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Investigation of Possibility of Fennel (*Foeniculum vulgar* L.) Autumnal Sowing in Mashhad Condition

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Abstract

In order to investigate the possibility of Fennel autumnal sowing in Mashhad condition, 2 sets of experiments were conducted in Agricultural College, Ferdowsi University of Mashhad in 2003-2005. This experiment was performed in the manner of Split Blocks based on completely randomized Blocks with three replications. Treatments were two fennel ecotypes (Khorasan and Kerman) and three planting dates (October, December and March). Fennel seeds only were planted in 2003 and in next year, plants were grown of remains parts of stem in surface of soil. Results showed in end of first years, number of remain plant in March planting dates, three times of October planting dates. In second years, number of remain plant in March planting dates 6.5 and 2.7 times October and December planting dates, respectively. Number of remain plant between Khorasan and Kerman ecotypes were not significantly different in two years. However, effects of planting date and ecotype on dry matter and number of primary and secondary branches were not significant but plant of October planting dates superior to the plant of December and March planting dates. Number of umbel without seed in October planting dates was 3.4 and 8.8 times of December and March planting dates. In spite of weight of seed in October planting dates highest than December and March planting dates, effect of planting dates on weight of seed in plant was not significant. In first year highest and lowest yield were obtained in October (68.7 gr/m^2) and March (20.5 g/m^2) planting dates. But in second year maximum and minimum of yield were obtained in March and October planting dates with 45.3 and 14.2 g/m^2, respectively.

Keywords: Ecotype, Planting date, Survival percentage, Yield

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The Effect of Irrigation Regimes and Mulch Application on Vegetative Indices and Essential Oil Content of Peppermint (*Mentha piperita* L.)

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Abstract

Peppermint (*Mentha piperita* L.) from Lamiaceae family is one of the most important medicinal plants, used in food, sanitary and cosmetic industries. A field experiment was carried out in Ferdowsi University of Mashhad in 2010-2011 to evaluate the effects of three irrigation levels (100, 80 and 60 percent of water requirements calculated by evaporation pan class A) and two mulch types (black plastic and wood chips) in comparison to control (without mulch) on physiological parameter and essential oils content in a factorial experiments on the basis of Randimised Complete Block Desing with four replications. The data obtained from each harvest analyzed as a factorial experiment on the basis of randomized complete block design with four replications and the results of two harvests analyzed as split plot on time. The results of two harvest indicated that peppermint plants grow better in the first harvest than the second harvest. Plants collected in the first harvest showed higher dry matter and essential oil yield. The highest dry herb yield (44.12 g/plant), the highest percentage of essential oil (2.835 %v/w) and the highest essential oil yield (116.7 l/ha) detected in plots treated with third level of irrigation and use of wood chips mulch. In conclusion the results also confirmed that the highest dry herb and the highest oil yield per area unit were observed in plots treated with third level of irrigation with use of wood chips mulch.

Keywords: Irrigation, Mulch, Yield, *Mentha piperita*

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Comparative of Qualitative and Quantitative Characteristics of Four Commercial Mandarin Cultivars on 'Flying Dragon' Rootstock

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Abstract

'Flying dragon' is one of the citrus rootstocks that are considered to be a promised dwarfing rootstock in the world. This experiment was conducted in the Astara research station for study of qualitative and quantitative characteristics of 4 mandarin cultivars (Unshiu, Clementine, Page, and Yunesi) budded on 'Flying dragon'. This experiment was carried out with four cultivars in randomized complete bloke design (RCBD) with three replications. Qualitative and quantitative characteristics of fruits, as well as vegetative traits were recorded and analyzed for 3, 6 and 1 years, respectively. The highest yield was observed on Yunesi cultivar in the final year of experiments and the lowest yield was on Unshiu cultivar in the fifth year. TSS/TA and means of fruit weight were affected by interaction of year and cultivar. The highest means of fruit weight was on Yunesi in the years of 85 and the highest TSS/TA was in years of 88 on Clementine cultivar. The highest alternate bearing index obtained in years of 88 on the Unshiu cultivar and the lowest that was on the Page cultivar. The highest yield efficiency, cumulative yield and plant height were observed on Yunesi cultivar, and the highest width and canopy of tree were on Unshiu cultivar. The lowest yield and tree size were on Page cultivar.

