



## Evaluation of Tolerance in Sugarbeet Varieties to Dodder (*Cuscuta campestris*)

F. Fallahpour<sup>1\*</sup>- A. Koocheki<sup>2</sup>- M. Nassiri Mahallati<sup>2</sup>- M. Falahati Rastegar<sup>3</sup>

Received:06-10-2009

Accepted:13-11-2012

### Abstract

Dodder is an obligate parasite of many plant families and among dodder species *Cuscuta campestris* has the most diverse around the world. Extensive infestation to dodder recently has been reported in some sugarbeet production regions of Khorasan provinces. So, in this study greenhouse and field experiments were conducted to test and characterize the tolerance of commercial sugarbeet varieties to *C. campestris*. A completely randomized design with five replications and a randomized complete block design with three replications were used for the greenhouse and field experiments, respectively. Treatments were five common varieties of sugarbeet included Castille, Paulina, Brigitta, Flores and Laetitia with dodder infestation and control treatments (sugarbeet varieties) without infestation. Traits measured were shoot and root dry weight of sugarbeet, dry weight of dodder, the number of houstorium on shoot of sugarbeet, growth percentage of dodder and sugarbeet. The results indicated that varieties showed different levels of tolerance to dodder infection. The variety of Flores had the most percentage of shoot and root dry weight and Paulina with 13.48% of root dry weight and 31.96% of shoot dry weight compared to control showed the least tolerance. Whereas the number of houstorium and dodder dry weight had the most and the least amount in Castille and Flores, respectively. In this experiment Flores variety exhibited tolerance to dodder and Castille was known as susceptible variety.

**Keywords:** Dodder, Sugar beet, Houstorium, Obligate parasite

1,2,3- PhD Student and Professors, Department of Agronomy and Plant Breeding, College of Agriculture, Ferdowsi University of Mashhad, Respectively

(\*- Corresponding Author Email: farnoush.fallahpour@stu-mail.um.ac.ir)

4- Professor of Plant Protection Department, College of Agriculture, Ferdowsi University of Mashhad

## Evaluation of Weed Diversity and Modelling Light Interception and Distribution in Multiple and Sole Cropping of Millet (*Setaria italica* L.) and Bean (*Phaseolus vulgaris* L.)

A. Koocheki<sup>1</sup>- M. Nassiri Mahalati<sup>2</sup>- S. Sanjani<sup>3\*</sup>

Received:24-01-2010

Accepted:25-04-2010

### Abstract

In order to investigate the weed diversity and modeling light interception in sole and intercropping millet and bean an experiment was conducted as complete randomized block design with 4 treatments and 4 replications at the Agricultural Research Station, Ferdowsi University of Mashhad, Iran, during 2008. Treatments included monocultures, intercropping of millet and bean and a control treatment where weeds grew without crops. In this experiment Shannon diversity index and Sorensen similarity index was investigated at six stages. Results indicated that in each stage Shannon index was affected by treatments. In first stage intercropping had the lowest weed diversity but in another stages it has no significant with monocultures. Control treatment has highest weed diversity. For modeling light interception were used INTERCOM model. Results showed that in light interception plant height and leaf distribution was more effective than LAI (Leaf Area Index). Light interception in intercropping was more effective than monoculture.

**Keywords:** Weed diversity, Shannon index, Sorensen index, Modeling light interception

---

1,2,3- Professors and PhD Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\*- Corresponding Author Email: sanjani20\_s@yahoo.com)

## Effects of Different Sowing Depths and Soil Compactions on Emergence and Initial Growth of Pepper Varieties (*Capsicum annum* L.)

R. Shahriari<sup>1\*</sup>- M. Khaje Hosseini<sup>2</sup>- S.M. Hasheminia<sup>3</sup>

Received:05-06-2010

Accepted:30-05-2012

### Abstract

One of the main problems in the mass production of pepper transplant is the stickiness of seed coat to the cotyledony leaves that can lead to no emergence or having poor emergence of pepper seedlings. Therefore, in order to evaluate the effects of different sowing depths and soil compactions on emergence and early seedlings growth of pepper, a greenhouse experiment was conducted in the Faculty of Agriculture, Ferdowsi University of Mashhad, Iran, in 2010, using a completely randomized design with factorial arrangement and four replications. The experimental factors included different levels of soil compactions (0 (no compaction), 150.5, 681.340 and 1201.7 Pa, different sowing depths (0 (surface), 1 and 2 cm) and different pepper varieties (Olter, California Wonder, EM Bell, Anahiem and Iranian Falei). The results indicated that except the seed coat adherence to cotyledon leaves and the emergence percentage traits, the compaction treatments had a significant effect on (dry matter of seedlings, height, leaf area, number of abnormal seedling and mean emergence time) were significant. In addition, sowing depth treatments had positive and significant effects on increasing the number of seedling with releasing seed coats from the cotyledony leaves.

