



The Effect of Seed Density and Plant Distance on the Yield and Growth Components of Radish (*Rhaphanus sativus* cv. Longipinatus) As Second Culture in Paddy Field.

M. Hassanpour Asil^{1*}- M. Dehestani Ardakani²- M. Rabiee³

Received: 10-8-2009

Accepted: 9-4-2013

Abstract

To study the effect of seed density and plant distance on yield and growth parameters of radish, an experiment was conducted in Research of Station Rice at office Rasht in 2008-2009. This study was set in secondary culture after rice by factorial experiment with randomized complete block design with 3 replications. Treatments consisted of factorial arrangement of three seed density levels (5, 10 and 15 Kg/ha) and plant spacing (20 and 30 cm). Measurements comprising of total production in hectare, weight of one shrub, weight of tuber, weight of foliage, shrub height, leaf number, length of leaf, length and diameter of tuber. Results showed that seed density of 5 Kg in hectare in plant distance of 20 cm with yield of 45.38 ton in hectare was most performance and recommendable for this region.

Keywords: Radish, Morphological traits, Total yield, Tuber, Density

1,2- Associate Professor and M.Sc. Student, Department of Horticultural Sciences, Faculty of Agricultural Sciences, University of Guilan, Respectively

(*- Corresponding Author Email: hassanpurm@yahoo.com; hassanpurm@guilan.ac.ir)

3- Researcher, Rice Research Institute of Iran



The Effect of Different Sources of Calcium on the Some of Quantitative and Qualitative Parameters of Tea Plants (*Camellia sinensis* L.)

M. Taiefeh^{1*}- M. Moez Ardalan²- F. Baghery³

Received: 17-6-2010

Accepted: 9-4-2013

Abstract

Soil pH is one of the important chemical characteristics of soil that plays major role in growing of tea plant and affects on absorbing of food elements by plant and their usability. In this study, the effect of different calcium source was investigated on some of quantifying parameters in tea plant, pH and EC in tea soil. Tea is plant with shallow roots, this shrubs grows two forms wild and farmed. The leaves of plant are the use in tea that is important economically. This study was conducted as a factorial with two factors, calcium fertilizer type and fertilizer levels on the basis Completely Randomized Design (CRD) with three replications. In order to supervise content of calcium component which contains calcium carbonate, dolomite, calcium oxide and calcium chloride with four levels (0, 1, 2, 3) g ca / kg was added to soil with three replications. The result of analysis of variance related to calcium fertilizer on soil pH indicated that only calcium fertilizer type in soil pH is significant at 0.1%. Also the result of calcium fertilizer on soil EC showed that the type of calcium fertilizer, fertilizer level and interaction effects and level of fertilizer on soil EC is significant at 0.1%. But the effect of different sources of calcium has not significantly different on parameters of quantity in tea plant during investigation (three months).

Keywords: Calcium composition, EC, pH, *Camellia sinensis*

1- M.Sc. Student Graduate, Department of Soil Science, Trends of Soil Fertility and Soil Chemistry and Plant Nutrition, Faculty of Agriculture, Tehran University

(*- Corresponding Author Email: Mahsa_taiefeh82@yahoo.com)

2- Professor, Department of Soil Science, Faculty of Agriculture, Tehran University

3- Laboratory Supervisor of Soil and Water in Research Lahidjan of Tea and Instructor, Department of Soil Science, Faculty of Agriculture, University of Guilan



Influence of Mycorrhizal Symbiosis on the Uptake of Nutrients and Vegetative Characteristics of Barhee Date Palm (*Phoenix dactylifera*)

A.H. Mohebi¹

Received: 22-11-2010

Accepted: 19-2-2013

Abstract

Mycorrhizal symbiosis increase nutrient uptake and enhance plant growth by elaborating root system. The positive effects of mycorrhizal symbiosis on the growth, physiology and ecology of various plants have been recognized. The symbiotic relations between mycorrhizal fungi and date palm with regard to nutrient uptake by this plant have not yet been explored and studied in Iran. This project was conducted as a randomized complete block design with four replications (blocks) in a greenhouse at Date Palm and Tropical Fruit Research institute during 2008 to 2009. Factor A such as; five rate of fertilizer superphosphate triple (0, 5, 10, 15, 20 mg/kg soil), factor B including; with or without mycorrhiza inoculation. Fresh and dry weight of shoots and roots, root length, mycorrhizal root length and nutrient concentration in different treatments were measured. The results showed significantly differences between dry weight of roots and shoots, nitrogen, potassium and phosphorus in shoot and roots ($P < 5\%$).

