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Effect of training system and calcium chloride foliar spray on storability of apple fruit cvs. 'Gala' and 'Delbarestival'

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Abstract

The type of training system and application of calcium spray have considerable effects on storability of fruits. In this study, the effects of calcium chloride spray (0, 0.75, 1.5 and 3 $g.L^{-1}$) in three times during 2, 4 and 6 weeks before harvest time on apple (*Malus domestica*) fruits cvs. 'Gala' and 'Delbarestival', which trained in three different training systems (V shape, HighTech and Cordon) were investigated after 4 months in cold storage. This experiment was designed as split factorial in frame of randomized complete block design with four replications. The fruit characteristics such as fruit firmness, total soluble solids (TSS), titratable acid (TA), TSS/TA, total phenolic, total flavonoids, total anthocyanin, ethylene and respiration rate were evaluated at the end of storability. The results showed that training systems types and foliar application with calcium chloride had significant effect on postharvest quality of fruits. Calcium chloride spray increased TSS, TA content, antioxidant capacity, anthocyanin content, phenol content and tissue firmness of fruits at the end of storage in compared to control. Fruits firmness of Gala was higher than Delbarestival cultivars. The highest TSS (14.22%) and TA (0.47%) content were found in fruits produced with High-tech system when sprayed with 0.75 g. L^{-1} calcium chloride. Ethylene production of Delbarestival (18.36, 15.22 and 15.11 nL/g.h) was higher than Gala fruits (6.60, 6.38 and 8.43 nL/g.h) at three different training systems. Preharvest calcium spray suppresed ethylene production and respiration rate of apple fruits produced at three different training systems as compared to control at the end of storage.

Keywords: Apple, Training systems, Calcium chloride, Fruit firmness, Ethylene and respiration rate

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Investigation the response of morphological, physiological and biochemichal attributes of marigold to seed priming and 24-epibrassinolide foliar

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Abstract

To investigate the effects of priming and foliar spray by 24-epibrassinolide (EBR) on some of Marigold morphological, biological and biochemical traits, an experiment was conducted as factorial on completely randomized design with three replications at experimental laboratory of department of horticulture, Shahid Bahonar University of Kerman in 2014. Each of priming and foliar spray of EBR had four concentrations (0, 0.1, 1 and 10 µM). Results showed that growth parameters and photosynthetic pigments increased proportional to the increment of EBR in priming and foliar spray treatments. . The greatest shoot weight (79 percent), root (33 percent), fresh (28 percent) and dry (26 percent) weights of pot marigold compared to control were obtained at priming with 0.1 µM plus foliar spray at 0.1 µM of EBR. Furthermore, the highest chlorophyll a, b, total chlorophyll and carotenoids were found at the same concentration (0.1 µM priming + 0.1 µM foliar spray of EBR) with 2.4, 3.1, 2.6 and 2.7 percent increase respectively. The EBR increased protein and reduced sugar up to (35 percent) and (18.3 percent) compared with control. The results of this experiment indicated that application of EBR can be used to improve the growth and development traits of pot marigold.

Keywords: Growth regulation, Growth parameters, Photosynthetic pigments, Protein, Reduced sugar

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Effect of Different levels of Vermicompost and Nitrogen on the Growth Parameters of Tomato Seedlings

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Abstract

Today, the production of healthy and high quality seedlings is the main factors of success in growing vegetables such as tomato. Hence, in order to investigate the effect of different levels of vermicompost and nitrogen on the growth parameters of tomato seedlings (*Lycopersicon esculentum* Mill. cv. Rio Grande), a factorial experiment was conducted in a randomized complete design with three replications in 2014 at the research greenhouse of Department of Horticultural Science, University of Zanjan. Treatments consisted of five vermicompost levels (0, 5, 10, 20 and 40 wt %) and nitrogen at five levels (0, 25, 50, 100 and 200 mg N/kg soil). The results showed that nitrogen treatments caused a significant increase in seedling growth. The maximum seedling height, dry weight of root and stem, fresh weight of stem, leaf area and chlorophyll content was observed in 100 mg N/kg Soil. The vermicompost treatments significantly increased seedling growth, so the highest seedling height, internodes length, root and stem length, fresh and dry weight of root and leaf area was obtained in the 10 wt% vermicompost. Also vermicompost caused a significant decrease in growth period of transplant and the minimum period (39.6 days) was recorded in the 10 wt% vermicompost. According to the results the concentration of N. P and K in leaf increased with application of vermicompost. Application of 100 mg N/ kg soil and 10 wt% vermicompost improved seedling growth

