

Study on Relationships between Yield and its Components in Iranian Cantaloupe Genotypes

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ABSTRACT

Study on relationships between yield and its components will improve the efficiency of a breeding program with appropriate selection criteria. In this study, interrelationships between yield and its components in cantaloupe were investigated using sequential path coefficient analysis. To determine important components of yield in cantaloupe, 49 genotypes generated from 7×7 diallel, were evaluated in α -lattice design with 3 replications. The highest coefficient correlation was obtained between fruit weight and fruit number with yield. Sequential stepwise multiple regression analysis was performed to organize the predictor variables into first, second and third order paths based on their respective contributions to the total variation of yield and minimum collinearity. Based on the variance inflation factor and magnitude of direct effects, average of fruits weight and number of fruit per plant were considered as first order variables and accounted for 96 percent of total variation of yield. The t-test of significance, using standard error values, obtained through bootstrap resampling, indicating that all direct effects were significant. The results also indicated that both two traits of average of fruits weight and number of fruit per plant could be considered as selection criterion in selecting for increased yield in cantaloupe.

Keywords: bootstrap analysis, cantaloupe, correlation, *Cucumis melo* L., sequential path analysis.

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Evaluation of Genetic Diversity of Some Pear (*Pyrus* spp.) Genotypes and Species based on Morphological Characteristics

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ABSTRACT

Pears (*Pyrus* spp.) belongs to the Rosaceae family, which have been cultivated for more than 3000 years. Pears are among the most important fruits in all the temperate regions in about 50 countries of the world. The objectives of this study were to classify pear genotypes based on qualitative and quantitative characteristic and determination of their genetic distance. Evaluation of genetic diversity of 47 pear accessions including European, Asian and wild species, was started since 2008 in University of Tehran and seed & plant certification & registration institute. Result showed that some traits such as fruit size, maximum fruit diameter, fruit shape, shape of base and apex in leaf had high variability. In this study genotypes were classified according to their characteristics and Ward's method. Results derived from cluster analysis divided the genotypes into three main groups including European, Asian and wild species. Results of simple correlation analysis showed that leaf blade length and width have positive correlation with fruit weight and size. Results of factor analysis indicated that nine main factors indicated 80% of total variance. First and second factors that were related to leaf and fruit characteristics, described nearly up to 32% of variance.

Keywords: Pear, Genetic diversity, Morphological marker, Correlation, Cluster analysis.

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Effect of Trinexapac-Ethyl on the Quality and Physiological Constituents of Perennial Ryegrass (*Lolium perenne* L.) in the Salinity Conditions

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ABSTRACT

Turf is one of the most important ground covers and it is one of the main elements of urban landscape design. Plant growth regulators, such as growth inhibitors, are widely used in turfgrass management to suppress shoot growth and inflorescences production. This experiment was conducted to determine the interactive effects of trinexapac-ethyl (TE) and salinity on the growth, visual quality, and chemical constituents of perennial ryegrass (*Lolium perenne* L.). Plants were grown hydroponically under four levels of salinity (1.5 (control), 2.5, 5.0 and 7.5 dS/m) and three levels of trinexapac-ethyl (0, 0.02, and 0.04 g/m²). The results showed that growth rate of perennial ryegrass decreased significantly with both trinexapac-ethyl and salinity treatments, although the differences in growth rate were not significant between trinexapac-ethyl treatments at 0.02 and 0.04 g a.i./m² application rates. Root penetration depth, fresh and dry weights increased by trinexapac-ethyl, while salinity decreased them. The results showed that total chlorophyll, chlorophyll a, chlorophyll b, and proline concentrations increased by application of trinexapac-ethyl, while TE had no significant effect on the carotenoid content. Salinity treatment decreased total chlorophyll, chlorophyll a, chlorophyll b, and carotenoid content, but increased proline concentration. Overall, it can be suggested that for improving the tolerance of perennial ryegrass to salinity up to 2.5 dS/m and reduced mowing frequency, the turf should be sprayed monthly with TE at 0.02 g/m².

Keywords: growth rate, perennial ryegrass, proline, trinexapac-ethyl, salinity.

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Evaluation of supercooling temperatures in apricot flowers

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ABSTRACT

Late spring frost damage is the main factor that limits apricot production in Iran. This research was aimed to evaluate the damage of freezing in two apricot cultivar flowers: ‘Nasiri’ and ‘Nori-Dirras’ during spring 2011. Reproductive organs of these cultivars at two phenological stages, popcorn and full bloom, were transferred to programmable freezer with temperature touch down from 5°C to -10°C. Temperature were detected by the mean of thermocouple and recorded by a data logger connected to a PC Computer. According to the results, differences between two cultivars and interaction of cultivar and phenological stages were not significant, whereas the effect of phenological stage was significant. The lowest supercooling temperature was -6.1°C and recorded at full bloom stage in ‘Nori-Dirras’. More than 30% of ‘Nori-Dirras’ buds and more than 60% of its flowers showed less supercooling than -5°C. According to this result, ‘Nori-Dirras’ showed lower supercooling temperature than ‘Nasiri’.