Keywords: Mycorrhiza, Nutrient uptake, Vegetative growth, Date palm

1- Scientific Board, Institute of Date Palm and Tropical Fruit Research, Iran
(* - Corresponding Author Email: hamidmohebi@hotmail.com)



Effect of Nitrogen, Manure, Potassium and Iron on Yield, Fruit Quality and Leaf Mineral Nutrient Content in *Pistacia vera* cv. Fandoghi Grafted on Badami-Riz Zarand Rootstock

Z. Mohammadi¹- H.R. Roosta^{2*}- A. Tajabadipour³- H. Hokmabadi⁴

Received: 20-12-2010

Accepted: 9-4-2013

Abstract

This research carried out in the Rafsanjan pistachio orchard to investigate the effect of N form, manure, K and Fe on yield, nut quality and leaf mineral nutrients concentrations of *Pistacia vera* L. cv. Fandoghi grafted on Badami-Riz Zarand rootstock. The experiment was as factorial with four factors including; manure (without manure and 10 kg tree⁻¹ sheep manure), N form (ammonium sulfate and calcium nitrate), K (without K and 600 kg K tree⁻¹) and Fe (without Fe and 100 g Fe tree⁻¹) and randomized complete blocks design with 6 replications. Fertilizers were added to the soil in holes with 40-60 cm depth on two sides of trees, and treatments effects was evaluated during two years. The results showed that ammonium application increased the nut yield compared to nitrate fertilizer, this increase in yield is may related to the higher N and Fe in plants and consequently leaf chlorosis alleviation due to the chlorophyll contents elevation by these elements. Combination of ammonium-N and Fe increased split pistachio nuts. In this research, ammonium application increased the concentration of Fe, Zn, N and K and reduced P, Ca and Mg concentrations in leaves. Therefore, it is suggested to use N fertilizer containing ammonium rather than nitrate in pistachio orchards with mainly high soil pH.

Keywords: Hole fertilization, Nutrient elements, pH, *Pistacia vera* L., Tree fruit nutrition

1,2,3- M.Sc. Student and Associate Professors, Department of Horticulture Science and Department of Soil Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Respectively

(* - Corresponding Author Email: roosta_h@yahoo.com)

4- Section of Horticulture, Pistachio Research Institute of Iran, Rafsanjan



Effects of Sterilization Protocol and Pre-chilling Treatment on *In vitro* Seed Germination of *Levisticum officinale* Koch.

R. Khatibzadeh^{1*}- M. Azizi²- H. Arouiee³- M. Farsi⁴

Received: 26-12-2010

Accepted: 29-8-2012

Abstract

To protect and multiply important and rare plant resources, *in vitro* culture serves as a more efficient alternative to traditional propagation approaches. *Levisticum officinale* Koch. a member of Apiaceae is an important, endangered and neglected species in Iran, which has been shown to have diuretic, spasmolytic and carminative effects. In order to supply enough plant materials for micro-propagation of this herb and study effects of different methods of disinfection and stratification on *in vitro* seed germination, a factorial experiment laid out in a completely randomized design was set out to establish sterile plants out of seed culture. It was concluded that a pre-chilling treatment for 3 months resulted in maximum percent of germination (92%) and the largest germination rate. The best superficial sterilization protocol was proved to be soaking in 70% (v:v) ethanol for 30 s and then, using of 2% (v:v) dilution of NaOCl for 15 min, followed by 3 rinses in sterile distilled water.

