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(Journal of Agricultural Crops Production)

Vol. 17 ■ No. 2 ■ Summer 2015

The application of chitosan on germination characteristics of two dragonhead varieties (*Dracocephalum moldavica* L.)

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Received: 24 September 2013 **Accepted: 6 February 2014**

Abstract

To study the effects of chitosan at 0.5 (C_1), 0.1 (C_2), 0.05 (C_3) and 0.01 (C_4) (weight percent) concentrations, distilled water (C_5) and one percent acetic acid (C_6) as controls on physiological and morphological characteristics of two landrace and modified (SZK-1) dragonhead (*Dracocephalum moldavica* L.) varieties, a factorial experiment was conducted in completely randomized design in germinator of the Agronomy Department, Tarbiat Modares University. Results showed that, the interactions of treatments had significant effects on radicle length, plumule dry weigh, protein content and SOD activity. C_2V_2 and C_6V_1 produced the highest and the lowest of radicle length with 1.52 mm difference respectively. Also C_2 increased the protein content of landrace variety in compare to C_5. High concentrations of chitosan (C_1 and C_2) increased the SOD activity of modified variety compare to C_5. Therefore chitosan can increase some germination characteristics of dragonhead varieties and improved bred varieties showed a better response to this organic compound.

Keywords: germination, landrace variety, plumule, radicle, super oxide dismutase.

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Effect of gamma irradiation before seed germination and different levels of nitrogen on growth and yield of German chamomile

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Received: 15 September 2013 **Accepted: 14 December 2014**

Abstract

To evaluate the effect of gamma rays on the seeds and amounts of nitrogen on growth and yield of chamomile (*Chamomilla recutita* synonym *Matricaria chamomilla*), a factorial experiment was conducted based on randomized complete block design with three replications at the Research Farm of Agriculture College of Shahid-Beheshti.-Urmia in 2010. Treatments were gamma rays from cobalt-60 on chamomile seeds *cv.* 'Bodegold' (zero, four, eight, 12, 16, and 20 Gray) and different levels of nitrogen (zero, 50, 100, and 150 kg/ha, urea after appearance of the 4th leaf). The highest leaf dry weight per plant (12.5 g) and per hectare (4194 kg/ha), stem dry weight per plant (49 g) and biomass (19995 kg/ha) were obtained at 8 gray and 100, 100, 150, and 150 kg/ha of nitrogen. The highest dried flower yield at the second harvest (104 kg/ha) were obtained from 20 gray by 100 kg/ha nitrogen, and the yield of the third harvest (122 kg/ha) was from 20 gray of gamma irradiation. While, the highest flower yield at the first harvest (419 kg/ha) and total yield (533 kg/ha) were produced from 0 gray and 150 kg/ha nitrogen. Essential oil percent did not affected by treatments, but despite the significant interaction effect of gamma irradiation and nitrogen on the yield of essential oil, means comparison showed no significant differences among treatments. Yield of dried flower in the first harvest, had the greatest impact on the harvest index.

Keywords: biomass, Cobalt60, essential oil, urea, yield.

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Effect of consumption of nitrogen and phosphorus fertilizers on harvest indices and some important agronomical traits of Triticale (*Triticosecale* Wittmack) in Guilan area

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Received: 19 November 2014 **Accepted: 7 April 2015**

