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# SPECIALIZED ORGANIZED INDUSTRIAL ZONES BASED ON AGRICULTURE AND ITS IMPORTANCE

**Abdurrahman KÖSEMAN**

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**Abstract:**

Sustainable production, food quality in all aspects, animal health and welfare, food security and safety constitute the important issues of agricultural policy. Continuing rural development efforts, improving animal health conditions, strengthening animal health controls, making regulations that increase competitiveness in production and preventing possible income losses of breeders are the most important animal husbandry targets. Specialized Organized Industrial Zones Based on Agriculture can play an important role in achieving the determined goals. These regions, where necessary infrastructure investments are provided by the public, will be supported by incentives, temporary tax exemptions, cheap energy and long-term low- interest credit opportunities; It has a great potential to overcome the difficulties in animal husbandry, to increase the national income obtained, and to strengthen the people in the sector socially and economically. Considering the animals, environment and climate, these regions where production will be made have features that will increase productivity, protect resources and contribute to the sustainability of production. Due to the integration in production, activities and investments such as providing inputs cheaper, revealing effective marketing opportunities, establishing facilities for processing the produced products as finished and semi-finished products can also be beneficial in the supply of employment and reducing unemployment.

**Keywords:** Animal production, competition, low price, safe food, yield.

# SEVERAL METHODS FOR EXTENDING THE STRAWBERRY PRODUCTION SEASON

**Adis LIZALO*, Leyla DEMİRSOY**

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**Abstract:**

Fruit growers in the world are faced with challenges that include decreased agricultural land availability, harsh climatic conditions, and significant competition from both domestic production and imports. In order to keep fruit production viable in the region, growers need to adopt strategies that minimize these challenges but on the other hand maximize the harvest period using new day-neutral varieties, low-chilling June-bearing varieties, specialized growing techniques and crop protection and forcing systems. This brief report have identified production technologies that can extend the growing season for strawberry crops and result in change from a cultural risk to an opportunity for strawberry expansion in a wider range of growing areas all over the continent.

**Keywords:** Fragaria×ananassa, harvest season, plant material, protected cultivation, forcing

# MANUFACTURING OF ACIDOPHILUS MILK WITH MARE'S MILK

**Kanykei SALIEVA, Aichurok MAZHITOVA*, Asylbek KULMYRZAEV**

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**Abstract:**

Thirty six fermented milks were manufactured from mares' milk by using: a blend of mare's milk and cow's milk or goat's milk at respective weight ratio of 90:10, 70:30, 50:50; a mix of mares' milk and powdered cow milk, at respective weight ratio of 95:5, 93:7 and 90:10 and all samples fortified with calcium chloride at a concentration of 0.0M, 0.1M, 0.3M and 0.5M. Lactobacillus acidophilus was used as starter culture (ca. 6.0 log cfu ml-1) by inoculating (0.014g L-1) the milk at 37°C for 14 hours. Samples with high content of mares' milk showed separation of whey about 4-60% of total mass. Only four samples: S1 – mare milk: powdered cow milk (93:7) with 0.1M CaCl2; S2 – mare milk: powdered cow milk (90:10) with 0.1M CaCl2; S3 – mare milk: cow milk (50:50) with 0.1M CaCl2 and S4 – mare milk: goat milk (70:30) with 0.1M CaCl2 were selected according to appearance (no fractionation), pH and titrimetric acidity (>75°T) for further analysis. The highest content of total dry matter (21.49%), protein (4.61%), lactose (13.28%) and ash (2.32%) were in S2 sample and the fat (2.15%) in S4 sample. The titratable acidity of fermented milks ranged from 81-98 °T. Rheological measurements showed that all samples except of S1 displayed a shear thinning thixotropic behavior with the highest hysteresis area of S2 sample. The results of this study indicate applicability of production of acidophilus milk with addition of mare milk.

**Keywords:** mare's milk, acidophilus milk, fermented products, cow's milk, goat's milk

# ACCELERATED METHOD FOR EXTRACTİNG FLAVONOIDS FROM TARRAGON WORMWOOD (*ARTEMISIA DRACUNCULUS*)

**Kulumkan SARTOVA, Aichurok MAZHITOVA*, Gulzifa ARAPBAEVA, Zhanyl SOLTOBAEVA, Meerim MYRZAGULKYZY**

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**Abstract:**

The scope of the study refers to optimize the recovery of flavonoids by fractional extraction with shorter time intervals. The influence of the extraction conditions (concentration of the extractant; raw material: extractant ratio; degree of grinding; extraction temperature) on sum of extracted phenolic compounds was also investigated. For this reason total mass (ripe and unripe) and leaves (unripe) of tarragon wormwood (Artemisia Dracunculus) were analysed separately. Samples were air-dried to constant weight, crushed and to observe effect of grinding were sieved on mesh of 0.71mm, 1 mm and 2 mm sizes. Optimal extraction conditions were as follows: the concentration of extractant is 70% ethyl alcohol; the ratio of raw materials to extractant are 1: 30 and 1:50 (leaves and total mass, respectively); the degree of grinding of the sample material 0.71-1 mm mesh size and temperature conditions for all samples are the same within 60-70°C. Flavonoid content in ripe total mass of tarragon wormwood was 19.54% after single extraction for 3 hours and 26.18% after three times extraction with 30 min intervals with 70% water-alcohol mixture. Flavonoid yield by weight of dry material in unripe total mass of tarragon wormwood was 36.78% and 42.47% and in leaves 41.95% and 59.35% for single and three times extraction, respectively. The results of the study have shown that the fractional extraction with 30 min intervals increase extraction yield of flavonoids.

**Keywords:** Tarragon wormwood; Artemisia Dracunculus; flavonoids; extraction; phenolic compounds

# PRODUCTION OF THE RECOMBINANT BRUCELLA MELITENSIS OMP 19 PROTEIN IN ESCHERICHIA COLI VECTOR SYSTEM

**Ali USLU*, Aslı SAKMANOĞLU, Beatriz de los Angeles PADRON-PEREZ**

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**Abstract**:

Brucellosis is a zoonosis and causes serious economic losses in both public and animal health in developing countries. Brucella melitensis, which causes infection in sheep and goats, is the most pathogenic species compared to other species. Early diagnosis of infected animals is important for disease control. Some problems in live vaccines cause limitations in the fight against the infection. Therefore, it is important to develop an effective subunit vaccine. Small Outer Membrane Protein (OMP) such as Omp 19, Omp 16, Omp 10 is found in 6 Brucella species, in all their biovars. This study aimed to express soluble in Escherichia coli. The rOmp19 was concentrated using an ultra membrane cassette system. The rOmp19 was expressed in One Shot®BL21(DE3) E. coli when induced by IPTG in TY medium. The nucleotide sequence of the rOmp19 gene was 99.62 % similar to the Omp19 gene of B. melitensis in the NCBI GenBank Database. In future studies, The sub-unit vaccine prepared with Omp 19 lipoprotein obtained and the classical vaccine will be compared with the efficacy of B. melitensis Rev.1 vaccines.

**Keywords:** Omp 19, Recombinant Protein, Brucella melitensis, Sub-Unit Vaccine

# THE EFFECTS OF DIFFERENT ROOTSTOCKS ON THE YIELD, QUALITY AND PLANT GROWTH OF GABRIEL 1 AND W135 WATERMELON CULTURE

**Alim AYDIN*, Hamide BOZOK**

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**Abstract:**

Selecting appropriate rootstocks in grafting is an important aspect to increase yield and fruit quality of vegetables. The present study aimed to evaluate potential rootstock for commercial watermelons Gabriel 1 (black watermelon) and W135 (seedless watermelon) in comparison to the commercial rootstock R172, R173, R174, Nun 9075 and TZ 148 (Cucurbita maxima Duch. × Cucurbita moschata Duch.), and non- grafted plants. An experimental design of Randomized Complete Blocks was applied with treatments replicated three times,but non-grafted plants died 20 days after planting due to soil-borne diseases. Grafted watermelon plants were compared in terms of yield, yield components, morphometric and textural characteristics, sweetness. When the average number of fruits per plant was evaluated, the highest average number of fruits was measured in the grafted combinations 172/W135 (4.34) and Nun9075/W135 (4.33), respectively. In average fruit weight, the highest mean fruit weight was measured in the 172/Gabriel 1 grafted combination. The yield per plant was measured in the grafted combinations of R172/W135 (17,211 kg) and R172/Gabriel 1 (13,448 kg), respectively, and the highest yield per decare was obtained with the grafted combination of R172/W135 (3552 kg). Fruit size and diameter were measured in the highest W172/Gabriel 1 grafted combination, while the highest shell thickness was Nun 9075 / Gabriel 1, while the lowest was R174/W135. Grafted combinations with the highest brix value are R172/Gabriel 1, Nun907 /Gabriel 1, respectively, and when looking at the taste scoring values, the combinations with the highest value are R172/W135, R172/Gabriel 1, respectively. Considering the general results, the rootstock

**Keywords:** Grafting, Scion, Rootstock, Yield, Watermelon

# EFFECT OF VERMICOMPOST ON SEEDLING QUALITY AND GROWTH IN WATERMELON (*CITRULLUS LANATUS* L.)

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**Abstract:**

In this study carried out under greenhouse conditions in summer period 2018, a mixture of field soil, soil and farm manure (1:1 v:v) was used as growth medium. 0 (control), %2.5, %5 and %10 vermicompost were added to each soil. In the study using one liter pots, the amount of vermicompost was adjusted according to weight. A total of 8*9*2 = 144 seeds were used. In this study, the effects of watermelon (Citrillus lanatus L.) on seedling growth were investigated. The parameters measured in plants were measured plant height, stem and leaf fresh and dry weights and leaf area. According to the results obtained in the study, plant growth was observed in the highest soil and farm manure mixture and 5% vermicompost application, while the lowest plant seedling growth was observed in unmixed field soil. In both soil mix, after 10% vermicompost application, plant seedling growth decreased. As a result, it is seen that vermicompost application increases plant growth but has a negative effect on plant growth after a certain place. For this, the mixture should be prepared for each plant species and according to the content of the vermicompost used

**Keywords:** Farm manure, Seedling development, Vermicompost, Watermelon

# DETERMINATION OF THE OPTIMUM CULTURE MEDIUM FOR IN VITRO DEVELOPMENT OF FESTUCA RUBRA SSP. RUBRA L.

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**Abstract:**

The current study aimed to determine the optimum culture medium composition for a better in vitro development of Festuca rubra ssp. rubra L. cv. Maxima 1. Developmental parameters evaluated based on the morphometric data were used to determine the optimum medium among the De Greef & Jacobs (DG), Linsmaier & Skoog (LS), Murashige & Skoog (MS), and Schenk & Hildebrandt (SH) media tested. SH medium gave the highest germination rate (78%), while the lowest germination rate (73%) was calculated from MS medium. However, the germination data remained statistically the same. The statistically same leaf numbers were recorded from DG (2.05) and SH (2.03) media. However, the seeds sown to MS, and LS media gave fewer leaves (1.63-1.38). The mean leaf lengths had a similar statistical trend with the mean leaf numbers. SH and DG media gave 9.73 cm and 9.14 cm mean leaf lengths, respectively. MS and DG media gave the highest root induction ratio with the mean root numbers 2.81 and 2.75, respectively. However, the SH medium gave the lowest mean root number (2.29). A similar trend in root elongation data was found among the media tested. The longest roots (4.26 cm) were measured from the plants grown in MS medium, while LS medium gave the shortest roots (2.45 cm). In conclusion, DG or SH media should be preferred over the other medium to achieve a better foliar growth of F. rubra ssp. rubra. However, MS and DG media were found more efficient in rhizogenesis in the same species.

**Keywords:** Culture medium, Red fescue, Seed germination, Tissue culture

# ORGANIC AGRICULTURE FROM THE BEGINNING TO THE PRESENT IN TURKEY

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**Abstract:**

Organic farming activities in Turkey, in Europe in the mid-1980s, start with the companies operating in the field of supplying organic agricultural products in Europe seek new production areas to meet the increasing demand for organic products. These companies informed the producers around Izmir about this new production technique and encouraged them to produce. The first exports of organic agricultural products from Turkey in the year 1985, only three items with the product (dried apricots, raisins and dried figs) was held from Izmir. Organic products have generally increased both in variety and amount, with fluctuations over the years. As of 2019 in Turkey, it is seen that the 74 thousand 545 producer is doing organic agriculture with 213 kinds of products and 2 million 30 thousand 476 tons of production in a total area of 545 thousand 870 hectares. Organic products produced in our country have been increasingly diversified in recent years. The main ones can be listed as fresh fruits and vegetables, legumes, field crops such as cotton and wheat, medicinal and aromatic plants and dried fruits (apple, hazelnut, walnut, pistachio, dried fig, apricot and grape). In addition to Organic Honey, which is the only animal origin product that has been produced for many years, organic milk, meat and egg production has started in recent years. Organic production in our country, increasing demands from abroad and domestically, Republic of Turkey Ministry of Agriculture and Foresty's support of organic production, international projects, universities, public research organizations, Non-governmental organisations, the formation of the domestic market, the increase of the private sector's interest and investments in organic animal husbandry and other developments the result is increasing rapidly. In this study will be assessed by examining the development of organic agriculture in Turkey since the beginning.

**Keywords:** organic farming, organic product

# MARKETING CHANNEL OF ORGANIC AGRICULTURAL PRODUCTS IN TURKEY

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**Abstract:**

Organic agricultural production in Turkey, to meet the demand for organic products from Europe began in the mid-1980s. The first exports of organic agricultural products in Turkey in 1985, only three items with the product (dried apricots, raisins and dried figs) was held from Izmir. The types of organic products subject to export have continuously increased in terms of both variety and quantity over the years. On the other hand, high prices of organic products at the beginning, low level of income, lack of consumers' knowledge of organic products, lack of marketing practices, limited variety of fresh organic vegetables in the market, limited the diversification and consumption of organic products in the domestic market. As a result of the formation of local demand since the late 1990s, in order to meet the domestic demand, boutique shops selling only organic products were established in big cities, in some districts with a high foreign population. Subsequently, while producers in ecological markets established in big cities started to market their products directly to consumers, supermarkets and hypermarkets started to sell organic products in separate sections. In addition, large amounts of organic products are processed in the food industry. These products are exported or offered to the domestic market. In addition, exporting companies put up for sale their own products, products that have been obtained from other companies in Turkey, their imported agricultural and non-agricultural products(aromatic oils, personal care products, etc.) in their own organic product stores. Today, organic products are marketed as direct sales through ecological neighborhood markets and open-air shops, stores selling natural products (specialized stores), in separate departments in special outlets, supermarkets and hypermarkets, and as home delivery via e-commerce. In this study will be assessed by examining organic products marketing channels in Turkey.

**Keywords:** Organic Products Marketing, Distribution channels, organic product

# THE EFFECTS OF DIFFERENT DOSES OF BIOCHAR AND COMPOST APPLICATION ON THE GRAIN YIELD AND GROWTH PARAMETERS OF THE CORN

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## Abstract:

Contrary to increasing population in the world, decrease in production areas leads to the problems of hunger and nutrition, which are the main problems of humanity. Together with the efficient and sustainable use of soils, while providing the improvement of problematic soils on the one hand, productivity and quality increases will be provided on the other hand. Besides the increase of organic matter content of soils together with the improvement in soil properties, increases in productivity and quality in crop production are also provided. Different wastes such as farm manure, composted wastes, post-harvest plant residues and biochar can be used for increasing soil organic matter. For this reason, this study was carried out to determine the effects of compost and biochar obtained from the same plant material on the properties of a calcareous and alkaline yield components of the corn plant. The application of 0, 2 and 4 tons da-1 of biochar and compost were investigated in this study, which was carried out in line with a randomized block design with three replications in the 14 $m^2$ sized parcels under field conditions, and the effects of the treatments on plant height, stem diameter, leaf chlorophyll content and grain yield were determined. When the yield values are examined in the highest doses of compost and biochar relative to the control, it was found that yield values increased by 284.2% and 147.4%, respectively and also the effects of the applications on the other measured plant parameters were statistically significant ($p < 0.05$).

**Keywords:** Organic matter, compost, biochar, corn yield, efficient elements.

# THE IMPORTANCE OF ANIMAL PRODUCTION AND ITS CONTRIBUTION TO SOMALIA ECONOMY

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**Abstract:**

The livestock sector in Somalia is at the center of the economic and cultural life of society. The sector provides the livelihood of a large part of the population directly and indirectly. The livestock sector has a 40% share in Somalia's Gross Domestic Product. In this study, the contribution of animal production to the Somali economy has been evaluated. Goat, sheep, cattle and camel are the main animal species that are bred in the Somali livestock sector. However, these animal species are mostly bred by family-type businesses in rural areas. Animal products produced in the livestock sector in Somalia are mainly milk, meat and leather. Animal products are mostly used fresh without processing. Most of the livestock activities are carried out by nomadic families in rural areas of the country at subsistence level. The export of the livestock sector in Somalia is the country's main source of foreign income. In addition, it is the largest traded commodity industry product. Livestock products exported are live camels, cattle, goats and sheep. The largest foreign market is Saudi Arabia, where Somali live animals are exported during the feast of sacrifice. Besides Saudi Arabia, animals are also exported to other Middle Eastern countries such as the United Arab Emirates, Qatar, Kuwait, Oman and Egypt. Somalia is the world's largest exporter of camels and the world's second-largest exporter of goats and sheep. Somalia lost $ 500 million in export revenue this year due to the fact that livestock was not exported to Saudi Arabia due to the Covid-19 outbreak. In 2018, 46,663 thousand tons of camel meat, 58,690 tons of beef, 39,625 tons of goat meat and 39,244 tons of mutton were produced in Somalia. In the same year, 958,079 thousand tons of camel milk, 448,745 tons of cow's milk, 374,869 tons of goat's milk and 369,378 tons of sheep milk were produced. Somalia earns between $ 300 million and $ 500 million in export revenue each year from the livestock industry. More than half of the rural population has connections with the livestock sector. In Somalia, the livestock sector provides the biggest contribution to GDP, employment sources and economic growth. The livestock sector in Somalia faces fundamental problems in production. In this context, it is necessary to implement sustainable solutions to the problems of the sector. The state should make a pioneering and exemplary investment in the livestock sector that provides economic growth in Somalia. Large-scale livestock enterprises should be established in the livestock sector and should be expanded throughout the country. In order to meet the meat and milk needs of people in Somalia at a sufficient level, breeding animals should be imported and cross-breeding studies should be carried out. There is a need for trained human resources in the sector. Therefore, efforts should be made to train producers. For the development of the livestock sector, the state, especially the milk and meat industry, should establish industrial enterprises based on animal husbandry.

**Keywords**: Livestock sector, animal production, Gross Domestic Product, Somalia

# IMPORTANCE OF LIVESTOCK IN THE BURUNDI ECONOMY AND THE SITUATION OF DAIRY CATTLE

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**Abstract:**

The Republic of Burundi is a landlocked country located in the eastern part of the central part of the African continent. Burundi has an area of 27,834 km². It borders with Rwanda to the north, Tanzania to the east and the Democratic Republic of Congo to the west. The population of Burundi is estimated at 12 million inhabitants in 2019. With a population of more than 300 inhabitants per km2, Burundi is one of the most densely populated African countries. The main economic sectors in Burundi are currently agriculture and livestock, industry and crafts, forestry and energy. Livestock plays an important economic and social role. It is used in the production of milk, meat, leather and fertilizer. Many Burundian households are engaged in animal husbandry activities. These family businesses are important in terms of market taxes and providing employment and income across the country. The agriculture and livestock sector provides employment at a rate of 93%. Agriculture represents 50% of the gross domestic product (GDP). Agriculture provides more than 95% of the food needs and more than 80% of the country's foreign exchange income. Animal production is widespread and accounts for around 4.6% of Burundi's GDP. In the Bututsi region, 63.4% of agricultural income comes from animal husbandry and cattle breeding provides 94.9% of income. Basic household income is divided into subsistence agriculture or food production 47%, agricultural work 18%, livestock 10% and industrial facilities 3%. In the markets, cow traders pay a tax of 3,500 BIF (± 15 Tl) per animal. There is a slaughter tax of 5,000 BIF (± 20 Tl) per bovine and 1700 BIF (± 8 Tl) for sheep, goats and pigs. Leather exports between 1997- 2001 are estimated at 215,000 euros and Burundi's leather exports are estimated at 2.7 thousand tones in 2018. Milk and dairy products represent about 62% of the total value of Burundi's animal products imports. Imports of milk and dairy products are 5.6 million litres per year; 72% of them are fresh milk, 20% powdered milk, 9% cheese and 1% yoghurt. Meat imports represent around 34% of the total food imports recorded at customs. There is no official export of livestock products. Milk production in Burundi is carried out by rural households, small modern breeders and some zootechnical stations of the state. Currently, annual milk consumption is estimated at 3.3 litres per capita in Burundi. The average milk production during the period 2010-2013 was 50.600 tonnes, of which 74% came from cattle, 23% from goats and 3% from sheep. Animal husbandry in Burundi is traditionally and extensively carried out as a secondary income-generating activity. The existing infrastructure is insufficient for the transformation of aquaculture products and suitable for the proliferation of animal diseases. As a result of the economic and political instability of the country, inadequate animal husbandry policies make the sector less productive. The state and NGOs should provide the necessary technical and economic support to the livestock sector. It should also contribute to the development of the livestock industry, increase the number of productive animal breeds and finally facilitate the access of livestock products to final markets. Researchers should increase work on the processing, marketing and sales chains of livestock products. Training activities should be carried out for the breeders and necessary initiatives should be taken to make more conscious animal husbandry.

**Keywords**: Livestock products, Burundi economy, dairy cattle and Burundi

# KARYOLOGICAL FEATURES OF CONIFERS IN THE CONDITIONS OF ANTHROPOGENIC POLLUTION IN THE BISHKEK

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**Abstract:**

The basis of the research is a study of karyological features of conifer trees growing in conditions of anthropogenic contamination in Bishkek, Kyrgyzstan. As part of the study, samples from the seeds of the Tien Shan spruce (Picea schrenkiana subsp. Tianschanica) and Scots pine (Pínus sylvéstris) growing in Bishkek were taken and a cytological analysis was performed. Temporary microscopic slides, which were prepared from the collected biomaterials, were studied under the Boeko and Nikon ECLIPSE 50i microscope at magnifications of 40 × 10, 100 × 10. Micrographs of cells in different stages of mitosis were obtained using Nikon Digital Sight DS-Fi1 video cameras. Studies have shown that the seed progeny of the Tien Shan spruce (Picea schrenkiana subsp. Tianschanica) growing in Bishkek (3.95%) compared to the control population (0.53%) shows a high incidence of mitosis disorders. 2.36% abnormal mitotic cells were found in common pine (Pínus sylvéstris) growing in Bishkek, while common pine which is growing in the Kegeti Gorge had 0.46%. Based on the studies, the following types of mitotic anomalies were discovered: the ring chromosome, B- chromosome, run-in and lagging chromosomes located outside the metaphase plate of the chromosome, chromosome fragments, chromosome bridges. The data obtained as a result of studies suggests that the karyological variability of the seed progeny of conifers is an indicator of cytotoxicity and can be used to monitor the genotoxic effects of the air environment of the city.

**Keywords:** cytogenetic indicators, chromosomal abnormalities, mitosis pathology

# DETERMINATION OF GENOTOXIC EFFECTS OF OXYFLUORFEN BY THE ALLIUM – TEST METHOD

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**Abstract:**

In this research, genotoxic and cytotoxic effects of the herbicide «Oxyfluorfen» (0.1% and 0.5% solutions) have been studied using the Allium – test method. The research was carried out in the laboratories of cytology, histology and biochemistry at the Biology Department, Faculty of Sciences in the Kyrgyz - Turkish Manas University. Onion roots were used as a material for research. They were placed in beakers and left under natural light at room temperature for 72 hours. 12 onion bulbs in 100-150 ml of distilled water were used as control group, as well as 12 pieces in the herbicide mixtures at a concentration of 0.1% and 0.5% for studying the cytogenetic effect of the herbicide «Oxyfluorfen». Screening tests were performed by analyzing morphometric parameters of prepared roots. All stages of mitosis and chromosomal aberrations caused by the herbicide were recorded on video under a microscope. The ana- telophase method was used for analyzing the stages of normal mitosis and abnormal stages, types of chromosomal abnormalities. According to the results of the obtained morphometric parameters, the average root length was 2.6 ± 0.06 cm in the control sample, 0.24 ±0.03 cm in 0.1% solution of the herbicide «Oxyfluorfen», and in 0.5% solution it was equal to 0.19 ± 0.02 cm. In all cases, the level of variability of the trait was high. Analysis of the effect of concentrated solutions on cell division of the vascular apical meristem showed a decrease in the mitotic index with an increase in the concentration of herbicides.

**Keywords:** Oxyfluorfe, Allium – test, Allium cepa L., mitotic activity

# CHANGES IN SOIL CARBON MINERALIZATION UNDER THE EFFECTS OF FUNGICIDE CYPRODINIL

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**Abstract:**

Soil organic carbon mineralization refers to the overall processes by which microorganisms mineralize soil organic C and release it in the form of CO2. A short term experiment was carried out to ascertain the effects of different recommended doses (RD) of fungicide cyprodinil [0 (Control), 10.7 (RD), 21.4 (RD x2) and 42.9 mg/ kg soil (RD x4)] on soil carbon mineralization using an agricultural soil. Soil was sampled from Research Farm of Faculty of Agriculture in Cukurova University (Adana, Turkey) in June 2018. This soil had no history of cyprodinil usage. After the determination of some soil physical and chemical properties, soils were humidified at 80% of field capacity, mixed with doses of the fungicide tebuconazole and incubated for 42 days at 28°C. CO2 respiration was measured during the following days of incubation: 1, 3, 6, 9, 12, 16, 23, 30, 37 and 42. Cumulative carbon mineralizations (mg C(CO2)/ 100 g soil) were in the range between 68.56 (Control) and 79.20 (RD x4) while their rates were in between 3.78% (Control) and 4.37% (RD x4) at the end of incubation period. All doses of cyprodinil significantly increased carbon mineralization ($P<0.05$). Stimulations of microbial activity by doses of fungicide cyprodinil were 9.9% for RD, 10.5% for RD x2 and 15.5% for RD x4. It ’s suggested that microorganisms in this soil may positively mineralize both recommended field dose of fungicide cyprodinil and its higher doses.

**Keywords:** Fungicide, aminopyrimidine, cyprodinil, soil microbial activity, soil carbon mineralization

# DEVELOPMENT OPPORTUNITIES FOR LIVESTOCK AND DAIRY CATTLE PRODUCTION IN UGANDA

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**Abstract:**

In addition to promoting food security, creating employment opportunities and alleviating rural poverty, livestock also contributes to the growth of Uganda ’s economy. The sector is characterized by high utilization of family labour, ownership of small pieces of land, high reliance on natural pastures and ownership of a large number of local animal breeds. There are 14.6 million cattle, 4.6 million sheep, 16.05 million goats, 4.2 million pigs and 48.9 million poultry in Uganda. Because of their versatility and easy adaptation to the local climatic and disease conditions, local animal breeds continue to dominate exotic breeds in terms of numbers despite their low production capacity. Livestock production plays several roles in the growth of Uganda’s economy. The sector plays a role in ensuring food security, reducing rural poverty, improving employment and people's livelihoods. The sector also contributes to the growth of Uganda's GDP. Animal production contributed 3.5% to the total national GDP of $ 1,188 million in 2018. According to the available data, Uganda produced 0.217 million tons of beef worth the US $ 0.5 billion, 40,910 tons of goats meat and mutton, more than 24,681 tons of pork, 65,000 tons of chicken meat worth the US $ 87.7 million and 0.9 million eggs worth the US $ 36 million in 2018. Annual per capita consumption of beef, goats meat, mutton, pork, chicken meat and eggs is 6 kg, 0.9 kg, 0.3 kg, 3.2 kg, 1.8 kg and 22 eggs respectively. Uganda also produces 2.04 million tons of milk annually and the annual consumption of dairy products is 58 litres per person. Despite the aforementioned contributions of the livestock sector to Uganda’s economy, major challenges do exist. These challenges are due to the low productivity and the subsistence nature of Uganda’s livestock sector. Challenges such as poor policies, low levels of infrastructural development, low income and economic growth levels in most parts of the country, high poverty levels, the prevalence of livestock diseases and dry climatic conditions in some parts of the country hinder the sector’s growth. As solutions to these constraints, the government needs to develop new and monitor and strengthen existing institutions that provide credit, animal health and breeding services. There is a need to support research and development, implementation of veterinary subsidy programs and effective farmer extension services. Potential developments in the sector will bring various benefits such as growth in national income, reduction of dependence on imported livestock products, employment opportunities, improvement of livelihoods and poverty reduction.