Keywords: Flying dragon, Mandarin, Yield, Morphology

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The Effect of Metal Ion Contents in Petal Tissue on Perception of Flower Final Colors in *Gerbera hybrid*

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Abstract

Interaction of floral pigments with metal ions can alter the final color of the petals. Metal ions can affect stability of flowers final color by altering vacuolar pH and activity of enzymes involved in biosynthesis, destruction, accumulation and transition of pigments. In this study, contents of metal ions of petal tissue and their relationships with parameters of petal color analyzed and compared in stage of full blooming in six varieties Gerbera with different colors. Investigation on metal ion contents in different varieties didn't show statistically significant difference in Cu^{2+} content. Results showed that enhancement of Fe^{2+} content in petals increased *a** and *C** parameters and decreased *L** value. Also, reduction of Zn^{2+} amounts in petal tissue increased *h** value. Unlike Ca^{2+}, a positive significant difference observed between Mg^{2+} contents and parameters of *C** and *a**, also a negative significant difference between Mg^{2+} content and *L** value. Ions of Fe^{2+}, Ca^{2+} and Mg^{2+} presented more effective relationship with flower color parameters. Concentration of Fe^{2+}, Cu^{2+}, Zn^{2+}, Mn^{2+}, Ca^{2+} and Mg^{2+} in petal tissue were ranged to 0.0076-0.012, 0.0035-0.004, 0.0017-0.003, 0.0021-0.0032, 2.18-2.97, 1.45-1.79 mg g^{-1} FW, respectively.

Keywords: Chroma, Lightness, Absorption spectra, Metal ions, *Gerbera hybrida*

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Effect of Fe and Zn Micro Nutrients on Yield and Yield Components of *Pimpinella anisum* L.

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Abstract

The higher levels of essential elements in soil may be caused in optimum yields and crop quality. So it seems to be necessary to examine different levels of nutrients like Fe and Zn on plants and their productivity. To evaluate effects of iron and zinc application on yield and yield components of *Pimpinella anisum* an experiment was conducted at the research farm of Urmia University in 2009. Treatments, iron application (0, 0.2, 0.4 and 0.6%) and zinc (0, 0.2, 0.4 and 0.6%), were arranged as factorial based on randomized complete block design with 3 replications. Results showed the significant effect of interaction between iron and zinc on the number of seed in per plant,1000 seed weight, biomass yield, seed yield and harvest index (HI). The maximum value of the 1000 seed weight (2.22 g) was obtained from 0% of Fe and 0.2% of Zn, whereas the minimum value of the 1000 seed weight (1.92 g) belonged to 2% of iron and 0% of zinc. The highest number of seed per plant (762), maximum value of biomass yield (2652 kg/ha) and highest of seed yield (1372 kg/ha) were obtained from 0.6 and 0.4 percent of Fe and Zn and the lowest number of seed per plant (272), maximum value of biomass yield (716 kg/ha) and highest of seed yield (470 kg/ha) were obtained from 0 and 0.6 percent of Fe and Zn, respectively. The highest HI (66.18) was obtained at control treatment and the lowest one (46.67) at both 0.4 percent of Fe and Zn. The essential oil percent increase in average values of Fe and Zn spraying. But accumulation of Fe and Zn were the maximum in higher levels of spraying.

Keywords: *Pimpinella anisum,* Iron, Biomass, Zinc, Essential oil percent, Seed yield, Manure, Medicinal Plant

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Effects of Different Fertilizer Treatments on Quantitative and Qualitative Characteristics of Isabgol (*Plantago ovata*)

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Abstract

Application of organic manures is one of the most important strategies for plant nutrition compared to chemical fertilizers, especially in organic management of medicinal plants. In order to evaluate the effects of different organic and chemical fertilizers on yield, yield components and qualitative characteristics of isabgol (*Plantago ovata*), a field experiment was conducted based on randomized complete block design with three replications at the Agricultural Research Station, College of Agriculture, Ferdowsi University of Mashhad, during growing season of 2011-2012. Treatments included three levels of nitrogen fertilizer (25, 50 and 75 $kg.ha^{-1}$), three levels of cow manure (5, 10 and 15 $t.ha^{-1}$) and three levels of vermicompost (2, 4 and 6 $t.ha^{-1}$) and control.The results showed that the effectof different fertilizers was significant ($p\leq0.05$) on all studied traits except swelling rate of isabgol. The maximum amounts were observed in 6 $t.ha^{-1}$ vermicompost and 15 $t.ha^{-1}$ cow manure. The highest seed yield (548.4 $kg.ha^{-1}$) was observed in 6 $t.ha^{-1}$ vermicompost that it enhanced up to 26% compared to control. By increasing in organic fertilizers enhanced mucilage content, swelling factor and swelling content of isabgol. The maximum mucilage content and swelling factor were observed in 15 $t.ha^{-1}$ (with 35.3% and 13.4 ml, respectively). Since, organic matters improved quantitative and qualitative yield of isabgol compared to chemical fertilizer, it concluded that these organic inputs could be regarded as a suitable alternative to enhance the growth and yield of medicinal plants such as isabgol especially in low input systems.

