



Impact of Recommended Bio-Fertilizers Technologies on Yield of Soybean in Ujjain District of M.P.

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Abstract: Agriculture production depends on availability and use of quality and quantity of farm inputs. The chemical fertilizer is supposed to be an essential input for boosting up agricultural production. It had played a significant role in increasing agriculture production in the country. However, the continuous use of chemical fertilizers had deteriorated soil fertility, destroyed soil microbial activity and disturbed environmental balance and ecological soundness. Soil is biologically active and home to a wide range of living organisms, including soil microbes, earthworms and growing plant roots. Recommended dose of bio-fertilizers are believed in the potential alternative to chemical fertilizer in improvement of soil fertility for sustainable crop production. e.g. Rhizobium + Phosphotika at 200 gm each per 10 kg of seed as seed treatment are recommended for pulses such as pigeonpea, green gram, black gram, cowpea etc, groundnut and soybean. Azotobacter + Phosphotika at 200 gm each per 10 kg of seed as seed treatment are useful for the crops. For this study 120 respondents were taken as sample of bio-fertilizer users from the Ujjain district of M.P. to collect the data. This index consisted of sixteen components of use of bio-fertilizers in soybean production technologies disseminated to the respondents through various KVK program. Hence, researcher is interested to see the impact of bio-fertilizer in soybean crop in Ujjain district with 120 respondents were the sample of bio-fertilizer users in the study. The major finding was obtained Out of total 60 beneficiary respondents 60.00 per cent of respondents had medium production of soybean use of bio-fertilizers, 25.00 per cent high production group whereas only 15.00 per cent beneficiary low production of soybean in use of bio-fertilizers while out of 60 non beneficiary farmers, higher percentage of the respondents i.e., 51.67 per cent belonged to medium production of use of bio-fertilizers in soybean crop followed by low and high production group.

Introduction:

Agriculture production depends on availability and use of quality and quantity of farm inputs. The chemical fertilizer is supposed to be an essential input for boosting up agricultural production. It had played a significant role in increasing agriculture production in the country. However, the continuous use of chemical fertilizers had deteriorated soil fertility, destroyed soil microbial activity and disturbed environmental balance and ecological soundness. Soil is biologically active and home to a wide range of living organisms, including soil microbes, earthworms and growing plant roots. Recommended dose of bio-fertilizers are believed in the potential alternative to chemical fertilizer in improvement of soil fertility for sustainable crop production.



Bio-fertilizer is a novel tool for agriculture. It provides eco- friendly organic agro-input and is more cost-effective than chemical fertilizers. Since bio-fertilizer is technically living, it can symbiotically associate with plant roots. Involved microorganisms could readily and safely convert complex organic material in simple compounds, so that can easily take up by plants. It maintains the natural habitat of the soil. There are different types of microorganisms which are used in the Bio-fertilizer, Rhizobia and Phosphate solubilizing bacteria (PSB) are the commonly applied in microbial inoculants legumes (Soybean). The rhizobium culture strains are antigenically very selective and require particular host. PSB are beneficial bacteria able of solubilizing inorganic phosphorus from unsolvable compounds. Nowadays, many bio-fertilizers are commercially available in the market for farmers to buy and use. These not only help replenish the soil nutrients but also reduce the dependency on chemical fertilizers. This helps in maintaining the mineral content of the soil and reduces pollution to a great extent.

Objective:

To find out the impact of bio-fertilizer on yield of soybean crop.

Review of Literature:

Ghosh *et al.* (2013) the findings implied that farmers showed significant improvement in their overall awareness 70.10 per cent, attitude 68.27 per cent and skill 64.91 per cent. The overall impact gain of the farmers on different scientific techniques for enhancing water productivity in agriculture was found to be significant and the adoption of these techniques by the farmers were found to be at the satisfactory level. Thus, trainings had motivated the farmers for adopting the modern techniques in order to get more production and farm income per drop of water.

Sharma *et al.* (2013) the findings referred that the on-campus trainees had medium impact than the off-campus trainees. This indicated that the exposure of KVK training programmes significantly changed the attitude of farmers in desired direction, which one could obviously expect.

Sharma (2016) conducted a study on pigeon pea farmers in Rewa and Satna district of M.P. and found that the benefit-cost analysis of pigeon pea crop before FLD showed that average produce of yield of pigeon pea (q/ha) was 14.22. Average value of pigeon pea Rs.56722/-, gross income (Rs. /ha) 56722/-, average cost in cultivation (Rs./ha) 16845/-, net income (Rs./ha) 39877/- and B:C ratio 3.36, followed by benefit- cost ratio of pigeon pea crop after FLD average yield of pigeon pea q/ha 19.85, average value of pigeon pea - Rs. 69875/-, gross income (Rs./ha) 69875/-, average cost in cultivation (Rs. /ha) 19725/-, net income (Rs./ha) 50150/- and B:C ratio 3.54.