**Keywords**: Uganda, Livestock, Dairy Cattle, Development Opportunities

# DETERMINATION OF THE FACTORS AFFECTING LIVESTOCK ENTERPRISES TO GET ANIMAL LIFE INSURANCE*

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## Abstract:

Animal production process requires measures against certain risks and uncertainties due to its nature. Animal diseases and other risks cause yield losses and deaths in enterprises. This situation causes loss of capital in enterprises. The ability to compensate for income and capital losses through insurance provides significant benefits to enterprises. The aim of this study Animal Life Insurance (ALI) of the provinces as producers was made in Turkey it to determine the factors affecting the reasons for taking and will provide benefits to be increased by the rate of insurance is to demonstrate the proposed solutions. The material of the research consists of the data of the enterprises engaged in small ruminant and cattle breeding in the provinces determined, Afyonkarahisar, Aksaray, Ankara, Burdur, Karaman and Konya. Sampling distribution by provinces was calculated according to the Neyman stratified sampling method. Within the scope of the research, the data obtained from 252 enterprises were evaluated. In the analysis of the data, the relationship between two continuous variables was evaluated with the Pearson Correlation Coefficient, and if the parametric test did not meet the prerequisites, the Spearman Correlation Coefficient was evaluated. Categorical data were analyzed with Fisher's Exact Test and Chi-Square test. Animal Life Insurance Attitude Scale was developed in order to determine the reasons why producers do not have animal life insurance. A 5-factor structure was determined as a result of Varimax rotation method for the items of the scale developed. The collectibility of the scale was evaluated with the Tukey summability test. There has been an increase in the rate of insurances of enterprises that have an illness-free certificate, less than 5 years of professional experience and additional income sources other than animal husbandry.The low education level of the producers reduces the tendency to get insurance. They stated that most of the producers do not plan to have ALI in the coming years, but they can put insurance on their agenda again if their income increases and premiums become cheaper. The Animal Life Insurance Attitude Scale was evaluated and the scale was developed. The Animal Life Insurance Attitude Scale questions are divided into 5 factors. The factors are respectively named as Expectation from Insurance, Insurance Awareness, Procedure and Belief, Financial Factors, Cost. Increasing the rate of insurance is important for the producers and the insurance company. With the increase in the participation rate and the increase in the accumulation in the insurance pool, it is possible to lower the premiums and to expand the insurance coverage. In order to increase insurance rates, measures should be taken to inform producers on ALI continuously and regularly and to increase the income and welfare levels of producers. In addition, positive discrimination to insured producers in the practices and procedures of the Ministry of Agriculture and Forestry (such as priority in payment of support and incentives) will encourage producers to remain in the system.

Acknowledgements: This study was supported by TARSİM within the scope of the Project.

**Keywords**: Animal Life Insurance, Risk Management, Cattle, Small Ruminant.

# INITIAL EVALUATION OF THE PRODUCTIVITY AND PHYSICAL PROPERTIES OF A SELECTED KYRGYZ CASHMERE GOAT BREEDING FLOCK

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**Abstract:**

Cashmere production offers a new source of income for remote farmers in Central Asia where goats have long been raised. Between 2008-2018 we established a selected breeding flock to preserve, assess and improve the economic and genetic potential of cashmere-bearing indigenous goats in Kyrgyzstan. The flock was managed in an enhanced traditional system by a local shepherd in the mountainous region of Osh Province. Significant effects of year, age and the sex of goats affected cashmere weight, while year and age of goat affected cashmere length and year affected cashmere fiber diameter. The best statistical model explained about 60% of the variation in both cashmere weight and length and about 30% of the variation in fiber diameter. No particular measurement year trend could be detected for any trait. Between years, cashmere weight varied between 103-150 g, fiber diameter between 15.8-17.6 m and length between 32-48 mm. Males produced more cashmere than females with no difference between sex in diameter or length. Cashmere weight was constant between ages 1-4 years before declining progressively from about 144 g to 90 g at age 6 years. Given the harsh winter environment, remote conditions, and limited research resources, data for some years is missing. No genetic trend could be calculated with the information currently available.

**Keywords:** Coat color, Indigenous goats, Fiber diameter, Fiber length, Genetic improvement

# DISCOVERY OF SUKKULA AND NIKITA RETROTRANSPOSONS IN HONEY BEE GENOME

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**Abstract:**

Honey bees are essential for agriculture in terms of pollination and human nutrition. Barley-specific Nikita and Sukkula retrotransposons were identified in honeybee for the first time as a result of our study. In this study, 33 Caucasian honeybees (Apis mellifera caucasica) were collected from three different colonies. Each colony consisted of a queen, five workers, and five larvae. Polymorphism was determined using Jaccard similarity index which relies on the presence or absence of the bands generated by IRAP marker. Both of two retrotransposons were found in all samples of all colonies. It was observed that Nikita retrotransposon (0-100%) was more active than Sukkula retrotransposon (0-67%). Moreover, comparison of polymorphism among queens, workers and larvae showed varying results. These findings could be expected to figure out the connections between retrotransposon movements and honey bee development.

**Keywords:** Mobile genetic elements, polymorphism, IRAP molecular marker

# THE POTENTIAL USE OF SOME ORANGE PEEL OIL ON CHEMICAL CONTROL OF PLANOCOCCUS CITRI RISSO (HEMIPTERA: *PSEUDOCOCCIDAE*)

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**Abstract:**

The discovery or the use of Herbal based Organic active ingredient has been playing an important role day by day in comparison with pesticides in terms of environmental, ecological and sustainability. Planococcus citri Risso (Hemiptera: Pseudococcidae) is known as one of the most important pests and limited insecticides are used against this pest. This study has been conducted to determine the effects and potential use of orange peel oil in comparison with Mineral oil and spirotetramat (certificated insecticides). Bioassay experiments were done on P.citri and LD50 levels were calculated. According to results of this study, LD50 of the orange peel oil, which is obtained from industrial applications, were found % 0,9, LD50 of mineral oil was 1542 ppm, and LD50 of spirotetramat was found 791 ppm. In conclusion, the potential effectiveness of orange peel oil against P. citri was determined during this study and comprehensive studies should be done for future works.

**Keywords:** Planoccocus citri, Orange Peel, Chemical Control, Management

# MAPPING ANATOLIAN STEPPE REGION AND ECOSYSTEM TYPES BY USING EARTH OBSERVATION AND GIS

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**Abstract:**

Turkey's steppe ecosystems are globally significant and unique environments having very rich flora and fauna composition; and they are extremely vulnerable ecosystems. Although there are some preliminary studies about the steppe region, there was not sufficiently detailed map showing the actual delineation of Anatolian steppe region and the different steppe types. Anatolian Steppe map was produced mainly based on the Earth Observation data interpretation and was produced by analyzing satellite imagery with the help of GIS technologies based on existing data ( Forest stand map, surface temperature, aridity/drought index, soil information, elevation, Geological formations, vegetation indices (NDVI, EVI)) and interpretation of other sources. The mapping activity based on convergence of the evidences approach which provided by the cost-effective, scientifically sound and robust mapping techniques with the help of remote sensing technologies and GIS. The signatures of the steppe region were analyzed and the final border of Anatolian steppe region was predicted. The map both reveals the delineated border, including information about the different dynamics of the homogeneous clusters, and also ecosystem types. Moreover, the impacts of land cover changes between 2006 and 2012 and hot-spot analysis that considers several different aspects of the threats and vulnerable areas of region were also analyzed and discussed in this study. Therefore this study should be considered very important key output for the policy makers to build the specific agricultural planning strategies for each of the regions by pointing out the exact locations and to secure integrated management of natural resources in Anatolian steppe.

**Keywords:** Anatolian Steppe, Remote Sensing, GIS, Mapping, Ecosystem Types

# NOVEL METHODS USED IN MEAT TENDERIZATION

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**Abstract:**

Tenderness is one of the most important features of meat and meat products that considerably affects its consumer acceptability. The process of tenderness that occurs naturally as a result of a series of biochemical changes during pre-rigor and post-rigor stages in fresh meat after slaughter, including pre- slaughter, can be accelerated and made more effective by various treatments. For this process, some methods have been applied for years such as electrical stimulation, tenderstretch, marination, aging. However, new technological methods have become popular to improve the meat quality and to increase the consumer demands, in recent years. These methods include such as high-pressure processing, hydrodynamic-pressure, shockwaves, pulsed electric field, ultrasonic. This review has been prepared to give information about the biochemical changes in the process of meat tenderness, new technologies used in meat tenderness and the advantages and disadvantages of these technologies.

**Keywords:** Beef, Meat quality, New technology, Tenderness

# ANTIFUNGAL EFFECT OF ANHYDROUS BORAX AGAINST PENICILLIUM EXPANSUM CAUSING BLUE MOLD DECAY ON APPLE FRUIT

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**Abstract:**

Penicillium expansum, which causes blue mold disease, is one of the most important pathogens of pome fruit and is a necrotrophic fungus that requires wounds to infect the fruit. In this study, the efficacy of anhydrous borax against P. expansum, in vitro experiments and the curative and preventive efficacy of this salt against pathogen infections on apple fruits in vivo were determinated. Anhydrous borax strongly inhibited mycelial growth, spore germination and germ tube elongation of P. expansum in vitro. While this salt completely inhibited the mycelial growth of P. expansum at a concentration of 0.25%, completely inhibited the spore germination and germ tube elongation at a concentration of 0.125%. In addition, the EC50 value of anhydrous borax was 0.09. The minimum inhibitory concentration (MIC) of the boron salt was 0.25%, while the minimum fungicidal concentration (MFC) of the same salt was found to be greater than 1%. Lesion area of blue mold on apple fruits treated with 3% concentration of anhydrous borax after fungal inoculation (1x105 conidia mL-1) as curative activity was significantly reduced by 95.73%, compare to control treatment ($P<0.05$). However, at same concentration, lesion area on apple fruit treated with the boron salt before inoculation as preventive activity with the fungus reduced by 97.85%. These results indicate that the boron salt can be used as a potential alternative to synthetic fungicides for controlling postharvest disease of apple fruit caused by P. expansum.

**Keywords:** Apple, anhydrous borax, blue mold, postharvest, alternative control

# ISOLATION ENTOMOPATHOGENIC FUNGI FROM THE TWO-SPOTTED SPIDER MITE (TERANICHUS URTICAE) AT ERZINCAN PROVINCE

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**Abstract**:

In this study, the infested with mites of the bean leaves were collected from the bean production and then by put them in polyethylene bags and they brought to the laboratory. The mites on the bean leaves were transferred to the petri dish ( PDA) by a brush at the laboratory. The Petri dishes were incubated for growth and sporulation of the fungus (2 weeks in incubator at 25 ± 1 ºC). As a result 6 entomopathogenic fungi were ısolated from the cadaver of the Tetranichus urticae. 4 of them is Beauveria bassiana (Balsamo) and 2 of them is Metharizium anisopliae. After the Identification of isolates have been coded and stored under refrigerator conditions for use in other studies at the Pharmaceutical Microbiology laboratory of the Faculty of Pharmacy of Erzincan University

**Keywords:** Tetranychus urticae, Beauveria bassiana, Metharizium anisopliae

# CRYOPRESERVATION STRATEGIES FOR AROMATIC-MEDICINAL PLANT SPECIES

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**Abstract:**

Aromatic-medicinal plant species are therapeutic resource for starting materials of drugs. These plant species present variable character as far as preservation and sustainable use strategies are concerned. Aromatic-medicinal plant group automatically has a heterogenous construction of diverse plant species with their own features like habitat, growth properties, metabolite quality and quantity and responses to immediate environment. Because the all protocols need to be species specific, traditional conservation approaches cannot work for all species. Cryopreservation, in which living call, tissues and organs are preserved at ultra low temperatures such as in liquid nitrogen (−196°C) to prevent mitotic and metabolic activities, provides a useful biotechnological tool. Plant material can be storaged without change for a theoretically unlimited period of time. In addition, cultures are stored in a small volume of area, are protected from contamination, and require only limited maintenance. In this study, different long-term strategies based on cryogenic procedures for conservation of aromatic-medicinal plant species have been taken for detailed discussion.

**Keywords:** Cryopreservation, liquid nitrogen, long-term conservation, plant germplasm

# LONG-TERM CONSERVATION OF SESAMUM ORIENTALE L. CV. "GOKOVA SESAME" GERMPLASM VIA DROPLET VITRIFICATION TECHNIQUE

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**Abstract:**

"Gokova Sesame " known as the highest quality sesame of Turkey is cultivated with traditional methods. Because of their phytate compound and other rich secondary metabolites, they function as an antioxidant, reduce the effects of free radicals and prevent cancer. There have no any work on biotechnological strategy for long-term conservation of "Gokova Sesame" in the literature and this local cultivar is just cultivated only small area, for his reason, its germplasm needs to be urgently protected. Cryopreservation is a cryogenic technique that provides long-term protection in liquid nitrogen at -196oC. The aim of the current work to develop efficient procedure for long-term conservation of cv. "Gokova Sesame" via one-step freezing techniques, droplet vitrification. In this procedure, after cold hardening and sucrose preculturing steps, the meristems of in vitro grown cv. "Gokova Sesame" were treated with 4 µl PVS2 solution [(30% glycerol (w/v), 15% ethylene glycol (w/v), 15% DMSO (w/v) in MS medium supplemented with 0.4 M sucrose] for 15, 30, 45, 60, 75, 90 minutes on aluminum foil strips. Then, they were directly transferred liquid nitrogen. After thawing process, obtained regeneration rate was 40% for preliminary study.

**Keywords:** Cryopreservation, DMSO, Droplet vitrification, Liquid nitrogen, Sesamum orientale L.

# DETERMINATION OF CATALASE ACTIVITY IN SALT AFFECTED SOILS IN IGDIR

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**Abstract:**

Soil salinity and alkalinity is an important problem that causes degradation in soils caused by the effect of climatic, topographic or anthropogenic factors. Approximately 955 million hectares of land in the world were affected by salt and approximately 20 million hectares were out of agriculture. In our country, there are salinity and alkalinity problems in 1.5 million ha area, 74% of these areas have salinity, 25.5% salinity- alkalinity and 0.5% alkalinity. Iğdır Plain has a surface area of 92,000 ha, which has microclimate characteristics in the Eastern Anatolia region, where agricultural production is intensely carried out (two products per year). There are salinity and alkalinity problems due to the high ground water in the plain, low rainfall (254.2 mm) and high evaporation (1094.9 mm), and human activities accelerate this process. In the region; saline, alkaline, saline-alkali and boron lands are 36,476 ha. . This study was established to determine the catalase enzyme activity in soils affected by different degrees of salt. For this purpose, soil samples were taken from 3 different lands from 0-30 cm depth, 3 samples from each land with different salinity and alkalinity levels. Catalase enzyme activity of soil samples taken was determined with 3 replicates according to Beck (1971). Results showed that catalase activity was 37.25 mlO2 3min-1gr soil-1 in highly saline- alkaline soils, 68.23 mlO2 3min-1gr soil-1 in alkaline soils, 169.23 mlO2 3min-1gr soil-1 in soils without salinity and alkalinity. As a result of the experiment, it was determined that soil salinity decreases the catalase activity.

**Keywords:** Catalase activity, soil properties, soil salinity, soil alkalinity

# TODAY AND FUTURE USE OF BIOPESTICIDES

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**Abstract:**

Biopesticides are certain types of pesticides derived from biological materials such as animals, plants, and bacteria. While, biopesticides consist only 2% of the whole used pesticdes, its growth rate indicates an increasing trend in past two decades. By the beginning of 2050, 50% of the total used pesticides will be biopesticides. While there are some issues concerning product performance, such as slow to kill, cost, difficulties of production, lack of appropriate formulations, the production and fromulation of pesticdes is a burgeoning area. Some of these problems can be solved by formulation improvements. For the necessity of product performance, formulation becomes the most important field for improving and expanding the activity of biopesticides. Nanoformulations and microencapsulation technologies can enhance the stability and biological efficiency of biopesticide products, and this could grow their land use. Currently, microbial pesticides account for approximately 75% of the global biopesticide market with the bacterial agent, B. thuringiensis kurstaki, and other subspecies being the most widely used (Olson, 2015). The 67 registered B. thuringiensis products that are marketed in more than 450 formulations alone generate annual sales exceeding $90 million (Jindal et al., 2013). This review will discuss the current status, future prospect and challenges associated with the usage and formulation of biopesticides in pest control.

**Keywords:** Biopesticides, Agriculture, Biotechnology

# DETERMINATION OF SOME BIOLOGICAL CHARACTERISTICS OF GREEN PEACH APHID (Myzus persicae Sulz.) HEMIPTERA: APHIDIDAE] FED ON PEPPER (Capsicum annuum L.) GROWED IN DIFFERENT FERTILIZER APPLICATIONS

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**Abstract:**

The green peach aphid (Myzus persicae Sulz), which is a polyphage pest, is one of the pests that causes economic losses in pepper production areas. In addition to general aphid damage, it vectors virus diseases. One of the important stages of the management against pests without breaking the ecological balance is the creation of conditions that are not suitable for them. Fertilization methods used to increase soil fertility, especially in the plant growing stage, contribute significantly to the optimal physical, chemical and biological properties of the soil, this enables plants grown in that soil to be more resistant to diseases and pests. In this study, it was aimed to determine the effect of fertilizer on suppression of pest fed on vermicompost, vermisuspension, and animal fertilizer treated pepper plant depending on population development. Lowest hereditary reproductive ability, reproductive power limit and net reproductive power were obtained from suspension and animal manure applications, of Myzus persicae (Sulz.), which feeds on pepper plant grown in four different applications, in climate rooms where 25 ± 1 0C, 60±5 % humidity and 16: 8 hours bright dark conditions are provided. Thus, it was determined that the application of vermisuspension and animal manure to the soil had a significant negative effect on the biological parameters of Myzus persicae compared to other treatments. It is envisaged that these practices can be used as an ecological control method for pests.

**Keywords:** Biofertilizer, Vermicompost, Vermisuspension, Animal manure  Population parameters

# ESTIMATION OF MAIZE WATER FOOTPRINT BASED ON GPCC AND AGCFSR GRIDDED DATASETS

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**Abstract:**

Because of the huge lack of data in space and time scale, especially in places far from synoptic stations, datasets can be good alternatives. In this study, the GPCC and the AgCFSR datasets were used to estimate the water footprint (WF) of maize in the Qazvin Plain, Iran. The 30 years of data from datasets were used as input for the AquaCrop model. The model calculated the WF parameters. Then the closest synoptic station in the province was used to evaluate data. Results showed the ability and efficiency of both datasets. The GPCC dataset was more efficient in estimating the WF than the AgCFSR dataset. Results showed that the GPCC dataset is more efficient in estimating the green WF, but the AgCFSR is better in estimating the blue WF. According to the results, datasets are efficient in estimating the WF of maize in the province. With more studies, the best dataset in estimating the WF of each crop in other places can be found.

**Keywords:** Maize, AquaCrop, AgCFSR, GPCC, Dataset

# ESTIMATION OF WHEAT WATER FOOTPRINT BASED ON CRU AND AGMERRA GRIDDED DATASETS

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**Abstract:**

There is always a huge lack of data in space and time scale, especially when there is no synoptic station near a specified location. In this paper, the 30 years data from two datasets, CRU and AgMERRA, were used to estimate wheat's water footprint. Wheat is the main cereal of the Qazvin Plain, the largest plain in the Salt Lake basin. The AquaCrop model was used to estimate the water footprint (WF) parameters. Then, the synoptic station in the province evaluated data. According to the results, the CRU dataset was much more efficient than the AgMERRA dataset. The amount of R2, RMSE, NRMSE, and ME in estimating the blue WF were 0.414, 94.93, 22.3%, and 171.51 with the CRU dataset, and 0.326, 189.66, 38.43%, and 402.66 with the AgMERRA dataset, respectively. These results were 0.463, 94.93, 22.32%, and 171.51 to estimate the green WF with the CRU dataset, while the same index was 0.253, 145.23, 34.35%, and 243.6 with the AgMERRA dataset, respectively. According to the results, using the CRU dataset to estimate the blue and the green WF of wheat in the Qazvin province is suggested. This study suggests more studies on datasets in estimating the WF of crops.

**Keywords:** Wheat, CRU, AgMERRA, Dataset, AquaCrop

# *IN SILICO* CHARACTERIZATION OF SUCROSE SYNTHASE (*SUS*) GENES IN HIGHER PLANT SPECIES

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## Abstract

Sucrose synthase (SUS) is widely expressed in plants and plays vital roles in plant metabolism and growth. In this study, a total of 50 plant SUS protein sequences were collected from the NCBI protein database and were subjected to homology search, physiochemical, motif, and domain analyses. The domain analysis revealed that sucrose synthase (PF00862) and glycosyl transferase (PF00534) are domain structures in all SUSs. Also, all SUSs are acidic in character and contain a greater number of negatively charged residues (Asp+Glu). Analysis of 10 commonly distributed motifs in the SUSs showed that 6 of 10 motifs are related to sucrose synthase domain, whereas 3 of 10 motifs are associated with glycosyl transferase domain. Predicted N-glycosylation sites showed variations in a species-specific manner, suggesting functional diversities. It was observed that the 3D structure of sucrose synthases domain of Zea mays, Gossypium raimondii, Triticum aestivum, and Pinus taeda had the structural divergences. The findings may help for laboratory studies aiming at understanding of SUS genes in plants.

**Keywords:** Sucrose synthase, SUS, *in silico* analysis, sequence analysis, 3D model.

# URBANIZATION EFFECT ON THE ASSEMBLAGES OF GREEN LACEWINGS (NEUROPTERA, CHRYSOPIDAE)

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**Abstract:**

Humankind migration to urban centers has resulted in diverse environmental disturbances that affect biodiversity. Undoubtedly, understanding the response of green lacewings also known as Neuropter ’s to urbanization will aid in the development of urban biodiversity management, planning, and conservation strategies worldwide, which will lead us to more sustainable, livable, and biodiverse cities. In a whole 341 specimens belonging to 5 species have been collected and diagnosed from 8 urban parks. Undoubtedly, understanding the response of green lacewings to urbanization will contribute to the development of urban biodiversity management, planning, and conservation strategies worldwide which together with knowledge of other insect groups, will lead us to more sustainable, safely, and biodiverse areas. Our results showed that different traits of lacewings can respond to urbanization. The results of this study could be used in an integrated pest management approach to biological control.

**Keywords:** Chrysopidae, Composition, Distribution Species, Urbanization

# SUSTAINABLE YIELD AND QUALITY MANAGEMENT IN BANANA CULTIVATION IN TURKEY

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**Abstract:**

In the basin between the Taurus Mountains and the Mediterranean Sea in the east of Antalya, a "microclimate" with a tropical climate is dominant. Banana cultivation has been carried out for about 60-70 years in Alanya and Gazipasa, which are located in this microclimate. In recent years, with increasing state support and incentives in Alanya and Gazipasa, as well as in other districts of Antalya (Aksu, Serik, Manavgat), banana production has started to become widespread by taking greenhouse conditions. On the other hand, banana production, which was only a family business in the past, is now also carried out in the form of producer unions and especially corporate company investments. In the rapidly growing and developing greenhouse banana sector, producers (family business, producer association, company etc.) and consultants-technical staff (agricultural engineer, agricultural technician) have important duties in order to ensure the sustainability of yield and quality management. At this point, it is of great importance to take precautions for the protection of soil fertility. Because, despite all agronomic practices to be made as a result of the decrease in soil fertility, it will be inevitable to experience an inevitable decline in banana yield and quality from year to year. In addition, the conventional model in greenhouse banana production (control of plant diseases and pests, soil-plant-water relations management, etc.) and the implementation of both producer and consumer protective systems (good agriculture and / or organic farming practices) in the context of sustainability is quite will be in place.

**Keywords:** Alanya, Gazipasa, Microclimate, Soil fertility, Tropical fruit

# PROTECTIVE EFFECTS OF MELATONIN (MLT) AGAINST CADMIUM INDUCED NEUROTOXICITY IN WISTAR RATS

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**Abstract:**

It was aimed to investigate the effects of melatonin (Mlt) in protecting the Cd-induced changes in the levels of lipid peroxidation (MDA), non-enzymatic [glutathione (GSH)] and enzymatic antioxidant [superoxide dismutase (SOD), and catalase (CAT)] status, and some cytokine [tumor necrosis factor-alpha (TNF- α), interleukin (IL)-6, and IL-10] values as well as acetylcholinesterase (AChE) and gamma- aminobutyric acid (GABA) levels in the hippocampal tissue of the rats. Thirty-two male Wistar rats were divided randomly into four groups as follows untreated control (C; n = 8), cadmium (Cd; n = 8), melatonin (Mlt; n = 8) and Cd + Mlt (CdMlt; n = 8). The rats in the Cd and CdMlt groups received cadmium chloride (CdCl2) (2 mg/kg/day) orally by gastric gavage three times a week for 4 weeks. Also, Mlt (100 mg/kg/day) was administered to Mlt and CdMlt groups by the same way five times a week for 4 weeks. After the treatment, animals were decapitated and tissue samples were taken for biochemical measurements. Tissue TNF-α and IL-6 values were detected the highest in the Cd group compared to other groups ($P < 0.05$). It was attenuated by Mlt in the CdMlt group when compared to Cd ($P < 0.05$). We found a significant increase in tissue GABA levels in the Mlt and CdMlt groups when compared to Cd ($P < 0.05$). Mlt exhibits protective effects on some antioxidant, cytokine as well as GABA levels in the hippocampal tissue of the rats exposed to Cd toxicity.

**Keywords:** Antioxidant, cadmium, cytokine, hippocampus, melatonin, rat.

# THE APPLICATION AREAS OF NANOTECHNOLOGY IN FOOD INDUSTRY

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**Abstract:**

The term 'nanotechnology' comes from the term 'nanometer', which is one billionth of a meter. Nanotechnology is a field of science and technology that deals with the production, characterization and modification of atomic, molecular or colloidal level of materials. New products can be developed by applying nanotechnology in many fields such as food, medicine, biotechnology, agriculture, pharmacology, electronics, defense, textile, machinery and construction industries. In the food industry, nanotechnology has applications in many areas such as the development of nutrient-enriched foods, preservation, packaging, reduction of agricultural inputs, new product development, increasing food safety, and the development of nano-additives and nanosensors. The nanoparticles produced by nanotechnology applications provide the desired properties to foods such as texture and aroma. Food packaging is the most applied area of nanotechnology and its applications in this area are gradually increasing. Food safety and shelf life can be secured by developing active and intelligent packaging systems instead of traditional packaging systems. With nanosensors and intelligent packaging, indication of spoilage occurring in foods can be determined in advance. Although the applications of nanotechnology in food are becoming crucial all over the world, there is no definite information about its effects on human health. This situation causes consumers to be cautious about nanotechnology applications. In this review, nanotechnology and its usage areas in food industry are discussed.

