

## Possibility of Peat Replacement with Compost in Mushroom Production

S. Rezaei<sup>1</sup>- A. Lakzian<sup>2\*</sup>- M. Farsi<sup>3</sup>- M. Abolhassani-Zeraatkar<sup>4</sup>- Gh. Haghjnia<sup>5</sup>

Received: 14-12-2010

Accepted: 28-11-2012

### Abstract

One of the most important steps of *Agaricus bisporus* production is casing. In this step a layer of soil is added on top of compost. Peat is the most suitable casing soil for *A. bisporus* production. The lack of peat in Iran is one of the major problems in *A. bisporus* production for mushroom producers. It seems that peat can be replaced by Spent Mushroom Compost (SMC). In order to study the possibility of peat replacement, a factorial experiment was conducted in a completely randomized design layout with two replications. The experimental factors consisted of Spent Mushroom Compost with two levels (one and two years old), leaching with three levels (one (L1), two (L2) and three (L3) times) and EDTA with two levels (without EDTA (E1) and with EDTA, 0.3 M (E2)) and different casing soil with four levels (SMC+loam, SMC+Azolla, SMC+Peat (1:1) and Peat). The experiment was carried out in the Mushroom Production Center of Agricultural College, Ferdowsi University of Mashhad. The results showed that the highest mushroom yield was obtained in peat treatment (24%). The average of yield in SMC+Peat treatment was 11.78%. The Diameter of mushroom cap in SMC+Peat treatment was 44.1 mm. The lowest yield (8.1%) and diameter of *A. bisporus* cap (37 mm) was observed in SMC+Azolla treatment. The results also showed that the EDTA had a negative effect on yield (44.3 %) and diameter of the mushroom cap.

**Keywords:** *Agaricus bisporus*, Peat, Spent mushroom compost, Azola, EDTA

1,2,4,5- M.Sc. Student, Associate Professor, Ph.D. Student and Professor, Department of Soli Science, Faculty of Agricultural, Ferdowsi University of Mashhad, Respectively

(\*- Corresponding Author Email: Lakzian@ferdowsi.um.ac.ir)

3- Professor, Department of Biotechnology, Faculty of Agricultural, Ferdowsi University of Mashhad

## Effect of Some Citrus Rootstocks on the Amount of Biochemical Composition of Parson Brown and Mars Oranges in Jiroft

K. Mashayekhi<sup>1</sup>- H. Sadeghi<sup>2</sup>- V. Akbarpour<sup>3\*</sup>- S. Atashi<sup>4</sup>- S.J. Mousavizadeh<sup>5</sup>- M. Abshaei<sup>6</sup>- Z. Nazari<sup>7</sup>

Received: 21-1-2011

Accepted: 22-1-2013

### Abstract

Citrus fruits contain numerous nutrients and secondary metabolites including sugars, vitamin C, flavonoids and phenols which have high antioxidant activity and nutritional value. Factors such as cultivar, type of stock and fruit position affect the amount of these compounds. Hence in this study the amount of sucrose, glucose, total sugar, vitamin C, flavonoids and phenols in pulp, mesocarp and flavedo of Parson Brown and Mars oranges grafted on Citrange, Cleopatra and Rough Lemon stocks were measured. According to the results, maximum of vitamin C was in Parson Brown cultivar on the Citrange and Cleopatra grafting stocks. The highest total sugar was recorded in Parson Brown and Mars cultivars on the Rough Lemon stock ( $P < 0.01$ ), respectively. The highest glucose was in Mars cultivar on the Rough Lemon stock ( $P < 0.01$ ). Parson Brown on Rough Lemon stock had highest sucrose levels. The lowest of sucrose and glucose level was in the Parson Brown that grafting on Cleopatra stock ( $P < 0.01$ ). The results show that, the highest phenol (28.84 mg/g) and flavonoids (22.57 mg/g) were in the flavedo of Mars cultivar on the Rough Lemon grafting stock. The results of correlation show that between the amount of flavonoid and phenols exist positive and significant correlation ( $P < 0.01$ ).