Singh (2017) in his study on chickpea farmers in Bemetara and Mungeli district of Chhattisgarh found that the benefit-cost analysis of chickpea crop before NFSM showed that average yield of chickpea (q/ha).



Mythology:

In this stage Ujjain, Khachrod, and Badnagar blocks of Ujjain district were selected randomly. A list of farmers from ten selected villages who used recommended bio-fertilizers technologies on soybean crop was prepared. From these selected villages 60 respondents (beneficiary) have been selected under KVK. On the other hand, 60 respondents (non beneficiary) have been selected from the same villages. Thus, total 120 respondents were the sample of bio-fertilizer users in the study.

Result & Discussion:

Impact of use of bio-fertilizers on soybean production

The impact of bio-fertilizers on soybean production was measured in terms of production of soybean crop by the respondents, as followed the recommendations mentioned in bio-fertilizers for enhancing the soybean production and other economic gain through strengthening their technology, resources and risk bearing ability. The distribution of respondents according to their adoption regarding realization of enhancement in soybean production through use of bio-fertilizers in following Table :-

S.No	Production	Beneficiary	Non beneficiary
1.	Low	09 (15.00)	19 (31.67)
2.	Medium	36 (60.00)	31 (51.67)
3.	High	15 (25.00)	10 (16.66)

(Figures in parenthesis indicate percentage)

Table showed that out of total 60 beneficiary respondents 60.00 per cent had medium production of soybean by use of bio-fertilizers, 25.00 percent high production group whereas only 15.00 per cent low production of soybean by using bio-fertilizers.

The table also revealed that out of 60 non beneficiary farmers, higher percentage of the respondents i.e., 51.67 per cent were from medium production of use of bio-fertilizers in soybean crop.



Table: Distribution of respondents of their impact of bio-fertilizer on yield of soybean crop

S. No.	Category	Mean Score	Standard deviation
1.	Beneficiary	15.58	3.02
2.	Non Beneficiary	13.41	1.96
	z value	3.98	

Significant at 0.01 level of probability

z value - (when calculated value is greater than tabulated value showed significant and hypothesis is rejected and tabulated value is greater than calculated value showed non-significant and hypothesis is accepted)

For comparison of practice-wise enhancement of production, bio-fertilizer used in soybean crop, mean score “standard deviation, Test” (Z test) applied in case of beneficiary and non beneficiary farmers of soybean growers and results are presented in Table 4.14.

The data Indicated that significant difference in beneficiary and non beneficiary farmers of soybean growers were mean score (15.58 and 13.41), standard deviation (3.02& 1.96) and z value is (3.98>2.58) at 0.01 level of probability.

Impact of bio-fertilizers on soybean production was measured in terms of production of soybean by the respondents, as followed the recommendations mentioned in bio-fertilizers for enhancing the soybean production and other economic gain through strengthening their technology, resources and risk bearing ability. Out of total 60 beneficiary respondents 60.00 per cent of respondents had medium production of soybean by using bio-fertilizers, 25.00 per cent had high whereas only 15.00 per cent low production of soybean by using of bio-fertilizers. Out of 60 non beneficiary farmers, higher percentage of the respondents i.e., 51.67 per cent had medium production by using bio-fertilizers in soybean crop followed by high and low.

Impact on yield Indicated that significant difference in beneficiary and non beneficiary farmers of soybean growers were mean score was (15.58 &13.41), standard deviation (3.02& 1.96) and z value is (3.98>2.58) significant at 0.01 level of probability that indicated the significant difference in adoption between beneficiary and non- beneficiary farmers.



Conclusion:

The impact of bio-fertilizers on soybean production was measured in terms of production of soybean by the respondents, as followed the recommendations mentioned in bio-fertilizers for enhancing the soybean production

Out of total 60 beneficiary respondents 60.00 per cent of respondents had medium production of soybean use of bio-fertilizers, 25.00 per cent high production group whereas only 15.00 per cent beneficiary low production of soybean in use of bio-fertilizers while out of 60 non beneficiary farmers, higher percentage of the respondents i.e., 51.67 per cent belonged to medium production of use of bio-fertilizers in soybean crop followed by low and high production group.

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