**Keywords:** Pepper, Mean emergence time, Seed coat, Cotyledony leaves

---

1,2- PhD Student and Assistant Professor, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Iran

(\*- Corresponding Author Email: ro\_sh753@stu-mail.um.ac.ir)

3- Lecturer, Department of Water Engineering, Faculty of Agriculture, Ferdowsi University of Mashhad



## Evolution Effect of Absciscic acid (ABA) Foliar Application on Salt Tolerance of Canola Varieties

R. Farhodi<sup>1</sup>

Received: 06-07-2010

Accepted: 24-02-2013

### Abstract

This experiment was conducted to investigate the effect of salinity and ABA foliar application on growth and physiology of two canola varieties (Fornex and Okamer). Salinity levels (0 and 12 ds/m) and ABA foliar application (0, 15 and 30  $\mu\text{mol L}^{-1}$ ) were investigated using a factorial split design in 3 replications. Results showed variety Fornex was salt stress tolerance variety. ABA foliar application had negative effect on variety Fornex under salinity condition. ABA foliar application (15  $\mu\text{mol L}^{-1}$ ) under salinity condition increased shoot dry matter, peroxidase activity and leaf  $\text{K}^+$  concentration but decreased leaf  $\text{Na}^+$  concentration in variety Okamer. ABA foliar application (15  $\mu\text{mol L}^{-1}$ ) increased salinity tolerance in variety Okamer but used 30  $\mu\text{mol L}^{-1}$  ABA foliar application decreased growth in this variety.

**Keywords:** Salt stress, ABA, Dry weight, Peroxidase activity, Canola

---

1- Assistant Professor of Agronomy and Plant Breeding Department, Faculty of Agriculture, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran  
Email: rfarhodi@gmail.com

## Effect of Chemical Fertilizer, Cow Manure and Municipal Compost on Yield, Yield Components and Oil Quantity of three Sesame (*Sesamum indicum* L.) Cultivars in Mashhad

P. Rezvani Moghaddam<sup>1\*</sup>- A. Saburi<sup>2</sup>- A.A. Mohamad Abadi<sup>3</sup>- R. Moradi<sup>4</sup>

Received:24-07-2010

Accepted:16-05-2012

### Abstract

In order to evaluate the effects of different organic and chemical fertilizers on yield, yield components and seed oil content of sesame an experiment was conducted in a split plot layout based on randomized complete block design with four replications at Research Station, Faculty of Agriculture, Ferdowsi University of Mashhad in year 2006. Four types of fertilizer, including chemical fertilizer, cow manure, municipal compost and no fertilizer (control) were allocated as main plots and three sesame cultivars (two local varieties of Kalat and Esfarayen, and Oltan cultivar) were used as sub plots. The results showed that fertilizer treatments had significant effect ( $P<0/05$ ) on number of branches per plant, number of capsules per plant and biological, grain and oil yield. Grain yield increased by fertilizer application compared to no fertilizer, the highest yield (1518 kg/ha) was obtained in chemical fertilizer treatment. In addition, grain yield in manure (1418 kg/ha) and compost (1259 kg/ha) treatments, was significantly higher than control (1078 kg/ha) treatment. Plant height, 1000 seeds weight, number of seed per capsule, and oil percentage were not affected by fertilizer treatments. Effect of cultivar was significant on all studied traits. Esfarayen variety was the tallest (122 cm) and had the greatest number of capsules per plant (94 capsules) compared with two other cultivars. Kalat variety had the highest 1000 seeds weight (3.50 g), grain yield (1533 kg/ha) and oil percentage (52.03%) compared with two other cultivars. Highest oil yield was obtained in Kalat cultivar with chemical fertilizer treatment.

