

Determination of the critical period of weed control in winter safflower (*Carthamus tinctorius* L.) in Yasouj

M. Bonyadi¹, A.R. Yadavi^{2*}, M. Movahhedi Dehnavi² and M. H. Fallah Heki¹

Submitted: 25-12-2010

Accepted: 01-06-2011

Abstract

In order to determine the critical period of weed control in safflower (*Carthamus tinctorius* L.), a field study was conducted in the Agriculture Research Station of Yasouj, Iran, during 2008-2009. The experiment carried out in a Randomized Complete Block Design (RBCD) with 16 treatments and four replications. Treatments consisted of two series of treatments. The first group consisted of weed removal from planting to 5-leaf, stem elongation, mid period of stem elongation, lateral stem emergence, beginning of flowering, end of flowering, end of seed ripening stages and then weed retaining until harvest. The second group consisted of weed retaining from planting to mentioned stages and then weed removal until harvest. Two control treatments (weed free and weedy check) were also applied. In order to determine the critical period of weed control, curve fitting Gompertz equation (for weed free period) and Logistic equation (for weed infested period) were used. Results showed that seed yield (31.4%), number of heads per plant (61.5 %) and number of seeds per head (23.9 %) were significantly decreased by increasing the weed interference period, and by increasing weed-free period, these characteristics were increased significantly. With considering 10% acceptable yield losses, the critical period of weed control of safflower was 134-188 days after planting (between early stem elongation and lateral stem emergence).

Keywords: Competition, Gompertz, Logistic, Weed interference, Yield

1 and 2- MSc Student in Agronomy and Assistant Prof., Department of Agronomy and Plant Breeding, Yasouj University, Iran, respectively.

(* - Corresponding author E-mail: Yadavi53@yahoo.com)



Effect of freezing stress on viola (*Viola gracilis* L.) under laboratory conditions

A. Nezami^{*1}, F. Keykha Akhar², M. Javad Mousavi³, E. Izadi⁴, S. Nezami² and M. Yousef Sani²

Submitted: 27-12-2010

Accepted: 01-06-2011

Abstract

In order to evaluation of freezing tolerance in viola (*Viola gracilis* L.) under controlled conditions, a trial carried out in completely randomized design with six replications at college of agriculture, Ferdowsi University of Mashhad, Iran, during 2008-2009. Seeds were planted in bed and seedlings were acclimated during natural conditions in autumn and at 5-7 leaves stage plants transferred to the thermo-gradient freezer to apply 12 freezing temperatures (0, -2, -4, -6, -8, -10, -12, -14, -16, -18, -20 and -22°C). Leaf cell's membrane integrity was measured through electrolyte leakage (EL) after the freezing and survival percentage and plant recovery (e.g. plant height and dry weight, number of branches and flowers and flower's diameter) were determined after three weeks of plant re-growth in the cold frame. As temperature decreased, EL% increased significantly and reached to the maximum in -20°C. Survival percentage did not affected by temperatures between 0°C to -18°C but all plants killed in -22°C. LT_{50el} and LT_{50su} were -20.0°C and -19.4°C, respectively. Decreasing the temperature lower than -18 °C reduced plant dry matter severely and RDMT₅₀ was -19.2°C.

Keywords: Cold acclimation, Dry matter, Electrolyte leakage, Survival percentage

1, 2, 3 and 4- Associate Prof., MSc students, Instructor and Assistant Prof., Faculty of Agriculture, Ferdowsi University of Mashhad, Iran, respectively.

(*- Corresponding author E-mail: nezamiahmad@yahoo.com)



The effects of soil disturbance due to land use change of forest lands to cultivated lands on biological soil quality indices of forest ecosystems of Northern Iran