**Keywords:** Citrus, Phenol, Flavonoid, Parson Brown, Mars

1,4,5,6,7- Associate Professor and Former M.Sc. Students, Department of Horticultural Sciences, Gorgan University of Agricultural Sciences and Natural Resources, Respectively

2,3- Assistant Professor and Lecturer, Department of Horticultural Sciences, Sari University of Agricultural Sciences and Natural Resources, Respectively

(\* - Corresponding Author Email: V\_Akbarpour@yahoo.com)

## Effect of Different Boron Concentrations on Some Vegetative and Physiological Characteristics of Olive

H.A. Rostami<sup>1\*</sup>- S.J. Tabatabaei<sup>2</sup>- F. Zaare-Nahandi<sup>3</sup>- J. Hajilo<sup>4</sup>

Received: 15-7-2011

Accepted: 25-12-2012

### Abstract

Boron toxicity is one of the most important disorders for plant cultivation in the arid and semi-arid regions. Boron accumulation usually occurs in deeper soil layers due to leaching and therefore improvement of such a soil in this situation is difficult. An experiment was conducted to find out the effect of boron on the vegetative and physiological aspects of olive trees. Six concentrations of boron (0.2, 10, 20, 30, 40 and 50 mg/l) and two cultivars (*Amygdalia* and *Konsevolia*) were used in this experiment. The experiment was arranged in a completely randomized design with four replications. The results showed that with increasing levels of boron dry weight of leaves, stems and roots compared with controls in both cultivars declined. *Amygdalia* cultivar in the high concentration of boron was unable to grow and decrease in the production of new leaves was significant but *Konsevolia* cultivar high concentrations of boron also could grow, although the growth of this cultivar was as well significantly reduced. Efficiency of photosynthesis (Fv/Fm) in both cultivars decreased with increasing boron levels. However, *Amygdalia* showed a more reduction than *Konsevolia*. Boron toxicity symptoms appeared 45 days after the start of the experiment in concentrations (30, 40 and 50 mg/l) in *Amygdalia* cultivar. However, 75 days after the *Amygdalia* cultivar symptoms were observed at concentrations 40 and 50 mg/l. The results showed that olive can have a good resistance to boron toxicity, although much of this resistance is largely dependent on the cultivar.

**Keywords:** Olive, Boron, Toxicity, Efficiency of photosynthesis

---

1,2,3,4- M.Sc. Student, Professor, Assistance Professors, Department of Horticulture Sciences, Faculty of Agriculture, University of Tabriz, Respectively

(\* - Corresponding Author Email: Hojatrostami@gmail.com)



## Effects of Drought Stress on Growth and Physiological Characteristics of Dill (*Anethum graveolens* L.)

Z. Setayesh-Mehr<sup>1\*</sup>- A. Ganjeali<sup>2</sup>

Received: 3-12-2011

Accepted: 23-10-2012

### Abstract

In order to study the effect of different water potential on *Anethum graveolens* L. an experiment was conducted. This study was carried out based on completely randomized design with three replications. In this experiment, morpho-physiological characteristics were assessed under hydroponic. Stress was established with PEG 6000, and drought potentials were: 0 (control), -1.5, -2, -2.5 and -3 bar. The results showed that effect of drought stress on morphological characteristics including: shoot length, root length, surface of leaves and leaves number was significant ( $p \leq 0.01$ ). Mean comparison of treatments showed that with increasing drought stress, all parameters decreased. Effect of drought stress on amount of a, b and total chlorophyll, carotenoid, soluble proteins, phenolic compounds and  $K^+$ , P and  $Ca^{+2}$  concentrations in shoot and root were significant ( $p \leq 0.01$ ). Effect of drought stress on chlorophyll a/b ratio was significant ( $p \leq 0.05$ ). Mean comparison of treatments showed that with increasing drought stress, amount of chlorophyll, carotenoid, soluble proteins,  $K^+$ , P and  $Ca^{+2}$  and shoot/root  $K^+$  ratio decreased where as amount of phenolic compounds in shoot and root increased. Shoot to root length ratio and shoot/root  $K^+$  ratio were not influenced by drought stress ( $p \leq 0.05$ ). From the results of this study, it can be deduced that dill medicinal plant respond to drought stress by increasing of phenolic compounds.

**Keywords:** Morphological parameters, Chlorophyll, Protein, Phenolic compounds

1- Instructor, Department of Biology, Faculty of Sciences, University of Zabol

(\*- Corresponding Author Email: Setayeshmehr.zahra@yahoo.com)

2- Assistance Professor, Department of Biology, Faculty of Sciences, Ferdowsi University of Mashhad



## Study and Comparison Jar and Periodical Bioreactor for Mass Propagation of Rootstocks GF677 (*Prunus amygdalus*×*Prunus persica*)