**Keywords:** Oltan, Compost, Esfarayen, Kalat, Manure, Oil, Sesame

---

1,2,3,4- Professor, M.Sc. Graduate, Assistant Professor and PhD Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\* - Corresponding Author Email: rezvani@um.ac.ir)

## Analysis of General and Specific Combining Ability in Canola Using Biplot Method

B. Roostabaghi<sup>1</sup>- H. Dehghani<sup>2\*</sup>- B. Alizadeh<sup>3</sup>- N. Sabaghnia<sup>4</sup>

Received: 17-08-2010

Accepted: 22-01-2013

### Abstract

To study combining ability and genetic parameters of seed yield trait in rapeseed, eight lines of rapeseed were evaluated by a design of half diallel cross. Seeds of F1 generation and their parents were grown in a  $6 \times 6$  simple lattice design with two replications. According to the analysis of variance, general combining ability (GCA), specific combining ability (SCA) and mean squares of genotypes were significant for seed yield at 0.05 and 0.01 probability level, respectively. We used GGE biplot approach for graphical diallel cross analysis. The biplot displays the most important entry by tester patterns of the data and allows the information to be extracted visually. The biplot analysis indicated that the first two principal components explained 74.3% (47.7 and 26.6% by PC1 and PC2, respectively) of the variation for seed yield. GGE biplot graphical procedure results indicated that one parent, Opera, had the highest positive GCA and parents of Fornax had the highest negative GCA. The largest SCA obtained from ORIENT and the smallest SCA came from TALAYE. Also, the SCA mostly came from OPERA and TALAYE, ORIENT and TALAYE. Overall, the results of this study suggest that, within individual hybrid crosses, sufficient heterosis for yield exists to justify hybrid development in rapeseed.

**Keywords:** Canola (*Brassica napus* L.), GCA, SCA, GGE biplot, Diallel, Heterosis

1,2- M.Sc. Student and Associate Professor of Plan Breeding Department, Faculty of Agriculture, Tarbiat Modares University, Tehran

(\*- Corresponding Author Email: [dehghanr@modares.ac.ir](mailto:dehghanr@modares.ac.ir))

3- Assistant Professor of Oilseeds Department, Seed and Plant Improvement Institute, Karaj

4- Assistant Professor of Agronomy and Plant Breeding Department, Maragheh University

## Corn (Hybrid BC666) Response to Supply Nutrients from Organic Nutrition (Azotobacter and Manure) in Climate Conditions of Lorestan

M. Beiranvadi<sup>1</sup> - A. Ghalavand<sup>2</sup> – Y. Filizadeh<sup>3</sup> – S.K. Mousavi<sup>4</sup> – A. Ahmadi<sup>5\*</sup>

Received:06-03-2011

Accepted:12-03-2013

### Abstract

Maize (*Zea mays* L.) is one of the most important crops that used for food, feeding and industrial products and in Iran a developing cultivation. In order to study of corn s reactions (Hybrid BC666) to supply nutrients to organic nutrition (Bacteria and manure) as summer sown in climate conditions of Lorestan. An experiment was conduct in Meteorology Station of Lorestan s agriculture research field during 2007 four planting densities as 75000,85000, 95000 and 105000 plant ha<sup>-1</sup> in main plots and two amount manure (24 and 30 ton ha<sup>-1</sup>) set in subplot and application and non application *Azotobacter chroococcum* set in sub-sub plots , were arranged in a split split plot design as base of RCBD. The results indicated that plant densities significantly affected Biological yield, grain yield and ear number in m<sup>2</sup>. Increase plant densities of 75000 to 105000 plant in per hectare caused 42% addition biological yield, 65% addition grain yield and 42% raise ear number in m<sup>2</sup>. eventually researches showed in climate conditions of Lorestan corn to be able as summer sown to enter rotation cycle. thus corn summer sown planting densities 105000 plant ha<sup>-1</sup> is optimum density and application 24 ton ha<sup>-1</sup> manure for supply plant nutrients to be enough. In rich soils with fertilizers, not available field for to show beneficial effects bacteria.