Keywords: *Levisticum officinale*, Medicinal plants, Seed germination, *In vitro* culture

1,2,3- Master Graduate, Associate Professor and Assistant Professor, Department of Horticulture Sciences, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively

(*- Corresponding Author Email: khatibzadeh_rahele@yahoo.com)

4- Professor, Department of Crop Biotechnology and Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad



Studying the Efficiency of Floral Dip Method for Genetic Transformation of *Apiaceae* Plants

M. Ghabouli¹- A.R. Bahrami²- F.A. Shahriari³- J. Zolala⁴- A. Mohammadi⁵

Received: 12-1-2011

Accepted: 19-2-2013

Abstract

Plant tissue culture techniques are used as basic requirement of common plant transformation systems. In most cases of plant transformation, a reproducible regeneration protocol is the limiting step due to long time lasting, specialized facilities and well experienced persons. Furthermore, tissue culture procedures induce somaclonal variation among regenerated transgenic plants. Therefore, recently current studies in plant molecular biology prefer plant transformation procedures avoiding tissue culture phase. Various in plant a transformation procedures have been explored, among which the floral dip method is the most reliable *in vivo* transformation method. In this research, with the aim of evaluating the ability of floral dip method for genetic transformation of some *Apiaceae* plants, we studied Dill (*Anethum graveolens*), Fennel (*Foeniculum vulgare*), Coriander (*Coriandrum sativum*), Carrot (*Daucus carota*), Parsley (*Petrocelium sativum*) and Celery (*Apium graveolens*). *Arabidopsis thaliana* was used as a model plant of experimental procedure. Flowers, in different stages of inflorescence development, were immersed in different suspension of *Agrobacterium tumefaciens* carrying the plant binary vector pBI121. This vector carries plant reporter gene *uidA* (*gus*) and the plant selectable marker gene *npt II*. Although, producing transgenic *Arabidopsis* plants with a high transformation rate of 4% verified the accuracy of experimental procedure, floral dip method was not successful for transformation of *Apiaceae* plants. Only one transformed celery plantlet, carrying *nptIII* gene with no expression of GUS, was obtained by screening more than 10000 seeds produced by treated plants from all the species. Transgenic *Arabidopsis* plants expressing *gus* reporter gene were confirmed through PCR and histochemical assays.

Key words: Floral dip, Plant transformation, *Apiaceae*, *Arabidopsis*, *Agrobacterium*

1- Assistant Professor, Department of Agronomy, Malayer University

2- Associate Professor, Biotechnology Research Center, Ferdowsi University of Mashhad

(*- Corresponding Author Email: ar-bahrami@um.ac.ir)

3- Associate Professor, Department of Plant Breeding and Biotechnology, Ferdowsi University of Mashhad

4, 5- Assistant Professor, Former MSc Student Department of Agricultural Biotechnology, Shahid Bahonar University of Kerman, Respectively



Effect of Nitrogen Form and Oxygen Levels in Nutrient Solution on Growth and Some Macronutrients in Hydroponically Grown Lettuce (*Lactuca sativa* cv. Great leak)

M.H. Bagheri¹ - H.R. Roosta^{2*}

Received: 7-2-2011

Accepted: 19-2-2013

Abstract

In this study the effect of nitrogen form and different oxygen levels on growth and development and macronutrients concentrations in lettuce plants was investigated. This investigation showed that sole ammonium application caused fresh and dry weight reduction of shoot and root in lettuce plant. But different oxygen levels had no effect on them. Nitrogen concentration of shoot was higher in ammonium treatments compared to nitrate treatment and with increasing of oxygen levels in the presence of ammonium, nitrogen content also increased, although it was not the same in nitrate treatment. Phosphorous concentrations in shoot and root were not affected by any of treatments and their interaction. Ammonium also caused reduction of potassium concentration in shoots, but different oxygen levels and its interaction with nitrogen form had no significant effect on it. Magnesium content of shoot also decreased in the presence of ammonium, although it was not the same in root. With increase of dissolved oxygen level, magnesium content of shoot decreased in ammonium treatment, but in nitrate treatment the concentration of this element was not affected by oxygen levels. It is concluded that probably reduction of potassium and magnesium in ammonium-fed plants has a role in plant growth reduction, and it was also observed that in spite of increase in the concentration of shoot nitrogen and root magnesium with increase of dissolved oxygen level in ammonium treated plants, lettuce growth was not affected by oxygen levels.

