

Interferences of common lambsquarters, *Chenopodium album* L. in two planting patterns of corn

M. Pouryousef¹, A. Javanshir², A. Dabbage Mohammadi Nasab³ and A. Hasanzadeh Ghurt Tappe⁴

Abstract

In order to study of eco-physiological aspects of interferences of different lambsquarters, *Chenopodium album* L. densities in two planting patterns of single cross corn 704 and competitive effects of the weed on yield quality and quantity of corn, an experiment was conducted at Miyandoab agricultural research station from 2004 to 2005. The experimental design was factorial in a randomized complete block design with three replications. The treatments were: a combination of three levels of lambsquarters population (4, 10, 16 plants per meter of corn row) and two planting patterns (common and two zigzag row) of corn. The treatments lacking corn weed in two planting patterns were considered as control. Seeds were planted on the sides and end of corn rows in zigzag between corn plants. Results showed that the competition of lambsquarters caused significant decrease in grain yield, biological yield and harvest index. Seed protein content of corn was decreased but seed oil content increased. The effects of weed density on studied characteristics of corn was greater than those of different planting patterns. Competition of weed significantly decreased LAI in comparison to the control. This decrease was considerable in higher weed densities. It was also greater in conventional planting pattern than two zigzag row planting pattern.

Keywords: Planting patterns, Competition, Interference, Weed density, Corn, *Zea mays*, Common lambsquarters, *Chenopodium album*.

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

2. Associate Professor in Agronomy, Tabriz University.

3. Assistant Professor in Agronomy, Tabriz University.

4. Assistant Professor of Agricultural and Natural Resources Research Center of Azarbayejan e Gharbi Province, Iran.

Response of soybean varieties to N and K fertilizers application at northern Khorasan province, Iran

H. Hatami¹, A. Inehband², M. Azizi³, A. Soltani⁴ and A. Dadkhah⁵

Abstract

In order to study the effects of nitrogen and potassium fertilizers on yield and yield components of soybean, *Glycine max* L., an experiment was conducted as factorial in a randomized complete block design with three replications at northern Khorasan province during 2006-2007. Factors were variety (Habit, L.W.K., and Williams), nitrogen fertilizer amounts (0, 50, 100, and 150 kg N/ha) from urea source, and potassium fertilizer levels (0, 80, and 160 kg K/ha) from potassium sulphate source. Results indicated that seed yield was significantly affected by variety, N and K fertilizers. Williams variety showed the highest seed yield. Seed yield significantly increased with increasing fertilizer application. The number of pods was affected by all factors, but the number of node per stem, the number of seed per pod, 100 seed weight, and seed yield per branches were affected only by variety.

Keywords: Variety, Nitrogen fertilizer, Potassium fertilizer, Seed yield, Yield components, Soybean

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1. Ph.D. Student in Agronomy, Islamic Azad University of Ahvaz, Science and Research Branch.
2. Assistant Professor of Agriculture faculty, Shahid Chamran University of Ahvaz.
3. Scientific Board of Agricultural Research Center of Khorasan Razavi Province, Iran.
4. Scientific Board of Agriculture University of Ghorghan.
5. Scientific Board of Agronomy Department, Agriculture Faculty of Shirvan University.

Effect of drought stress and defoliation on some of agronomical traits, yield and yield components of oil sunflower