**Keywords:** Plant density, Yield seed, Leaf area index

1,3- Master of Science and Associate Professor, Department of Agriculture, Shahed University

2- Associate Professor, Department of Agriculture, Tarbiat Modarres University

4- Research Assistant Professor of Plant Protection Research Division, Research Center for Agriculture and Natural Resources of Lorestan

5- Assistant Professor Department of Agriculture, Lorestan University

(\*- Corresponding Author Email: ahmadi1024@yahoo.com)



## Evolution of Intercropping of three Sesame Cultivars (Sabzevar, Kashmar, Kalat) on Seed Yield and Yield Components Indices

H. Zarghani<sup>1\*</sup>- M. Mohamadian<sup>2</sup>- P. Rezvani Moghaddam<sup>3</sup>- A. Yanegh<sup>4</sup>

Received: 11-03-2011

Accepted: 30-05-2012

### Abstract

In order to study the effect of inter cropping (Blend) of three sesame (*Sesamum indicum* L.) cultivars (Sabzevar, Kashmar, Kalat) an experiment was conducted as a factorial based on Complete Randomized Block Design with 3 replications at Research Farm Ferdowsi University in 2009. The experimental treatments were obtained: sole cultivation of Sabzevar, Kalat, Kashmar, and their mixed crops (1. Sabzevar with Kashmar, 2. Sabzevar with Kalat, 3. Kalat with Kashmar). The results showed that highest and lowest studied traits (including: biological and seed yield, the number of capsules on main stem and branches, number of seeds per capsule and seed weight) obtained in Sabzevar-Kashmar and sole cultivation of Kalat respectively. Generally Sabzevar in mix with other cultivars increased total yield seed, and Kalat and Kashmar Cultivars in mixed with Sabzevar cultivar had the highest positive effectives. And mix of Kashmar and Kalat cultivars had the lowest indicator amount. Also mix of Sabzevar with Kashmar cultivars and mix of Kalat with Kashmar cultivars had the highest (1/14) and lowest (0/93) Land Equivalent Ratio (LER). Based on the results of this experiment mix of Sabzevar with Kashmar is best treatment in order to achieving high seed yield of sesame in Mashhad area.

**Keywords:** Land Equivalent Ratio, Number of Capsule, Seed Weight, Seed Yield

---

1,2,3,4-PhD Student, Former MSc Student, Professor and PhD Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\* - Corresponding Author Email: [H.zarghani2004@yahoo.com](mailto:H.zarghani2004@yahoo.com))





## Evaluation of Nitrogen and Phosphorous Levels on Forage Yield and Characteristics of *Kochia scoparia* in Irrigating with Two Saline Waters

S. Khaninejad<sup>1\*</sup> - M. Kafi<sup>2</sup> - H.R. Khazaei<sup>3</sup> - J. Shabahang<sup>4</sup> - J. Nabati<sup>5</sup>

Received: 05-05-2011

Accepted: 01-01-2012

### Abstract

*Kochia scoparia* is a salt resistant plant that can be used in producing forage in the areas with salt water and soil resources. One of the problems which produce the forage plants in these areas decreases the function and quality of the forage in irrigation condition with salt water. Therefore, using the chemical fertilizers can be considered as a useful solution. This study was conducted to evaluate the effects of various levels of phosphorus and nitrogen fertilizer in irrigating condition with saline water on forage yield and characteristics of *Kochia* by applying split plot experiments based on Randomized Complete Block design with three replications. The main plots consisted two levels of salinity of irrigating water, 5.2 and 16.5 dS/m, and the subplot consisted of factorial of three nitrogen levels in the form of urea (0, 100, 200 kg/h) and three phosphorus levels in the form of Triple Super Phosphate (0, 75, 150 kg/h). Results showed that salinity had no significant effect on height, stem diameter and dry matter percentage. But, nitrogen application leads to increase in height, lateral shoots and forage yield compared with control. Phosphorous had significant effect of dry forage yield. The interactions of salt with nitrogen and phosphorus showed that the fertilizers can partially reduce the negative effects of salt stress on *Kochia* and improve the forage characteristics and biomass production.

**Keywords:** Dry matter percentage, Interaction of salinity and nitrogen and phosphorus, lateral shoot

---

1,2,3,4,5- PhD Student, Professors, Lecture and Former PhD Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\*- Corresponding Author Email: [skhaninejad@yahoo.com](mailto:skhaninejad@yahoo.com))



## Effect of Sulphur and Zinc on Growth and Yield of Peanut (*Arachis hypogaea L.*)

S. Eismailpour<sup>1\*</sup>- J. Asghari<sup>2</sup>- M.N. Safarzadeh Vishgayi<sup>3</sup>- H. Samizadeh Lahiji<sup>4</sup>