Keywords: Nutrient solution, Ammonium, Hydroponic, Lettuce, Nitrate

1,2- M.Sc. Student, Associate Professor, Department of Horticultural Sciences, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Respectively

(* - Corresponding Author Email: roosta_h@yahoo.com)



The Effect of Hormones and Photoperiod on *In vitro* Microtuberization of Two Potato Cultivars

A.R. Bolandi¹- H. Hamidi^{2*}- R. Beidokhti³

Received: 30-5-2011

Accepted: 25-12-2012

Abstract

The experiment was conducted to study the effect of photoperiod and hormones on production of microtubers for two potato cultivars (Sante and Savalan), which were clean and pathogens free. This experiment was performed as a factorial experiment based on randomized design with three replications. The results showed that cultivar, hormone and photoperiod would effect on all studied traits. Sante cultivar indicates more efficiency for all measured traits than in Savalan cultivar. In this experiment by using the combination of two hormones 2, 4-D and BAP would increase number, diameter and weight of microtubers. The means comparison of photoperiod showed that highest efficiency for all traits as treatment of plant for 8 hours in darkness plus 16 hours in light plus utter darkness (P3). In this research, the highest number of microtuber was related to cultivar of Sante (9.47) is gained with hormone 2, 4-D, as well as photoperiod P3 which this superiority for Savalan cultivar is gained by using the combination of two hormones and P3 photoperiod.

Keywords: Tissue culture, Potato, Microtuber, Photoperiod, Hormone

1,2- Assistant Professor and M.Sc. Student, Agriculture and Natural Resources Research Center of Khorasan-e-Razavi, Mashhad, Respectively

(* - Corresponding Author Email: Hamidy1065@yahoo.com)

3- Former M.Sc. Student, Department of Agriculture, Islamic Azad University, Golbahar Branch, Mashhad



Study of Comparison and Adaptation of 15 Iranian and Foreign Olive (*Olea europaea* L.) Cultivars Under Sar-e-Pol-e- Zehab Conditions

A. Hadjiamiri^{1*}- H. Safari²- M. Gardakaneh³- M. Najafi⁴

Received: 19-6-2011

Accepted: 19-2-2013

Abstract

In order to study adaptation ability of 15 commercial olive cultivars, this experiment was carried out using a randomized complete block design with three replication during the period from 2007 to 2009 in dry-warm climate of Sar-pol-e-Zehab Dallaho olive station of Kermanshah province. In this experiment, vegetative and reproductive traits were measured according to I.O.O.C. descriptors. Flora emergence was significantly different over years and among cultivars and flowering period appeared from end March to early May. Korneiki, as the late ripening cultivar, produced the smallest fruits (0.59 gr/fruit) among other cultivars. The highest fruit set, dry matter and content of oil accumulation (12.1%, 12.2%) in fresh matter were recorded in Amphisis and Korneiki cultivars, respectively. Mary was early ripening cultivar and it had the least dry matter and oil in fresh matter (5.2%). Conservalla cultivar had the most fruit weight (4.2 gr/fruit), flesh and yield per hectare (6700 kg/ha). On the other hand, the least percentage of fruit set and yield was obtained in Gorgan1 genotype (720 kg/ha) and Roghani Roodbar cultivar (637 kg/ha). The results indicated that temperature played a major role in delay of flowering by affecting phenological status and development of flowers. It also oil content in olive affected by environmental condition and genetic background of cultivars. Finally, Olive Table cultivars (Conservalia, Manznila and Sivillano), Zard-e- ziton (Dual-Purpose) and Oil Amphisis cultivar were better than the others for Sar-e-Pol-e- Zehab weather conditions.