Abstract

In order to investigate the effect of consumption of nitrogen and phosphorus fertilizers on harvest indices and some important agronomic traits of Triticale (*Triticosecale* wittmack *var. Javaniloo*), a factorial experiment based on the randomized complete block design with three replications was conducted in paddy field of Rice Research Institute of Iran (Rasht) during 2010-2012 for two years. The first factor was nitrogen in five levels: zero, 50, 100, 150 and 200 kg.ha^{-1} in the form of urea and phosphorus in four levels: zero, 50, 100 and 150 kg.ha^{-1} in the form of superphosphate. Results showed that among the nitrogen levels, the treatments of 200 and 150 kg.ha^{-1} had maximum grain yield (3000.5 and 2999.7 kg.ha^{-1}, respectively), protein yield (442.7 and 449.5 kg.ha^{-1}, respectively) and biological yield (13318 and 12525 kg.ha^{-1}, respectively). Among the levels of phosphorus fertilizer, the treatment of 150 kg.ha^{-1} showed maximum grain yield (2971.0 kg.ha^{-1}), protein yield (434.4 kg.ha^{-1}) and biological yield (12375 kg.ha^{-1}). Also results showed none of the nitrogen levels had the highest phosphorus and potassium indices. Moreover, with the increasing of nitrogen, phosphorus and potassium indices were reduced. Based on the obtained results, the treatments of 150 kg.ha^{-1} nitrogen and 150 kg.ha^{-1} phosphorus are recommended for cultivating triticale in Guilan area due to high grain and protein yields.

Keywords: biological yield, chemical fertilizer, grain yield, morphological traits, protein content.

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The possibility of chemical weed control in nursery of orange coneflower (*Rudbeckia fulgida*) and moss rose (*Portulaca grandiflor*)

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Received: 30 November 2013 **Accepted: 9 October 2014**

Abstract

In order to investigate chemical control of weeds in nursery of orange coneflower and moss rose two experiments were conducted in Randomized Complete Block Design (RCBD) with four replications in 2011. Treatments were Per-plant trifluralin (EC48 percent) with and without incorporation with soil at 0.2 and 0.3 ml/m^2, Per-emergence and Post-emergence oxyfluorfen (EC24 percent) at 0.2 and 0.3 ml/m^2, Pre-plant chlorthal-dimethyl (WP48 percent) at one g/m^2, two-times hand weeding, weedy and without weed control. Results showed that the use of all herbicide avoided germination of moss rose, thus chemical control of weeds was not recommended. In orange coneflower, kochia, pigweed, lamb'squarters, purslane (broad-leaf weeds) and monocots were controlled by terifluralin, but poor control of common mallow, velvetleaf and venice mallow was achieved. Chlorthal-dimethyl had less efficiency in control of broad-leaf and grass weeds comparing to other herbicides. The best treatment for the control of weeds in the nursery of orange coneflower was trifluralin + hand weeding.

Keywords: chlorothal-dimethyl, efficiency of control, herbicide, oxyflurfen, trifluralin.

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Evaluation of Peach, Bitter Almond, GF677 and GN15 Rootstocks for Bicarbonate or Iron Deficiency-Induced Chlorosis

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Received: 22 July 2014 **Accepted: 24 September 2014**

Abstract

In order to evaluate tolerance of four Prunus rootstocks to Fe-deficiency-induced Chlorosis, an experiment was carried out in Bu-Ali Sina University in 2012 using a RCBD design with four replications. Four rootstocks were used, including GF677, GN15, bitter almond and peach and nutritional treatments were: Hoagland solution without Fe (pH= 6), Hoagland solution containing 90µM Fe as control (pH= 6), and Hoagland solution containing 90 µM Fe + 10 mM KHCO3 (pH= 8). At the end of experiment, total and active content of iron in leaves and roots, chlorophyll content, hydrogen peroxide levels as well as catalase and ascorbate peroxidase enzyme activity were measured. Based on the results, peach was the most sensitive rootstock to iron deficiency and bicarbonate treatments, while almond was the most tolerant rootstock. Comparing two peach×almond hybrid rootstocks showed that GF677 had better performance under iron deficiency and in the presence of bicarbonate rather than GN15. Bicarbonated nutrient solution inhibited the Fe absorption and transport by peach roots, whiles other rootstocks uptake high amount of iron and transferred it to shoots. In this condition, on both peach-almond hybrids, GF677 and GN15, large amounts of iron in leaves were in inactive form but on bitter almond rootstock in addition to high iron uptake and transport, large amounts of this element was active and utilizable by leaves.

