROGEN CONCENTRATION ON THE GROWTH OF NEOCHLORIS AQUATICA STARR

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**Abstract:**

Microalgae consist of photosynthetic microorganisms that has huge variability and produce commercial and biotechnological compounds. Because of their great benefits in many area, microalgae were chosen as a material in biotechnological studies.

In this study, the effects of nitrogen and light on the growth of *Neochloris aquatica* (KF803402) that attracts attention with its high oil production was researched. *N. aquatica* was grown under two different light intensities (45, 135  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$ ) and in four media that have different nitrogen concentrations (3, 9, 18, 27 mmol/L) by modifying BG11 medium. Cell number values and dried weight were measured for 30 days.

Light is very important factor for photosynthetic microorganisms for their growing. But higher intensity light did not cause further growth. More cell number and dried weight values were observed in all of media when they were grown under low light intensity. Nitrogen is major element for all living things because; it is found in the structure of proteins which are the most abundant organic matter in the cell. Under low light intensity, 3 mmol/ L has the highest cell number (448x10<sup>4</sup> cell/mL). Otherwise, under high light intensity, 9 mmol/L has the highest cell number (347x10<sup>4</sup> cell/mL). Under low light intensity, 3 mmol/L has the highest weight values (0,904 g/L).

All results show that high light intensity is unnecessary to produce more biomass and modified medium (3 mmol/L) must be used for growing *N. aquatica* instead of standard BG11 medium (18mmol/L).

**Keywords:** Culture growth, light stress, *Neochloris aquatica*, nitrogen deprivation.

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**MOLECULAR SCREENING OF SOME DISEASE RESISTANCE STATUS IN DERIVED TOMATO GENOTYPES**

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**Abstract:**

Tomato breeding is studied intensively all over the World and new cultivars are released to market every day. This leads to great competition in tomato breeding research area. Current cultivars are constantly changing and developing according to the demands of our era. In this study, 400 derived elite tomato genotypes were screened in terms of *Tomato Mosaic Virus*, *Verticillium dahliae*, *Verticillium albo-atrum*, *Fusarium oxysporum* f.sp. The resistance levels of *Lycopersicon* (race 0-1) and *Meloidogyne incognita* diseases by using related molecular markers.

**Keywords:** Tomato, Resistance screening, Molecular identification



**STACHYS CRETICA SPP. ANATOLICA RECH. F., ANN. 'NIN YAPRAK VE ÇİÇEK UÇUCU  
BİLEŞENLERİ**

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**Abstract:**

Son yıllarda, yaşam standartlarının yükselmesi ile birlikte doğal bitkilere olan ilgi artmış ve tıbbi ve aromatik bitkilerin beslenmede lezzet, koku, tat verici, iştah açıcı vb. özelliklerinden dolayı kullanımları yaygınlaşmıştır. Günümüzde tedavide kullanılan ilaçların önemli bir kısmını doğal kaynaklı bitkisel kökenli ilaçlar oluşturmaktadır. Doğal ürünlerin tüketimindeki artışa bağlı olarak tıbbi ve aromatik bitkilerin Türkiye ve Dünya'daki pazar hacmi hızlı bir artış göstermektedir. Zengin tıbbi ve aromatik bitki cinsini içeren Lamiaceae familyası, baharat, halk ilacı ve koku kaynağı olarak kullanılan önemli bir familyadır. Lamiaceae familyasının tıbbi ve aromatik açıdan öneme sahip önemli cinslerinden biri olan *Stachys* cinsi, yaklaşık 200 takson içeren bir türdür. 2018 ve 2019 yılları arasında, Akseki (Antalya) Çimi Köy mevkiinden çiçeklenme döneminde toplanan *Stachys cretica* spp. *anatolica* Rech. F., Ann. çalışmanın materyalini oluşturmaktadır. Katı faz mikro ekstraksiyon tekniği (SPME) kullanılarak uçucu bileşenler gaz kromatografisi kütle spektroskopisi (GC-MS) yardımı ile tespit olup, *Stachys cretica* spp. *anatolica* Rech. F., Ann. 'da 34 farklı bileşen belirlenmiş ve germacrene-D (%35,96), Benzaldehyde (%9,55), Bicyclogermacrene (%8,43) ve Limonene (%8,07) ana bileşenleri olarak bulunmuştur. Uçucu bileşen sınıflarına bakıldığında seskiterpen hidrokarbonların yüksek oranda olduğu bulunmuştur.

**Keywords:** Uçucu bileşen, *Stachys cretica* spp. *anatolica*,

**DOĞAL YAYILIŞ GÖSTEREN BAZI BİTKİ TAKSONLARININ ETNOBOTANİK ÖZELLİKLERİ BELİRLENMESİ: KÖYCEĞİZ (MUĞLA) YÖRESİ ÖRNEĞİ**

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**Abstract:**

Son yıllarda teknolojinin gelişmesi ve refah seviyesinin yükselmesi ile birlikte insanların doğal ürün kullanımında ve bitkilere olan ilgilerinde artış görülmektedir. İnsanlığın varoluşundan günümüze kadar tıbbi ve aromatik bitkiler, gıda, çeşni, ilaç ve şifa amaçlı kullanılmış ve önemini hiçbir zaman kaybetmemiştir. Ülkemiz zengin bitki örtüsü ve etnobotanik bilgi birikimi ile gelişen tıbbi ve aromatik bitkiler sektöründe önümüzdeki dönemde yıldızı parlayacak ülkeler arasında görülmektedir. 2018-2019 yılları içerisinde gerçekleştirilen bu çalışmada, Köyceğiz yöresindeki orman köylülerinin demografik ve sosyoekonomik yapısı, köylülerin tıbbi bitkiler başta olmak üzere, odun dışı bitkisel orman ürünlerini tüketim amaçları, tüketim zamanı, tüketim sıklığı, temin şekilleri, tüketilen bitkisel ürünlerden görülen faydalar ve yan etkileri, tüketim alışkanlığının oluşumunda etkili olan faktörlere ilişkin değerlendirmeler ortaya koymak amacıyla 25 sorudan oluşan bir anket formu kullanılmıştır. Çalışmada, 12 familyaya ait toplam 18 odun dışı bitkisel orman ürünü değerlendirmeye alınmıştır. Bu bitki taksonlarının bilimsel adları, familyaları, odun dışı orman ürünü olarak kullanılan kısımları, yöresel kullanım alanları ve yerel halka katkıları konularında bir veri tabanı oluşturulmuştur. Köyceğiz Yöresinde Odun Dışı Bitkisel Ürünlerinin (ODBÜ) en yoğun tüketimi genel sağlık, tedavi ve keyif amaçlı ve kış ve sonbahar mevsimlerinde olduğu belirlenmiştir. Tüketim alışkanlığında etkili olan faktörler incelendiğinde aile ve yakın çevrenin tavsiyeleri ilk sıradadır. Tüketicilerin büyük bir bölümü tüketilen ürünlerden fayda görmektedir. Yöre halkının ODBÜ ile olan ilişkisini etnobotanik bakımından incelendiği zaman halk arasında kullanımı oldukça yaygın olduğu tespit edilmiştir.

**Keywords:** Odun dışı bitkisel orman ürünleri, Köyceğiz,

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**THE EFFECTS OF DIFFERENT PLANT NUTRIENT APPLICATIONS ON YIELD AND  
QUALITY CRITERIA OF LETTUCE GROWN IN THE GREENHOUSE**

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**Abstract:**

The effects of three different applications of three plant nutrients [Biovin Plus (BP), Biofertilizer (BF) and Potassium Humate (PH)] on yield and quality criteria were investigated during the cultivation of lettuce (*Lactuca sativa* var. *longifolia*) cv. ‘Presidential’ under greenhouse conditions. The experiments were conducted in accordance with the rules of good agricultural practices, in a heated greenhouse on the campus of Konya Food and Agriculture University. Biomass (g/plant) as the yield criterion; the number of leaves (pieces/plant), plant height (cm), plant width (cm) and chlorophyll content (SPAD) as the quality criteria, were determined in each application group during harvest. The ANOVA of the data obtained was performed according to a randomised complete block design. Differences between means were evaluated with the LSD test at 0.05 significance level. Correlation matrix analysis were also performed at 0.05 significance level. When all the parameters were evaluated together, the 2nd dose of PH application (PH2) gave the best results compared with the control application in terms of yield and quality criteria. This was followed by the 2nd dose of BP application (BP2) in general. Although BF applications were statistically better than control group, they lagged behind PH and BP applications. As a result of different plant nutrient applications conducted in lettuce, the interrelationships between yield and quality parameters were determined by a correlation matrix analysis. Consequently, the highest correlation was found between biomass and plant width. This was followed by the correlations between biomass and number of leaves and biomass and chlorophyll content.

**Keywords:** *Lactuca sativa* var. *longifolia*, Biovin Plus, Biofertilizer, Potassium Humate, yield, quality criteria

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**FARMERS' ADOPTION OF INTERRELATED CONSERVATION PRACTICES**

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**Abstract:**

Adoption of conservation practices have been widely analyzed in the literature. However, little is known about the interlinkages among adoption of conservation practices or technologies with similar purposes. Instead of adopting a bundle of interrelated conservation practices or technologies at the same time, farmers could strategically behave and adopt conservation practices or technologies one at a time. The objective of this study is to analyze how farmers behave when they face adoption of multiple conservation practices. Our results indicate that instead of adopting all components of interrelated conservation practices, farmers might behave strategically and adopt one component at a time and obtain experience from that component, which could lead to adoption or rejection of other components.

**Keywords:** conservation practices, technology adoption, off-farm income, sustainable agriculture, socio-economic factors

TARIMSAL KALKINMA KOOPERATİFLERİNDE FİNANSAL ANALİZ: MUĞLA İLİ FETHİYE İLÇESİ ÖRNEĞİ

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**Abstract:**

Kooperatif, bireylerin, tek başlarına yapamayacakları ve birlikte yapmalarında yarar bulunan işleri en iyi biçimde ve maliyet fiyatına yapmak üzere dayanışma suretiyle ekonomik güçlerini bir araya getirmeleridir. Tarım kooperatifi, ortakları “çiftçi” ve faaliyet alanları “tarım” olan kooperatiflerdir. Tarım kooperatifi, çiftçilerin, bazı ekonomik haklarını korumak ve işletmelerinden daha fazla kâr sağlamak amacıyla birleşmelerinden oluşmaktadır. Bu birleşme sonucunda elde edilmesi planlanan kâr, çiftçinin kooperatifi vasıtasıyla ya ürününü daha yüksek fiyata satması sonucunda (tarım satış kooperatiflerinde olduğu gibi) ya da işletmesine gerekli üretim girdi ve araçlarını kooperatifi vasıtasıyla daha ucuz fiyata sağlaması sonucunda oluşmaktadır (tarım alım ve tarım kredi kooperatiflerinde olduğu gibi). Tarım kooperatifleri, genellikle aile işletmesi olan küçük çiftçilerin haklarını korumak ve güçlenmelerini sağlamak için kurulurlar.

Tarımsal Kalkınma Kooperatifleri, ortaklarının bütün yönlerden kalkınmasını hedef alan çok amaçlı kooperatiflerdir. Bu çalışmada Muğla’nın Fethiye ilçesinde sosyal ve ekonomik açıdan faaliyet gösteren Fethiye Tarımsal Kalkınma Kooperatifinin finansal analizinin yapılması amaçlanmıştır. Kooperatif bölgede önemli bir geçim kaynağı olan arıcılık konusunda faaliyet göstermektedir. Çalışmanın ana materyalini kooperatifin 2005-2013 dönemine ait bilanço ve gelir tabloları oluşturmaktadır. Kooperatifin bilanço ve gelir tablolarından yararlanılarak finansal oran analizi yapılacaktır. Elde edilen bulgular ile kooperatifin belirtilen dönemdeki finansal durumu analiz edilecektir.

**Keywords:** Kalkınma Kooperatifi, Finansman, Oran analizi, Fethiye

**SERADA SEBZE ÜRETİMİNDE KREDİ KULLANIMI VE FİNANSMAN RİSKİ:  
ANTALYA İLİ ÖRNEĞİ**

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**Abstract:**

Tarım sektörünün doğal koşullara bağlı olmasından kaynaklanan özellikleri, bu sektörü pek çok açıdan diğer sektörlerden farklı kılmaktadır. Üretimin ve gelirin mevsimsel ve kesikli olması risk ve belirsizliklerin diğer sektörlerle göre daha fazla olmasına yol açmakta işletmelerin sermaye yetersizliği, uzun vadeli planlama ve finansman sorunlarını yaşamalarına neden olmaktadır. Bu sorunlar tarım işletmelerinde işletme dışı kaynaklara sıkça başvurulmasını zorunlu kılmaktadır. Bu nedenle, tarımsal krediler işletmelerin sürdürülebilir üretim yapabilmeleri açısından büyük önem taşımaktadır. Tarımsal ürünlerin genellikle yılda bir kez satılması ve üretimi için tüm yıl boyunca masraf yapılmasının gerektiği gibi hususlar nedeniyle sermayenin devir hızı yavaş olmakta, tasarruf yoluyla sermaye oluşturma'nın güçlüğü nedeniyle kullanılabilir sermaye genellikle yetersiz kalmaktadır. Bu durum, Türkiye'de tarım işletmelerinin modernleşmesini, üretimin artmasını ve üreticilerin gelir düzeylerinin yükseltilmesini engellemektedir. Sermaye yetersizliği içerisinde bulunan üreticilerin üretim faaliyetlerine devam edebilmeleri, girdi alımını ve yatırımlarını aksatmadan yapabilmeleri için uygun şartlarla desteklenmeleri gerekmektedir.

Bu araştırmada, Antalya'da serada sebze üretim faaliyetine yer veren işletmelerde kredi kullanımı, üreticilerin kredi kullanımına yönelik görüşleri ve finansman riski konuları incelenmiştir. Çalışmada, bu üretim faaliyetinde üreticilerin karşılaştıkları finansman risklerine karşı uygulayabilecekleri risk yönetimi stratejileri araştırılmış, sözleşmeli üretim ve sürdürülebilirlik konusundaki görüşlerine yer verilmiştir. Çalışmanın birincil kaynağını Antalya ilinin Merkez ilçelerine ait köylerde serada sebze üretimine yer veren 50 adet işletmede uygulanan anketlerden elde edilen veriler oluşturmuştur. Anket uygulaması 2018 yılında yapılmış olup, elde edilen veriler SPSS programında değerlendirilmiştir.

**Keywords:** Kredi, Finansman, Risk yönetimi, Sera Üretimi, Antalya

**SPATIAL VARIABILITY ANALYSIS OF NITRITE AND NITRATE WASHING IN  
IRRIGATION AREA OF ANTALYA OSMANKALFALAR POND**

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**Abstract:**

In this study, it is aimed to reveal the spatial distribution of nitrite (NO<sub>2</sub>-) and nitrate (NO<sub>3</sub>-) contents which have become a problem in soil and groundwater as a result of the using chemical fertilizers and pesticides for irrigation in agricultural areas in the Osmankalfalar Pond irrigation area in Antalya in recent years. For this purpose, samples were taken from underground observation wells drilled in the existing irrigation field and nitrite and nitrate analyzes were performed. In this study, geostatistics analyzes were carried out in order to reveal the spatial distribution of nitrite and nitrate contents of water samples taken from known sampling points. Geostatistics of semivariogram analysis and Ordinary Kriging methods were applied. As a result of the research, models of nitrite and nitrate contents of the region were extracted and accuracy analyzes and models were compared. In addition, spatial distributions of nitrite and nitrate contents in the irrigation area were determined.

**Keywords:** Graund-water, Nitrite, Nitrate, Geostatistical analysis

**DETECTION OF BURNED AREAS BY SENTINEL-2 SATELLITE IMAGES: ANTALYA KUMLUCA FOREST FIRE EXAMPLE**

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**Abstract:**

Forest areas have a great importance in the ecosystem with flora and fauna diversity in the world. On the other hand, forest fires has great importance among the natural disasters in terms of giving harm to living beings and the environment. Therefore, accurate and rapid detection of fire-damaged areas, calculation of environmental losses in fire management, defining of planning strategies and subsequent planning of vegetation restorations are extremely important. In recent years, remote sensing technology has been widely used in the detection and mapping of fire damaged areas. In this study, The Sentinel-2 satellite has the bands in the new near infrared (NIR) and short wave infrared (SWIR) spectral regions which contain more spectral information and enable the development of indices used for mapping the burned areas. In this study, Normalized Burned Ratio (NBR), Burned Area Index (BAIS2) and Normalized Differential Vegetation Index (NDVI) developed from spectral bands of Sentinel-2 satellite images. Difference Normalized Burned Ratio (NBR) and Difference Normalized Vegetation Index (NDVI) obtained from the difference of these indexes and tested in burned areas. As a result of the research, burned areas were evaluated with General Directorate of Forestry and Copernicus Emergency Management (EMS) data and the mapping and burning intensity levels created by European Forest Fire Information System (EFFIS) furthermore comparisons were made.

**Keywords:** Sentinel-2, Burned Area Index, NBR, BAIS2



**MECHANISMS AND MANAGING OF HERBICIDE RESISTANCE IN PLANTS**

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**Abstract:**

The control of weeds in crop areas is one of the key steps to improve yield due to increasing of the world population very fastly. In recent decades, herbicides have turn into the most effective conducting tool for satisfactory weed control. Herbicides have a large usage about %47 percent worldwide, and herbicides are ranked as first among pesticide. The target of herbicides in the plant is one or more regions. These target regions are designated as sites of action which can be such as enzyme proteins, non-enzyme proteins, and cell division mechanism. Herbicide resistance is a result of an evolutionary process that is effected from genetic factors, weed species, herbicide chemistry, and application conditions. Mechanisms of herbicide resistance can be mainly classified as target site resistance, non-target site resistance, cross resistance and multipleresistance. However, within each category there are distinct resistance mechanisms.

In order to overcome this problem, the diagnosis and the type of herbicide resistance must be accurately carried out. It may be the most important stage during the management of herbicide-resistant weeds. This presentation aims to summarize the current state of understanding on herbicide resistance, current methods for overcoming that problem and predictions for future research on herbicide resistance may be headed.

**Keywords:** Herbicide resistance; mechanisms of herbicide resistance; managing of resistance

**IMPORTANCE OF LEGUMES IN NITROGEN FIXATION**

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**Abstract:**

Nitrogen is essential for life because it is found in the structure of proteins and nucleic acids found in animal, plant and microorganism cells. There is 79% nitrogen in the air and it is the most common gas. However, it is present in the soil in a limited amount. Millions of people in developing countries cannot grow yielding crops due to lack of nitrogen in the soil. This is because nitrogen gas cannot be used directly by most organisms and nitrogen must first be converted to ammonia by some bacteria. Biological nitrogen fixation is the fixation of elemental nitrogen in the atmosphere by microorganisms. Nitrogen is generally accepted as the most important factor determining plant yield. The importance of symbiotic nitrogen fixation is increasing due to the increasing need for protein in the world and the environmental problems during the production and use of mineral nitrogenous fertilizers. It is accepted that the amount of nitrogen that is biologically bound is 175 million tons / year. About 50% of this nitrogen is supplied by the Legume-Rhizobium association. Biological nitrogen fixation is especially important in problematic agricultural areas. In addition, biological nitrogen fixation is the cheapest, greenest and most effective method.

**Keywords:** Rhizobium, Legumes, Biological nitrogen fixation

THE IMPORTANCE OF LEGUMES IN NUTRITION

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**Abstract:**

People provide the protein requirement from animal and vegetable sources. Vegetable proteins are preferred because they are cheaper and healthier than animal proteins. Legumes are one of the vegetable-based foods that are important in human nutrition. They have many advantages in terms of nutritional value compared to other vegetable-based foods. Legumes are a rich source of protein with 20-40% and degree of protein digestibility (78%) is quite high. It is sufficient in terms of essential amino acids especially lysine. Legumes are very rich in minerals, especially potassium, phosphorus, calcium and iron, and contain large amounts of dietary fiber (18% in pea, chickpea and lentil, 28% in bean). It is also rich in group B vitamins. Legumes such as soybean and peanuts have an important place in terms of oil and soybean oil cake is widely used in animal feed. Thanks to these high-quality nutrients, the role of legumes in the prevention of common diseases such as heart disease, cancer and obesity is increasingly recognized.

**Keywords:** Legumes, Human nutrition, Protein, Vitamins, Minerals

PLANT GROWTH PROMOTING ACTINOBACTERIA FROM HALOPHYTE PLANT ROOTS

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**Abstract:**

Crops require nutrition and cofactors to grow. These requirements are normally fulfilled by biological food cycles in nature. In order to improve agricultural production, a cleaner and more environmentally friendly approach is needed worldwide. This approach requires employing naturally accessible plant growth regulatory compounds or natural producers of such compounds. Actinobacteria are one of the bacterial groups that can be used as microbial fertilizers. Soil-dwelling actinobacteria are a group of microorganisms which can survive extreme habitats such as arid and alkali soils and also can degrade complex polymers such as cellulose and chitin. We aimed at isolating plant growth promoting actinobacteria from rhizosphere and underground parts of halophyte plants. Therefore, selective isolation of actinobacteria were conducted from rhizosphere and roots of the plant samples of *Atriplex hastata* L., *Spergularia marina* (L.) Griseb., *Tripolium pannonicum* (Jacq.) Dobrocz., *Ammophila arenaria* (L.) Link and *Sedum eriocarpum* Sibth. & Sm. distributed in the Black Sea coast, and then the actinobacteria were analysed for the production of indole acetic acid (IAA), siderophore and ammonia, and for nitrogen fixation, phosphate solubilisation and 1-aminocyclopropane-1-carboxylate (ACC) deaminase activity. The strains positive for at least one test were identified at the genus level by the 16S rRNA gene sequence analysis. Accordingly, the strains were identified as members of the genera *Streptomyces* (19 strains) and *Micromonospora* (3 strains). These strains will be investigated for their suitability for usage as microbial fertilizers in the foreseeable future.

**Keywords:** Endophyte, Halophyte plants, Microbial fertilizer, Rhizosphere

THE PHYSICAL AND ANTIOXIDANT PROPERTIES OF GLUTEN-FREE THIRD GENERATION SNACKS ENRICHED WITH GINGER

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**Abstract:**

In this study, gluten-free corn-based third generation snacks containing 3% ginger powder were produced at different screw speeds (240 and 320 rpm) in an extruder. Half products were expanded with microwave for 2 different heating time (30 and 40 s). The color value (CIE; L\*, a\*, b\*), bulk density (BD), expansion index (EI) and antioxidant activities (total phenolic contents [TPC], 1,1-diphenyl-2-picryl-hydrazyl [DPPH] scavenging activity, ferric reducing antioxidant power [FRAP], cupric ion reducing antioxidant capacity [CUPRAC]) of half and expanded products were examined. According to results, BD of all half products decreased with microwave heating. Maximum EI values were found as 2.06 in ginger added and 40 s microwave-expanded sample. Lightness (L\*) of half product increased with 30 s microwave heating, but decreased with 40 s microwave heating time. Ginger addition and screw speed also affected the L\* values of half products. Redness (a\*) of half products increased with screw speed. Yellowness (b\*) were increased with ginger addition. In addition to these, ginger added extrudes had higher antioxidant activities than control samples and the effect of screw speed and heating were also important. The ginger added and 40 s microwave-expanded sample possessed the highest antioxidant activity (46.65 mg trolox/100 g in DPPH, 88.39 mg gallic acid/100 g in TPC, 324.86 mg FeSO<sub>4</sub>/100 g in FRAP and 344.95 mg trolox/100 g in CUPRAC). As a result, it could be concluded that screw speed, microwave heating and addition of ginger affected the physical and antioxidant activities of gluten-free third generation snacks.