Keywords: Chlorophyll content, Growth index, NPK, Nutrition, Seedling height

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Study of different tillage methods on some soil properties, seed yield and morphological traits of wheat and chickpea under rainfed conditions of Sarpolezahab region

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Abstract

In order to study of no-tillage, reduced tillage and conventional tillage systems on some soil physical properties, yield and some traits of wheat and chickpea, experiments were perfumed across two years in Sarpolezahab's dryland region. Results of combined analysis of variance indicated that different tillage systems had significant effects ($P \leq 0.01$) on seed yield, volumetric soil moisture, bulk density, organic carbon, economic value and morphologic traits of wheat and chickpea. In the first year, seed yield of wheat in reduced tillage treatment was 8 percent higher than no-tillage treatment and 10 percent higher than conventional tillage treatment while in the second year seed yield of wheat in reduced tillage treatment was 2 percent higher than no-tillage treatment and 14 higher than conventional tillage treatment. Also, seed yield of chickpea in reduced tillage treatment was 8 and 56 percent higher than no-tillage and conventional treatments, respectively and in the second year was 51 and 20 percent higher than no-tillage and conventional treatments, respectively. In general, the results showed that the reduced tillage system was favourable and using of this system in replacement of conventional system could be advised to the farmers of dryland areas of Sarpolezahab region in Kermanshah province.

Keywords: chickpea, rainfed conditions, soil properties, tillage, wheat, yield

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Effects of chitosan coating and hot water treatment on postharvest characteristics of fruit pepper

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Abstract

In order to study the effects of chitosan and hot water treatments on storability and fruit quality of sweet pepper "Paks", an experiment was conducted as a factorial design in the base of CRD with three replications.Fruits were treated withchitosan at four levels (0, 1, 1.5 and 2 percent) and hot water at 20 and 45ºC (dipping for 2 min time) and 60ºC (dipping for 2o sec time), then stored for 12, 24 and 35 days at 8°C and 98% RH in refrigerator. The results showed that the quality and vitamin Ccontent of fruits decreased during storage. Coating of pepper with chitosan significantly delayed loss of TSS, firmness, vitamin C, weight losses and fruit quality. Pepper coated with 2% chitosan had the highest effect on keeping fruit quality. Hot water had significant effect on fruit quality. Water with 45°C as hot water treatment improved firmness, titrable acidity, vitamin C, visual quality and activity of catalase and peroxidase enzymes. Heat damage was observed on fruit dipping at 60°C. According to the results, treatment of 2 percent chitosan with hot water 45°C had the best effect on the studied parameters.

Keywords: Acidity, Catalase enzyme, Firmness, Peroxidase enzyme, Total soluble solid

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The effect of humic acid on some yield characteristics and leaf proline content of safflower under different irrigation regimes

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Abstract

In order to investigate the effect of different irrigation regimes on yield and leaf proline content of a spring Isfahan local variety of safflower, a field experiment was conducted as split plot in Randomized Complete Block Design with three replications at the Research Station of Shahrekord University in 2013-2014. The main factor consisted of four different irrigation regimes (irrigation after 50, 80, 130 and 180 mm evaporation of water from evaporation pan class A) and subplots were spraying humic acid (at a rate of zero, one, three and six liters per hectare). Evaluated traits in this experiment included, the number of heads per plant, 1000 seeds weight, oil content, grain yield, oil yield and leaf proline content. Irrigation treatments and foliar application of humic acid significantly contributed to the above characteristics. Based on means comparisons, less irrigation caused a significant decrease and spraying humic acid also increased significantly number of heads per plant, 1000 seeds weight, grain yield and oil yield. Also, with increased Irrigation and increase application of humic acid, oil content and proline compared to the control group showed a significant increase. In addition, increased irrigation, increase seed oil content from 22.22 percent to 25.43 percent (in irrigation treatment after 180 mm evaporation and application of six lit/ha) has been upgraded. Oil yield also decreased as a result of irrigation after 50 mm evaporation from 394 to 289 kg per hectare after 180 mm evaporation.