S. Bagheri<sup>1\*</sup>- M.E. Amiri<sup>2</sup>- D. Davoodi<sup>3</sup>- M. Entesari<sup>4</sup>

Received: 11-12-2011

Accepted: 27-11-2012

### Abstract

The GF677 (*Prunus amygdalus*×*Prunus persica*) is a peach rootstock tolerant to Fe deficiency. Therefore, mass propagation of GF677 rootstock is recommended by bioreactor. On the other hand, plant micro-propagation using bioreactors can decrease the cost of production and makes it an economical method. In this research, the possibility of using bioreactor and optimization of the tissue culture procedure in GF677 rootstock micro-propagation was studied. *In vitro* stock plantlets from axillary buds and liquid modify MS basal medium supplemented with 1 mg/L BAP, 0.2 mg/L GA<sub>3</sub>, and 3% sucrose were used for inoculation and multiplication in the bioreactors. Periodical nutrition of the explants established for 10 minutes in each 24 hours. Bioreactor system was compared with routine *in vitro* procedure in tissue culture laboratory. Results showed that the bioreactor system multiplication rate, number of shoots, and biomass production was significantly different from routine *in vitro* culture. The total number of shoots in bioreactor was about 600 whit 7.43 cm length and was very more efficient than routine system (20 shoots whit 2.47 cm length per 300 ml jar).

**Keywords:** GF677 (*Prunus amygdalus*×*Prunus persica*), Mass propagation, Periodical, Bioreactor

1,2- M.Sc. Student and Associate Professor, Department of Horticulture Science, Faculty of Agricultural, Zanjan University, Respectively

(\*- Corresponding Author Email: S.bagheri67@yahoo.com)

3- Assistant Professor, Biotechnology Research Institute, Karaj

4- M.Sc. Student, Department of Plant Breeding, Faculty of Agricultural, Zanjan University

## Evaluation of Compatibility and Comparison of Qualitative and Quantitative Characteristics of Some Nectarine Cultivars in Meshkinshahr Condition

H. Fathi<sup>1\*</sup>-H. Karbalaei Khiavi<sup>2</sup>- U. Jahani<sup>3</sup>- N. Bouzari<sup>4</sup>

Received: 7-1-2012

Accepted: 27-11-2012

### Abstract

In order to select of the best nectarine cultivars in Meshkinshahr environmental condition, 11 cultivars of nectarines (including: Independence, Star Redgold, Stark sunglow, Sanking, Quata, Shabrang e Karaj, Germez-e-Paez-e-Mashad and 4 new imported cultivars including: Winberger, Vega, Orion and Gioia) were grafted on Misory peach rootstock. Cultivars were planted in randomized complete block design (RCBD) with 3 replication and 4 trees in each replication. In this research, cultivars characteristics were evaluated, vegetative traits (such as: Trunk diameter, annual growth, tree height and canopy extension), bearing traits (such as: begin of flowering, flowering period, end of flowering, fruit set and harvest time), Quantitative and qualitative traits were evaluated. Results showed that vegetative annual growth of Vega, Germez-e-Paez-e-Mashad, Quata and Sanking cultivars were higher than other cultivars and Star Redgold cultivar has the highest yield with 11.43 Kg and 9524 Kg per tree and area unit, respectively. Independence, Sunglo, Germez-e-Paez-e-Mashad, Winberger and Quata cultivars is located in later rank classes. Orion cultivar with 5.93 Kg and 4942 Kg per tree and area unit, respectively has the lowest yield with Vega cultivar. All cultivars had not significant differences on stem diameter in first 2 years but have significant differences in 3<sup>th</sup> year. Final results showed that, Star Redgold, Independence, Starksunglo and Winberger nectarines have the highest adaptability with Meshkinshahr condition. These cultivars had the highest growth, better compatibility and other vegetative characteristics such as: annual growth and canopy extension were higher than other cultivars. Therefore, mentioned cultivars are recommended for new orchards establishment.

**Keywords:** Nectarine, Adaptability, Quality and quantity, Yield, Meshkinshahr

1,2,3- Researcher, Instructor and Researcher, Agriculture and Natural Resources Research Center of Ardabil, Horticultural Research Station of Meshkinshahr, Respectively

(\*- Corresponding Author Email: Fathih\_1353@yahoo.com)

4- Assistant Professor, Horticultural Section of Seed and Plant Improvement Institute of Karaj



## Evaluation of Chilling Requirement in Four Commercial Grape Cultivars

H. Araghi<sup>1\*</sup>- A. Tehranifar<sup>2</sup>- B. Abedi<sup>3</sup>- Gh. Davarynejad<sup>4</sup>- M. Shoor<sup>5</sup>