**Keywords:** Gluten-free snack, extrusion, microwave, antioxidant, ginger

**THE EFFECT OF ADDITIONAL ORGANIC ZINC ON MILK YIELD AND  
REPRODUCTIVE PARAMETERS IN THE TRANSITION COW**

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**Abstract:**

This study was conducted to determine the effects of organic zinc on some reproductive parameters in transition dairy cows. Twenty primiparous cows were used as study material. Cows assigned into two groups as control (C) and treatment (Z). Groups were similar in live weight, parity and body condition score. Experimental part of the study has begun 3 weeks before parturition and ended at 3 weeks after parturition. All cows were consumed same diet. Organic zinc (5 g/day per head, Optimin, Throuw Ntr) Oral presentationsly administrated to cows in group Z shortly after the morning milking. Milk yield, open days, rate of insemination per conception, rate of days for first oestrus after parturition were achieved from Dairy Plan herd management systems (Gea Farm Tech/Germany). Milk yield was similar between groups. Days open, insemination per conception, days from parturition to first heat were mathematically decreased, calving interval was statistically decreased in group Z as compared group C ( $p<0,05$ ). It is concluded that Oral presentationsly administration of organic zinc has no affect on milk yield, may improve reproductive performance, in dairy cows throughout transition period.

**Keywords:** Organic Zinc, Cow, Yield, Reproduction

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**DETERMINATION OF ADULTERATION IN FEEDS BY USING FT-NIR TECHNOLOGY**

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**Abstract:**

Every year economic losses worth of billions of dollars are caused by adulterants in animal feed throughout the world because the safety and quality food and feed are matter of public health concern. So there is a dire need to develop standard methods for detection of these animal feed adulterants for producers and cereal manufacturers to ensure safety of feedstuff. In this scenario some chromatographic reference methods are in-practice but these are time consuming and costly. Thus, alternative methods such as infrared spectroscopy are increasingly in demand to provide simple, rapid, and nondestructive methods to detect the animal feed adulterants. The adulterated feed is a serious health risks to meat producing animals as well as to the ecosystem. Over the past few decades, the adulteration practices in animal feeds have become common to gain benefits in the form of money and these pose a risk not only to the animals but also to human beings. In order to ensure the health of animals and consumer safety, some state-of-the art technological advancements to help in detecting and identifying the adulterants in food products and feed are important. This article reviews research conducted in past regarding the use of Fourier transform near-infrared (FT-NIR) and other related technologies to detect adulteration in feed samples.

**Keywords:** Adulteration, Feed, FT-NIR

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**MONITORING PHYSIOLOGICAL DEVELOPMENT PERIODS OF CITRUS TREES USING SENTINEL-1 (SAR) IMAGES**

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**Abstract:**

Optical and radar images obtained by remote sensing can be used for monitoring and mapping of crops. In recent years, Sentinel Satellite images launched by Copernicus program of the European Space Agency (ESA) have met an important need in this regard since they are up-to-date and free of charge. In this study, it is aimed to monitor parcels, considering the physiological developmental periods of young, middle age and old citrus trees produced in province of Antalya. Primarily, parcel boundaries of citrus orchards are determined by digitization of high spatial resolution optical data. Then, the vector data matched with Sentinel-1 images and analyses were conducted for monitoring in these areas. In this context, 12 SAR images were obtained for each month of 2018 and each image was analyzed and reflection graphs of citrus orchards with different ages are obtained. As a result of this research, SAR reflections of citrus orchards with different ages were interpreted by considering physiological development periods of the plant.

**Keywords:** SAR, crop monitoring, precision farming



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**DETECTING LAND USE DYNAMICS BY MEANS OF REMOTE SENSING METHOD: A CASE STUDY IN ANTALYA**

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**Abstract:**

In this study, land use changes within the boundaries of the Metropolitan Municipality of Antalya from 1999 to 2019 were determined by Landsat Satellite images. After this process, the estimation of spread trend of the usage type which has increased significantly has been made for the year 2029. The process of creating land use map was carried out by supervised classification using Random Forest method which is a machine learning algorithm. Then, accuracy analysis was applied to the classified images and land use percentages of the area were determined. According to the classification results, significant differences were determined between the spatial distribution of all land use classes. The most important change in the classification occurred in Urban Fabric. The increase in the Urban Fabric has led to a decrease in the agricultural areas and large portion of these areas are transformed to Urban Fabric. The rapid increase in Urban Fabric is associated with factors such as the increase in the population and the migration of rural people to the city. Finally, a trend estimation was performed for the next 10 years. In this context, possible Urban Fabric area of 2029 was obtained.

**Keywords:** urbanization, environment, trend analysis, land use

VARIATIONS OF HERB LAYER DIVERSITY IN RELATION TO FOREST MANAGEMENT IN TEMPERATE MIXED FORESTS OF IRAN

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**Abstract:**

Understory plant diversity is considered as relevant indicators for human impact and evaluate biodiversity in ecosystem-based forest management. Hyrcanian forests (in Iran) are managed with single tree selection systems. The aim of this paper is to address the following questions: Does single tree selection management lead to change herb layer diversity in managed forests compared to unmanaged forests? Three lowland mixed forests and three upland mixed forests were selected. Managed stands were compared to stands that had not been managed since at least 30 years at each of the six sites. A total of 120 plots were established (10 plots within each forest to record the percent cover of each plant species. Comparison between species richness and diversity indices in managed vs. unmanaged forests was done with Mann Whitney test. Non-metric multidimensional scaling ordination (NMDS) was used to investigate variations of species composition in managed and unmanaged forests. Generalized linear models (GLM) were employed to analyze the effect of management on species diversity indices. The results showed that that there was no significant difference between in managed and unmanaged forests respect to total cover and diversity measures. GLM analysis illustrated that forest management didn't have significant effect on species richness, species evenness and Shannon diversity. Also NMDS was demonstrated that managed and unmanaged sample plots were not ordinated by variation of their species composition. It was concluded that the single tree selection method operated in the managed forests is a suitable approach to maintain herb layer diversity in Hyrcanian forests.

**Keywords:** Forest management, Species diversity, Hyrcanian forests, Iran

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**MOLECULAR DEFENSE REACTIONS ON PEARS AGAINST *ERWINIA AMYLOVORA* INFECTION**

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**Abstract:**

*Erwinia amylovora* is the causal agent of fire blight, which is the most devastating disease of apple, pear and some other members of the family Rosaceae. This study examined the possible involvement of antioxidative enzymes (hydrogen peroxidase, ascorbate peroxidase, superoxide dismutase, glutathione peroxidase, catalase, phenylalanine ammonia-lyase), arbutin and proline accumulation, chlorophyll concentration levels, pH variation following proton extrusion of plants, sorbitol content in phloem tissues, biofilm formation using amylovoran production deletion mutant cells (Delta-ams), total protein amounts in the initiation of infection of pear cultivars by the pathogen. Three year old seedlings were grown in individual pots in the greenhouse at 25°C ±2 and in 60-65 % relative humidity and under natural photoperiod conditions. Shoots of susceptible cultivars (Santa Maria and Williams) and tolerant cultivar (Ankara) were artificially inoculated with a suspension (10<sup>8</sup> CFU ml<sup>-1</sup>) with highly virulent strain Eakb29 in the spring and autumn. The variation of chlorophyll a and chlorophyll b ratios and positive effects of light on the appearance of the first disease symptoms were observed in pears. Ankara variety has the highest total protein content, and while total protein concentrations at 6th and 12th hours increased, a decrease in the amount of 24th hour. The increase in bacterial resistance was correlated with an increase in root ferric reductase level activity and leaf iron content. Delta-ams mutant cells were nonpathogenic and died rapidly following inoculation in pear shoots. Arbutin and proline accumulation, and chlorophyll concentration levels increased, hydrogen peroxidase showed the highest activity in all pear cultivars. Understanding host pathogen interactions might be provided an excellent additional tool for fire blight control.

This study was supported by Selcuk University Scientific Researches Coordinators (BAP)

**Keywords:** pear, fire blight, enzyme, protein, defense, control

**SOME MORPHOLOGICAL CHARACTERISTICS OF GENE POOL FROM THE HYBRIDIZATION OF LOCAL TOMATO GENOTYPES AND SOME COMMERCIAL TYPES**

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**Abstract:**

The determination of different gene sources is important for plant breeding studies, therefore local genotypes are interesting. In this study picked up local genotypes and hybridized local genotypes with commercial types were improved for some traits such as post harvest, resistance disease in this way a gene pool was obtained and after two times self polinated this gene pool some morphological traits were determined. While anthocyanin formation was observed in 130 of 136 seedlings, plant growth power was determined as 'medium' in 90 of them. Shape of plant growing was observed as determinate in 70 genotypes. The longest stem internode was measured 10 cm in 1\*4 genotype. The thickest stem internode was measured 19.3 mm in 5\*13 genotypes. While the heaviest fruits were 244 gr in 5\*15 hybrids, the lightest fruits were 27 gr in 11\*16 genotype. While the widest fruit was 74 mm in 1\*6 genotype, While the widest fruit was 74 mm in 1\*6 genotype, the lowest width fruit was 27mm in 1\*16 genotype. While the longest fruit was 100 mm in 5\*5 genotype, the minumum height of fruit was 33 mm in 10\*17 genotype. Mature fruit colour were different, 3 pink, 6 red and 37 light red tomatoes were observed. The rate of dry matter was observed between 2.6 and 4.8. Nine different groups was created from combinations via result of clustered analysis. According to the result of basic component analysis (PCA) , totally % 65. 208 rate of variations were obtained. As a result of the research, it has been formed with half way materials which are thought to be used in obtaining qualified varieties or varieties whose characteristics are determined. As a result of the research, half way materials which are thought to be used in obtaining qualified variety or varieties whose properties are determined have been obtained.

**Keywords:** Tomato, local, Genotypes, Morphologic characteristics

**ORAL PRESENTATIONS / III. International Eurasian Agriculture And Natural Sciences Congress**

**ASSESSMENT OF STABILITY OF VARIETIES OF APPLE FRUIT TO FIRE BLIGHT**

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**Abstract:**

A bacterial fire blight is a dangerous disease of plants of the Rosaceae family caused by the bacterium *Erwinia amylovora*. Today this disease is registered in more than 40 countries of the world, including Kyrgyzstan. The fruiting plantations of Kyrgyzstan occupy an area of more than 5% of the total number of agricultural land; therefore, the aggressive development of this disease poses a serious threat to our gardens, as well as wild plants of natural walnut-fruit forests.

One of the measures to combat a bacterial burn is the search for apple varieties that are resistant to this disease. The most resistant varieties found can be used to create gardens in areas where outbreaks of fruit burns occur, or to cross with other varieties and to breed new resistant crops.

To study the assessment of the susceptibility of various varieties of apple trees to a bacterial fire blight, 17 varieties of apple fruits were tested. The fruits of the apple tree were collected from the collection of the Botanical Garden named after E.Z. Gareev of NAS KR.

Thus, according to generally accepted phytobacteriological methods (Methods in Phytobacteriology (Ed. Klement F., Rudolf K. & Sands DC), Budapest: Akademiai Kiadó (HU), 1990), the bacterial culture of *Erwinia amylovora* strain J7 was infected with apple fruits, their tested by the wet chamber method in sterile Petri dishes. Whole fruits were used, as well as cut fruits. The one-day bacterial culture was inoculated into a sterile buffer with PBS solution, and the skin was punctured using disposable syringes and a bacterial culture was introduced in an amount of 10 µl (10<sup>9</sup> cells/ml) to a depth of 5 mm. The test was performed in triplicate. The assessment was carried out visually at 2-7 days after infection. The end result was expressed in the degree of susceptibility. Among the varieties of apple fruits, according to preliminary analysis, the Discovery and Vkusnaya varieties have increased resistance to bacterial fire blight. Varieties Starkrimson, Aichurek, Ostankino, Ainur and Borovinka are medium resistant, the remaining varieties were particularly susceptible to bacterial fire blight.

**Keywords:** resistant, varieties, *erwinia amylovora*, fire blight, Kyrgyzstan

CU AND ZN SPECIATION IN MODEL SOIL CONTAMINATION

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**Abstract:**

The fractional composition of Cu and Zn in the Haplic Chernozem under the artificial contamination of acetates in the dose of 300 mg/kg and 2000 mg/kg was studied. To determine the speciation of the investigated metals was used the conventional BCR method (Ure et al., 1993). In uncontaminated soils, the major part of Cu and Zn (68- 70% of the sum of fractions) is retained in the crystalline lattices of primary and secondary minerals, which makes them inaccessible for living organisms. The mobility of Cu and Zn is low, the relative content of acid-soluble fraction is 2-3%. Under contamination conditions, there is a significant increase in the Cu compounds associated with organic matter (up to 28%). The Cu content in the acid-soluble fraction increases sharply in the contaminated samples (up to 9%). In the uncontaminated soil, the organic fraction appreciably contributes to Zn fixation; however, non-silicate Fe compounds become the main Zn-sorbing component under contamination conditions (after the residual fraction). The influence of this fraction in Zn absorption on the pollution dose of 2000 mg/kg is especially noticeable, the share of Fe-Mn oxides contain to 30%.

This research was supported by the Council of the grants of the President of the Russian Federation (project no. MK-4015.2018.5), Russian Foundation for Basic Research (projects no. 19-29-05265\_mk, no.19-34-90185 ).

**Keywords:** Heavy metals, BCR method, soil contamination

**NITRATE LEACHING THROUGH SUBSURFACE DRAINAGE SYSTEM UNDER  
CROPPING CONDITIONS**

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**Abstract:**

Surface water quality and quantity is greatly affected by the agricultural drainage and water management practices. These effects should be considered while designing and managing drainage systems, and its effect on agricultural production. Maximizing productivity and agricultural benefits should not be prioritized over water quality and environmental requirements. This research which is currently under progress will describe the transport and fate of N-nitrates and the application of various simulation models to predict the effects of the design and management of underground drainage systems for nitrogen losses and crop yields. This research will involve the use of the DRAINMOD water management model which has been tested and used extensively in water management sites at the basin and watershed level. For poorly drained soils a newer versions of DRAINMOD include nitrogen cycle routines to assess the impact of water management on the fate of nitrogen and its transportation in these types of soils. The research is currently going on in Punjab India, under the area which is highly waterlogged and the objective of the study will be to simulate the nitrate movement, optimize the design parameters of the already installed drainage system and finally a nitrogen balance will be predicted for the study area.

**Keywords:** Nitrate Leaching, Subsurface Drainage, Simulation Models

**NORMALİZE EDİLMİŞ SAYISAL YÜZEY MODELİ (nDSM) İLE BİTKİ BOYU ÖLÇÜMÜ  
VE VERİM İLİŞKİSİ**

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**Abstract:**

Tahıllar tüm dünyada ve ülkemizde insan beslenmesi açısından ayrı bir öneme sahiptir. Bu nedenle artan nüfusa bağlı olarak temel gıda maddelerinin ana kaynağı olan tahılların üretim alanlarının artırılmasının yanı sıra mevcut üretim alanlarından alınacak verimin artırılması da gerekmektedir. Bu çalışmada, makarnalık buğday çeşidinde farklı yöntemlerle elde edilen bitki boyu ölçüm değerleri ile verim parametresinin karşılaştırılması amaçlanmıştır. Çalışmada, makarnalık buğdayın farklı iki vejetasyon döneminde insansız hava aracı (İHA) ile 10 m yükseklikten elde edilen ortofoto ve sayısal yüzey modeli ile yersel ölçüm değerleri kullanılmıştır. Araştırma sonucunda İHA ile elde edilen bitki boyları, yersel ölçüm değerleri ile karşılaştırılmış ve tahmin edilen yükseklik değerleri ile yer gerçekleri arasında bitkinin iki farklı gelişme dönemi için istatistiksel olarak önemli ilişkiler bulunmuştur. Bu bulgular, İHA ile verimle ilişkili olan bitki yüksekliğinin son derece hassas bir şekilde belirlenebileceğini göstermektedir.

**Keywords:** Bitki boyu, Buğday, İHA, Tahıl



**AŞIRI YAĞIŞLAR SONUCU ZARAR GÖREN ALANLARIN SENTETİK AÇIKLIKLI RADAR (SAR) GÖRÜNTÜLERİ İLE TESPİT EDİLMESİ**

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**Abstract:**

Uzaktan algılamada uydu görüntüleme sistemleri son yıllarda doğal afet yönetiminde sıkça kullanılmaktadır. Bu kapsamda kendi enerji kaynağını kullanan, kötü hava koşullarından etkilenmeyen, gece ve gündüz görüntü verebilme kabiliyetine sahip Sentetik Açıklıklı Radarlar (SAR) genellikle tercih edilmektedir. Bu çalışmanın amacı, Hatay’da meydana gelen aşırı yağışlar nedeniyle Amik Ovasında zarar gören alanların SAR görüntüleri ile belirlenmesidir. Çalışmanın ilk aşamasında, aralık ayındaki yoğun yağışlar öncesine ve sonrasına ait iki farklı tarihli Sentinel-1 SAR uydu görüntüleri temin edilmiştir. Ayrıca bu aşamada her iki görüntüye de radyometrik kalibrasyon, benek filtresi ve geometrik olarak arazi düzeltme ön işlem adımları uygulanmıştır. Ön işlem adımlarından sonra elde edilen görüntüler Universal Transverse Mercator (UTM) projeksiyonunda ve World Geodetic System (WGS84) datumunda tanımlanarak analize hazır hale getirilmiştir. Çalışmanın ikinci aşamasında görüntüler layer stack işlemi ile birleştirilerek obje tabanlı sınıflandırma yöntemi ile analiz edilmiştir. Obje tabanlı sınıflandırmanın segmentasyon aşaması, çoklu çözünürlüklü segmentasyon algoritması ile sınıflandırma aşaması ise eşik değeri kullanarak gerçekleştirilmiştir. Çalışmanın son aşamasında, sınıflandırma işlemi sonucu elde edilen ve aşırı yağışlar nedeniyle zarar gören alanları gösteren veri, vektör formatında Coğrafi Bilgi Sistemleri (CBS) ortamına aktararak alansal değerler elde edilmiştir. Bu değerler, Hatay Valiliği’nin 11 Ocak 2019 tarihli basın açıklamasında yer alan ön hasar tespit çalışmalarına ait veriler ile karşılaştırılarak değerlendirmelerde bulunulmuştur.

**Keywords:** Amik, Hatay, Obje tabanlı, SAR

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**226RA, 232TH AND 40K LOADS IN DIFFERENT TISSUES OF CULTURED RAINBOW TROUT (ONCORHYNCHUS MYKISS, WALBAUM 1792)**

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**Abstract:**

The aim of the study is to determine natural radionuclide loads in different tissues of rainbow trout grown in fish farm. For this purpose, pan sized dead fish were sampled from the rainbow trout farm after the fish harvest. The fish were placed in PE bags and brought to the laboratory in an ice-cold box. The fish were first washed with sterile distilled water. Liver, gill and skin samples were separated. After the pretreatments required for the analysis, 226Ra, 232Th and 40K radioactivity concentrations of the samples were counted for 50000 s with a high resolution germanium detector. According to the findings, 40K, 226Ra and 232Th were accumulated in gill tissue more than other liver and skin. Findings are important for monitoring and improving the quality of rainbow trout produced in aquaculture conditions in terms of natural radionuclide accumulation.

**Keywords:** Oncorhynchus mykiss, aquaculture, 226Ra, 232Th, 40K

**ERÇEK GÖLÜ'NDEN İZOLE EDİLEN BACILLUS CİNSİ BAKTERİLERİN  
EKTRASELÜLER HİDROLİTİK ENZİM ÜRETME KABİLİYETLERİNİN  
BELİRLENMESİ VE 16S rDNA ANALİZİ**

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**Abstract:**

Bu çalışmada, Van ilinde bulunan Erçek Gölü'nde belli istasyonlardan alınan su örneklerinden Bacillus cinsi bakterilerin izolasyonu, ekstraselüler hidrolitik enzim aktivitelerinin belirlenmesi ve 16S rRNA analizinin yapılması amaçlanmıştır. Dilusyon plak yöntemi ile 26 Bacillus cinsi bakteri izole edilmiş ve ardından saflaştırma işlemi yapılmıştır. Bu 26 Bacillus cinsi bakterilerin ekstraselüler hidrolitik enzim aktivitesi çalışmaları, 12 izolat ksilanaz aktivitesinde, 7 izolat amilaz aktivitesinde, 22 izolat proteaz aktivitesinde, 25 izolat katalaz aktivitesinde ve 1 izolat lipaz aktivitesinde pozitif sonuç vermiştir. Seçilen 7 izolatın geneomik DNA'sı izole edildikten sonra 16S rRNA gen bölgesinin PCR amplifikasyonu, 27F ve 1492R evrensel primerleri ile gerçekleştirilmiştir. Türler arasındaki genetik uzaklığı belirlemek için Maksimum Likelihood filogenetik ağacı oluşturulmuştur. İzolatların filogenetik ağaçta güçlü bir homoloji ile kümelendiği gözlemlenmiş olup genetik pozisyonları ortaya konmuştur.

**Keywords:** Bacillus, Hidrolitik ekstraselüler enzim, 16S rDNA

**MICROPROPAGATION AND ROOTING OF DIFFERENT BLACKBERRY CULTIVARS (*RUBUS FRUCTICOSUS* L.) WITH CLASSIC AND NEW GENERATION PLANT TISSUE CULTURE TECHNIQUES**

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**Abstract:**

In this study, micropropagation and rooting studies were carried out in comparative Temporary Immersion Plantform Bioreactor system and solid media with five different blackberry cultivars (Black Diamond, Black Pearl, Chester, New Berry and Triple Crown). Micropropagation of blackberry cultivars were evaluated in solid MS media supplemented with BA (0, 1.0, and 2.0 mg/L) and GA3 (0.5 mg/L) for micropropagation, in solid MS media supplemented with NAA (0, 0.5, 1.0, and 2.0 mg/L) and IBA (0, 0.5, 1.0, and 2.0 mg/L) for rooting. Based on the solid media, the best results in all five blackberry cultivars were obtained from MS medium containing 1 mg/L BA plant growth regulator concentration for micropropagation and the best results in all five blackberry cultivars were obtained from MS medium containing 1 mg/L NAA plant growth regulatory concentration for rooting. Micropropagation and rooting studies were carried out in the Plantform system with the best-defined media content. As a result of studies, Plantform system showed better plant growth, multiplication coefficient, plant quality and rooting than solid culture system for all five blackberry kinds. Plantform bioreactor system was evidenced as a more effective method in terms of micropropagation and rooting compared to solid culture media with this study.

**Keywords:** Plantform Temporary Immersion Bioreactor Systems, Blackberry, *Rubus fruticosus* L., Micropropagation

AN ALTERNATIVE APPROACH TO CONTROL OF MULTIPLE ANTIBIOTIC RESISTANT BACTERIA

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**Abstract:**

In this study, the antibacterial and antibiofilm activities of p-cymene on multiple antibiotic resistant *Stenotrophomonas maltophilia* and staphylococci strains were determined. The synergistic activity of the combination of p-cymene with gentamicin and trimethoprim-sulfamethoxazole (TMP-SXT) on *S. maltophilia* strains were also determined. The standard test strains *Staphylococcus aureus* ATCC 25923 and *Escherichia coli* ATCC 25922 were used. The antibacterial activity was determined with disc diffusion and agar dilution methods. The antibiofilm activity was determined with the microplate biofilm method using MTT. The synergistic activity of the combination of p-cymene with antibiotics at 25, 12.5 and 6.25 mg/ml concentrations were evaluated in agar media. The strongest antibacterial activity of p-cymene was observed on *S. maltophilia* MU 99. p-cymene exhibited slight activity of all of the tested bacteria. According to the synergistic activity results, the combination of the p-cymene (25 and 12.5 mg/ml concentrations) with gentamicin and TMP-SXT exhibited synergic activity on *S. maltophilia* strains. The p-cymene has various antibiofilm activity rates on test strains. The maximum antibiofilm activity was observed on *S. maltophilia* MU 64 and *S. maltophilia* MU 94 strains (40%). According to the results, the combinations of p-cymene with antibiotics can be used for treatment of the infections, which caused resistant *S. maltophilia* strains. The antibiofilm activities of this compound are important for combat of this resistant strains. This study is a part of the Master of Science thesis of Aslı Yapucu and was supported by the Scientific Research Project Unit of Mugla Sıtkı Kocman University, through the Grant number 15/180.