N. Hajhasani¹, M. Roshdi², M. Ghaffari³, E. Alizadeh³ and A. Moradi Aghdam⁴

Abstract

In order to evaluation of effects of drought stress and defoliation stages and strata on yield and its components of Alstar hybrid of sunflower, an experiment was conducted during 2006 - 2007 at agricultural and natural resources research station of Khoy. Irrigation after 80, 120 and 160 mm evaporation from class A pan, as main factor, defoliation stage in two levels (R₂ and R₆ stages) as sub factor and defoliation location in three levels (control, middle up leaves defoliation and middle down leaves defoliation) as a sub sub factor were evaluated in strip split plot design in the basis of randomized complete block design in four replications. The results showed that drought stress decreased plant height, head diameter, harvest index, 1000 seeds weight, full seeds number, seed yield and oil yield (except seed kernel percent), but increased huld seed percent. Seed yield was 5522 kg in irrigation after 80 mm evaporation treatment, but decreased in two other levels of irrigation up to 437 and 1297 kg, respectively. Defoliation stage had significant effect on the studied traits and thousand seeds weight, seed yield and oil yield (except seed kernel percent) were higher in R₆ stage. Comparison of the effect of defoliation in R₆ and R₂ stages on seed yield showed that leaves are important especially in primary reproductive growth stage. Defoliation in different parts of stem caused significant differences in plant height, head diameter, huld seed percent, harvest index, seed kernel percent, 1000 seeds weight, full seed number, seed yield and oil yield and middle up leaves defoliation decreased most characters, significantly. Between interactions, middle down leaves defoliation in R₆ stage didn't have significant difference with control treatment. The results showed high value of sunflower upper leaves protection until beginning of seed filling stage.

Keywords: Defoliation, Drought stress, Seed and Oil yield, Sunflower.

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1. M.Sc. in Agronomy, Islamic Azad University, Khoy Branch, and Member of Young Researchers Club.

2. Scientific Board of Islamic Azad University, Khoy Branch.

3. Scientific Boards of Agricultural and Natural Resources Research Center of Azarbayejan e Gharbi Province, Iran.

4. M.Sc. in Agronomy, Islamic Azad University, Takestan Branch, and Member of Young Researchers Club.

Effects of plant density and defoliation during development stages on yield and yield components of sunflower

M. Roshdi¹, S. Rezadoost², J. Khalili Mahalleh³ and N. Hajihassani Asl⁴

Abstract

To evaluation of effects of plant density and defoliation in two development stages on yield and yield components of sunflower, two year research was carried out during 2004-2006 in the agriculture research station of Khoy. The experiment was done in split factorial in the basis of randomized complete block design in three replications. The plant density levels were considered as the main factor in three levels of 30000, 40000, 50000 plants per hectare and defoliation percentage in four levels (0, 33, 66 and 100 percent) and defoliation stage in appearance of anthodium and anthesis were as the sub factors. The results of compound analysis of variance showed that plant density effect was significant on plant height and stem diameter, seed numbers in an anthodium, thousand seed weight, plant lodging percentage and grain yield. The maximum grain yield was obtained in 50000 plant density per hectare treatment with optimum leaf area index and sufficient number of anthodium in area unit. However, this treatment caused the least number of seeds in an anthodium and thousand seed weight. Increasing defoliation percentage resulted in decreased number of seeds in an anthodium, thousand seed weight, grain yield and harvest index. Defoliation in the anthesis stage had more negative effect on thousand seed weight, number of seeds in an anthodium, grain yield and harvest index than defoliation in appearance of anthodium. The results showed that cropping of sunflower in density of 50000 plants per hectare with leaves protection and high leaf area duration resulted in economical yield in Khoy region and so, even little percentage of defoliation in any different development stages wasn't recommended.

Keywords: Plant height, Stem diameter, Seed per anthodium, Thousand seed weight.

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1. Assistant Professor of Agronomy and Plant Breeding Department, Islamic Azad University, Khoy Branch.

2. Scientific Board of Agronomy and Plant Breeding Department, Islamic Azad University, Khoy Branch, and Ph.D. Student of Agroecology, Islamic Azad University, Karaj Branch.

3. Scientific Board of Agronomy and Plant Breeding Department, Islamic Azad University, Khoy Branch, and Ph.D. Student of Plant Physiology, Islamic Azad University of Tehran, Science and Research Branch.

4. M.Sc. in Agronomy, Islamic Azad University, Khoy Branch, and Member of Young Researchers Club.

Effect of different strains of mycorrhizal fungus on some root traits in Alfalfa, *Medicago sativa* L.

