

Effect of drought and salt stresses on yield, yield components, and ion content of hull-less barley (*Hordeum sativum* L.)*

A. Bagheri¹ and H. Heidari Sharif Abad²

Abstract

Drought cause yield losses in cereals in most regions of Iran. Barley and hull-less barley are the most suitable cereal crops for such situation. Four hull-less barley genotypes (UH3, U46M, EHM81-12 and CM67) were grown in research station of Eqlid azad university in two different experiments for drought stress study in 2005- 2006. Four irrigation methods including irrigating after reaching soil water potential to -0.5 bar (control), 1.5 bar, -3 and -5 bar were used. The experimental design was split plot based on randomized complete block design with three replications in which the drought treatments were arranged in main plots and genotypes in subplots. The determined parameters were yield, its components and ion content in shoots. The results revealed that the number of spike and grain per plot were reduced significantly by stress and grain weight was less sensitive to that. The biological and grain yields were decreased by stress. Among the genotypes, UH3 and CM67 had the lowest and highest grain and biological yield, respectively. The biological yield differences was related to low plant height, leaves area and tillers and the grain yield differences were caused by reduction in ear per plant and grain per ear. The grain protein content was influenced by drought stress. Drought stress decreased ion content, except Na and Cl. The LAR value was initially decreased by stress treatments but an increase at high stress levels was seen. In general, UH3 genotype showed lowest yield and yield components, stress tolerance index, photosynthesis, growth and ion content and CM67 was vice versa.

Keywords: *Drought stress, Yield, Hull-less barely, Genotype.*

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1- Ph.D. Student of Islamic Azad University of Tehran, Science and Research Branch, and Scientific Board of Islamic Azad University, Eqlid Branch.

2- Scientific Board of Seed and Plant Certification and Registration Institute, Karaj

Optimal cropping pattern of Eqlid's sugar beet growers under water constraints and risky considerations

F. Boostani¹ and H. Mohammadi²

Abstract

The main objective of this study was to develop an optimal cropping pattern for sugar beet growers of Eqlid district (Fars province) and to investigate its importance in cropping pattern. Regarding the effect of risk on producer's decision, two sources of risk including price and yield risks was considered. Beside the other objectives, reduced water use was also dealt with applying multi objective Programming framework. The results showed that the income difference of current and optimal cropping pattern is only 7 percent. However, they are different in crop combination, so that, in current pattern 3.8 hectare out of 6.8 hectare of representative growers belongs to sugar beet, while in the case of optimal pattern, it reduces to 0.2 hectares. In general, in developed cropping patterns, sugar beet-wheat dominated production combination changes in favor of been. The change meets the goal of reduced water use up to 33 percent in addition to providing the current gross margin. The results revealed that farmers mainly consider price risk, to a great extent, in cropping pattern. It was also determined that inefficiency of sugar beet in using water as a restricting input has been resulted in reduced priority of sugar beet in cropping pattern.

Keywords: Sugar beet, Optimal Cropping Pattern, Water, Risk, Fars Province.

1- Scientific Board of Islamic Azad University, Marvdasht Branch

2- Scientific Board of Islamic Azad University, Jahrom Branch

Study on effect of two calypso formulations on codling moth in Azarbayejan-e-Sharqi province, Iran

A. Pourhaji¹

Abstract

Codling moth is one of the most important pests of apple trees and this crop is treated by different pesticides several times each year. In this research, effect of different doses of Calypso (240 OD) ($\frac{0.4,0.5,0.6L}{1000LW}$) and calypso (480 SC) with 300 ppm dose on codling moth was studied in comparison to Azinphos methyl ($\frac{2L}{1000LW}$) and untreated trees. Trial was carried out on one of the apple orchards in Azarbayejan-e-sharqi province in completely randomized block design (CRBD) with 6 treatments and 4 replicates. Falled fruits were sampled one day before and 3, 7, 14 and 25 days after spraying in plots. After 25th day of late spraying, number of infested and uninfested fruits on trees and falled fruits were counted in plots. Effect percent of different treatments was calculated by Schneided-Orelli formulae. In the basis of percent of uninfested fruits and effect percent aspects, there were significant difference between treatments ($p < 0.01$) and in comparison of means, all calypso OD and SC doses settled in level A and AB groups, Azinphos methyl in level B and control in level C groups. Results showed that all doses of two formulations of calypso in comparison to Azinphos methyl had good effect in declining of codling moth population and application of this new insecticide instead of Azinphos methyl and other common insecticides used to control of codling moth could be recommended.

Keywords: Codling moth, Azinphos methyl, Calypso, Azarbayejan-e-Sharqi.