Received:22-05-2011

Accepted:22-01-2013

### Abstract

Peanut are one of the paired plants of oilseed and protein seed oil is a rich source. In order to evaluate effects sulphur and zinc on growth characteristics and yield of peanuts, a experiment was conducted in Bandar Kiashahr, Guilan province, Iran in 2008. The experiment laid out in a factorial arrangement with two factors sulphur (0, 40, 80, 120 kg ha) and zinc chelate on (0, 0.5, 1 and 1.5 g per lit) in a completely randomized complete block design with three replications. Results showed that amounts of sulphur and zinc significant effects were on Peanut plant traits, as pod yield, seed yield and oil content. The mean comparison of the properties studied showed that rate of 120 kg.h<sup>-1</sup> sulphur was better than other treatments. Also had better efficacy between treatments of zinc chelate on treatment to 1.5gr per lit. Also, the interaction of the sulphur and zinc had the most increase on these parameters.

**Keywords:** Peanut, Plant growth rate, Pod growth rate, Pod yield, Seed oil

---

1,2,4- MSc Graduate and Associate Professors, Department of Agronomy and Plant Breeding, Agricultural College, University of Guilan, Respectively

(\*- Corresponding Author Email: sadegh.esmailpoor@yahoo.com)

3- Assistant Professor of Agronomy and Plant Breeding Department, University of Azad Rasht Branch



## Evaluation of the Potential Use of Agricultural and Forestial Waste in Spawn Production of Medicinal Mushroom (*Ganoderma lucidum*)

M. Tavana<sup>1</sup> - M. Azizi<sup>2\*</sup> - M. Farsi<sup>3</sup>

Received:06-07-2011

Accepted:04-06-2012

### Abstract

Spawn quality plays an important role in successful production of medicinal mushrooms. In this study, firstly, to determine the optimum temperature for mycelia growth of *G. lucidum*, four basal media, including seeds of wheat, barley, millet and *Abies sp.* wood chip were studied separately at  $25\pm 1^\circ\text{C}$  and  $29\pm 1^\circ\text{C}$ . In the second section, in order to achieve suitable the mycelia growth, barley, wheat and millet seeds were mixed with different ratios of agriculture waste including wheat bran (10, 20 and 30% dry weight) and millet peel (20, 40 and 60% dry weight) and also *Abies sp.* wood chips (20, 30, 50 and 60% dry weight) as forestial waste. In the final section, several forestial waste including sawdusts (*Platanus orientalis*, *Acer sp.*, *Robinia pseudoacacia*, *Ailanthus altissima*, *Fagus orientalis*, *Alnus subcordata* and *Populus alba*) were used as medium for spawn production. In the first experiment, a higher mycelia growth rate (8.92 mm/day) was obtained by applying wheat seed at  $29\pm 1^\circ\text{C}$ . In the second experiment, the results showed that higher mycelia growth rate was obtained by using wheat with 10% wheat bran (9.66 mm/day). In the final section of spawn production, *R. pseudoacacia* sawdust (C/N=25.84) was generated higher growth rate (9.36 mm/day). Also, using supplements containing nitrogen (N) such as sawdust and bran, encourage mycelium growth and with increasing C/N ratios more than 61.3 decreased growth rate due to reduce N amount.

**Keywords:** Spawn, Mycelium growth rate, C/N ratio, Agricultural waste

1,2- MSc Student and Associate Professor, Department of Horticultural Science, Faculty of Agriculture, Ferdowsi University of Mashhad

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

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



## The Effect of Nitrogen Rate on Nitrogen Use Efficiency index in Wheat (*Triticum aestivum l.*) Cultivars

R. Hosseini<sup>1\*</sup>- S. Galeshi<sup>2</sup>- A. Soltani<sup>3</sup>- M. Kalateh<sup>4</sup>- M. Zahed<sup>5</sup>

Received:06-09-2011

Accepted:17-06-2012

### Abstract

In order to investigate the effects of different levels of nitrogen rate on yield and seed yield components of wheat cultivars, an experiment was conducted on Araghi Mahalleh (Gorogan) research farm in 2008. Treatments, nitrogen in the form of urea (0, 90, 180 and 270 kg/ha) and cultivars (Tajan, Falat and N81-18) were arranged as factorial based on randomized complete block design with four replications. Measured parameter include: Nitrogen Use Efficiency, nitrogen uptake efficiency, nitrogen utilization efficiency, nitrogen efficiency indices, protein seed. The best nitrogen indices were observed in control condition. Also N81-18 cultivar had the highest nitrogen use efficiency, nitrogen utilization efficiency, nitrogen harvest index and the lowest nitrogen uptake efficiency. It has been shown that two multiple components of nitrogen use efficiency (nitrogen utilization efficiency and nitrogen uptake efficiency) had not similar contribution on nitrogen use efficiency and differences in NUE seem to have been mostly associated with UTE and less with UPE for all cultivars.