**Keywords:** Nanotechnology, food industry, food safety, intelligent packaging system, nanosensor

# CONJUGATED LINOLEIC ACID IN MEAT AND MEAT PRODUCTS AND ITS EFFECTS ON HEALTH

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**Abstract:**

Conjugated linoleic acid (CLA) is a term used for the mixture of positional and geometric isomers of linoleic acid (C18:2), an essential omega-6 fatty acid, containing double bonds in the cis-9 and cis-12 arrangement. The double bonds contained in the CLA are found in the form of cis or trans. CLA has 28 different isomers, but only biological properties of cis9-trans11 and trans10-cis12 isomers have been determined. The main source of CLA is milk and meat products. Cooking time-method, storage and fermentation process do not cause to any changes, while the level of CLA in meat varies with various factors such as season, type of animal, diet, age, individual physiological characteristics and environmental conditions. Meats from ruminant have more CLA amount than meats from nonruminant. In several studies, it has been determined that CLA has quite significant and positive effects on human health. It has been stated that CLA has antioxidative impact and positive effect on the immune system. It was reported that it protects against various diseases such as obesity, diabetes, cardiovascular diseases and some types of cancer as well as increases muscle development. In this review, the structure of CLA, its presence in meat and meat products, and the effects of its consumption on human health will be discussed.

**Keywords:** Conjugated linoleic acid, essential fatty acid, meat, ruminant, health

# MOLECULAR SPECIES IDENTIFICATION BY DNA BARCODING IN TAENIOTHRIPS INCONSEQUENCES (THRIPIDAE: THYSANOPTERA)

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**Abstract:**

The need for expertise on insect systematics including Thysanoptera led to an increasing interest in their molecular identification in recent years. Molecular techniques are essential for rapid and accurate species identification. DNA barcoding based on nucleotide sequencing analysis of the mitochondrial cytochrome oxidase I (COI) gene has become a popular technique for species identification and discrimination. The mtCOI sequence was shown to provide sufficient variation to be used within the pear thrips. The pest thrips species, Taeniothrips inconsequens (Uzel), as knows the pear or prune thrips, is a serious pest on a number of forest and horticultural crops. There is a little reference about it. It is reported first time from Turkey in 1955 on pear fruit tree. We collected for it in cherry orchard habitats in Konya (Hadim) in 2016. This study aimed to construct a molecular identification key for T. inconsequens. Here, we present mtCOI and ITS sequencing data for T. inconsequens. Molecular data indicate that the species is located in genbank samples of T. inconsequens in phylogenetic tree. Overall results show that molecular keys can be a useful on T. inconsequens identification for pest management and plant quarantine purposes.

**Keywords:** Taeniothrips inconsequences, DNA barcoding, molecular identification, Turkey, Konya

# SINGLE NUCLEOTIDE POLYMORPHISMS (SNP) ALLELE FREQUENCY ESTIMATED IN POOLED DNA OF FRANKLINELLA OCCIDENTALIS BY NEXT-GENERATION SEQUENCING

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**Abstract:**

Next-Generation Sequencing (NGS) a massive advance in sequencing technology has enabled of a targeted genomic region or a whole genome sequencing at an extraordinary rate. And also, it supplies an opportunity for SNP discovery in pooled samples and a key application for determination the sequence of genomic regions. Especially pooling of DNA from many individuals could be used to determine the SNP spectrum or for combined SNP discovery and association analyses. Thrips are mainly phytophagous, mycophagous, or predatory insects and usually tiny, fringe winged and are classified into nine families within two suborders. Several thrips species as Frankliniella besides many others are essentially flower inhabiting, feeding on various parts of the flower, thereby causing deceleration of growth, destruction of buds and flowers, and deformity of fruits. As some thrips identified and described, Frankliniella occidentalis is known to be vectors of plant viruses and an invasive species and the most economically significant pest. Here, we have studied the mitochondrial SNPs to detect on pooling F. occidentalis using sequence data generated by the Illimuna sequencer. The results (100 induvial F. occidentalis by NGS) were evaluated align at one of the whole mt genome GenBank data of F. occidentalis. We detected 61 SNPs in the most diverse PCG is cox1 (8SNPs/1500bp length), the least diverse PCG is nad5 (1SNPs/1400bp length) gene region and 46 SNPs is in tRNAs region. The results show most of SNPs detected corresponds to at least 80% of the reads differing from the reference. a massive advance

**Keywords:** NGS, Illimuna, Frankliniella occidentalis SNP

# DETERMINING THE EVALUATION POSSIBILITIES OF WASTES ARISING IN OLIVE AND OLIVE OIL PRODUCTION

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**Abstract:**

The archaeological excavations carried, out show that the gene center of the olive tree is the region between the Euphrates and Tigris rivers and called Mesopotamia. In the production process of olive and olive oil, which constitute a valuable and important nutritional resource, bringing waste water, olive pomace, olive leaf and olive seed to the economy has an important place in the commercial return of the olive sector. It is seen that the most important source of oleuropein, which is an important phenolic component, is the olive leaf, a by-product of olives. The content of oleic and linoleic acids, flavonoid and phenolic components of the by-products in the olive and olive oil sector increases the appeal of these products. Optimum use of these products enables the products to be evaluated as a resource rather than waste.

**Keywords:** Olive pomace, Waste water, Mesopotamia, Oleuropein, Polyphenol

# INVESTIGATION OF THE TOCOPHEROL COMPOSITIONS OF COMMERCIAL FISH OILS

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**Abstract:**

In this study, the chemical properties of some commercial marine oils (MO) obtained from local markets were investigated using standard methods. Tocopherol compositions of 20 different MO samples provided in the study were examined using international standard methods. According to the analysis made for the determination of the tocopherol composition of MO samples, most of the MO samples were determined with the current standard analysis method. In total, the highest tocopherol ratio was obtained from the MO11 sample with 881.93 mg / kg oil. The lowest ratio was obtained from the MO3 sample with 32.60 mg / kg oil. No tocopherol species could be detected in the MO2, MO5, MO6, MO7, MO8, MO19 and MO20 samples. It was observed that the samples examined within the scope of the study mainly contained α and β tocopherol. All tocopherol species were found only in MO11 and MO12 samples. The least determined type of tocopherol was δ tocopherol. According to the results obtained, it has been determined that fish oil food supplements sold in the markets of our country and bought and consumed by consumers are rich in vitamin E, as well as their high omega-3 ratios.

**Keywords:** Food supplement; marine oil; tocopherol composition, vitamin E.

# USE OF PROPOLIS AS A DIGESTIVE SYSTEM REGULATOR IN POULTRY

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**Abstract:**

Intestinal microflora is one of the most important factors affecting performance in poultry. Increasing the rate of conversion of feed to meat by keeping the disease factor microorganisms in general microflora relatively low and keeping the immunity levels of animals. It is essential to know the types and amounts of microorganisms present in order to know the effect of plants and plant extracts on the digestive system. Medicinal and aromatic plants, both remove pathogenic microflora in monogastric and increase the concentration of microorganisms that will assist in the digestion and absorption of nutrients. In particular, birds are more susceptible to pathogenic microorganisms such as Escherichia coli, Salmonella spp. Microorganisms in the digestive system of poultry live symbiotically with the host and are very important for the host's nutrition, metabolism and immunity. Propolis, as a resinous, natural and strong adhesive substance, is collected by honey bees from buds, tree and plant leaves and used to protect the hive from natural events such as rain or to prevent bacterial invasion of the hive. The most important active components of propolis are aromatic acids, phenolic compounds and especially flavonoids (flavones, flavonols and flavones) and phenolic acids. Flavones and flavonoids are the components that give to propolis; antifungal, antiviral and antibacterial properties. Another mechanism is to prevent bacterial growth by destroying the bacterial cell, especially the cytoplasm, cell membrane and cell wall. In this article, the possibilities of using propolis as a digestive system regulator in poultry were evaluated.

**Keywords:** Flavonoids, phenolic acid, antibacterial, poultry, intestinal microflora

# IN-OVO FEEDING WITH PROPOLIS EXTRACT IN POULTRY

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**Abstract:**

Live vaccination applications requires both costly and labor-intensive work. For this reason, research continues on both easier and more reliable methods that can reduce the workforce to minimum. In addition, vaccines can minimize the need for vaccination by improving immune systems of animals in the embryonal period. In this context, the in-ovo injection system was launched in 1985 as new application. In-ovo injection, which was previously developed as a vaccination system, has recently been continuing with in- ovo feeding studies aimed at feeding the embryo. During the embryonic period, the feeding of the creature inside the egg (in-ovo) is carried out in order to prevent the deficiency of the nutrients that creatures need at hatching. During the period when the chicks of the embryonic period take the amniotic fluid orally, the additional nutrient injection can accelerate the enteric development and increase the digestion capacity and digestion of the food. During the embryonic period, isotonic fluid and nutrients are injected in-ovo into the amniotic fluid, allowing the embryo to ingest the nutrients supplied to the amniotic fluid before hatching. Chicks can be fed in-ovo before hatching, so they can develop earlier than desired. In addition to its use in vaccination, it has also been used in last 10 years to improve the immune systems of poultry and increase their performance values with the in-ovo injection system. In this article, the usability of special growth factors and immune supportive nutrients such as propolis in poultry production with in-ovo injection system was discussed.

**Keywords:** Embryonic feeding, in-ovo injection, poultry, immune system, digestive capacity, special growth factors

# DISSOLVED ORGANIC CARBON AND ORGANIC NITROGEN TRENDS BELOW COMPOST APPLICATION AND MINIMUM TILLAGE IN TWO CONTRASTING SOILS

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**Abstract:**

The present study investigated the effects of compost application combined with minimum tillage followed by traditional fertilization on shallow groundwater bodies. The study area is located in the Po valley lowland (Ferrara Province, Italy) declared vulnerable to nitrate. Here two field sites, named Gualdo and Bando, characterized by contrasting soil types and depositional environments, were selected as representative of the most common environments of the Po valley lowland. The two field sites were instrumented with multi-level samplers (MLS) installed at 3 different depths to distinguish leaching from plots from background pollution. Here dissolved organic carbon (DOC) and organic nitrogen (Norg) were monitored for three years (2016-2019) via several campaigns. For each experimental site three treatments were carried out: a control plot with traditional tillage and no compost application, a plot with traditional tillage and compost application and a plot with minimum tillage and compost application. The trends of DOC and Norg in the shallower sampling point highlighted that there were no significant variations between the control and the other two treatments in both sites. Increasing concentrations of Norg were found in the lower sampling point of Gualdo due to background pollution, while fluctuating concentrations of DOC and Norg in the lower sampling point of Bando were due to peaty lenses. Therefore, even if compost application did not triggered a substantial impact on DOC and Norg in shallow groundwater, without MLS misleading results would be obtained given the presence of multiple pollution sources.

**Keywords**: Dissolved Organic Carbon, Compost, Minimum Tillage, Organic Nitrogen, Groundwater

# TISSUE CULTURE STUDIES IN PEPPER

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**Abstract**:

Obtaining and developing new varieties requires a long time, effort and expense with classical breeding methods. Today, tissue culture techniques are often used in rapid reproduction, obtaining disease-free plants, especially in ornamental plants and plant breeding applications that are difficult to reproduce. In tissue culture, haploid technique is widely used in vegetable breeding, as it both shortens the breeding process and provides permanent results. In addition to the use of classical breeding methods, the breeding of new varieties that take a long time can be shortened and facilitated by using various biotechnological methods. He states that the most reliable means to obtain pure lines suitable for rehabilitation are double haploids and the easiest and most useful method to obtain double haploids in peppers is anther culture. In particular, in vitro androgenesis has been used by breeders in recent years to rapidly obtain homogeneous lines from heterozygous materials in pepper breeding and to produce traditional F1hybrids. In this way, the breeding period is shortened and it is possible to take time in classical breeding, hybrid production is difficult and slow, or it is possible to emerge in the characteristics of recessive genes that cannot be seen. As with many vegetable varieties, the anther culture of pepper is used in breeding studies and new varieties are developed in this way. Therefore, haploid plant production, one of the tissue culture methods that have an important place in plant breeding, has been used intensively in recent years.

**Keywords:** Tissue culture, in vitro, androgenesis, heterozygous, biotechnology

# OKRA PRODUCTION POTENTIAL IN SOUTHEAST ANATOLIA

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**Abstract:**

In Turkey, the agricultural sector is of great importance in terms of nutrition, employment, contribution to the economy and export potential. The farmers need to be able to produce for domestic and foreign markets and to use their production resources more effectively in order to have a better income level. It is important to determine, develop and use the agricultural resources it has and to plan these studies together with those who use the resources. Suggestions have been made for the development of okra production in Southeastern Anatolia of Turkey, which has a high economic value, to determine agricultural resources and problems, to increase productivity and farmer income by evaluating the resource and potential. When the average temperature values are examined in the Southeastern Anatolia Region, the highest values are seen in the other months except October with 14.4 ° C. Okra likes climates with high temperatures. It makes a high yield by showing a regular development in regions with high temperatures.The total vegetative production area of the region is 3 212 086 ha and 78.8% of this area is used as field agriculture, 13.2% as orchard, 5.9% fallow and 2.1% as vegetable area. The Southeastern Anatolia Region still has a high potential in terms of sustainable agriculture, as it is covered with areas where the soil is poorly cultivated, farm manure is used in many areas, and chemicals are almost never used. In this paper, okra production potential in Southeast Anatolia is discussed.

**Keywords:** Agriculture, ecology, okra

# EFFECTS OF MEDETOMIDINE/KETAMINE ANESTHESIA AND THEIR REVERSAL BY ATIPAMEZOLE ON OCULAR PARAMETERS AND MONITORED ANESTHESIA CARE IN CATS

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**Abstract:**

The aim of this study was to research the summary impact of the general anesthetic drug ketamine and premedication agent xylazine, and their reversal by atipamezole, on feline ocular parameters such as intraocular pressure, horizontal pupillar diameter, and Schirmer tear test and monitored anesthesia care values. A randomized, single-blinded study was conducted. Ten sexually intact female cats (weiging between 2.2 and 3.6 kg, and 0.5 to 5.5 yrs of age) referred for ovariohysterectmy procedure by owner at regular intervals over 4 months were included in the study. The cats were included to one group with ten cats in group (T0, baseline). The cats were anesthesied using a combine with xylazine hydrochloride 2 mg kg-1 IM and ketamine hydrochloride 10 mg kg-1 IM in group. At the end of the ovariohysterectomy procedure anesthesia regimes were reversed by using atipamezole 200 µg/kg intramuscularly. Monitoring of respiration rate, heart rate, mean arterial pressure, peripheral arterial oxygen saturation, and body temperature were conducted using a patient monitor at T0, T1, T2, T3, and T4 time points. The animals showed declines in intraocular pressure and increases in horizontal pupil diameter after anesthesia induction (T0 vs. T1, all, $p < 0.05$); however, the chance and recovery pattern of intraocular pressure and horizontal pupil diameter showed significant intergroup difference. In conclusion, xylazine/ketamine is effective in attenuating the intraocular pressure, increasing the horizontal pupil diameter, and chance the monitored anesthesia care response in the general anesthesia.

**Keywords:** Anesthesia, atipamezole, cat, intraocular pressure

# EFFECTS OF MEDETOMIDINE/KETAMINE ANESTHESIA AND THEIRS REVERSAL BY ATIPAMEZOLE ON ECHOCARDIOGRAPHIC VALUES IN CATS

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**Abstract:**

In order to improve the quality of results of an investigation on cardiac morphology and function in cats undergoing anesthesia, the aim of this study was to clarify, investigate, and visualize in vivo the short-term echocardigraphic effects of medetomidine/ketamine (MED-KET) anesthesia regime and their reversal (atipamezole) in cats undergoing ovariohysterctomy. A randomized, single-blinded study was conducted. Ten sexually intact female cats (weiging between 2.2 and 3.6 kg, and between 0.5 and 5.5 yrs of age) referred for ovariohysterectomy procedure. Electrocardiogram, non-invasive blood pressure, respiratory rate, heart rate, pulse oximetry, and rectal temperature were monitored throughout the anesthesia. The group showed declines in left ventricular diameter (LVD%) and left ventricular ejection fraction (EF) after anesthesia induction (T0 vs. T1, all, $p < 0.05$); nevertheles, the reduction and starting pattern of LVD% and left ventricular EF presented important intergroup distiction. In conclusion, echocardiographic values effected significantly after anesthesia with MED-KET; and atipamezole can be useful for return to baseline values quickly and safely in cats after abdominal surgery such as ovariohysterectomy.

**Keywords:** Echocardiography; Anesthesia; Atipamezole; Cat

# USE OF MICROBIAL STIMULANTS TO REDUCE THE NEGATIVE IMPACT OF DROUGHT IN SUSTAINABLE VEGETABLE PRODUCTION

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**Abstract:**

Drought is one of the most important abiotic stress factors that limit agricultural production in many regions of the world, especially in arid and semi-arid areas. As a result of global climate change, many regions are faced with water scarcity in the world, and accordingly, 45% of agricultural areas have drought stress. Therefore, for the economical use of available water, determination of plant water consumption, growing drought tolerant plants, using microbial biostimulants that reduce the impact of drought by different mechanisms, etc. are important approaches. It is well known, AMFs and PGPRs living in the rhizosphere are known as microbial stimulants (MS). MSs interacts with plant roots to assist in plant nutrient uptake and decomposition of organic substances from the soil, as well as promote plant development and also helps suppress the phytopathogens. Some MS practices that contribute significantly to plant development are known to tolerate abiotic stress conditions and reduce yield losses. In this review, the effects of environmentally friendly MS applications on vegetable crops and its use in reducing drought stress have been revealed through current studies

**Keywords**: Abiotic stress, Bio-stimulants, Drought stress, Microbe, Vegetable

# SECTOR THAT DETERMINES THE MARKET VALUE OF FOODS: COLD STORAGES

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**Abstract:**

Most of food in the world cannot be consumed immediately after production. Keeping food stable in an environment of suitable temperature and humidity is of great importance, especially in terms of protecting sensitive foods such as meat, milk, fish and frozen foods and keeping them intact. Failure to create an ideal food environment causes microbial growth and disrupts the physiological and chemical structures of food. Therefore, food must be stored in appropriate conditions. Cold storage is the process of preserving a product by creating conditions that preserve its market value and quality. Cold storage aims to generate a high income from the product. The overwhelming majority of cold storages operating in our country are deprived of the technological capabilities that engineering technologies provide. The most obvious reason for this is unsuitable selection of a refrigeration system suitable for food storage conditions. This study will explain basic storage information and provide information on the parameters needed to design a refrigeration system suitable for food storage.

**Keywords:** Cold Storage, Food Storage, Refrigeration Technology, Cold Storage Management.

# HOW CAN WE USE COMPUTER AND SOFTWARE TECHNOLOGY TO ANALYZE AND DEVELOP AGRICULTURAL MACHINERY DESIGN?

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**Abstract:**

Soil constraints limit crop productivity. In order to overcome soil constraints a wide range of agricultural machines are used. Selection of a suitable agricultural machinery is a challenging job as the performance of each machinery is difficult to evaluate. The performance of the agricultural machineries is generally evaluated through time and resource intensive field works which can only be undertaken at certain times of the year. Similarly, development of new agricultural machineries to increase agricultural production is also based on field experiments. If the interaction between soil and agricultural machinery can be simulated using computer and software technology (a) the performance agricultural machineries can be evaluated (b) more effective agricultural machineries can be designed without performing field tests. In this paper a useful methodology, which includes using of 3D scanner and discrete element method (DEM) to evaluate and design agricultural machinery, has been suggested. The aim is to help and offer a new perspective to the academics working on agricultural machinery and agricultural machinery manufacturers for agricultural machinery design.

**Keywords:** Computer simulation of agricultural machinery, agricultural machinery design, computer technology in agriculture

# DETERMINATION OF ADAPTATION ABILITIES OF SOME APRICOT VARIETIES IN BISHKEK ECOLOGICAL CONDITIONS

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**Abstract:**

In this study, Kyrgyzstan-Turkey Manas University Faculty of Agriculture, Research and Applications in the parcel that was founded in apricot was conducted in 2019. In the experiment, phenological observations and pomological analyzes were made on 4 apricot varieties, Medov ıy, Korolevskiy, Issyk-Kulsky and Krasnoşekiy, and the results obtained were evaluated. In the parcel with apricot varieties within the scope of the thesis; Phenological criteria such as bud swelling, first flowering, full bloom, fruit setting and fruit ripening and fruit weight, width, length, height, seed weight, width, height, fruit top color, ground color and flesh color, core weight, width, pomological values such as size and taste, and SÇKM were recorded. When the phenological observations made in apricot varieties are evaluated in general; In Medov ıy, Korolevskiy, Is ık-kulskiy and Krasnoşekiy varieties; bud swelling, 12-15 March; beginning of flowering, March 16-17; in full bloom, March 25; fruit set, April 3-4 and fruit ripening, June 26 - July 17; recorded as. When the pomological analysis of the varieties included in this study was evaluated, the largest fruits in terms of fruit weight belonged to the Isık-kulskiy variety with 34.0 g. While the Krasnoşekiy variety has the most intense red top color, the Isık-kulskiy variety attracted attention with its completely hairless skin. The seed inside of all varieties were determined as sweet, and the solubility values were found between 22.0- 17.9%.

**Keywords:** Apricot, phenology, pomology, Kyrgyzstan

# DETERMINATION OF POMOLOGICAL CHARACTERISTICS OF SOME LOCAL APPLE GENOTYPES GROWN IN KYRGYZSTAN

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**Abstract**:

This research was carried out in 2019 to determine some pomological characteristics of some local apple genotypes grown in Kyrgyzstan. Within the scope of the research, Aport (Isık-Köl), Prevoskod (Talas), Tomkins King, Zahatoy Ranet, Semerenko, Aygül (Isık-Köl) varieties grown in the region were examined in terms of fruit characteristics. Varieties were evaluated in terms of fruit weight, fruit width, fruit length, stem thickness, stem length, fruit skin color, seed number, seed weight, fruit flavor. According to the results of the research; average fruit weight was determined between 159.3 and 69.8 g, fruit width 73.2- 53.2 mm, fruit length 61.6-42.7 mm, stem length 23.5 and 11.2 mm, fruit stem thickness 2.6 to 1.7 mm, and number of seeds between 11 and 7.3.

**Keywords:** Apple, Pomology, Kyrgyzstan

# CURRENT STATE OF THE ENDEM FRITILLARIA EDUARDII AND ITS INTRODUCTION TO THE CHUI VALLEY (KYRGYZ REPUBLIC)

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**Abstract:**

Part of the Central Asian mountain range Tien-Shan is one of the seven largest mountain ranges in the world. The height of various region abounds in the rich Western Tien-Shan of Kyrgyzstan is the section of the Western Tien-Shan varying from 700 to 4503 m. Many landscapes are characterized by exclusive biodiversity. It is of global importance, as it is the place of origin of several types of fruit trees, a wide variety of forest types and a unique flora. In 2015, with the support of UNDP and the local regional administration, a nature reserve was established on 253 hectares on Aigul-Tash mountain, where efforts are being made to preserve and reproduce the endemic species Fritillaria eduardi. Every year, for the purpose of landscaping, seedlings of trees and shrubs (Prunus dulcis, Pistacia vera, Prunus armeniaca, Picea, etc.) are planted on its territory. Petillium eduardi can be found in following countries: in Tajikistan 10%, in Sweden 4%, in Kyrgyzstan 2%, in Belgium and Germany 1% and in the above-mentioned countries it is also a rare species. Alamedin district became the place of introduction in our experiment. The bulbs were dug from a local resident's garden. This plant came to its site after the descent mudflows in 2001, when heavy rain washed away a certain number of plants down the slope of the Aigul-Too. "Aigul", as they call it, where people could stop or drive through with cars, drive off livestock, or just passers-by could trample. The residents decided to dig them up and plant them at least in their yard in order to preserve the endemic species.

In 2018 in order to preserve and resettle this species in other regions of the republic, it was brought to the Chuy valley. The bulbs were small in size, 5-6 cm in diameter. They were planted by taking into account all the requirements they needed. The first year after planting in late March and early April, weak plants grew up to 8-10 cm high. Usually, in order not to deplete the plants, the buds that appeared in the first year should be removed, but we left one bud for each. Instead of a large brightly colored flower, small, light yellow and orange flowers appeared. The flowering period lasted the same for two weeks as in natural conditions. According to long-term observations of local residents, no diseases were observed in Fritillaria eduardi during the growing season. However, for representatives of this genus, according to the literature data, the following pests are: Phyllopertha horticola, Melolontha melolontha, Amphimallon solstitialis, which gnaw at the roots and at the bulbs making holes in them. Aphis lilei's leaves tops of the shoots, which carries viral diseases, acquire an ugly appearance and roll up. The second year from March 12 to March 19, the daytime and nighttime air temperature was 28 °C in the Chuy valley, which created the optimal temperature for plant growth. Compared to 2018, the growth processes proceeded normally. Stem length - 30 cm, average leaf length 15-20 cm, leaves are arranged in order. In the last week of March Aigul blossoms fully. It doesn't have any fragrance, but it attracts others with its beauty.

**Keywords**: endemic, anthropogenic factor, climate, introduction, soil, flora, conservation issues.

# MODERN COTTON VARIETIES (GOSSYPIUM) AND PECULIARITIES OF THEIR CULTIVATION IN THE SOUTHERN KYRGYZSTAN

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**Abstract:**

The Kyrgyz cotton-growing experiment station is located in the Eastern part of the Osh valley, in the Kara-Suu region. Soil-climatic conditions of the Fergana cotton zone are typical for most cotton growing farms. The relief in the agricultural zone of the farm is mostly flat, favorable for gravity irrigation. Meteorological conditions in 2019 were stable with variable temperatures and precipitation of various types. The soils of the experimental station are characterized by a significant variety in terms of fertility and reclamation state. The content of humus in the arable soil horizon of the agricultural zone ranges from 0.8- 1.9 %, gross nitrogen – 0.10-0.16 %, phosphorus – 0.12-0.20 and potassium –2.3-2.5 %. Climatic conditions with sufficient irrigation allow growing medium-ripened cotton varieties here. In 2019, spring field work, despite heavy rains in many regions of the Republic, began ahead of schedule due to the early onset of spring. Industrial crops: cotton was sown on 24.4 thousand hectares, or 106.0 %, and 1.4 thousand hectares more than in 2018. During the growing season, phenological observations of plant growth and development were carried out on 10 labelled plants in the experiments of extended and competitive variety testing. Growth measurements showed that the variation in the height of the main stem, depending on the depth of processing of row spacings, is within the range of 25.3-38.4 cm. The highest height of the main stem was in the Kyrgyz-5 variety. By the number of buds, the L –13-14 variety had an advantage, with a height

**Keywords:** cotton, cotton varieties, agriculture, harvesting, climate, experimental station.

# SOME PHYSICOCHEMICAL PROPERTIES AND ANTIOXIDANT CAPACITY OF BEE POLLEN IN MUĞLA

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**Abstract:**

Bee pollen is collected from flowers by the honey bee. Pollen is also known as a valuable apitherapeutic food due to its nutritional specifications. Bee pollen is a rich source of carbohydrates, protein, enzyme, fatty acid, mineral and vitamins. However; bee pollen can easily contaminate by bees, air, plant parts, insects, animals, human, and other agricultural equipments. For this reason, food quality and organoleptic properties of bee pollens are important for the consumer. The aim of the present study was to examine the physical, chemical and antioxidant properties of bee pollen that collected from beekeepers in Muğla region. Ten bee pollen samples were purchased and tested. The mean value of dry matter, ash, titratable acid, pH, ascorbic acid, total carbohydrate, protein, fat, total phenolic content, ferric reducing ability of plasma (FRAP), and trolox-equivalent antioxidant capacity (TEAC) of the bee pollen samples were 76.760%, 1.993%, 3.376%, 4.52, 32.047 mg/100g, 5.394 mg/g, 27.609 mg/g, 5.519%, 110.092 mg/Kg, 29.644 µmol Troloks/g, and 1.736 µmol Troloks/g sample, respectively. The color values of the tested pollens were 56.923, 7.556, 26.456, 27.604, and 74.138 for L *, a*, b*, C*, and H*, respectively. The results were a wide variety probably due to the geographical conditions, soil, and taxonomic reasons, etc.

