SUSTAINABLE ENVIRONMENT MANAGEMENT THROUGH ECO-FRIENDLY AGRICULTURAL PRACTICES

Dr.M.KAVASKAR
Assistant Professor
Department of Agricultural Extension
Annamalai University
Annamalainagar - 608 002, Tamil Nadu

Dr.SANTHA GOVIND, Professor
Department of Agricultural Extension
Annamalai University
Annamalainagar - 608 002, Tamil Nadu

Abstract

During the last four decades, spectacular progress has been achieved in India's agricultural production. This achievement was due to cultivation of high yielding varieties that were highly input responsive. Shrinking crop areas, fast degenerating natural resource base, continued use of chemical inputs without organic replenishments, indiscriminate use of pesticides, improper soil and water management methods, etc. have caused much disturbance to the ecological base of farming. The major effect of green revolution is that agriculture has become chemicalised. The effect of prolonged and over usage of chemicals and soil has resulted in human health hazards and pollution of the environment. Modern agriculture is equipped with emerging problems. An Eco-friendly practice is one of the best ways to safeguard national food security. Hence, the present research was taken up to assess the adoption behaviour of paddy growers in Tiruvannamalai district of Tamilnadu. A sample size of 80 paddy growers was selected based on random sampling. The findings revealed that majority of the respondents have not adopted the eco-friendly practices such as organic manures, bio-fertilizers, bio-pesticides etc., Hence, there is an imperative need to raise the level of adoption of these practices in order to reduce the quantum of environmental hazards by agricultural chemicals, pest resistance, pollution, etc.

Key words: Sustainable agriculture, organic farming, environment management, eco-friendly agricultural practices, etc.

1. Introduction

Agriculture is considered as the backbone of India, where 70 per cent of the population is dependent on agriculture and allied activities for their livelihood. A massive application of science and technology has enabled the Indian agriculture to face serious challenges of poverty, food security and malnutrition in the recent past. Intensification of agriculture through massive adoption of high yielding varieties, increased use of synthetic inputs like chemical fertilizers and pesticides, greater exploitation of irrigation potentiality of surface and ground water resources and farm mechanization have largely been responsible for the spectacular achievement in the food grain production that we have achieved over past four decades. Paradoxically however over exploitation of natural and renewable resources and indiscriminate and irrational use of synthetic inputs like inorganic fertilizers and pesticides in view of producing more from unit piece of land are being increasingly realized to seriously impair the ecological balance and putting the environment in jeopardy.

High yielding cultivation is more fertilizer responsive which often led to aggravation of pest problem as the plants become succulent enough to be fed upon by a variety of crop pests. This in turn necessitates increasingly huge amount of pesticides to combat pest problem. Increased use of pesticides has emerged as a potential source of danger to sustainability of environment that endangers the existence of all forms of life on this planet. Perils and pitfalls of pesticides have been well evidenced due to their residual toxicity in our food chain. From a number of trials conducted across the country, toxic residues of pesticides have been revealed in the food stuff not only of plant but also of animal origin like milk and milk products, fish, meat, egg, etc. at concentrations much higher than the permissible level of human body. Therefore, the apparent contradiction of our necessity for nutritional security on one hand and environmental sustainability on the other makes it inevitable to resort to eco-friendly farming system as it appears to be a possible option to meet both these objectives. The later implies a farming system that primarily aims at cultivating land and raising crops under ecologically favourable condition. It emphasizes restricting the use of chemical inputs whether it is inorganic fertilizers or pesticides and instead relies more on an integrated approach of crop management practices making use of cultural, biological and natural inputs.

2. Research methodology

The study was taken up in Thiruvannamalai district of Tamilnadu state. A sample size of 80 paddy growers was selected based on random sampling. An interview schedule was used to collect the data on adoption of eco-friendly production and protection practices. Twenty six eco-friendly practices used to measure the adoption behaviour of respondents. Against each of the practice, there were two columns representing adoption and not adoption with the weightage of 2 and 1 respectively. The collected data were analyzed by using simple percentage analysis.

3. Results and discussion

TABLE 1

Distribution of Respondents According to their Adoption of Selected Eco-friendly Production Practices

S.No	Eco-friendly Production Practices	Number	Per cent
	Transplanting		
1	Transplanting at the right age of seedlings	71	88.75
	Bio-fertilizer		
1	Azospirillum seed treatment	19	23.75
2	Azospirillum seedling dip	14	17.50

3	Azospirillum broadcast	30	37.50
	Organic manures		
1	Application of farm yard manure (FYM)	68	85.00
2	Application of enriched farm yard manure	39	48.75
3	Application of vermicompost	27	33.75
4	Application of green manure/ green leaf manures	49	61.25
5	Spraying of panchagavyam	13	16.25

Source: Primary Data

Transplanting: Majority (88.75 per cent) of the respondents followed the transplanting of paddy seedling at the right age. This might be due to that respondents had more knowledge and importance of transplanting the seedling at the right age.