**Keywords:** *Stenotrophomonas maltophilia*, *Staphylococcus aureus*, Synergic activity

THE ANTIMICROBIAL AND ANTIBIOFILM ACTIVITIES OF *Laurus nobilis* L. ON ORAL STREPTOCOCCI

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**Abstract:**

In this study, the antibacterial and antibiofilm activities of *Laurus nobilis* L. essential oil and its major compound eucalyptol on the oral pathogens *Streptococcus mitis* DSMZ 12643, *Streptococcus oralis* DSMZ 20395, *Streptococcus sobrinus* DSMZ 20742, *Streptococcus parasanguinis* DSMZ 6778 and *Streptococcus sanguinis* DSMZ 20068 strains were determined.

The essential oil was obtained with hydrodistillation using Clevenger apparatus. The antibacterial activity of the essential oil and eucalyptol on oral pathogens were determined by disc diffusion and tube dilution methods, the antibiofilm activity was determined by crystal violet method.

The highest inhibition zones of *L. nobilis* essential oil and eucalyptol was observed on *S. oralis* DSMZ 20395. The Minimum Inhibition Concentration (MIC) of the essential oil and eucalyptol were determined between 2.5-7.5 mg/ml. *L. nobilis* essential oil showed the highest antibiofilm activities against *S. sanguinis* DSMZ 20068 (96.02%) at MIC concentration and *S. sobrinus* DSMZ 20742 (96.06) at MIC/2 concentration.

As a result of this study, it was concluded that essential oil of *L. nobilis* has a potential preventive effect on oral streptococci that cause caries and thus these natural agents may be used effectively against biofilm formation of the oral streptococci.

This study was supported by the Scientific Research Project Unit of Mugla Sitki Kocman University, through the Grant number 17/125.

**Keywords:** Lauraceae, Streptococci, Inhibition, Antibiofilm

**META-DATA ANALYSES OF ASCORBIC ACID CONTENT IN STRAWBERRY UNDER  
VARYING CONDITIONS**

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**Abstract:**

Ascorbic acid has numerous critical functions in plants as well as animals. It serves as an essential vitamin (C) in humans and is taken in the form of food to meet daily requirements. Mainly ascorbate acts as an antioxidant and plays role in fight against stress. The evaluation of ascorbic acid content in various foods and food products is being considered a main component of quality determination. Strawberry is one of the most popularly consumed fruits and is known for richness in vitamin C. Many recent studies have focused on understanding the changes in ascorbic acid content in different fruits and vegetables under varying conditions. The studies pertaining to variation in ascorbate content in strawberry have a direct significant impact on other commercially important members of Rosaceae family. A brief outlook on analyses of meta-data obtained from research conducted in previous decades on vitamin C content in strawberry is presented here. The meta analyses covered data from a range of possible conditions including different cultivars, seasons, production regions and systems, fruit maturity, light and temperature conditions, substrate and fertilizer application, irradiation effects and postharvest treatments. Ascorbic acid content has been shown to greatly vary under the influence of these conditions. Some very evident trends of variation in vitamin C content were observed under particular environmental conditions which are discussed. The insights from these analyses of meta-data would give a better comprehension on changes in vitamin C content in strawberry fruits under stress conditions.

**Keywords:** Ascorbic acid, meta-data, vitamin-C, strawberry

IDENTIFICATION OF PHYTOCHEMICALS AND INVESTIGATION OF ANTIOXIDANT CAPACITIES OF *ACHILLEA GYPSICOLA* HUB.-MOR. IN DIFFERENT PLANT PARTS AND AT PHENOLOGICAL STAGES

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**Abstract:**

Phytochemicals which are commonly found at different levels in many medicinal plants, are natural strong antioxidants used in traditional medicine. In this paper, phytochemical compositions and antioxidant capacities of *Achillea gypsicola* root-stem, leaf, flower, flower head samples were evaluated periodically (pre- full and post flowering) and daily. Total phenolic and flavonoid contents were determined by spectrophotometric methods and antioxidant capacities were evaluated by DPPH, RP and MCA assay. In addition, the phenolic acid and flavonoid compositions were evaluated by RP-HPLC. This study presented a comprehensive report for the first time on evaluation of the phytochemical composition and the biological properties of *A. gypsicola* at different phenological stages. Full flowering stage was found as the richest period in terms of analyzed phenolic acid and flavonoid compositions of *A. gypsicola* for the first time. The species examined in this research showed a high antioxidant activity in comparison to other studies with *Achillea* species. Besides, a high correlation between antioxidant activity and phytochemical content of *A. gypsicola* was found. These results suggest that *A. gypsicola* can be used as a safe source in the cosmetic, food and pharmaceutical industries.

**Keywords:** Developmental stage, Harvesting times, Phenolic compounds, Turkish yarrow



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**COPII COATED VESICLE COMPONENTS IN CHLAMYDOMONAS REINHARDTII**

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**Abstract:**

The secretory pathway has an essential role in the localization of proteins to correct subcellular compartments in all eukaryotes. An initial step in cargo sorting is the budding of COPII coated vesicles from the ER and their trafficking to the cis Golgi network in a process called anterograde transport. The inner layer of the COPII coat contains Sar1 GTPase, SEC23 and SEC24 proteins. While *C. reinhardtii* is an excellent model organism for cell biology, it has not been used for functional analyses of components of COPII vesicles. *C. reinhardtii* has paralogs of both the SEC23 and SEC24 genes. Our objective is to determine the functional differences among these paralogs. We plan to use CRISPR technology to generate mutations in each paralog. In addition, we have recently begun to characterize insertional mutant lines in each of these SEC genes. Phenotypic analyses of these mutants will provide insights into the functions of each of them in the trafficking of proteins to their sites of function, especially for proteins of agricultural importance.

**Keywords:** Secretory pathway, extracellular proteins, Chlamydomonas

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**NEXT-GENERATION MOLECULAR METHODS AND NEXT GENERATION BREEDING**

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**Abstract:**

Selection is one of the key components of plant breeding. Breeding science has emerged as a cumulative result of all selection activities, whether intentionally or not, from past to present. The focus of all these breeding attempts is to increase productivity. Increases in productivity are achieved by improving various plant properties and in the meantime it is attempted to be provided with the resistance/tolerance mechanism attained against biotic and abiotic stress elements. In any case, due to the fact that the number of regions controlling the yield and yield components and their position on the genome is located in different points, combining certain genes which are the ultimate goal of the breeding process could be complicated to produce superior varieties. Some genes that can adversely affect the quality of varieties can be transferred and also some desirable genes can be removed from the breeding process. To eliminate this situation and increase the success in developing new requested varieties, exact location and number of complex inherited genomic regions need to be determined by breeders. Identification of these genomic regions and the detection of hereditary forms increase success in breeding. The emergence of new generation DNA sequencing methods brings a different dimension to this development and allows the detection of variations in sequence or structural level with high accuracy and inexpensive cost. Consequently, NGS led revealing genotyping platforms ("SNP chips") that can analyze genomic positions with high accuracy and low cost. The revealing SNP platforms can analyze an individual's genotype at high

**Keywords:** Breeding, GBS, RAD-sequencing, QTL-seq

**RHIZOBIUM AND MYCORRHIZA APPLICATIONS ON DRY BEAN AND SUSTAINABLE AGRICULTURE**

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**Abstract:**

Edible legumes including bean, chickpea, lentil, pea, cowpea and faba beans are essential for human nutrition especially for the people who are limited to reach the animal based foods for several reasons. Edible legumes are the main protein source of more than 2 billion of people over the world welded by higher protein content and especially for lysine amino acid while dry bean is the most cultivated and produced legume crop in the world.

Although the nitrogen is the most occurred element in the atmosphere, it is the most required nutrient for plants. Nitrogen is the main component of important structural material for all the living organisms due to be primary component of protein. Furthermore, nitrogen acts on chlorophyll, enzyme and vitamin composition. Except for some of the bacteria (Amylobacter, Azotobacter, Bacillus, Clostridium, Klebsiella, Rhizobium), blue-green algae (Anabaena, Calothrix, Nostoc, Oscillatoria) and fungus (Mycorrhiza); none of the living organisms including plants are not able to use the nitrogen directly. Rhizobium bacteria are host selective and live as symbiotic by legumes. Effective biological nitrogen fixation provides using less nitrogen fertilizers – which need 20000 kcal energy for only production of 1 kg fertilizer and finally supports sustainable agricultural principles.

Purpose of higher yield from unit area caused to many problems such as using more chemicals, decrease in biologic yield of soil, more environment and health problems. Present paper reviews on those microorganisms related with dry bean applications.

**Keywords:** Agricultural sustainability, environment friendly, fertilizer, inoculation

**MOLYBDENUM APPLICATION AND SYMBIOTIC NITROGEN FIXATION IN  
SUSTAINABLE AGRICULTURE**

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**Abstract:**

Nitrogen cycle in the ecosystem realizes by several ways such as natural and synthetic forms. Atmospheric events (lightning, flash, chemical oxidation, precipitation) and symbiotic living organisms are the natural ways while chemical fertilizer usage that are industry based produced nitrogen components are known as synthetic ways. Sustainability of ecological stability tightly depends on natural nitrogen gain. Several microorganisms such as *Achromobakterler*, *Aerobakter*, *Azotobakterler*, *Pseudomonas* and *Rhizobium* are able to conversion of free nitrogen in the air to inorganic form. Total nitrogen value in the World is known as 386 million kg while its 110 million kg is provided from *Rhizobium* bacteria which are able to symbiotic live by only legumes. Molybdenum is one of the essential element for an active fixation mechanism by acting on nitrogenase enzyme which converts the free nitrogen of air to utilizable form to plant and so structure, quality and quantity of nodules. Present review describes effects of molybdenum application on symbiotic nitrogen fixation mechanism and its highlight on concept of sustainable agriculture.

**Keywords:** Agricultural sustainability, environment friendly, legumes, nitrogen

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**THE CURRENT STATUS OF GREENHOUSE CULTIVATION IN KYRGYZSTAN**

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**Abstract:**

In Kyrgyzstan, with a total area of 199,951 km<sup>2</sup>, agricultural areas have a share of 7% (27 575 000 ha) in the total area. Of this, 68% of field crops, 13% of horticultural crops are grown, while 19% of the fallow land is allocated. Kyrgyzstan has various ecological conditions and enables cultivation of many species of horticultural crops. Protected cultivation also has a considerably important place in this group. Protected cultivation includes production in greenhouses and low plastic tunnels. Kyrgyzstan Ministry of Agriculture has started to keep records of greenhouse data since 2014 and there are 1928 greenhouse growers and 154.9 ha greenhouse area. Greenhouse areas have been reached 200 hectares In 2019. In Kyrgyzstan, the number of greenhouse plants and greenhouse area has increased rapidly for the last 4 years. Regarding the regions, the highest number of greenhouses is seen in Çüy, Oş, Calal-Abad and Batken regions. The current status of the protected cultivation in Kyrgyzstan, expected developments, it's problems and possible solutions were addressed in this article.

**Keywords:** Kyrgyzstan, Greenhouse, protected cultivation, grown vegetables, greenhouse problems

**HASAT SONRASI MODİFİYE ATMOSFER PAKETLEME VE 1-METHYLCYCLOPROPENE UYGULAMALARININ PAPAZ ERİĞİNDE DEPOLAMA SÜRESİNCE KALİTEYE ETKİLERİ**

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**Abstract:**

Bu çalışmada, bir yeşil erik çeşidi olan papaz eriğinde hasat sonrası modifiye atmosfer paketleme ve 1-Methylcyclopropene (1-MCP) uygulamalarının ve bu iki uygulamanın kombinasyonunun depolama süresince kaliteye olan etkileri incelenmiştir. Bu amaçla erik meyvelerinde 625 ppb ve 1250 ppb dozlarında 1-MCP uygulanmış, bunun yanında düşük yoğunluklu polietilen bazlı modifiye atmosfer paketleme (MAP) işlemi gerçekleştirilmiştir. Bunun yanında her iki 1-MCP dozuyla MAP uygulamasının kombinasyonu da söz konusu olmuştur. Uygulamalar yapılan ve yapılmayan kontrol erik meyveleri 1-2C sıcaklık ile %90-95 oransal nem koşullarında sırasıyla 20,40 ve 60 gün süreyle muhafaza edilmişlerdir. Hasattan sonra ve her depolama süresi sonunda meyvelerde meyve zemin rengi değişimi, meyve eti sertliği, suda çözünür kuru madde oranı, titre edilebilir toplam asitlik miktarı ve toplam fenolik bileşik içeriği gibi bazı kalite özellikleri incelenmiştir. Elde edilen sonuçlara göre tüm uygulamalar kalite üzerinde etkili bulunurken etki düzeyinin en yüksek olduğu uygulama 1250 ppb dozunda 1-MCP ve MAP kombinasyonu olarak saptanmıştır.

**Keywords:** Papaz eriği, modifiye atmosfer paketleme, 1-Methylcyclopropene, depolama, kalite

THE DETERMINATION OF MONTHLY CATCH COMPOSITIONS OF THE BOTTOM TRAWLING AT 2016-2017 FISHING SEASON IN THE MIDDLE BLACK SEA (ORDU-SAMSUN)

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**Abstract:**

This study was conducted aiming the determination of the catch composition of bottom trawl in Middle Black Sea (Ordu-Samsun). In 2016-2017 fishing season, as a result of the 217 bottom trawling operations, whiting (*Merlangius merlangus euxinus*), red mullet (*Mullus barbatus*), thornback (*Raja clavata*), pontic shad (*Alosa immaculata*), gobies (*Gobius* sp.), turbot (*Psetta maxima maeotica*), halibut (*Platichthys flesus*), greater weever (*Trachinus draco*), bluefish (*Pomatomus saltatrix*), horse mackerel (*Trachurus mediterraneus*), dogfish (*Squalis acanthias*), picarel (*Spicara smaris*), scorpion fish (*Scorpaena porcus*) and sole (*Solea nasuta*) were identified. The total catch per unit effort (CPUE) of trawl were estimated as 64.6 kg /hour. *Merlangius merlangus*, *Mullus barbatus*, *Raja clavata*, *Alosa immaculata* and *Gobius niger* species dominated in bottom trawl catch composition.

**Keywords:** Bottom trawl, Catch composition, Catch efficiency, Middle Black Sea

**BLACK SEA ECOSYSTEM AND SOME INVASİVE SPECİES**

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**Abstract:**

The Black Sea ecosystem has undergone many radical changes as a result of the increase in the concentration of nutrient salts (nitrate and phosphate) carried by the rivers and as a result of these changes, firstly phytoplankton and then zooplankton quality and quantity have been observed.

New species that do not belong to a certain ecosystem and come to this region in different ways are called invasive species. Invasive species can adapt to their areas and cause serious destruction in these new areas. The Black Sea has been one of our seas exposed to these effects and showing changes. Although the Black Sea is the sea with the highest productivity in terms of fisheries, it is an unprotected sea against strong effects such as global climate change, pollution and invasive species and the changes occurring in the ecosystem are rapidly showing itself.

In this study, some invasive species such as *Rapana venosa*, *Anadara inaequalis*, *Mnemiopsis leidyi*, *Beroe ovata*, *Mya arenaria*, *Balanus improvisus*, *Mugil soiyu*, *Potamopyrgus jenkinsi*, *Asterias rubens* were examined with the Black Sea ecosystem and the effects of these species on local species are indicated.

**Keywords:** Invasive species, ecosystem, fisheries, Black Sea



**SUSTAINABLE DEVELOPMENT OF ORGANIC AGRICULTURE IN RUSSIA IN THE CONTEXT OF DIFFERENTIATION OF REGIONAL STRATEGIES**

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**Abstract:**

Organic agriculture can be considered as a model of sustainable agriculture because of its focus on resolving environmental problems, increasing resource and energy efficiency and supporting local communities throughout the entire value chain from producer to consumer. The authors analyze the organic agriculture from the perspective of its contribution to ensuring the food security problem of the country, the development of agricultural entrepreneurship and the effective coverage of the growing demand for high-quality food. Along with this, serious environmental and climatic consequences of the intensification of the agricultural sector of the economy are studied while assuming the premise of its orientation towards traditional production technologies. Following the recommendations of the "Organic Agriculture 3.0" concept, the authors examine environmental, economic, social and institutional factors that should be in the spotlight for a consistent transition to a new model of agricultural production. The authors elaborated complex development strategies for the agriculture of Russia and its regions. based on accounting for the supply of organic food, and the demand for it. Following the concept of sustainable development, the authors propose developing a special environmental index to identify environmentally friendly regions that have the most suitable conditions for organic agriculture. It is proposed to use data on the areas of unused agricultural land that have the greatest potential for the production of organic products as an economic indicator. The proportion of unemployed working-age population in rural areas serves in the study as a social indicator. By analyzing these selected indicators, the authors identify four

**Keywords:** Sustainable development, regional development, organic agriculture

DETERMINATION OF SOME MORPHOLOGICAL CHARACTERISTICS IN SELECTED  
CONFECTIONARY PUMPKIN GENOTYPES

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**Abstract:**

This study was carried out to determine some traits in 105 inbred and S4 level confectionary pumpkins (*Cucurbita pepo* L.) which were promising. UPOV parameters were prepared by modifying the morphological definition, plant characteristics, fruit characteristics, seed characteristics, observation and measurements were made. The appearance Plant of genotypes; 81.9% upright, 15.2% wrapper, 0.9% semi wrapper; arm throwing in plant; %84.7 available, %15.2 absent; the trunk color was found as 49.5% green, 37.14% light green, and 13.3% dark green. Leaf characteristics; leaf color, 64.7% green, 30.4% dark green, 4.7% light green; leaf slicing, 1.9% less, 48.5% medium, 2.8% more, 4.7% too much, 41.9% none; the presence of the ring at the base of the crown is 81.9% available, 18.0% absence. The color of the ring at the base of the crown was 81.9% absent, 2.6% green yellow and 13.3% green. Fruit properties; fruit spot color, 31.4% green, 7.6% orange, 0.9% yellow, 60% cream; fruit speck density; 73.3% less, 24.7% dense, 1.9% more; color was found to be 19.0% cream, 4.7% yellow, 0.9% green, 1.9% green-yellow, 4.7% dark-yellow, 28.6% light yellow, 41.9% orange. Length of seed fruit; 21.9% short, 38.0% medium, 40% long; The diameter of the seed fruit was 62.8% long, 35.23% medium, 3.8% narrow; Length ratio was 58.0% round, 22.8% elliptic and 20% long. The size of seed fruit was 14.2% coarse, 36.1% medium and 50.4% small. The data were analyzed by Principal Component Analysis (PCA) and factor analysis. According to this analysis, genotypes were divided into 6 groups.

**Keywords:** Confectionary pumpkin, morphological description, UPOV

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**DETERMINATION OF RESISTANCE TO *FUSARIUM OXYSPORUM F.SP.MELONIS* RACE 1,2 AND ZUCCHİNİ YELLOW MOSAİC VİRUS (ZYMV) İN SOME KIRKAĞAÇ AND HASANBEY TYPE MELONS**

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**Abstract:**

The production area in melon is around 102000 ha feet and is around 1,7-1,8 million tons. Turkey 70-80% of the melon production İnodorus (Kırkağaç - Altınbaş, Yuva, Hasan bey) group constitutes. Although these melons are common in village populations by traditional methods and the use of standard seeds, there is an intense tendency towards F1 cultivars especially for reasons such as high yields and disease resistance. The most important factors limiting productivity in agriculture in Turkey melon *Fusarium oxysporum f.sp.melonis* (FOM) and Zucchini Yellow Mosaic Virus (ZYMV) is known. For this purpose, the resistance levels against Fom-1, Fom-2 and ZYMV pathogens were investigated by SCAR and SSR methods in 300 melon genotypes. As a result, Fom 1; 89 homozygote resistance (RR), 106 homozygotes susceptible (rr), 105 heterozygote (Rr), 118 homozygote resistance (RR) in Fom 2, 36 homozygous susceptibilities, 146 heterozygotes (Rr), 291 to ZYMV homozygous susceptibility and 9 heterozygous (Rr).

**Keywords:** FOM-1, FOM-2, ZYMV, Resistance, Melon

ANTALYA ' DA KENTİÇİ YOLLARDAKİ PEYZAJ DÜZENLEMELERİNDE DOĞAL BİTKİ KULLANIMININ İNCELENMESİ

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**Abstract:**

Kentsel peyzajların sürdürülebilirliğini artırmak için; adaptasyon yeteneğinin yüksek, bakım ihtiyacının düşük olması ve kent ekolojisine olan katkılarından dolayı doğal bitki kullanımının yaygınlaştırılması gerektiği düşünülmektedir. Ancak peyzaj uygulamalarında hem maliyetli hem de düzenli bakıma ihtiyaç duyan yabancı yurtlu bitki kullanımının yoğunlukta olduğu göze çarpmaktadır. Son yıllarda küresel iklim değişikliğinin etkilerinin artması ve yanlış tür seçimleri nedeniyle özellikle yaz aylarında Akdeniz bölgesinde peyzaj alanlarında sararmalar ve bozulmalar görülmektedir. Turizm kenti olan Antalya'da, nüfus yoğunluğu bu dönemde arttığı için gerek turistler gerekse yerli kullanıcılar tarafından aktif şekilde kullanılan kentiçi yollardaki peyzaj düzenlemelerinde yerel bitki türleri kullanımıyla bu görüntülerin önüne geçilip, hem kente estetik değer katılabileceği hem de kente özgün bir kimlik kazandırılabilceği düşünülmektedir. Araştırmada öncelikle Antalya ilinin iklimi hakkında veriler toplanmış, ardından kentin en işlek güzergahından seçilen cadde ve bulvarlardaki kaldırım ve refüjlerde kullanılmış olan ağaç, çalı ve çok yıllıklar belirlenerek bu türlerin doğallığı, uygunluğu ve sürdürülebilirliği incelenmiştir. Ardından, Akdeniz koşullarında kentiçi yollardaki peyzaj düzenlemelerinde kullanılabilecek doğal bitki örtüsündeki türler hakkında literatür taraması yapılarak, bitkilerin genel özellikleri, peyzajda çekicilik oluşturan unsurları ve fidanlıklarda bulunabilirliğini içeren bir bitki listesi oluşturulmuştur. Çalışmanın son aşamasında ise doğal bitki kullanımının biyoçeşitliliğin korunmasını sağlayacağından, peyzajların sürdürülebilirliğini artırarak, ülke ekonomisine ve ekolojisine katkı sunulacağından bahsedilmiş ve doğal bitkilerin fidanlıklarda satışlarının yaygınlaştırılması gibi konularda öneriler geliştirilmiştir.