**Keywords:** bee pollen, antioxidant, physical, chemical, food quality

# HISTORICAL INFORMATION REMAINING ON THE STONE

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**Abstract:**

The good side of the Son of Man's hunting is that he is interested in dog and bird hunting. Or it has been noted that hunters were photographed in Bronze Age paintings. Hunting with eagles is mentioned in pictures drawn on stones 2000-2500 years ago, starting from the Early Iron Age. Hunting with a dog may have originated in the Middle Stone Age. As a result of old research, people began to protect their dogs in the Middle Stone Age 12-7 years BC. According to the latest information, the human dog is known to have been bred nearly 30,000 years before the Upper Stone Age. According to medieval pictures, dog and bird hunting turned into games like fun. The hunting of Kagan and heads of state is said in written sources. In general, the images of hunters riding horses and hunting with birds were taken by different researchers. At that time, it was found not only in beautiful statues, objects and shades made of bronze, but also in shadows. For thousands of years, the dog has interfered with the spiritual life and traditions of the human race in its duty to protect our lives next to old hunters. Sometimes they buried him next to the body of the deceased. According to other world beliefs, the dog is responsible for protection. Now there are reports of more than 50 dead and buried dogs in the highlands of Eurasia.

**Keywords:** Mankind, dog, bird hunting, kagan

# THROUGH A PARTNERSHIP TO SAFETY OF VALUABLES "KYRGYZ TAIGAN"

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**Abstract:**

There are many cases when individual animals occupy a special place among the national values of the peoples of the world, especially neutered and raised to a high level, as the pride of the entire nation. In many countries, there are cases when some animal proudly points to the eyes and sanctifies it. For example: in Kazakhstan – the snow leopard, Spain – the heat in Thailand – the elephant in India – tiger in Turkey –kangal in the UK – a lion, Australian kangaroo, Finland – deer in Germany – bear, Italy – wolf, Hungary – dog breed mosquitoes in the United Arab Emirates – poultry, in Azerbaijan is the Karabakh horse, in Bolivia, llama, Albania – eagle, in Algeria –a view of a Fox named the Fennec Fox. The Kyrgyz people highly appreciated the Taigan dog breed and have preserved it to this day. We can say that this animal with its critical, special properties and currently obtains respect among the peoples of other countries, finds its fans and finds its place under the name "Kyrgyz taigan". It is one of the symbols of the Kyrgyz people. It has good qualities such as laughter, intelligence, dexterity, courage, and spice. The breed of this dog, mentioned in the epic Manas, is also found in oral and cultural sources about the Kyrgyz. For thousands of years, the taigan dog has accompanied Kyrgyz heroes, hunters, and manaps. Taigan-a special animal, it needs freedom, it was used in hunting, military campaigns, was given as a gift with honor and respect

**Keywords:** The Kyrgyz People, Kyrgyz Taigan, Turkish Kangal, Manas Epic

# PROTEIN BLOOD PROFİLE OF YAKS (BOS GRUNNIENS) OF THE KYRGYZ POPULATION AND CATTLE (BOS TAURUS) OF THE ALATAU BREED

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**Abstract:**

Determination of concentration levels of total protein and its fractions is important to reflect the physiological state of protein metabolism in organism, both in cattle and yaks. In this study, the analysis of total protein, albumin and globulin in the blood serum of yaks of the Kyrgyz population and cattle of the Alatau breed, both kept under high-mountain conditions, was carried out. The concentration of total protein in the control group of the Alatau breed cattle, which were kept at an altitude of 760 m above sea level, was 6.8 g / dl. With an increase in height above sea level, this indicator for cattle was 5.34-5.71 g / dl. The total protein level, with no significant difference from the control group, was in the range of 6.1-6.68 g / dL. In the protein fractions of the Alatau breed cattle, a highly significant decrease in the concentrations of albumin and globulin was observed. There was a slight decrease in the albumin fraction in the yaks of the high pasture zone; the globulin fraction, in comparison with the control group, was slightly increased under high- mountain conditions. Thus, semi-wild yaks, adapted to high altitude conditions, did not show significant changes in comparison with the control group, while protein fractions in cattle of the Alatau breed had significant decreases in values within the physiological norm as altitude rises.

**Keywords:** Total Protein, Albumin, Globulin, yaks of The Kyrgyz Population, Cattle of The Alatau Breed.

# BIOCHEMICAL PARAMETERS OF ALATAU BREED CATTLE İN THE AK-SHYYRAK HIGH PASTURE

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**Abstract:**

In this study, experimental animals were taken from the Ak-Shyyrak village (>3200 m above sea level), Jeti-Oguz district, which islocated in the Issyk-Kul region,and cattle that were kept in peasant farms of the Chui region (>760 m above sea level) were taken as control. Biochemical parameters of blood serum were determined on an automated biochemical analyzer "PERFECT MINDRAY 400". The Alatau breed cattle kept in the highland area differ in the biochemical parameters. Statistical significance of differences of aspartat transaminase(AST) and alanine transaminase (ALT) ($p< 0.05$) between the animals kept in the high pasture at an altitude of >3200 m above sea level and the animals of the control group, kept in farms at an altitude of >760 m above sea level was derived by carrying out statistical processing of the obtained data. Depending on the conditions of keeping, the results showed a statistically highly significant ($p< 0.001$) difference in the concentration levels of total and direct bilirubin compared with the control group. In other words, under an alpine condition of detention, transaminases and bilirubin fractions increased.

**Keywords:** biochemical parameters, transaminase, bilirubin fraction,protein fraction,highland area, Alatau cattle.

# SEROPREVALENCE OF VECTOR BORNE RICKETTSIAL AND PARASITIC AGENTS IN DOGS IN KOCAELI PROVINCE OF TURKEY

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**Abstract:**

Many infectious pathogens are transmitted to dogs by vector arthropods. Some of the most well-known agents causing canine vector-borne diseases (CVBDs) are Anaplasma spp., Ehrlichia spp., Leishmania spp. and Dirofilaria immitis. These rickettsial and parasitic agents pose a public health risk due to their zoonotic significance, and dogs in close contact with humans are important reservoirs of these infectious agents. This study was planned to determine the prevalence of Anaplasma spp. (A. platys/A. phagocytophilum), Ehrlichia spp. (E. canis), Leishmania spp. (L. infantum) and D. immitis in dogs in Kocaeli province of Turkey. For this purpose, blood samples were collected from 100 different dogs brought to a private clinic in Kocaeli with non-specific clinical symptoms such as anaemia, weight loss and loss of appetite. By using an immunochromatographic immunoassay (Antigen Rapid Caniv-4 (Leishmania) Test Kit), the presences of D. immitis antigens, and the anti-E. canis, anti-L. infantum and anti- A. platys/A. phagocytophilum antibodies were investigated. The prevalences of D. immitis, E. canis, L. infantum and A. platys/A. phagocytophilum were determined as 1%, 2%, 3% and 9%, respectively. Dual co-infection by E. canis and L. infantum was detected in only one dog. This study demonstrates that the presence of rickettsial and parasitic pathogens causing CVBDs in dogs in Kocaeli province of Turkey for the first time. Therefore, taking preventive measures against infection-transmitting arthropod vectors is recommended for both animal welfare and public health perspective.

**Keywords:**Anaplasma, Dirofilaria immitis, Ehrlichia, Leishmania, Dog

# ESTABLISHMENT OF A RECIRCULATING SUMP SYSTEM FOR THE CRAYFISH CULTIVATION IN

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**Abstract**:

Consumption of crayfish as human food has become more common in recent years. With its rich amino acid and fatty acid content, crayfish have high protein value like other aquatic animals. Therefore, with the increasing interest in crayfish worldwide, studies on crayfish culture systems have started to be concentrated. Plastic aquariums (280 x 420 x 176 mm) with covers were provided to stock crayfish. Using U-PVC (Unplasticized Polyvinyl Chloride) pipes and fittings (elbow, ball valve, tee, union, muff, cole, cap, interior and exterior threaded adapters) and machinery equipment (submersible pump, external heater, and electromagnetic air pump) plastic aquariums were connected to each other and two closed circuit sump systems were created. Water inlets are opened to the front of the aquariums and ball valves are connected. The water collected through the pipes was filtered in a 50 x 140 x 25 cm glass aquarium (main sump) and the clean water was pumped back into the aquariums via circulation pumps. Biological sponge, filter fiber, ceramic, bio-ball and activated carbon are placed in the main sump as filter material. In addition, an external heater is connected to circulation pump outputs of the systems. An electromagnetic air pump was connected to each system and air lines were installed in all aquariums. Thus, systems that do not cause water waste, have their own filtration and aeration equipment and suitable for crayfish cultivation have been established. This study was funded by General Project Coordination Unit of İzmir Katip Celebi University with the project number 2019-GAP-SUÜF-0004.

**Keywords:** Crayfish Breeding, Recirculating, Sump System, Piping, Water Filtration

# GROWTH PERFORMANCE OF RED SWAMP CRAYISH (PROCAMBARUS CLARKII) FED WITH COMPENSATORY FEEDING REGIMES

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**Abstract**:

Crayfish are aquatic animals that are both consumed as human food and demanded in the aquarium sector. The red swamp crayfish (Procambarus clarkii) has 99% of world crayfish production. Therefore, research on feeding management in crayfish cultivation has increased. In this study, a compensatory growth trial was performed on red swamp crayfish. Animals were stocked as 8 individuals per aquarium in recirculated sump systems with 270-L water capacity consisting of 280 x 420 x 176 mm plastic aquariums. In the trial, eight different compensatory growth groups were formed as twice a day (GTT), once a day (GT), every other day (AT), one day hungry two days full (ATT), two days hungry two days full (2AT), three days hungry three days full (3AT) five days hungry five days full (5AT), and seven days hungry seven days full (7AT). Crayfish were fed near satiation with bottom feed (50% protein, 10% fat) in the specified periods. The water temperature in the systems was kept constant at 25.4±0.4 °C by external heaters (Hydor ETH 300). Weight measurements of crayfish were made with precision scale (KERN PCB 2500-2) and total length measurements were made with digimatic caliper, biweekly. After 96 days, the growth performance of ATT group was significantly different among the other groups ($P<0.05$). In further studies, there is a need to carry out and expand feeding studies with commercial crayfish species.

This study was funded by General Project Coordination Unit of İzmir Katip Çelebi University with the project number 2019-GAP-SUÜF-0004.

**Keywords:** Crayfish Cultivation, Feeding Regime, Frequency Feeding, Compensatory Growth

# BLACK GARLIC (*Allium Sativum* L.) AND BIOLOGICAL ACTIVITIES

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**Abstract:**

Black garlic is actually a processed food. Fresh garlic (*Allium Sativum* L.) is obtained as a result of fermentation under certain temperature and dehydration conditions. As a result of these reactions, the bitter taste and smell of the garlic is lost. There is also an increase in nutritional values. Studies have shown that black garlic is superior to the biological activity of fresh garlic. It stands out especially with its antioxidant activity. The resulting black garlic functions such as anti-cancer, anti-obesity, anti-inflammatory, immunostimulator, anti-allergic, hepatoprotective, cardioprotective and oxidative stress syndrome. In addition, it is known to have beneficial effects in terms of memory and nervous systems. In this review, investigations were made about the characteristics and biological activities of black garlic.

**Keywords:** Black garlic, biological activity, fermentation, antioxidant, anti-obesity

# DETERMINATION OF THE ANTIBACTERIAL EFFECT OF EXTRACTS OF PEACH TREE (*Prunus Persica* L.) RESIN IN DIFFERENT SOLVENTS

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**Abstract:**

Peach tree resin (Prunus persica) is known as exus gum from the Rosaceae family. The leaks that this tree secretes for the purpose of closing and repairing the slits formed in its branches and bark are defined as peach resin. The peach tree, which is native to China. It also has an antibacterial properties in content due to the phenolic component of naringen. In this study, ethanol obtained from peach tree resins, Bacillus cereus (ATCC 14579), Listeria monocytogenes (ATCC 51774), Escherichia coli (ATCC 25922), Enterobacter aerogenes (ATCC 13048), Salmonella Typhimurium (ATCC 14028), Staphylococcus aureus (ATCC 6538) and Pseudomonas aeruginosa (ATCC 15442) antimicrobial effect against 7 different foodborne pathogenic bacteria such as disc diffusion method. Minimal inhibitory concentration (MIC) and minimum bactercidal concentration (MBC) values on pathogenic bacteria were also detected. As a result of the research; The highest antibacterial effect was observed in the methanol extract of peach tree resin against Staphylococcus aureus with a zone diameter of 17.52±3.14 mm, while Listeria monocytogenes were found to be followed by ethanol extract with a zone diameter of 15.52±2.24 mm. The lowest MIC and MBC values were found to be 0.070 mg/L and 0.047 mg/L respectively against Staphylococcus aureus in peach methanol extract. The results are compared to the reference values of Eucast, CLSI and the National Microbiology laboratories; Staphylococcus aureus was found to be susceptible to ethanol, Listeria monocytogenes' ethanol extracts. Salmonella Typhimurium, on the other hand, was found to be resistant to methanol and distilled water extracts.

**Keywords:**Peach Resin, Antibacterial, Naringenin, MIC, MBC.

# GENOM WIDE AND GENE SPECIFIC EPIGENETIC ANALYSIS IN FUSARIUM SPECIES

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**Abstract:**

Fusarium graminearum and F. culmorum are the predominating causal agents of the head blight and crown rot diseases of all small grain cereals worldwide. In this study, the relationship between epigenetics characteristics with phenotypic and genetic traits in Fusarium isolates from Turkey have been investigated. The asexual and sexual reproduction characteristics of the isolates were achieved with counting macroconidium and linear growth rate analyses. Genomic and epigenetic profiles were revealed by RAPD and CRED-RA methods. Non-digested, MspI-digested, and HapII-digested gDNA samples were subjected to polymorphism analysis with RAPD primers. Bands with range of 131-172 were obtained in totally six different analyses. Average similarity values were determined as %42.7, %48.4 and %49.2 with %49.65, % 58.15 and %57.5 respectively in RAPD, HapII-digested and MspI-digested analyses in F. graminearum and F. culmorum isolates, respectively. The Top1, Mgv1, Chs1, RED, URA, tri6, tri101-tri5 genes were amplified from non-digested, HapII digested and MspI digested gDNA samples. The Type I - Tip IV methylation differences were determined in all the genes except for Chs1. RED, URA, tri5, tri6, Top1, and Mgv1 genes were subjected to gene expression analysis in two or four samples. Lower levels of similarity for gene expression values were detected among isolates with contrast epigenetic profiles. Fungal isolates with closely related epigenetic profiles were found to be similar genetical characteristics in RAPD assays at a crucial level. The data obtained in the study suggest that epigenetic typing may be a powerful tool in distinguishing complex phenotypic traits for plant pathogen Fusarium species.

**Keywords:**Fusarium graminearum, Fusarium culmorum, Epigenetics, CRED-RA, PCR.

# INVESTIGATION OF THE PRESENCE OF PESTICIDE RESIDUES IN ALMOND BROWNED IN ADIYAMAN PROVINCE

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## Abstract

In this study 94 almond samples, as green, shelled and 1-year stored products, were obtained from the producers engaged in good agriculture, organic agriculture and conventional agriculture in Adıyaman Province Center, Besni, Gölbaşı and Kahta districts, where approximately 15% of Turkey almond cultivation was carried out between 2019-2020 and the samples were investigated in terms of residual amount by analyzing pesticide residue and mycotoxin. In the research; The extraction steps of the samples prepared by collecting for analysis, T.C. Q-Orbitrap LC-MS / MS were extracted by GC-MS / MS method, 484 active ingredient (pesticide) residue levels were determined in LC-MS / MS and GC / MS devices at the Ministry of Agriculture and Forestry Antalya Food Control Laboratory Directorate. According to the analysis results, the residue amounts found were evaluated according to the Turkish Food Codex and the European Union Maximum residue levels (MRL). According to the findings of the research, the residues were determined on 16 samples in kernel filling period and on 2 dried samples during the harvest period, however, 9 samples from the kernel filling period were not found suitable according to the TGK Legislation Regulation. The amounts of pesticide residue in the other 7 samples were found to be under the tolerance value and they were considered suitable. No detectable level of pesticide residue was found in 66 samples in which pesticide residue and mycotoxin analyzes were performed as kernel almond and stored kernel almond. In 94 almond samples supplied from Adıyaman, which ranks first in almond cultivation in our country in terms of production area, 100% of the products presented for analysis as hard shelled and kernel almonds were determined to be suitable for food safety. In the green almonds period, the awareness of the producer should be increased due to the fact that some active substances have values above the MRL or tolerable values. These results show that despite the increased phytosanitary problems with production, the residue risk can be reduced by Good Agricultural Practices and at the same time, the residue risk should be taken into account in every production model.

**Keywords:** Almond, Pesticide, Residue, Nuts

# MODELLING THE SEASONAL PRODUCTIVITY OF NATURALISED PASTURE IN THE SOUTH OF CHILE

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**Abstract:**

In the last few decades, considerable research has been conducted on pastures in the south of Chile; most of it related to pasture production. There is a large amount of data providing a very useful resource to develop models for pasture production. The aim was to evaluate decision tree models for predicting seasonal pasture production and the effects of environmental factors and management inputs on pasture production. Decision tree models for seasonal pasture production were developed on naturalised pastures. Environmental data collected included pasture management variables as well as soil chemical analysis attributes, soil physical properties and climatic variables. A traditional regression modelling approach was also used to provide a comparison for the performance of the decision tree model. The highest Spring productivity (4746 kg/ha) was found with rainfall equal or more than 91.3 mm. The highest Summer productivity (2712 kg/ha) was found with soil pH more than 5.6. The highest Autumn productivity (3172 kg/ha) was with rainfall equal or more than 131.4 mm, and the highest Winter productivity (3012 kg/ha) was under low soil aluminum saturation. The decision tree model showed a high correlation between the predicted and the observed value. The successful integration of the most important variables influencing pasture production with the decision tree models provided a new approach to understand the effects of environmental factors and management inputs on pasture production in humid temperate regions, such as the south of Chile.

**Keywords:** Decision tree, Modelling, Predicted value, Pasture productivity, Temperate climate

# A MOLECULAR PHYLOGENY OF A GEOGRAPHICALLY ISOLATED WILD POPULATION OF TANACETUM PARTHENIUM L. (FEVERFEW: AN ANCIENT MEDICINAL PLANT)

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**Abstract:**

Tanacetum parthenium L. (feverfew) belonging to the family Asteraceae is a traditional medicinal plant used for treatment of many disease for years in the world. The present study provides results of Bayesian inference (BI) analyses of non-coding trnH-psbA intergenic spacer of the chloroplast gene and the nuclear ribosomal internal transcribed spacer (ITS) gene region sequences to infer the phylogenetic relationships among the geographically isolated Turkish Tanacetum parthenium population (Çatak, Van) and other Tanacetum species from the world (GenBank) in the combined molecular phylogenetic tree. The results showed that polymorphism levels were found higher in nrDNA (147/654) than cpDNA (51/388) gene region. The presence of highly variable sites in ITS 1-2 seemed to be responsible for the divergence of studied population from the other groups. The three individuals from the studied population made a well supported monophyletic group among the clade consisting of Tanacetum species having radiate capitula with significant posterior probability as 1. On the whole, according to studied gene regions, high genetic diversity was detected in the isolated wild T. parthenium population of Turkey.

**Keywords:**Tanacetum parthenium L., Molecular Phylogeny, Medicinal plant, Van, Turkey.

# FIELD PERFORMANCE OF WILLOWS IN THE NATIONAL BOTANICAL GARDEN OF TURKEY

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**Abstract:**

Species of Salix L. characterized by visuality, good adaptability and ecological resilience are preferred to be used in conservation, landscape, and horticulture. According to the Project of exhibiting willows in the willow garden of the National Botanical Garden of Turkey (NBGT), the cuttings of Turkish willow species were collected during February-March from Ankara and Muğla province and rooted in plastic pots. Then these cuttings were planted in related outdoor willow garden in May 2020. Fourty nine individuals of 7 species were selected to test the field performance in the garden. Willows were observed and being recorded for 4 months. The Two way Anova analysis of 4 months growth performance was perfomed in Phyton Ver. 3.7, Seaborn 0.10.1 library and resulted that the species S.fragilis had the highest plant height (156cm), diameter at height (15mm). Besides, pathogen presence in leaf, habitat preference and some important morphological traits in landscape and horticulture (stem color, leaf density, leaf shape, leaf color, bark type, branch habit) were also evaluated in the study. Statistically, the meaningful characters were determined as stem color, leaf color, leaf denstiy and brunch habit with having significant P values lower than 0.05. According to initial morphological observation and field performance, the species S.cinerea, S.fragilis and S.purpurea subsp. leucodermis (endemic to Turkey) were found suitable with fast growth and landscape visualization for exhibition in the botanical gardens.

**Keywords:**Willow, Salix L., Growth, Landscape, Horticulture, Turkey.

# USE OF BIOCHAR IN AGRICULTURE

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**Abstract:**

That agricultural activities and practices are compatible with the environment and being permanent is major importance in terms of contributing to the sustainability of the ecology. Biochar which has very promising potential for sustainable agriculture and ecology has attracted the attention of researchers, entrepreneurs, and other stakeholders, recently. Biochar is a solid biological material that synthesized through pyrolysis of different biomass sources. İt can be derived from different potential sources of biomass such as agricultural, forestry, and industrial residues, poultry manure, urban waste, and sewage sludge. In this review, remarkable findings of studies conducted on investigating the biochar application on effects on improving crop productivity and soil fertility, and mitigating abiotic stress have been examined. The effect of biochar on soil fertility, plant growth, and alleviating stress interactively determined by the properties of the applied biochar and the soil, the application dose, and the requirements of the applied product. However, numerous studies have been published reporting that biochar has on potential direct or indirect benefits in agriculture. Based on the studies reviewed has been put forward that more field-based and longer-term studies should be done needed to observe the reaction of biochar in time and the adaptation of the environment to its addition in soil, to assess its long-term impacts on soil quality, and to explore its use as a sustainable alternative to the existing chemical fertilizers.

**Keywords:** Biochar, Crop productivity, Soil fertility, Alleviating abiotic stress, Sustainable agriculture

# DETERMINATION OF THE MOST SUITABLE HARVEST TIME FOR MISCANTHUS AND SWITCHGRASS GROWN AS BIOENERGY CROP UNDER EASTERN MEDITERRANEAN CONDITIONS

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**Abstract**:

Miscanthus (Miscanthus x giganteus) and switchgrass (Panicum virgatum L.) have been considered as model bioenergy crops worldwide thanks to their high biomass yield, quality and low input requirements. This study was conducted to determine the most suitable harvest time for miscanthus and switchgrass grown under eastern Mediterranean conditions. Biomass quality parameters (moisture, ash, nitrogen contents, cell wall components, and lignin/holocellulose ratio) of both two crops were evaluated at five successive harvest times (October, November, December, January, and February) in the study. Harvest times significantly affected all quality parameters except for hemicellulose content in switchgrass. In miscanthus, the contents of moisture, ash, nitrogen, lignin, cellulose, and hemicellulose contents, and lignin/holocellulose ratio ranged from 46.85% to 19.96%, 4.18% to 1.09%, 0.39% to 0.18%, 8.90% to 11.60%, 39.28% to 50.98%, 28.03% to 23.49%, and 0.132 to 0.156, respectively. On the other hand, the contents of moisture, ash, nitrogen, lignin, cellulose, and hemicellulose contents, and lignin/holocellulose ratio ranged from 32.69% to 18.76%, 4.96% to 2.28%, 0.43% to 0.26%, 8.87% to 10.61%, 39.39% to 46.65%, 31.73% to 28.47%, and 0.124 to 0.140, respectively, in switchgrass. In miscanthus; moisture, ash, nitrogen, and hemicellulose contents decreased from October to February harvests, while an opposite trend was observed for lignin and cellulose contents, and lignin/holocellulose ratio. Similarly, moisture and ash contents declined from October to February harvests in switchgrass. The results obtained from the present study indicate that miscantus and switchgrass should be harvested in January or February for sustainable biomass production in Eastern Mediterranean environment

**Keywords:** Miscanthus; Switchgrass; Bioenergy; Mediterranean

# THE EFFECTS OF HYPHANTRIA CUNEA DRURY ON THE MAIZE HEIGHT AND COB

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**Abstract:**

This research was conducted to reveal the effects of Hyphantria cunea Drury on maize height and cob. The research was carried out in Düzce Ağa District 266, 403 and 726 parcels in 2020. Dekalp 6777 maize variety was sowned on the parcels on 2 July 2020. During the production season, weed control, fertilization, 2 times sprinkler were carried out. As of September 14, 2020, Hyphantria cunea Drury have reached maize plants in the northwest of the area and have fed with their leaves. The average plant height measured in samples taken from areas not reached by Hyphantria cunea Drury is 2.65 cm, the cob length is 22.6 cm, and the diameter of the cob is 4.83 cm. The plant height measured in the areas it reaches is 2.06 cm, the cob length is 18.6 cm, and the diameter of the cob is 4.2 cm. According to the data obtained, statistically significant difference was found between the areas reached and not reached by Hyphantria cunea Drury. With this study, it was concluded that it is necessary to fight against Hyphantria cunea Drury in maize areas sowned as the second crop in Düzce and similar ecologies.

**Keywords:** Damage, Duzce, Harvest, Second crop, Yield

# EFFECTS OF EMS DOSES ON GERMINATION AND PLANT HEIGHT IN MAIZE

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**Abstract:**

This research was conducted to determine the appropriate dose or doses for chemical mutagen (EMS) applications in maize. ADK 1122 line developed by Sakarya Maize Research Institute was used in the experiment. On April 18, 2018, doses of 0.1%, 0.2%, 0.3% and 0.4% of EMS were applied to ADK 1122 inbred maize line kept in water for 12 hours on 17 April 2018. It was subjected to agitation for 6 hours after application. The washed and dried ADK 1122 inbred maize line seeds were sown according to the randomized parcels experimental design. Sown was done in 15x15 cm pots on April 19, 2018. In the measurements made 21 days after sown, germination loss in parcels treated with EMS compared to control was found to be statistically significant, and the difference between EMS doses was not statistically significant. According to the measurements in the field, it was determined that the effects of EMS doses on plant height were statistically significant, and plant height decreased with increasing EMS dose. It is thought that studies should be continued to obtain mutations that create resistance against IMI herbicides in maize.

**Keywords:** Imazomax, Mutation, Sown, Tolerant, Yield

# ALLELOPATHIC ACTIVITY OF WHITE CABBAGE SEEDLINGS AGAINST SELECTED WEEDS OF MAIZE AND SUGARBEET CROP

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**Abstract:**

This study is known as allelochemical effect of white cabbage (Brassica oleracea L.) seedlings of weeds purslane (Portulaca oleracea L.), lamb's quarters (Chenopodium album L.), black nightshade (Solanum nigrum L.) and redroot pigweed (Amaranthus retroflexus L.), with the culture plant maize (Zea mays L.) and sugarbeet (Beta vulgaris L.) seed germination was carried out between 2018-2019 in order to determine the effect. Methanol and aqueous extracts (30, 40, 50 %) of dry and fresh white cabbage seedlings were used in the study. While none of the practices of maize plants were effective, only dry plant methanol applied to sugar beet. The best result in weed seeds was obtained in dry aqueous application of 50 % concentration in black nightshade. Purslane, lamb's quarters and redroot pigweed have generally shown the highest effect of 50% concentration of fresh plant methanol application. There are significant differences between the results obtained from cultivated plants and weed seeds which is an important result in terms of transferring this study to practice.