M. Rezvani¹, M. R. Ardakani², F. Rejali³, Gh. Noormohammadi⁴, F. Zaefarian⁵ and S. Teimoori⁶

Abstract

Study of rhizosphere is important in sustainable crop production. Mycorrhizal fungus are one of the most important microorganisms in rhizosphere, that has key function in sustainability of agroecosystems through symbiosis with plants root. In order to investigation the effect of different strains of mycorrhizae on alfalfa root traits, a pot experiment with five treatments including *Glomus mosseae*, *G. etanicatum*, *G. intraradices*, combination of *G. mosseae*, *Gigaspora hartiga* and *G. fasciculatum* strains and a control at four replications was conducted in 2006. The roots were washed with tap water after harvesting of shoots. Root traits such as root dry matter, root length, mycorrhizal colonization based on grid line intersect method, total dry weight of mycorrhizal root and root length to root dry weight ratio were measured. Results of analysis of variance indicated that different strains had significant effect on colonization index, so that *G. mosseae* had the most amount of colonization. Different strains had significant differences in concentration of P, Zn and K in plants and *G. mosseae* had more uptake and translocation ability of P, Zn and K than others.

Keywords: Mycorrhizal symbiosis, Root traits, Alfalfa, *Medicago sativa* L.

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1. Ph.D. Student of Agroecology, Islamic Azad University of Tehran, Science and Research Branch., m_rezvani52@yahoo.com

2. Assistant Professoer of Agronomy and Plant Breeding Department, College of Agriculture, Islamic Azad University, Karaj Branch.

3. Assistant Professoer of Soil and Water Research Institute of Iran, Tehran.

4. Professoer of Islamic Azad University of Tehran, Science and Research Branch.

5. Ph.D. Student of Agronomy Department, College of Agriculture, Tarbiat Modarres University.

6. Researcher of Agriculture, Medicine and Industrial School, Institute of Nuclear Science and Technology, Karaj.

Response of yield and morphological traits of some mungbean, *Vigna radiate* L. genotypes to drought stress

M. Rafie¹ and M. R. Asghari pour²

Abstract

Water deficit is a great constraint for agricultural productivity world wide. Mungbean is a traditional pulse in arid and semi-arid areas. This research was conducted in a research greenhouse at the Ferdowsi university of Mashhad to investigate the impact of five drought levels (-0.3, -3, -6, -9, and -12 bar) on yield and morphological characteristics of eight mungbean genotypes (Jalagon17, Kopergaon, D45-6, IlagS6A, MD15-2, MY-17, Berken, Kiloga). The experiment was conducted as factorial in completely randomized design with four replications. The genotypes were exposed to drought stress 10 days after emergence. Some parameters were measured during growing seasons including plant height, leaf number, flower and pod number, length and number of lateral branches. Results showed significant differences of genotypes in all studied parameters in the first stage of stress. Reduction in the flowering and podding time were also observed in most genotypes. Flower numbers was a suitable parameter in assessment of drought tolerant genotypes. Most measured parameters did not show significant differences in all drought stress levels, and interactions at the end of growth season. At this stage, weight of pods was the best index. At the end of growing season, all of the measured parameters showed a reduction with increasing levels of drought stress. The highest amount of all parameters were observed in field capacity (-0.3 bar). Among the levels of water potential tested, -3 and -6 bars were the best treatments for evaluating drought stress of mungbean genotypes. Among studied genotypes, D45-6, Ilag S6A, and MD 15-2 were the best ones in terms of responding to drought stress.

Keywords: Mungbean, Drought stress, Yield, Morphological traits.

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1. Scientific Board of Islamic Azad University, Shirvan Branch, and Member of Young Researchers Club.

2. M.Sc. in Agronomy, Islamic Azad University , Shirvan Branch.

Impact of socio-economic characteristics on farmer's attitude and access to the information to adopt and utilize irrigation systems in Lorestan province, Iran

