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شاپا: ۴۷۳۰ - ۲۰۰۸

Effects of Harvesting Date and $CaCl_2$ Concentration on Storage Quality of Pear (cv. "Spadona" and cv. "Coscia")

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Received:26-7-2009
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Abstract

Harvesting date of pear cvs. "Spadona" and "Coscia" and the effect of different $CaCl_2$ concentrations on fruit quality in cold storage were studied. The experimental design was structured as factorial with 4 factors and 3 replicates based on completely randomized design. Pear cv. " Coscia " was harvested in July 24th, July 31st and August 6th and " Spadona" in August 7th, August 14th and August 21st. After treatment with CaCl2 solutions (0, 4% and 6%), the fruits were transferred to cold storage (at 0 - 1 º C, 85-90% RH) and preserved for 6 months. The qualitative characteristics of fruits were calcium content, total soluble solids, titrable acidity, TSS/TA, reduced sugar and flesh firmness. They were measured immediately after harvesting and after 30, 60, 90, 120, 135, 150, 165 and 180 days stored in cold storage. At the end of storage time, sensory attributes (texture, color, taste, odor and overall quality) were determined. Results revealed that flesh firmness of cv. Coscia was higher (1.3 lb/in^2) but cv. Spadona has higher total soluble solids and TSS/TA. Besides the scores of texture, color, odor and overall quality were higher in cv. Spadona. The results showed that pear cv. Spadona that was harvested in August 21st (heat unit=1986/8, full bloom=140 days) and treated with 6% $CaCl_2$ solution, had highest calcium content and gained the highest score of panelist for overall quality. Totally this treatment maintained the best qualitative and quantitative characteristics and sensory attributes after 180 storing days in cold storage.

Keywords: Pear cultivars, Harvesting date, $CaCl_2$ solutions, Calcium content, Overall quality

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Effect of Plant Density and Time of Nitrogen Application on Morphological, Phenological Characteristics, Yield and Yield Components of Black Cumin (*Nigella sativa* L.)

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Abstract

In order to study the effect of density and time of nitrogen application on morphological, phenological characteristics, yield and yield components of black cumin (*Nigella sativa* L) a field experiment was conducted at Chenaran in Khorasan Razavi Province in 2005 growing season. Three nitrogen fertilizer (Urea) application times (1- control 2- at 4-6 leaves stage 3-preblooming 4-complete flowering) and three plant densities (150, 250, 350 plant m^{-2}) were compared in a split plot based on complete randomized block design with three replications. Studied components were stem branch, capsule weight, seed weight/capsule weight, ratio number of capsules per plant, number of seeds in each part of capsule and phenological characteristics. Results showed that nitrogen fertilizer application times had significant effects on number of capsules per plant, capsule weight, stem branch, number of seeds in each part of capsule. Densities had significant effects on capsule weight, seed yield and distance of the first branch from soil surface. Results showed that 250 plant m^{-2} and nitrogen application at 4-6 leaves stage had the highest seed yield (588 kg/ha) in this region.

Keywords: Black cumin, Density, Nitrogen application, Morphological characteristics, Phenological growth stage

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Allelopathic Potential in Angelica (*Angelica archangelica* L.)

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Abstract

There is a world-wide effort to reduce the amount of chemicals used in crop production by introducing modern biological and ecological methods. One possible alternative is allelopathy. A laboratory trial was carried out to investigate of alleopathic potential of Angelica . In this study the effect of different concentrations of aqueous extract of Angelica herb was investigated on seed germination percentage and rate of Upland Cress (*Lepidium sativum*) and Radish (*Raphanus sativus* L.). The trial was carried out in completely randomized design with four replicates. Seven treatments (aqueous extract including 10, 20, 30, 50, 70, 100% and distilled water as a control treatment) were applied on Upland Cress seeds and five treatments (water extract including 30, 50, 70, 100% and distilled water as control) were applied on Radish seeds. The results revealed that treatment of Upland Cress seeds with 50, 70 and 100% aqueous extract significantly decreased percent and rate of seed germination. In Radish, treatment of seeds with 70 and 100% aqueous extract resulted in the least percent of seed germination and treatment of seeds with 50, 70 and 100% aqueous extract resulted in the least rate of seed germination. Overall results showed that with increasing the applied extract concentration, seed germination percentage and rate significantly decreased.