**Keywords:**Allelopathy, Brassica oleracea, Culture plant, Germination, Weed

# DETERMINATION OF SOME BIOCHEMICAL TRAITS OF LOCAL GRAPES GROWING IN VAN REGION

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**Abstract**:

Although viticulture has been done for hundreds of years in Van province, the local grapevine cultivars are in danger of extinction. A series of measurements, weighing and analyzes were made on the bunches and grapes of the samples of theses local varieties; some must properties has been also evaluated. Moreover, phenolic and organic acid contents, HPLC, total antioxidants amounts have been determined by FRAP method. Considering the phenolic content amounts (mg kg-1); the highest amounts were found as: Resveratrol (48.03) in Ercis Uzumu (Ercis); Protocathechic (10.92) in Beyaz Kismis; Rutin (26.61) in Beyaz Kecimemesi; Gallic acid (14.19) in Ercis Uzumu (Van); Syringic (97.03) in Beyaz Kismis; p- qumaric acid (0.75) in Beyaz Kecimemesi; Ferulic acid (0.93) in Beyaz Ksimis; o-qoumaric acid (0.63) in Kizil Uzüm; and Fluorodizin (1.75) in Telli Baba. For Organic acids (mg kg-1), gallic acid equivalent fresh weight basis, the highest amounts were found as: Tartaric Acid (9690.30) in Siyah Kismis; Malic Acid (23043.80) in Siyah Kecimemesi; Citric Acid (635.60) in Siyah Kismis, and Fumaric Acid (13.40) in Ercis Uzumu (Van). The Siyah Kismis has the highest total antioxidant capacity (91.89 mg g-1) and followed by the other local cultivars as Telli Baba, Beyaz Kismiş, Kizil Uzum, Ercis Uzumu (Van), Ercis Uzumu (Ercis), Gok Uzum, Koyun Gozu, Siyah Kecimemesi ve Beyaz Kecimemesi. Phenolic substance, total antioxidant capacity, and organic acid except citric acid acids amounts in the studied local varieties were found statistically significant.

Acknowledgement: We would like to thank the Scientific Research Projects Directorate of Van Yuzuncu Yil University for the support provided within the scope of this study (Project #: FYL-2018-7111).

**Keywords:**Antioxidant, Phenolic, Local cultivar, Organic Acid, Antioxidant, Grape

# THE USE OF BIOSTIMULANTS IN SUSTAINABLE VITICULTURE

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**Abstract:**

Viticulture, which has a very wide application area in the world, is of great importance economically and in terms of human diet. The fact that the grapevine is evaluated in many areas, its fruit and leaf contain valuable compounds such as many vitamins, minerals, antioxidants, organic acids, oils, proteins, has enabled it to be cultivated widely. However, it has become inevitable that sustainable production techniques, the use of new integrated techniques, and sufficient sensitivity to protect human and environmental health have to be applied for viticulture which is of great importance in terms of human diet. Sustainable viticulture includes human and environment friendly production systems. It is seen that biostimulants, in other words bioactivators, are used within the scope of scientific researches and in viticulture applications in sustainable viticulture in the world. Containing organic or inorganic compounds, microorganisms; biostimulants are applicable to leaves, soil or seeds; positively affect plant growth, fruit yield, nutrition, and product quality. It has been determined by various studies that biostimulants increase the resistance of plants to biotic and abiotic stress conditions and also regulates the soil structure. Biostimulants have been classified by some researchers as humic substances, amino acids and other nitrogenous compounds, seaweed and plant extracts, chitin and chitosan-like polymers, inorganic compounds, beneficial fungi and beneficial bacteria, waste, exudates and extracts of seeds, leaves and roots. Biostimulants have an important place within the scope of sustainable viticulture in areas such as protection of natural resources, especially soil and water, combating erosion and forest fires, ensuring biological diversity, and integrated pest management. The need to increase soil and plant productivity, to create ecological balance, and most importantly to protect the health of humans and other living things, is better understood every day. This need for a sustainable life and healthy continuity of future generations leads scientists and producers to friendly applications such as biostimulants.

**Keywords:**Viticulture, Sustainable production, Biostimulants

# ISOLOTION OF PREDATORY FUNGI FROM ENVIRONMENTAL SAMPLES

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**Abstract:**

This study aimed to isolate the predatory fungi from environmental samples. The environmental samples were soils, plant residue, and compost samples. During research, from collected samples isolated 10 primary colonies of possibly predatory fungi were obtained by soil sprinkling method (Duddington, 1955) is the simplest method for the recovery of nematophagous fungi. When challenged with nematodes under microscopic observation, 2 fungal isolates displayed a response expected for predatory fungi as trap formation and interlocking of nematodes by fungal mycelia corresponding to Arthrobotrys oligospora. To determine the predatory properties of fungi were taken phytopathogenic nematodes from potato and garlic samples suspected for nematode infestation that had been collected during vegetation, harvest and storage time within the period 2017-2018 from Chui region in Kyrgyzstan. Isolated nematodes were identified as potato rot nematodes, Ditylenchus destructor, and garlic or stem nematodes, Ditylenchus dipsaci.

**Keywords:** Arthrobotrys oligospora, predatory fungi, environmental samples

# DETERMINATION OF VIRUS INFECTIONS ON CUCURBITS IN ESKISEHIR PROVINCE

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## Abstract:

Cucurbit plants are members of the Cucurbitaceae family. There are approximately 119 genera and 825 species within this family. Melon (Cucumis melo L.), cucumber (Cucumis sativus L.), squash (Cucurbita pepo L.), watermelon (Citrullus lanatus (Thunb.) Matsum. & Nakai), pumpkin (Cucurbita moschata L.), winter squash (Cucurbita maxima L.) and snake melon (Cucumis melo var. flexuosus) are the main cultivated species in this family. With this study, the problematic viruses in the cucurbit cultivation areas of Eskişehir were identified for the first time and the prevalence of these virus diseases in the cultivation areas were revealed for the first time. This research was conducted in order to determine the virus infections in Eskişehir province cucurbit cultivation areas. For this purpose, from August to September in 2019, surveys were carried out and samples were obtained from cucurbit plants showing virus diseases symptoms and weeds. In total, 164 cucurbit plant samples with common symptoms of virus infections, and 8 weed samples were collected in 2019. All the samples were tested by DAS-ELISA against to Zucchini yellow mosaic potyvirus (ZYMV), Watermelon mosaic potyvirus (WMV), Cucumber mosaic cucumovirus (CMV), Papaya ringspot potyvirus-watermelon strain (PRSV-W), Cucurbit aphid borne yellows virus (CABYV), Cucurbit green mottle mosaic virus (CGMMV) and Squash mosaic comovirus (SqMV). According to DAS-ELISA results, CABYV (49.35%), WMV (44.87%), ZYMV (24.35%), CMV (17.30%), PRSV-W (1.28%) and SqMV (1.92%) infections were detected in cucurbits samples and ZYMV (12.5%) and CABYV (12.5%) infections were detected in weed samples. CGMMV infection was not detected in samples. Also reactions of some squash genotypes against to ZYMV and WMV isolates were determined by mechanical inoculation studies. According to the results it was determined that 5th, 8th and 9th genotypes were highly infected by WMV (100%) and 9th (%95), 3rd (%93) ve 7th (%91) genotypes were highly infected by ZYMV. Furthermore, all of the genotypes were determined susceptible against to either WMV or ZYMV. The average prevalence rate of virus diseases in Eskişehir was determined as 4.13%.

**Keywords:**CABYV, Cucurbitaceae, DAS-ELISA, Virus, Weeds, WMV, ZYMV.

# DETERMINATION OF VIRUS DISEASES ON EDIBLE SEED SQUASH IN KAYSERI PROVINCE, TURKEY

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**Abstract:**

As seeds of squash or pumpkin consume as snack, these crops have been growing also for their seeds in Turkey. This study was conducted in order to determine the virus infections and their infection sources in edible seed squash growing areas in Kayseri province. In total, 228 edible seed squash plant samples with common symptoms of virus infections and 49 weed samples were collected during 2018 and 2019. The viruses were identified by DAS-ELISA and RT-PCR. The results showed that 97,8% of plant samples and 22,5% of weed samples were infected with Cucurbit aphid borne yellows polerovirus (CABYV), Zucchini yellow mosaic potyvirus (ZYMV), Watermelon mosaic potyvirus (WMV), Papaya ringspot potyvirus-watermelon strain (PRSV-W) or Squash mosaic comovirus (SqMV). According to the test results, predominant viruses were ZYMV (86,4%), WMV (53,9%) and CABYV (17,9%) for plant samples and ZYMV (16,3%), CABYV (6,1%) and WMV (2%) for weed samples. Also mixed infections were determined commonly especially in plant samples. Cucumber mosaic cucumovirus (CMV) was not determined in any of the tested samples.

**Keywords:**CABYV, Cucurbitaceae, Edible seed squash, WMV, Weeds, ZYMV

# EFFECTS OF WATERLOGGING ON SOME MORPHOLOGICAL, PHYSIOLOGICAL AND PHOTOSYNTHETIC PARAMETERS IN BARLEY

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**Abstract:**

Waterlogging is an important abiotic stress factor that can affect a large part of the cultivated areas. Due to this stress, serious losses occur in agricultural production. As it is difficult to predict waterlogging, it is also difficult to take precautions in this regard. The prediction that the frequency of waterlogging will increase with the effect of global warming increases the importance of the studies to be carried out in this regard. The barley (Hordeum vulgare L.) plant is an important grain product produced intensely in the world and, like all other agricultural plants, is highly affected by waterlogging. In this study, the changes occurring in barley exposed to waterlogging stress for 15 days were examined by morphological, physiological and photosynthetic analyses. According to our results, waterlogging significantly suppressed the growth and development of barley plants. In particular, photosynthetic parameters remarkably affected. Leaf water potential increased with waterlogging. There are different results in the literature related to this situation and the subject is open to study. As a result, it can be said that waterlogging affects the development of barley plants, especially by suppressing photosynthesis efficiency.

**Keywords:** Waterlogging, Barley, Photosynthesis, Plant development

# POSTHARVEST UV-C TREATMENTS TO MAINTAIN COLD STORAGE QUALITY OF BLACKBERRY FRUITS

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**Abstract:**

Ultraviolet (UV-C) treatment is one of the alternative strategies against chemical uses in extending postharvest quality of the horticultural fruits. The blackberry fruits cv 'Jumbo' at commercial maturity was subjected to UV-C radiation with various application duration (0, 5 and 10 minutes). After treatments, all the fruits were kept at 1°C and 90% relative humidity for 10 d. Weight loss, total soluble solid, titratable acidity, pH, fruit color, visual quality, total phenol and total antioxidant analyses were performed initially on 4th, 7th, or 10th day of storage to compare the effectiveness of treatments. UV-C treated fruits were higher in titratable acidity, and exhibited less biochemical changes than the control fruit at the end of storage. UV-C treatment reduced the weight loss and exhibited markedly better visual quality with greater effect at 5 min than 10 min. Considering the overall findings, this study revealed that postharvest 5 min UV-C treatment maintained the storage-life and conserved the valuable marketing features of blackberries over 10 d in cold storage.

**Keywords:** Blackberry, UV-C, Postharvest, Quality

# THE EFFECTS OF DIFFERENT ROOTSTOCK AND GRAFTING METHODS ON PLANT GROWTH AND YIELD IN TOMATO

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**Abstract:**

The study was carried out in Antalya Grow Fide A. Ş. and Agriculture Faculty of Konya Selcuk University in greenhouses in order to determine the suitability of different rootstock and grafting methods in tomato. As plant materials Fantastic 144 F1 tomatoes cultivar, as rootstock 7-RZ and 61-53; as grafting methods cleft graft and tongue graft were used. The experiment was conducted in the randomized blocks desıgn as four replications. In this study is examined succes rate, rootstock diameter, scion diameter, seedling height, callus formation, plant height, stem diameter, number of leaves, total yield, average fruit weight of fruit, total soluble solid content, pH, titratable acidity and fruit quality classification. In the study, it was determined that there were no significant differences in terms of rootstocks and grafting methods. Therefore, it was concluded that both rootstocks and grafting methods could be preferred.

**Keywords:** Vegetables, Grafting, Rootstocks, Scion, Grafting Methods

# DETERMINATION OF VIRUS RESISTANCE WITH MECHANIC INOCULATION AND MOLECULAR METHODS IN SOME MELON ACCESSION COLLECTED FROM VAN LAKE BASIN

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## Abstract:

Melon (Cucumis melo L.) is an important vegetable crops grown in different geographical regions of Turkey. Zucchini yellow mosaic virus (ZYMV), Cucumber mosaic virus (CMV) and Watermelon mosaic virus (WMV) cause major economic damages because of destructive effect on melon. Along with 22 different melon genotypes that are collected from the Lake Van Basin, 3 resistant genotypes and 2 commercial varieties were screened against these three viruses by mechanical inoculation and molecular methods. Firstly, in the study, virus inoculation was performed on melon genotypes using only ZYMV virus, and disease severity was determined according to 0-5 scale by performing morphological observations in genotypes. In second stage of the study the presence of markers related to resistance genes against to ZYMV, CMV and WMV were defined in these genotypes by screening with 7 primers including 3 SCAR primers and 4 CAPS primers. It has been determined that the disease severity was ranged between 10- 95% in melon genotypes. While bands were obtained from SCOPE14541 primer in 21 genotypes SCAPB051046 primer that was developed based on the Creb-2 resistance gene gave bands only in the U6, U13 and YYU6 genotypes from 25 genotypes. VirSq-F19 primer that was developed based on the resistance genes to ZYMV and WMV gave band in all genotypes excluding YYU47. Only two of the 4 CAPS primers associated with the Zym resistance gene produced band.

Acknowledgement: This study was funded by Van Yuzuncu Yil University, Scientific Research Project # FYL-2017-5899.

**Keywords:** CAPS, Melon, Mechanic inoculation, SCAR, Resistance to virus

# CURRENT STATUS OF DITYLENCHUS DESTRUCTOR (Tylenchıda: Anguınidae), POTATO ROT NEMATODE, IN KYRGYZSTAN

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**Abstract:**

Ditylenchus destructor, potato rot nematode, is one of the destructive pests of numerous crops including the potato, causing significant damage and yield loss, worldwide. It infects young potato tubers in the field end develops as the tuber grows. After the harvest, nematodes activities and invasion within the tubers, ultimately, leaving rotten potatoes. It is in the quarantine list in many countries to prevent its dispersal to non-infested areas. Infested potato tubers were collected from the common potato growing regions of Kyrgyzstan such as Issık-Kul (Teplopluçenko Village, Aksu) Narin (Koçkor Village, Koçkor) as well as Chuy (Kemin Village, Kemin). The nematode has the highest population density in Iss ık-Kul samples, Narin and Chuy, respectively. The pest has been known to present and a serious problem in potatoes in the temperate regions of the world. By the study the presence of D. destructor was discovered and reported for the first time in Kyrgyzstan. A further research is urgent on the detailed distribution areas and management practices to control the pest.

**Keywords:** Potato rot nematode, potato, Kyrgyzstan

# STUDIES ON NEMATODE DIVERSITY IN SOME GRASSLAND AND FOREST AREAS IN BOLU, TURKEY

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**Abstract:**

The study was carried out to investigate nematode diversity in some grassland and forest areas in Bolu province. For this purpose, a total of 90 soil samples were taken from the grassland and forest ecosystems in Abant, Atyaylasi and Aladag regions of Bolu province. After the extraction, nematodes are identified at genus level and their densities were determined. The results revealed that 45 genus nematodes belonging to 25 families from 8 orders were found. In the study areas, the most common trophic group was fungivorous nematodes, followed by bacterivorous, plant parasites, predator and omnivorous nematodes, respectively. Bacterivorous and fungivorous, nematodes were found in forest areas while plant parasites were more intense in grassland areas. The most common nematodes in the soil samples were the genus Acrobeloides belonging to the bacterivorous group and followed by plant parasites such as Tylenchus, Helicothylenchus, Basiria, respectively. The average number of bacterivorous in Abant sub-region was found to be higher than Atyaylasi, and the number of fungivorous, predator and omnivorous than in Aladag region.

**Keywords:** Nematodes, Bolu, Nematod diversity, Grassland, Forest

# DISTRIBUTION AND PHENOLOGY OF OAK SAWFLY, PROFENUSA PYGMAEA KLUG (HYMENOPTERA: TENTHREDINIDAE) IN KYRGYZSTAN

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**Abstract:**

Oak sawfly Profenusa pygmaea (Klug) is one of the most important pest of oak trees in Kyrgyzstan. It was first recorded in 2007 and caused damage 80% of oak trees in 2012 in Bishkek urban areas. Damage, caused by P. pygmaea, is notable in urban areas where the impact of browning tree crowns in early summer raises public concern. This pest is host spesific and it attacks at least four species of Quercus in Kyrgyzstan. For the last several years, P. pygmaea has been continuing to spread to other regions. Thus, we aimed through this study to determine the distribution of oak sawfly in Kyrgyzstan. During our study, a survey was conducted to determine the spread of oak sawfly throughout the country where oak trees are common. Adult emergence, flight period, and larval phenology were assessed also. Surveys done through 2018-2020 show that P. pygmaea is present over 80% of the surveyed area with the largest population in Bishkek urban areas and localized populations in Jalal-Abab urban areas. In addition, Sympiesis spp. identified as an egg parasitoid of oak sawfly during our study.

**Keywords:** Sawfly, Profenusa pygmaea, Sympiesis spp, Kyrgyzstan

# AN OVERVIEW OF HISTORICAL DEVELOPMENT AND CURRENT SITUATION OF NATURAL ENEMY USE AGAINST PESTS IN KYRGYZSTAN

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**Abstract:**

Agriculture is the main economic sector employing around 40% of population in Kyrgyzstan. The country faces harsh winters and hot, arid summers because of its elevation. Due to its climatic conditions, agricultural lands of the country are ecologically compitable for organic farming. The recent trend demonstrates that organic farming is growing in the country. Starting 2019, Kyrgyzstan has been planning to shift to 100% organic farming within the next ten years. In 2019, The Organic Agriculture Department (OAD) was established by the Ministry of Agriculture of the Kyrgyz Republic to develop organic agriculture. In the past, OAD was known as the AgroBioCenter that produce and sell biological crop protection agents and pest control products. Main products of this institution against agricultural pests are Trichogramma spp, Chrysoperla carnea, Bracon hebetor, Aphelinus mali and Amblyseius mckenziei. These useful insects and the mite have been successfully used thruougout the world within biological control. In this study, we aimed to investigate historical development, current situation and future contribution of using natural enemies as management tool against pests in Kyrgyzstan.

**Keywords:**Kyrgyzstan, natural enemies, organic agriculture

# CHARACTERIZATION OF PSEUDOMONAS SYRINGAE PV. SYRINGAE FROM DISEASED STONE FRUITS IN KYRGYZSTAN AND TESTING OF BIOLOGICAL AGENTS AGAINST PATHOGEN

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**Abstract:**

Plant diseases caused by the Pseudomonas syringae complex bacteria are economically essential and occur worldwide on various plants. It is a pathogen that has not been the object of studies, and little is known about its epidemiology in Kyrgyzstan. The conventional phenotypes (LOPAT, API tests) and PCR-assisted isolation were used for the identification of Pseudomonas syringae pv. syringae isolates from the affected organs of local stone fruits, such as peach (Prunus persica), cherry (Prunus subgen), apricot (Prunus armeniaca), and plum (Prunus salicina) samples taken from the Chy, Issuk-Kul, and Batken regions of the country. 16S rRNA gene amplification was performed with primers 27F (5'-AGA GTT TGA TCC TGG CTC AG -3') and 907R (5 '–CCG TCA ATT CCT TTG AGT TT-3') for the identification of obtained Pseudomonas syringae pv. syringae isolates. Of the 40 primary isolates of Gram-negative rod-shaped bacteria, 12 were identified as Pseudomonas syringae pv. syringae, while the remaining isolates were identified as bacteria from Stenotrophomonas, Xanthomonas, Erwinia genera. The antagonist biocontrol agent—Streptomyces bacteria strains were screened and selected against the bacterial canker pathogen in vitro experiments and on apricot seedlings in vivo conditions. Obtained results could encourage developing a local bio-product based on this bioagent for spraying stone fruits with the initial manifestation of disease symptoms and conducting preventive treatments in the fall and spring to increase the plant's resistance pathogens.

**Keywords:** bacterial canker pathogens, phenotypes, molecular identification, antagonists, Streptomyces bacteria

# THE MONITORING OF THE FIRE BLIGHT SPREAD AND ITS DANGER FOR THE CONSERVATION OF GENETIC RESOURCES OF WILD APPLE VARIETIES IN THE FORESTS OF KYRGYZSTAN.

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**Abstract:**

In Kyrgyzstan, forest landscapes occupy small areas, only 4-5% of the country's total area. Apple forests as a component of natural walnut forests are represented mainly by wild species: Kyrgyz apple trees (Malus kyrghisorum), Sivers apple trees (M. sieversii), and Nedzvetsky apple (M. niedzweckiana). Local species of apple trees are a vital genetic resource. They must be protected from possible hybridization with cultivated apple varieties and the invasion of dangerous pests and diseases. Moreover, the arrival of fire blight disease in the center of the origin of endangered fruit species is a significant threat to the whole forest ecosystem. The study aimed to release the spread of fire blight in orchards and natural forests of Kyrgyzstan and the phenotypic characteristics of the resistance of wild and commercial apple forms to fire blight. Erwinia amylovora isolates as fire blight pathogen were identified by using the specific diagnostic primer pairs PEANT-1/PEANT-2 and Ea CR1 – F1/Ea CR1-sp 18R.Specific primers targeting previously identified CRISPR genotypes were used for different spacer regions. Screening for relative resistance or sensitivity of apple cultivars to fire blight was carried out in a quarantine room. Six different apple varieties were inoculated by dissecting the tips of the two upper leaves of shoots with scissors soaked in a suspension of highly virulent E. amylovora strain containing 10 9 CFU/ ml. After a three-time artificial infection with interval ten days, the tested apple varieties like Vkusnay, Diskovery, Karowella, and Ostankino have shown an evident resistance ability.

**Keywords** Local apple trees, vital genetic resources, Erwinia amylovora invasion, apple variety resistance

# DESIGN PRINCIPLES OF 'THE ROSE GARDEN' BUILT IN NATIONAL BOTANICAL GARDEN of TURKEY

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**Abstract:**

Rose which is one of the most ancient of flowers originated in Central Asia have been one of the significant symbols of love and beauty, and have taken a great place in many cultures throughout the history. A rose garden or rosarium is a garden or park used to exhibit and raise various types of roses. Today, rose gardens are generally presented in botanical gardens through the world like The Peggy Rockefeller Rose Garden in New York Botanical Garden, Rose garden in Royal Botanic Gardens, Kew, Rose Garden in Auckland Botanic Gardens and many. National Botanical Garden of Turkey which is currently under construction in Ankara, is founded in 2011 and the directorate is established in 2018. The garden is planning to be open to public soon and several concept gardens are projected to be built in the garden. As botanical gardens are the places where several plants are conserved and exhibited, and as Turkey is one of the important gene center of Rosa genus about having 25%of all rose species native; Rose Garden is one of the essential gardens to be built in the National Botanical Garden of Turkey. This paper explains the design principles of the rose garden in National Botanical Garden of Turkey: what are the considered issues in the design process, what garden elements are used to increase aesthetic value of the garden? Moreover it addresses the cultural value of rose for Turkish culture and it analyses some of the rose garden examples from the world.

**Keywords**: Rose, rose gardens, garden design, botanical gardens, National Botanical Garden of Turkey

# ANTIOXIDANT AND IMMUNOSTIMULANT EFFECTS OF SOME MEDICINAL AND AROMATIC PLANTS

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**Abstract:**

Medicinal and aromatic plants, their extracts and essential oils are considered as alternative feed additives to antibiotics in animal nutrition. It has been determined that aromatic herbs and essential oils obtained from them increase the amount and activity of enzymes in the digestive system, improve the microbial flora in the intestine, strengthen the immune system and increase the shelf life of the products due to their antioxidant effect.. It is stated that essential oils have positive effects on feed consumption, feed utilization, improvement of carcass quality, decreasing mortality and increasing productivity. Aromatic plants and essential oils derived from them are also used as an antimicrobial preservative in many industrial sectors such as medicine, food and cosmetics. It is also recommended by many researchers because of its "antioxidant activities" that counteract the effects of free radicals. In this review, antioxidant and immunostimulant effects on livestock of aromatic plants and their essential oil components were evaluated.

**Keywords:** Animal nutrition, medicinal and aromatic plant, antioxidant, immunostimulant.

# ESSENTIAL OILS AS NATURAL ADDITIVES

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**Abstract:**

With the prohibiton of the use of antibiotics as a growth enhancing feed additive in animal nutrition in the Europan Union, the search for alternative products regulate growth, use of feed and regulate digestive system health. In this context, researchers have searched for natural and safe additives that can be alternative to antibiotics in recent years. Concern and data about synthetic additives are harmful to human health has caused natural additives to be preferred in this sector. In recent studies, the fact that natural additives as antioxidans have immunity-enhancing effects on the defense system, and consumers have turned to organic and natural product consumption, have highlighted natural additives as an alternative. Plants and essential oils derived from them come to the fore with their various microbial activities, and in many countries; herbal extracts are considered as one of the effective solutions. It has been proven that essential oils obtained from plants have no health hazards when consumed by humans and animals, and it has been stated that these additives are suitable for usage in animal nutrition. In this study, the facilities of using essential oils as natural feed additives in animal nutrition were evaluated.

**Keywords:**Animal nutrition, essential oils, natural additives.

# THE EFFECT OF SEAWEED FERTILIZATION ON THE DEVELOPMENT OF SPINACH AND LETTUCE PLANTS

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**Abstract**:

In this study, the effects of seaweed manure applied in increasing doses in greenhouse conditions on the development of spinach and lettuce plants and some yield components were investigated. Trial coincidence plots were carried out in 2 different types of plants (spinach, lettuce), seaweed manure, four different doses (0, 0.1, 0.2, 0.5 %) and 3 repeats according to the trial pattern. When the spinach and lettuce plant has completed its 60-day development, it was harvested, plant growth and some yield elements (plant upper part and root length, plant and root age and dry weights) were determined. The application of seaweed manure to soil in increasing doses supported the development of the plant in both plant varieties and showed differences according to the increasing doses. These differences were found statistically significant and insignificant depending on plant variety, doses and some yield factors. According to the research results; The effect of seaweed manure fertilizer applied in increasing doses on the root length, upper age and dry weight of spinach plant was found statistically significant. The application of seaweed manure in lettuce plant, on the other hand, was determined to be important on the plant's upper parts and root length, and the effect of the plant on wet and dry weight.

**Keywords:**Spinach, lettuce, seaweed manure, soil

# PHYSIOLOGICAL AND VEGETATIVE DEVELOPMENT RESPONSES OF GRAPEVINE ROOTSTOCK SAPLINGS TO GRAPE POMACE, SPENT MUSHROOM COMPOST AND FARMYARD MANURE APPLICATIONS

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**Abstract:**

Agricultural production has been pressurized by multiple environmental stress factors aggravated by climatic extremes. Precision agricultural techniques have therefore gained particular prominence to maintain the food demand of global population with sustainable principles. Grape pomace as juice process residue, spent mushroom compost, farmyard manure and control (no supplement) were tested on the physiological and vegetative development saplings of 41 B, 44-53 M and Rupestris du Lot rootstocks. The general growth medium was obtained with the equal mixture of vineyard soil and sand. Four different growth media were obtained by supplementing the each substance in 25% solid volume, while the control group has not received any of them. The rooted cuttings of each rootstock were transplanted into the plastic pots filled with the mixture of the growth media. Spent mushroom compost resulted in the highest shoot length in 41 B and Rupestris du Lot rootstock saplings. Certain physiological activities of the rootstocks were also affected by the applications, indicating the significance of growth media in nursery practices. The uses of spent mushroom compost and fermented pomace have been recommended to use in nursery production to harden the grapevine saplings against the stress factors for a sustainable viticulture.