A. Beheshti Al Agha¹, F. Raiesi^{2*} and A. Golchin³

Submitted: 30-01-2011

Accepted: 20-08-2011

Abstract

Land use change of forest ecosystems in northern Iran changes the soil quality of Paresar (Gilan province) and Gorgan (Gorgan province) regions. In order to study changes in some biological soil quality indices due to land use change from forest to cultivated lands, composite soil samples from two depths (0-20 and 20-40 cm) were taken from Paresar and Gorgan regions and urease, alkaline and acid phosphatase, invertase and arylsulfatase enzymes activities besides some biological properties consisting of microbial biomass carbon and nitrogen, carbon and nitrogen mineralization and respiration due to substrate addition were measured. Results showed that land use change caused biomass carbon (44-82%), biomass nitrogen (30-200%) and their ratio (20-30%), carbon mineralization (11-67%), nitrogen mineralization (3-68%), respiration due to substrate (8-45%) and microbial enzymes activities to decrease in both regions (except carbon and nitrogen mineralization in Paresar region). However, the metabolic coefficient (qCO_2) in both regions increased due to land use change. Therefore, agricultural practices in forest lands cause oxygen availability to increase for soil microorganisms and this phenomenon stimulates the microbial activity and enhances organic matter decomposition and CO_2 -C emission from soil resulting in soil quality reduction. Also enhancement of carbon mineralization (microbial respiration), decreases soil organic matter concentration and reduces energy for microorganisms and this phenomenon caused soil microbial population to gradually decrease. According to the results it is recommended to reduce soil disturbance by using no-tillage or minimum tillage systems and planting perennial legumes can decrease greatly the harmful effects of cultivation.

Keywords: Carbon and nitrogen mineralization, Cultivation, Enzymes activity, Land use change, Microbial biomass

1, 2 and 3- Instructor in Soil Science Department, College of Agriculture, Razi University of Kermanshah (PhD student in Soil Science, Shahrekord University), Associate Prof. in Soil Science Department, College of Agriculture, Shahrekord University and Prof., in Soil Science Department, College of Agriculture, Zanzan University, Iran, respectively.

(*- Corresponding author E-mail: f_raiesi@yahoo.com)



Investigation of growth indices and yield of two wheat (*Triticum aestivum* L.) cultivars in competition with rye (*Secale cereale* L.) and wild mustard (*Sinapis arvensis* L.) weeds

B. Saadatian¹, G. Ahmadvand^{2*} and F. Soleymani¹

Submitted: 30-01-2011

Accepted: 20-08-2011

Abstract

This research was investigated to evaluate growth indices and competitive ability of two wheat (*Triticum aestivum* L.) cultivars in interference with two species of narrow and broad leaf weeds as two separated experiments based on a randomized complete block design with three replications at Agricultural Faculty of Bu-Ali Sina University, during 2008-2009. In both experiments, Alvand and Sayson cultivars were planted at 450 plants.m⁻². In the 1st experiment, rye (*Secale cereale* L.) with densities of 0, 20, 40, 60 and 80 plants.m⁻² were planted between wheat rows. In the 2nd experiment, wild mustard (*Sinapis arvensis* L.) with densities of 0, 8, 16, 24 and 32 plants.m⁻² were planted. Results showed that increasing plant density in both weed species led to reduction of leaf area index, dry matter accumulation, crop growth rate, leaf area index duration, biomass duration, and yield of wheat cultivars. Mentioned traits and grain yield of Alvand showed less decrease in competition with both weed species. Sayson plant height was decreased with increasing weed density but such observation was not found in Alvand cultivar. Individual plant damage of wild mustard on two wheat cultivars was more than that of rye. Overall, Alvand competability against both weed species was more than Sayson.

Keywords: Biomass duration, Leaf area index duration, Model, Yield loss

1 and 2- MSc Student and Associate Prof. of Faculty of Agriculture, Bu-Ali Sina University, Hamedan, Iran, respectively.

(* - Corresponding author E-mail: gahmadvand@basu.ac.ir)



Effect of flaming on wild mustard (*Sinapis arvensis* L.) soil seed bank, soil microorganisms and physicochemical characteristics

H. Salimi^{1*}, S. Samavat² and P. Shimi¹

Submitted: 03-03-2011

Accepted: 20-08-2011

Abstract

In order to study the effect of flaming on seed viability of *Sinapis arvensis* L., changes in microorganisms population and physicochemical characteristics of soil after canola (*Brassica napus* L.) harvesting, an experiment was carried out based on randomized complete block design with four replications and eight treatments at Karaj Research Center, Iran, during 2005- 2006. After harvesting canola at the end of spring, wild mustard seeds were distributed evenly on the surface of the soil. In some plots, canola stubbles were left on the ground and in some plots canola stubbles were taken off. Under this condition, the following treatments were applied: Flaming under wet and dry soil condition, burning stubbles under wet and dry soil condition. In other plots canola stubbles were taken off the plots and then flaming was applied under wet and dry soil conditions. Check plots did not receive any treatment. Results indicated that all treatments reduced seed viability, and the highest loss in seedling density occurred in the flaming treatment on dry-soil. Flaming did not have any serious affect on soil microorganisms or on its other physicochemical aspects, however dry-soil treatments proved the safest.