Keywords: Allelopathy, *Angelica archangelica*, Aqueous extract, *Raphanus sativus*, *Lepidium sativum*

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Investigation of the Effect of Nutrient Resources and Weed Control on Qualitative and Quantitative Criteria of Cat Tyme *(Teucrium polium)*

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Received:11-1-2010
Accepted:30-8-2011

Abstract

In order to investigate the effects of nutrient resources and weed management on qualitative and quantitative criteria of cat tyme *(Teucrium polium*), an experiment was conducted as split plot based on a complete randomized block design with 3 replications at the agricultural research station, Ferdowsi University of Mashhad, Iran, during the years 2008 and 2009. Treatments included different nutrient resources: manure fertilizer (10 ton/ha), chemical fertilizer (based on the amount of macro elements existing in manure fertilizer), Nitroxin biological fertilizer (4 l/ha), Manure fertilizer (10 ton/ha) plus chemical fertilizer (based on the amount of macro elements existing in manure fertilizer), Nitroxin biological fertilizer (4 l/ha) plus manure fertilizer (10 ton/ha) and control (no fertilizer) under weed infested and weed free conditions. Weed management was located in main plots and nutrient resource in sub plots. In the first year, the highest height of plant was observed in manure + chemical fertilizer treatment (26.3 cm) and the lowest in manure + Nitroxin fertilizer treatment (14.8 cm). The results indicated that there was not significant different between treatments for shoot and crown diameter of cat tyme, in the first year. But in the second year, type of nutrient resource and weed management affected shoot and diameter significantly. The highest and the lowest shoot number was observed in manure+chemical fertilizer under weed free condition (88.5) and control under weed infested condition (38.2), respectively. The highest and the lowest diameter of *Teucrium polium* were obtained in manure fertilizer (48.4cm) and control (28.6 cm) under weed free condition treatments, respectively. In the first year, the highest of leaf and flower dry matter was observed in manure+chemical fertilizer treatment under weed free condition with 2889 kg/ha. In second year, maximum yield was obtained in Nitroxin biological fertilizer under weed free condition (3261 kg/ha). In the first year, the maximum percentage and yield of essential oil was obtained in chemical fertilizer and manure+Nitroxin treatments under weed free condition. In the second year, the highest essential oil percentage was observed in plants treated with Nitroxin and manure+chemical fertilizer under weed infested condition.

Keywords: Nutrient resource, Weed, *Teucrium polium*, Quantitative criteria, Essential oil

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A Survey of Cyanide Metabolism in Two Apple Cultivars Fuji and Abbasi Mashhad

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Received:26-1-2010
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Abstract

Cyanide is a colorless, harmful, and dangerous substance with a smell similar to bitter almond. Cyanide forms a stable compound with iron and magnesium and interferes with cell activity by interfering with respiration, carbon stabilization and nitrate revival. In order to evaluate cyanide metabolism in Fuji and Abassi Mashhad apples, a factorial experiment was conducted as split plot based on a complete randomized block design in 4 replications. The fruits were randomly divided into four separate parts and were stored at four different temperatures (-2, 0, 2, and 4°C) in a normal cold storage (under refrigerator conditions), with a relative humidity of 85%±2 for a period of four months. The cyanide accumulation amount and Beta-CAS enzyme activity analysis were evaluated after removal of the samples from the storage for a period of thirteen days. Beta-CAS enzyme activity was assessed using colorimetric method based on the production of H_2S. The result showed that the highest cyanide accumulation was at -2°C and the lowest was at 4°C in both cultivars. It seems that higher temperatures were more effective in the decomposition and metabolization of cyanide. Beta-CAS enzyme activity in Abassi Mashhad cultivar was more than fuji cultivar and different storage temperatures, had different effects on the enzyme's activity. Activity of the enzyme increased daily up to 12 days but decreased on day 13.

Keywords: Apple, Beta-CAS enzyme, Cyanide, Ethylene, Temperature

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Effect of Hydrogel, Paclobutrazol and Irrigation Intervals on Qualitative Characteristics of Turf grass (*Lolium perenne* cv. Barbal) in Mashhad Climate

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Received:15-3-2010
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Abstract

Turf grass as a main grown cover plant has a unique place in green space planning. In order to study the effect of hydrogel and paclobutrazol on water requirement of turfgrasse (*Lolium perenne* L. Barbal) a factorial experiment based on a BRCD with 3 replication was conducted in the summer of 2010 in Mashhad. The factors under study were 4 levels of hydrogel (0, 3, 6, 9 gr/kg soil), 3 levels of irrigation (2day, 4day, 6day intervals) , 2 levels of paclobutrazol (control and preplanting seed treated, with 30mg/lit) on *Lolium perenne*. Results showed that the best density obtained using 6 g hydrogel and irrigation intervals of 2 days. The turf quality in soils with hydrogel application was better than the control. In general, the results showed that the plot with hydrogel had 33, 44 and 48% higher value in traits of color, density and chlorophyll content, respectively. Also the plot treated with paclobutrazol as compared with the control had 2, 7.5 and 11% more value in traits of density, cutting weight and root dry weight respectively. It is concluded that using 6 gr/kg hydrogel and paclobutrazol in soils with similar texture could reduce water consumption.