Keywords: *Plantago ovate,* Organic manure, Medicinal plant, Nutrient management, Mucilage

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Effect of Natural Antitranspirant Compounds on Physiological and Biological Properties of Basil (*Ocimum basilicum*) under Water Stress Condition

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Received: 19-02-2013
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Abstract

In order to study the effect of natural antitranspirant compound and water stress on growth, development and essential oil content of *Ocimumbasilicum* a factorial experiment based on completely randomized design with three replicates was conducted. 3 levels of water stress (500 as control, 375 and 250 ml/day) and 3 antitranspirant compound (chitosan, plantago mucilage and psyllium mucilage) in 3 levels of 0.5, 1 and 1.5% (m/v) and applied during the plant growth. Photosynthesis, transpiration, stomatal conductance, stomatal chamber CO_2, leaf temperature, fresh and dry weight of herb, essential oil percentage and content were measured. The results showed that water stress and antitranspirant application had a significant effect on all measured traits ($P\leq0.05$ and $P\leq0.01$). The highest values of these traits were observed in control for water stress treatment and different levels of antitranspirant compounds. Transpiration levels from leaf were significantly decreased by antitranspirant compounds application. Chitosan (1 and 1.5%) decreased transpiration by 200% over control. Photosynthesis was also increased up to 30% by chitosan treatment (0.5 and 1) in comparison to control.Also, antitranspirant compounds increasing dry matter yield in water stress condition but reducing essential oil % and yield in comparison with control. In general, according to the result of this experiment, antitranspirant compounds with natural origin are safe, biodegradable, easy available, low cost and alternatives which can be used in substitution with common chemical types.

Keywords: Basil, Antitranspirant, Water stress, Chitosan, Plantago mucilage, Psyllium mucilage, Photosynthesis, Essential oil

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Investigation on the Hormone Effects on *in vitro* culture of *Iris pseudacorus*

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Received:09-05-2013
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Abstract

Three experiments were conducted in tissue culture and biotechnology laboratory of Horticulture Department of Mohaghegh Ardabili University in 2012. For the regeneration of plant from seed, different concentrations of NaOH (5, 10, 15, 20 M) and various scarification methods with sandpaper (soft scarification, medium scarification and hard scarification) were used based on completely randomized design with 4 replications. The results of experiment revealed that seeds treated by 20 M NaOH and hard scarification produced the highest germination rate. After 2 months of seed germination, hypocotyles of seeds were used as explants and cultured in MS medium containing different concentration of 2,4-D, picloram, TDZ and BA (1, 2, 4 mg/l) based on completely randomized design with 4 replications. Mean comparison revealed that explants treated by 4 mg/l picloram and 1 mg/l 2,4-D produced the highest callus content. Mean comparison showed that explant treated by 1 mg/l BA produced the highest shoots. However, to investigate the soluble protein changes during growth stages and to study the effects of 2,4-D, picloram, TDZ and BA on soluble protein and experiment was conducted. The result showed that by increasing the plant age, soluble protein was reduced and also the highest soluble protein was found after 4 weeks of germination. The result also showed that explants treated by 4 mg/l picloram and 1 mg/l BA produced the highest soluble protein content.