Received: 8-1-2012

Accepted: 4-7-2012

### Abstract

No Sufficient of chilling is a major problem in producing temperate fruit in warm climates. So determination of chilling requirement of different cultivars of grape is important. The aim of this research was determination of chilling requirement of four grape vine commercial cultivars including: Kolahdary, Red Rasin, Yaghoti and White Rasin that factorial experiment based on a completely randomized design with 12 chilling temperatures included: control, 50, 100, 200, 300, 400, 500, 600, 700, 800, 900 and 1000 hours below  $5\pm 10C$  and three replications with 6 individual samples in each replicate. Results showed that the effects of chilling requirement and cultivars on the studied traits including sprouting percentage, number of days to first sprouting shoot, number of days to last sprouting shoot and ratio of fresh weight to dry weight were significantly different. With increasing chilling duration from 200-1000 hour in Yaghoti cultivar and from 300-1000 hour in other three cultivars, there was no significant difference in the percentage of sprouting. Nevertheless at least 100 hr, of chilling is needed to get the favorable sprouting in Yaghoti cultivar and 200 hr, in other three cultivars. Results showed that with increasing chilling duration 0-1000 hr, the number of days for complete sprouting in kolahdary, Red Rasin, Yaghoti, and White Rasin cultivars decreased by 19, 19, 22 and 15 day, respectively. Moreover, the highest ratio of fresh weight to dry weight of vegetative parts of cutting above mentioned cultivars was observed in 200-1000 hr, rang of chilling.

**Keywords:** Chilling requirement, Grape cultivars, Climate, Bud sprouting

---

1,2,3,4,5- M.Sc. Student, Associate Professor, Assistant Professor, Associate Professor, Assistant Professor, Department of Horticultural Science, Faculty of Agricultural, Ferdowsi University of Mashhad, Respectively  
(\* - Corresponding Author Email: Hoseinaraghi@yahoo.com)



## Effect of Nitrogen and Plant Spacing on Nutrient Uptake, Quality and Quantity Characteristics of Tuberose (*Polianthes tuberosa* L. 'Double')

M.A. Khalaj<sup>1\*</sup>- B. Edrisi<sup>2</sup>

Received: 21-1-2012

Accepted: 28-8-2012

### Abstract

Tuberose (*Polianthes tuberosa* L.) is one of the most important cut flowers in tropical and subtropical areas. This flower has forth order in cut flower and second order in bulbous plants production in Iran. Plant spacing and nitrogen necessity are the most important factors for tuberose quality and quantity. In this study, field experiment carried out as factorial design in Randomized Complete Block Design (RCBD) format whit 3 replications. Different level of nitrogen (0, 50, 100, 150, 200 and 250 kg/ha) in ammonium nitrate was the first factor. Second factor was different plant spacing (10x10, 15x15, 20x20 and 25x25 cm×cm). Plant space (25×25 cm) has significant effect on flower stalk height, stem diameter, spike length, floret diameter, vase life and also nitrogen, phosphorus and potassium uptake as well. Nitrogen usage as 200 kg/ha N could improved significantly growth indices and yield of tuberose as flower stalk height, stem diameter, spike length and nitrogen uptake.

**Keywords:** Tuberose, Nitrogen, Plant spacing, Growth indices, Nutrients uptake

---

1,2- Scientific Members, National Ornamental Plant Research Station (Mahallat)  
(\*- Corresponding Author Email: Khalaj56@yahoo.com)



## The Study of Culture Media Composition and Cytokinin Type Effects on Establishment and Proliferation of Walnut Explants, Eenotype Z60

S. Mohamadi-Nejad<sup>1</sup>- M. Gholami<sup>2\*</sup>- M. Esna-Ashari<sup>3</sup>

Received: 14-2-2012

Accepted: 10-9-2012

### Abstract

This research was conducted to study the factors affecting establishment, growth and shoot proliferation of Persian walnut, genotype Z60. Explant establishment was studied through a factorial experiment based on a completely randomized design with two factors including culture media (DKW and WPM) and BA concentration (0 (control), 0.5 and 1.0  $\mu\text{M}$ ). Single-node explants were prepared from the young branches of Z60 trees in the middle of May. Although the effect of two culture media on the growth characteristics had no significant difference, but mean comparison of the data with this regard showed that DKW medium performed better than WPM. No significant difference was observed between the two BA concentrations, but significant difference was between two concentrations (0.5 and 1.0  $\mu\text{M}$ ) with 0 (control). In shoot proliferation experiment, two cytokine hormones (BA and Kinetin) in three concentrations (4.4, 6.6 and 8.8  $\mu\text{M}$ ) were studied in DKW medium. The data obtained from this part of experiments were analyzed through unbalanced completely randomized design. The effect of different hormonal treatments and their concentrations on Z60 genotype growth characteristics showed that 8.8  $\mu\text{M}$  BA was more effective in compared to the other two treatments. However, no significant difference was observed between the three concentrations with this respect.