Keywords: Heat shock, Organic matter, Seed germination, Seed viability

1 and 2- Research Instructor, Iranian Research Institute of Plant Protection and Researcher, Iranian Research Institute of Soil and Water, Iran, respectively.

(* - Corresponding author E-mail: hom_salimi@yahoo.com)



Economical factors of wheat (*Triticum aestivum* L.) diversity: econometric estimation

S.S. Hamraz¹, M.R. Kohansal^{2*}, M. Ghorbani² and A.R. Koocheki³

Submitted: 11-03-2011

Accepted: 20-08-2011

Abstract

In this study tried to calculate attributed-based index and measurement of farmer's attention to wheat (*Triticum aestivum* L.) seed environmental, cropping and marketing attribute and evaluate social- economical factors influencing on this index. After this estimation, effective factors have selected. Related data to 102 Mashhad wheat producers, Iran were used for estimations Poisson regression. Results showed that in seed characteristics set; marketability and taste were more important factors. Also, results of this study corroborant previews study and only variables age and family number make difference. Also, education, farming and non-farming income, farming experience, farm area and loan receive have positive effect on these characteristics.

Keywords: Attribute-based index, Biodiversity, Poisson regression

1, 2 and 3- MSc Student and Associate Prof., Department of Agricultural Economics and Prof. Agronomy, College of Agriculture, Ferdowsi University of Mashhad, Iran, respectively.

(*- Corresponding author E-mail: kohansal1@yahoo.com)



Influence of intensity and exposure duration of magnetic field on behavior of seed germination and seedling growth of wheat (*Triticum aestivum* L.)

H. Feizi^{1*}, P. Rezvani Moghaddam², A. Koocheki², N. Shahtahmassebi³ and A. fotovat⁴

Submitted: 11-03-2011

Accepted: 20-08-2011

Abstract

In order to study the effect of intensity and exposure duration magnetic field on wheat (*Triticum aestivum* L.) seed germination an experiment was conducted in laboratory of Ferdowsi University of Mashhad, Iran. The experiment was including 11 treatments as three level of magnetic field intensities (pretreatment of seeds with 50, 100 and 150 mT magnetic field) and three exposure durations (10, 20 and 30 minutes), permanent magnetic field with intensity 3 mT and control. Results indicated that the lowest mean germination time (MGT) was found in 100 mT magnetic field with 20 min exposure duration. MGT was reduced by 43 percent in comparison to control at 100 mT magnetic field with 20 min exposure duration. In contrast the highest and the lowest germination rate was showed in 100 mT magnetic field with 20 min exposure duration and 150 mT magnetic field with all of the durations respectively. Magnetic treatments not affected on seed germination. Magnetic field stimulated shoot growth more than root growth. The highest shoot length was achieved in 100 mT magnetic field with 10, 30 and 20 min exposure duration and the lowest was shown in control. Magnetic treatments increased shoot length by 27 percent comparing to control. Magnetic treatments not affected shoot, root, seedling dry matter, and vigor index II. It seems that low magnetic field intensities had a stimulative effect on germination traits whereas high intensities had a negative effect.

Keywords: Mean germination time, Physical treatments, Seedling length, Vigor index

1, 2, 3 and 4- PhD student in Crop Ecology and Prof., Department of Agronomy, Prof., Department of Physics and Associate Prof., Department of Soil Science, Ferdowsi University of Mashhad, Iran, respectively.
(*- Corresponding author E-mail: hasanfeizi@yahoo.com)



Effect of chemical and organic fertilizers on quantitative and qualitative characteristics of fenugreek (*Trigonella foenum-graecum* L.) forage

A.A. Mohammad Abadi¹, P. Rezvani Moghaddam^{2*}, J. Fallahi³ and Z. Bromand Rezazadeh³

Submitted: 21-10-2010

Accepted: 06-02-2011

Abstract

In order to study the effect of different organic fertilizers on quantitative and qualitative characteristics of fenugreek forage, an experiment was conducted based on completely randomized block design with six treatments and three replications at Agricultural Research Station, College of Agriculture, Ferdowsi University of Mashhad, Iran, during 2006. The experimental treatments were four organic fertilizers (40 t.ha⁻¹ cow manure, 30 t.ha⁻¹ sheep manure, 20 t.ha⁻¹ hen manure, and 30 t.ha⁻¹ compost), chemical fertilizer (250 kg.ha⁻¹ ammonium phosphate + 100 kg.ha⁻¹ urea) and control (no-fertilizer). The results showed that there were no significant differences between different fertilizer treatments in terms of all quantitative and qualitative characteristics. However, the highest fresh forage yield (5618 kg.ha⁻¹) and dry forage yield were obtained in using chemical fertilizer treatment. The highest leaf dry matter and organic matter digestibility and the lowest stem dry matter and organic matter digestibilities were produced in hen manure treatment. Chemical fertilizer treatment produced the lowest leaf dry matter and organic matter digestibility and the highest stem dry matter and organic matter digestibility. Generally, within studied fertilizers, chemical fertilizer had relatively higher effect on quantitative studied criteria.