Keywords: Micropropagation, Scarification, Tissue culture

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Evaluation of the Effects of Disinfection Method and Packaging Type on Quality Attributes of Rutab Fruit (*Phoenix dactylifera* cv. Barhee)

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Abstract

Barhee is one of the most important date cultivar worldwide that its production in Iran is done mainly in Khuzestan province. This cultivar has many consumers at its three last developmental stages especially Rutab stage. In Rutab stage, the fruit texture is very soft and due to high water and sugar content is a good target for microorganisms and so it has a short storage life. Using new disinfection and proper packaging methods to reduce these undesirable factors can result in expanding the market of this valuable product. In this research, date fruit cv. Barhee was harvested at Rutab stage and after disinfection with two methods (i.e. heat pasteurization and UV-C irradiation) was packed with polypropylene films in two types of completely sealed and perforated. Fruit was stored at 5°C for three months and then analyzed for quality attributes including weight loss, fruit water content, TSS, titratable acidity, antioxidant capacity, phenolic content, mold content and surface color. The experiment was conducted as factorial based on completely randomized design with three replications. The results showed that both method of disinfection resulted in considerable control of fruit microbial count and the fruit which was treated with UV-C light had lowest level of weight loss, titratable acidity and TSS. Also, the fruit that packed in sealed type represented negligible weight loss and color changes as well as microbial contamination due to lack of exposure to ambient air.

Keywords: Date fruit, UV-C irradiation, Pasteurization, Packaging and Quality

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Chlorophyll, Soluble Sugar and Flower Dry Weight of German Chamomile in Response to Methyl Jasmonate under Salinity Stress

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Abstract

Using plant growth regulators at the stresses environment can improve plant growth and crop production. Hence, in this research response of photosynthesis rate, chlorophyll, soluble sugar and flower dry weight of chamomile to methyl jasmonate under different salinity levels was studied. Values of 0 (control), 75, 150, 225 and 300µM methyl jasmonate (MeJA) with salinity levels of 2, 6, 10 and 14 dS/m was evaluated as a factorial experiment based on a randomized complete block design with three replications. The effect of MeJA and salinity was significant for photosynthesis rate, leaf temperature difference (ΔT), relative water content (RWC), chlorophyll a, chlorophyll b, total chlorophyll, soluble sugar and flower dry weight. Also, MeJA × salinity interaction affected all traits except ΔT. The highest value of photosynthetic rate (9.99 µmolCO_2 m^{-2} s^{-1}), chlorophyll a, b and total chlorophyll, in averaging 5.98, 41.18 and 45.10 mg g^{-1}, respectively, and flower dry weight (3.73 g pot^{-1}) were obtained at 75µM MeJA and 6 dS/m salinity. But, there was no significant difference between 75µM MeJA×6 dS/m and 75µM MeJA×2dS/m for RWC and flower dry weight traits. Maximum soluble sugar was achieved at 75µM MeJA×14 dS/m treatment. In general, using of MeJA increased RWC and decreased undesirable effects of salinity. With decreasing RWC photosynthetic rate, chlorophyll and flower dry weight decreased, but ΔT increased.

Keywords: German chamomile, Salinity Stress, Physiological characters, Yield flower, Methyl jasmonate

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Effect of Foliar Application of Iron, Zinc and Manganese Micronutrients on Yield and Yield Components and Seed Oil of Pot Marigold (*Calendula officinalis* L.)

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Abstract

Although micronutrients effect on growth and yield of different plants has been intensively investigated, but there is limited information on its effect on grain yield and seed oil content of pot marigold (*Calendula officinalis* L.). In order to investigate the effects of micronutrients (Fe, Zn and Mn) spraying on yield and yield components and seed oil of pot marigold, a field experiment was conducted based on randomized complete block design with three replications at the Research Farm of Payame Noor University of Nagadeh in 2010. Treatments included Fe, Zn, Mn, mixed solutions of these elements (Fe+Zn, Fe+Mn, Zn+Mn, Fe+Zn+Mn) and control (water). Treatments were applied in 2 g/litter twice at stem elongation and early flowering stages. Different traits such as plant height, number of capitol per plant, number seed per capitol, thousand seed weight, biological yield, seed yield, seed oil percentage and oil Yield were recorded. The results showed that foliar application of micronutrients had significant effects on all of these traits. Yield components, seed yield, oil percentage and yield were enhanced by foliar application, compared with control (untreated plants). The maximum number seed per capitol, thousand seed weight and biological yield were relevant to Fe treatment. The highest numbers of capitol per plant and seed yield (643.33 $kg.ha^{-1}$) were relevant to Zn+Fe treatment and the maximum oil yield (124.20 $kg.ha^{-1}$) was produced by Zn+ Fe+ Mn treatment. Seed yield and oil yield increased by 31.27% and 44.18% yields more than control, respectively. It can be concluded that, foliar application of micronutrients had positive effects to obtain high yield and oil of pot marigold.