1- Scientific Board of Agricultural and Natural Resource Research Center of Azarbayejan-e-Sharqi, a_pourhaji@yahoo.com

Evaluation of energy efficiency in dry farming of Barley (*Hordeum vulgare L.*) fields in Azarbajejan-e-Sharqi province, Iran

D. Taghavi¹, J. Ajali², A. L. Valadyani³ and I. fatahi⁴

Abstract

The main goal of management of agricultural ecosystems is to maximize the energy flow and human's artificial inputs. This investigation was conducted in order to evaluation of economical efficiency and crop energy of dry farming barley in Azarbajejan-e-Sharqi province. Information and data were obtained from barley farmers and Jihad-e- Agriculture organization of the province. In this study, routine scientific methods were used to change input and output data to their equal quantities and then energy efficiency (ratio of produced energy to consumed energy) was calculated. The rate of inputs engaged in these fields was 5923.79 kcal/ha and the rate of produced energy was computed 7644.16 kcal / ha. The rate of energy efficiency (the ratio of output / input) was 1.22 for the crop. Results revealed that most used energy in barley cultivation belonged to fertilizers and machinery energy, so consumption of the energy can be reduced and the energy efficiency can be increased for conducting a correct management.

Keywords: Energy efficiency – Output – Input – Barley (Hordeum vulgare L.).

1- Graduated from Islamic Azad University, karaj Branch

2- Scientific Board of Islamic Azad University, Miyaneh Branch

3- Ph.D. Student of Biotechnology, University of Putra, Malaysia

4-Graduated from Islamic Azad University, khoy Branch

Evaluation of two types of tractor steel lugged wheels in paddy soil preparation

A. Reshadsedghi¹ and M. Zabolostani¹

Abstract

It is obvious that a tractor with ordinary rubber tyres performs poorly in wetland operations due to slip and sinkage. To overcome this problem and consequently, to increase tractive efficiency and field capacity of tractor in different farm operations in rice cultivation, two types of tractor steel lugged wheel were manufactured. One of them was a folding type cage wheel which could be attached on each tractor rear wheel, and could provide facility for road transportation. The other one was a steel wheel with several teeth around it, named swampy steel wheel, that can be replaced instead of each tractor rear wheel and could move in puddled soils. In this study, for folding type cage wheel evaluation, travel reduction and field capacity of tractor were measured with and without cage wheels by various tractor speeds in primary tillage operation and data analyzed as split plot based on randomized complete block design with three replications. Second type of steel wheel was evaluated from view point of capability of land leveling operation with different tractor speeds, separately. Results showed that, folding type cage wheels had significant effect on slip reduction in wet soil, thus, it increased travel speed and field capacity in tillage operation and using the second type steel lugged wheel increased tractor speed and field capacity of field operations such as land leveling, seed broadcasting and spraying in puddled soils.

Keywords: Paddy soil preparation, Tractor steel lugged wheel, Travel reduction, Field capacity, Mechanization.

1- Scientific Boards of Agricultural and Natural Resource Research Center of Azarbayejan-e-Sharqi

Developing an optimal solution for meat transporting network among production, cold storage, and consumption points of Fars province, Iran

R. Shahedi¹, H. Mohammadi¹, M. Rahimi¹ and S. Pishbin¹

Absracts

Meat cold storages of Fars province including Lar, Shiraz, Marvdasht, and Kazeroun are supported by Eqlid, Shiraz, Tehran, Kazeroun, and Marvdasht districts and their commodities is distributed in Lar, Jahrom, Marvdasht, Shiraz, Fasa, Kazeroun, and Darab. Lingo 10 software were used to obtain optimal pattern of meat transporting network. In current pattern, the total cost of transportation through two transporting networks equals to 1181 million rials, while in optimal solution it reduced to 940.1 million rials, i.e., using the optimal solution can result in a saving of 20.4 percent. Transportation paths of Kazeroun to Shiraz, Kazeroun to Lar, and Kazeroun to Fasa couldn't get a priority to contribute to transportation, thus two nearly optimal solutions, considering a 5% deviation (increment in cost) from optimal point, were developed. Nearly optimal solutions were obtained by some changes occurred in transportation paths from production to storage points. The first nearly optimal solution was obtained by change in the transportation paths to Kazeroun and Lar storages and the second one was obtained by change in the transportation paths to Shiraz and Kazeroun storages.

Keywords: Meat, Cold Storage, Transportation, Optimal Solution, Fars Province.