Keywords: active iron, almond, ascorbate peroxidase, catalase, rootstock.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of soybean oil and naa on delaying bud break and reducing spring low temperature damage in grape cv. Fakhri

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Received: 12 May 2014 **Accepted: 5 November 2014**

Abstract

Delaying bud break, using chemicals is an approach to avoid spring frost damage. Therefore, the effect of spraying different concentrations of soybean oil and naphthalene acetic acid (NAA) on delaying bud break, altering internal atmosphere and cold hardiness in grape cultivar 'Fakhri' was studied in 2011 in a commercial vineyard in Maryanaj, Hamedan using a factorial trial based on randomized complete block design with three replications. Selected branches were pruned to six buds. The concentration of carbon dioxide and ethylene gases in the buds were measured three days after spraying. Results showed that spraying 10 percent soybean oil alone or in combination with 100 mg/l naphthalene acetic acid caused the highest concentration of carbon dioxide and ethylene in buds, delayed bud bursting for 12 days and improved cold resistance of buds by 5°C. Auxin had minor impact on delaying opening and increasing cold tolerance of buds, while five percent soybean oil alone or in combination with NAA had intermediate effect. Applying oil treatments in March had more considerable effect on delaying bud opening and CO_2 and ethylene accumulation, compared to April spraying. It seems that applying soybean oil prolongs bud dormancy due to increasing respiratory gases accumulation which subsequently delays bud break and resulted in decreased spring frost damage.

Keywords: auxin, delay blooming, grape, respiration, soybean oil, spring frost.

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Evaluation of yield, Land Equivalent Ratio (LER) and silage quality related traits in oat (*Avena sativa*) and vetch (*Vicia sativa*) intercropping

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Received: 4 February 2014 **Accepted: 12 July 2014**

Abstract

Effect of different planting ratios of oat (*Avena sativa* L.) and vetch (*Vicia sativa* L.) was assessed on quality and quantity of forage and silage in an intercropping system as completely randomized block design (RCBD) with four replications. The treatments were different planting ratios of oat and vetch including 0:100, 20:80, 40:60, 50:50, 60:40, 80:20 and 100:0 (Oat-Vetch) formed as replacement series. The results indicated that the highest quantitative yield obtained from 40 percent: vetch + 60 percent oat where their fresh and dry matters were 62.88 and 15.72 ton/ha, respectively. The results obtained from analysis of variance showed, all the parameters including crude protein, butyric acid, lactic acid, acetic acid, Natural Detergent Fiber (NDF) and Acid Detergent Fiber (ADF), propionic acid were significantly different with differing planting compositions except ethanol and ammoniac nitrogen. Monoculture of vetch (0-100) produced the highest level of crude protein, butyric acid and lactic acid whereas maximum acetic acid was obtained from 20 percent vetch + 80 percent oat. Maximum NDF and ADF observed from 40 percent vetch + 60 percent oat and the highest level of propionic acid were related to oat monoculture. Generally the ratio of 40 percent vetch + 60 percent oat with maximum of quality and quantity of yield was superior to others and it was acceptable as qualitative characteristics.

Keywords: legume, seed ratio, silage, stability of production, sustainable agriculture.

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Evaluation of some physiological and morphological characteristics of three apple (*Malus domestica* Borkh.) cultivars onto vegetative rootstocks, MM106, MM111 and M9

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Received: 8 April 2014 **Accepted: 8 December 2014**