Keywords: 1000 seeds weight, Foliar application, Grain yield, Oil content, Oil yield, Proline

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The effect of supplemental irrigation and seed priming on seed yield, yield components and some characteristics of vetch

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Abstract

To evaluate effected of supplemental irrigation and seed priming on yield and some quantity and quality characteristics of vetch (*Vicia dasycarpa*) rainfed maragheh cultivar, an experiment was carried out at the Research Farm of Faculty Agriculture of Urmia University, West Azarbaijan province, Iran, during 2011. The experimental design was split-plot, laid out in Randomized Complete Block with three replicates. The main plots were without supplemental irrigation (I_1), one times supplemental irrigation (I_2), two times supplemental irrigation (I_3) and three times supplemental irrigation (I_4). The subplot included four levels of seed priming: Control (C), Water (W), Phosphate (P) and Nitroxin (N). Plant height, Pod number in stems, 1000-grain weight, biological yield (6.83 t/ha) and harvest index were influenced by the supplemental irrigation. Plant height, 1000-grain weight in second and third harvest and harvest index were influenced by seed priming. Maximum and minimum 1000-grain weight was observed in N (40.66g and 14.72) and C (37.05g and 10.36) seed priming, respectively. As a result, applying two times supplemental irrigation and seed treatment with phosphate and nitroxin had positive effects on quality and quantity yield of vetch.

Keywords: Biological Fertilizer, Nitroxin, Phosphate, Quantity Characteristics, Water Deficit Stress

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Investigation of antioxidant enzymes activity and photosynthetic pigments content changes of stevia medicinal plant inoculated with *Piriformospora indica* fungi under salt stress

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Abstract

In order to evaluate the effect of *Piriformospora indica* fungi inoculation on antioxidant systems and photosynthetic pigments of Stevia under salt stress, an experiment was conducted in a factorial based completely randomized design with four replications under in vitro culture conditions. Factors include salinity at six levels (0, 50, 100, 150, 200 and 250 mM of NaCl) and inoculation of mycorrhizae like fungi at two levels (non-inoculated and inoculation with fungi). The results showed that the hydrogen peroxide (H_2O_2) and malondialdehyde (MDA) concentration and catalase (CAT) activity was increased linearly in control plants while in inoculated plants fitted by a segmented equation. Accordingly, in mild stress the activity of these enzymes were reduced. Chlorophyll *a*, *b* and *a*+*b* content changed as a segmented model in both inoculated and uninoculated plants. Carotenoid content, however, linearly decreased in both inoculated (slope of -0.007) and uninoculated (slope of -0.005) plants. In conclusion, the results indicated that *P. indica*, particularly in low levels of salt stress, could reduce hydrogen peroxide (by two percent up to 124 mM of NaCl) and malondialdehyde content (17 percent up to 50 mM of NaCl) which resulted in decreased antioxidant activities and improved photosynthetic pigments and relatively increased tolerance to salt stress in stevia plants.

Keywords: Antioxidant enzymes, Catalase, Chlorophyll, Endophytic fungi, Malondialdehyde

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Effect of transplanting time on grain yield and physiological traits in grain filling period in rice cultivars

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Abstract

Dry matter remobilization, grain filling rate and duration has principle role on rice grain yield, and environment condition directly affect on them. For study the influence of climate factors a factorial field experiment in randomized complete blocks design with three replications conducted at Haraz Extention and Technology Development Centre in Spring 2013. Treatments included rice cultivars namely; Samadi, Tarom Hashemi, Local Tarom, Shiroudi, Keshvari, Gohar and transplanting times (5^{th} may, 20^{th} may and 10^{th} June). Results showed that dry matter remobilization rate, stem dry matter remobilization efficiency, grain filling rate and duration, and grain yield varied significantly among different transplanting times. Transplanting time on 5^{th} may was higher than other two transplanting dates in all traits except for grain filling rate. Tarom Hashemi had highest and improved variety, Shiroodi had lowest grain filling rate. Dry matter remobilization rate, Stem dry matter remobilization efficiency, effective grain filling duration, and grain yield was higher in Shiroudi among rice cultivars. Grain yield negatively correlated with grain filling rate. Increasing in grain filling duration with increased dry matter remobilization had more effective role in rice cultivars grain yield. Increasing temperature in vegetative growth phase with increasing in accumulated growing degree day accompanied with decreasing in tiller number, less tiller number caused higher grain filling rate and lower grain filling duration and dry matter remobilization restriction that decreased grain yield.