**Keywords:** Sürdürülebilirlik, Antalya, Doğal Bitki, Kentiçi Yol Bitkilendirmesi

**PAMUKKALE - HIERAPOLİS DÜNYA MİRAS ALANI'NDA REKREASYON DENEYİMİNİ ETKİLEYEN FAKTÖRLERİN DEĞERLENDİRİLMESİ**

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**Abstract:**

Dış mekan rekreasyon deneyimini alan özelliklerinin etkilediği bilinmektedir. Doğal, tarihi ve kültürel alanların ziyaret edilmesinde de bu faktörler ziyaret memnuniyeti üzerinde rol oynamaktadır. Dış mekanda iklim koşullarının belirlediği biyoiklimsel konfor turizm planlama çalışmalarında önem taşımaktadır. Biyoiklimsel konfor, insanın kendisini en sağlıklı ve dinamik hissettiği iklim koşulları şeklinde tanımlanmaktadır. Bu konforun sağlanması sıcaklık, bağıl nem ve rüzgar gibi önemli iklim bileşenleri ile radyasyon, giyim şekli ve aktivite türü gibi unsurlara bağlıdır. Turizm bölgelerinde ziyaretçiler tarafından iklimsel konforun aranması ziyaret deneyimini etkilemektedir. Bu çalışma kapsamında Pamukkale -Hierapolis Dünya Miras Alanı'nda rekreasyon deneyimini etkileyen faktörlerin mevcut durumunun ortaya konulması amaçlanmıştır. Pamukkale-Hierapolis Dünya Miras Alanı 3 farklı giriş kapısından ziyaret edilebilmektedir. Bu girişlerden ören yeri içerisindeki seyir terası, termal su kaynakları, traverten sahası, arkeolojik sit alanı ve müze gibi kullanımları birbirine bağlayan üç ana güzergah belirlenmiştir. Ziyaret deneyimini etkileyen iklimsel konfor, yönlendirme ve bilgilendirme tabelaları ile rehberlik ve personel hizmetleri gibi faktörler her bir güzergah için ayrı ayrı değerlendirilmiştir. Geniş arkeolojik sit alanına sahip alanda iklimsel konfor açısından gereksinim duyulan gölgeleme elemanlarının yetersiz olduğu görülmektedir. Bitkiler ile uygun gölgelemelerin sağlanamadığı alanda yönlendirmeler de zayıf kalmaktadır. Gölge amaçlı kullanılan bazı bitki türlerinin alanın doğal ve kültürel özelliklerine uygun dikilmediği dikkat çekmektedir. Tarihi alanların kimliklerinin korunması ve yansıtılması için doğal ve kültürel çevre koşullarına uygun düzenlemelerin yapılması ve alanın çevresi ile birlikte ele alınarak korunması önemlidir. Sonuç olarak alanın doğal, tarihi, kültürel ve anlamsal değerlerini ön plana çıkaracak, doğal ve kültürel özelliklerine uygun, ziyaretçilerin ziyaret kalitesinin yüksek olmasına katkı sağlayacak bir takım öneriler geliştirilmiştir.

**Keywords:** Rekreasyon, Biyoiklimsel konfor, Denizli, Pamukkale, Travertenler

**ORAL PRESENTATIONS / III. International Eurasian Agriculture And Natural Sciences  
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**THE IMPACT OF FOOD SAFETY STANDARDS (AZOXYSTROBIN MRL AND  
CHLORPYRIFOS MRL) ON VIETNAM'S AGRICULTURAL EXPORTS**

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**Abstract:**

Globalisation and the boom of bilateral and multilateral trade agreements over the last few decades have substantially reduced tariffs. Nonetheless, non-tariff barriers such as requirements on food safety standards have emerged as an important restriction to international trade. While the cost of these measures is claimed as disproportionately borne by developing countries, empirical evidence to support this claim remains scant. This paper takes the case of Vietnam, a transitional and arguably one of the most open economy in terms of trade. We focus on the impact of maximum residue limit (MRL) standards of Azoxystrobin and Chlorpyrifos on the rice and coffee exports of Vietnam. We find that their impacts are negative, but heterogeneous between products.

**Keywords:** Agricultural exports, MRL standards, Gravity

MICROBIOLOGICAL, ANTIOXIDANT, AND ANTIMICROBIAL CHARACTERISTICS OF GOAT MILK KEFİR DURING STORAGE

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**Abstract:**

The aim of the present study was to examine the effect of two different kefir grains (KG1 and KG2) and storage on microbiological, antioxidant and antimicrobial properties of kefir produced by using goat milk. The number of aerobic lactobacilli, anaerobic lactobacilli, Lactococci, acetic acid bacteria (AAB) and yeast-mold were counted during the storage and also total phenolic content and antioxidant capacity of kefir samples were determined. The fat, protein, dry matter and ash content and pH values of kefir samples were found to be 5.25 g/100g, 3.93 g/100 g, 14.96 g/100 g, 0.84 g/100 g and 6.70, respectively. The counts of aerobic lactobacilli, anaerobic lactobacilli, Lactococci, AAB, and yeast between 6.3-9.4 log CFU/mL, 8.4-9.4 log CFU/mL, 8.8-9.5 log CFU/mL, 8.1-9.4 log CFU/mL, and 4.1-6.4 log CFU/mL, respectively. After fermentation, the presence of aerobic lactobacilli, anaerobic lactobacilli, Lactococci, and AAB were decreased during the storage for both type of kefir samples. However, the count of yeast was increased. The disk diffusion method was performed for the antimicrobial activity. It was determined that kefir samples had strong inhibitory activity against *L. monocytogenes* and *Salmonella Typhimurium*, foodborne pathogenic bacteria. The pH values of the kefir samples were decreased from 4.59 to 4.15 for KG1 and from 4.60 to 3.98 for KG2 during storage. Total phenolic content was between 2.37-4.90 mg GAE/100mL. The antioxidant capacity of kefir samples was measured using two different methods: Trolox equivalent activity (TEAC) and inhibition of lipid peroxidation. The antioxidant capacity of the kefir samples was higher than control.

**Keywords:** Kefir, Goat Milk, Antimicrobial, Antioxidant

**HISTORY AND DEVELOPMENT OF KYRGYZ TAYGAN HUNTER DOG BREED**

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**Abstract:**

Kyrgyz taigan is a kind breed in Central Asia of greyhound. It is used for hunting, hunting wolves, foxes and rabbits because run fast their smell and sight senses are well developed they are very good at tracking and detecting prey. These dogs which are ancestors of the Turkish hounds with hunds and fragile looking skulls and body structure are considered to be very rare. Hounds are believed to have been brought to Anatolia during in migrations from Central Asia.

**Keywords:** Kyrgyz taigan, fast running, hunting, Turkish hounds



**KYRGYZ HONEYBEES AND ITS PERSPECTIVES**

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**Abstract:**

Kyrgyzstan possesses high mountaineous area where medical herbs and honeys are gathered and majority of the territory is pasture land. Low mountaneous areas, flat land at the mountaneous edges grow dragonhead, wild strawberries, dog rose and other different plants which produces honey. Above mentioned plants are strong, rich forage value founded together, honey production development is essential and each year country can produce 100 thousand tons of high quality honey. For that country possesses all conditions. For the first time bees were introduced in 60s and 70s of the twenties century to Kyrgyzstan from abroad. According to the information of beekeepers union “Kyrgyz Honey” was awarded second as a high quality honey in the world. In 2015 in the Sounth Korea was conducted Apimondiya (World Honey Association) where was international congress in which union association of “Kyrgyz Honey Union” grand prix was awarded, obtained one gold medal, two silver and four bronx medals. In 2013 in the Kiev city was conducted expo and “Kyrgyz Honey Union” was awarded to three golden medal and two silver medals were obtained. Therefore, further bee adaptation was conducted to the climatic conditions and improved honey production. Also priority was to make breeds of high productive bees. Bee breeding for high honey production and good ability of overwintering, bee families main evaluation was completed. This article provides information to farmers and people who are interested in beekeeping. Furether bee breeding and its breeds growing organization, proliferation, feeding and feedings ways are writen.

**Keywords:** “Kyrgyz Honey”, high mountaineous, honeybees, beekeepers

**GELENEKSEL YÖNTEMLE ÜRETİLEN YABAN MERSİNİ SİRKESİNİN BAZI KALİTE ÖZELLİKLERİ**

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**Abstract:**

Bu çalışmada yaban mersini (*Vaccinium myrtillus*) geleneksel yöntemle üretilen sirkenin bazı fiziksel, kimyasal ve duyuşsal kalite özelliklerinin belirlenmesi araştırılmıştır. Araştırma sonunda; briks (%), yoğunluk (g/cm<sup>3</sup>) ve renk (L,a,b) değerleri sırasıyla 0.65±0,05, 1.01±0,00, L (28,57±0,22), a (1,50±0,10) ve b (-1,63±0,02) olarak belirlenmiştir. Ayrıca iletkenlik değerleri ortalama 2,08±0,01 µS/cm, pH 3,43±0,01, toplam asitlik 2,19±0,03 g/L olarak tespit edilmiştir. Örneklerin toplam Antioksidan ve toplam fenolik madde değerleri ise sırasıyla 11857,14±828,57 Teq mL/L ve 140,00±14,81 ga uL/mL olarak belirlenmiştir. Buna karşın altı aylık depolama sonrasında numunelerin hiçbirisinde alkol varlığı tespit edilememiştir. Yaban mersini sirkesi örneklerinin mineral madde içerikleri sırasıyla K; 438,16±0,96 ppm, P; 253,50±1,47 ppm, Mg; 187,84±3,09 ppm, Na; 35,76±0,13 ppm Ca; 20,87±0,35 ppm olarak belirlenmiştir. Panelistlerce yaban mersini sirke örneklerin duyuşsal analiz skorları ise renk; 5,75±0,25, aroma; 4,25±0,25, koku; 4,10±0,10, görünüş; 5,15±0,15 ve genel beğeni 5,20±0,20 olarak verilmiştir. Geleneksel yöntemle üretilen yaban mersini sirkesinin bileşimindeki A ve C vitaminleri, flavonoid ve antosiyanin insan sağlığı açısından oldukça yararlı bileşenler olduğu bilinmektedir. Ayrıca yaban mersini sirkesi bileşimindeki klorojenik asit, kuersetin, ellaiik asit ve kuersetin-3-galaktosid gibi fenolik bileşiklerden dolayı güçlü bir antimikrobiyal etkisi bulunmaktadır. Bunun yanında kolesterol düşürücü, antikanser etkisi, sindirim düzenleyici, beyin işlevlerini artırıcı, antidiyabet, antioksidan ve kardiyovasküler hastalıkların önlenmesi gibi özellikleri sayesinde insan sağlığına faydalı olabileceği düşünülmektedir.

**Keywords:** Yaban Mersini, Sirke, Fermantasyon, Antosiyanin, Potasyum

**ZAYIFLAMA DİYETLERİNDE FONKSİYONEL SİRKE ÇEŞİTLERİNİN ETKİSİ**

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**Abstract:**

Obezite, bir beslenme bozukluğu hastalığıdır. Ayrıca çeşitli hastalıklara yol açması, yaşamı kısaltması ve tedavisi için pahalı bir sağlık hizmeti gerektirmesi açısından oldukça önemli bir sorundur. Dünya’da ve Türkiye’de obezitenin görülme sıklığı gün geçtikçe hızla artmaktadır. Bu yüzden nedenlerinin tespit edilmesi ve tedavisinin uygulanması noktasında önem arz etmektedir. Obezitenin en önemli nedenleri; hareketsiz yaşam ve aşırı kilo alımıdır. Günümüzde obezitenin önlenmesi ve tedavisi için en iyi yöntem diyet ve egzersizin kombine bir şekilde uygulanmasıdır. Artan obezite salgınının üstesinden gelmek için biyoaktif bileşenler içeren fonksiyonel sirke çeşitlerinin diyetlerde kullanılması önerilmektedir. Obezite tedavisinde yardımcı olabileceği düşünülen fonksiyonel sirke çeşitleri; Elma, Domates, Nar, Mısır, Dut, Alıç ve Mor Tatlı Patates sirkeleridir. Yapılan çalışmaların olumlu sonuçlarından dolayı da fonksiyonel sirke çeşitleri diyetlerde önem kazanmaktadır.

**Keywords:** Obezite, Diyet, Fonksiyonel, Sirke, Sağlık

REGENERATION OF PLANTS FROM ALGİNATE-ENCAPSULATED SHOOT TIPS OF MYRTLE (*MYRTUS COMMUNIS* L.)

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**Abstract:**

Myrtle is one of the significant medicinal and aromatic species. In the present study, we report synthetic seed production and subsequent conversion of encapsulated shoot tips into plantlets comparing with non-encapsulated shoot tips for myrtle. Two different myrtle genotypes were used and shoot tips from 4-week-old in vitro proliferated shoots were used for synthetic seed production. For encapsulation, sodium alginate solution was prepared in the rate of 3.0%, while 100 mM calcium chloride solution was prepared. Encapsulation was accomplished by mixing shoot tips into sodium alginate solution and dropping these in calcium chloride solution. Encapsulated shoot tips were retrieved and washed three times with sterilized distilled water. Encapsulated and non-encapsulated shoot tips were cultured in Murashige and Skoog (MS) medium supplemented with 0, 0.5, 1, 2 mg L<sup>-1</sup> BAP (6-Benzylaminopurine). Half of shoots coming from encapsulated and non-encapsulated tips were transferred to MS medium supplemented with 1 mg/l IBA (Indole-3-butyric acid) for rooting after five weeks of culture. The rest of shoots were subcultured in 3 times every for five weeks and all shoots were transferred to rooting medium. Percentage response for conversion of encapsulated and non-encapsulated shoot tips into plantlets after five weeks of culture, micropropagation coefficient, plant length, rooting rate and number of roots were calculated. The maximum percentage response for the conversion of encapsulated shoots tips into plantlets was on MS medium supplemented with 1 mg/l BAP for both genotypes. Different responses were observed between myrtle genotypes for the conversion of encapsulated shoots tips.

**Keywords:** Encapsulation, BAP, IBA, MS, Micropropagation

DETERMINATION OF TIMING OF ADULT EMERGENCE OF THE ALMOND SEED WASP AND ITS THERMAL REQUIREMENT IN ALMOND ORCHARDS OF ADIYAMAN

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**Abstract:**

In this study; the timing of adult emergence of almond seed wasp (*Eurytoma amygdali* End.) depending on the temperature and its thermal requirement in the almond orchards at Besni and Kahta district (Tuğlu and Hacıyusuf village) of Adıyaman province were determined. In order to observe pupa development and adult emergence of *E. amygdali* almond trees chiffon branch cages were placed on the twigs on different directions (north, south and southwest), in which the infested fruits from previous year were inserted. Daily temperature and relative humidity values were recorded by placing data logger in each orchard. It was observed that there was no significant difference between the times of first white pupa formation, the first adult emergence and development time of pupa in the cages placed in three different locations in the almond trees. The first adult emergence was observed in the 1st orchard, 2nd orchard of Kahta district and in the orchard in Besni district on March 24, 24 and 22 respectively where almond trees were in unripe almond with the size of a lentil period. The adult emergence period lasted 14, 15 and 17 days in the 1st orchard, 2nd orchard of Kahta district and in the orchard in Besni district respectively. For the development of pupa stage, 64.2 and 81.1 day-degrees were needed in the 1st orchard of Kahta district and in the orchard in Besni district respectively. For the first adult emergence, a thermal requirement of 207.1 and 228.2 day-degrees in the 1st orchard of Kahta district and in the orchard in Besni district respectively was determined.

**Keywords:** *Eurytoma amygdali*, almond, adult emergence, thermal

**RECOVERY AFTER EXPOSURE TO HEAT: WHEN THE WORK MUST STOP, WHERE RECOVERY MUST TAKE PLACE, HOW LONG IT SHOULD BE**

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**Abstract:**

Many jobs in the agricultural world imply exposure to heat. Because exposure occurs mostly outdoors, it is characterized by thermal conditions which exhibit strong daily variations. Existing international standards on the evaluation and assessment of human exposure to heat provide reliable estimates of the time evolution of relevant physiological quantities during the heating phase. However, they lack the ability to predict the details of the cooling phase, that is when recovery takes place. This is no minor issue, since without a reliable prediction of the cooling phase, it is impossible to know precisely what will happen during any other additional ensuing exposure to heat. Available literature experimental data on the time evolution of the rectal temperature during the recovery phase have been analyzed. All existing cooling data are found to be well approximated by simple exponential curves. No dataset extend over a long enough time base to check that complete recovery to pre-exposure values actually takes place. However, there is no indication that a plateau occurs, similar to what happens for the evolution of the esophageal temperature. Each cooling curve has been characterized using the exponential timescale whose experimental values range from 25 to 72 minutes, depending on the thermo-hygrometric conditions in the recovery environment. Smaller values, that is faster recovery, are associated to environments with lower temperature and humidity and higher ventilation, which agrees with expectations. The role of clothing during the recovery phase is still poorly known, since most experimental data have been taken using similar, very light clothing.

**Keywords:** exposure to heat, core temperature, safety

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**EVALUATION OF THE TEMPORAL PRESENTATIONS CHANGES OF AGRICULTURE,  
FORESTRY AND SETTLEMENT IN YEŞİLIRMAK BASIN WITH USING REMOTE  
SENSING TECHNIQUES AND GIS**

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**Abstract:**

As a result of the multifaceted change and transformation processes in the world, the damages and pressures on natural resources have increased and irreversible losses, especially biodiversity, have been and continue to be on the agenda. While the majority of the societies living in the world most of the time remain observers of these changes and transformations, scientific circles, decision-makers, technical people, environmental sensitivity holders are working on reducing the effects of change-transformation processes and avoiding irreversible mistakes, legal, administrative, technical, it focuses on developing and integrating many educational tools.

Land cover changes were evaluated by using satellite imagery for the area within the borders of Yeşilırmak Basin of Amasya, Tokat, Çorum, Samsun, Ordu, Giresun, Sivas, Gümüşhane, Yozgat, Erzincan and Bayburt provinces within the scope of the Yeşilırmak Basin Landscape Atlas project prepared for this purpose.

In this study; The change maps of the agricultural, forest and settlement areas for 1990 and 2013 and the districts in Yeşilırmak Basin were overlapped and the values of increase and decrease in each district were calculated and visualized separately for agriculture, forest and settlement areas.

**Keywords:** Remote Sensing, Cover Changes, Environmental Monitoring, Yeşilırmak Basin

ECONOMIC ANALYSIS OF LAND CONSOLIDATION RESULTS BY SURVEYS

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**Abstract:**

Agriculture appears as a sector. In other words, it is an economy that can be expressed in numbers. The cost of landholding and the profit they earn from the products are the basis of this economy. Consolidation works bring water channels, combine scattered parcels, bring modern roads and increase the profit from agricultural activity. Kozluca Quarter of Burdur, which was previously consolidated, was identified as the study area in this study.

One of the most important items that increase economic income in agriculture is the construction of modern irrigation channel system. As a result of the survey, 78% of the farms stated that they were satisfied for the parcel reached the irrigation channel. In another heading, 70% of enterprises stated that pre-consolidation roads were not sufficient. After the consolidation, 78% of the enterprises stated that they were satisfied with the roads. After the consolidation, the fuel costs decreased.

Regarding the increase in land value after consolidation, 45% of the enterprises stated that there was an increase in value, 40% remained the same and 15% stated that the value decreased. Landholding owners do not have sufficient information about consolidation. In addition, it was observed that some Landholding owners were emotionally approaching the answers of the surveys because they could not get the field from their desired location in the distribution. As a result, in all interviews conducted with all farmers, it was observed that there was an increase of 20% yield after consolidation.

**Keywords:** Land consolidation, Economic Analysis, land value



**HİYERARŞİK KÜMELEME ANALİZİ İLE VAN GÖLÜ HAVZASINDAN İZOLE EDİLEN MICROMONOSPORA CİNSİ BAKTERİLERİN SINIFLANDIRILMASI**

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**Abstract:**

Hiyerarşik kümeleme analizi değişkenlerin benzerliklerini dikkate alarak belirli düzeylerde birbiri ile birleştirmeyi amaçlayan tekniklerdir. Hiyerarşik kümeleme birleştirici ve ayrıştırıcı hiyerarşik teknikler olmak üzere ikiye ayrılır . Bu çalışmada birleştirici hiyerarşik teknik ve metot olarak da gruplar arası linkage metodu kullanılmıştır.

Bu çalışmanın amacı değişik özellikleri incelenen (morfoloji ve pigmentasyon, substrat miselyumu, antimikrobiyal aktivite, enzim testleri vb) bakterilerin incelenen farklı özelliklere göre hiyerarşik kümeleme analizi ile gruplara ayrılmasıdır. Çalışmada 141 farklı bakterinin 83 farklı özelliği incelenmiştir. Özellikler her bir bakteri için var(+) ya da yok(-) olarak işaretlenmiş ve bu bakteriler bu özelliklerine göre hiyerarşik kümeleme analizi ile 23 gruba ayrılmıştır. Bu grupların özellikleri açısından birbirine olan uzaklıkları elde edilen dendogram ile de görselleştirilmiştir.

Bu bakterilerin gruplara ayrılması özellikle toprak ve akuatik ortamlardan izole edilmeleri bakımından önemlidir. Özellikle topraktan izole edilen izolatların kendi aralarında sıkı bir şekilde kümelendiği ortaya çıkmıştır. Genel olarak kümelenme lokaliteler ile paralellik göstermiştir. Micromonospora cinsi özellikle sağlık sektöründe oldukça önemlidir. Bu nedenle onların yapılarının, faaliyetlerinin, sınıflandırılmalarının ve tür karakterizasyonlarının bilinmesi çok önemlidir

**Keywords:** hiyerarşik kümeleme analizi, micromonospora

THE EFFECT OF HUMIC ACID APPLICATIONS ON THE CUTTINGS OF SOME GRAPEVINE (*Vitis vinifera* L.) CULTIVARS UNDER SALT STRESS

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**Abstract:**

In the study, the cuttings of three grapevine cultivars (Sultani Seedless, Narince and local cv Ercis) with two buds were planted in 3 liter undrained rectangular growth containers containing perlite and applied with different doses of humic acid and salt. Three different doses of NaCl (0 mM, 50 mM and 100 mM) and 3 different doses of humic acid (0 g, 0.5 g and 1.0 g) were replicated three times; there were 108 containers each having 3 cuttings.

In addition to determination of tolerance to salt, biochemical contents and some physiological parameters of the used humic acid doses were determined in order to understand the protection mechanisms developed in the plant under stress conditions. Thus, in terms of stress conditions and humic acid applications, the physiological and morphological responses of the varieties were tried to be determined from different aspects.

As a result of the study, the findings showed differences according to the cultivars and applications, it was observed that cv. Erciş and cv. Narince were tolerant to salt, but the salinity tolerance of cv. Sultani seedless was low when compared with the other two cultivars. It was observed that humic acid applications increased the tolerance of the plants to salty growth conditions in the majority of the parameters examined.

#We would like to thank Van Yüzüncü Yıl University Scientific Research Projects Coordination Unit for supporting the study within the scope of Individual Research Project (2015-EMYO-B158).

**Keywords:** Grape cuttings, Humic acid, Salt stress

HIGH ALTITUDE VINEYARD; THE CASE OF VAN PROVINCE

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**Abstract:**

Altitude, expressed as elevation above sea level, has several positive or negative effects on plants. While high altitude causes some negatives in viticulture such as low yield, long vegetation period, smaller clusters and grape structure, it has also some positive changes in the fruit content and there were less damage of diseases and pests. Studies have shown that nitrogen, anthocyanin, caratenoid, malic acid, phenolic content are higher in the leaves and grains of grapes grown at high altitudes. In viniculture at high altitude, grapes form a more positive phenolic profile in terms of high tannin and anthocyanin content. Red grapes have a more apparent and dark coloration due to anthocyanin increasing in parallel with increasing light intensity; It has been also demonstrated that polymeric tannin concentrations are increased and acidity is high and pH is low; more aging wines can be obtained

The Van Province on the shores of Lake Van has a viticulture culture dating back to the Early Iron Age despite an altitude of 1730 meters. When the climatic data of Van Province are analyzed for long years, it is seen that it has a daily average sunshine duration is 7 hours and 58 minutes. Studies in the region have shown that the Effective heat summation (EHS) had varied according to cultivars and rootstocks; from 1112.6 to 1440.3 degree days (dd) Considering the EHS values in the development period in Van Province and the position of the province in terms of s sunshine duration; Although the region has cold climatic characteristics in winters, it is considered that there will be no problems in reaching the harvest maturity of especially early and middle season grape cultivars and the basin has the potential to be an important center for high altitude viticulture.