M. Abdolmaleki¹ and M. Chizari²

Abstract

In this study, farmer's attitude and the extent of their access to technical information to adopt and utilize irrigation systems have been studied. Statistical sample in this study was drawn randomly from 220 farmers adopting the irrigation systems in their farms. A number of 140 farmers were selected through classified sampling. This study is a kind of descriptive-correlation research which has been accomplished through questionnaire and interview. Face and content validity of the questionnaire were established using a panel of experts consisting of faculty members in the department of agriculture at Khoramabad Islamic Azad university. The questionnaire was field-tested and Cronbach's Alpha coefficient for attitude and the extent of access to technical information questions was calculated using software SPSS ($\alpha=84\%$). The results obtained from calculating correlations between variables showed positive and statistically significant relations between the farmer's attitude regarding adoption of irrigation systems and the amount of irrigated land ownership, the amount of the land which is irrigated by these systems, increase in value of water, kind of educational programs, and obstacles associated with utilization. Moreover, there is positive and statistically significant relations between the extent of access to technical information and educational level, main job, performance, effective factors in utilization of systems, implementing educational programs, agent's visits, agent's implemented programs, and problems and obstacles associated with utilization. Stepwise multiple regression, indicated that the amount of irrigated land ownership, the amount of the land which is irrigated by these systems, increase in value of water, obstacles associated with utilization explained a statistically significant portion of variance (R square = 48.3) for the farmer's attitude regarding adoption of irrigation systems. Moreover, stepwise multiple regression indicated that educational level, performance, effective factors in utilization of systems and obstacles associated with utilization explained a statistically significant portion of variance (R square = 43.1) for the extent of access to technical information regarding adoption and utilization of irrigation systems. Thus, farmer's socio-economic and job characteristics, which exist in every zone, must be analyzed and in order to adoption and development of utilization of irrigation technologies, useful educational and technical programs must be planned and implemented.

Keywords: Access to technical information, Attitude, Adoption and utilization, Irrigation systems.

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1. Assistant Professor in Agricultural Extension and Education, Islamic Azad University, Khorramabad Branch.

2. Professor in Agricultural Extension and Education, Tarbiat Modares University.

Response of yield related traits in three grain corn hybrids to weed competition periods

B. Mirshekari¹, H. Shahi Ahmad Abad², A. Valad Abadi³ and A. Dabbage Mohammadi Nasab⁴

Abstract

In order to investigate the response of yield related traits in three grain corn hybrids to weed competition periods, a factorial experiment was conducted in research station of agriculture faculty of Islamic Azad university of Tabriz based on randomized complete block design in three replicates in 2007. The treatments were combination of weed interference periods (interference until 2–4, 4–6, and 6–8 leaf stages of corn, full season weed interference and weed free control plot) and three corn hybrids (504 , 604 and 704). Results showed that the traits such as stem height, number of grain row per maize, and grain yield were significantly influenced by corn hybrids, But by weed interference treatments. Results indicated that biological yield, dry weight of stem, leaf and maize were affected by weed interference treatments and reduced 25%, 22%, 23% and 32%, respectively in full season weed interference treatment. 504 Hybrid with stem height of 169 cm, grain yield of 5.8 tha⁻¹ and biological yield 11.6 tha⁻¹ was better than 604 and 704 hybrids. In interference treatments, weed free control plot showed the best result.

Keywords: Interference periods, Competition, Corn, , Weed, Yield.

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1. Assistant Professor of Islamic Azad University, Tabriz Branch.

2. M.Sc., Islamic Azad University, Takestan Branch.

3. Assistant Professor of Islamic Azad University, Takestan Branch.

4. Associate Professor of Tabriz University.

The effect of drought stress and nitrogen levels on yield and water use efficiency of forage millet and sorghum

S. G. R. Moosavi¹, M. J. Mirhadi², S. A. Siadat³, G. Noor Mohammadi² and F. Darvish²

Abstract

In order to evaluation of different irrigation and nitrogen levels on yield and yield components and water use efficiency of forage millet (cv. Notrifeed) and sorghum (cv. Speedfeed), an experiment was conducted in agricultural research station of Islamic Azad university of Birjand in 2005. Experimental design was split-split plot based on randomized complete block design in three replications. The main plots were three irrigation levels (33, 67 and 100 percent of water requirement), sub plots were three nitrogen levels (46, 92 and 138 kg/ha) and sub-sub plots were plant species (forage sorghum and millet). The results showed that the effect of irrigation and nitrogen treatments and plant were significant at 0.01 confidence level on total fresh and dry yield and water use efficiency. The dry forage yield in 33 and 67 percent water requirement treatments were 62.6 and 15.5 percent lower than 100% water requirement treatment, respectively. The highest water use efficiency was belonged to medium water stress. Also total fresh and dry yield of forage and water use efficiency in millet were greater than sorghum. In addition, interaction between irrigation and nitrogen fertilizer in mentioned traits was significant at 0.01 confidence level. Application of higher levels of nitrogen increased total fresh and dry yield of forage and water use efficiency at all irrigation levels, significantly.