Keywords: Cumulative temperature, Dry matter remobilization, Effective tillers, Grain filling duration, Grain filling rate

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Optimization of nitrogen concentration of plant tissue for increased quantity and quality of tobacco leaf using an artificial neural network

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Abstract

Nitrogen (N) affects adversely the tobacco yield quantity and quality as it increases yield, Chlorine and nicotine contents, but decrease potassium content. This experiment was aimed at optimization of (the balance between) N concentration in leaf, stem and root to increase both yield quantity and quality (high potassium, low Chlorine and medium nicotine contents) using artificial neural network. Two field experiments based on complete block design with three replications were conducted in Tirtash and Urmia tobacco research centers. Treatments were factorial arrangement of two N sources (urea and nitrate ammonium) and four application patterns (basal, 2/3 basal and 1/3 after initiation of rapid growth (AIRG), 1/2 basal and 1/2 at AIRG, 1/3 basal and 2/3 at AIRG). The N concentration of leaf, stem and root (model inputs) was measured in 30, 50, 70, 85 and 100 days after transplanting. After harvesting, the quantity of cured leaf and its Cl, K and nicotine content (model outputs) were also determined. The results indicated that a model with one hidden layer and configuration of 15-15-4 is appropriate and there were no significant different between two N sources. The best pattern was use of nitrate ammonium in 2/3 basal and urea 1/3 basal. The average value of optimized N concentration was 3.06, 2.42 and 1.5 percent for leaf, stem and root, respectively. These optimized concentrations can lead to potential increase in quality and quantity of tobacco which should be taken into consideration by breeders and agronomists.

Keywords: words: Leaf, Potassium, Chlorine, Nicotine, Model **.**

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Harvest management of Alfalfa cultivars evaluation within and between different growing season under Khouzestan warm and dry condition

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Abstract

To assessment Alfalfa cultivars research project this research has been fulfilled in 2011 at Khouzestan Agricultural and Natural Resource Research Center in southwest of Ahwaz in Khouzestan province (Iran) by position 31º20′ N, 48º40′ E. At first section for evaluation wet forage yield cultivars such as "Baghdadi", "Mesasersa", "Yazdi", "Bami", "Nikshahri", "Synthetic" (Main factor) and two cutting time (Sub factor) according harvest time in four experiment by statistical plane of split plot based randomized complete block design in four replication was conducted. In summer cutting cultivar at 5% flowering stage, autumn cutting at 6-8 cm height of crown buds, winter cutting at 10-12 cm height of crown buds and spring cutting cultivars harvested at 15% flowering stage. Second section was conducted according statistical plane was mentioned expect sub factor include four level. Result showed Baghdadi, Mesasersa and Synthetic were superior to another cultivars and harvest time on forage yield and also interaction effect of factors on all traits expect stem diameter and number of stem in square meter were significant at 1% probability level. Because of climate factors in summer and spring cutting 25-30 day was best period for growing season. In autumn and winter cutting according low flowering it possible use growing degree days and period of received sunshine hours, their values in order 300-350 and 400-450 hours (Enough time), as well as Baghdadi, Mesasersa and Synthetic cultivars were superior in all cutting.

Keywords: Cutting, Dry matter, Morphology, Plant height, Re-growth

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Effect of manure and chemical fertilizer on physiological and phytochemical properties of coneflower

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Abstract

Plant secondary materials play an important role in health and human nutrition. According to the importance of coneflower in the production of secondary materials and also the effect of nutrient on the amount of secondary materials, a pot experiment was conducted with a completely randomized design six treatments and three replications in Sari University of Agricultural Sciences and Natural Resources in 2015. Treatments were included: chemical fertilizer (150 kg N, 120 kg P_2O_5 and 250 kg K_2O per hectare from urea, triple super phosphate and potassium sulphate source, respectively) (CF), 30 $t.ha^{-1}$ manure (M), 15 $t.ha^{-1}$ M+25 percent CF, 15 $t.ha^{-1}$ M+50 percent CF and 15 $t.ha^{-1}$ M+75 percent CF and control (without applying chemical fertilizer and compost). Result indicated that all traits such as chlorophyll a and b, yield of anthocyanin and flavonoid in leaf and root, yield of total phenolic in flower and percentage of antioxidant activity in full bloom were affected by different fertilizer treatments. So that the maximum concentration of chlorophyll a and b (11.33 and 2.41 $mg.gr^{-1}$ FW respectively) were related to the application of chemical fertilizer that with incorporation manure and chemical fertilizer (15 $t.ha^{-1}$ M + 25 percent CF and 15 $t.ha^{-1}$ M+75 percent CF) were statistically the same level. Meanwhile, the application of 30 $t.ha^{-1}$ M had the greatest effect on anthocyanin and flavonoid in leaves and total phenolic of flower. Maximum antioxidant activity was obtained with using 15 $t.ha^{-1}$ M+25 percent CF increased 10 percent and 80 percent compared to the control and CF treatments, respectively.