**Keywords:** Viticulture, high altitude, biochemical structure, yield

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**DETERMINATION OF POMOLOGICAL CHARACTERISTICS SOME APPLE  
CULTIVARS (*Malus X domestica* Borkh.) AFTER STORAGE**

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**Abstract:**

This study was carried out in Karaman province for considering some pomological properties of standard apple varieties (Granny Smith, Fuji, Golden Delicious) grafted on M9 dwarf apple rootstock. Apple varieties grown in Karaman province kept in different warehouses after harvest. In the spring of 2019, samples were taken randomly among stored apple varieties. Some quality (fruit weight, fruit flesh firmness, soluble solids content) attributes of after storage apple samples were evaluated in the physiology laboratory.

Fruit weight (g), fruit flesh firmness (N) and soluble solids content (%) was determined as pomological observations. Variety characteristics, Considering the storage property and conditions the highest average fruit weight in the fruit samples taken 202.8 g (Granny Smith) apple cultivar and the lowest average fruit weight of 150.2 g (Golden Delicious) varieties were recorded. Fruit flesh firmness and soluble solids content (TSSC), values were statistically significant differences between varieties. The highest and lowest amounts of fruit flesh firmness value, respectively, 86.4 N (Granny Smith) and 66.1 N (Golden Delicious) varieties and the total amount of soluble solids content is 15.4% (Fuji) and 11.6% (Granny Smith) varieties were determined.

**Keywords:** Apple (*Malus X domestica* Borkh.), Cold Storage, Fruit Properties,

INVESTIGATION OF GRAFTING SUCCESS IN BALABAN, BİLECİK AND CHANDLER WALNUT CULTIVARS

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**Abstract:**

This study aimed to determine the grafting potential of obtained from some walnut cultivars. The seeds of Balaban, Bilecik, Chandler and walnut cultivars were used as material. The patch and chip grafting method was used in the study. 60 days after grafting, anatomical and histological examinations were performed on the samples. When cross-sections were taken from the joints of rootstock and shell were examined; It has been observed that there is an association between callus tissue between grafting elements and necrotic tissue with different density in different grafting combinations. It was observed that the fusion activities continued in the grafting combinations of the cultivars but the full fusion could not be achieved.

**Keywords:** Walnut, Rootstock, Grafting, Anatomy.

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**ISOLATION AND CHARACTERIZATION OF STRAINS OF ERWINIA AMYLOVORA FROM SOUTHERN KYRGYZSTAN**

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**Abstract:**

Fire blight, caused by the enterobacterium *Erwinia amylovora*, is a devastating disease of plants belonging to the family Rosaceae that was first reported from Kyrgyzstan in 2008. 3-4 years later, the disease has spread across the South part of the country, affecting fruit orchards mainly in Jalalabad region. Using semi-selective cultivation media, bacteria have been isolated from plant material sampled in infested orchards from different locations in Kyrgyzstan, and 16S rRNA gene sequence determination together with diagnostic PCR have been used to identify *E. amylovora* bacteria among isolates.

**Keywords:** Fire Blight; *Erwinia amylovora*; Kyrgyzstan; diagnostic PCR

OBTAIN OF HAPLOID AND DIHAPLOID LINES IN EDIBLE SEED PUMPKIN  
(*CUCURBITA PEPO* L.)

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**Abstract:**

Pumpkin (*Cucurbita pepo* L.) have different consumption shapes and consumed as appetizer and therefore are produced in Turkey. Pumpkin seed cultivation in Turkey tend to be widespread. Especially after 2000's, there has been an increase in both production area and production. According to the latest data, the production area is 65.000 hectares and the production amount is 41.000 tons (TUIK, 2017). There is a need to F1 pumpkin seed varieties in Turkey. For this purpose, 77 genotypes were used as vegetational material in our study, haploid and doubled haploid line was aimed to be obtained. In this study, irradiated pollen technique was used. The ray doses used were 100 and 150 Gy. In the pollination studies pollinated 74 flowers at a dose of 100 Gy, 39 fruit obtained and fruit set rate was 52.7%. The average fruit weight was between 405 g and 3760 g. Pollinated 70 flowers at a dose of 150 Gy, 35 fruit obtained and fruit set rate was 50%. The average fruit weight was between 602 g and 4205 g. 9301 seeds and 244 embryos were obtained from 39 fruits at a dose of 100 Gy. The number of seeds per fruit was 238 and the number of embryos per fruit was 6.3. Of the 150 Gy doses, 8,774 seeds were counted in 35 fruits and 234 embryos were removed. The number of seeds per fruit was 250.7 and the number of embryos per fruit was 6.7. Of the 244 embryos obtained from 100 Gy ray doses, 136 were rooted, 54 of them were transformed into plants and transferred to external conditions, 44 of them was kept alive by being accustomed to external conditions. The plant conversion rate was 18.0%. Of the 234 embryos obtained from 150 Gy ray doses, 99 were rooted, 67 of them were transformed into plants and transferred to external conditions, 51 of them was kept alive by being accustomed to external conditions. The plant conversion rate was 21.8%. As a result, 478 embryos were obtained in total; 235 of them were rooted, 121 of them have been transformed into plants and adapted to external conditions, of these, 121 were transformed into plants and transferred to external conditions, 95 of them was kept alive by being accustomed to external conditions, plant conversion rate was 19.9%. We have observed 63 plants in the ploidy detection we have done so far, 3 plants from 100 Gy doses and 6 plants from 150 Gy doses were identified as haploid (n). In 6 plants myxoploid (n + 2n) structure was observed.

**Keywords:** Dihaploid, Edible pumpkin seeds, Haploid

**THE DETERMINATION OF ENERGY EFFICIENCY PARAMETERS OF DAIRY SHEEP FARMS IN KONYA, TÜRKİYE**

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**Abstract:**

Sheep milk is very important for human nutrition because of its high fat content. In recent years, an increase in sheep breeding was observed in the research region. To evaluated energy use efficiency of animal production farms and is very significant for sustainable animal production and their environmental effects. The aim of this study was to determine the input and output relationship on dairy sheep farms by using energy use efficiency, energy productivity, specific energy and net energy yield parameters and their environmental effects. Data was obtained from 14 dairy sheep farm owners who have barn systems can represent the research area (Konya, Türkiye) with face to face surveying. The results of the research showed that energy use efficiency in milk production was calculated as 0.011-0.050 while energy production values was found range from 0.20 L/100M to 0.90 L/100MJ. The net energy yield values in this study was determinate between -4472128.87 MJ and -30518.77MJ while specific energy was found between 10.54 MJ/L and 494.48 MJ/L. According to this results, the planning new farm management system is needed in order to increase energy efficiency and to decrease unfavorable environmental effects of dairy sheep farms.

**Keywords:** Energy productivity, energy use efficiency,specific energy



THE EVALUATION OF ENERGY EFFICIENCY OF TRADITIONAL DAIRY GOAT  
FARMS IN KONYA, TÜRKİYE

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**Abstract:**

Goat milk is very significant for baby due to contents similar to mother's milk. The Konya region have an important capacity in goat breeding and goat milk production in Türkiye. The aim of the research was to evaluate the energy use efficiency, energy productivity, specific energy and net energy yield parameters of dairy goat farms for sustainable animal production. The study was conducted traditional dairy goat farms in Konya, Türkiye. All data was provided from 4 dairy goat farm owners by face to face surveying. The results showed that energy use efficiency in this study was found as 0.023-0.522 while energy production values was calculated between 0.412 L/100M to 9.489 L/100MJ. The values of net energy yield in the dairy goat farms were counted range from -284750.45 MJ and 69841.42 MJ while specific energy was found range from 10.55 MJ/L to 242.79 MJ/L. According to the research, goat breeding and goat milk production should be carried out using more modern techniques.

**Keywords:** Energy use efficiency, Konya, goat farm, net energy yield, specific energy

MINERAL CONTENT OF STYRAX (*STYRAX OFFICINALIS* L.) LEAVES AT DIFFERENT PHENOLOGICAL STAGES\*

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**Abstract:**

*Styrax officinalis* L. (*Styracaceae*) is a deciduous shrub reaching a height up to 4 metres. It is native to Southern Europe and the Middle East, and mostly found in Mediterranean region, America and Mexico. *Styrax* leaves are rich of some useful mineral elements such as Na, K, Fe, Zn and Cu. The concentration of these mineral elements in *Styrax* vary according to region and phenological stages. In this study *Styrax* leaves were collected from 4 different districts in Balıkesir, South Marmara of Turkey, at 3 different phenological stages (early vegetative, flowering and discernible seed). Total concentration of Na, K, Fe, Zn and Cu elements were determined using atomic absorption spectroscopy. Zn, Cu and Fe concentration ranged from 15.4-39.3, 6.2-11.3, 294.8-392.8 mg/kg on DM basis while Na and K concentration varied from 0.11-0.71 and 6.59-20.91 g/kg on DM basis during phenological stages. Only Fe and K levels were in substantial amounts in all phenological stages to meet adult goat requirements, while Zn and Cu levels were moderate. With the exception of early vegetative phenological stage *Styrax* leaves had extremely low Na concentrations. The grazing livestock in the area, intense in *Styrax* shrub, should be provided with mineral supplements due to low levels of both macro and micro minerals especially after flowering period.

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**Keywords:** *Styrax officinalis*, *Styrax*, potential mineral intake

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**ORGANIC GOAT FARMING ON ULUS AND AKDAG MOUNTAINS: CURRENT STATUS  
AND FUTURE ASPECTS\***

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**Abstract:**

Nowadays, goat breeding is a livestock activity that made especially in forests and rural areas and meets the living expenses and nutritional needs of poor people in the region where they are bred. Even though there are different genotypes and breeds in our country, the most common recurring genotype and bred almost all of our regions is Hair Goat. In addition increasing levels of education and living standards in recent years have led to increased animal food consumption and increased importance of consumers to the quality concept, leading to the entry of organic livestock into our lives. Ulus and Akdağ Mountains, located in Balıkesir and Kütahya, has a very rich plant diversity and different mountain ecosystems due to the intersection area of Europe - Siberia, Mediterranean and Iran - Turan flora regions. Over 24 thousand hectares of meadow-pasture area of Bigadiç, Dursunbey, Sındırgı and Simav districts with the significant coverage of woodland pasture and shrublands of this zone, makes this region an important for goat breeding. The main objective of this study is to review current status and future aspects of organic goat farming in Ulus and Akdağ Mountain areas.

\* This review was prepared by Selim ESEN's doctoral presentations seminar.

**Keywords:** Organic goat farming, Ulus, Akdağ

UÇUCU YAĞ (UY) VE ARBUSKÜLER MİKORHİZAL FUNGUS'UN (AMF) DOMATES KÖK VE KÖK BOĞAZI ÇÜRÜKLÜĞÜ *FUSARIUM OXYSPORUM F. SP. RADICIS LYCOPERSICI* (FORL) HASTALIĞINA ETKİLERİ

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**Abstract:**

Bu çalışmada, bazı Arbusküler Mikorhizal Fungus (AMF) türleri (*Glomus intraradices* (Gİ), *G. mosseae* (GM)) ile bazı uçucu yağların ( kekik, nane, adaçayı ), domatesteki önemli hastalıklar arasında yer alan *Fusarium oxysporum f. sp. radicis- lycopersici* (FORL)' nin yol açtığı kök ve kök boğazı çürüklüğü hastalığı üzerine etkileri incelenmiştir.

Çalışmanın birinci aşamasında, vitro koşullarda üç farklı uçucu yağ çeşidi ile bu uçucu yağların beş farklı dozu (25, 50, 75, 100, 150 µl/L ) FORL' ye karşı denenmiştir. Çalışma sonucunda en iyi engellemenin kekik uçucu yağının (KUY) 150 µl/L dozunda olduğu saptanmıştır. Çalışmanın ikinci aşamasında in vivo koşullarında yetiştirilen domates bitkilerine, AMF türleri ile 150 µl/L dozundaki KUY uygulanmıştır ve en iyi uyumun Gİ ile olduğu saptanmıştır. Çalışmanın üçüncü aşamasında, Gİ 150 µl/L dozundaki kekik uçucu yağının, domates bitkisinde FORL'ye etkileri araştırılmıştır. Çalışma sonucunda en yüksek AMF kolonizasyonu Gİ muamele grubunda, en düşük değer ise Gİ + FORL muamele grubunda tespit edilmiştir. Mikorhizal bağımlılık oranı en yüksek Gİ muamele grubunda, en düşük değer ise AMF X KUY X FORL muamele grubunda tespit edilmiştir. AMF spor sayıları açısından, en yüksek spor sayısı Gİ + KUY muamele grubunda olurken, en düşük değer Gİ + KUY + FORL grubunda elde edilmiştir. Domates bitkilerinde en yüksek ve en düşük hastalık şiddeti sırasıyla kontrol ve FORL + KUY + Gİ uygulamalarında görülürken FORL + Gİ ve FORL + KUY uygulamalarının hastalık şiddetini baskılamada oldukça etkili olduğu belirlenmiştir.

**Keywords:** Arbusküler mikorhizal fungus, Domates, *Fusarium oxysporum f.sp. radicis- lycopersici* Jarvis & Shoemaker, Uçucu yağ

**THE STRUCTURE OF FISHERIES COOPERATIVE IN AKSARAY PROVINCE AND TECHNICAL PROPERTIES OF FISHING GEARS AND VESSELS**

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**Abstract:**

This study was conducted in Aksaray provinces in Internal Anatolia Region. In the research, data is obtained from fisheries cooperative, founding year, fishing area, fisherman number, number and properties of fishery vessels, type and characteristics of fishing gears, catching fish species and amounts and, socio-demographic characteristics of fishermen in Aksaray city. These data have been determined by exact counting method.

At the result, it was determined that there were cooperative, 33 fisherman and 21 vessels belonging to fisheries cooperative. The total catch was 178 toones of year. It was determined that total length of the gillnet 27200 m, the pinter number 1000 and seine nets as 5.

**Keywords:** Fisheries Cooperative, Inland Water Fishing, Fishing Vessels, Aksaray

**DETERMINATION OF MONTHLY LENGTH-WEIGHT RELATIONSHIPS AND LENGTH COMPOSITION OF WHITING (*Merlangius merlangus euxinus*) CAPTURED FROM THE SOUTH BLACK SEA COASTS (ORDU)**

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**Abstract:**

The research was conducted to investigate monthly length-weight relationship and length composition of whiting (*Merlangius merlangus euxinus*) from the South Black Sea coasts. Study data were obtained between October 2017 and September 2018 from commercial fishing vessels (gillnets) in the Ordu region. Mean length for general, female, male and general lengthweight relationship of examined individuals were calculated  $15.49 \pm 0.06$  cm,  $15.90 \pm 0.07$  cm,  $14.65 \pm 0.08$  cm and  $W=0.0052L^{3.1399}$  ( $n=1236$ ;  $R=0.953$ ) respectively. Whiting has as generally positive allometric growth but negative allometric growth showed for December 2017, July-August-September 2018, izometric growth for May 2018 and positive allometric growth showed for other months were established.

**Keywords:** Whiting (*Merlangius merlangus euxinus*), Length-weight relationship, Length composition, Ordu, Black Sea

SAKARYA İL ORMANI TABİAT PARKI'NIN REKREASYONEL KULLANIMI VE  
KULLANICILARIN FARKINDALIĞI

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**Abstract:**

Son yıllarda insanların korunan doğal alanlardan rekreasyon/turizm amacıyla yararlanma talepleri, çeşit ve kalitesi konusundaki istekleri önemli artış göstermektedir. Korunan doğal alanların temel olarak kaynak koruma gerekçeleri, rekreasyon/turizm amaçlı kullanımlarıyla çoğunlukla çelişmekte; biyolojik çeşitlik başta olmak üzere doğal ve kültürel kaynakları olumsuz etkilenmektedir. Bu çalışmada, araştırma alanı olarak seçilen Sakarya İl Ormanı Tabiat Parkı'nın sunduğu rekreasyonel olanakların belirlenmesi, kullanıcıların beklentilerinin ortaya koyulması, kullanıcıların korunan alanlar ile ilgili olarak bilinç düzeyinin ve farkındalığının belirlenmesi ve artırılması amaçlanmıştır. Çalışmada yöntem olarak 400 kişiyle yüz yüze görüşülerek anket uygulaması yapılmıştır. Sonuç olarak Sakarya İl Ormanı Tabiat Parkı'nın eksiklikleri belirlenerek, koruma-kullanma dengesinde sürdürülebilir kullanımı için önerilerde bulunmuştur.

**Keywords:** Korunan Doğal Alanlar, Rekreasyon, Tabiat Parkı, Sakarya

COMPARING ARTIFICIAL NEURAL NETWORK AND HARGREAVES-SAMANI  
METHOD FOR ESTIMATING SUGAR BEET CROP EVAPOTRANSPIRATION IN  
ÇUMRA

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**Abstract:**

Çumra is one of the most important sugar beet cultivation area in Turkey. However, the area has water resources problem due to uncontrolled agricultural water use and climatic reasons. Therefore, irrigation management should be considered in the area. Hargreaves-Samani is one of the well-known evapotranspiration equation, which is recommended by Food Agriculture Organization (FAO). This equation is simple and only requires temperature climatic input. However, crop evapotranspiration is a non-linear process. It is difficult to estimate by other methods especially with less climatic inputs. This difficulties can be solved applying the artificial neural network (ANN). In this study, Hargreaves-Samani equation was used for comparing with artificial neural network methods. The study was covered a period of 10 years (1986-1995). The dataset were divided into two subset for training and testing. The ANN architecture was chosen to 5-5-1 structure, with 5 neurons in the input layer, 5 neurons in the hidden layer and 1 neuron in the output layer. Artificial neural network was evaluated according to the following performance indices: mean squared error (MSE), root mean square error (RMSE), mean absolute error (MAE), and coefficient of determination (R<sup>2</sup>). The result showed that the ANN acceptable performances for testing subset (MSE= 0.161, RMSE = 0.401, MAE= 0.300, R<sup>2</sup> = 0.969).

**Keywords:** ANN, sugar beet, crop evapotranspiration



**EFFECT OF DIFFERENT SOWING DENSITY ON FORAGE YIELD AND QUALITY COMPONENTS OF BIRDS FOOT TREFOIL (*Lotus corniculatus* L.)**

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**Abstract:**

While not commonly grown in the our country , birdsfoot trefoil produces high quality forage, that supports, animal performance from ruminant livestock, that are often superior to alfalfa or other forages. Improving the production of birdsfoot trefoil forage is possible by creating high yielding varieties and by improved cultural practices. This study was conducted in order to determine, effect of different (20, 40, 60 and 80 cm) row spacing and (5,10, 15, and 20 kg ha<sup>-1</sup>) seeding rate on green forage yield and yield components of birdsfoot trefoil (Candidate varieties) under the semi-arid climatic conditions at Tokat Kazova region. The field experiment was been conducted at the Central Black Sea Transition Zone Agricultural Research İnstitute, using a randomized complete block split-plot design with three replicates, beetween 2016-2019 years. According to 2018 year research results, in general, increasined row spacing decreased green forage yield, contrary to this, in general, increasing seed rate increased green forage yield. The row spacing had a statistically no significant effected its the green forage yield for both harvest. The seeding rates had a statistically significant affected (p<0.01) its the green forage yield for first harvest, but had no significant effect on the green forage yield for second harvest. The evaluated properties displayed significant variation between two harvests, yield and quality of the first harvest was been considerably higher than second harvest. During 2018, variances in crude protein ((14.2-15.4 % CP), neutral detergent fiber (46.5-48.0 %NDF) acid detergent fiber (37.5-40.2 % ADF) were mainly influenced by location-harvest environments, but the row spacing and seed rates did not significantly influence of the forage quality parameters. The for experiment year, the highest birdsfoot trefoil green forage yields, was obtained with plants grown in 20-40 cm spaced rows at a seeding rate of 20 kg ha<sup>-1</sup> (29472- 30462 and 29577 per ha in respectively).

**Keywords:** Row spacing, Seeding rate, forage yield, Crude protein, Acid detergent fiber

**EFFECT OF SOWING DENSITY ON SEED YIELD AND YIELD COMPONENTS OF BIRDSFOOT TREFOIL (*LOTUS CORNICULATUS* L.)**

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**Abstract:**

Birdsfoot trefoil is an important component of pasture ecosystems and natural life, apart from producing adequate feed in restricted areas in the direction of environment. Improving the production of birdsfoot trefoil seed is possible by creating high yielding varieties and by improved cultural practices. Information on optimum sowing frequency was not well insufficient for this region. Current study was conducted in order to determine the effect of different (20, 40, 60 and 80 cm) row spacing and (5,10, 15, and 20 kg ha<sup>-1</sup>) seeding rates on seed yield and yield components of birdsfoot trefoil (candidate varieties) under the semi-arid climatic conditions at Tokat Kazova region. The field experiment was be conducted at the Central Black Sea Transition Zone Agricultural Research Institute, using a randomized complete block split-plot design with three replicates, beetween 2016-2019 years. According at during 2018 research results, in general, increasing row spacing and seed rate decreased seed yield percentage. The row spacing had a statistically significant effect on seed yield and harvest index, but had no significant effect on the number of pods per plant, the number of seeds per pod and the seed weight per thousand. The seeding rates had a statistically significant affected its number of pod per plants, but had no significant effect on the number of seeds per pod, thousand seed weight and seed yield with harvest index. However, there were no significant interactions between row spacing and sowing rate for seed yield and yield components. The for experiment year, the highest birdsfoot trefoil seed yields, was obtained with plants grown in 40-20 cm spaced rows at a seeding rate of 10 kgha<sup>-1</sup> (16.8-16.38 and 15,15 kg per ha in respectively).

**Keywords:** Birdsfoot trefoil, Row Spacing, Seeding rate, Seed yield, Yield components.

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**INVESTIGATION OF EFFECTS OF SOME ROOT BACTERIA ON COMMON BEAN (*PHASEOLUS VULGARIS* L.) PLANTS GROWN ON SALT STRESS**

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**Abstract:**

Salinity is one of the most important problems in arid and semi-arid areas. The increase in salinity in agricultural areas creates great difficulties in terms of soil and plant. In this study, the effects of PGPR on the seedling growth parameters and nutrient content of bean plants grown under salt stress were investigated. Five different bacteria isolates (Control, R15/1, R38/1, R54/2, and 66/3) were applied with salt application (NaCl) at four levels (0, 20, 40 and 60 mM). As a result of the study, it was determined that the development of the bean plant generally affected negatively by salinity applications, while the PGPR applications showed differences according to the growth parameters and bacterial isolates. From the seedling growth parameters, it was observed that R54 / 2 bacterial isolate at shoot height gave better results than other bacterial isolates and control. The intake of macro and micronutrient elements was generally negatively affected by the application of salinity, but it was concluded that PGPRs gave different results in terms of nutrients. Especially, it was determined that R15 / 1 bacteria isolate for Mg ingestion, R54 / 2 bacteria isolate for Zn and Cu uptake, and 66/3 bacteria isolate for Mn content have a significant positive effect. It was also observed that the amount of chlorophyll was generally increased as a result of PGPR applications.

**Acknowledgements:** We are grateful for the financial support provided for this research by Van YuzuncuYil University Scientific Research Project Department (2015- FBE-YL174).