Abstract

Rootstock and cultivar selection is the most critical decision at the time of an apple orchard establishment. Tree size, yield and fruit quality are affected by roostock and cultivar. Non-sufficient study of rootstocks and cultivars effects on mentioned traits will lead to incorrect result or failure in orchard managing. In this study the effects of three vegetative rootstocks (MM106, MM111 and M9) on vegetative and reproductive growth and some physiological characteristics of three apple *(Malus domestica* Borkh.) cultivars, 'Golden Delicious', 'Fuji' and 'Delbarestival' were evaluated in a factorial experiment based on randomized complete block design in Khodabande (Zanjan Province) during two growing seasons in 2011 and 2012. The results showed that different combinations of rootstock and cultivar have significant effects on vegetative vigor, primary and final fruit set, yield per tree and yield per hectare, amount of fruit dry weight, leaf photosynthesis rate, stomatal conductivity and transpiration rate, water use efficiency and leaf soluble carbohydrates. In two years of study, 'Golden Delicious' and 'Fuji' cultivars had the highest and lowest fruit length, respectively. The highest trees were observed in 'Delbarestival' cultivar. Among the evaluated rootstocks, the lowest tree canopy diameter was measured in M9 rootstock. Nitrate reductase activity was affected by cultivar and rootstock and the highest activity of this enzyme was measured in leaves of 'Golden Delicious' cultivar grafted on M9 rootstock. 'Delbarestival' onto MM106 rootstock and 'Golden Delicious' onto M9 rootstock were the most appropriate grafting combination based on the studied traits in this research .

Keywords: apple, carbohydrates, june drop, nitrate reductase enzyme, productivity.

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The effects of drought stress and humic acid on some physiological characteristics of roselle (*Hibiscus sabdariffa*)

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Received: 9 July 2014 **Accepted: 24 January 2015**

Abstract

To study the effect of humic acid and drought stress on some physiological characteristics of roselle (*Hibiscus sabdariffa*) an experiment was conducted in the research field of Agricultural Education Centre of Jiroft in 2013. Field experiment was carried out as split plot design with three replications. Water deficit stress as main factor with three levels (A1 = Irrigation after 50, A2 = 100 and A3 = 150 mm evaporation from pan class A) and humic acid was sub plots in four methods of application (B1 = non humic acid, B2 = with irrigation, B3 = with irrigation + once spraying, B4 = with irrigation + twice spraying). Humic acid was used with irrigation at 10kg/ha and for spraying at 250ml/100l. Drought stress had significant effect on chlorophyll a, chlorophyll b, carotenoids, relative humidity content and proline of roselle leaves. Interaction effect of humic acid and drought stress was only significant for total chlorophyll and soluble carbohydrate. Drought stress decreased chlorophyll a (48.22%), chlorophyll b (32.77%), carotenoid content (79.64%) and relative humidity (12.59%), while increased proline content (12.59%). Humic acid increased chlorophyll a, chlorophyll b and carotenoids but reduced proline content (15.04%).

Keywords: osmotic adjustment, pan evaporation, proline, relative humidity, spad.

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(Journal of Agricultural Crops Production)
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Interaction effect of cultivar and living mulch on sunflower yield and weed control

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Received: 19 May 2014 **Accepted: 3 Jan 2015**

Abstract

In order to evaluate the effects of crop cultivars and living mulch on sunflower yield and weed control, a field experiment was carried out as factorial arrangement based on a randomized complete block design with three replications in 2013. Treatements were sunflower cultivars (‘Azargol’, ‘Allstar’, ‘Farokh’) and weed control treatments (weed-free, weed-infestation and intercropping of *Fagopyrum esculentum*, *Medicago scutellata*, *Vicia villosa as living mulch* alone and in combination with one hand-weeding).In comparison to weedy treatement, *F. esculentum*, *M. scutellata* and *V.villosa* cover crops were reduced total weed biomass 43.7, 33.8 and 25 percent, and weed density 57.1, 38.1 and 29, respectively. Weed control was improved significantly when cover crops used in combination with one hand-weeding. The lowest weed biomass and density were recorded in the ‘Azargol’ cultivar. The highest Sunflower leaf area index (LAI) was obtained in ‘Azargol’ cultivar under weed-free condition. Weed interference decreased grain yield of ‘Azargol’, ‘Allstar’ and ‘Farokh’ by 18.6, 22.1 and 33.4 percent, respectively compared to weed-free plots. The highest grain yield was obtained in ‘Azargol’ cultivar. *Medicago scutellata* as cover crop in combination with one hand weeding resulted in yields similar to the weed-free treatment. Overall, the results of this study revealed that the use of *M. scutellata* as living mulch and ‘Azargol’ as competitor cultivar can be used as part of an integrated weed management for sustainable sunflower production.