1- Scientific Boards of Islamic Azad University, Jahrom Branch

Evaluation of nitrogen fixation ability of common bean (*Phaseolus vulgaris* L.) cultivars with three types of inoculants which contain different strains of *Rhizobium phaseoli*

M. Taherkhani¹, G. Noormohammadi², M. J. Mirhadi² and R. Alimohammadi¹

Abstract

The ability of nitrogen fixation in three cultivars of common bean (*Phaseolus vulgaris* L.) with three types of inoculants which contain different strains of *Rhizobium phaseoli* was evaluated in Khoramdareh, Zanzan province, Iran in 2006. Treatments were three types of biological fertilizers including: Rhizobean super plus, Super nitro plus and Azetobacter, with two treatments: N75 (use of 75 kg nitrogen/ha) and control (without seed inoculation and fertilizer) and three bean cultivars including: COS16 (spotted bean), Keshavarze (white) and Naz (red bean). The experiment was conducted as factorial in randomized complete block design with three replications. The results showed significant differences in seed yield, nitrogen percent per plant, seed protein percentage, number and weight of nodules (48 day after emergence), seed and dry matter yield among seeds inoculated and non-inoculated. Rhizobean and N75 caused the most seed yield, total dry matter and nitrogen and protein percentage. Results showed that Rhizobean super plus was more effective on common bean, as compared with Super nitro plus and Azotobacter. This investigation showed that, all of industrial biofertilizers should be used as complementary materials with mineral fertilizers to achieve satisfying yield and sustainable agriculture.

Keywords: *Common bean, Biological Nitrogen Fixation, Seed yield, Rhizobean super plus, Protein percentage.*

1- Scientific Boards of Islamic Azad University, Miyaneh Branch

2- Professors of Islamic Azad University of Tehran, Science and Research Branch

Study of genetic diversity of bread wheat genotypes in view point of remotion of assimilates to seed in two normal and drought stress conditions

M .Tousi Mojarrad¹, M . R . Ghannadha² and M. Salehi³

Abstract

Genetic diversity of bread wheat genotypes in view point of assimilate remotion potential to seed in two normal and drought stress conditions, was evaluated in 2003. Two experiments were conducted as RCBD design with four replications and eight genotypes. In one experiment, irrigation was done all growing season based on climate condition and plant need. While, in other experiment, irrigation was done only in spikelet stage and seed filling stage under drought stress condition. Results showed that there were no significant differences in dry matter remotion from peduncle and second median node in all genotypes in two normal and stress conditions. While all genotypes showed significant differences in dry matter remotion from other parts of plant. In normal condition, there was no significant difference in remotion of dry matter from peduncle and second median node, but in other parts of plant there was significant difference at 5% confidence level. Otherwise, in drought stress condition, there was significant difference in remotion of dry matter from peduncle and second median node at 5% confidence level and in other parts of plant, there was no significant difference. Remotion dependent characteristics did not correlate with seed yield. Thus, though this process acts as a support source of seed weight, it does not seem that variety selection based on mentioned characteristics results in high yield genotypes in semidwarf wheat genotypes, due to their low contribution to seed weight.

Keywords: Assimilate, Bread wheat, Genetic diversity, Normal and drought stress condition.

1- M.Sc., Islamic Azad University, Karaj Branch

2- Scientific Board of Faculty of Agronomy, Tehran University, Karaj, Iran

3- M.Sc. in plant Breeding, Member of Young Researchers Club of Islamic Azad University- Miyaneh Branch

Effect of different application methods of micronutrients on quantitative and qualitative properties of wheat

A. Farajniya¹ and M. B. Khourshidi Benam¹

Abstract

To comparison of micronutrient application methods effect on grain and straw yield, and protein and element concentration, a RCBD design with 5 treatments (soil apply, leaf spraying, seed treatment, soil applying+leaf spraying and seed treatment+leaf spraying) in 3 replications was conducted at Tikmedash research station, Miyaneh, Iran. Regarding Verthic Haploxrepts soil analysis results, N, P, and K was applied from urea, triple super phosphate and potassium sulfate bases, respectively. Half of urea was dressed at seed elongation and heading stages. In soil applying method, MgSO₄, ZnSO₄, MnSO₄, CuSO₄, EDDHA and H₃BO₃ was applied about 50, 40, 30, 20, 10, and 20 kg/ha, respectively. In leaf spraying method, micronutrients such as ZnSO₄, MnSO₄, CuSO₄, FeSO₄ and H₃BO₃ in 0.002 concentration+0.05% urea was applied in stem elongation, heading and a week after anthesis stages. In seed treatment method, a stock solution in 30% concentration of all above mentioned nutrients was prepared and sprayed on 10 kg wheat seeds, before sowing. In soil application+leaf spraying method, the first and second methods in leaf spraying and the second and third methods in seed treatment was used. During growth stages, 5 time irrigation was applied by sprinklers. Statistical analysis showed that the soil application+leaf spraying method increased grain and straw, protein contents and seed elements concentrations significantly, and so could be recommended in wheat cultivation.

Keywords: Wheat, Fertilizer, Application methods, Micronutrients, Protein, Gain

1- Scientific Boards of Agricultural and Natural Resource Research Center of Azarbayejan-e-Sharqi