**Keywords:** Bean, Developmental parameters, PGPR, Salinity.

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**INVESTIGATION OF THE EFFECTS OF SOME ROOT BACTERIA ON BEAN BLIGHT BACTERIA (*XANTHOMONAS AXONOPODIS* PV. *PHASEOLI* (Xap)) IN BEAN (*PHASEOLUS VULGARIS* L.)**

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**Abstract:**

In the present thesis study, the effects of 10 PGPR isolates against *Xanthomonas axonopodis* pv. *phaseoli* (Xap) on the Gina bean variety were investigated. In the study, phosphorus (P), sodium (Na), magnesium (Mg), potassium (K), phosphorus (K), and phosphorus in root and plant roots, plant height, shoot diameter, shoot dry weight, shoot fresh weight, root dry weight, root fresh weight, the contents of calcium (Ca), copper (Cu), iron (Fe), manganese (Mn) and zinc (Zn) were measured. R15/1, R17/1, R53/2, R54/2 and R55/1 PGPR isolates were found to reach larger shoot diameter when compared to disease inoculated control application. It was found that R15/1, R17/1, R53/2 and R54/2 PGPR isolates had a higher shoot fresh weight than disease inoculated control application. It was determined that R15/1, R17/1, R53/2 and R54/2 PGPR isolates had higher root fresh weight than disease inoculated control application. It was found that R17/1 and R53/2 PGPR isolates had a higher shoot dry weight than the disease-inoculated control application. R53/2 and R55/1 isolates were found to have higher root dry weight than disease inoculated control application. It was also found that all PGPR applications except R15/1, R38/1 and 66/3 had higher root zinc content than their disease-inoculated control applications. It has been found that chlorophyll a, chlorophyll b, total chlorophyll and carotenoid amounts were significantly increased compared to control applications of R38/1 and 66/3 isolates.

**Acknowledgements:** We are grateful for the financial support provided for this research by Van YuzuncuYil University Scientific Research Project Department (2015- FBE-YL173).

**Keywords:** Bean, Seedling growth parameters, PGPR, Xap

**ORAL PRESENTATIONS / III. International Eurasian Agriculture And Natural Sciences Congress**

**EXPLORING ARCHAEOAL DIVERSITY BY METAGENOMIC ANALYSIS IN LAKE TUZ, TURKEY**

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**Abstract:**

Lake Tuz is the largest and economically significant salt lake in Turkey. In this study, we performed metagenomic 16S rDNA amplicon sequencing to reveal archaeal community in this hypersaline environment. Metagenomic sequencing was completed with water sample collection from Lake Tuz. DNA was extracted from collected samples and used to prepare 16S rDNA amplicon libraries for next generation sequencing. After quality control of reads, Qiime tools were operated for bioinformatics analysis of paired end 2x300 bp reads. Taxonomic analysis revealed that archaeal community in Lake Tuz was consisted of phylum of Euryarchaeota. Metagenomics result showed that Lake Tuz was dominated with Haloquadratum, Halobellus, Halorubrum, Halonotius, Halalkalicoccus, Halorussus and Halobacterium genera.

**Keywords:** Metagenomics, Hypersaline, Bioinformatics, Archaeal diversity

**DETERMINATION OF *PRUNUS ANGUSTIFOLIA* RESPONSE TO DIFFERENT  
DROUGHT STRESS LEVELS IN VITRO CULTURE CONDITION**

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**Abstract:**

In this study, it was investigated morphological and biochemical responses of *Prunus angustifolia* against different drought stress levels establishing in vitro culture media including different polyethylene glycol (PEG) levels. Three PEG levels; control, -1.0MPa, and -1.5MPa was used in order to make drought stress conditions. Morphological parameters such as plant height, root length, plant fresh and dry weight, membrane permeability, and biochemical features such as chlorophyll and protein content were measured and analyzed. Morphological and biochemical parameters were measured and analyzed at the end of the tenth day in the present study because the plantlets died after the tenth day.

The highest plant height was found in the control group with 3.06cm while the lowest rate in plant height was calculated in -1.5MPa with 2.80cm at 10. days. The root growth was found higher in control (6.18cm) than stress conditions including -1.0 and -1.5MPa with 5.32cm and 5.40cm respectively. The content of the total chlorophyll and protein content were the highest in the control group while the lowest chlorophyll and protein content in -1.5MPa.

In conclusion, the sand plum, *Prunus angustifolia*, was found susceptible to the highest drought level like - 1.5MPa but it was found that the plantlets of the sand plum were tolerant and they continued to live under - 1.0MPa level of drought in vitro culture condition.

**Keywords:** Drought Stress, Plant Tissue Culture, *Prunus angustifolia*

**SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES HYBRID WITH HUMIC ACID AND ITS APPLICATIONS IN AGRICULTURE**

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**Abstract:**

Naturally occurring macromolecular humic acid (HA) have gained interest in the chemical, biological and medicine industry owing to their unique behavior, i.e., strong adsorptive and non-toxic nature. In the present research work, the functionalization of organic (HA) with inorganic (ZnO) hybrid nanoparticles was investigated. Humic acid was extracted from agriculture soil by IHSS method and white ZnO nanoparticles were rapidly synthesized from  $\text{Zn}(\text{CH}_3\text{CO}_2)_2$  solution using KOH by precipitation method. different spectroscopic and analytical techniques UV-Vis, FTIR, XRD and SEM were applied for characterization. The spectral data proved the successful isolation and formation of HA, ZnONPs and hybrid ZnONPs-HA. The XRD pattern indicated the humic acid semi crystalline and ZnONPs crystalline in nature. The crystal size was calculated from the XRD patterns by applying Scherer's formula. The SEM results showed that the diameters of ZnO NPs were in the range of 10  $\mu\text{m}$  and spherical shaped hybrid ZnONPs-HA found 1.0  $\mu\text{m}$ . The comparison of spectral data of HA, ZnONPs and ZnONPs-HA vividly showed that the coating of HA on ZnONPs has been done and confirmed successful synthesis of hybrid ZnONPs-HA and their application to the plant (*Brassica compestris*) seeds improved the germination, root and plant growth.

**Keywords:** ZnO NPs, Humic Acid, Agriculture Soil Spectroscopic analysis

ZINC AND SULFUR COMPOUNDS IN TECHNOGENICALLY CONTAMINATED HYDROMORPHIC SOIL

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**Abstract:**

Soils formed after the desiccation of Lake Atamanskoe, which has served as a reservoir for liquid industrial waste from the city of Kamensk-Shakhtinskii (south of Russia) during a long time, were studied. These soils differ from zonal soils by a strong contamination with zinc and sulfur. The contents of zinc and sulfur exceed their lithosphere clarks in up to 800 and 80 times, respectively. Among authigenic minerals, the share of sulfates is high (45–60%). The aim of this study was to study composition of Zn- and S-containing compounds in this technogenic soil using X-ray powder diffraction and X-ray absorption spectroscopy (XANES and EXAFS). Two types of local surroundings are determined for Zn corresponding to its coordination by O and by S (close to ZnS). The lengths of Zn–O bonds close to the bounds in ZnSO<sub>4</sub> are identified in the samples, as well as a mixed local surrounding with Zn–S and Zn–O bonds. The fitting results of the EXAFS data on the metal state in soils revealed 70% of Zn–S bonds and 30% of Zn–O bonds. It is suggested that fixation of Zn in hardly available forms with Zn–O and Zn–S bonds occurs under alkaline conditions and high content of sulfate ions of the studies in technogenically hydromorphic contaminated soil, which reduces the mobility of Zn and restricts the environmental risks of biological uptake.

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**Keywords:** Zn, S, hydromorphic soil, contamination



**KURAKLIĞA HASSAS FASULYE GENOTİPLERİNDE KALSİYUMUN DEĞİŞEN DOZLARININ ETKİSİ**

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**Abstract:**

Fasulye üretimi ülkemizin her bölgesinde yoğun şekilde yapılmaktadır. Ancak üretim esnasında kuraklık gibi olumsuz çevre şartları fasulye de verim ve kaliteyi düşürmektedir. Bitki bünyesinde yeterli oranda potasyum ve kalsiyumun olması bitkilerin olumsuz çevre şartlarına mukavemetlerini arttırmaktadır. Yapılan çalışmada kalsiyum un 0, 100, 200 ve 400 mg/kg Ca dozlarının kuraklı stresine hassas genotipler üzerine etkisi araştırılmıştır. Çalışmada kuraklık stresine hassas olan Zulbiye çeşidi ile önceki çalışmalarımızda kuraklığa hassas olan T7, V71 genotipi kullanılmıştır. Fasulye tohumlarının ekimi sadece perlit doldurulmuş 2 litrelik saksılara yapılmıştır. Çalışma da kullanılan her saksıda iki bitki olacak şekilde ve dört tekerürlü her tekerrürde 4 saksı şeklinde tesadüf parselleri faktöriyel deneme desenine göre kurulmuştur. Tohumlar ekilip deneme sonlandırılıncaya kadar Hogland besin çözeltisiyle sulanmıştır. Çalışmamızın yapıldığı iklim odasının sıcaklığı çalışma süresince 22 0C' de tutulmuştur. Fide döneminden itibaren kuraklık stresinin uygulandığı bitkilerde sulama tamamen kesilirken kontrol bitkilerinde ise sulamaya devam edilmiştir. Kuraklığın 10. gününde çalışma sonlandırılarak fasulye genotiplerinde, bitki ağırlığı, yaprak oransal su içeriği, memebran zararlanma indeksi ile. K ve Ca içeriklerindeki değişimleri incelenmiştir. Ca'un 200 ve 400 mg/kg Ca dozlarının kuraklığa hassas olan Zulbiye çeşidi ile T7 ve V71 genotiplerinde kuraklıktan kaynaklanan zararların azaldığı gözlenmiştir.

**Keywords:** Kalsiyum.Fasulye, Kuraklık

**TUZ STRESİNDEKİ İSPANAKTA VERMİ KOMPOST VE YOSUN UN ERKEN BİTKİ GELİŞİMİNE ETKİSİ**

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**Abstract:**

Tuz oranı yüksek arazilerde tuz oranına bağlı olarak bitki gelişimi olmamakta veya verim ve kalite düşmektedir. Bu gibi ortamlara organik maddeler uygulayarak ıslah edilme yoluna gidilebilir. Yapılan çalışmada yosun ve vermi kompost ortamlarının tuzun 50 ve 100 mmol uygulamalarında ıspanak bitkisinde ne kadar olumlu etki ettiği amaçlanmıştır. Çalışmada 2 litrelik saksılara 1/2 oranında toprak ve vermi kompost, toprak ve yosun ile sade toprak ortamlarına tuz sıfır, tuz 50 mmol ve tuz 100 mmol uygulamaları yapılmıştır. Çalışma da kullanılan her saksıda bir bitki olacak şekilde ve üç tekerürlü her tekerrürde 4 saksı şeklinde tesadüf parselleri faktöriyel deneme desenine göre kurulmuştur. Ispanak bitkileri üç gerçek yaprak olduğunda tuz uygulamaları yapılmıştır. Tuz uygulandıktan 13 gün sonra deneme sonlandırılmıştır. Yapılan analiz ve ölçümlere göre ıspanakta bitki gelişiminde tuz'un 100 mmol dozunun olumsuz etkisine vermi kompostun daha çok olumlu etki ettiği ve yosunun ise çok az bir fayda sağladığı istatistiksel olarak gözlemlenmiştir.

**Keywords:** Ispanak, Tuz, Vermi kompost, Yosun

EXPLORING THE POTENTIAL OF POMEGRANATE (*PUNICA GRANATUM*) AND ITS BYPRODUCTS IN ANIMAL NUTRITION

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**Abstract:**

One of the most important strategies in animal nutrition is the use of affordable, readily available, native and abundant feed sources. For this purpose agro-industrial by-products are the first option. In addition to their nutritional value, these by-products which usually thrive in the environment have functional properties because they possess secondary metabolites. Banning the use of feed additives such as antibiotics and hormones incorporated into animal feed as performance enhancers has increased interest in phyto-chemical substances found in plants. In order to make use of these phyto-chemical substances, either the plants themselves or their extracts are used. Among them, pomegranate and its by-products (pomegranate seeds, skin, flowers, etc.) are predominant with high bioactive component amounts due to high phenolic content. Nowadays, numerous clinical trials are in progress exploring the therapeutic potential of pomegranate and pomegranate extracts. In human and animal studies, pomegranate has been shown to exert significant antiatherogenic, antioxidant, anticarcinogenic, analgesic, antiparasitic and anti-inflammatory effects. In this review, the availability of pomegranate plants, their components and use of pomegranate plants and fruit by products in animal feed have been reviewed to discover the potential of pomegranate to be used in animal nutrition.

**Keywords:** Pomegranate pulp, Alternative feeds, Non-conventional feeds

**COMPARISON OF IN-VITRO DIGESTIBILITY OF DIFFERENT SOYA PRODUCTS USING DAISY INCUBATOR IN BUFFALO AND CATTLE RUMEN JUICE**

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**Abstract:**

The objective of this study that determination in-vitro Dry matter digestibility (DMD) of different soya products [American soya (AS), soypass (SP), soya flake(SF), full fat soya(FFS)] using daisy incubator in cattle and water buffalo rumen juice. Digestibility of 4 different soybean products were evaluated in vitro using the Daisy incubator. Dairy and Buffalo rumen juices were used as incubation medium. Incubation period was evaluated during 48 hours. The 250-mg samples were placed in 5 x 4 cm, 25µm-pore, polyester/polyethylene bags (F57filter bags), which were heat-sealed and then placed in 4-liter capped glass jars spinning inside a temperature-controlled chamber. Twenty five (repetitions) were incubated in each jar, including one blank bag (empty and sealed bags containing no sample) to obtain the correction factor for potential bag contamination with particles or bag weight loss. Dry matter digestibility of all soya products were different exclude soy pas both of buffalo and dairy cow juice at 48th hours. Dry matter digestibility of soy pas were 93.40% and 92.96% at 48th hours for cows and buffalos. This results were significantly difference ( $P<0.01$ ). The DMD of AS, FFS and SX were 98.58-97.63%, 93.66-93.82% and 90.27-92.82%, respectively. As a conclusion, the results revealed that soya products in-vitro DMD of buffalo and dairy cow are almost same. There is a need for further work in order to better understand the subject. "This study was supported by Scientific Research Projects Coordination Unit of Afyon Kocatepe University (Project Number 17.SAĞBİL.04)."

**Keywords:** Daisy incubator, buffalo, cow

**THE EFFECTS OF MİNİ TUBERS, SEED TUBER SİZE, NUMBER OF TUBER AND SAME  
MİCROORGANİSMS OF REPRODUCTION OF POTATO MİNİ TUBERS**

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**Abstract:**

In this study, it was aimed to investigate the effects of some microorganisms, size of tubers, planting density on original seed grade tuber production. In this study, elite seed tubers of Basciftlik Beyazi potato varieties were used. The study was carried out in 2015 in Tokat Artova under the net greenhouse in pots. The study was conducted in a Randomized Complete Block Design in split-split plots with three replications. Microorganism applications in the main plots (normal, mycorrhiza, bacteria), the size of the seed tubers in the lower parcels (7, 15, 30, 45, 60, 80 and 100 g), the number of seed tubers planted in pots in the lower-lower parcels (1, 2 and 3 pieces/pot) are placed. In this research, characteristics such as number of mini tuber and mini tubers yield per pot. It was determined that the number of tubers per pot was increased and the seeds produced in mycorrhizal medium gave the best results in mini tuber yield.

**Keywords:** Potato, mini tuber, yield, mycorrhiza, bacteria

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**STUDY ON BREEDING OF POTATO CLONES ADAPTABLE TO CENTRAL-NORTH INTERSECTIONAL REGION OF TURKEY**

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**Abstract:**

Potato breeding studies are new ,although potato has been produced for years in Turkey. But in recent years, studies on developing new cultivars were gained acceleration in Turkey. Potato cultivars growth in Turkey were mainly imported from overseas. This study was aimed at development of new potato cultivar and has been performed. The promising clones were planted in the field and seed tubers have been produced in Tokat-Artova during 2017-2019. Clone selection has been continued by use of clonal selection method. The following yield and tuber parameters were used in clonal selection studies; tuber yield/per hill, number of tuber/per hill, average tuber weight, tuber shape, tuber dry matter and starch content.

**Keywords:** Potato, *Solanum tuberosum*, Clonal selection, Development of cultivars.

**THE USE OF ECOSYSTEM SERVICES IN SUSTAINABLE FOREST MANAGEMENT: A CASE STUDY OF YIGILCA MOUNTAIN REGION**

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**Abstract:**

The lands of Yığılca District of Düzce province are generally mountainous. The most important of the rivers flowing from the valleys is the Melen Stream. The mountains are covered with dense forests. Since the district has a sloping, most rocky and forested land structure due to its geographical characteristics, the agricultural land is narrow and inefficient. The development of the district and the management of its forests depend largely on the use of ecosystem services.

As stated in the final report on the revision of the national set of sustainable forest management criteria and indicators prepared by the Ministry of Forestry and Water Affairs, forests are among the most productive resident ecosystems in the world and are very important for life on earth. Sustainable forest management is needed. The concept of sustainable forest management is defined as the way in which the ecological, economic and social functions of forests and forest areas can be fulfilled at the local, national and global levels today and in the future without harming other ecosystems. The concept of ecosystem services is the benefits and products that are offered to people directly or indirectly as a result of the functions and processes of ecosystems. According to the EU Technical Report, there are 3 international classifications for ecosystem services: regulatory, sourcing and cultural. Within the scope of the study, ecosystem services of Düzce province Yığılca district were determined and smart forestry was discussed in the context of sustainable forest management concepts.

**Keywords:** Sustainable Forest Managment, Smart Forestry, Ecosystem Services, Mountain Region, Yığılca

**MORPHOLOGICAL CHARACTERISTICS OF SOME SPINACH (*SPINACIA OLERACEA*  
L.) GENOTYPES**

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**Abstract:**

Spinach cultivation in the World is to be produced for three different leaf types. Curly twisted leaf are frequently produced for fresh consumption, flat-leaf types are generally for food industries and baby-leaf types are produced commonly for baby food. Spinach, grown in all regions of Turkey, is a leafy type vegetable consumed intensively in winter months. In order to be successfully released new cultivars, adequate genetic and agronomic knowledge is required for available genetic resources.

This study was conducted to create the gene pool for breeding F1 hybrid spinach program and determine some leaf characteristics of S2 level spinach genotypes of which is derived from this gene pool. Following characteristics such as intensity of green color in leaf blade, blistering to leaf blade, lobing to leaf blade, petiole attitude, petiole length, leaf blade attitude, leaf blade shape, leaf blade curving of margin, leaf blade shape of apex, leaf blade shape in longitudinal section, number of leaf, leaf fragility were used to evaluate S2 level spinach genotypes. Cluster analysis was implemented to the observed data. According to the cluster analysis results, S2 spinach genotypes were placed in 13 different groups.

**Keywords:** *Spinacia oleracea*, morphological characterization, cluster



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Congress**

**EFFECTS OF DIFFERENT N, P, K AND PGPR APPLICATIONS ON YIELD AND YIELD  
COMPONENTS IN LETTUCE (*LACTUCA SATIVA* L.)**

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**Abstract:**

In order to achieve high yield and quality in conventional agriculture, intensive chemical use is required. These chemicals not only cause cost increases but also adversely affect human and environmental health. One of the factors that can eliminate or reduce the effects of chemical use is PGPR applications. This study was carried out to determine the effect of PGPR applications on plant growth, yield and some yield components at varying fertilizer doses (N, P, K) in lettuce (*Lactuca sativa* L.) underfield conditions. The experiment was conducted in Silifke-Mersin in 2019. PGPR strains (SA-7, SB39, YÖ19, YÖ15, YÖ, 41, SK72) were used in the experiment at a concentration of 10<sup>7</sup>cfu / ml. The other factor in the experiment was varying of N, P, K doses (0%, 25%, 50%, 100%, 150% and 200% of the recommended dose). PGPR applications have a positive effect on plant growth in lettuce in general. As a result of the measurements, positive effects of bacterial applications were observed in the plant height, stem diameter, root length, root collar diameter, number of leaves, TSS, fresh and dry weights, yield, marketable yield. In particular, there was non significant reduction in fertilizer doses compared with half of the reduced recommended dose (50% NPK) with other increasing doses.

**Keywords:** PGPR, Lettuce, Yield, Quality

**ORAL PRESENTATIONS / III. International Eurasian Agriculture And Natural Sciences Congress**

**EFFECTS OF TREATED WASTEWATER ON GERMINATION AND SEEDLING GROWTH OF TWO DIFFERENT BEAN VARIETY**

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**Abstract:**

With the water resources becoming inadequate, the utilization possibilities of treated wastewater, which is an alternative water source especially in the agricultural sector, began to be investigated. In this study, the effects of treated domestic wastewater on germination and seedling growth of beans were investigated. The experiment, which was established under controlled conditions, was established with 4 replications according to the split plots experiment design. The main parcels were bean cultivars (Gina ve Noyanbey- and sub-parcels were established with treated waste water doses (pure water, % 25, % 50, % 75, % 100 treated waste water). In this study, germination speed, germination percentage, shoot length, root length, fresh weight and dry weights were determined. Statistical analysis of the data was performed by using MSTAT-C package program. As a result, statistically significant differences were determined between cultivars and treated waste water doses in terms of investigated properties.

**Keywords:** Bean, Germination, Seed, Waste water

TRANSCRIPTOME ANALYSIS OF FRUIT CRACKING MECHANISM IN POMEGRANATE (*PUNICA GRANATUM* L.) BY RNA-SEQ

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**Abstract:**

Pomegranate (*Punica granatum* L.) is an important fruit species in terms of nutrient content and antioxidant properties. It is a common and valuable plant for use in health, cosmetic and industrial fields as well as indispensable in human nutrition. These characteristics lead to increases in pomegranate demand and increasing demands create pressures to increase production. However, many problems in fruit production cause decreases in production and serious economic losses. The most important of these problems is fruit cracking. Cultural practices and especially genetics are the factors causing the problem. By clarifying the genetic mechanism of fruit cracking problem and integrating the information obtained in breeding programs, it will make significant contributions to the development of commercial varieties with high nutritional composition, high yield, resistant to environmental factors and high added value. Nowadays, RNA Sequencing technology enables the effective elucidation of genetic information in a short time, genetic regulation, molecular elements, physiological, metabolic and biochemical functions and pathways related to functions. Illumina HiSeqTM 2000 sequencing platform was used to clarify the mechanism of fruit cracking in pomegranate and to identify the genes associated with the mechanism, transcriptome analysis was performed on fruit peel tissues of crack-sensitive İzmir-15 and crack-resistant Hicaznar cultivars. A total of 830000000 base readings and 22000 Unigen were determined as a result of sequencing. Transcriptomal analysis revealed differences in expression profiles of cellular organelles, cell wall and membrane, organelle membranes, abiotic stress responses, intra and extracellular activity, cellulase catabolic process, vacuolar membrane, nuclease activity, chloroplast and plastid activity.

**Keywords:** Pomegranate, Fruit cracking, Transcriptome, Unigene, RNA-Seq



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**THE ABSTRACTS OF POSTER PRESENTATIONS**

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**TİKA**

**COMPARISON OF REFERENCE EVAPOTRANSPIRATION ESTIMATING MODELS IN IRAN**

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**Abstract:**

There are different models for estimation of evapotranspiration that are based on mass transfer, radiation, temperature and combination groups. The main purpose of the present study is calibration of evapotranspiration methods and selection of the best method in different climatical situations in provinces of Iran. Meteorology data were collected for this research from 10 synoptic stations of Iran. The comparison that was performed between the results of calculated reference evapotranspiration based on the available four experimental groups and observational lysimeter data for selecting best model. The Hargreaves-Samani (1985) with  $R^2 < 0.94$  and  $RMSE < 1 \text{ mm/day}$  was investigated in seven arid and semi-arid climate provinces and was identified as the best method in these regions. While, the mass transfer models show proper results in central provinces and Caspian Sea basin (with moderate and humid climate) and Albrecht (1950) method was selected as the best method among them in these provinces.

**Keywords:** Temperature, Radiation, Mass transfer, Combination methods

EFFECTS OF PHYTOHORMONE AND ESSENTIAL OIL APPLICATIONS ON STOLON AND TUBER GROWTH IN POTATO (*SOLANUM TUBEROSUM* L.)