Bio-fertilizer: The adoption of bio-fertilizers was comparatively less. More than one-third (37.50 per cent) of the respondents followed azospirillum broadcast and azospirillum seed treatment (23.75 per cent). Only 17.50 per cent of the respondents adopted azospirillum seedling dip. This might be due to fact that lack of knowledge and easy availability of urea and other inorganic fertilizers acted as impediment switching over to the use of bio-fertilizer. This finding derives support from the findings of (Sathishkumar, 2016).

Organic manures: Application of organic manures was comparatively medium level. Majority (85 per cent) of the respondents adopted farm yard manure application followed by green manure/green leaf manures (61.25 per cent), enriched farm yard manure (48.75 per cent) and vermicompost application (33.75 per cent). Only (16.25 per cent) of the respondents adopted the spraying of panchagavyam to the rice crop. The reason for medium to low level of adoption due to that lack of knowledge on potentiality green manures, vermicompost and panchagavyam, also their non-availability were the main reason for most of the farmers not adopted above practices.

TABLE 2

Distribution of Respondents According to their Adoption of Selected Eco-friendly Protection Practices

S.No.	Eco-friendly Protection Practices	Number	Per cent
	Weed management		
1	Summer ploughing	74	92.50
2	Use of clean seeds	65	81.25
	Pest and disease management		
1	Trimming and plastering	70	87.50
2	Clipping off the top growth	05	6.25

3	Spacing	63	78.75
4	Flooding the field	26	32.50
5	Alternate wetting and drying of field	30	37.50
6	Usage of light traps	23	28.75
7	Usage of pheromone traps	11	13.75
8	Usage of yellow sticky traps	09	11.25
9	Case worm control through rope	06	7.50
10	Neem oil spraying	19	23.75
11	Application of neem kernel extract	16	20.00
12	Seed treatment with Trichoderma viride against blast disease	10	12.50
	Rodent management		
1	Tanjore trap	16	20.00
2	Bird perches	48	60.00
3	Burrow fumigation	41	51.25

Source: Primary Data

Weed management: Majority of the respondents (92.50 per cent) adopted the summer ploughing practice followed by 81.25 per cent of the respondents used clean seeds. Deep ploughing in summer is an important method of exposing the early stages of pest to sun for natural destruction as well as to control weeds and making the soil to a fine tilth for increasing the soil fertility and for good germination of seeds. This may be probable reason for higher level of adoption.

Pest and disease management: About (87.50 per cent) of the respondents adopted the trimming and plastering of filed bunds to eliminate the host weeds for pest and disease. More than two third (78.25 per cent) of the respondents adopted the practice of appropriate spacing followed by alternate wetting and drying of field (37.50 per cent), flooding the field (32.50 per cent), usage of light traps (28.75 per cent), neem oil spraying (23.75 per cent), application of neem kernel extract (20 per cent), usage of pheromone traps (13.75 per cent), seed treatment with Trichoderma viride against blast disease (12.50 per cent), usage of yellow sticky traps (11.25 per cent), case worm control through rope (7.50 per cent) and clipping off the top growth (6.25 per cent). In case of bio-pesticide, majority of the respondents were found in non-adoption category regarding the use of neem seed kernel extract and seed treatment with Trichoderma viride. This might be fact that the bio-control techniques are the innovative practices, lack of knowledge about the use and non-availability of bio-control agents might be the possible reason for lesser adoption of bio-pesticides. Non-adoption regarding the use of pheromone traps and light traps required good care on the part of the farmers, require periodical replacement of the lure and their non-availability may be the reason for non adoption.

Rodent management: Around (60 per cent) of the respondents adopted the practice of bird perches followed by burrow fumigation (51.25 per cent) and Tanjore trap (20 per cent).

4. Conclusion

Majority of the respondents have not adopted the practices such as organic manures, bio-fertilizers, bio-pesticides, etc. Hence, there is an imperative need to raise the level of adoption of these practices in order to reduce the quantum of environmental hazards by agricultural chemicals, pest resistance and pollution, etc. Besides providing more technical guidance through conducting demonstration in each village and follow up approach.

5. References

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