Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(6): 943-945
Received: 22-09-2019
Accepted: 24-10-2019

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Constraints faced by farmers in adoption of bio fertilizer

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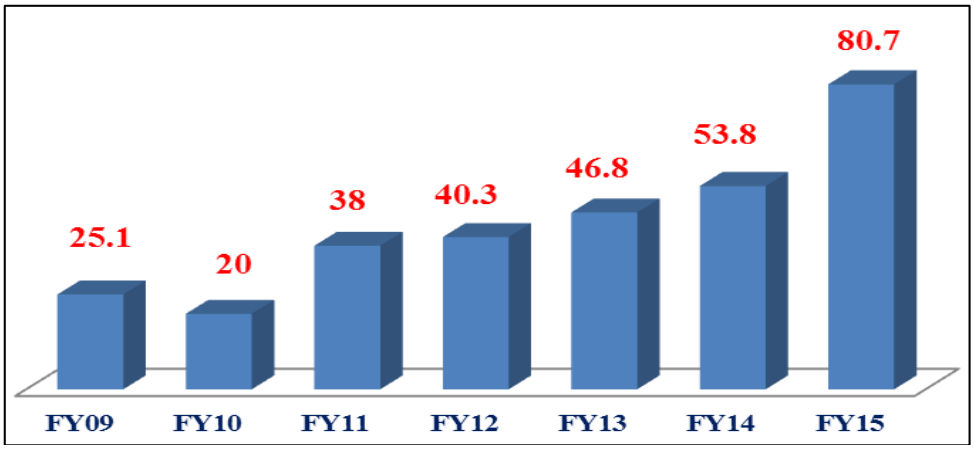
Abstract
Micro organism is natural soil improver which is play significant role for plant to uptake nutrients from soil. Due to hybrids and Bt. variety used by the farmers there was increase in chemical fertilizer which also have negative effect on soil micro organism. But after research of agricultural scientist, important organism can be cultured and it's directly used by farming community on their field. Junagadh Agricultural University developed *Rhizobium, Azotobacter* and Phosphate Solubilizing Bacteria as '*Sawaj*' trade name. University provides facility to buy '*Sawaj*' biofertilizers at university campus and KVKs (Krishi Vigyan Kendra). It is also available at various NGOs (Non-Government Organizations) and co-operative societies of Saurashtra to the farmers. The present study highlighting the constraints faced by the farmers in adoption of bio fertilizers. Total 100 respondents selected for the study. It was revealed that Sawaj Bio fertilizer are not available at taluka places ranked first followed by Sawaj Bio fertilizer is not timely available ranked second, lack of awareness about the concentration, time and method of biofertilizer application ranked third, non availability of subsidy ranked fourth, Unawareness about Sawaj Bio fertilizer impact ranked fifth.

Keywords: Constraint, biofertilizer, adoption, technology

Introduction
Biofertilizers, denotes all nutrient inputs and plant growth which are of biological origin that can improve soil fertility and crop productivity. The main sources of biofertilizers are bacteria, fungi and cyanobacteria. These microorganisms have symbiosis relationship with the partners i.e. plants. This microorganism generates plant nutrients like nitrogen and phosphorus through their activities in the soil and make available to plants in gradual manner. They are beneficial in enriching the soil with microorganisms which increases quality of nutrient in soil and also impart strength to combat with diseases. We have not enough production of chemical fertilizers to supply farmers so we import chemical fertilizer like urea from foreign country. In this condition biofertilizers have emerged as a highly potent alternative to chemical fertilizers due to their eco-friendly, easy to apply, non-toxic and cost effective nature. Also, they make nutrients that are naturally abundant in soil or atmosphere, usable for plants and act as supplements to agrochemicals. Indian biofertilizer market had grown rapidly in the period FY09 to FY15, the production of biofertilizers in India had more than tripled during FY09-15. The growth is expected to continue in future owing to the strong push by the Government of India (GoI) to promote bioagriculture.



Source: Department of fertilizers, ministry of chemicals & fertilizers, NCOF annual report 2014-15

India biofertilizers industry-production (in '000 tons)

Gujarat ranks 2nd in the production of liquid biofertilizers with a capacity of 7,075 KL per annum (2014-15), 12th in the production of solid biofertilizers with a capacity of 4,670 tons per annum (tpa). Gujarat has set up eight biofertilizer production units under National Project on Organic Farming (NPOF) with a cumulative capacity of 1,850 tpa during October 2014 and March 2015. (Anonymous, 2017) [1]. To know importance of biofertilizer and its future Junagadh Agricultural University (JAU) has started the commercial production and selling of different biofertilizers like Azotobacter, Rhizobium and PSB culture under the brand name of SAWAJ. Now a day people also more Conesus about their health. Its force to farmer to use chemical free product like Biofertilizers which are improve the fertility of the land without harmful to the living soil as well as consumer. But there were some constraints faced by farmers adopting biofertilizers. Looking to above facts a study entitled "Constraints faced by farmers in adoption of bio fertilizer" was undertaken with following objectives:

- To know the constraints faced by farmers to adoption of SAWAJ bio fertilizers.
- Suggestions from respondents to overcome constraints to increasing level of adoption of SAWAJ bio fertilizers

Materials and methods

The study was conducted in Krishi Vigyan Kendra, Junagadh Agricultural University, Amreli operational area of Saurashtra region. List was prepared of farmers, who purchased bio fertilizers (PSM, Azotobacter, Rhizobium) from the KVK-Amreli during 2017-18. Out of listed farmers 100 respondents were selected and interviewed as per the objective of the study.

To assess the constraints in use of "SAWAJ" biofertilizer, nine item statements were presented and assessment based on yes and no, percentage of statements were work out and ranked it. For the suggestions to overcome the constraint was kept open-handed and percentage work out and on basis of percentage ranked given.

Result and Discussion

Constraints faced by the farmers in adoption of SAWAJ Bio fertilizer

The constraints faced by the respondents were recorded in the schedule itself. The frequency for each constraint was worked out. The data was converted in to percentage. A rank was assign to each constraint and presented.

Table 1: Constraints faced by respondents in adoption of bio fertilizer n=100

Sr. No.	Constraints	Frequency	Percentage	Rank
1	Sawaj Bio fertilizer is not timely available	79	79.00	II
2	Sawaj Bio fertilizer are not available at taluka places	86	86.00	I
3	Unawareness about Sawaj Bio fertilizer impact	67	67.00	V
4	Lack of practical training about use of Bio fertilizer	38	38.00	VIII
5	Non-availability of subsidy	70	70.00	IV
6	Non-availability of agricultural literature in village	44	44.00	VII
7	In case of high temperature biofertilizer application is not successful	51	51.00	VI
8	Lack of awareness about the concentration, time and method of biofertilizer application	73	73.00	III

The constraints faced by the respondents w for the adoption were presented in Table 5 clearly indicated that Sawaj Bio fertilizer are not available at taluka places (86.00 per cent) ranked first, Sawaj Bio fertilizer is not timely available (79.00 per cent) ranked second, Lack of awareness about the concentration, time and method of biofertilizer application (73.00 per cent) ranked third, Non availability of subsidy (70.00%) ranked fourth, Unawareness about Sawaj Bio fertilizer impact (67.00 %) ranked fifth.While leastimportance was given to In case of high temperature biofertilizer application is not successful (51.00%) having rank sixth, non-availability of agricultural literature in village (44.00%) ranked seventh and lack of practical training about use of Bio fertilizer (38.00%) having rank eighth.

Suggestion obtained by the farmers in adoption of SAWAJ bio fertilizer

To overcome the constraints faced by the respondents they had also suggested some remedies are presented in Table 6.The farmers suggested that SAWAJ Bio fertilizer provide at village level (90.00 per cent) ranked first, SAWAJ Bio fertilizer provide at subsidies rate (86.00 per cent) ranked second, Timely available (73.00 per cent) ranked third, increase awareness about use of SAWAJ Bio fertilizer (65.00 per cent) ranked fourth, Impart training about method of application (49.00 per cent) ranked fifth and Quantity discount (36.00 per cent) ranked sixth.

Table 2: Distribution of the respondents according to suggestion obtained about adoption of SAWAJ biofertilizers (n=100)

Sr. No.	Suggestions	Frequency	Percentage	Rank
1	SAWAJ Bio fertilizer provide at village level	90	90.00	I
2	SAWAJ Bio fertilizer provide at subsidies rate	86	86.00	II
3	Timely available	73	73.00	III
4	Increase awareness about use of SAWAJ Bio fertilizer	65	65.00	IV
5	Impart training about method of application	49	49.00	V
6	Quantity discount	36	36.00	VI

Conclusion

Adoption of SAWAJ biofertilizer was good alternatives to replace chemical fertilizers in Saurashtra region of Gujarat. It is cheap price product also eco friendly and safe for our food chain. Keeping these potentials in mind, farmers starts practicing SAWAJ biofertilizer but at the same time they are facing several constraints like Sawaj Bio fertilizer are not available at taluka places, Sawaj Bio fertilizer is not timely available, Lack of awareness about the concentration, time

and method of biofertilizer application, Non availability of subsidy and Unawareness about Sawaj Bio fertilizer impact.

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