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**Abstract:**

This study was conducted to determine the effects of indole butyric acid (IBA), jasmonic acid (JA) and essential oils of oregano (*Origanum onites* L.) and fennel (*Foeniculum vulgare* L.) on root and stolon growth and tuber formation in potato at 2017 under greenhouse conditions. Seed tubers (Agria cv.) were treated with IBA (0, 250, 500 and 1000 ppm), JA (0, 1.5, 3.0 and 4.5 mM) and oregano and fennel (0, 100, 500 and 1000 ppm) essential oils, then were planted in pots containing peat-perlite (3:1). Both phytohormone and essential oil applications significantly affected the root and stolon development and tuber formation in potato. IBA applications generally promoted root growth while JA and fennel essential oil treatments promoted stolon and tuber growth. The number of stolon was increased up to 35% and the number of tubers increased up to 24% with the treatments compared to control. 250 ppm IBA, 3.0 mM JA with 100 ppm fennel and 500 ppm oregano essential oil were more effective than other applications in terms of stolon and tuber formation. It was concluded that phytohormone and essential oil applications on seed tubers before planting could be effective in seed tuber production.

**Keywords:** Essential oil, Phytohormone, Potato, Stolon, Tuber

**EFFECT OF PROTEIN SUPPLEMENTATION ON PERFORMANCE, INTAKE, DIGESTIBILITY AND RUMEN FLUID PH OF AWASSI LAMBS FED LOW QUALITY FORAGES**

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**Abstract:**

The objective of this study was to evaluate the effects of feeding graded levels of soybean meal (SBM) on nutrient intake, digestibility, N balance and growth performance of Awassi lambs fed low quality forages. Twenty-one Awassi lambs [initial body weight (BW)  $26.1 \pm 2.57$  kg] were randomly assigned to three diets. Diets were: 1) basal diet (forage mix; CON;  $n = 7$ ), the basal diet supplemented with either 125 (SBM125;  $n = 7$ ) or 250 (SBM250;  $n = 7$ ) SBM g/head/day. Forage mix composed of 65% wheat straw and 35% alfalfa hay. The basal diet was offered to all groups ad libitum. The experimental diet was offered to the animals for 54 days (7 days were used as adaptation period followed by 47 days for data collection). On day 40 of the study period, 4 animals from each group were selected randomly and housed individually in metabolism crates ( $1.05 \times 0.80$  m) to evaluate nutrient digestibility and N balance. Hay intake was greater ( $P < 0.05$ ) for lambs supplemented with SBM vs lambs fed the CON diet. The intake (g/d) of dry matter (DM) and crude protein (CP) intake was the highest ( $P < 0.016$ ) for lambs fed SBM250 followed with SBM125 diet when compared to lambs fed CON diet. Neutral detergent fiber (NDF) and acid detergent fiber (ADF) intake was greater ( $P \leq 0.028$ ) for lambs fed SBM125 and SBM250 diet compared with the CON diet. Digestibility of DM and CP was greater ( $P < 0.05$ ) for lambs fed SBM-containing diets vs the CON diet. Digestibility of NDF was higher ( $P = 0.029$ ) in the SBM250 diet than the CON diet, whereas the SBM125 diet was intermediate. Nitrogen retention percentage was greater ( $P \leq 0.002$ ) for lambs fed SBM125 and SBM250 diets compared with the CON diet. Final body weight (kg), total gain and average daily gain were greater ( $P \leq 0.008$ ) for lambs consumed SBM containing diets compared with CON diet. Serum glucose and urea N content was greater ( $P \leq 0.0003$ ) for the SBM125 and SBM250 diets compared with the CON diet. In summary, growth performance, forage utilization, nutrient digestibility and N balance was improved for lambs fed low quality forages when supplemented with soybean meal.

**Keywords:** Soybean meal, Awassi lambs, Intake, Digestibility, Growth performance

**THE EFFICIENCY OF HIGH SOLUBILITY PRIMING AGENTS IN SEED VIGOR TESTS**

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**Abstract:**

In our study, 4 different standard pepper varieties obtained from commercial seed company were used. Seeds of each varieties were subjected to priming application in 3 different salt solutions (MgCl, NaCl, PEG) and carried out between 2017-2018 in Uşak University Faculty of Agriculture and Natural Sciences Seed Laboratory to determine the effects on germination and emergence performance as a result of vigor tests. Seeds were kept in 1% MgCl, NaCl, PEG salt solutions for 8, 16 and 24 hours and were subjected to germination, accelerated aging, controlled deterioration, electrical conductivity, seedling emergence tests with the control group. In the end, total and normal germination (%), mean germination time (day), wet and dry weight (g) were determined. The most favorable effect on total germination rate in terms of solutions used in pre-germination was PEG solution which was primed for 8 hours at 20 and 25°C. The lowest germination rate compared to the control group was the application of priming 16 hours at 20 and 25°C. According to the results of germination test, the highest germination rate is Yalova Çorbacı 12 and the lowest is Yalova Çarliston 341 In accelerated aging test (72 hours); total germination rate was highest in the pre-treatment varieties made in MgCl solution for 16 hours. Compared with the control group, the highest germination rate of 8 hours in the PEG solution was applied pre-germination at 24% humidity 24 hours controlled deterioration occurred. Among the all seed varieties showing the highest value of 1% MgCl solution was applied

**Keywords:** pepper, vigor tests, priming, germination and emergence rate



**USE OF GRANULAR NEMATOCIDE AGAINST SOİL ORİĞİN PATHOGENS**

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**Abstract:**

It is recorded that 52% of the soils used as agricultural areas in the world are contaminated with root-knot nematodes. Plant parasitic nematodes are small organisms that are not visible with the naked eye. Their feeding takes place through the mouth called stylet, by absorbing plant sap from the capillary roots of plants. It is known that these species, which feed on plant roots, cause harm and have more than 3,000 hosts. It is recorded that there is a loss of approximately 12% in the total agricultural production in the world caused by plant parasitic nematodes. Various methods have been applied to combat such nematodes that cause such damage. One of the most effective chemical control methods is the use of various nematicides on the market. Fenamiphos, one of the nematicides, is an acetylcholinesterase inhibitor in the organophosphorus class. Organophosphorus nematocytes cause paralysis by inhibiting nematode acetylcholinesterases. The affected nematodes show symptoms such as a twitch, tremor, rapid muscle contractions before paralysis, and then they become paralyzed. In this study, Fenamiphos active substance product produced in granular formulation in Safa Tarım A.Ş. against the effects of nematodes in tomato, citrus, and banana growing areas were tested. The formulation was made ready for industrial production under the trade name “NEMAFEN 10 GR”

**Keywords:** Fenamiphos, nematode, nematicide, root-knot nematode, organophosphorus

**EFFICIENT DOSE DETERMINATION OF SULFONYLUREA GROUP HERBICIDE AGAINST WILD OATS (*AVENA STERILIS* L.) PROBLEM IN WHEAT PLANTING AREAS**

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**Abstract:**

Wheat is the kind of grain that has the largest cultivation area with 72 million decare and 20 million tons of production in our country. Weeds that cause wheat production losses between 10-24% are an important problem in our country as well as in the cultivation areas in the world. One of the products used to prevent this harm is the herbicides containing mesosulfuron-methyl and iodosulfuron-methyl-sodium active substances and mefenpir-diethyl (safaner) in the sulfonyleurea group. Sulfonyleurea group herbicides inhibit the enzyme ALS (Acetolactate synthetase) involved in the biosynthesis of branched chain amino acids. In this study, the biological activity of the herbicide containing sulfonyleurea group active substances against the biological oats (*Avena sterilis* L.) which is a problem in Adana wheat cultivation areas was tested on the Adana 99 cultivars. For this purpose, 4 different doses (20, 25, 30, 60 g/da+100 mL spreader adhesive, YY) were prepared according to the standard trial method. The experiment was designed as randomized block design with 6 characters (4 trial drug doses+comparison drug+control) and 4 replicates. The spraying was carried out by sprayer with 4-6 leaves of weeds and in the period of tillering of wheat. 40 litres of water is used per decare. The comparative drug was tested at the recommended dose (30 g/ha+100 mL YY). The dose of 30 g/ha+100 mL HG showed sufficient effect according to the results. The dose of 60 g/ha+100 mL YY did not cause any phytotoxicity in wheat plant. As a result, it has been found that

**Keywords:** sulfonyleurea, water dispersible granules, wheat, wild

DETERMINATION OF FREQUENCY AND DENSITY OF WEED SPECIES IN WHEAT (*TRITICUM AESTIVUM* L.) FIELDS OF UŞAK PROVINCE

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**Abstract:**

Wheat (*Triticum aestivum* L.) is the most important cultivated plant that is the fundamental of human nutrition and is on the first rank among the plants cultivated in the world. Weeds stand out from other biotic factors with 48-52 % of losses and cause competition and quality and yield losses in wheat through the alleopatical matters that they secrete. For that reason, determining the species and population of weeds in this study conducted in conditions of our province is important in terms of creating resources for the further studies on the control against the weeds. The purpose of this study is to determine the species, frequency and density of weeds by visiting 115 wheat cultivation fields (Banaz, Eşme, Karahallı, Ulubey, Sivaslı) of Uşak province regardless of considering the weed management. As a result of the study totally 76 weeds species were determined belonging to 24 plant families in Uşak province. While Brassicaceae and Asteraceae families were on the first rank with 10 each weed species, Apiaceae and Poaceae families were on the second rank with 8 each species and Fabaceae family was on the third rank with 5 species. *Secale cereale*, *Convolvulus arvensis*, *Avena* spp., *Galium* spp., *Bifora radians* and *Papaver rhoeas* species were the weeds on the top in terms of frequency and density.

**Keywords:** Uşak, Wheat, Weeds, Frequency, Density, Survey

DETERMINING THE SPECIES, FREQUENCY AND DENSITY OF WEEDS IN SUGAR BEET (*BETA VULGARIS* L.) CULTIVATION FIELDS IN UŞAK PROVINCE

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**Abstract:**

Weeds are the leading factors that restrict the production of sugar beet and the yield losses vary depending on the competitive capacity and population of the weeds and the competition duration with the product. First of all, it is necessary to know the species, population, biologies, ecologic demands and critical periods of the weeds in a successful control of the weeds. For that purpose, 51 weed species from 22 families were detected as a result of the study conducted in 73 fields to determine the problematic weeds in sugar beet cultivation areas in late period in Uşak province and counties. With 9 species Asteraceae and Brassicaceae families and with 6 species Poaceae family stood out as the families with the most amount of weeds in Uşak province. In terms of frequency and density of population *Amaranthus retroflexus* L., and *Chenopodium album* L. were on the first rank. *Convolvulus arvensis* L. and *Polygonum* spp. were the other important species for Uşak province in sugar beet cultivation areas.

**Keywords:** Sugar Beet, Uşak, Survey, *Amaranthus retroflexus* L., *Chenopodium album* L., *Convolvulus arvensis* L., *Polygonum* spp,

**THE CREATION OF TECHNOLOGY REMOTE SENSING OF CROPS USING SPECTRAL CAMERA FOR UNMANNED AERIAL VEHICLES**

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**Abstract:**

Precision farming technology is based on the use of spectral cameras and sensors installed on agricultural machinery and unmanned aerial vehicles. Such approaches make it possible to obtain maps of the state of crops, yield, irrigation process, harvesting and other technological characteristics. Obtaining such operational information allows us to characterize crops not by averaged indicators (yield, leaf area, density of standing, etc.), but by large numerical data arrays (Big Data), which was impossible before. An effective tool for solving these problems is the definition of vegetation indices, such as NDVI. When assessing the heterogeneity of agrochemical soil indicators, it is necessary to establish statistical indicators of crop parameters to identify the presence or absence of cause-effect relationships between crop yields and soil fertility indicators. Therefore, with the use of modern technologies focused on the specifics of crop programming and precision farming using remote sensing and unmanned aerial vehicles, it is possible to increase the efficiency of agricultural production.

**Keywords:** vegetation index, unmanned aerial vehicles, remote

**THE EFFECT OF HOT PRETREATMENTS AND SUGAR CONCENTRATIONS ON HAPLOID EMBRYO AND PLANT FORMATION VIA GYNOGENESIS IN CUCUMBER (*CUCUMIS SATIVUS*)**

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**Abstract:**

Cucumber (*Cucumis sativus* L) is one of the most important vegetable crops in the world and there is a need to develop effective protocols for the routine use of double haploid (DH) lines to accelerate plant breeding. For this purpose, different heat shock applications and sugar doses were compared in this study in order to make DH production more effective by gynogenesis method in cucumber. In this study, 2 different genotypes (432 and BDR-77 breeding line) and 3 different types of commercial cucumber varieties (Ufuk, Meriç, Sedir) were used. For heat shock applications was applied 35 ° C for 3 days or 27 ° C for one week. Four different doses of sucrose (30, 60, 90 and 120 g / l) were used in the study during the induction, cucumber female flowers were collected one day before the anthesis and cultured in MS medium. Although it varies according to the genotypes used in the experiment, different rates of haploid embryo and plant regeneration were obtained while heat shocks and different sugar concentrations were generally induced callus formation.

**Keywords:** *Cucumis sativus* L., Gynogenesis, Haploid, Heat

**POSTER PRESENTATION / III. International Eurasian Agriculture And Natural Sciences Congress**

**A NEW CONCEPT - SMART HYDROGEL FOR REMEDIATION OF DEGRADED SOILS**

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**Abstract:**

The area of interest is the synthesis and study of properties of new types of hydrogels made from pelt waste, in order to recover waste from tanneries.

The research paper shows that exploratory research as a starting point to obtain new polymeric complex products -multicomponent - called hydrogels, by processing organic waste with applications in agriculture. Hydrogels that are based on biopolymers, compared with hydrogels based on synthetic polymers, have the advantage of biodegradability and a low level of toxicity. The paper presents the production of biodegradable polymer mixtures obtained from hydrolysis and enrichment of the resulting hydrolysate with phosphorus and potassium. Hydrogels with collagenous structure are tested using a high-performance instrumental analysis system (FT-IR-ATR, SEM, EDAX, etc).

The paper presents an experimental model for obtaining hydrogels with collagenous structure from pelt waste resulting from the liming process.

**Keywords:** polymers, pelt waste, collagen, tannery, agricultura.

**THE IMPACT OF NUTRITIONAL AND PSYCHOLOGICAL CARE ON CANCER PATIENTS TREATMENT AND THE REDUCTION OF CANCER TREATMENT SIDE EFFECTS**

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**Abstract:**

Cancer is abnormal cell division, and it is an important cause of morbidity and mortality. In 2018, it was estimated that there would be 18.1 million cases and 9.6 million cancer deaths worldwide. Cancer may be caused by genetic and/or many environmental factors. Chemotherapy treatment may effect cancer patients psychological, nutritional, and quality of life, which may lead to reduced food intake, weight loss, muscles wasting, alteration in eating behaviors, change in the body metabolism, protein calorie malnutrition, stress, anxiety, and depression. In this study we aimed to assess the nutritional practices, dietary intake, and psychological status among cancer patients and to evaluate their impact on cancer patients well-being who undergo their treatment regimen. This study was an observational study over three cycles of chemotherapy. Seventy five participants first cycle chemotherapy treatment included in this study, all of them filled the questionnaire, psychological scale, quality of life scale, and three day food records to assess the nutritional intake, and baseline anthropometric measurements. All anthropometric measurements decreased after 2 months of chemotherapy. Approximately half of participants had depression and anxiety. There were significant difference ( $P \leq 0.05$ ) between all micronutrients and macronutrient intake except for fat, unsaturated fatty acid, and iron ( $p \geq 0.05$ ). Also, there was significant association ( $P \leq 0.05$ ) between nutritional care and quality of life scale (functional and health status scales), and depression. Chemotherapy negatively effects patients eating patterns, psychological status, body composition measurements, and quality of life. There was a relationship between poor nutritional care, depression and health status.

**Keywords:** Cancer, Nutrition, intake, recommendations



RT-SQPCR MAY NOT BE QUANTITATIVE AT ALL

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**Abstract:**

Real-time quantitative PCR (RT-qPCR) has become an accurate and sensitive method for detecting and quantifying nucleic acids with various usages ranging from copy number determination to gene expression quantitation. An economical alternative, RT-semi-quantitative PCR (sqPCR), which relies on end-point-PCR detection of the initial quantitative differences, has been used in similar way for a long time, but its reliability and sensitivity remained to be a controversy. In our RT-qPCR optimization and primer validation experiments, amplification behavior of five primer pairs representing five different maize genes, namely, Actin1 (housekeeping gene), CA, Bip2, Arrp3, ARP1, ALD were studied in a dilution array of 1, 0.1, 0.01 and 0.001. In general, observed Ct value differences are evenly spaced in parallel to initial concentration changes with the values close to the theoretically expected 3.32 cycles per 10 fold dilution unit. Contrary to this concomitant Ct value changes, end-point amplification results of the same reactions revealed enormous quantitative deviations, for example, reactions prepared as 10<sup>-3</sup> dilution have amplified nearly 50 times greater than that of the undiluted one. Large deviations in the end point-PCR based quantitation are known and generally considered to be within the range of 10-50 fold of the initial template concentrations. To our knowledge, this much quantitative deviations have not been reported. Our poster address this aspect of the qPCR and sqPCR amplifications and warns users that more than 1000 fold superfluous quantitative differences can be generated or same amount of actual differences may be masked in RT-sqPCR experiments.

**Keywords:** PCR, RT-sqPCR, RT-qPCR, qPCR, primer validation

THE ANTIFUNGAL EFFECT OF SOME ESSENTIAL OILS FROM MEDICINAL PLANTS ON ALTERNARIA ISOLATES IN CITRUS FRUITS

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**Abstract:**

Plant essential oils have a potential to be an alternative to synthetic fungicides in the control of post-harvest fruit and vegetable diseases. Fungal infections occur in the processes during the harvest, package, storage and market transportation of fresh fruit and vegetables. In this study *Alternaria* isolates were obtained from the oranges picked from some supermarkets and shopping centers in Uşak city center. This study was conducted in in-vitro conditions in order to identify the antifungal effect of some essential oils (Cummin Oil, Marjoram Oil, Clove Oil, Rosemary Oil, Cinnamon Oil, Garlic Oil, Black Cumin Oil, Lavander Oil, Thyme Oil, Peppermint Oil) against *Alternaria* spp.. 7-day cultures of fungi developed in Potatoes Dextrose Agar (PDA) medium were used. 5 mm of mycelial discs of the developed cultures were inoculated in PDA medium including different concentrations (250, 500, 1000 µL) of essential oils and incubated for 7 days at 25 °C. The trails were conducted as 3 replications for each essential oil. Petri dishes containing only PDA medium were assessed as control. As a result of the trial, the mycelial development of the fungus was calculated. No mycelial development was observed in all concentrations of thyme oil and marjoram oil and 1000 µL concentrations of cummin, cinnamon and peppermint oils. It was determined that the increasing concentrations of clove, lavender, rosemary and black cumin oils inhibited the mycelial development as compared to the control.

**Keywords:** Essential oil, Antifungal Activity, Post Harvest Diseases, *Alternaria* spp.

EFFECT OF SOME PLANT ESSENTIAL OILS ON GROWTH AND SPORE GERMINATION OF FUSARIUM OXYSPORUM IN VITRO.

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**Abstract:**

This study was conducted in order to identify the antifungal effect of 5 different essential oils (*Lavandula officinalis* L.,(levander) *Cinnamomum verum* L. (cinnamon), *Mentha piperita* L. (peppermint), *Origanum vulgare* L. (origanum), *Thymus vulgaris* L.(tyhme)) to the mycelial growth and spore germination of *Fusarium oxysporium* which is a pathogen in strawberries in in vitro conditions. For this purpose, essential oils were implemented in in vitro conditions using antibiogram disc method. 7-day cultures of pathogen isolates developed in Patatoes Dextrose Agar (PDA) medium were used. Different doses (1, 2, 5, 10 and 20 µl/petri) of essential oils were put into the petri plates in PDA through antibiogram disc and the developed cultures (mycelial discs with 5 mm diameter) were planted and then incubated for 7 days at 24 °C. The study was conducted as 4 replications for each essential oil and the colony diameters were measured on the 3rd, 5th and 7th days and the inhibitory activities (%) of the essential oils were calculated as compared to controls. According to the results, it was found that the increasing doses of origanum (5 µl,10 µl and 20 µl) and thyme (10 µl and 20 µl) oils inhibited the mycelial growth of *Fusarium oxysporium*; however, levander, cinnamon and peppermint oils had no effect. While the highest dose (20 µl) of thyme oil had an effect on spore germination with 68 %, it was found out that origanum oil had an effect of 4 % at 1 µl, 46% at 2 µl, 73% at 5 µl, 94% at 10 µl and 99% at 20 µl on germination. It was observed that cinnamon, levander and peppermint oils did not prevent spore germination.

**Keywords:** Strawberry, *Fusarium oxysporum*, essential oil, antifungal activity

**INVESTIGATION OF OXIDATIVE STRESS INDEX IN SHEEP WITH TOXOPLASMOSIS**

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**Abstract:**

The aim of this study was to define the oxidative-antioxidative capacity in sheep with toxoplasmosis. A total of 20 sheep were used in the study, among those, 10 toxoplasmosis infected and 10 antibody-negative healthy bovine sera were used according to ELISA test results to investigate the biochemical parameters. Biochemical analysis included total oxidant capacity (TOC), total antioxidant capacity (TAC), oxidative stress index (OSI). TAC value was found to be statistically significantly lower, and TOC and OSI values were found to be higher in sheep with toxoplasmosis compared to the control group. Toxoplasmosis was detected to cause important changes in the oxidative-antioxidative capacity in sheep.

**Keywords:** Toxoplasmosis, Sheep, Total oxidant capacity, Total

NEW INSİGHTS TO THE FUNCTION OF PROTEİNS İN ERWİNİA AMYLOVORA AND ITS HOSTS İNTERACTİONS

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**Abstract:**

*Erwinia amylovora* is a Gram-negative plant pathogenic Enterobacterium that causes fire blight disease of apple, pear and other Rosaceous plants. A type III secretion system, encoded by clustered, chromosomal hrp genes, is essential for infection, but only a few proteins are known that are secreted through this pathway. In this study, it is aimed to investigate alignment, phylogenetic tree and three dimensional structures based on the similarity of the structures of some proteins in apple and pear which interact with the effector or virulence proteins secreted by *E. amylovora*. The effector proteins of *E. amylovora* which is determined by uniprot were marked and the functions of these proteins were classified according to protein families. In addition, proteins used by *E. amylovora* in infecting apples and pears are shown separately with PHIBASE. In the apple, alignment results of two proteins interacting with the single effector protein were obtained. Using the SWISS-MODEL, the similarities of these proteins were obtained by taking the highest sequence similarity and coverage ratio in a NMR model. The genes involved in the synthesis of amylovoran were constituted 36% of the current distribution, while the ratio of the effector protein was occupied 3%. It was determined to constitute a rate of Etk/wzc protein family 4%, glikozil transferaz-2 family 7%, polysaccharide piruvil transferase family 3%, glycozil transferase group-1 family- glikoziltransferaz-4 subfamily 4%, polysaccharide synthesis family 4%, BexD/CtrA/VexA family 4%, protein phosphatase family with low molecule weight 4%, polysaccharide lyase family 4%, HrpA type 2 family 4%. The sequence similarity of HrpN protein, which is the effector protein of *E. amylovora*, and 2 proteins, HIPM and HrBP1, which interacted in *Malus domestica*, were not found. For this reason, it was tried to make a prediction by researching of these proteins with SWISS Model and 3D structures. HrpN protein of the pathogen interacts with HIPM and HrBP1 proteins in apple. To understand the reason for this, the two proteins in apple was aligned to detect similar regions. In the study, it was understood that the uncharacterized proteins SERP0419 (D4HX89) and YHBH (D4HUY4) proteins are closely related to each other. The results will be important to understand the molecular relationships between *E. amylovora* and its hosts and will shed light on new approaches to combating disease.