Keywords: Olive (*Olea europaea* L.), Adaptability, Sar-e-Pol-e-ZehabOil, Yield

1,2,3- Scientific Staff Members and Researcher of Kermanshah Agricultural AND Natural Recourse Research Center
(* - Corresponding Author Email: mhajiamiri@yahoo.com)

4- Tecnicial Researcher Dallahoo Station



The Effect of Root Partial Salinization on the Photosynthesis Rate and Nutrient Concentration in Strawberry

M. Yusefi^{1*}- S.J. Tabatabaei²- J. Hajilu³- N. Mahna³

Received: 20-6-2011

Accepted: 5-2-2013

Abstract

Salinity affects the yield and quality of fruits crops as result of modifying water and nutrient uptake. In split root system, it should be possible to reduce the deleterious effect of salinity on the plant growth. Therefore, an experiment was conducted on strawberry with different concentration of NaCl (0, 30, 60 and 90 mM) in a completely randomized blocks design in studding hydroponic greenhouse. The roots were divided into two portions and either even or uneven salinity was applied to the root portions. The treatments consist of 0:0, 0:30, 0:60, 0:90, 30:30, 60:60 and 90:90 with three replications. In general, the increased salinity reduced photosynthesis rate but in uneven salinity the photosynthesis rate was increased. Proline concentration was reduced in 0:0 treatments but increased in 0:30 and 30:30 treatments. Ca, N, P and K concentrations were reduced by increasing salinity, but were increase in uneven salinity. The highest concentrations of Cl and Na were observed in 60:60 and 90:90 salinity treatments. Na and Cl concentrations were reduced in uneven salinity in the root zone so that in 0:30 treatments, the concentration of Na were 20% lower than that in 30:30 treatments. Based on the results of this study the application of uneven salinity in a concentration of 30 mM could be recommended for growing strawberry in salinity stress conditions.

Keywords: Strawberry, Salinity, Split Root, Photosynthesis, Proline

1- Lecturer, Department of Agriculture, University of Payame Noor
(*Corresponding Author Email: pnumehr_yoosefi@yahoo.com)

2,3- Professor and Assistant professor, Department of Horticulture Science, Faculty of Agriculture, University of Tabriz, Respectively



Possibility of Increasing Irrigation Period Without Decreasing Growth of Rose Saplings by Implementing Super Absorbent Polymer Trawat A200 in a Semi Arid Region

J. Jalili¹- Kh. Jalili^{2*}- H. Sohrabi³

Received: 7-2-2012

Accepted: 23/10/2012

Abstract

One fundamental strategy for increasing efficiency of plans which aim to develop natural resources is decreasing water loss and using this restricted water optimally. In arid and semi-arid regions such as a large part of Iran, increasing period of irrigation which results in decreasing the irrigation costs, without causing water stress to planted sapling is a vital task. In this research we examined the effect of using super absorbent on increasing irrigation period and growth of Rose's saplings. The experiment designed in randomized block with two factors (super absorbent in 4 levels 0, 40, 90 and 140 g. and irrigation period in 4 levels 6, 10, 14 and 18 days) and 3 replications. The results indicated that using super absorbent make it possible to increase irrigation period, while surprisingly causes some increases in growth of saplings. Considering height growth of saplings, 10 days irrigation period with 40 g super absorbent and based on collar and crown growth of 14 days with 140 g. were the best treatments. It means that these treatments which implemented the minimum amount of super absorbent lead to decreasing irrigation period while growth of saplings in contract to saplings in control treatment had no significant decrease.