**Keywords:** Wheat, Nitrogen Fertilizer, Cultivar, Radiation Use Efficiency, Extinction Coefficient

---

1,5- M.Sc. Graduated, Department of Agronomy and Plant Breeding, Gorgan University Agricultural Sciences and Natural Rescores, Iran

(\*- Corresponding Author Email: hosseini240 @yahoo.com)

2,3- Professors, Department of Agronomy and Plant Breeding, Gorgan University Agricultural Sciences and Natural Rescores, Iran

4-Faculty Member, Golestan Agriculture Research Center Iran



## Evaluation of Clethodim Herbicide Efficiency in Comparison to other Graminicides for Weedy Grasses Control in Soybean (*Glycin max L.*)

S.K. Mousavi<sup>1\*</sup>- P. Sabeti<sup>2</sup>- N. Bagherani<sup>3</sup>

Received:06-09-2011

Accepted:24-02-2013

### Abstract

Field studies were conducted at Lorestan, Kermanshah and Golestan provinces in 2006 to separately evaluation of Clethodim herbicide for weedy grass control in soybean. All experiments were designed as randomized complete blocks with four replicates. Treatments included: clethodim at 0.6, 0.8, 1, and 1.2 L/ha; cycloxydim at 3 L/ha; Haloxyfop-R-methyl at 0.75 L/ha; Quizalofop-P-ethyl at 2 L/ha; and weeding control. In Lorestan postemergence application of clethodim at 1.2 L/ha reduced grass weed biomass by 74%. In Kermanshah, postemergence application of clethodim at 1.2 L/ha reduced grass weed density by 78%. In Golestan, post emergence application of clethodim at 1, and 1.2 L/ha reduced barnyard grass density 75% and 80% respectively. Accordingly, use of clethodim for grass weed control in soybean, because of high-performance and lower consumption in comparison with some common herbicides is recommended.

**Keywords:** ACCase inhibitors, Select, Cycloxydim, Quizalofop-P-ethyl, Haloxyfop-R-methyl

---

1- Research Assistant Professor, Agricultural and Natural Resources Research Center of Lorestan  
(\*- Corresponding Author Email: skmousavi@gmail.com )

2- Research Assistant Professor, Agricultural and Natural Resources Research Center of Kermanshah

3- Research Assistant Professor, Agricultural and Natural Resources Research Center of Golestan



## Genetic Analysis of Inheritance of Resistance in Some Hexaploid Wheat Cultivars to 134E134A<sup>+</sup>, 174E174A + Races of Stripe Rust\*

M.R. Bihamta<sup>1\*</sup> - A. Ebrahimi<sup>2</sup> - M. Dashetaki<sup>3</sup>

Received: 11-09-2011

Accepted: 30-05-2012

### Abstract

Inheritance of resistance to stripe rust was studied in wheat by determining the responses of 5 hexaploid wheat cultivars and 10 F1 progenies of their diallel mating crosses, against 2 races of pathogen including 174E174A<sup>+</sup>, 134E134A<sup>+</sup> in completely randomized design with 3 repetitions under greenhouse conditions at Tehran University. The components of resistance including latent period, infection type, pustule size and pustule density were recorded after inoculation over time. Analysis of variance showed significant differences among genotypes for all traits. Kotari cultivar had the most GCA among the parents for resistance increase. For the 2 races, there was dominance effect for most alleles. In addition for both races the additive component compared to the non-additive component was more estimated to be more important to decrease infection type. Whereas the non-additive component was calculated to have more impact to increase size and density of pustules. The results of variance analysis of Vr+Wr and wr-Vr showed the existence of dominant effect for for the 2 races. Combined analysis of variance also indicated significant effects for race and race\*genotype interactions for all traits suggesting that there differences in pathogenicity of races as well as the presence of specific genes in some of the cultivars.