Keywords: Number seed per plant, Number of capitol per plant, Quantitative yield, Qualitative yield, Medicinal plant

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Investigation of Catalase, Proxidase and Total Protein Level in Some Cold Treated Grapevine Cultivars Cold Stress Response

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Abstract

Chilling is an important environmental stress that influences the yield and quality of many agricultural crops. Different plants use different systems to endure this stress and minimize its effects. One of these systems is enzymatic reaction. To find out more about responses of different grapevine species and cultivars to the low temperature conditions, their enzymatic changes were evaluated in a factorial experiment based on randomized complete design with 3 replication during different periods after chilling stress. Leaf samples of plants under cold stress had been taken and maintained in -80 °C until enzyme extraction. Low temperature around 4 °C is sufficient to induce genes that produce chilling acclimatization proteins. In the present study, leaf samples were collected from the plants that were kept at 4 °C during different time intervals, and then total proteins as well as two main antioxidant enzymes (catalase and guaiacolperoxidase) activities were measured. Results showed that as temperature decreased, enzymatic activities were increased in six Iranian grapevine cultivars (‘Atabaki’, ‘Khalili-Danedar’, ‘Shahroodi’, ‘Rajabi-Siah’, ‘Askari’ and ‘Bidane-Sefid’) as well as ‘Riparia’, an American species. The highest enzymatic activities of catalase and ceroxidase were recorded in ‘Khalili-Danedar’ and ‘Riparia’. However,the lowest activities were recorded in ‘Rajabi-Siah’, ‘Bidane-Sefid’ and ‘Shahroodi’. For all studied cultivars, peroxidase showed its highest activity at 12 h after chilling stress, then remained constant, while, the highest activity of catalase were recorded at 8 h. In addition, cold stress increased the total protein content for all studied cultivars, in which ‘Khalili-Danedar’ had the highest protein content amongstudied cultivars. Also, the highest proteins content were recorded at 12 h after exposing plants to cold.

Keywords: Grapevine, Chilling stress, Catalase, Guaiacol Peroxidase, Total proteins

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شاپا: ۴۷۳۰ - ۲۰۰۸

Effects of BAP and TIBA on Shoot Proliferation of *Rosa hybrida* L. cv. Full House in *in vitro* Culture

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Abstract

Micropropagation is a proper approach to rapid and large-scale propagation of rootstocks and rose cultivars for huge demand of flower market. Proliferation rate of shoot is decreased drastically following several subcultures. Growth regulators have remarkable effects on the key phase of proliferation in micropropagation of this popular crop. In this research the effects of BAP and antiauxin of TIBA on quality and quantity of developed shoots in *Rosa hybrida* cv. Full House were studied. BAP and TIBA were applied at three concentrations of 0, 2.2 and 8.8 µmol in proliferation phase of micropropagation. The experiment was conducted based on factorial and completely randomized design with four replications. After two months, the percentage of proliferated explants, survived main and lateral shoot number, length of the main and lateral shoots, number of green leaves on the shoots, the average number of shoots with chlorotic and necrotic leaves, the average axillary shoot base diameter, fresh weight of shoots and number of shoots with necrotic tip were recorded. Analysis of variance indicated that BAP was ineffective on the number of the main shoot green leaves and decreasing number of shoots with necrotic tip, but enhanced other traits. The concentration of 8.8 µmol of BAP had greater effect than 2.2 µmol of this growth regulator on mentioned traits. The higher concentration of TIBA resulted to more shoot with necrotic tip. This antiauxin had anegative impact on shoot fresh weight, but the other parameters were not significantly affected.

Keywords: Rose, Micropropagation, BAP, TIBA

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Effects of Organic, Chemical and Biological Fertilizers on Crude Protein, Oil Yields and Fatty Acids of Black Seed (*Nigella sativa* L.)

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Abstract

In order to investigate the effects of organic, chemical and biological fertilizers on crude protein and oil yields and fatty acids composition in black seed (*Nigella sativa* L.), a field experiment was conducted at Agricultural Research Station of Ferdowsi University of Mashhad, Iran, in 2009-2010. The experiment was arranged by using a complete randomized block design based on factorial arrangement with three replications and 12 treatments. The experimental treatments included fertilizer sources (vermi compost, urea fertilizer and control) as first factor and different biological fertilizers (nitroxin (including *Azotobacter* sp. and *Azospirillum* sp), mycorrhizae, biosulfur (including *Thiobacillus* sp.) + sulfur and control (no biofertilizer)) as second factor. Results showed that crude protein and oil yields of black seed in vermi compost were significantly higher than urea fertilizer. In addition, the biological fertilizer had no significant increasing effects on crude protein and oil yields, except biosulfur + sulfur. Chemical analysis of black seeds showed a composition of 10.9% crude protein and 24.5% fat. Linoleic (49.18%) and oleic acids (26.77%) was the major unsaturated while palmitic acid (12.68%) was the main saturated fatty acid.