Keywords: Growth Parameter, Water Stress, Survival Rate, Sapling

1,2- Scientific Members, Department of Hydraulic and Water Resources, Kermanshah Province

(*- Corresponding Author Email: khaliljalili@yahoo.com)

3- Assistant Professor, Department of Forest Biometrics, Tarbiat Modares University



The Effect of Fertilizer Treatments in Various Compactness Levels on the Some of Qualitative Factors of Fall Lawn

S. Javahery^{1*}- H. Zarei²- S.A.R. Movahedi Naeini³- Gh. Roshani⁴

Received: 23-4-2012

Accepted: 19-2-2013

Abstract

In current study, seven organic fertilizers including; Leaf Mold (LM), Rice Husk (RH), Manure, Spent Mushroom Compost (SMC), mixture of LM, RH and SMC (M 1), mixture of LM, RH and Manure (M 2) with the ratio of 1:1:1 and control (no fertilizer) along with some levels of soil compactness comprising roller weights of 36, 56, 76 kilogram were used. Treatments were applied in a strip plot design with three replications, in research farm of Gorgan University of Agricultural Sciences and Natural Resources during fall 2008-2009. Effects of these treatments were investigated on chlorophyll content of lawn, amount of density and cover rate, growth height and percent of plant dry matter in fall season. According to results, SMC and RH treatments in first compactness, manure and M2 treatments in second compactness and manure treatment in third compactness showed the maximum chlorophyll content. The most and the least amount of nitrogen in each three compactness levels were observed in manure and control treatments, respectively. The highest density was related to manure treatment and the lowest one was related to LM treatment. In each three compactness, maximum and minimum height was observed in manure and control treatments, respectively. This project results will be used for lawn management in relation to the use of organic fertilizer and compactness rate of planting bed in Gorgan city conditions.

Keywords: Lawn, Culture bed, Roller, Nutritional elements, Appearance quality

1,2,3- M.Sc. Student, Assistant Professor and Associate Professor, Department of Horticultural Science, Gorgan University of Agricultural Sciences and Natural Resources, Respectively

(*- Corresponding Author Email: S.javahery@yahoo.com)

4- Assistant Professor and Scientific Members of Agricultural Research Center of Golestan Province



Effect of Population Type and BAP Treatments on *In vitro* Regeneration of Hyssop (*Hyssopus officinalis* L.)

M. Alizadeh¹- B. Hosseini^{2*}

Received: 19-4-2012

Accepted: 25-6-2012

Abstract

Hyssop (*Hyssopus officinalis* L.), belongs to the family of Lamiaceae which its origin is Asia Minor, and is considered as one of the most important medicinal plant. This experiment was done to study the effects of population and BAP concentrations on hyssop plant regeneration under *in vitro* culture conditions. This research were performed in factorial experiment with three populations (Hamadan, Shiraz and Mashhad) and four levels of BAP (0, 2.2, 4.4, 13.2 μ M), in three replications. Results showed that there is significant difference between populations. In all three populations, the lowest average and percentage of regeneration was observed in MS medium without any growth regulators. In Hamadan population, the highest average of regenerated shoots (7.86) and percentage of regeneration (86%) was obtained in BAP (4/4 μ M) and in Shiraz population, maximum number of regenerated shoots (7) and 80% regeneration percentage was observed on 4.4 μ M BAP. The minimum regeneration percentage with 0% was obtained in MS medium without plant growth regulators and MS media supplemented with 13.2 μ M concentration of BAP. 2.2 μ M BAP in Mashhad population with an average of 9 regenerated shoots and 86% regeneration percentage was known as the best treatment. ANOVA results showed significant ($P < 0.01$) effect of IBA levels on root induction. The highest rooting percentage (86.66%) was achieved in MS medium supplemented with 9.84 μ M of IBA and the lowest rooting percentage (0%) was observed in $1/2$ MS hormone-free medium.

Keywords: *Hyssopus officinalis* L., Population, *In vitro* regeneration, Hormonal treatment

1- M.Sc. Student, Department of Horticultural Sciences, Faculty of Agricultural Sciences, University of Uramie

2- Assistant Professor, Department of Horticulture Science, Faculty of Agricultural Sciences, University of Uramie

(*- Corresponding Author Email: b.hosseini@urmia.ac.ir)



Study on the Effects of Summer Pruning and Calcium Phosphat on Color Improvement and Other Qualitative Characterize of Red Delicious Apple After Storage in Semirom