Keywords: Chlorophyll, Irrigation interal, Density, Electrolyte leakage

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شاپا: ۴۷۳۰ - ۲۰۰۸

Effect of Four Types of Mulches Including Wood Chips, Municipal Compost, Sawdust and Gravel in three Different Thickness on the Growth of *Platanus orientalis* L.

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Abstract

To study the effects of four types of mulches including wood chips, municipal compost, sawdust and gravel in three different thicknesses on growth of Platanus orientalis during two years, an experiment was conducted in Mashhad area with semi-arid climate. The research was conducted as split plot based on a completely randomized block design with four replications. Treatments included control (no mulching) and four types of mulch including wood chips, municipal compost, sawdust and gravel in three thickness (5, 10 and 15 cm). During the study, soil moisture and temperature, total leaf number, fresh and dry weight of leaves, tree height, fresh weight of tree, trunk circumference at height of 20 cm from soil surface was measured. Sawdust mulch with 15cm thickness had highest soil moisture and lowest soil temperature. All factors in sawdust mulch with 15cm thickness showed the highest growth characteristics. In all factors (tree fresh weight, leave fresh and dry weight, tree height, total number of leaves and trunk circle at 20 cm height) increasing of mulch thickness led to increased rate of growth and the best results was observed at 15cm thickness of all kinds of mulches. There were no significant difference among mulch types on height of the tree but all mulch types had significant difference with control. In the other measured factors including total leaf number, fresh and dry weight of leaves, fresh weight of tree, trunk circumference at height of 20 cm from soil surface, the highest growth was related to sawdust, wood chips, compost, gravel and control, respectively. It seems that sawdust with keeping soil moisture and reducing drought stress could help better growth of the plants compare to other mulches in dry and semi-arid areas.

Keywords: Mulch, Plane, Soil moisture, Soil temperature, Growth factors

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Effect of Planting Distance and Cultivation Depth on Some Quantitative Traits of Narcissus (*Narcissus tazetta* L.) Cut Flower in Climatic Conditions of Khouzestan (Mollasani)

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Received: 28-6-2010
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Abstract

Narcissus species (Amaryllidaceae) are highly suitable outdoor ornamental plants and also as cut flower. Narcissus is used in folk medicine and is a medicinal plant, because of galanthamine properties. South area of Iran such as Khouzestan province, is one of the most important areas of producing cut flower of narcissus in winter season. In this research, the effects of planting distance (10, 15 and 20 cm) and depth of culture (10 and 15 cm) of narcissus bulbs on some quantitative characteristics of cut flower in climatic conditions of Mollasani (Khouzestan province, southwest of Iran) were studied. Two-factor experiment was conducted in completely randomized design with four replications. Results showed that it was significant difference among the number of cut flower in different planting distance. The most number of cut flower were obtained in planting distance of 15 cm and depth culture of 10 cm, that only it were not significantly differed with number of cut flower which were produced from planting distance of 10 cm and depth culture of 10 cm. The most height of cut flower were obtained in distance of 15 cm and depth culture of 15 cm that only were significan9:50:42 AMly differed with the height of cut flower in distance of 20 cm and depth culture of 10 cm. The most stem diameter in treatment of 15 cm depth culture and 10 cm planting distance were existed which only they were significantly differed with stem diameter in the treatment of 10 cm depth culture and 20 cm planting distance. Only in the treatment of planting distance of 20 cm and depth culture of 10 cm, the diameter of florets were significantly more than the treatment of planting distance of 20 cm and depth culture of 15 cm. The treatments of depth and planting distance were affected on the flowering time. The treatments of depth and planting distance or their interaction did not significantly affect on the number of floret, open floret at the time of harvesting and floret diameter. The results showed that in climatic condition of Mollasani, planting of narcissus bulb in depth of 10 cm and planting distance of 10 cm were optimum.