Keywords: Unsaturated fatty acids, Oil percentage**,** Gas chromatography mass

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The Effect of Foliar Application of Salicylic acid and Thiamine on the Biochimical Characteristics of *Gerbera jamesonii* cv. Pink elegance

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Abstract

Gerbera is one of the ten important cut flowers in terms of production and consumption in the world and Iran. In this research effects of foliar application of salicylic acid and thiamine on biochemical characteristics of gerbera flower were investigated. This experiment was conducted in a completely randomized design with four replications in the greenhouse commercial of the Golazin Maghsoud Company. Treatments were included of municipal water (control), salicylic acid 75 and 150 µM and thiamine 250 and 500 µM. Foliar application was performed with interval of two weeks in two stages. The results showed that the treatments had a significant effect on biochemical characteristics of gerbera. The greatest amount of chlorophyll a (36.6 µg/g Fw), b (17.27µg/g Fw) and total chlorophyll content (61.17 µg/g Fw) were related to Thiamine 250 µM and the highest level of carotenoids content 7.87 (µg/g Fw) was related to Thiamine 500 µM. The most reducing sugars content (181.51 mg/g Fw) reported in 75 µM salicylic acid. The highest activity of catalase and peroxidase enzyme (94.5 and 70.7 unit enzyme per minute in gram fresh weight, respectively) were related to 75 and 150 µM salicylic acid. Thus, salicylic acid and thiamine increased photosynthetic pigments, antioxidant enzyme activities.

Keywords: Peroxidase enzyme, Reducing sugars, Chlorophyll, Carotenoid, Catalase enzyme

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Evaluation of Relative Genome Content and Response of Tall Fescue Seedling under Drought Stress Collected in Iran

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Abstract

Decrease in genome content may play a role in environmental adaptation. Many studies were reported significant correlation between genome size, weather condition and germination percentage. Relative genome content and its correlation with seedling establishment of 14 populations of tall fescue collected from various regions in Iran and two commercial tall fescue cultivars were studied under drought conditions. Results showed that except one entry diploid (Brojen = 2x), all entries were hexaploid (6x). Cluster analysis revealed that the populations fell into four groups. Isfahan (Group II: average DNA content 17.92 pg) and Ghochan (Group VI: average DNA content 18.56 pg) with 100% and 6.7% final emergence and 8.8, 2.3 cm leaf length respectively in 40% FC soil water content wree the most tolerable and sensitive entries under drought stress. Relative genom content of the wild populations and two commercial cultivar were negatively correlated with emergence (r=-0.56) and leaf length (r=-0.61). The reduction in genome size may be a mechanism of adaptation to arid environments. The drought tolerance was observed among the entries that grouped in cluster I and II represent potentially useful germplasm for a breeding program.

Keywords: DNA content, Emergence percentage, Drought stress, Leaf length

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Relationship Between Seed Yield And Some of Fruit Traits in Iranian Squash (*Cucurbita pepo* L.) Accissions

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Abstract

In order to evaluation of squash (*Cucurbita pepo*) seed yield per fruit and its relations with other characteristics of fruit include: length, diameter, length: diameter ratio (fruit shape), flesh thickness, thousand seed weight and fruit weight, an experiment was conducted using 24 accessions of squash as a randomized complete-block design with three replications. Morphological traits were evaluated according to UPOV descriptor and UPGMA clustering algorithm clustered the accessions in 4 groups (predominantly on the basis of fruit shape). Correlation, regression and path analysis were done for mentioned characteristics in 4 type-fruit groups. There was negative correlation between seed yield of individual fruit and its length and fruit length: diameter ratio. But fruit weight, fruit diameter, and thousand seeds weight had positive correlation with seed yield. Seed weight: fruit weight ratio had negative relationship with fruit weight. Therefore small size fruit is more suitable for seed yield per area. Path analysis was showed fruit weight had the most positive direct effect on seed yield per fruit in all groups.

Keywords: Correlation analysis, Fruit shape, Fruit weight, Path analysis, Seed yield, Squash

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