H. Akbari-Bishe^{1*}- H.R. Bahrami²

Received: 26-6-2012

Accepted: 28-11-2012

Abstract

A study of two years was carried out on apples, red delicious cv. in Comeh of Semirom region. The objective of this research was to assess the effect of pre-harvest calcium phosphate (Seniphos) spraying and summer pruning on the skin color and quality characteristics of the fruit. Study was carried out using a complete randomized block design with 3 replications. Trees were subjected to pre-harvest spraying of 0.8, 1% and 1.2% seniphos (calcium phosphate) and pruning on 6 and 21 of august. A control test also was carried out. Each block contained 3 trees. 15 kilo of fruit was harvested randomly from each block. Firmness, skin color, acidity, TSS, overall acceptability, bitter rot, rotting and farinaceous texture of fruit were assessed after 2 and 4 month storage at 4 °c and 95% of humidity. ANOVA test based on 2 year study data indicated significant effect of applied treatments ($\alpha=1\%$) on all studied parameters. Skin redness increased significantly comparing to the control sample. The highest redness was observed in the 1.2% seniphos spraying treatment. After 2 months of storage, firmness farinaceous texture, bitter rot and overall acceptability of fruit in seniphos and summer pruning treatments changed significantly comparing to those of control sample. After 4 months of storage, there was significant difference between 1.2% seniphos treatment and other treatments including the control in view point of firmness, rotting, farinaceous texture and bitter rot of the fruit. The acceptable firmness and overall acceptability were obtained by using 1% and 1.2% seniphos spraying treatments.

Keywords: Red delicious, Skin color, Seniphos, Pruning

1- Researcher, Section of Seed and Plant Improvement, Agricultural and Natural Research Center of Isfahan
(*- Corresponding Author Email: Ak.hassan@yahoo.com)
2- Scientific Member, Agricultural and Natural Research Center of Isfahan



Influence of Effective Microorganisms on Flower Buds Formation of Two Almond Genotypes in Water Stress Conditions

A.A. Shokouhian^{1*}- Gh. Davarynejad²- A. Tehranifar³- A. Imani⁴- A. Rasoulzadeh⁵

Received: 4-11-2011

Accepted: 30-4-2013

Abstract

The base of nut production in almond is flower buds set with best quality and quantity. Although the process of flower buds set is controlled by genetic characteristics, however it affected with inside and outside diverse factors. To understand relationship between these factors for achieve to annual and regular nut production economically. An experiment was conducted in order to evaluate effects of effective microorganisms (EM) under water stress conditions on bud flower formation in two genotypes of almond trees in Department of Horticultural Science, Faculty of Agriculture, Ferdowsi University of Mashhad, in 2011. In this research effects of two different concentrations (0 and 5%) of EM and three levels of aridity stress treatments (100, 66, and 33% of FC) on number of flower buds in two genotypes (H1 and H2) of almond was evaluated. This experiment was arranged as a factorial experiments based on a randomized complete blocks design with four replications. Results showed that the EM increased amount of leaf area, chlorophyll, storage protein, N, K and P in leaves. In this research, effects of different genotypes, EM and irrigation levels on number of flower bud set were significantly different at the %1 level. Number of flower bud formation increased by treatments of EM application, H1 genotype and irrigation level of FC% 100. There was significant interaction between treatments for this trait at %1 level. The best result was obtained from interaction between H2 genotype and irrigation using level of FC% 100 and EM application.

Keywords: Chlorophyll, Deficient irrigation, Leaf area, Protein, Nutrition elements

1- Ph.D. Student, Department of Horticulture Sciences, Faculty of Agriculture, Ferdowsi University of Mashhad, and Scientific Member, Faculty of Agriculture, University of Mohaghegh Ardabili

(* - Corresponding Author Email: shokouhiana@yahoo.com)

2,3- Professors, Department of Horticulture Sciences, Faculty of Agriculture, Ferdowsi University of Mashhad

4- Assistant Professor, Department of Horticulture Science, Research Institute on Seed and Plant Breeding

5- Assistant Professor, Department of Water Engineering, Faculty of Agriculture, University of Mohaghegh Ardabili