Keywords: Nasiri, Noori-Dirras, spring frost, supercooling.

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Investigation of Genetic Diversity and Relationships of 'Kurdistan' Strawberry to some Commercial Cultivars using Microsatellite Markers

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ABSTRACT

In order to evaluate genetic relationship, diversity and possible genetically and physical mixing of Kurdistan cultivar with Russian, American and European cultivars a collection of 33 samples including: 20 accessions of cv. Kurdistan from different fields of Kurdistan province, 7 Russian and 6 American and European cultivars were analyzed using 10 molecular markers. Result indicated that in each microsatellite locus, between 4 to 8 (with an average of 5.5) alleles were seen and Polymorphism information content of loci varied between 0.59- 0.86. Using cluster and also factor analysis, cultivars were divided in to 8 groups: (including 2 main groups of Kurdistan cultivar samples and Russian cultivars, the rest of the commercial cultivars were placed in the 4th to 8th groups. High Similarity was obtained between Kurdistan cultivar and Russian Cultivars. In comparison to American and European cultivars, considering historical background, it could mean that Kurdistan variety might have been a Russian cultivar originally, which has brought to Iran in the past. Results of this study revealed some cases of physical mixing of Kurdistan strawberry with other commercial cultivars in growing fields and also a case of mutation of this cultivar.

Keywords: Kurdistan strawberry, genetic relationship, genetic mixing, microsatellite marker, commercial strawberry cultivars.

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Quality and Quantity Characteristics of Two Gladiolus Cultivars (*Gladiolus grandiflorus* cv. White Prosperity and Ruse Supreme)

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ABSTRACT

Storage conditions influence quality of gladiolus corms which thereby affects quality of flowers. In the present study, the effects of pre-storage curing and different temperature conditions on corm germination and various vegetative and reproductive growth parameters of *Gladiolus grandiflorus* cv. White Prosperity and *Gladiolus grandiflorus* cv. Ruse Supreme were studied. Application of pre-storage curing with one or two months of cold treatment 5⁰C resulted in the best dormancy release and faster bolting. These corms produced better plant and cut flower quality. The elongation of flowering shoot and flowering delayed when the corms stored at 5⁰C for the whole storage period, but produced good quality cut flowers, showing interruption of dormancy release. In the other hand, the corms stored during whole storage period at 13⁰C had lower and longer plant emergency and produced lower quality plants and flowers. This shows that dormancy release was not completed. The corms stored in non-controlled temperature room showed growth and production characteristics between these two categories. The observation and data for both cultivars showed the same tendency.

Keywords: cold treatment, curing, storage.

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Effect of Essential Oils and Silver Nanoparticles (SNP) on Vase Life of *Alstroemeria* Cut Flowers (cv. Sukari)

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ABSTRACT

In order to examine the effects of essential oils and silver nanoparticles as an antimicrobial preservative in the solutions of *Alstroemeria* cv. Sukari cut flowers, an experiment was conducted with 11 treatments and 3 replications in a completely randomized design. In this study, we used essences of carvacrol, thymol and Zataria oil with concentrations of 50 and 100 mg L⁻¹ and silver nanoparticles with concentrations of 5, 10 and 15 mg L⁻¹ with 3% sucrose. *Alstroemeria* cut flowers were pulsed for 24 hours by these compounds. Results showed that the average vase life of flowers that treated with distilled water and 3% sucrose as a control treatments were 8.66 and 8.33 days, respectively. The vase life of cut flowers was improved by 50 mg L⁻¹ carvacrol + 3% sucrose (14.83 day) and 5 mg L⁻¹ silver nanoparticles + 3% sucrose (14.16 day). Vase life of cut flowers that treated with carvacrol 50 mg L⁻¹ + sucrose 3% and silver nanoparticles + sucrose 3% was 5.5 days higher compared to other treatments. Treatment of 50 mg L⁻¹ carvacrol + sucrose 3% and 5 mg L⁻¹ silver nanoparticles + sucrose 3% delayed leaf yellowing in cut *Alstroemeria* flowers during vase life (5 days). So, petal abscission time and the leaf yellowing decreased. Zataria oil did not improve vase life. Maximum water uptake, relative fresh weight and chlorophyll contents were observed in treatments with 50 mg L⁻¹ carvacrol + sucrose 3% and 5 mg L⁻¹ silver nanoparticles + sucrose 3%.