Keywords: Bulb, Planting distance, Cultivation depth, Cut flower, Narcissus

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Effect of Sowing Date and Plant Density on Yield and Morphophysiological Traits of Persian Shallot (*Allium altissimum* Regel) in Mashhad Climate Condition

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Received:21-9-2010
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Abstract

Persian shallot (Moseer) belongs to Alliaceae family, is a perennial medicinal and industrial edible alliums in Iran. Very little information is available about different aspects of this species particularly on its agronomical production. In order to determine optimum sowing date and plant density in Persian shallot, an experiment was conducted as split plot based on complete randomized block design with 3 replications at the Agricultural Research Station, Ferdowsi University of Mashhad, Iran, during 2009 and 2010. Main plots included different sowing dates (17Oct, 16Nov, 20Feb, 16Mar) and sub plots included different plant densities (6, 10, 14, 18 plant m^{-2}). The results showed that there was a significant effect of sowing date, plant density and their interaction of bulblet production, bulblet weight and diameter, bulb weight and diameter, capsule number per inflorescence, seed number per umbrella, seed weight, seed yield, bulb yield (bulb dry and fresh weight), total dry mater and height. The highest bulb yield was obtained in first sowing date (17Oct) belonged to density of 18 plant m^{-2} and the lowest bulb yield was obtained in fourth sowing date (16Mar) belonged to density of 6 plant m^{-2}. The highest seed yield was obtained in first sowing date (17Oct) belonged to density 14 plant m^{-2}. The results of simple correlation analysis indicated a significant positive association between bulb yield (fresh), bulb weight, number of seed, weight of 1000 seeds, seed yield and height. Based on the results of this study, the optimum sowing date and plant density for bulb production is 17Oct and the best density is 18 plantm^{-2} and for seed production the best sowing date is 17Oct and the best density is14 plant m^{-2} in Mashhad climate conditions.

Keywords: Persian shallot (Moseer), Bulb, Bulblet, Plant density, Sowing date

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Effects of Salicylic acid Application on Morphological and Physiological Characteristics of Cucumber Seedling *(Cucumis sativus cv.* Super Dominus) under drought Stress

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Received:27-8-2010
Accepted:26-4-2011

Abstract

Application of Salicylic acid (SA) as a phytohormone has been increased due to its role in plant tolerance to environmental stresses such as drought. The main goal of this experiment was to evaluate the effects of SA on morphological and physiological characteristics of cucumber seedlings under drought stress. A factorial experiment based on completely randomized block design was conducted with 5 levels of SA (0, 0.25, 0.5, 0.75 and 1mM) and 3 levels of drought stress, daily irrigation (control) and irrigation period of 3 and 6 days with 3 replications. SA was sprayed on shoots of the seedlings at 3-4 leaf stage under drought stress. The results showed that SA increased leaf area and chlorophyll content by 60 and 15 percent, respectively. In contrast, application of (1mM) SA, decreased stomatal conductance by 96%. Stem diameter, plantlet height, leaf number, shoot and root dry weight, increased by applying SA compared to control. Seedling height, shoot dry weight and leaf area, decreased with increasing drought stress, whereas increased due SA application. Interaction between SA application and drought stress showed no significant effects on stomatal conductance, stem diameter, root dry weight. As conclusion salicylic acid treatment increased mentioned physiological and growth parameters in cucumber seedlings.

Keywords: Biomass, Leaf area, Drought stress, Hormone, Stomatal Conductance, SA

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Study of Yield and Yield Components of Iranian Land Race and Indian RZ19 Cumin (*Cuminum cyminum*) under Drought and Salinity Stress

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Received:5-10-2010
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Abstract

Cumin (*Cuminum cyminum*) is one of the most important medicinal plants in Iranian dry region. In order to study the effects of irrigation times and salinity stress on yield and yield components of cumin, an experiment was conducted at the Research Farm Ferdowsi University of Mashhad in 2009. Factors including irrigation times (1: one time irrigation, 2: two times irrigation 3: three times irrigation and 4: four times irrigation (control)) with two levels of salinity stress (irrigation with normal water and saline water of 5 dS/m) and two Cumin cultivars (Sarayan, Indian cultivar RZ 19) were compared in a split plot based on randomized complete block design with three replications per treatment. The results showed that two and three time irrigation with normal water produced the highest biological and seed yield and there was no significant difference at these traits. One time irrigation and two times irrigation treatments with saline water had lowest seed yield, biological yield and seed number per umber and umbers per plant. Salinity stress decreased significantly all parameters of cumin cultivars such as seed yield, biological yield, number of umbers per plant, number of seeds per umber, 1000 seeds weight. The Indian cultivar was less reduced on seed yield than Sarayan cultivar under salinity stress and also Sarayan cultivar was less affected on seed yield in drought stress than Indian cultivar, however, in overall, Sarayan cultivar had higher seed yield than Indian cultivar in all treatments. Based on the results of this experiment (two times irrigation with normal water for Cumin in Mashhad area) will be achieved as desirable seed yield. However, yield reduction of cumin under irrigation with saline water of 5 dS/m was less than 20% compared with control.