**Keywords:** Diallel analysis, Stripe rust, Latent period, Infection type, Pustule density

---

1,2,3- Professor, PhD Student and Expert of Agronomy and Plant Breeding Department ,Agricultural College, University of Tehran, Karaj, Iran, Respectively

(\* - Corresponding Author Email: mrghanad@ut.ac.ir)

## Comparison of Production Effectiveness of Wheat and Barley in Terms of Energy Use and Productivity in Sistan and Blochestan Province

S.M. Ziaei<sup>1</sup> - F. Hosseinpanahi<sup>2\*</sup> - J. Valizadeh<sup>3</sup> - S.A. Barabadi<sup>4</sup>

Received: 13-09-2011

Accepted: 09-06-2012

### Abstract

Comparison of energy productivity of different crops can be used as an effective tool to prioritize crops planting in each area. This study was conducted in order to compare of wheat and barley farms of Sistan and Blochestan province in relation of various aspects of energy consumption at 2009. 100 wheat and 100 barley fields were selected randomly from Zahedan, Zabol, Saravan, Khash, Iranshahr, Gasht, Sib and Soran, Zaboli, Nahok, Jalegh and Nikshahr cities. Inputs data and yield of wheat and barley fields were collected in the form of questionnaires in a face-to-face interviewing. Results showed that total energy inputs of wheat and barley fields were 32492.97 and 25655.81 MJ.ha<sup>-1</sup>, respectively. Total energy outputs for wheat and barley fields also were 48517.24 and 49800.87 MJ.ha<sup>-1</sup>, respectively. Based on these results the amount of energy use efficiency for wheat and barley fields were 1.49 and 1.94 respectively, and the amount of energy productivity for mentioned fields were 0.056 and 0.066. The share of renewable energy as one of the sustainability index of agricultural systems was 19.60 for wheat and 14.60 for barley fields. Therefore, it seems that barley production is more efficient from various aspects of energy consumption rather than wheat in Sistan and Blochestan province.

**Keywords:** Energy Productivity, Nonrenewable Energy, Renewable Energy, Specific Energy

---

1,4- Faculty Members, Faculty of Agriculture and Natural Resource of Saravan, University of Sistan and Baluchestan  
2- PhD Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad  
(\*- Corresponding Author Email : agro\_expert@yahoo.com)  
3- Associate Professor, Department of Biology, Faculty of Science, University of Sistan and Baluchestan

## Quantity and Quality of *Cucurbita pepo* L. as Affected by Winter Cover crops (*Lathyrus sativus* and *Trifolium resopinatum*), PGPRs and Organic Manures

M. Jahan<sup>1\*</sup> - M.B. Amiri<sup>2</sup> – M. Aghhavani Shajari<sup>3</sup> – M.K. Tahami<sup>4</sup>

Received: 17-09-2011

Accepted: 31-05-2011

### Abstract

In recent years, in order to enhance the health of agroecosystems, concerns on ecological inputs especially to produce medicinal plants, has been increased. In order to evaluate the effects of winter cover crops on PGPRs activities and soil nitrogen content in simultaneous application of organic manures and biological fertilizer in a low input production system of *Cucurbita pepo* under minimum tillage condition, a split split plot experiment based on RCBD design with three replications was conducted in 2009-10 growing season in Research Farm of Ferdowsi University of Mashhad, Iran. Four different types of organic manures (cow, sheep, chicken and vermicompost) plus control, inoculation and no-inoculation with Nitroxin<sup>®</sup> (as biological fertilizer containing of *Azotobacter* sp., *Azospirillum* sp.) and cultivation and no-cultivation of winter cover crops (*Lathyrus sativus* and *Trifolium resopinatum*), assigned to main plots, sub plots and sub-sub plots, respectively. The results showed that all organic manures except chicken manure, increased the fruit yield, compared to control. Inoculation with Nitroxin<sup>®</sup> and cover crop cultivation resulted in increased fruit number and fruit yield, respectively, meanwhile improved soil nitrogen content was happened. Simultaneous application of vermicompost and Nitroxin<sup>®</sup>, increased seed yield significantly compared to single use of these factors. In both conditions of cultivation and no-cultivation of winter crop, all organic manures increased seed protein content, compared to control. The triple interaction effect of treatments was significant as the best result of vermicompost application resulted when simultaneously applied with cover crop and Nitroxin<sup>®</sup>. The effects of organic manures and cover crops on soil EC and pH were not significant, but Nitroxin<sup>®</sup> reduced soil pH amount of 0.6. Soil EC showed a positive linear correlation with soil pH. In general, the results showed that simultaneously application of organic manure, a biological fertilizer and winter cover crops resulted in beneficial interactions, moreover improved soil fertility and finally produced an optimum, healthy and agrochemicals-free yield of summer squash in a low input and ecofriendly cropping system aligned with long term guidelines of sustainable agriculture.