Keywords: Animal manure, Digestibility, Forage nutritive value, Leaf and stem percentages

1, 2 and 3- Instructor, Prof., and PhD. Student of Crop Ecology, Center of Excellence for Special Crops, Department of Agronomy, Faculty of Agriculture, Ferdowsi University of Mashhad, Iran, respectively.
(*- Corresponding author E-mail: rezvani@ferdowsi.um.ac.ir)



Effect of seeds rates on yield and yield components of three rapeseed (*Brassica napus* L.) varieties in Neka, Mazandaran

V. Sina^{1*} and V. Rameeh²

Submitted: 11-03-2011

Accepted: 20-08-2011

Abstract

In order to investigate the effect of seed rate on seed yield and yield components of three rapeseed varieties, a split-plot experiment was conducted in randomized complete block design with four replicates during 2008-2009 at Baykola Agricultural Research Station, Neka, Mazandaran province. In this experiment four seed rates (5, 7, 9 and 11 kg.ha⁻¹) as main plots, three rapeseed cultivars (Hyola 401, RGS-003 and Sarigol) as sub plots were assessed. Each plot was included six lines with five meter length and distance between lines was 30 cm. Results showed that the effect of seed rates on seed yield and number of pods per plant was significant. The highest grain yield (4829 kg.ha⁻¹) was related to the lowest seed rates. The effect of varieties on the secondary branch number, 1000-seed weight of pods per plant and seed yield were significant. Hyola 401 with 5033 kg.ha⁻¹ was performed better than RGS-003 and Sarigol (PF) with 4357 and 4066 kg.ha⁻¹ seed yield, respectively. Significant positive correlation of seed yield with 1000-seed weight, number of pods per plant, number of seed per pod indicating that Hyola 401 with highest yield components at the different plant density had the highest seed yield.

Keywords: Correlation, Lateral branches, Pod

1 and 2- Graduated student in Agronomy, Qaemshahr Azad University and Scientific Member of Agricultural and Natural Resources Research Center of Mazandran, Iran, respectively.
(*- Corresponding author E-mail: Vali.6507@gmail.com)



Effect of seed inoculation with plant growth promoting rhizobacteria (PGPR) on germination components and seedling growth of corn (*Zea mays* L.)

R. Seyed Sharifi^{1*} and K. Khavazi²

Submitted: 11-03-2011

Accepted: 20-08-2011

Abstract

In order to investigate the effects of seed inoculation with plant growth promoting rhizobacteria (PGPR) on germination components and seedling growth of corn (*Zea mays* L.), a factorial experiment based on randomized complete block design with three replications was conducted at the seed technology laboratory of Mohaghegh Ardabili University, Iran, during 2008. Studied factors were: corn cultivars in four levels (SC-434, Kenez, DC-370 and SC-301) and seed inoculation with plant growth promoting rhizobacteria in three levels (no inoculation, seed inoculation with *Azotobacter chroococcum* strain 5, *Azospirillum lipoferum* strain OF). The results showed that seed inoculation with PGPR had significant effect on growth seedling, uniformity of germination, Radicle and plumule dry weight, germination percentage of corn. Cultivars had different response to germination indices and seed inoculation with plant growth promoting rhizobacteria. Seed inoculation with PGPR increased germination indices. Seed inoculation with *Azospirillum lipoferum* strain OF increased proportion of radicle to plumule, longer radicle and plumule compared with inoculation with *Azotobacter chroococcum* strain 5 and no inoculation. Thus, in order to increasing of germination indices and seedling growth, it can be suggested that seeds inoculation of SC-434 was applied with *Azospirillum lipoferum* strain OF.

Keywords: Germination indices, Plant growth promoting rhizobacteria (PGPR), Seed biopriming.

1 and 2- Associate Prof., College of Agriculture, University of Mohaghegh Ardabili, and Assistance Prof., Research Institute of Soil and Water, Tehran, Iran, respectively.