**Keywords:**Grapevine nursery, sustainable viticulture, cultural practices, sapling hardening

# BICARBONATE INDUCED CALCIUM STRESS IMPAIRS THE PHYSIOLOGY OF GRAFTED OR NONGRAFTED 'PRIMA' GRAPEVINES IN NURSERY

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**Abstract:**

Calcareous soil conditions frequently cause significant decreases in agricultural productivity worldwide. Therefore, investigations on the physiological responses of grapevine genotypes to calcium stress would yield invaluable knowledge to recover growth imbalances in nursery. This study was conducted on the evaluation bicarbonate (NaHCO3) induced calcium stress on the physiology of grafted or nongrafted 'Prima ' grapevines in nursery. One year old saplings cultivated individually in plastic pots under glasshouse condition were subjected to two different doses (50 and 100 mL per plant) of 1 N NaHCO3 solution. The application of NaHCO3 solutions was replicated three times to understand the detrimental effect of calcium stress on grapevine physiology. Findings revealed remarkable negative effects of calcium stress on grapevine physiology depending of the doses and the use of rootstock.

**Keywords:** Rootstock use, chlorosis, vine physiology, calcium stress, soil pH.

# SOME PHYSICAL AND MECHANICAL PROPERTIES AND WORKABILITY OF SOILS IN A SARAYKÖY RESEARCH AND APPLICATION STATION

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**Abstract:**

The aim of this study was to investigate selected mechanical and physical soil properties of Sarayköy Research and Application Station field such as bulk density, field capacity, penetration resistance, relative saturation, Atterberg limits (liquid limit, LL; plastic limit, PL; plasticity index, PI), activity of clays, consistency index and suitable moisture contents for soil workability in the clay textured soil. Soils were taken from 0-20 cm depth in 2017. Clay content of soil in the Research and Application Station field ranged between 40.80 and 54.80%. Mean field capacity (FC), bulk density and penetration resistance values of soils were identified as 39.91%, 1.19 g cm-3 and 1.20 MPa, respectively. Atterberg limits ranged between 69.90 and 79.60% for LL, between 31.70 and 35.60% for PL and between 38.20 and 46.10% for PI. Liquid limit significantly correlated with plastic limit (0.466*), plasticity index (0.832**), field capacity (0.338*), and relative saturation (0.680**). Consistency index values of soils were significantly correlated with field capacity (-0.491*). Penetration resistance values showed significantly correlations with field capacity (- 0.645**), bulk density (-0.614*) and relative saturation (-0.605*). Moisture contents for soil workability were 43.86, 33.34 and 27.03%, reference to consistency index values of 0.75, 1.0 and 1.15, respectively. The soils are classified as inorganic silts of high compressibility and highly plastic. The soils in the Sarayköy Research and Application Station can be cultivated without structural deformation at FC (39.91%). According to the results obtained, lower and upper moisture limits for suitable cultivation of the soils in Sarayköy Research and Application Station field were recommended 27.03 and 39.91%, respectively.

**Keywords:** Clay, Soil Cultivation, Atterberg Limits, Consistency İndex, Soil Workability, Field Capacity

# SOIL PHYSICAL QUALITY: EFFECT OF LAND USE AND POLYACRYLAMIDE ADDING

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**Abstract:**

Soil physical quality, especially structure stability is a vital aspect of sustainable soil and land management. The objective of this study was to assess the contribution of f long-term crop and grass land- use systems resulting in significantly varying soil properties and organic carbon (SOC), on structure stability of soils from three watersheds of Ethiopia (Guder, Abagerima and Dibatie). Two sets of experiments were conducted to assess the effects of land use, and anionic polyacrylamide (PAM = 25 and 200 mg l-1) application on top soil structural stability using the sensitive high energy moisture characteristic (HEMC, 0- 50 hPa) method. The water retention curves of the soil samples were characterized by the modified van Genuchten model that provides (i) model parameters α and n, representing the location of the inflection point and the steepness of the curves, and (ii) a composite soil structure index (SI). Watershed, land use and PAM treatments had significant effects on the shape of the water retention curves ( α, n) and SI, but mode of stabilization was different, since predominant changes were observed in different ranges of the macro-pore sizes (> 250 μm for land use, and 60-250 μm for PAM addition). The SOC storage and SI were strongly related to soil properties (pH, exchangeable Ca2+, and Na-, CaCO3, EC) and soil type-clay mineralogy (Acrisol, Luvisol and Vertisol). The order of SOC (1.4 –3.1 %) by land use and soil SI (0.012–0.060 cm-1) was similar (grass > crop land). There was a strong linear relation between SOC and SI for non-treated and PAM 25 mg l-1 treated samples. PAM treatments significantly increased the mean of SI of soils (1.2–2.0 times) regardless of land use, but were more effective in soils from low (Vertisol), following medium (Luvisol) and high (Acrisol) elevated watersheds with SOC ≤ 3%. Treating cropland soils with a high rate of PAM yielded greater SI (0.02–0.04 cm 1) than non-treated grass land soils (0.02–0.03 cm-1). To improve soil quality, soil properties in a faster manner, land use history should be strongly considered prior to PAM application to fit the site-specific effect related to sustainable soil and land management.

**Keywords:** land use, soil organic carbon, structure stability, soil type, polyacrylamide, sustainable soil and land management

# THE EFFECTS OF DIFFERENT SOLID GROWING MEDIA ON ONION FRESH LEAF YIELDS IN SOILLESS CULTURE

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**Abstract**:

Nowadays, soilless culture is a common agricultural method in many countries, and also in some developed countries, the great part of the agricultural land is used as a greenhouse and soilless cultivation. The peat and perlite are two of the most common solid growing media used in soilless cultivation for growing various horticultural plants including onion. In the trial, perlite, a kind volcanic glass, organic peat and a mixture of these two in a ratio of one to one were used as growing media. The study was carried out in laboratory conditions in the Bishkek/Kyrgyzstan in 2019. In the laboratory of Kyrgyz-Turkish Manas University Agriculture Faculty, three replications according to the completely randomized block design were used in the experiment. The Onion bulbs having 2-4 cm diameter were used as experimental material. In the experiment, stem diameter, leaf number, leaf length, leaf width, leaf weight parameters were recorded to determine to the yield of onion leaf. According to the results, the highest onion fresh leaf yield was obtained from the peat-perlite mixture, whereas the lowest onion fresh leaf yield was obtained from the peat medium. The best results in terms of leaf number and leaf length were also obtained from the peat-perlite mixture.

**Keywords**: Onion, soilless culture, growing media, leaf yield

# THE INVESTIGATIONS ON GROWING POSSIBILITIES OF SOME PLANT SPROUTS

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**Abstract**:

Today, as with the consumption of sufficient food, food consumption with healthy ingredients containing nutrient content has become a very significant part of diets for human being. These foods contain plenty of the vitamins, minerals, amino acids, proteins, low amount of carbohydrates, high amount of dietary fiber, total phenolic content, aglycone, isoflavones, saponin, glycosides, and antioxidants which health benefits of those ingredients were proven by many studies. It has been supported by many studies that the above- mentioned health content of sprouts obtained from the germination of seeds is high and the sprouts are now widely consumed in countries such as the Far East, some European countries, and the USA. These edible sprouts could be obtained by the germination of a diversity of seeds like soybean, alfalfa, broccoli, radishes, kale, watercress, peas, cereals, mustards, adzuki bean, mung bean, etc. The aim of this research is to determine major yield-related properties of sprouts such that soybean, mung bean, chickpea, and wheat by measuring the length, fresh and dry weights of sprout. For this purpose, seeds of soybean, mung bean, chickpea, and wheat were germinated in sterile laboratory conditions in three replications. The height, fresh, and dry weight measurements were taken from at least 50 sprouts from each replication, and the sprouts with the highest dry matter content were decided by comparing the results with each other. The results will be given in the full text.

**Keywords:** Plant sprout, soybean, mung bean, chickpea, wheat, germination

# FUNGAL DISEASE MONITORING CONIFERS OF BISHKEK CITY

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**Abstract**:

Improvement of the city and urban ecosystem is impossible without the use of conifers. Conifers are able to purify city air, but at the same time they themselves are subject to various diseases. Sick and damaged conifers not only do not improve the appearance of the urban ecosystem, but also pose a real threat to the health of the urban population, since spores of various fungi spread very quickly. At the same time, a high anthropogenic factor weakens trees, and weakened trees are more quickly affected by fungal diseases. As a result of the study, four districts of Bishkek were surveyed. A large number of fungal diseases were discovered, and bacterial diseases were also encountered. The main purpose of monitoring was what types of disease are more susceptible to conifers and in which of the regions they are more common and how to further fight these diseases. Our research covered only the city of Bishkek, monitoring was carried out in Pervomaisky, Leninsky, Sverdlovsky and Oktyabrsky districts. Fungal diseases were mainly found on trees, such as: Fusarium sp., Diplodia sp., Penicillium sp., Mucor sp., Alternaria sp., Phytophthora sp. and some types of rust fungi. Basically, trees damaged by fungal diseases were not provided with proper care, were not provided with timely watering, the soil around them was trampled. Trees with mechanical damage were also exposed to fungal diseases. All this led to the disease with secondary pathogens.

**Keywords:** monitoring, conifers, diseases, fungus

# GREEN SYNTHESIS AND CHARACTERIZATION OF METAL NANOPARTICLES USING PLANT LEAVES EXTRACT (BRASSICA COMPESTRIS)

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**Abstract**:

In recent years, the eco-friendly green synthesis methods are applied for the formation of metal nanoparticles which are extensively used in many scientific fields. Among all the metallic nanoparticles, iron and copper nanoparticles have gained high attention due to their unique chemical, physical and biological properties. They are very important mainly due to their physiochemical and antimicrobial properties which are helpful in therapies, medical diagnostics, electronic devices, reagents in various reactions, biosensors lubricants, industrial engineering, agricultural, antibiotic, antifungal, anti-microbial agents and in various medical procedures. Brassica campestris has high dietary value. Epidemiological studies suggest that Brassica vegetables are protective against cancers of the lungs and alimentary tract and posses highly antifungal, antiviral, antibacterial, anticancer properties against different microorganisms. In this study leaves of Brassica Compestris plant were collected from garden of Shah Abdul Latif University Khairpur. Metal NPs were synthesized from Brassica compestris leaves extract in aqueous medium by using Green synthesis method. The results recorded by FTIR, ZP, SEM and XRD supported the successful bio synthesis and characterization of Cu and Fe NPs. Finally the synthesized NPs employed effectively against antibacterial activity of Staphylococcus aureus, Eutrococcus faecalis, Pseudomonas SB and Escherichia coli. This purely green method showed promise for future eco-friendly production technologies and also provides an interesting tool for materials science and number of novel applications in biological sciences.

**Keywords**: Green Synthesis, Metallic Nanoparticals, Iron and Copper, antimicrobial

# APPLICATION OF WETLAND+ SYSTEM FOR TREATMENT OF HCH CONTAMINATED DRAINAGE WATER

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**Abstract:**

The presentation will introduce LIFEPOPWAT EU project on wetland systems for treatment of HCH contaminated drainage water. LIFEPOPWAT is a European project in LIFE 2018 that promotes innovative technology for the treatment of pesticide contaminated waters. The treatment technology is based on the constructed wetlands system Wetland+®. Wetland+® offers a more robust, low maintenance, and sustainable treatment that is cheaper than conventional wastewater treatment methods and can be deployed in remote locations where access to infrastructure may be limited. It is based on integrated reactive zones with a wetland as a final treatment step. The project will install the system at two pilot sites (Hájek and Jaworzno) with the aim to replicate it across the EU and globally. The system is intended for mega-sites because of their importance, but the approach is also down-scalable for smaller problem sites. Results of project monitoring on both locations, long-term (6 years) experience will small wetland system on site and plans of the full-scale application will be presented.

**Keywords:** HCH, lindane, wetlands, biosortion, oxidation processes, reduction process, biodiversity

# STATISTICAL ANALYSIS OF MORPHOLOGICAL FEATURES OF LOCAL BEAN POPULATIONS

**Necibe KAYAK*, Ünal KAL, Yeşim DAL, Gülbanu KIYMACI, Münevver AĞCA, Arif Selim ARICI, Neslihan ISSI, Musa SEYMEN, ÖNDER TÜRKMEN, ERTAN SAİT KURTAR**

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**Abstract**:

Bean (Phaseolus vulgaris L.) is one of the important species included in legume group vegetables in Turkey. Some morphological and agronomic characteristics of 29 bean genotypes developed for fresh consumption were determined in the study. In the study, some morphological and agronomic characteristics of 29 bean genotypes developed for fresh consumption were determined. The variability in bean populations was determined morphologically by examining the parameters in the UPOV criteria in plant, flower, pod, seed, and productivity. As a result of the study, the results obtained in yield and fruit characteristics were subjected to PCA analysis. Working with PCA was explained as 12 components with a rate of 85.94% higher. The PCA graph shows the similarities reflecting the genotypes in the table in terms of the measured variables. The PCA graph shows the similarities reflecting the genotypes in the table in terms of the measured variables. When the cluster analysis is examined; It has been determined that genotypes are divided into two groups on the axis of PCA1 and PCA2. It was seen that the genotypes numbered 64, 23,38 were different from the others in the cluster. As a result of the research, it was revealed that genotypes differ from each other in terms of morphological features.

**Keywords:** Bean (Phaselous vulgaris L.), Diversity, PCA

# DETERMINATION OF MORPHOLOGICAL AND AGRONOMIC PROPERTIES OF SOME F1 MELON VARIETY CANDIDATES

**Necibe KAYAK*, Yeşim DAL, Ünal KAL, Abdurrahman YAŞAR, Gülbanu KIYMACI, Önder TÜRKMEN, Musa SEYMEN**

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**Abstract:**

In this study; Some morphological and agronomic characteristics of 83 melon F1 varieties candidates were determined. The results obtained in yield and fruit characteristics were subjected to PCA analysis. As a result of the study, the study with PCA explained as high as 68.1% in three components. The highest positive correlation between fruit parameters was found between fruit weight, shell thickness, and seed house width. On the other hand, the highest negative correlation was found between yield per plant and seed house height. When PC1 and PC2 were evaluated together, considering the fruit quality parameters, the F1 candidate number 39 was found promising.

**Keywords:** Cucumis melo, fruit characteristics, morphological characteristics, PCA, yield

# ONE-POT SYNTHESIS AND CHARACTERISATION OF HUMIC ACID HYBRID ZINC OXIDE NANOPARTICLES: APPLICATIONS ON BRASSICA GERMINATION

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**Abstract:**

Applications of nanoscale materials in agriculture are still in infancy compared to medical and industrial sectors. For promising applications in nanoagriculture, zinc oxide nanoparticle synthesised and capped withhumic acid were investigated for Brassica compestrisseed germination. A simple one-pot method was used HA/ZnO NPs involving zinc oxide nanoparticles (ZnO) core (20-35 nm in diameter) and humic acid shell were synthesised. HA/ZnO NPs were used to investigate the effect on germination profile of Brassica compestris. Germination profile parameters were measured as root-shoot length, germination index, fresh and dry weight for up to 15 days. HA/ZnO NPs were confirmed with variety of physicochemical techniques such as X-ray diffraction, Fourier transform infrared (FTIR), UV-Vis spectroscopy and scanning electron microscopy (SEM).The data confirmed the adsorption of humic acid on surface of ZnO nanoparticles. The HA/ZnO NPs exposure significantly increased germination by 83 %, root length (60 %), shoot length (78 %), fresh weight (71.4 %) and dry weight (45.9 %). This study reveals that HA/ZnO NPs application as co-fertilizer in suitable concentrations becomes more effective for improvement of seed germination and seedling growth of Brassica plant. The germination response varies with concentration. To the best of our knowledge, this study first time reports the humic acid hybrid ZnONPs on germination of Brassica.

**Keywords:** Zinc oxide nanoparticles, Humic acid, Seed germination, Brassica compestris

# INTERACTIONS ON MORPHOLOGICAL AND AGRONOMIC CHARACTERISTICS OF SOME QUALIFIED TOMATO GENOTYPES

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**Abstract:**

Tomato is one of the most grown vegetable species in the world and is very important for human health. The main reasons for the high production and consumption of tomatoes are that they are suitable for table consumption and can be processed in different areas in the industrial sector. In this study, some agronomic and morphological characteristics were determined of 77 different cherry tomato of inbred lines in S5 stage. Obtained measurements and observations were subjected to principal component analysis. Looking at the results, the study was explained in 6 components at a rate of 63% with the PCA. According to the analysis results; it was observed that there was a positive correlation between Brix, fruit width, fruit height and pericarp thickness, and a negative correlation between leaf stand and fruit ripeness time. It was concluded that tomato genotypes included in the study had a significant variation, which could be a gene source and should be evaluated in future breeding studies.

**Keywords:** Tomato, PCA, correlation, breeding

# DETERMINATION OF AGRO-MORPHOLOGICAL CHARACTERISTICS OF SOME COMMON BEAN (Phaseolus vulgaris L. var. Pinto) GENOTYPES

**Yeşim DAL*, Necibe KAYAK, Ünal KAL, Gülbanu KIYMACI, Münevver AĞCA, Neslihan ISSI, Arif Selim ARICI, Musa SEYMEN, Ertan Sait KURTAR, Önder TÜRKMEN**

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**Abstract:**

This study was carried out to determine the agro-morphological characteristics of 36 kidney bean genotypes (Phaseolus vulgaris L. var. Pinto.). In the morphological description, 27 features determined by using UPOV parameters were examined. PCA analysis was carried out in these measurements and observations. As a result of the study, working with PCA was explained with a high rate of 77.28% in 5 components. The highest positive correlation was found between seed width and seed height. On the other hand, the highest negative correlation was found between grain color L and a values. When PC1 and PC2 were evaluated together, the G3 hybrid line, which showed important results in terms of agro-morphology, emerged as promising. Genotypes showed high variation in terms of agro-morphological characteristics and differences were determined in terms of yield elements and some genotypes were found promising in terms of yield components

**Keywords:** agronomic, kidney beans, morphology, PCA

# POSTER PRESENTATIONS

# SUMMER-FALL STRAWBERRY PRODUCTION WITH DAY- NEUTRAL STRAWBERRIES

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**Abstract**:

In Turkey, main strawberry fruit production is from April to June. There is increased interest in producing high quality fresh strawberry fruit during summer and autumn periods. Fruit produced from July to November has the greatest market value, but meteorological conditions during this period are often suboptimal for strawberry growth and fruiting. Recently, for out-of-season production growers have attempted to use day-neutral cultivars, with different plant material such as tray plants, waiting-bed and A+ frigo plants. Day-neutral plants are established in the early spring, come into production near the end of the June-bearing production season, and continue to fruit through the summer and fall months. Providing the benefits of harves season extension and avoidance of inclement weather, protected culture has transformed strawberry production in many regions of the world. The objective of this review was to investigate opportunities for out-of-season strawberry production with day-neutral strawberries.

**Keywords:** Fragaria x ananassa, day-neutral, season extension, protection system

# THE EFFECTS of GA3 APPLICATIONS on STIMULATION of MALE STERILITY IN LETTUCE (*Lactuca sativa* L.)

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## Abstract:

In the study, the effects of $GA_3$ applications to stimulate male sterility in lettuce were investigated. $GA_3$ was applied at 50, 100, 200, and 300 ppm doses to lettuce inflorescences in the early bud stage. $GA_3$ applications caused the formation of non-viable and empty seeds, 100 seed weight (g), germination and emergence rates (%) decreased compared to the control, germination and emergence were not also detected at 200 and 300 ppm doses. As a result, 200 ppm $GA_3$ application was found to be recommendable.

**Keywords:** Male sterility, Gametocide, Lettuce, F1 hybrid seed production

# PRECONCENTRATION AND DETERMINATION OF COPPER IONS IN AQUEOUS SOLUTION BY CLOUD POINT EXTRACTION – FLOW INJECTION ANALYSIS SYSTEMS

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## Abstract:

Solvents used in the liquid-liquid extraction method, which is one of the classical analysis methods, are both harmful to the environment and damage the ecosystem and create a financial loss in terms of experiment costs. There are many extraction methods developed differently from classical extraction methods. Cloud point extraction, which is one of these extraction methods, is superior to classical extraction methods in terms of being less toxic, low cost and more practical. CPE; It is based on the principle of micelle formation by adding non-ionic surfactants to a sample containing the species desired to be separated / enriched, after providing the appropriate environmental conditions (pH, temperature, salt addition) and determining the micelles (containing analysis). Separation and purification method using appropriate analysis techniques. On the other hand, this extraction method made it possible to detect environmentally harmful heavy metals and toxic substances up to the detection limit.

A suitable HPLC system for cloud point extraction analysis was modified and a new and efficient system for copper ions was used without changing the connections. Determination of cloud point extraction with chromatographic systems; High efficiency, reproducibility and practicality made the method more useful for the extraction method in question. Flow Injection Analysis system is a practical method used after CPE. After CPE, pre-determination was made with UV-VIS spectrophotometer and flow injection analysis system was switched. In the flow injection system, an optimization study was carried out with the central composite design and the optimum conditions of the system were determined.

**Keywords:** Cloud Point Extraction, Copper Ions, Flow Injection Analysis, Triton X-114

# BIOCHEMICAL EFFECTS ON THE FLAVOUR OF FERMENTED SAUSAGE

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**Abstract:**

Flavour is a complex feeling phenomenon involving taste, odour and textural responses and the flavour chemistry of foods. Flavour chemistry of foods is being the subject to different researches in fermented products. Fermented meat products generally have a flavour resulting from the chemical changes and ingredients that occur during the fermentation and drying processes. Flavour formation in dried meat products is quite complex because there are many reasons that affect this situation such as smoking, salting, the use of nitrate and nitrite and components resulting from them, spices, various bacterial ferments and enzymes found in meat. Hydrolysis of proteins, carbohydrates and fats play an important role in the flavour formation in fermented meat products. The accumulation of carbonyl components during fat hydrolysis and its relation to the role of bacteria in chemical changes is remarkable. Glycolysis, proteolysis, lipolysis and lipid oxidation play an important role in the flavour development of various ingredients. During glycolysis, pH affects the formation of aroma by ionizing the carboxyl groups of amino acids. Proteolysis during ripening and significant increases in the concentrations of amino acids and peptides in fermented sausage have a significant effect on flavour formation. As a result of lipolysis, the formation of cholesterol as a result of the release of short chains consisting of neutral and phospholipids and chemical changes during the ripening of fermented sausages affect the formation of flavour. In this study, information about the biochemical effects on the flavour of fermented sausages will be given.

**Keywords**: Fermented meat, Flavour, Ingredients, Lipolysis, Proteolysis

# FLEECE QUALITY TRAITS OF BAFRA SHEEP

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**Abstract:**

Fleece quality traits of Bafra Sheep The aimed to determine of the fleece quality traits of Bafra breed. The study material were consisted of 32 male and female Bafra sheep, which were 10 and 24 months of age. A total of 96 fibre samples were taken from three regions of the body (wither, chest, rump) separately from each animal to determine the fleece quality traits. Least squares mean of fibre diameter, fibre elongation, fibre tenacity, and fibre proportion for 10 and 24 months of age Bafra sheep were defined as 31.26 and 31.24 μm, 37.04 and 38.37 %, 15.92 and 22.95 cN/tex, 67.33 and 67.49 %, respectively. Fibre diameter, fibre elongation, fibre tenacity, and fibre proportion traits were affected by sex ($P<0.001$). Fibre diameter, fibre tenacity, fibre elongation and fibre proportion of the females were significantly higher than those of the males. The effects of body region on fibre diameter ($P < 0.05$), fibre tenacity ($P < 0.05$) and fibre proportion ($P<0.001$) were statically significant. According to the research results, compared to other Turkey indigenous sheep breeds, we concluded that the fleece of Bafra breed has a moderate quality in terms of fibre diameter and it is well quality in terms of fibre proportion. By making selection studies in the Bafra race, high-quality wool (fibre diameter 30 μm and below) herds can be created that can be used in the fabric industry.

**Keywords**: Bafra, Fleece, Fleece Quality Traits

# ANATOMICAL INVESTIGATIONS ON RELATED SIDERITIS SPECIES II: S. SYRIACA L. SUBSP. NUSAIRIENSIS (POST) HUB.-MOR. AND S. HUBER-MORATHII GREUTER & BURDET

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**Abstract:**

The genus Sideritis L. (Lamiaceae) is distributed in an area stretching from the Mediterranean region to Europe, Bahama's, Western China and Morocco. In the Flora of Turkey and the East Eagean Islands, 38 Sideritis species were reported by Huber-Morath in 1982. Since then, 6 species and 2 new records have been described in the flora of Turkey and the number of Sideritis species reached to 46. The genus Sideritis comprises two sections in Turkey. While section Hesiodia Bentham, which includes 4 species, is known with reliable taxonomic characters, section Empedoclia (Rafin) Bentham including 42 species, is a taxanomically difficult section, which usually has no particular element since growing in areas transitional between two phytogeographical regions in Turkey. In the Flora of Turkey, Sideritis huber-morathii Greuter & Burdet was reported to be closely related to Sideritis syriaca subsp. nusairiensis (Post) Hub.-Mor. This study was carried out in order to provide insight into the anatomy of these two close Sideritis species which belong to section Empedoclia and discuss their taxonomic status. The characteristics detected during anatomical studies were explained by drawings and original pictures. Results were comparatively evaluated.

* This work was supported by TUBITAK (TBAG 1853)

**Keywords:** Sideritis, botany, anatomy, Empedoclia, mountain tea, S. syriaca subsp. nusairiensis, S. huber-morathii

# ANATOMICAL INVESTIGATIONS ON RELATED SIDERITIS SPECIES I: S. PISIDICA BOISS. & HELDR. APUD BENTHAM AND S. PERFOLIATA L.

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**Abstract:**

The genus Sideritis L. (Lamiaceae) is represented by more than 150 species which are distributed from Bahama's to Western China and from Germany to Morocco, and mainly found in the Mediterranean region. 46 species are growing in Turkey and some of which are widely used in the treatment of gastrointestinal disorders, for the common cold, as diuretic and carminative, as well as herbal tea in folk medicine. The genus Sideritis comprises two sections in Turkey. Section Hesiodia Bentham is known with reliable taxonomic characters. Section Empedoclia (Rafin) Bentham which shows a high level of endemism was reported with a few clear-cut species. As a part of our ongoing studies on Sideritis species growing in Turkey, in this study, anatomical characteristics of two Sideritis species, S. pisidica Boiss. & Heldr. apud Bentham and S. perfoliata L., which belong to Empedoclia section and are very close to each other by means of taxanomic features, were determined. The characteristics detected during anatomical studies were explained by drawings and original pictures. Results were comparatively evaluated.