**Keywords:** fire blight, protein, bioinformatic, plant-microbe interaction

**IMPACT OF COAL MINE WASTE DUMPS ON ARABLE SOILS AND VEGETATION: A CASE STUDY OF TULA REGION, RUSSIA**

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**Abstract:**

The work is devoted to the study of the influence of the old coal waste on the surrounding agricultural fields. This impact makes agricultural products from this field dangerous. The work substantiates the inadequacy of re-reclamation, carried out in 2017, 2018 and 2019, and provides recommendations on how to minimize the impact of the waste. The aim of the study was to evaluate the change in the content and composition of organic matter, sulfur and water-soluble forms of metal compounds in arable soils located at different distances from the mine shaft 15-bis (Tula region). Objects of study were chemozems and replantozemy located at different distances from the coal mine dump (Former coal mine 15-bis, Tula region, Shchekino district, Ozerki farm). Vegetation selected from different distances from the coal dump. The entire investigated territory is affected by the dumps of a coal mine, which is expressed in the intake of coal dust and debris on the surface of soils. The total carbon content ranges from 0.69 to 23.15 % in the 0-10 cm layer. PH values below 3 units are noted on the slopes of the heaps, with the distance from it the pH of the aqueous suspension rises to 5.22 on the surface, but does not reach the values characteristic of the Tula region soils (pH 5.5-6.0).

**Keywords:** slagheap, coal mining and dumps, arable soils

STUDY OF CU INTERACTION WITH SOIL SOLID-PHASES COMPONENTS USING  
CHEMICAL FRACTIONATION AND SYNCHROTRON RADIATION XANES  
SPECTROSCOPY

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**Abstract:**

Information value of sequential extraction for assessing the speciation of Cu<sup>2+</sup> in Technosols (up to 2000 Cu mg/kg) was shown at the selective removal of the main solid-phases components from the soil. The speciation of Cu was studied by the Tessier method (Tessier et al. 1979). Carbonates, Fe-Mn sesquioxides, and organic matter were removed from soil samples. When organic matter was removed nonsilicate Fe compounds become the most active components in metal sorption, and the role of organic matter in metal retention increases in the absence of Fe oxides. At the removal of carbonates by treating the soil the accumulation of metal in the exchangeable form increases significantly. Mechanisms controlling the fixation of metal by soil solid-phase components on the molecular level were determined using synchrotron radiation XANES spectroscopy. It was found that the surface structure and the composition of functional groups of the adsorbent acquire the leading importance in metal sorption. In the interaction between Cu<sup>2+</sup> ions and humic acids of soils, octahedral inner-sphere chelate complexes can be formed. Copper sorption on calcite phase, local Cu<sup>2+</sup> forms are presented by tetragonally distorted inner-sphere complexes on the calcite surface due to bonding with surface carbonate ligands. In the interaction of Cu with the surface of iron hydroxide, specific sorption with the formation of Cu-hydroxyl clusters is the essential mechanism. The combined use of chemical and physical analytical techniques fully characterizes the interaction of Cu with soil solid-phases components.

This research was supported by the Russian Science Foundation (no. 19-74-00085).

**Keywords:** copper, soil components, transformation, speciation

**IMPORTANCE OF GRAFTED SEEDLING USE AGAINST SOIL-BORNE DISEASES IN TOMATOES**

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**Abstract:**

With the increasing world population, the problem of hunger increases. One of the most important ways to cope with hunger problems is to increase the yield of products without damaging the ecological system and human health. Tomatoes are the most grown vegetables in the world. Turkey is an important country in tomato production due to favorable climatic conditions. Due to the multipurpose consumption of tomatoes in our country and being an important product of the food industry, the cultivation areas have increased in recent years. However, product losses during production and the cost of struggle to prevent them increase production costs. In our country where agricultural control is perceived as chemical control, 19% of pesticides are used in vegetable fields. This situation brings about residues and similar problems in vegetables. For this purpose, it should be aimed to minimize the use of chemical products. For this purpose, grafting technique used in tomato and some vegetables is an important technique. Grafting, allows two plant parts of similar organic structure to be combined with different methods to grow as a single plant. Objectives of grafting; Soil-borne diseases, resistance to low temperatures, tolerance to adverse soil conditions such as salinity and excessive moisture, more effective uptake of water and plant nutrients, stronger development of plants, environmental protection, earliness and increase in yield. With the increase of yield in the cultivation using grafted seedlings, input costs arising from spraying will be reduced and the use of chemicals that disrupt the balance of nature and threaten human health will be minimized.

**Keywords:** Tomato, soil-borne disease, grafted seedling



**EFFECTS OF TREATED WASTE WATER ON GERMINATION AND SEEDLING GROWTH OF DIFFERENT PLANTS**

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**Abstract:**

As a result of global warming and rapidly increasing world population, water resources has become inadequate. The lack of water resources has increased the pressure in the agricultural sector, which is the largest user of water. Since it is not possible to increase water resources, people have turned to search for alternative water resources. Treated wastewater is one of these alternative water resources. The use of treated wastewater in agriculture has many benefits. The most important benefit of using treated wastewater in agriculture so that contains macro (N, P, K) and micro (Fe, Zn, Mn, Cu) nutrients necessary for plant growth. Thanks to these nutrients, it provides fertilizer saving and high yield. In many studies, it has been shown that treated wastewater increases efficiency with controlled use. Although to these benefits, some precautions should be taken in order to avoid short and long term environmental pollution in the use of treated wastewater. In areas where treated wastewater is used for irrigation, ground water resources should be monitored for N, P and heavy metals in order to avoid ground water pollution. In this study, the research about the effects of treated wastewater on plant germination were investigated.

**Keywords:** Agriculture, Germination, Seed, Waste water

**BİBERDE (*Capsicum annuum* L.) IN VITRO ANDROGENESIS VE BU KONUDA YAPILMIŞ ÇALIŞMALAR**

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**Abstract:**

Bu derleme ile biber (*Capsicum annuum* L) türünde dihaploidizasyon hedefli olarak yapılmakta olan anter kültürü tekniğinin ayrıntılı prosedürü verilmiş olup ülkemizde konu ile ilgili yapılmış çalışmalara değinilmiştir. Bu şekilde konu üzerinde çalışacak olan araştırmacılara hem prosedür hem de literatür açısından rehber olunması amaçlanmıştır. Derlemenin son bölümünde ise yürütmekte olduğumuz “Biberde Anter Kültürü Uygulamalarının In vitro Androgenesis Üzerine Etkileri” isimli yüksek lisans çalışmasının şu ana kadar elde edilmiş sonuçları hakkında da bilgi verilmiştir.

**Keywords:** Biber, Androgenesis, Dihaploidizasyon

**PIKE PERCH POPULATION CHARACTERISTICS FROM THE LOWER URAL RIVER RUNOFF**

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**Abstract:**

Ural River is about the only remaining spawning habitats in the entire Caspian basin for all fish species because unlike other Caspian rivers the Ural River's ecosystem has not been strongly altered and the natural hydrological regime is almost unimpaired. The environmental conditions to secure natural reproduction are still satisfactory for successful fish reproduction. Pike perch, Sudak (*Sander lucioperca*, formerly *Stizostedion lucioperca* (L.)) is one of the main commercial fishes in the Ural-Caspian fisheries basin. The age composition of the pike perch catches in the period 2006-2016, in the north-eastern part of the Caspian Sea and the delta of the Ural was represented by fish aged from 2 to 10 years. Based on materials from our research maximum values perch were reached 74 cm and weight of 4.60 kg. Ural Pikeperch grow relatively quickly, with fish estimated to reach a mean length of approximately 35 cm SL in second year, and dropped to 49 cm SL in fifth year old for males and females. The study reveals that no sex's growth differences were observed ( $p$  value was 0.415 at  $p \leq 0.05$ ), thus the following growth analysis would be as pooled sexes. Analysis of commercial catches for the period of research, revealed the following changes: decrease in size-weight, age characteristics; decrease in the dynamics of spawning in recent years 2006-2016.

**Keywords:** Pike perch, Ural-Caspian basin, water quality

**INVESTIGATION OF LEVELS OF HAPTOGLOBIN, CERULOPLASMIN AND ALBUMIN IN CATTLE WITH SUBCLINICAL KETOSIS**

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**Abstract:**

In this study, it was aimed to determine haptoglobin, ceruloplasmin, and albumin levels in cattle with subclinical ketosis. Thirty with subclinical ketosis and 10 healthy cattle were used in this study. Blood samples obtained from Jugular veins of animals were collected into plain tubes. Haptoglobin, ceruloplasmin and albumin levels were measured colorimetrically. When cattle with subclinical ketosis were compared with the animals in the control group, haptoglobin and ceruloplasmin levels were increased and albumin levels were decreased. In this study in animals infected cattle with subclinical ketosis occurs acute phase response and as a result haptoglobin and ceruloplasmin synthesis increased while albumin synthesis is determined decreased.

**Keywords:** Acute phase proteins, Cattle, Subclinical ketosis

TR22 VE TR31 BÖLGESİNDEKİ GENÇ ÇİFTÇİLERİN DEMOGRAFİK YAPILARININ BELİRLENMESİ

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**Abstract:**

Türkiye’de yapılmış olan genç çiftçi tanımlamasına göre ise; 18-40 yaş aralığında, kırsal alanda ikamet eden/etmek isteyen ve tarımsal faaliyet gösteren/göstermek isteyen gerçek kişiler genç çiftçidir. Çalışmanın amacı; gençlerin tarımsal üretim yapmayı tercih edip etmeme eğilimlerinin temelinde yatan faktörlerin belirlenmesi, gençlerin çiftçilik mesleği ile ilgili tutumlarının saptanması, Genç Çiftçi Projesi Desteklemelerine (GÇPD) kriter olabilecek parametrelerin belirlenmesidir. Ayrıca genç çiftçilerin tarımsal girişimcilik ile ilgili tutum ve davranışlarının belirlenmesi, kırsal kalkınma desteklemeleri kapsamında genç çiftçilere verilen hibe desteklemelerinin başvuru esnekliğinin hesaplanması amaçlanmaktadır. Bu çalışma ile 2016 yılında ilki uygulanan, 2017 ve 2018 yılında devam eden GÇPD’nin genel bir değerlendirmesi yapılmıştır. Bu kapsamda Türkiye İstatistiki Bölge Birimleri Sınıflandırması (İBBS2) kapsamında yer alan TR22 ve TR31Bölgesi’nde (Balıkesir, Çanakkale ve İzmir illeri) GÇPD’den yararlanan ve yararlanamayan toplam 169 kişi (86 desteklenen, 83 desteğe başvuran fakat desteklemeye hak kazanamayan) ile yapılan survey sonucu nasıl bir genç çiftçi profilinin desteklendiği ve desteklemede yer alan kriterlerin seçimde ne derecede etkili olduğu ortaya konulmuştur. Çalışma sonuçlarına göre; genç çiftçilerin yaş grupları incelendiğinde; destekten yararlananların % 69’u kadın % 31’i erkek, destekten yararlanmayanların % 26’si kadın % 74’ü erkek olduğu tespit edilmiştir. Destekten yararlananların %94’ü evli, destekten yararlanmayanların %63’ü evli olduğunu ifade etmiştir. Destek alan grupta; en yüksek 42 kişi ile 26-33 tabakalı grubuna girenler olup, ortalama yaş 30 yıl olarak hesaplanmıştır.

**Keywords:** Genç çiftçi, eğilim, tarımda kalma, ayrılma, demografik yapı.

**ADAKLI KÖYÜ (YÜKSEKOVA) VE ÇEVRESİNDE TESPİT EDİLEN ZEHİRLİ MAKROMANTARLAR**

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**Abstract:**

Mantarlar doğadaki önemli bir organizma bölümü olup karasal ekosistemlerde hemen hemen her yerde bulunurlar. Doğada kendiliğinden gelişen makromantarlar yemeklik olarak kullanılmalarının yanı sıra zehirli türlerinin sebep olduğu zehirlenmelerin sonucunda insanoğlunun dikkatini çekmiştir. Zehirli makromantarlar tür sayısı bakımından mantar çeşitliliği içerisinde az olmasına rağmen insan yaşamıyla doğrudan ilişkili olduklarından dolayı çok eski tarihlerden beri sürekli olarak gündemde yer almışlardır. Bu çalışmada Adaklı köyü (Yüksekova) ve çevresinde doğal olarak yetişen zehirli makromantarlar tespit edilmiştir. Çalışmanın materyalleri, 2012-2014 yılları arasında toplanan makromantar örneklerini içermektedir. Örnekler hakkında gerekli notlar alınmış ve doğal ortamlarında fotoğraflanmıştır. Materyallerin tanımlanması, laboratuvara alınan makromantarların mikroskopik özellikleri de belirlendikten sonra elde edilen verilere göre yapılmıştır. Bu çalışmaların sonucunda İlçe sınırlarında yer alan Adaklı köyü ve çevresinde 10 zehirli makromantar türü tespit edilmiştir.

**Keywords:** Adaklı, Yüksekova, Zehirli Makromantar

**BAZI ZEYTİN ÇEŞİTLERİNİN ÇELİKLE ÜRETİMLERİNDE FARKLI ORTAMLAR KULLANILARAK KÖKLENME ORANLARININ BELİRLENMESİ**

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**Abstract:**

Zeytin, yaprakları ve kökleri dışında diğer bütün organları ile çoğaltılabilen bir bitki türüdür. Dünyada ve ülkemizde zeytin fidanı üretimi genellikle 1950'li yıllarda geliştirilmiş ve günümüzde modern teknoloji ile entegre olmuş, kontrollü koşullar altında sisleme (=mist propagation) sistemi ile yapraklı yeşil çeliklerin köklendirilmesi yöntemiyle yapılmaktadır. Ancak bazı çeşitlerin çelikle üretimlerinde köklenme oranlarının düşük olması bu yöntemin bütün çeşitler için kullanılmasını sınırlandırmaktadır. Bu sebeple ele alınan bu çalışmada, bazı zeytin çeşitlerimizin farklı ortamlardaki köklenme yüzdelerine bakılmıştır.

Yapılan bu çalışmada zeytin çelikleri için en yüksek köklenme yüzdesi kokopit ortamında olmuştur. Zeytin fidanlarının çelikle üretimlerinde, aşı ile üretilen köklenme yüzdeleri düşük çeşitlerin kokopit ortamında çelikle üretimleri mümkün olabilmektedir

**Keywords:** Zeytin, Çelik, Üretim

**BENEFITS OF INTERIOR PLANTS**

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**Abstract:**

Global population is growing and urbanization is increasing rapidly. According to the United Nations population projection report, two thirds of the world's population is expected to live in cities by 2050. In urban areas, people spend most of their daily lives in narrow, noisy, artificial interior spaces without natural light such as houses, offices, shopping malls, schools. These space conditions cause negative physical and psychological health consequences such as fatigue and stress, and decrease work performance. Studies indicate that plants clean the air, reduce noise, create pleasant and aesthetic environments, and thus, these negative conditions in interior spaces decrease with the use of plants. In addition, it has been found that in environments with plants, there is an increase in work efficiency, feeling good, creativity and going to work rates of employees. In this study, ecological importance of interior plants is mentioned, the benefits are explained and the results of the studies are evaluated.

**Keywords:** interior plants, ecology, benefits of plants



**PROPERTIES OF SALT AND SODIUM SOILS BY IRRIGATION AND INVESTIGATION OF ANKARA SOILS IN TERMS OF THESE PROPERTIES**

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**Abstract:**

According to Soil surveys, with 1,517,695 hectares of arid land in Turkey; is equivalent to 5.48% of total cultivated agricultural land. There are salinity and drainage problems in 2 775115 ha of land. All available data in Turkey show that climate, drainage, agricultural operations and soil characteristics are effective in the formation of aridity. With the effect of climatic conditions, many irrigation projects were realized during the transition period from dry agriculture to irrigated agriculture being taken into consideration for high crop growth, without completing in-field services, without transferring necessary information to farmers and without taking necessary measures. As a result, new problems emerged. salinity problems in Turkey as well as other arid and semi-arid countries showed similar characteristics. Irrigation and washing water applications, physical, chemical and biological processes and the human factor, which is very important, form the basis of the management of saline soils. According to studies based on land for many years, Turkey wasteland reclamation research findings were passed to the application as data services for the provision of farm development in some plain. Decreasing precipitation, increasing evaporation, decreasing groundwater and surface water resources due to changing climatic conditions and increasing domestic and industrial water demand due to the improvement in social life lead to a decrease in water resources used for agricultural purposes. In this case, reduce the risk of excess water demand in irrigated areas and salinity must be prevented increasing the efficiency of the use of resources used for irrigation by reusing the agricultural good and bad quality irrigation waters and other wastewater sources within the framework of scientific methods and strategies.

**Keywords:** Arid land, salinity, drainage, irrigation, wastewater.

**BANDIRMA İLÇESİ KASAPLIK PİLİÇ KÜMESLERİNİN BAZI FONKSİYONEL ÖZELLİKLERİ**

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**Abstract:**

Bu çalışmada, Bandırma ilçesinde bulunan kasaplık piliç işletmelerindeki kümeslerin fonksiyonel özellikleri incelenmiş, kümeslerde çevre koşullarının yeterlilik durumları araştırılmış, sorunları belirlenmiştir. Araştırma, ilçede çeşitli tip ve kapasitedeki 187 adet broiler kümesinde yürütülmüştür.

Çalışmada kümeslerin fonksiyonel planlamaya esas olacak mevcut durumları ile ilgili bilgiler yerinde elde edilerek, Bandırma ilçesi için projelemede etkili iklim parametreleri belirlenmiştir. Araştırma sonucunda, kümeslerde çevre koşullarının denetlenmesinde ısı-nem dengesinin sağlanamadığı, yapı malzemelerinde yalıtım uygulanmadığı, kümeslerde üretim devresi sonunda biriken gübrelerin belirli bir yönetiminin olmadığı tespit edilmiştir.

**Keywords:** Bandırma, Kasaplık Piliç, Kümes

**TRANSFORMATION OF PHYSICAL AND CHEMICAL PROPERTIES OF HAPLIC CHERNOZEM AFTER ZINC CONTAMINATION**

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**Abstract:**

Studies of soil physical and chemical properties changes in soil are needed to better understand metal behaviors in the environment and implement repair strategies in different polluted soils. The aim of this work was to study the effect of Zn high rate on the physical properties and organic matter of Haplic Chernozem under the model experiment conditions.

In a model experiment, soil samples of Haplic Chernozem were artificially contaminated with Zn acetates at high rates of 2000 mg kg<sup>-1</sup>. The particle-size fraction, the microaggregates distribution, the structural status, the total content and fractional and group composition of organic matter were determined in soil without Zn and soil contaminated with metal.

Contamination of Haplic Chernozem affected the physical and chemical properties of the soil. The coefficient of water stability decreased in the control from 3.0 to 1.4 in the contaminated soil. The aggregate status (estimated from total agronomically valuable aggregates) changed from excellent to good. The content of organo-mineral particles in colloidal size increased, which resulted to an increase of the clay fraction content up to 4.5% compared to the control. The qualitative composition of organic matter changes: the contents of free and sesquioxide-bound humic acids and free fulvic acids increased. Thus, under conditions of model experiment, the contamination of Haplic Chernozem with high rates of Zn leads to changes of the microaggregates distribution, the structural status, and the qualitative composition of organic matter.

The research was supported by project of the President of Russian Federation № MK-2973.2019.4, RFBR 19-29-05265 МК.

**Keywords:** Soil, Organic matter, Particle size distribution

**DISTRIBUTION OF CU IN SOFT WHEAT PLANTS (*TRITICUM AESTIVUM*)**

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**Abstract:**

Among the environmental problems of protecting the environment from industrial pollution, more and more attention is paid to agroecosystems - the main factors for ensuring food security of every states. Emissions from Novocherskassk Power Station (NPS), enterprise of first hazard class, consist mainly of ash, heavy metals (among which Cu, Zn and Pb dominate), and others pollutants. The Cu content in soft wheat (*Triticum aestivum*) plants, most common agricultural crops grown in the impact zone of NPS has been analyzed. In the presented study, we investigated the distribution of Cu among various organs of *Triticum aestivum*. It has been established that the root system of wheat accumulates 20% more Cu than the stem and leaves of the plant. However, the predominant accumulation of Cu is observed in wheat grain, where the content of the element exceeds its concentration in the roots and stems up to 20% and 40%, respectively. The values of the distribution coefficient at various monitoring sites were 0.7-1.0 for the ratio of stems and leaves / roots and 1.3-2.0 for the ratio of grain / stems and leaves, which indicates a significant translocation of Cu to wheat grain. The results show that soft wheat has an increased accumulation of elements in the grain, which makes agricultural products grown in the impact zone of Novocherskassk Power Station dangerous to human health.

The research was supported by Russian Science Foundation № 19-74-10046.

**Keywords:** impact zone, copper, agricultural plants

**BIOGEOCHEMICAL AND MORPHOLOGO-ANATOMICAL CHARACTERISTICS OF MACROPHYTE IN THE LOCAL CONTAMINATION CONDITIONS**

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**Abstract:**

The present work is aimed at studying the biogeochemical and morphologo-anatomical characteristics on the resistance of natural populations of macrophyte plant – cattail (*Typha australis* Schum. & Thonn) on the coast of the Taganrog Bay of the Sea of Azov (Russian sector). The soil cover is represented by Fluvisols. The total content of heavy metals (HMs) in soils was determined by X-ray-fluorescent technique. The concentration of HMs mobile forms was extracted using 1 N NH<sub>4</sub>Ac, pH 4.8. The mineralization of plant samples was performed by the dry ashing method. The microscopic study and ultrastructural analysis were examined and photographed on a transmission electron microscope Tecnai Spirit G2. An excess in maximum permissible concentrations (MPCs) for Zn, Cd, Pb in Fluvisols has been found. High mobility of Zn, Cd, Pb, Cr and Ni in Fluvisols has been revealed, which is confirmed by the significant bioavailability of Zn, Cr and Cd that are accumulated in the macrophyte plant tissues. Adaptations to the effects of HM have been identified at the tissue, cellular and ultrastructural levels. The level of contamination found in plants of (*Typha australis* Schum. & Thonn) led to the reduction of the diameter of the root and the area of its air cavities. Ultrastructural changes in the cell membranes as well as in main cytoplasmic organelles of the root and leaves (mitochondria, plastids, pyroxis, etc.) have been identified. The degree of adaptive changes to the effects of contamination in the roots is higher than in the leaves.

This research was supported by the Ministry of Science and Higher Education of Russia, project no. 5.948.2017/PP, Grant of President of Russian Federation, project no. MK- № MK-2818.2019.5.

**Keywords:** Heavy metals, Fluvisols, *Typha australis* Schum. & Thonn, Contamination, Ultrastructure

**SCIENTIFIC AND PRACTICAL CHALLENGES IN FORMATION OF TECHNOZEM IN DISTURBED LANDS OF SIBERIA**

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**Abstract:**

Technozems is a soil forming material with required root layer parameters formed at the surface of disturbed lands using heavy equipment. Generally, fertile rocks and soil layers are placed in a sequence to imitate the natural soil structure. Depth of the root layer and quality of soil forming materials are the two key aspects that determine reclamation success.

The results of the research identified the following key aspects and challenges of technozem formation:

(i) Prior to the beginning of a land development, fertile soils need to be removed and stored for reclamation. The quality of the fertile soils degrades during this process; (ii) Due heavy equipment used for technozem formation the root layer is compacted, which slows down reclamation; (iii) Structure and connections between layers in technozems do not fully restore to the initial not disturbed soil structure, which impacts reclaimed success.

Melioration of technozems minimizes these challenges. The results of the research showed that the key fertility parameters in technozems are restored in 20 to 30 years. Technozems allow quick restoration of a vegetation cover but they do not have a natural soil profile.

The research was carried out with support by the Russian Foundation of Basic Research, project No. 19-29-05086 mk.

**Keywords:** Technozems, reclamation, soils, mining landscapes



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