Keywords: ecological weed management, living mulch, sunflower grain yield, weed interference, weeding.

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Crops Improvement
(Journal of Agricultural Crops Production)
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Salicylic acid application on some morphological and physiological traits in clary sage under salinity stress

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Received: 27 June 2014 **Accepted: 11 December 2014**

Abstract

To study the interaction effect of the salinity and salicylic acid on some morphological and physiological traits in clary sage (*Salvia sclarea*), a pot experiment was conducted as factorial based on a completely randomized design with three levels of NaCl and control (zero, 50, 100 and 150 mM), as the first factor and three levels of spraying the solution of salicylic acid and control (zero, 100, 200 and 300 mg/L), as the second factor with three replications in the greenhouse of Semnan Jihad-e-Agriculture Education center in 2013.The results of data variance analysis showed that the interaction of the salinity stress and salicylic acid levels were significant in other traits except the leaf length fresh weight and the rate of carotenoids. The maximum effect was seen at the salinity level of 50 and 100 mM and salicylic acid application at 200 mg/l. The results of this study indicated that leaf area and number, petiole length, leaf length and width, leaf fresh and dry weight, root length, chlorophylls concentration were influenced by the salinity levels in this plant. Somehow, their rates were decreased by increasing the salinity level, whereas the rates of soluble sugar, proline and carotenoid were increased. The application of salicylic acid showed a reducing effect in all traits.

Keywords: growth characteristics, growth regulator, lamiaceae, NaCl, *Salvia officinalis.*

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(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of foliar application of methyl jasmonate in cold tolerance improvement of greenhouse-grown cucumber cv. 'Negin' seedlings

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Received:6 October 2014 **Accepted: 28 November 2014**

Abstract

Cold stress is one of the limiting factors in production of greenhouse vegetables. Chemicals offer useful approach to reduce low temperature-induced damages. This study was conducted to evaluate the effect of foliar application of methyl jasmonate (MeJA) at concentrations of 0 (control), 50, 100, 200 µM) on electrolyte leakage (EL), relative water content (RWC), soluble carbohydrates, proline, chlorophyll content and chilling index of greenhouse- grown cucumber (*Cucumis sativus* L. cv 'Negin') in 4-6 leaf stage. MeJA was sprayed two times/day on cucumber seedling in a greenhouse of Bu-Ali Sina University, as a factorial based on completely randomized design with five replications per treatment, inlate- summer of 2013. Two days after spraying, seedlings were transferred from 25ºC to cold chamber and were subjected to chilling treatments of 15, 10 and 5 ºC for 4 hours. The EL of all plants increased with reducing the temperature. However, in MeJA-treated plants, especially in application of 200 µM, a lower leaf EL was observed. A clear increase in soluble carbohydrates and proline concentration was observed with decreasing temperature from 15 to 5ºC in all plants while in MeJA -treated seedlings, especially in application of 200 and 100µM, a greater amount of these osmolytes were observed in compared to control. Moreover, exogenous application of MeJA reduced RWC and visual damage of cold-stressed seedlings but increased chlorophyll content in compared to control plants. These changes correlated with the increment of cold tolerance in the cucumber plants. The results indicated that MeJA application especially at 200 µM has the capacity to improve chilling tolerance of seedlings and can be used as a prophylactic tool to protect against chilling injury of cucumber cultivars in greenhouses.

Keywords: cold stress, chlorophyll content, electrolyte leakage, soluble carbohydrates.