* This work was supported by TUBITAK (TBAG 1853)

**Keywords:** Sideritis, botany, anatomy, Empedoclia, mountain tea, S. pisidica, S.perfoliata

# BIOACTIVE PROPERTIES OF AN ENDEMIC HALOPHYTHE: *Limonium iconicum* (BoIss. et Heldr.) Kuntze

**F. Pinar TURKMENOGLU*, Galip AKAYDIN**

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**Abstract:**

The genus Limonium Mill., (Plumbaginaceae), is represented by 22 taxa in Turkey. Halophytic species, Limonium iconicum (Boiss. et Heldr.) Kuntze is endemic to Turkey. It is known that, in halophytic plants, polyphenol synthesis and accumulation is generally stimulated in response to biotic/abiotic stresses, such as salinity. Phenolic compounds are of great importance, owing to their multiple applications in food industry, cosmetic, pharmaceutical and medicinal materials because they play a key role in preventing oxidation processes in human. Therefore, scientists pay much attention to plants with high phenolic content. As a part of our ongoing studies on halophytic plants, in this study, total phenolic content of methanolic extract of L. iconicum and its hexane, dichloromethane, ethyl acetate and water fractions prepared from aerial parts were determined. Moreover, in vitro antioxidant and antimicrobial activities of methanol extract and fractions were evaluated. The total phenolic content resulted higher in ethlyacetate fraction of L. iconicum. The antioxidant capacity of the extract and fractions was evaluated by DPPH and TAC assays and a stronger activity in ethylacetate fraction were highlighted. Methanol extract and n-hexane fraction also showed strong radical scavenging activity. Antimicrobial studies revealed that methanol extracts and fractions are more active against Gram positive bacteria than Gram negatives and showed considerable growth inhibitions against tested fungi.

*Hacettepe University Scientific Research Projects Coordination Unit Project No: 014D06301003-666

**Keywords:** L. iconicum, Plumbaginaceae, Phenolics, Antioxidant activity, Antimicrobial activity

# ANTIOXIDANT AND ANTIMICROBIAL PROPERTIES OF FRANKENIA HIRSUTA L.

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**Abstract:**

In plant, unfavorable environmental conditions such as salinity and drought, lead to increased production and accumulation of reactive oxygen species (ROS), which can interact nonspecifically with various molecules and metabolites, and cause damage to vital molecules such as proteins, lipids and nucleic acids. Halophytes, besides being able to regulate the ion and water movements, are also known for their ability to quench these toxic ROS, since they are equipped with a powerful antioxidant system that includes enzymatic and non-enzymatic components. Frankenia L. genus, which belongs to Frankeniaceae family, consists of salt tolerant aromatic plants. F. hirsuta L., which is one of the three Frankenia species, is widely distributed in Turkey. However, research on this halophyte plant is very limited. Having in mind the stimulation of synthesis and accumulation of polyphenols and possible high antioxidant capacity of halophytes due to their resistance to salt stress, in this study, total phenolic content of methanolic extract of F. hirsuta and its hexane, dichloromethane, ethyl acetate and water fractions prepared from aerial parts were determined. In addition, in vitro antioxidant and antimicrobial activities of extract and each fraction was evaluated. The total phenolic content resulted higher in ethlyacetate fraction. The antioxidant capacity of the extracts was evaluated by DPPH and TAC assays and a stronger activity in ethylacetate fractions were highlighted. Methanol extracts and its fractions are more active against Gram positive bacteria than Gram negatives and showed considerable growth inhibitions against tested fungi.

*Hacettepe University Scientific Research Projects Coordination Unit Project No: 014D06301003-666

**Keywords**: Frankenia hirsuta, Frankeniaceae, phenolics, antioxidant activity, antimicrobial activity

# COMPARISON OF DEVELOPED LIQUID PLANT FEED PRODUCT CONTAINING CALCIUM, BORON AND AMINO ACID WITH OTHER PRODUCTS

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**Abstract**:

In this study, a plant feed product with calcium, boron and amino acid content was developed in liquid formulation and compared with the most effective imported product on the market. In the experimental method, 2200 plants were determined to be used per 1 Decar. The usage dose of our product is determined as 2.5 L/Decar. 10 plants per each parcel were planted in 1 decare divided into 220 parcels. The use dose of the products was determined as 1.3 mL per plant. Measurements were made by taking 10 plants from three groups which are “Safa Kal 007 boron 002”, “Amino qualent Ca” and control. On the day of the trial, leaf samples were taken from all plants and the calcium value was determined by age burning method. The first initial calcium value was 1.35 (deficiency). Exactly one week after the trial day, samples from 10 plants were taken from the parcels and calcium leaf analysis was performed. During sampling, equal samples were taken from the first, middle and upper leaves of the plant. When the results were examined, the calcium value detected in the samples used ” Safa KAL 007 boron 002 " is the highest. It was found that plant development was better in other groups except control, rooting was faster and more

**Keywords**: Liquid fertilizer, Calcium, boron, amino acid

# STUDIES ON MICROPROPAGATION OF Photinia X Fraseri

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**Abstract:**

Ornamental plant production in the world has been increasing rapidly in recent years. Tissue culture techniques should be used for the production of Photinia x fraseri, which is widely used in Turkey and is difficult to produce with traditional methods and especially to root. A suitable environment study has been carried out to be used in the micropropagation of the plant Photinia x fraseri, which is preferred due to its high economic value and especially its leaves. For this purpose, MS, MS-Mod, DKW, WPM, B5 media, which are widely used in tissue culture studies, were used. In Photinia x fraseri medium experiments, the best number of shoots per explant (10.40 shoots/ explant), the highest number of leaves per explant (59.96 leaves/ explant) was produced on MS with mg L-1 of BAP and IBA at 0.01 mg L-1. According to the results obtained in the study, it was determined that the most suitable medium for Photinia x fraseri, which is one of the media widely used in micropropagation, is MS plant media.

**Keywords:** Photinia x fraseri, micropropagation, Tissue Culture, clonal propagation, plant media

# A RESEARCH ON MICROPROPAGATION OF Loropetalum chinense (Chinese Fringe Flower)

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**Abstract**:

The ornamental plant sector has been increasing rapidly in the world and in Turkey in recent years. It is aimed to develop micropropagation protocols of Loropetalum chinense (Chinese Fringe Flower), which are widely used in our country in recent years and which are difficult to produce with traditional methods. For this purpose, MS and DKW medium which are used commonly; MS-Mod and DKW-Mod medium which are prepared considering the soil requirements of the plants were used for this plant. In Loropetalum chinensei medium experiments, the best number of shoots per explant (1.76 shoots/explant) was produced on DKW with 1 mg/L of BAP. Also It was determined that the MS-Mod medium with 1.00 mg L-1 BAP (1.63 shoots/explant) is suitable for Loropetalum chinense micropropagation. According to the results obtained in the study, the standard medium for Loropetalum chinense (Chinese Fringe Flower) proliferation medium that can be used for micropropagation have been determined. A suitable procedure for micropropagation has been established for this plant.

**Keywords:** Loropetalum chinense, Chinese Fringe Flower, micropropagation, Tissue Culture, clonal propagation, plant media

# PURIFICATION OF ACETYLCHOLINESTERASE FROM Beta vulgarıs L. var cıcla

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**Abstract**:

Acetylcholine is an ester of acetic acid and choline. It is a neurotransmitter of biological importance that acts as a chemical transmitter in the central nervous system, and also in parasympathetic nervous system. Acetylcholine is formed via choline acetylation by cholineacetyl transferase, an enzyme used in the diagnosis of Alzheimer and neurodegenerative diseases. On the other hand, acetylcholinesterase (EC.3.1.1.7) has a pharmacological important role in the hydrolysis of acetylcholine to acetic acid and choline. In the present study, acetylcholine esterase was purified from Beta vulgaris L. var cicla by ammonium sulfate fractionation DEAE-cellulose chromatography. In addition, the kinetic characteristics of the enzyme was examined. The enzyme was purified to 16.58-fold, giving a specific activity of 0.211 U/mg proteins. Optimal conditions for activity of the purified enzyme are as follows: optimal pH 8.00, optimal ionic strength 200 mM, and optimal temperature 40ºC. The apparent Michaelis constant value of acetylcholine was found to be 47.03 mM respectively, while the Vmax value was 0.196 U/mL respectively. The enzyme was inhibited by kojic acid and L-prolin.

**Keywords:** Beta vulgaris, purification,acetylcholinesterase

# THE EFFECT OF VITAMIN U ON PENTYLENETETRAZOLE INDUCED EPILEPSY IN RATS

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**Abstract:**

Epilepsy is a serious brain disorder and affects many people all around the world. Pentylenetetrazole (PTZ) is a selective GABAA antagonist and used for kindling epilepsy model. It causes elevation of oxidative stress and harms brain and other organs. Vitamin U (Vit U) is a sulphur-containing substance and has antioxidant effect. In this study, we aimed to investigate protective role of Vit U against PTZ-induced epilepsy model. Male Sprague-Dawley rats were divided four groups as follows: Group I, saline given control group (for 7 days and intraperitoneally); Group II, Vit U administered group (50 mg/kg/day; for 7 days and gavage); Group III, PTZ injected group (60 mg/kg, single dose, intraperitoneally); Group IV, PTZ + Vit U group (in same dose and time). At the end of the experiment, brain tissues were taken. They were homogenized. The glutathione, lipid peroxidation levels, alkaline phosphatase, myeloperoxidase, xanthine oxidase, catalase, superoxide dismutase, glutathione peroxidase, glutathione reductase activities were increased in PTZ group. Administration of Vit U reversed these results. In conclusion, we can say that Vit U used its antioxidant property and protected brain tissue against PTZ sourced ROS.

**Keywords**: Vitamin U,pentylenetetrazole, epilepsy

# ACTUAL PROBLEMS OF LAND MARKET AND LAND RELATIONS IN UKRAINE

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## Abstract:

The main problems of current land relations are studied in this article. It is summarized the foreign experience in land market reforming, that allowed to identify the trends for improvement of effective institutional framework of land legislation. The scope of the state policy in Ukrainian land market was formulated. The implementation of land market monitoring on the basis of the Real Property State Register information with the publication of its results is proposed. The factors on which the state administration should be based in the sphere of land ownership relations are determined. Problematic issues of land reforms implementation are raised. The necessity of transfer of state-owned lands outside settlements to communities is substantiated. It is proved that the economic mechanism of regulation of land relations in Ukraine requires a thorough rethinking and updating of an effective system of economic land policy regulators.

**Keywords:** land policy, reforming, land legislation, monitoring, land ownership, mechanism of regulation.

# CIRCULAR ECONOMY APPROACH FOR WEAK SOIL STABILIZATION

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**Abstract**:

The development of infrastructure is a challenge in specific geological and environmental conditions. Implementation of construction works on weak (e.g., compressible, collapsible, expansive) soils often is limited by logistics of equipment and shortage of available and applicable materials. Moreover, several obstacles need to be overcome as weak soils (e.g., peatlands) in the tundra are subjected to permafrost conditions, whereas those located in equatorial and tropical regions are affected by high temperatures and humidity in combination with intense precipitation and soil erosion. Stabilization of weak soils with low bearing capacity is of marginal economic importance, furthermore, sustainable stabilization is advisable, and innovative circular economy friendly approaches are recommended instead of using known methods such as pure cementing or excavation and a single replacement of soils. Substitution of conventional material (cement) and primary raw material (lime) with secondary raw material (waste and byproducts from various industries) corresponds to the Sustainable Development Goals set by the United Nations, preserves resources, saves energy, and reduces the greenhouse gas emissions. Apart from traditional materials, soil stabilization is achievable by using various secondary raw materials: 1. Thermal treated waste products: 1.1. Ashes from agriculture production (bagasse ash, rice husk ash); 1.2. Ashes from energy production (fly ash, fuel oil ash, coal ash, granulated blast furnace slag, oil shale ash, semi-coke, palm oil fuel ash); 1.3. Ashes from manufacturing (cement kiln dust, sawdust ash, pulp and paper ash); 1.4. Ashes from waste processing (sewage sludge ash, municipal solid waste incineration ashes); 2. Untreated waste and new products made from secondary raw materials: 2.1. Waste from municipal waste biological treatment and landfills (waste sludge, alum sludge, fine fraction of waste); 2.2. Waste from industries (lignosulfonates, natural plant fibers); 3. New products made from secondary raw materials (composite materials). Efficient solutions in environmental engineering may eliminate the accumulation of excessive amounts of waste and support innovation in the circular economy. The study was implemented within the scope of project No.1.1.1.2/VIAA/1/16/029 (Formula of peat-free soil conditioner with controlled-release fertilizing effect applicable for soil remediation and quality improvement of agricultural production) in cooperation with project KIK-15401 (Projekti Humiinaineid sisaldava pinnace stabiliseerimine teemulletes põlevkivituha abil / Stabilization of soil containing humic substances in roads with the help of oil shale ash).

**Keywords:** circular economy, secondary raw materials, soil stabilization, waste valorization, weak soils
**Poster Presentation/ IV. International Eurasian Agriculture and Natural Sciences Congress**

# FROM UTILIZATION OF WOOD COMBUSTION ASHES TO NEW PRODUCT FOR SOIL IMPROVEMENT

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**Abstract:**

Ash and charcoal are the main products generated during the thermochemical processes of biomass burning applied for the production of power and heat in cogeneration plants. Usually, they are considered to be industrial waste and deposed in landfills indicating an old-fashioned and ineffective style of waste management. Sustainable options for ash utilization should result in their return to the location where biomass was grown ensuring nutrient circulation back into the soil, however, this process is not as easily implementable as it seems. Several factors have to be taken into account before reuse of raw ashes, primarily, their consistency and composition to avoid environmental contamination with dust particles and potentially toxic elements; secondary, transporting, handling, and mode of application. Feasible options for use of biomass ashes involve their utilization as a raw material for the production of fertilizers, incorporation in building materials or reuse as a fuel (if the carbon content is sufficient). Granulation of wood ash has been shown in some circumstances as a cost-effective and environmentally friendly utilization method for energy production waste. Production of granules or pellets from wood ash (also charcoal) improves the recycling and logistics of waste as well as helps to control and avoid undesirable environmental effects such as leaching of nutrient excess. This study aimed to investigate possible uses of granules made from a mixture that consists of wood fly ash and freshwater lake sediments (sapropel). Granules made from these two components gained mutual effects to the final product: appropriate consistency and composition, enrichment with organic matter, stability in the environment during transporting and application, thus, turning waste to a valuable. Characterization of ash/sapropel granules included a range of physical- chemical analyses and biological tests to investigate the product's applicability for soil improvement. This study is supported by the project No.1.1.1.2/VIAA/1/16/029 (Formula of peat-free soil conditioner with controlled-release fertilizing effect applicable for soil remediation and quality improvement of agricultural production).

**Keywords:** biomass ashes, sapropel, soil improvement, sustainable waste utilization, waste valorization

# FUTURE OF AGRICULTURAL LAND MONITORING IN THE CONTEXT OF CLIMATE CHANGE - UNMANNED AERIAL VEHICLES

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**Abstract:**

Climate change is a major global problem that threatens the existence of both humanity and biodiversity on Earth. In connection with the abovementioned, research proves the indisputable relevance of monitoring studies of erosion processes, control of plant growth phases, pests and soil conditions, crop yield forecasting, identification of unused and irrationally used land. As object of research agricultural lands as complex systems that require constant monitoring of their condition are defined. The subject of research is the processes of topographic and geodetic support for the monitoring of agricultural lands. The aim of the study is to develop proposals for improving integrated monitoring of agricultural lands, taking into account the use of unmanned aerial vehicles (UAVs) as the main tool for aerial photography. Methods of topographic and geodetic support of monitoring of agricultural lands and stages of assessment and forecasting of a qualitative condition of agricultural lands are investigated. The relevance of the UAV's use for monitoring the development of agricultural land has been proven. It has been determined that the use of UAVs is many times more efficient from different points of view. The advantages of using UAVs in monitoring the state of the agricultural sector are shown - accuracy, mobility, high efficiency, environmental safety, relatively low cost. Possibilities as a result of UAV's application in the agricultural sector of the country are identified.

**Keywords:** monitoring of agricultural lands, unmanned aerial vehicles, climate change, topographic and geodetic works, UAV data processing

# INCREASING THE RELIABILITY OF COMBINES FOR HARVESTING GRAIN CROPS BY METHODS OF RESERVE SUBSTITUTION

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**Abstract**:

The results of experimental studies to ensure the health of combine harvesters for harvesting grain crops are presented. The reliability indicators of the aggregates, assemblies and parts of combine harvesters are determined, and the methods of spare parts redundancy at different storage levels are justified.

**Keywords:** combine harvester, reliability, performance, mean time to failure, average time to eliminate failure, spare parts, and different levels of storage.

# OPTIMIZATION OF THE STRUCTURE AND COMPOSITION OF TECHNOLOGICAL COMPLEXES FOR HARVESTING GRAIN CROPS BY ENERGY COSTS

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**Abstract:**

A model has been developed for optimizing the structure and composition of technology of technological complexes for harvesting grain crops for energy costs, taking into account the likely nature of their interaction. The problems of technical re-equipment of agricultural producers are being solved by the introduction of energy-saving technologies for growing and harvesting grain crops.

**Keywords:** technological complex, grain crops, structure and composition, harvester, transport, harvesting,energy consumption, optimization criterion, energy saving, model, probable state.

# THE EFFECT OF ABSORBENTS AND WATER-SOLUBLE COMPLEX CHELATED FERTİLİZERS IN DİFFERENT PLANTING METHODS ON THE DEVELOPMENT OF GRAPE PLANTS IN THE SOUTH OF UKRAINE

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**Abstract:**

The article provides data on the effect of absorbents and water-soluble complex fertilizers with microelements in a chelated form, as well as their interaction on the growth and development of wine grape varieties in the south of Ukraine. As a result of research, their positive influence on the development of vegetative mass (increased length, diameter shoots and the amount of leaves), root system and improvement of quantitative and qualitative indicators, that is, the productivity of grape plantations, has been proved.

**Keywords:** Grapes, absorbent MaxiMarin, chelated fertilizers Biochelat and Poly-feed, the root system, leaf, bunch, sugar content, acidity, harvest.

# MATHEMATICAL METHODS FOR EVALUATING THE EFFECTIVENESS OF ADVERTISING IN AGRICULTURAL PRODUCTION

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**Abstract:**

Successful financial activity of agricultural enterprises significantly depends on their advertising campaign. The article investigates the method of assessing the effectiveness of advertising in agricultural production as a type of psychological impact on the consciousness and behavior of potential consumers. It is noted that different models of influence are used in the process of developing modern agricultural advertising products. The system of the main factors influencing efficiency of advertising in the agrarian sphere, their ways of calculation and the economic maintenance are considered. Article provide examples of usage the mathematical methods for assessing the effectiveness of advertising in agricultural production, which provide opportunities to timely use tools to improve the effectiveness of advertising levers in the activities of agricultural enterprises.

**Keywords**: psychological influence, economic effect, models, logistic curve, agrarian sphere, quadratic dependence, differential equation/

# ANALYSIS OF THE PHYTOSANITARY STATE OF THE MAIN AGRICULTURAL CROPS OF THE SOUTH STEPPE OF UKRAINE

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**Abstract:**

The analysis of the phytosanitary state of the main agricultural crops cultivated in the southern steppe of Ukraine was carried out. The main diseases were determined and the species composition of pathogens was clarified. The extent and development of the pathogens in the field against the natural infectious background was assessed. The dominant species were identified. The factors contributing to the development and spread of diseases were analyzed.

**Keywords**: sunflower, soybean, pea, corn, cereals, diseases, pathogens, species composition, extent and development degree

# MARKETING DEVELOPMENT OF INNOVATIVE PRODUCTS

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**Abstract:**

The study of the marketing development of innovative products is crucial due to the active implementation of scientific and technical achievements, the rapid spread of digital technologies, globalization of the economy, the division of labor and involving different participants in production and economic activity, increasing competition between producers of various forms of management and countries of origin, the transformation of innovative products into a commodity for which demand is constantly growing. It is determined that the development of the marketing of innovative products is based on the ambiguity of a new socio-economic phenomenon, the system of properties of which characterizes innovation. It is proved that the properties of the product are inherent in both the innovative product – the result of research and development, and innovative production – new competitive products. The object of research is the processes of economic, institutional, and environmental nature, the integral unity of which reflects the development of marketing of innovative products. The subject of the study is a set of theoretical and methodological and practical aspects of the development of the marketing of innovative products. The purpose of scientific work is to substantiate the theoretical and methodological provisions and develop scientific and practical recommendations for the development of the marketing of innovative products. As a result of research, the urgency of development of marketing of innovative products is proven; the functional content of innovation marketing is determined; the characteristic features and properties of innovations as a market commodity are established; the importance of the strategy for constant updating of products is substantiated for market participants; the socio-economic expediency of marketing innovations for business entities is substantiated; the main sources of generating innovative goods are identified; the affiliation of human needs to the factors that combine innovation and marketing activities is proved; the institutional components of innovation marketing development are singled out.

**Keywords**: innovative goods, intellectual property, marketing, market demand, commodity offers, differentiation of production and economic activity, diversification, management, consumer, market activity

# EXPANSION OF TECHNOLOGICAL CAPABILITIES OF DIAGNOSTICS OF FINISHING THREAD GRINDING OPERATIONS

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**Abstract:**

When machining lead screws, the accuracy of thread grinding is influenced by random factors, in particular, axial temperature and residual deformations of the machined parts. Therefore, for high-precision thread processing of premium lead screws, in addition to ensuring the accuracy of thread grinding, it is necessary to use a rational finishing grinding technology. The existing methods for increasing the accuracy of finishing grinding can be conditionally divided into methods that allow to eliminate the influence of systematic components of the processing error and methods that allow taking into account the influence of a random component. The paper proposes a method for automated grinding, which makes it possible to take into account the errors of the kinematic chains of the grinding machine. According to this method, a preliminary measurement of machine errors is made, for example, errors of movement of the working bodies of the machine, and then these errors are recorded in the memory of the numerical control system in the form of a spreadsheet, in accordance with the data of which corrective actions are developed, or the error is described functionally, and a mathematical model is fixed in the memory of the system, which reduces the amount of memory occupied. Proactive active control of temperature deformation of precision screws, produced by an automatic system, allows to stabilize temperature deformation at the level of correction setting, and thereby eliminate the random component of the accumulated error of the thread lead.

**Keywords:** cemented layer, residual stresses, solid lubrication, intermittent circle

# ECONOMIC EFFICIENCY OF PRODUCTION OF COMPLETE FEED WITH THE USE OF PROTEIN AND VITAMIN SUPPLEMENTS FOR BROILER CHICKENS AGED 1-3 WEEKS 5 %

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**Abstract:**

Feeding of young poultry was carried out with complete feed for broiler chickens aged 1-3 weeks. The nutritional value of 1 kg of complete feed is 12.5 MJ of metabolic energy. 1 kg of compound feed contains: dry matter - 860 g, crude protein - within 230 g, lysine - not less than 14 g, methionine + cystine - 10, threonine - 9, tryptophan - 2.8, crude fat - 50, crude fiber - not more than 40, sodium - not more than 2, calcium - not less than 8 and phosphorus - 6 g. The basis of complete feed for broiler chickens aged 1-3 weeks are grain feed, plant protein concentrates, protein-vitamin supplement and oil fuz. Compound feed is balanced in the content of normalized microelements and vitamins, includes enzymes, antioxidant and adsorbent. Live weight of broiler chickens at the age of 3 weeks is 950 g. The cost of feed for the period of feeding broiler chickens aged 1-3 weeks - 1.17 kg, feed conversion - 1.3 kg, the cost of 1 kg of live weight gain - 15 UAH. According to the results of the research it is concluded that the production of complete feed using protein- vitamin supplements for broilers aged 1-3 weeks 5% allows to optimize protein, amino acid, mineral and vitamin nutrition of poultry, has a positive effect on productive qualities of animals, provides high efficiency of compound feed use and economic indicators of poultry production.

**Keywords:** broiler chickens, complete mixed fodder, complete feed, amino acids, calcium, phosphorus, conversion of feed.

# GROWING OF GRAIN CROPS ON THE BASIS OF APPLICATION OF BIOLOGICAL TECHNOLOGIES

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**Abstract:**

Abiotic stresses, such as drought and high temperatures, affect plant growth and productivity. In addition, the analysis of long-term observations of weather parameters in our region has ambiguously shown that global climate change leads to the frequency and severity of abiotic stresses at the local level, indicating the need to develop cultivation technologies in search of growth resistance and this is crucial for future sustainable crop production.

**Keywords:** cereals, crop capacity, organic growing technologies, bacterial drugs, growth regulators, biologica products of complex action

# INFLUENCE OF FEEDING BEES ON THEIR VIABILITY AND EGG LAYING BY QUEEN BEES

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**Abstract:**

The peculiarities of formation of productive qualities of bee families of Carpathian and Ukrainian steppe breeds under different conditions of wintering and use of honey plants, as well as different composition of fodder during autumn and spring feeding are established. It is proved that the productivity of bees and the quality of honey is positively affected by feeding them honey dough with quail eggs and sugar syrup with a suspension of microalgae "Live Chlorella". It is established that the environmental conditions and feeding contributed to the largest number of breeding bees of the Carpathian breed with queens of the second year per family in the Mykolayiv region by 2506 pieces. or 3.17%, and in the Vinnytsia region - by 1288 units. or 2.95%. Preservation of Carpathian bees after wintering in the wild when fed honey dough with quail eggs averaged 95.85%, citric acid - 91.85%, sugar syrup - 85.4%, and wintering in the winter - 97.5; 95 , 85; 90.4% respectively. It is revealed that feeding of bee colonies of Carpathian breed with suspension of microalgae "Live chlorella" on homestead apiaries increases average daily laying of eggs by a uterus on the average by 11,1% (P> 0,99), in comparison with the Ukrainian steppe breed in the conditions of the Nikolaev area, in the Odessa region in bee families of the Ukrainian steppe breed these indicators were respectively - by 11.3% (P> 0.99), and in homestead apiaries of Vinnytsia region - by 7.1%.

**Keywords:** Bees, queen bees, chlorella, productivit

# DYNAMICS of IgG TOXOPLASMA GONDII TITER IN BLOOD OF DOGS DURING THERAPY

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**Abstract:**

Toxoplasmosis is common in countries with different climatic and geographical conditions due to the presence of a wide range of hosts - more than 350 species of mammals. The causative agent of toxoplasmosis, Toxoplasma gondii, is an obligate intracellular parasite that belongs to the group of coccidia that can form cysts. The causative agent belongs to the type Apicomplexa, class Sporozoa, order Coccidiida, subfamily Isosporinae, genus Toxoplasma, species Toxoplasma gondii. The aim of our research was to analyze the dynamics of the IgG titer of Toxoplasma gondii in dogs over several years after the therapy. The study involved three dogs of the shepherd breed, 4-6 years old, in which anti-toxoplasmosis antibody titers were found during the initial visit to the clinic. The animals were treated with Daraprim (2 mg / kg), Sulfadiazin (150 mg / kg), Folic acid (5 mg). Subsequently, monitoring studies for IgG Toxoplasma gondii were carried out. IgG titer was registered by serological method (ELISA test). Analysis of the results showed that during the period of research, IgG titers increased several times. Increases in IgG titer corresponded to exacerbations of clinical signs of immune diseases. After the therapy (November - January), a decrease in the IgG titer is observed. This is the characteristic that exacerbations are recorded from the beginning of the autumn period of the year. Research proves that in the body of dogs, toxoplasmosis, as an intracellular parasite, retains a carrier and leads to clinical exacerbations, mainly in the autumn period.