Keywords: Irrigation, Salinity stress, Cumin, Yield, Yield component

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Effect of Biofertilizers Application on some Morphological Characteristics and Yield of Dragonhead (*Dracocephalum moldavica* L.)

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Received:18-10-2010
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Abstract

In order to evaluate the effects of biofertilizers on yield and morphological characters in dragonhead, an experiment based on randomized complete block design with four replications was conducted in 2008. Treatments were nitroxin, biological phosphorus, biosulfur, nitroxin+biological phosphorus, biological phosphorus+ biosulfur, nitroxin+ biosulfur, nitroxin+biological phosphorus+ biosulfur, chemical origin of nitrogen+ phosphorus+ potassium and control. The results showed the effects of treatments on stem diameter, the number of flowers, the number of branches and leaves, plant dry weight and biological yield of dragonhead were significant. The highest number of branches (10) observed in nitroxin+biological phosphorus treatment. The greatest number of flowers (43) and leaves (2475), stem diameter (0.76), dry weight (28.8 gr), and biological yield (6150 kg/ha) were obtained from chemical fertilizer, althought there was no significant difference between nitroxin and chemical fertilizer. It seems that application of Nitroxin could result an optimum yield of dragonhead compared to NPK, without harmful effects assigned to chemical fertilizers due to environmental and health issues.

Keywords: *Dracocephalum moldavica*, Biosulfur, Biological phosphorus, Nitroxin, Dry weight

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Effect of Application Time of Copper Sulfate, Streptomycin and GA_3 on Parthenocarpy and Quality of Grapevine (*Vitis vinifera* L. cv. 'Siyah-e-Shiraz')

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Received:5-1-2011
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Abstract

An investigation was performed in a commercial orchard in Shiraz to study the effect of time of application of $CuSO_4$ and streptomycin on quality and seedlessness of grapevine (*Vitis vinifera* L. cv. 'Siyah-e-Shiraz'). The experiment was Conducted as Completely randomized block design with 3 replications. Plants were treated with 25 mgl^{-1} $CuSo_4$. $5H_2o$ and 200mgl^{-1} streptomycin 2,4 and 6 days before full blooming. 50 mgl^{-1} GA_3 was applied 10 days after full blooming. Results indicated that both $CuSO_4$ and streptomycin increased parthenocarpy compared with untreated control. Streptomycin and $CuSO_4$ 6 days before full blooming plus GA_3 produced the highest rate of seedlessness (84%). Both $CuSO_4$ and streptomycin reduced the number of seeds, cluster weight, berry weight, length and diameter of the berries compared with untreated controls. GA_3 increased weight of seedless berries, vitamin C and total acid contents unsignificantly.

Keywords: $CuSO_4$, GA_3, Grape, Parthenocarpy, Streptomycin

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Yield and Yield Components of Grape (*Vitis vinefera* cv.peykani) as Affected by Foliar Application of Zinc, Humic acid and Acetic acid

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Abstract

Balanced nutrition and soil organic mater are among most important factors affecting yield and quality of grape (*Vitis vinifera* cv.peykani). Humic acid as an organic acid derived from humus and other organic sources, in accompany with zinc, and acetic acid can reduce deficiency symptoms in grape. To study the effects of zinc, humic acid and acetic acid on yield and yield components, an experiment with 8 treatments and 3 replications in a randomized complete block design was conducted. Treatments included zinc(0 and 0.005), humic acid (0 and 0.003), and acetic acid (0 and 0.01). Results showed that all treatments increased yield compared to control significantly ($P<0.05$). The highest yield (13.58 kg per plant) was obtained from zinc, humic acid and acetic acid treatment, while the lowest yield was obtain from the control (5.3 kg per herb). Leaf analysis results showed the effect of foliar application treatments was significant. Combined application of zinc and acetic acid increased zinc concentration of leaves significantly compared to control. Combined application of humic acid and acetic acid increased Fe concentration of leaves significantly ($P<0.05$) compared to control. Application of zinc decreased P concentration in leaves significantly ($P<0.05$) compared to control.

Keywords: Grape, Foliar application, Zinc, Humic acid, Acetic acid

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