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(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of gibberellic acid spraying and girdling on the improvement of the quantity and quality characteristics of 'Yaghooti' seedless grape

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Received: 9 July 2014 **Accepted: 11 December 2014**

Abstract

In the current study, for improving quality and quantity of 'Yaghooti' seedless grape, gibberellic acid was sprayed in four concentrations including zero (as control), 15, 25 and 40 mg/l, at three stages, and girdling treatments were carried out simultaneously with the third step of GA_3 spraying at the base of fruit bearing shoots with four replications. The cluster length was significantly increased by all three concentrations of GA_3 in compare with the control. In fact, 14 days after GA_3 spray, the cluster length respectively grew to 17.87, 19.73 and 23.95 cm at 15, 25 and 40 mg/L GA_3, whereas, in the control sample it was 13.46 cm. Furthermore, the berry and cluster weight were increased by foliar application of GA_3 and girdling in which the maximum berry weight (1.42 gr) and cluster weight (483.7 gr) were achieved by interaction of 40 mg/l GA_3 and girdling. In addition, girdling treatment significantly led to the increase of the berry length and width as compared to control sample; however, for some traits there was not any meaningful treatment. Application of GA_3 and girdling treatment significantly led to the increase of the TSS/TA ratio in compared to control.

Keywords: berry size, berry weight, cluster density, cluster length, cluster weight, grape.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Maintaining anti-radical compounds of blood orange using fruit coating in combination with methyl salicylate application

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Received: 13 June 2014 **Accepted: 13 December 2014**

Abstract

Most of the citrus fruits, especially in North of Iran are stored in common storages. This experimen in oder to persevere appearance and internal fruit quality were conducted in the Citrus Research Station at 1392, Britex-Ti wax, storage wax, polyethlene bag (individual fruit), polyethlene bag (pair fruits) were used alone and with combination with methyl salicylate (MeSA) vs. control (without coating and MeSA). 'Moro' blood orange fruits were treated and placed in the common storage for 80 days. Effect of every 20 days intervals was investigated to preserve fruit anti-radical compounds. Results showed that fruits in control and methyl salicylate treatments had the high ratio of TSS/TA after 80 days storage. Individual fruits in bags which treated by methyl salicylate had the highest total anthocyanin (3.99 mg/g FW) and total phenol (peel) contents (0.23 mg/g FW) during 40 days of storage. Individual fruit in bag treatment in combination with methyl salicylate application resulted to the highest ascorbic acid. The highest rate of total phenols was observed in fruits pulp treated with Britex –Ti wax after 60 days storage. Totally, combined treatments had significant influences on reducing decay and enhancing interval quality of 'Moro' fruits in common storage.

Keywords: anthocyanin, anti-radical, polyethylene bag, total phenol, wax.

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(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Changes in cuticular transpiration, leaf wax and leaf wax crystals of barley genotypes in response to terminal drought stress

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Received: 06 July 2014 **Accepted: 13 September 2014**

Abstract

In order to evaluate the effect of terminal water deficit stress on leaf traits and their relations to grain yield in different barley genotypes (‘Yousof’, ‘Fajr30’, ‘Nosrat’, ‘PBYT-46’, ‘PBYT-97’ and ‘Morocco’), two separated experiments were conducted in stress (water withholding from anthesis towards the end of growing season), and non stress (normal irrigation) conditions based on RCBD with three replications in 2010-2011 at Yazd Agricultural Research Station. The results indicated that drought stress significantly reduced leaf area index, greeness and increased canopy temperature and leaf rolling. Also, drought stress significantly increased epicuticular wax content at 21 days after anthesis. Studying by Scanning Electron Microscope (SEM) confirmed the increased dispersal of leaf wax crystals in leaf surface in ‘Yousof’ and ‘PBYT-46’ genotypes. ‘Fajr30’ genotype with the highest amount of cuticular transpiration and canopy temperature had the highest reduction in grain yield and ‘Yousof’ and ‘PBYT-46’ genotypes with higher amount of wax crystals dispersal, lower amount of cuticular transpiration, canopy temperature and greeness reduction in stress condition, had the least reduction percentage in grain yield. According to the non significant correlation between leaf wax and grain yield in both conditions (stress and normal) and in stress condition, it seems that increased epicuticular wax crystals had a more effective role than the quantity of wax in drought tolerance of barley genotypes.