Keywords: Forage millet, Forage sorghum, Drought stress, Nitrogen, Yield, Yield components, Water use efficiency.

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1. Ph.D. Student of Agronomy, Islamic Azad University of Tehran, Sciences and Research Branch.
2. Professor of Islamic Azad University of Tehran, Sciences and Research Branch.
3. Professor of Islamic Azad University of Ahwaz, Sciences and Research Branch.

Application of using fuzzy multi programming in optimal cropping products in Fars province: case study of Marvdasht region

H. Mohammadi¹, M. Naghshineh fard², and F. Boostani³ and S. Pishbin²

Abstract

The main objective of this study was to develop optimal cropping pattern for producers of Marvdasht district. Determination of optimal cropping contains providing the objectives of reducing production variance or risk, reducing water usage, and providing a special amount of gross margin, simultaneously. Regarding the fluctuations in coefficients used in objective function and constraints and fuzziness of the coefficients, the coefficients were used in fuzzy form. Considering the objectives and applying fuzzy values jointly was resulted in multi objective fuzzy programming. Current pattern of selected producers contains rice, wheat, maize, hay maize, tomato, sugar beet and canola with area of 2, 2.8, 0.2, 0.3, 1, 0.4, 0.2 and 0.2 hectares, respectively. Gross margin of the current pattern is 109.44 billions rials. Variance of gross margin and water consumption in the current pattern were 1387×10^{13} and 142130 m^3 , respectively. In fuzzy optimal pattern, rice, wheat, tomato and canola had priority over other crops, getting area of 0.3, 1.3, 1.5 and 4 Hectares, respectively. Gross margin, variance of gross margin and water consumption in fuzzy optimal pattern were 119.99, 916×10^{13} and 95784 m^3 , respectively. The results also revealed that increased uncertainty in water availability results in reduction of wheat area in favor of rice and canola.

Keywords: Optimal pattern, Fuzzy programming, Water, Risk, Fars province

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1. Assistant Professor of Islamic Azad University, Marvdasht Branch.

2. Scientific Board of Islamic Azad University, Jahrom Branch.

3. Assistant Professor, Islamic Azad University of Fars, Science and Research Branch.

Evaluation of the effects of different nutrient levels on performance of laying hens

A. Nobakht¹, Y. Mehmannaavaz¹ and S. Mahdavy¹

Abstract

This study was conducted to evaluate the effects of different nutrient levels on performance of laying hens. This experiment was conducted with 320 laying hens from 32 to 42 weeks in a completely randomized design with five treatments and four replicates with 16 birds in each replicate. Experimental diets were isocaloric and included: diet nutrients recommended by Hy-line company for commercial laying hens (control), diet with 10 percent lower nutrient level than nutrient recommended by Hy-line company, nutrients recommended by NRC (1994), diet 10 percent higher nutrient level of nutrient recommended by NRC (1994) and diet with average energy of nutrients recommended by Hy-line company and NRC (1994). The results of this experiment showed that the performance and egg traits in laying hens were significantly affected by different experimental diets and the egg weight was significantly different between treatments ($P < 0.05$). The highest amount of egg weight (60.35 g) was observed in control group. Also significantly differences were observed in egg mass between treatments ($P < 0.05$). The highest amount of egg mass (53.72 g) was observed in control group, whereas nutrients recommended by NRC (1994) caused the lowest amount of that (49.84 g). Moreover, feed efficiency significantly affected by studied nutrients ($P < 0.05$). The best amount of feed efficiency (2.13) was observed in control group. There was also significant difference between treatments for egg shell weight and the highest egg shell weight (6.07g) was observed in control group. The egg shell thickness was significantly affected by treatments, too ($P < 0.05$) and the lowest egg shell thickness (304mm) was observed in control group. There was not any significantly difference between treatments in other traits such as feed price to produce one kilogram of egg ($P > 0.05$). It can be concluded that performance and egg quality of laying hens can be improved by using nutrients levels recommended by Hy- line company for commercial laying hens.

Keywords: Performance, Laying hen, Nutrient levels, Egg shell quality.