Keywords: carvacrol, leaf yellowing, pulsing treatment, thymol, Zataria oil.

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Evaluation of Quality Changes on 'Elberta' Peach during Storage with Modified Atmosphere Packaging (MAP)

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ABSTRACT

In the present research, effects of modified atmosphere packaging (MAP) including three gas combinations and two packaging films (Low density polyethylene (LDPE) and Polypropylene (PP)) on postharvest quality and storage-life of 'Elberta' peach were evaluated. The study was conducted as a factorial experiment based on CRD (completely randomized design) with three replicates for 9 weeks. Fruits were stored at 1°C and 90% relative humidity (RH). Packages with air combination considered as control. Samples were taken out each week and quality parameters of the fruits (color index, weight loss, firmness, total soluble solids, titratable acidity, pH, ethylene production and TSS/TA ratio) were measured after 24hr at room temperature. Results showed that fruits in the modified atmosphere packaging had better preservation of quality characteristics. Factors such as firmness, pH, TA, TSS and TSS/TA ratio maintained better in LDPE film compared to polypropylene film. Ethylene production in polypropylene film was less than LDPE film. Gas combination of 10% CO₂ and 2% O₂ maintained a better quality according to firmness, pH, TA, weight loss, TSS/TA ratio and reduced ethylene production compared to treatment of 5% CO₂ and 2% O₂. In conclusion, in LDPE film with gas combination of 10% CO₂ and 2% O₂, quality was maintained better and the storage-life of 'Elberta' peach was extended for 63 days.

Keywords: ethylene production, low density polyethylene, polypropylene quality, storage-life.

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Effects of Different Concentrations of Boron on Concentration and Distribution of this Element and some other Nutrients in Hydroponic Condition in two Olive Cultivars

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ABSTRACT

Boron toxicity usually occurs in arid and saline soils. Among all the pollutant's resource, irrigation water is the most important factor in boron elevating in the soil. Modification of boron-rich soils is difficult and in this case, resistant varieties can play an important role in increasing the cultivation in areas with high boron level. To assess the effects of different concentrations of boron on nutrient concentration and its distribution in olive plants, a factorial experiment was carried out in completely randomized design with six levels of boron (0, 2, 10, 20, 30, 40 and 50 mg L⁻¹) and two varieties (Konservolia and Amygdalolia) with four replicates. Results showed that with increasing the levels of boron, the level of nitrogen, phosphorus, potassium and calcium decrease significantly. With increasing of boron concentration to 50 mg L⁻¹, nitrogen levels decreased to 47% in Amygdalolia compared to control. Boron concentrations in all plant parts increased with increasing boron level in the nutrient solution. Described diagnostic symptoms of boron toxicity were appeared 45 days after beginning of the experiment in the concentrations of (30, 40 and 50 mg L⁻¹) and in Konservolia appeared 75 days after beginning of the experiment in the concentrations of 40 and 50 mg L⁻¹.

Keywords: boron, diagnostic symptoms, nutrient uptake, Olive, toxicity.

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Evaluation of Relation between Carbohydrate with Development and Senescence in Lilium LA Hybrid cv. "CebDazzle"

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ABSTRACT

Lilium flowers vase life are associated by different factors which influence life quality of plant. Sugars are generally used to extend the vase life of the most cut flowers. Such beneficial effects have been associated with an improvement of water relations and an increase in available energy for respiration by floral tissues. In order to determine the importance of carbohydrate distribution in regulation of development and senescence, the role of sucrose was characterized based on completely randomized design in lilium LA hybrid "Ceb Dazzle" flowers. Postharvest flower longevity after anthesis of detached buds was well correlated with total carbohydrate content of the tepals at harvest time. Longevity of attached flowers remained constant within the inflorescence, likely due to postharvest redistribution of tepal carbohydrate. By increasing the buds growth, starch amount was increased. Buds with 80 mm length had the most amount of starch. In development time of buds, changes trend in sucrose, glucose, and fructose level was the same, approximately. The nearly identical amounts of fructose and glucose within lily tepals suggest that sucrose is probably converted by invertase, rapidly. It seems that reduced sugars supply a large proportion of the carbohydrate pool in the tepals. The flower buds are active metabolic centers, since the translocation sugar is probably sucrose. However, sugar application in the vase solution induced more development of leaf yellowing when compared to those in a sugarless solution and higher concentrations of sucrose caused leaf blackening.

Keywords: bud, carbohydrate, LA hybrid lilium (*Longiflorum*×*Asiatic hybrids*), leaf yellowing, senescence.

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