**Keywords:** Nitroxin<sup>®</sup>, Vermicompost, Soil fertility, Medicinal plant, Ecological input

1,2,3,4- Assistant Professor, PhD Students, M.Sc. Graduated of Agronomy and Plant Breeding Department, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\*- Corresponding Author Email: jahan@um.ac.ir)





## Effect of Nitrogen Rates on Canola (*Brassica napus* L.) and Wild mustard (*Sinapis arvensis* L.) Competition

A. Modhej<sup>1\*</sup> - A. Kaihani<sup>2</sup>

Received: 27-12-2011

Accepted: 24-02-2013

### Abstract

In order to study the effects of wild mustard density on grain yield and yield components of canola cv. Hyola 401 under different rates of nitrogen fertilizer, a field experiment was conducted in 2011-2012. The layout was split-plot in a completely randomized block design and three replications. Main-plots included four levels of nitrogen (0, 70, 140 and 210 kg ha<sup>-1</sup>) and sub-plots consisted of different wild mustard densities (0, 6, 12, 18 and 24 plants m<sup>-2</sup>). Results showed at densities of 6, 12, 18 and 24 wild mustard.m<sup>-2</sup>, grain yield losses were 15.5%, 36.7%, 47.4% and 58.6%, respectively. Grain yield loss was due to reduction in number of grains per plant and 1000-grain weight. Agronomic N use efficiency (ANUE) of canola decreased as the weed density increased. The highest ANUE was obtained in 70 kgNha<sup>-1</sup>, without weed interference. The lowest ANUE was in 210 kgNha<sup>-1</sup> and 24 wild mustard plant.m<sup>-2</sup> treatment. Generally, application of 140 kgNha<sup>-1</sup> lead to higher competitiveness and lower grain yield loss in canola compared with 0 kgNha<sup>-1</sup>, whereas, in 210 kgNha<sup>-1</sup>, the negative impact of 12 wild mustard.m<sup>-2</sup> and above on canola grain yield, was higher than other N treatments.

**Keywords:** Nitrogen rates, Wild mustard, Canola

---

1,2- Assistant Professor and MSc Student, Department of Weed Science, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

(\*- Corresponding Author Email: a.modhej@khuzestan.srbiau.ac.ir)



## Wheat Yield Response to the Competition Stress and Different Levels of Nitrogen

S. Asadi<sup>1\*</sup> - A. Aynehband<sup>2</sup> - A. Rahnama<sup>2</sup>

Received: 15-10-2012

Accepted: 24-02-2013

### Abstract

Optimum management of intra- and interspecific competitions are key subject in most agroecosystems. The objective of this experiment was the study effect of intra- and interspecific competitions and N rates on yield and yield components of wheat which was carried out in Agricultural Faculty of Shahid Chamran University of Ahvaz during 2011-2012. The experimental design was split-plot based on RBCD with 3 replications. The main plots including 4 N rates (i.e. 0, 50, 100 and 150 kg N ha<sup>-1</sup>) and sub-plots including 4 different competition pattern: (i.e. without competition, intraspecific competition, interspecific competition and intra- and interspecific competition). Our results showed that both nitrogen and competition pattern had significant effect on quantity and quality of wheat yield. The highest grain yield was obtained in no competition and application of 100 or 150 kg N ha<sup>-1</sup> (i.e. N<sub>100</sub>D<sub>1</sub>W<sub>0</sub> and N<sub>150</sub>D<sub>1</sub>W<sub>0</sub>). Grain yield reduced by increasing in competition intensity. The lowest grain yield was obtained in N<sub>0</sub> treatments. In addition, the highest protein percent was obtained in the highest nitrogen application rate, but it is reduced by increase in competition intensity. Moreover, in lower N levels, interspecific competition had the highest negative effect on wheat crop yield. But, at the highest N level, intraspecific competition had the same effect on wheat crop yield.

**Keywords:** Competition, Wheat, Nitrogen, Weed, Plant density

---

1,2,3- M.Sc. Student, Associate Professor and Assistant Professor, Department of Agronomy and Plant Breeding, Collage of Agriculture, Shahid Chamran Ahvaz University, Respectively  
(\*-Corresponding Author Email: Saraasadi.Sai@Gmail.com)