Choosing the best method of estimating reliability parameter for grain harvesting machines in Markazi province, Iran

M. R. Vafae¹, H. Mashhadi Meighani², M. Almasi³ and S. Minaee⁴

Abstract

The main goal of this study was finding an appropriate pattern for estimating reliability of cereal harvester specially John Deer 955 combine in Farahan region. In this purpose, five steps including: selecting the statistical community, recording of data related to repairs and their abundance with the time of operation, choosing a suitable distribution function which fallow repairs, estimating the parameter of distribution function, and using estimated functions for determining of reliability were considered. In this case, five JD955 combine with 1800, 1000, 900, 800 and 445 worked hours were selected, randomly. Combines were divided to five main parts including: cutting and feeding unit, belts and chains, engine, hydraulic system and rest of combine mechanisms including: threshing system, separating system, cleaning system and transmittion system. All of repairs were recorded based of time duration of work and systems. Repairs were divided into major and minor levels. Finally, time duration between impairments and their abundance types were recorded separately for each system. Based on data distribution and their variations, coefficient $\beta > 1$, and general form of graph inferred from survival function, Weibull distribution function was selected as the best equation to make clear of impairments. The general form of Weibull function was selected with three parameters, but it changed to $F(X) = 1 - \text{EXP}(-X^{(\beta/\alpha)})$ form because first impairments could occurre in initial time of combine operation. In order to estimating of Weibull function parameters, maximum likelihood estimated (MLE) method was used. For anticipating the time between repairs, Mont carlo method was used. Results showed that reliability of studied combines was zero after 130 hours operation and time duration between repairs of combine was calculated by 42.8 hours.

Keywords: Harvester, Reliability, Combine John Deer 955, Weibull function, Maximum likelihood method.

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1. Scientific Board of Islamic Azad University, Farahan Branch.
2. Scientific Board of Islamic Azad University, Arak Branch.
3. Scientific Board of Shahid Chamran University of Ahwaz.
4. Scientific Board of University of Tarbyat Modarres, Tehran.

Evaluation of growth indices in red bean, *Phaseolus vulgaris* inoculated with *Rhizobium leguminosarum* bv *phaseoli* and plant growth promoting *Rhizobacteria* (PGPR)

M. Yadegari¹, Gh. Noormohammadi² and H. Asadi Rahmani³

Abstract

The effect of co-inoculation with plant growth promoting Rhizobacteria (PGPR) and *Rhizobium* on yield and yield components of red bean, *Phaseolus vulgaris* L. cultivars was investigated in agricultural research station of Islamic Azad university of Shahrekord during 2006-2007. The experiment was done in split plot in the basis of randomized complete block design in three replications. Six strains of *Rhizobium* and a nitrogen fertilizer treatment were considered as the main factor and three red bean cultivars (Akhtar, Gholi, and Sayyad) were as the sub factors. PGPR strains of *Pseudomonas fluorescens* P-93 and *Azospirillum lipoferum* S-21 as well as two highly effective *Rhizobium* strains were used in this study. Common bean seeds of three cultivars were inoculated with *Rhizobium* singly or in combination with PGPR to evaluate their effect on growth characters. Results indicated that soil beneficial bacteria can positively affect symbiotic performance of Rhizobia. A significant variation of plant growth in response to inoculation with *Rhizobium* strains was observed. Treatment with PGPR significantly increased number of pods per plant, number of seeds per pod, weight of seeds per plant, weight of pods per plant, total dry matter in R₆ stage as well as seed yield and protein content. Co-inoculation with *Rhizobium* and PGPR caused a significant increase in the yield and yield components. The results showed that all treatments of bacteria increased yield. However, strains Rb-136 with *Pseudomonas fluorescens* P-93 caused the highest seed yield, number of pods per plant, weight of 100 seed, number of seeds per pod and seed protein yield.

Keywords: Red bean, *Phaseolus vulgaris* L., *Rhizobium leguminosarum* biovar *phaseoli*, Plant growth promoting *Rhizobacteria*, Yield, Yield components.

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1. Assist Professor of Agriculture Faculty, Islamic Azad University, Shahrekord Branch.

2. Professor in Agronomy, Faculty of Agronomy, Islamic Azad University of Tehran, Science and Research Branch.

3. Assist Professor of Soil and Water Research Institute, Tehran.