Keywords: canopy temperature, grain yield, leaf area index, leaf rolling, SEM, Yazd.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of drought stress and salicylic acid on yield and yield component of bean (*Phaseolus vulgaris* L.) genotypes

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Received: 13 July 2014 **Accepted: 12 December 2014**

Abstract

In order to evaluate the effect of salicylic acid on yield and yield components of bean genotypes under water deficit stress, an experiment was carried out as a factorial split plot design with three replications in research farm Bu Ali-Sina University (Hamadan, Iran) during 2009. Stress levels: consist of vegetative water stress, reproduction water stress and without water stress (control) and three bean genotypes ('Akhtar', 'D81083' and 'KS31169') allocated in the main plots and three concentrations of salicylic acid 0, 0.5 and 1 mM to the sub-plots. Based on results the treatments had significant effects on plant height, number of branches, pod number per plant, seeds per pod, 100 seed weight, biological yield, grain yield and harvest index. Vegetative and reproductive drought stresses reduced grain yield but foliar application of Salicylic acid improved the growth and yield of bean. Utilizing salicylic acid in vegetative and reproductive stages improved the grain yield 17.2 and 16.8 percent, respectively. Such this result observed for biological yield too. Totally this research showed that between the genotypes of experiment, the 'D81083' and 'Akhtar' genotypes had higher grain yield and harvest index compared to 'KS31169'. Foliar application of salicylic acid not only improved the growth and yield in no-stress condition but also for adjusting the drought stress especially at vegetative stress is recommended.

Keywords: bean, biological yield, genotypes, grain yield.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of foliar spraying by humic acid on mineral leaf composition, yield and fruit quality of apple cv. 'Granny Smith'

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Received: 14 July 2014 **Accepted: 22 September 2014**

Abstract

Effect of foliar spraying by humic acid on mineral leaf composition, yield and fruit quality of apple (*Malus domestica* L. cv. 'Granny Smith') was studied. An experiment based on randomized complete design was conducted in Khorramdare city of Zanjan province. Spraying of humic acid was conducted in four levels 0, 5, 10 and 15 mg/l on eight year-old 'Granny Smith' apples grafted on MM106 rootstock. Spraying was conducted two, four and eight weeks after full bloom stage. Results showed that humic acid treatment significantly increased yield, total soluble solid (TSS), acidity (pH), concentration of leaf potassium and total chlorophyll content. Concentrations of 10 and 15 mg/l had the highest effect on yield. The humic acid treatment reduced vegetative current shoot growth. There have not significant effect on fruit firmness diameter and length fruit of treated fruits and control. The parameters such as total sugar, leaf area, concentration of N and P of leaf did not influenced by humic acid treatment. According to the results, it can be concluded that concentrations of 10 and 15 mg/l of humic acid spraying have main effect on increasing yield and precocity of 'Granny Smith' apple.