**Keywords:** IgG Toxoplasma gondii, Daraprim, Sulfadiazin, toxoplasmosis treatment, dogs

# EXTERIOR AND PRODUCTIVE FEATURES OF SHEEP OF TSIGAYSKY BREED OF SVC "KRYNYCHNE" OF THE BOLGRAD REGION OF ODESSA REGION

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**Abstract:**

The sheep of the farm have a more or less compact body, a wedge-shaped head, a straight profile line covered with short hair. Ears erect, medium size. Legs of medium length, covered with hair to the wrists and hocks. Males have well-developed horns in the shape of a snail, and females are mostly hornless. But some ewes are found with small horns. The tail is long, thin and covered with wool. The fleece is mostly closed, but there are also animals with an open fleece. The wool is semi-thin. The fat is white, with a characteristic luster and compression. The front of the animals is white, but in isolated animals there are dark spots on the face. The limbs are white, but some individuals have pigment spots. When assessing the productive qualities of SVC sheep, we found: live weight among ewes was 45.4 ± 5.7 kg, rams - 78.5 ± 7.2 kg; the length of wool was - among ewes 8.5 ± 1.0 cm, rams, respectively, 10.0 ± 0.5 cm, wool corresponded - 56 - 46 quality, microns 27.1 - 37.0; Shearing of wool - among ewes 3.8 ± 0.5 kg, rams 5.7 ± 0.7 kg., The yield of washed wool was 55 - 60%. The milk yield of dairy ewes during lactation was in the range of 87 ± 8.5 kg., Biological fertility was - 112%.

**Keywords:** sheep, live weight, wool, shearing, length, tonnage, lactation, fertility, milk yield, microns

# SOME INDICATORS OF MILK QUALITY DEPENDING ON SANITARY AND HYGIENIC CONDITIONS OF ITS PRODUCTION

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**Abstract:**

Studies have shown that the use of probiotic udder cleanser before milking with a disinfectant effect of prolonged action "PIP Skin Cleaner" can significantly improve the quality of milk in accordance with the requirements of the current standard of Ukraine. Thus, in the experimental group where the tool was used, 93.33–100.00% of the studied samples were assigned to group I, and in the control group only 33.33–46.67%. The milk of the control group had worse indicators of bacterial contamination compared to the experimental group: the number of samples with total bacterial contamination ≤ 300 thousand CFU / cm3 in group I reached 16.67% against 90.00% in group II. The acidity of milk of the experimental group was lower (16–17 ° T - 93.33%; 18–19 ° T - 6.67%), compared with the control group (16–17 ° T - 43.33%; 18–19 ° T - 53.33%, 20 ° T and more - 3.33%). Thus, the use of "PIP Skin Cleaner" significantly improved the quality of milk: of all the studied milk samples of the experimental group, 90.00% were of the highest grade, 6.67% - grade I and only 3.33% - grade II; in the control group, the values were 16.67%, 23.33%, 56.67% and 3.33% of milk, respectively.

**Keywords:** probiotic, milking, milk, disinfectant effect, prolonged action, milk quality.

# FACTORS OF UKRAINIAN SOUTHERN REGIONAL GRAIN MARKET DEVELOPMENT

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**Abstract:**

The composition of Ukrainian grain market subjects has determined. The potential of Odessa region grain market development has considered. The tendencies of growth of grain and leguminous crops sown areas, gross production and productivity of Southern regional grain market of Ukraine on the example of Odessa region have investigated. The dynamics of average prices on Odessa region cereals and legumes market have studied. Problems of Ukrainian Southern regional grain market development have revealed. The key strategic guidelines for Southern Regional Grain Market development have proposed. The components of digital logistics system in the regional grain market development have determined.

**Keywords:** regional grain market, development, tendencies, grain areas, grain gross production, grain productivity, digital logistics

# AMARANT: FROM SOWING TO PROCESSING

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**Abstract:**

Modern conditions of fierce competition in the food market determine the reorientation of agricultural production to meet the needs not only of the population of Ukraine, but also to take into account world market demand. As a result, the task of including new, more universal models in the range of field crops becomes urgent. Among such non-traditional crops, amaranth should be especially noted. In addition to the content of protein balanced in its aminoacid composition, amaranth grain is characterized by the presence in the oil of a substance such as squalene, which is a source of oxygen, facilities its movement in the body, and has a high ability to penetrate cells through the skin later applied with burns, in dermatological practice, dentistry, cosmetology. This leads to an extremely wide range of uses of amaranth in the processing industry. The crop is characterized by high adaptive potential a nd yield of both green mass and grain. The basis for the formation of high seed yield of amaranth is the creation of optimal conditions for plant growth and development. Among the agricultural measures that are able to regulate these conditions, it is important to choose the optimal sowing time and depth of seed wrapping and determine the optimal feeding area and its configuration. The paper presents the cultivation technology and the technology of primary processing of amaranth grain, which allows to maintain its quality indicators at the appropriate level until the next target processing.

**Keywords:** amaranth, amaranth grain, agrotechnology of cultivation, agro-measures, technology of primary processing.

# HONEY BEE PRODUCTS AS FUNCTIONAL FOODS

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**Abstract:**

Honey bee products, secrete or produce by bees, are obtained by collecting, processing, and storing the natural ingredients from the hive or directly from bees. Honey, pollen, bee bread, royal jelly, and propolis are widely known honey bee products. Honey bee products gain popularity due to their positive effect on human health. These products are a good source for vitamin, mineral, protein, carbohydrate, and amino acids which metabolism need. In addition to the nutritional properties, these products may help maintain human health due to their content of biological active compounds. Honey bee products can be added to other foods for enriching their nutritional properties or consumed by itself cause of their high bioactive components. Therefore, honey bee products are described as functional food. In this review, honey bee products are evaluated as food and food supplements. Due to their characteristic features, their importance in the treatment of diseases is also stated.

**Keywords:** Honey bee product, Functional, Health

# RESEARCHİNG THE GEODETİC WORKS İN FORECASTİNG THE LEVEL OF THE BLACK SEA COASTLİNE

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**Abstract:**

Black Sea coasts are important targets for preventing the adverse effects of climate change due to their sensitivity to temperature and climate changes. Also, coastal zone is of enormous economic importance to countries of Black Sea basin. Research proves that in order to prevent the negative economic and social consequences caused by the destruction of economic and natural objects located in the coastal strip, it is necessary to monitor its condition and changes in the coastline. Appropriate researches should be carried out using measurement methods that allow to obtain necessary accurate and reliable information about current and permanent changes, taking into account the need to make a long- term forecast. The object of study is the Black Sea coastline. The subject of the study is surveying observations of changes in the Black Sea coastline and their impact on the surrounding areas. The aim of the research is to develop proposals for modernizing the effectiveness of research and monitoring of coastline changes. As a result of the study, the historical stages and the current state of the network of observation points and space data of the Black Sea level study are determined; the relevance of using the photogrammetric method of forecasting changes in the Black Sea coastline on the basis of data obtained by unmanned aerial vehicles (UAV) is substantiated; the classification of UAV on various signs is formed; the advantages of UAV use for the updated topographic and geodetic support for forecasting changes in the Black Sea coastline are substantiated.

**Keywords:** geodetic monitoring, unmanned aerial vehicles, topographic and geodetic observations, coastline, state of the Black Sea

# REACTION OF WINTER SOFT WHEAT VARIETIES OF DIFFERENT SELECTION TO THE CONDITIONS OF BESSARABIA

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**Abstract:**

The reaction of winter soft wheat varieties of different selection to the conditions of Bessarabia has been studied. Varieties of both domestic and foreign selection were studied. It is established that in the conditions of risky agriculture in the south of Odesa region the most productive varieties were Kherson and Odesa selection.

**Keywords:** winter wheat, interaction of genotype x environment, yield

# HUMUS CONDITION OF CHERNOZEM SOILS IN SOUTHWEST OF UKRAINE

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**Abstract:**

Results of research for status of humus of chernozem soils in southwestern Ukraine are summarized. Geographic and genetic features of humus status of soils on the territory under study are identified. Chernozem soils under study are found to reveal a tendency, in dehumification processes, to retain their parameters being typical for soils of the chernozem-type soil-formation. Features of humus formation processes under impact of natural and man-caused factors were studied as well.

**Keywords:** chernozems soils, humus condition, Ukraine

# HYDRATION OF RAPESEED OIL USING AN ELECTROMAGNETIC FIELD

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**Abstract:**

The prospects of using physical fields for the process of rapeseed oil purification are considered. The analysis of the existing research on the use of the processing of liquid food products by the electromagnetic field is carried out. In the context of the influence of the process of separation between two or more inhomogeneous media in the systems "liquid - liquid" and "liquid - solid". An experimental plant for the hydration of vegetable oils with processing by an electromagnetic field has been developed. Experimental studies of this process are presented, which were carried out in order to intensify and increase the release of the amount of phosphorus-containing substances, fatty acids, waxes and other related substances. The obtained results of experimental studies confirmed the positive expectations. The graphic material is presented that describes a physical experiment, the result of which is the receipt of the recommended parameters for using the electromagnetic field. Under these conditions, a high quality oil is obtained. Energy costs are reduced by intensifying the process.

**Keywords:** vegetable oil, electromagnetic field, hydration, phosphatides

# CLEANING SUNFLOWER OIL USING THE ULTRASONIC FIELD

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**Abstract:**

The options for using the ultrasonic field for primary cleaning of sunflower oil are considered. Developed an experimental installation with ultrasonic generator for purification of sunflower oil under the influence of ultrasonic field. Experimental studies of the effect of ultrasonic cavitation by changing the frequency and power of the electrical signal supplied to a magnetostrictive transmitter are presented. The technological parameters of the process of purification of sunflower oil by ultrasonic treatment have been determined.

**Keywords:** sunflower oıl, ultrasonıc fıeld, cleanıng process, magnetostrıctıve emıtter, ultrasonıc generator, ultrasonıc cavıtatıon

# PROSPECTS FOR THE UTİLİSATİON OF PİGSKİN OBTAİNED FROM PİGS OF DİFFERENT BREED-OF-ORİGİN İN UKRAİNE

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**Abstract:**

In Ukraine, there is a clear downward annual trend in numbers of all livestock species in the last 10-15 years. In particular, between 2010 to 2015, the number of pigs averaged about 7.5-8.0 million heads. The decline in the number of pigs down to 5.5-6.0 million heads since 2015 was caused by various issues associated with the spread of the African swine fever virus. In 2020, we can see a trend towards stabilization and even increase in numbers of pigs up to earlier levels. The pig industry per se provides valuable energy foods (such as pork and back fat), as well as organic fertilisers of good quality, for the country's population. Moreover, pigskin is quite essential as a raw material for leather foot-wear and accessories industry. The leather industry is supplied with a large number of pigskins, whose utilisation has been increasing systematically due to their high availability and low cost of production. On the one hand, today, the usage of pigskin as a raw material for foot-wear manufacturing becomes increasingly popular, which is associated with its availability and relatively low cost. On the other hand, pigskin does not make a truly presentable appearance and it is predominantly used as a lining material rather than as the shell fabric. This is mainly due to the fact that pigskin is not elastic enough, it gets wet easily and tends to have a rather rough, hard surface and long-lasting odour. Besides, pig skin is not durable enough, which results in a texture full of holes in the end product. Our research is aimed at finding out whether pigskin is currently suitable as a raw material for the leather industry, based on the morphology and main structural features of skins, obtained from pigs of the most popular breeds and genotypes (such as Large White, Landrace, Pietrain, Duroc, as well as their hybrids: F1 ½ (LW + L), F1 ½ (P + D) and F2 ¼(LW + L) + ½P), which are common for commercial pig production in Ukraine.

**Keywords:** Pigskin, raw material, structural features, leather industry

# EVALUATION OF WORKING QUALITIES OF ORLOV TROTTING HORSES BREED OF DIFFERENT ORIGIN AND TECHNOLOGY OF THEIR TRAININIG IN THE CONDITIONS OF THE BRANCH "ODESSA RACETRACK" OF DE "HORSE BREEDING IN UKRAINE"

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**Abstract:**

The current state of the breeding stock of horses of Orlov trotting breeds in Ukraine is studied and analyzed in the work. Orlov trotter breed makes up about 18% of the total breeding herd of horses in Ukraine. The predominant number of breeding stock and repair young stock (almost 72%) belongs to state- owned farms, namely branches of the State Enterprise "Horse Breeding" of Ukraine. During the research of selection methods in these enterprises it was established that the optimal method of breeding horses is cross lines with the use of inbreeding of moderate and remote degrees. In the Orlov trotter breed, the best indicators of liveliness belong to the offspring obtained as a result of complex inbreeding on such outstanding broodstock as Pion, Fagot, Viter, Otklik, Pozyv. The most successful were the crosses of the lines Pilot × Prolyv, Pion × Viter, Ispolnitelnyi × Voin. The largest number of descendants of class 2.05 was received from the stallions of the Prykaz (5 goals) and the Otklik (4 goals). According to the performance index, the best stallions at the moment are Malynovyi Zvon, Morfei, Uklon, Abatur and Kryk. The highest correlation coefficient between the liveliness of parents and their offspring is observed at the age of four years and older: $r = 0.550 \pm 0.17$ ($P < 0.95$). The best indicators of liveliness and exterior are characterized by representatives of the Dibrovskyi horse plant. The training system at the Odessa Racetrack applies a weekly training cycle to Orlov trotters, which varies with age and number of performances per prize per month. Over the past 10 years, 7 records of the hippodrome have been set at the Odessa Hippodrome by horses of the Orlov trotting breed, 4 of which belong to the pupils of the Zaporizhia Horse Farm. The largest number of victories in traditional prizes in the last year was won by the horses of the Dibrivskyi horse plant, the smallest - by the Lymarivskyi.

**Keywords:** horses, Orlov trotter breed, tests

# ENGLISH IDIOMS WITH ANIMALS: THE WAYS OF THE LINGUISTIC AND CULTURAL COMPETENCE FORMATION AT ENGLISH LESSONS

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**Abstract:**

In recent decades, there is increased interest in the study of phraseological units in different languages in various aspects. The object of this study is English idioms. The subject of this study is English idioms with animals. The aim of the article is to specify competence-oriented approach to professional training intended for the future specialists according to modern requirements and demands. The authors focus on idioms with animals as means of linguistic and cultural competence formation. Special attention is given to the the social and cultural competence. It is indicated that when learning English with a purpose of a professional communication students of agrarian universities should pay a particular attention both to terminology and phraseology. Competency is understood as some prescribed professional basis, which are considered to be obligatory for future specialists. The analysis considers explicit and implicit representation of the idioms, its semiotic and symbolic meanings. The article focuses on the efficient means of idiom formation in the English language as well. The authors discusses possibility of using idioms with the following phraseological models: adjective + noun, noun+noun, noun+verb, and forecasts further idiom-formations according to the phraseological model. The article is aimed at showing interaction of linguistic and extra linguistic aspects within an idiom with animals, as a linguistic unit. Aspects of English phraseology are analyzed by emphasizing an important role of idoms in cognitive processes. Working with idioms at English lessons proved to be effective for forming and developing such linguistic competences as reading, writing, listening, speaking.

**Keywords:** English, idiom, symbolic meaning, idiom-formation, competence

# ASSESSMENT OF THE MAIN SELECTION-GENETIC SIGNS OF THE PRODUCTIVITY OF THE SHEEP OF THE ODESA TYPE OF THE ASCANIAN MEAT AND WOOL BREED OF DIFFERENT ETHOLOGICAL TYPES

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**Abstract:**

The objective of determining the types of behavior in sheep in natural conditions was the technique of moving and eating reactions of sheep in perfection. In our studies, the slaughtering qualities of cornflowers of different ethological types were evaluated. The results of the control slaughter showed that the best slaughter qualities were characterized by mixtures of experimental groups. The most active animals were dominated by cowardly and cautious cornflowers by pre-slaughter weight, carcass weight and slaughter output. In our experiments, the offspring, with different most active behavioral responses, had a larger area of muscle. The II and I group shafts were characterized by the best development of the longest muscular tissue of the back. Thus, the best meat qualities were characterized by carcasses of the most active and moderate behavior, among them carcasses I groups.
The average purge of both washed and non-washed highest in brightest most active and moderate behavior. All groups of ewes are characterized by a high milk yield, which we associate with the inherited, high level of milk productivity of sheep of the Ascanian meat-wool breed with cross-wool. Characterizing the variability of the level of milk productivity, we can conclude that it is quite high. This indicates that the herd contains animals with a sufficiently diverse dairy productivity and this enables the selection of high-milked uterus for further use in breeding and breeding work.

**Keywords:** sheep, behavior, meat productivity, wool productivity, dairy productivity.

# DYNAMIC OF ENZYMES ACTIVITY ON COMPLEX THERAPY OF DOGS, SICK WITH ACUTE CATARRHAL BRONCHOPNEUMONİA

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**Abstract:**

Enzymes play very important role on the metabolism. Dogs, sick with catarrhal bronchopneumonia, have significant changes in the activity of enzymes. In particular, there is an increase in the activity of alkaline phosphatase, aldolase, ceruloplasmin, sialic acids, an increase in catalase number and catalase index.The purpose of our work was to evaluate different methods of treatment of dogs, sick with catarrhal bronchopneumonia and to explore the dynamic of enzymes activity during the treatment. The material for the study was twenty dogs, selected according to the principle of analogs, sick with acute catarrhal bronchopneumonia. In the first group we used traditional therapy and in the second group we used complex therapy with atihomotoxic preparations. At the beginning of treatment, the animals showed characteristic signs of bronchopneumonia. During the treatment the condition improved, and more clearly it is noticeable in the group where we used complex antihomotoxic therapy. Also at the beginning of treatment we noticed the rise of the enzymes activity. During the treatment the normalization of enzymes activity figures was observed, and more clearly it was in the second group. Complex therapy with antihomotoxic preparations Traumel and Phosphor-Homaccord is more effective, compared with traditional therapy.

**Keywords**: bronchopneumonia, dogs, complex therapy, Traumel, Phosphor-Homaccord, natural resourses.

# PHYSICOCHEMICAL CHARACTERIZATION AND HYGIENIC QUALITY OF 'KLILA' A TRADITIONAL HARD DRIED CHEESE, MADE FROM SMALL RUMINANTS SHEEP'S AND GOAT'S MILK COLLECTED IN BIBANS AREAS NORTH EAST OF ALGERIA: PRELIMINARY STUDY

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**Abstract:**

Klila a traditional dried cheese, widely known and appreciated in all regions of Algeria, with a grainy texture, formulated with raw milk and/or Lben; a fermented milk. The study aimed to valorize the Algerian traditional "Klila" cheese, and focused on 24 dried Klila's samples, manufactured from cow's (10 samples) goat's (10 samples) and sheep's (04 samples) fermented milk L'ben. Collected from various livestock farms in Algerian North-Eastern Bordj Bou Arreridj province (Bibans), during high lactation season March- April. The exploration of 05 physico-chemical parameters, gave values encircled between : pH. (04- 04,7), acidity in Dornic degree °D (22-44°D), conductivity microsiemens/centimeter (0,41- 02,16 ms/cm), dry matter (25- 48,48%) and ash (0,18- 0,6%). Microbiological quality control allowed to estimating average total mesophilic aerobic flora (01.24 x103 cfu/g), fecal coliforms (08,4 CFU/g), indologenes Flora (0.32), faecal streptococci (21,30 cfu/g). Samples hygiene level was acceptable; however, indigenous lactic flora, total fatty and proteins rates exploration are desirable.

**Keywords:** Klila, Lben, Physico-Chemical, Microbiological, Analysis

# DYNAMICS OF BIOLOGICAL MASS ACCUMULATION AND YIELD OF WINTER WHEAT VARIETIES IN THE PRECISION FARMING

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**Abstract:**

The dynamics of biological mass accumulation during the vegetation season were studied by the phases of plant growth and development, as well as reaches a maximum in the heading phase, differentiated by genotypes, i.e. varieties of winter bread wheat. Studied 10 varieties of winter bread wheat, which were characterized by different dynamics of biological mass accumulation. According to the maximum green index, different varieties are distinguished respectively - mainly Rasad and Mayra varieties before the heading phase and Progress variety during the heading and flowering phases; variety Zhalyn, Aliya, mainly the variety Sapaly in the heading and flowering phases. During the flowering phase, NDVI values on 7-14 plots for varieties Bezostaya 100, Grom, Aliya, and Matai varied from 0.68 for variety Bezostaya 100 (plot 102) to 0.83 for variety Matai (plot 103). The last sample in the variant (plot 87 and 93) was characterized by a high and stable NDVI during the entire vegetation season (0.67-0.86-0.83 and 0.57- 0.85-0.83, respectively) on different phosphorus backgrounds. Taking into account the data of the entire vegetation season, the variety Grom was also distinguished from plot 97 - (0.56-0.85-0.85-0.80) and 96 (0.45-0.83-0.85-0, 80), as well as the Aliya variety from plot 93 (0.56-0.83-0.82-0.80). Noteworthy is the max NDVI in different phases of heading and/or flowering, and the highest NDVI in the initial phases of tillering: Bezostaya 100 from plot 101 (0.60-0.82-0.83-0.79); Grom from plot 95 (0.63-0.81-0.84-0.81). Accordingly, the maximum yield is typical for the following varieties: Erythrospermum 350 (5.0 t/ha); Karlygash (4.9 t/ha), and Farabi (4.8 t/ha), potentially more intensive varieties. Comparing the yield with the NDVI, we have been expertly established the following boundary values of the average long-term value of the seasonal maximum of the NDVI groups: above 0.8 (very high yield), 0.75-0.79 (high yield), 0, 70–0.74 (medium yield), 0.65–0.69 (conventionally low yield), 0.60–0.64 (very low yield).

**Keywords:** winter wheat, precision farming, winter wheat varieties, Green Seeker, dynamics of biomass accumulation, NDVI, yield.

# SPECTRUM OF MEDICINAL PLANTS OF INSECTICIDE ACTION FOR ECTOPARASITOSIS OF ANIMALS

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**Abstract**:

According to the results of the analysis of the range of veterinary insecticides, it was found that they include the following plant components: geraniol, decanoic acid from coconut oil, extracts of cloves, wormwood, chamomile, thyme, marjoram, essential oils of mint, lavender, cinnamon, rose cinnamon, cinnamon, citronella, papaya and citrus fruits (orange and lemon). The study identified a wide range of plants that are capable of insecticidal action. According to various data, the following plant species have insecticidal properties: garlic (Allium sativum), wormwood (Artemisia absinthium), frankincense (Boswellia carterii), watermelon colocynth (Citrullus colocynthis), laurel (Laurus nobilis), mint flea (Mentha pulegium) and pepper (Mentha piperita), myrtle (Myrtus communis), oleander (Nerium oleander), fragrant cornflower (Ocimum basilicum), oregano (Origanum vul. fragrant rue (Ruta graveolens), German roosters (Iris germanica), neem tree (margoza) or azadirachta indica (Azadirachta indica), long pepper (Piper longum), thyme (or thyme) (Thymus vulgaris), coconut palm (Cocos nucifera), rosemary (Rosmarínus officinális), papaya (Cárica papáya), tea (Melaleuca alternifolia) and clove tree (Syzýgium aromáticum), citronella (Cymbopogon nardus and Cymbopogon winterianus), dissected geranium (Geranium dissectum), cinnamon (Cinnamomum verum). Insecticides and repellents based on compositions of essential oils of plants and their extracts on the market of Ukraine account for 13.5 % of the total number of drugs. Herbal insecticides for animals are produced mainly in aerosol (spray), liquid (spot-on solutions, shampoos) dosage forms. Leading countries in the supply of ectoparasitosis for animals are Germany and USA. The most common and available vegetable raw materials with insecticidal action in Ukraine are garlic, wormwood, mint flea and pepper, fragrant rue, dissected geranium, rosemary, thyme.

**Keywords**: endosmosis, medicinal plants, insecticides, pets

# TREELIN - NEW TECHNIQUE OF HCH AND POPS SAMPLING IN GROUNDWATER BY PHYTOSCREENING

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## Abstract:

HCH waste isomers spreading from the dumps represent a worldwide problem present at many sites. TREELIN is a cheap and handy technique that provides quick information on HCH spreading in groundwater without the need of heavy machinery participation and drilling into the aquifer. TREELIN is a technique for shallow underground HCH pollution delineation. It is based on the sampling of bioaccumulating (deciduous) trees that uptake dissolved pollutants from groundwater. TUL started TREELIN development at an HCH contaminated site in the Czech Republic and verified its accuracy at a Polish HCH megasite in Jaworzno.

**Keywords:** HCH, POPS, TREE SAMPLING, BIOACCUMULATION, HAJEK, JAWORZNO

# SOYBEANS RESPONSE TO FUSARIUM ROOT ROTS IN KAZAKHSTAN

**Yerlan Dutbayev[1]*, Nurlan Kuldubayev[1], Ayana Slyamova[1], Rafiq Islam[2], Nadira Sultanova[3], Vladimir Tsygankov[4]**

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## Abstract:

Soybean (Glycine max (L.) Merr) is the most important oilseed crop in Kazakhstan; however, in recent years its production has been affected by widespread soil-borne diseases especially root rot by Fusarium. The objective of our study was to evaluate soybeans response to Fusarium root rots and identify disease- resistant soybean cultivars adaptive to Kazakh soil and climatic conditions. A series of laboratory and field studies were conducted with Samer-1, Samer-2, Toury, Anastasya, Samer-3, Samer-5, Belor, Swapa and Cheremosh soybean genotypes. Result showed that the main causative agent of root rots of soybeans in Western Kazakhstan was Fusarium equiseti. Laboratory studies showed that soil infection of F. equiseti significantly impacted and increased to linear electron flow (LEF) chlorophyl fraction indices on Samer-1, Samer-2, Toury, Tanais, Isidor, Anastasya, Samer-3, Samer-5, Maple, Ridge, Belor, Swapa and Cheremosh soybean genotypes with respect to non-inoculated genotypes. Field observation showed that in 2018-2020 growing years, Fusarium root rot was responsible for 33 to 53.2% yield losses which were consistently correlated with the susceptibility of soybean genotypes to Fusarium. Under field condition, the genotypes and root rot intensity have significantly correlated with Phi2, PhiNPQ chlorophyll fraction, and relative chlorophyll content, respectively. Genotype, leaf position and growth stage factors on soybean significantly correlated with PhiNPQ, LEF, leaf temperature differential and relative chlorophyll fractions. Relative chlorophyll content variably increased on genotypes on 3rd leaf trifoliate in comparing with 4-outh ones. The LEF content significantly affected genotypes on 4rth leaf trifoliate when compared with 3rd one. Soybean yield losses were greatly associated with plant height, height of lower bean, number of beans per plant, and weight of beans as affected by Fusarium root rots. Results showed that while yield losses (11.7 to 14.6%) were minimum in Samer-5 and Swapa, but moderate (20.8 to 25.5%) in Toury, Tanais, Isidor, and Anastasya, and highest (29 to 38.7%) in Samer-1, Samer-2, Samer-3, Maple, Cheremosh, Ridge, and Belor, respectively. Based on our results, it is concluded that Samer-5 and Swapa were the most adaptive soybean genotypes resistant to Fusarium root rots and be recommended for growing in western Kazakhstan.

**Keywords**: soybean, fusarium root rot, genotype, disease internsity, multispeq, photosynthesis measurements, leaf position, growth stage, LEF,Phi2, PhiNPQ chlorophyll fraction, chlorophyl

# EFFICIENCY AND FEATURES OF THE USE OF FOLIAR DRESSING OF GRAPE BUSHES IN NON-IRRIGATED VINEYARDS IN THE SOUTH OF UKRAINE

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## Abstract:

The article presents the results of studies on the use of foliar dressing of grape bushes, fertilizers in a chelated form of various brands, in nonirrigated vineyards. The expediency of using foliar fertiling on grape varieties Merlot, Cabernet Sauvignon, Green Sauvignon and Odessa Muscat has been proved. The use of fertilizers of different brands, approximately the same chemical composition in terms of the set of macroand microelements, provided a significant increase in the growth of bushes and their yield. The yield of grapes Sauvignon green increased within 7.5-12%, and for Cabernet Sauvignon, Merlot and Odessa Muscat - 11-19%, thus confirming the different responsiveness of grape varieties to the substances used.

**Keywords**: Grape, feding, productivity, harvest of bush, chelate fertilizers, technical grapes, sugar content, bunch mass, leaf area, quality of grapes, phase of development

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