**Keywords:** Genotype, Micro-propagation, Growth characteristic, Proliferation, Tissue culture

---

1,2,3- M.Sc. Student, Professor and Associate Professor, Department of Horticultural Sciences, Bu-Ali Sina University, Respectively

(\* - Corresponding Author Email: Mgholami@basu.ac.ir)



## Study of Irrigation Interval and Mulch Effects on Vegetative Growth of Olive in Kermanshah Province

R.A. Gholami<sup>1</sup>- I. Arji<sup>2</sup>- M. Gerdakaneh<sup>3\*</sup>

Received: 14-3-2012

Accepted: 27-11-2012

### Abstract

In order to determine the effect of irrigation interval and mulch on growth of olive an experiment was carried out in Dallaho Olive Research Station at Sarepole. A split plot experiment was used based on a completely randomized design with three replications and two factors (mulch and irrigation interval). Each experiment unit consists of 4 trees. Land preparation was done in February 2005 in a 6048 squared meter area then tree planted. Pruning operation was done in next year. Mulch treatments for experiment were control, polyethylene and organic materials and irrigation treatments period for experiment were 3, 6 and 10 days interval. Some growth traits including height, trunk diameter and current season growth were measured at the end of growth season. Collected data were analyzed with MSTATC program. Results showed that organic materials mulch and interval irrigation treatments had significant differences in height, trunk diameter and current season growth so that organic materials mulch and 3 days interval irrigation treatments increased height, trunk diameter and current season growth of olive trees. The interaction effect between mulch and irrigation treatments was significance. So that 3 days interval irrigation and organic materials mulch had the highest height, trunk diameter and current season growth. 6 days interval irrigation supplemented with mulch treatment had more significant effect on these traits compared to 3 days interval irrigation alone.

**Keywords:** Olive, Irrigation interval, Mulch, Vegetative growth

---

1,2,3- Scientific Members, Agricultural and Natural Resource Research Center of Kermanshah  
(\* - Corresponding Author Email: Mgerdakaneh@gmail.com)



## Identification of Some Native and Foreign Apple Varieties Cultivated in Khorasan-e-Razavi Province Based on Qualitative, Quantitative Traits and Keywords

Sh. Attar<sup>1\*</sup>-Gh. Davarynejad<sup>2</sup>- S.H. Nemati<sup>3</sup>

Received: 23-4-2012

Accepted: 23-10-2012

### Abstract

Recognition and identification of many native and foreign apples cultivars are not clear for researchers, students, and gardeners. Additionally, since there is not any descriptor available on this case, they have different local names and sometimes similar in Khorasan-e-Razavi province. This study aimed to evaluate physico-chemical and morphological traits to offer descriptor for identification some native and foreign apple varieties. Native varieties including; Bijandi Akhlamad, Abdolmajidi, Golshahi Pish Ras, Compooti, Alimoori and foreign cultivars including; Prime Rose, Red Spur, Fuji, Braebern, and Ingrid grafted on MM.106 rootstock during two years (2010-2011) at Golestan garden in Chenaran, Mashhad. About 62 different qualitative and quantitative traits related to the tree properties, leaves, flowers and physico-chemical attributes of fruit were carried out in a completely randomized design with 10 replications. Results showed that the fruit shape of Prime Rose cultivar was flat, Red Spur was conical to globular, Bijandi Akhlamadi was globular and the other was flat globular. The shape of carpel in Alimoori and Prime Rose were completely open and in the others were closed. Data showed that the greatest variation between cultivars was at the traits such as; blossom end depth, fruit firmness, skin thickness, fruit length, fruit diameter, seed length, leaf width, fruit acidity and pH. Correlation analysis showed that petiole length significantly correlated with leaf length to leaf width ratio ( $r=0.74\pm 0.07$ ) and fruit weight with fruit length ( $r=0.96\pm 0.03$ ) positively at 1% probability level.

**Keywords:** *Malus domestica*, Genetic variation, Traits correlation, Fuji, Beraebern, Cultivar

---

1,2,3- M.Sc. Student, Associate Professor and Assistance Professor, Department of Horticultural Science, Faculty of Agricultural, Ferdowsi University of Mashhad, Respectively  
(\* - Corresponding Author Email: Sh\_at66@yahoo.com)