Keywords: chlorophyll, fruit firmness, growth, total sugar, yield.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of essential oil of *Satureja khuzistanica* Jamzad and *S. rechingeri* Jamzad, Carvacrol and Benomyl on growth inhibition of *Botrytis cinerea* Pres.: Fr., an agent of gray mold disease of fruit

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Received: 18 February 2015 **Accepted: 10 July 2014**

Abstract

To investigate the antifungal effects of essential oils of Khuzestani savory (*Satureja khuzistanica* Jamzad), Rechingeri savory (*S. rechingeri* Jamzad), carvacrol and Benomyl on *Botrytis cinerea*, this study was carried out in a PDA medium, and on grapes, kiwi fruits and strawberry. The experiment was laid out factorially based on a completely randomized design with three replications. The results showed that essential oil of Khuzestani savory, Carvacrol and Benomyl had greater antifungal effects compared with that in essential oil of Rechingeri savory. The main components of essential oil of Khuzestani savory were Carvacrol (91.16 Percent), p-Cymene (1.26 Percent), γ-Terpenen (0.74 Percent). The main components of essential oil of Rechingeri savory were Carvacrol (77.2 Percent), p-Cymene (1.26 Percent), γ-Terpenen (1.62 Percent). Essential oil of Khuzestani savory with concentrations of 200 ml, Carvacrol and Benomyl in all concentrations used showed 100 percent fungal inhibitory effects. The results of experiments in medium and on fruits showed that the antifungal effects of essential oils increased as their concentration increased.

Keywords: *Botrytis cinerea*, carvacrol, essential oil, fungus, inhibit of growth.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Effect of biofertilizer inoculation on mineral elements absorption in forage corn SC 540 under humidity different regimes

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Received: 23 August 2014 **Accepted: 6 May 2015**

Abstract

In order to investigate the effect of different levels of biofertilizer inoculation and phosphorus chemical fertilizer on mineral elements absorption in forage corn SC. 540 under humidity regimes, an experiment was conducted as Line source based on a randomized completele block design with three replications during two growing seasons of 2012 and 2013. The implementation of Line source was applied four levels of irrigation (not stress, mild stress, moderate stress, severe stress). Five phosphorus levels included the application of 100 percent triple super phosphate fertilizer and without biofertilizer, 75 percent recommended chemical fertilizer with biofertilizer, 50 percent recommended chemical fertilizer with biofertilizer, 25 percent recommended chemical fertilizer with biofertilizer, biofertilizer and without chemical fertilizer, too. The results of experiment showed significant differences of fertilizer treatment in most of studied traits in the first and second of year. The highest of fresh and dry forage yield obtained to apply treatment of 100 percent triple super phosphate fertilizer and without biofertilizer that this value wasn't statistically significant difference with 75 percent recommended chemical fertilizer and biofertilizer. The mineral elements absorption decreased with increasing of stress condition. The highest amount of absorption of phosphors recorded in 75 percent recommended chemical fertilizer with biofertilizer, although in stress condition, the highest amount of absorption of phosphor recorded in 50 percent recommended chemical fertilizer with biofertilizer.

Keywords: biofertilizer, corn, dry forage yield, line source, phosphors.

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Crops Improvement
(Journal of Agricultural Crops Production)
Vol. 17 ■ No. 2 ■ Summer 2015

Changes in the pattern of flowering and fruit production in 'Nagami' kumquat using paclobutrazol

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Received: 15 August 2014 **Accepted: 14 December 2014**

Abstract

Flowering and fruit production of 'Nagami' kumquat is somewhat different from other citrus species because usually have three flowering peak in a year which can lead to producing fruits with different quality on a tree. Considering the proper effect of paclobutrazol on raising citrus flowering, a pot experiment with three levels of paclobutrazol (zero, 0.1 and 0.5 g ai per tree) and six replications was conducted as a complete randomized block design. The results showed that paclobutrazol had effective effect on kumquat flowering and fruit set. Effect of paclobutrazol on shoot growth before and after the flowering period and the number of shoots after flowering period was significant and led to reducing them. All paclobutrazol treatments led to early flowering, increasing the number of first and second flower flush and fruit production. In terms of fruit quality, significant decrease in the length, diameter/length ratio and acidity of fruits was observed. In general, paclobutrazol caused a marked increase in fruit production of 'Nagami' kumquat, while retained most of the desirable traits of fruit.

Keywords: citrus, flower induction, GA, growth regulator, production.

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