Keywords: Anthocyanin, Antioxidant activity, Coneflower, Flavonoid, Total phenolic

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Quality improvement of New Guinea Impatiens by slow releasec fertilizer and humic acid application in medium culture

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Abstract

To evaluate the effect of slow release fertilizer and humic acid on quality of New Guinea Impatiens (*Impatiens hawkeri*), an experiment established in complete random design with 15 treatments and three replications. Treatments were slow release fertilizer (12-11-18-2.7MgO-8S) in five levels (0, 1.5, 3, 4.5 and 6 kg/m^3) and humic acid in three levels (0, 2 and 4 kg/m^3) that mixed with medium culture. The substrate medium was included 50 percecnt of peat moss, 40 percent of perlite and 10 percent of rice husk (v/v). Five months after seeding, results showed the most flower number (20 number) in 6 kg/m^3 mixed with 2 kg/m^3 of humic acid, and the most leaf number (122 number) in 3 kg/m^3 of slow release fertilizer treatments. The slow release fertilizer treatment showed a positive significant effect in all traits. Also, humic acid had a positive significant effect on plant height, leaf and shoot number, leaf area, total chlorophyll, shoot fresh weight, flower diameter, flower life and flower number. Considering that, humic acid in 2-4 kg/m^3 and slow release fertilizer in 3-4.5 kg/m^3 could be recommended for New Guinea Impatiens cultivation.

Keywords: Biological Fertilizers, Flower Life, Nitrogen, Rice Husk, Vegetative Traits

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Improving of quantitative and qualitative traits of sport turf by humic acid and vemicompot application

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Abstract

In order to evaluate the effect of vermicompost and humic acid on quantitative and qualitative traits of sod turf, a factorial experiment based on completely randomized design with three replications was established in research farm in Shahrekord University. Treatments were vermicompost (zero, 5, 10 and 15 v/v percent) and humic acid (zero, 150 and 250 g/m^2), respectively. Some traits such as shoot nitrogen and phosphorus content, shoot height, shoot dry and wet weight, total root length, root fresh and dry weight and root dry weight were evaluated. The results showed that the application of vermicompost and humic acid had a positive significant effect on shoot dry weight, sod root dry weight, total dry weight of roots, fresh weight of root, shoot nitrogen and phosphorous content compared to control. The vermicompost in 15% v/v and humic acid in 150 g/m^2 treatments had the most positive effect on measured traits and increased nitrogen (25.4 percent), phosphorous (39.6 percent) content, shoot dry weight (49.7 percent), root weight (83.3 percent), total root dry weight (215 percent) and sod root dry weight (204 percent). In this research application of vermicompost and humic acid increased uptake of nitrogen and phosphorus and it increased the sod quality.

Keywords: Appearnce quality, Nitrogen, Phosphorus, Root dry weigth, Shoot Height

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Effects of Vermiwash Foliar Application on Yield and Leaf Nutrient Status of Strawberry CV "Govieta"

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Abstract

The present investigation was carried out to evaluate the effect of vermivash on yield and leaf nutrient status of strawberry "Govieta" at research greenhouse of Shahrekord University in 2013. Treatments were included control (without vermiwash foliar spray) and different concentration of vermiwash (10, 15 and 25 percent) that spryed at 1, 2 and 3 weeks interval. Vermiwash was extracted from cow manure vermicompost through earthworm *Eisenia foetida*. The experiment was conducted in completely randomized design (CRD) with three replications. The results showed that there was significant difference between vermiwash treatments and control for the leaf elements of N, K and Fe, but was not significant for the other macro and microelements. Leaf Fe concentration increased up to excessive level in 25 percent concentration with weekly interval. Foliar spray of 25, 15 and 10 percent vermiwash with two-weeks intervals considerably enhanced the number of fruit and yield per plant, but decreaced fruit weigth average a little. Increasing the yield per plant ranged between 24 and 68g for various vermiwash treatments in comparison with control. Vermiwash treatments had no effect on inflorescence number per plant and flower number per inflorescence. Foliar spray of 15 and 10 percent vermiwash with two-weeks interval improved the yield of strawberry "Govita".

Keywords: Liquid Organic Fertilizer, Foliar Spray, Strawberry, Sustainable Agriculture, Vermiwash

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