(* - Corresponding author E-mail: Raouf_ssharifi@yahoo.com)



Study of growth and development features of ten ground cover plants in Kish Island green space in warm season

S. Shooshtarian^{1*}, H. Salehi² and A. Tehranifar³

Submitted: 06-04-2011

Accepted: 20-08-2011

Abstract

Having special ecological condition, Kish Island has a restricted range of native species of ornamental plants. Expansion of urban green space in this Island is great of importance due to its outstanding touristy position in the South of Iran. The purpose of this study was to investigate the growth and development of groundcover plants planted in four different regions of Kish Island and to recommend the most suitable and adaptable species for each region. Ten groundcover species included *Festuca ovina* L., *Glaucium flavum* Crantz., *Frankenia thymifolia* Desf., *Sedum spurium* Bieb., *Sedum acre* L., *Potentilla verna* L., *Carpobrotus acinaciformis* (L.) L. Bolus., *Achillea millefolium* L., *Alternanthera dentata* Moench. and *Lampranthus spectabilis* Haw. Evaluation of growth and development had been made by measurement of morphological characteristics such as height, covering area, leaf number and area, dry and fresh total weights and visual scoring. Physiological traits included proline and chlorophyll contents evaluated. This study was designed in factorial layout based on completely randomized blocks design with six replicates. Results showed that in terms of indices such as covering area, visual quality, height, total weight, and chlorophyll content, Pavioon and Sadaf plants had the most and the worst performances, respectively in comparison to other regions' plants. Based on evaluated characteristics, *C. acinaciformis*, *L. spectabilis* and *F. thymifolia* had the most expansion and growth in all quadruplet regions and are recommend for planting in Kish Island and similar climates.

Keywords: Climatic conditions, Compatible species, Covering area, Morphologic features, Ornamental plants

1, 2 and 3- Member of Young Researchers Club, Mashhad Branch, Islamic Azad University, Mashhad, Associate Prof. from College of Agriculture, Shiraz University and Associate Prof. from College of Agriculture, Ferdowsi University of Mashhad, Iran, respectively.

(*- Corresponding author E-mail: S.shooshtarian@Yahoo.com)



The response of N and P efficiency in forage maize to different urea and broiler litter levels under short-term drought stress conditions

S. Neisani¹, S. Fallah^{*2} and F. Raiesi³

Submitted: 06-04-2011

Accepted: 20-08-2011

Abstract

Water and nutrient availability are two major constraints to forage maize production in arid and semi-arid areas; however, the effect of different N levels from organic and inorganic sources on nutrient (i.e., N and P) efficiency under drought stress conditions is not well known for maize farming. Thus, a field study was conducted with the objective of determining the effect of N fertilization and drought stress on N and P efficiencies in maize (cv. SC 704) crop. The experimental setting consisted of four rates of N application (0, 100, 200 and 300 kg.ha⁻¹ N) as urea and broiler litter and two irrigation regimes (full irrigation and irrigation stop at tasseling stage lasted only for two weeks) that carried out at the Research Station of Agricultural Faculty, Shahrekord, Iran, during 2008-2009. Results indicated that no significant difference in N and P efficiencies between the two irrigation regimes. Although the effects of fertilizer treatments on N agronomic efficiency, N physiological efficiency, P agronomic efficiency and aboveground dry matter were significant, but N and P recovery efficiencies and P physiological efficiency were not significantly affected by N treatments. The highest aboveground dry matter (32289 kg ha⁻¹) and N agronomic efficiency (62.7 kg.kg⁻¹) were observed with 300 kg.ha⁻¹ N from broiler litter, but this efficiency did not differ from all urea N levels. The application of 100 kg.ha⁻¹ N from broiler litter resulted in the greatest N and P physiological efficiencies (141 and 114 kg.kg⁻¹, respectively) and these efficiencies were significantly different from all urea N levels. It is concluded that broiler litter application have had higher N agronomic and physiological efficiencies than urea application, and that short-term drought stress at tasseling stage apparently does not have an influence on the response of nutrient efficiencies to different N rates and sources.

Keywords: Eutrophication, Nitrogen use efficiency, Nutrient, Organic manure

1, 2 and 3- Graduated student in Agronomy, Assit. Prof. in Crop Ecology and Associate Prof. in Soil Science, College of Agriculture, Shahrekord University, Iran, respectively.

(*- Corresponding author E-mail: falah1357@yahoo.com)