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Response of the Tribal Farmers on Adoption of Vermiculture: An Avenue for Livelihood Improvement

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ABSTRACT

The study was designed to know the extent of adoption of different practices of vermiculture technology recommended by the scientists and to find out the adoption gap in various practices with the sample of 120 respondents who were selected purposively from West Siang district, Basar sub-division. Majority of the respondent were medium level adopters of vermiculture technology and there existed a tremendous adoption gap among the farmers which needed to be bridged by various means of extension activities. Maximum adoption gap (51.67%) was found in following the practice of preparing beds without treatment. The adoption gap of 45.84 per cent existed for the recommended practice of regular watering for maintaining temperature and humidity in the bed. Focused training programmes and exposure visits on scientific production of vermicomposting is necessary to impart necessary skill to the farmers.

Keywords: Adoption gap, Earthworms, Tribal, Vermiculture

INTRODUCTION

The increasing population of India has posed two formidable challenges before the planners; employment generation for about 35 crore people of the age group between 20 to 40 years, and provision of sufficient and nutritious food to all. Agriculture is the biggest private enterprise in our country and 60 per cent of the population who live in rural area and depend on agriculture, this sector alone can address this uphill task (Mishra *et al.,* 2020). In the era of globalization it is very important for Indian farmers to produce higher production within minimum cost by emphasizes the need to educate the farmers in adoption of improved technology to narrow the extension gaps through various technology transfer centers (Kalita *et al.*, 2019). Arunachal Pradesh is having land of rolling hills, rivers, dense forest and virgin land as farmers are not exploiting these lands properly. The farmers are very much conscious about their agriculture practices as they are never interested to use the insecticides, fertilizers and manure. They prefer the organic manure but lacked in scientific knowledge about vermicompost technology. Earthworms act as an aerator, grinder, crusher, chemical degrader and a biological stimulator wherever they inhabit (Bhat, 1994). It has been considered as a proven technology for increasing production and productivity of different agricultural and horticultural crops. Vermicompost is proving to be highly nutritive 'organic fertilizer' and a 'miracle growth promoter' rich in NKP (nitrogen 2-3%, potassium 1.85-2.25% and phosphorus 1.55-2.25%), micronutrients, beneficial soil microbes and also contain 'plant growth hormones & enzymes'. Use of vermicompost is of recent origin and thus many

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farmers are even not aware about its advantages. Various agencies such as Indian Council of Agricultural Research**,** SAUs, NGOs and voluntary agencies are working for dissemination and popularization of vermiculture technology among the farming community of Arunachal Pradesh. The technology is not intricate and involved simple procedure of compost preparation, skill of which can be learned and mastered by the users. There may be some factors like, lack of skill in making compost, poor economic condition or lack of knowledge about operations and use, which restrict the farmers to use the technology in the field (Kaur, 2002). Therefore the present study was undertaken to know the extent of adoption of different practices of technology recommended by the scientists and to find out the adoption gap in various practices.

METHODOLOGY

The study was designed with the sample of 120 respondents who were selected purposively from West Siang district, Basar sub-division. Out of 30 villages, study was confined only to four villages namely *Gori, Nigam, Garu and Ego* which were chosen by the ICAR and imparted hands on training on vermicomposting. The respondents were selected from a list of vermicompost unit holders of each selected village by following proportionate sampling procedure. The study focused on changes in attitude, skill and knowledge of the recommended Vermiculture practices of the demonstrated and non-demonstrated farmers. Similar exercise was also made to measure the adoption score of the recommended practices. Data were collected from the respondents through well structured interview schedule by employing face to face interview technique and it was constructed in accordance with the objectives. The data thus collected were classified, tabulated and analysed in light of the objectives of the study.

RESULTS AND DISCUSSION

It is evident from the data accorded in Table 1 that more than half of the total respondents (60%) fell in the category of medium level of adoption of technology. It is further noted that one-fourth of the total respondents had low level of adoption, while 15 per cent of them were reported from high adoption group of vermiculture technology. It can be safely concluded that majority of the respondent were medium level adopters of vermiculture technology and there existed a tremendous adoption gap among the farmers which needed to be bridged by various means of extension activities.

Table 1: Distribution of respondents on adoption status of vermiculture technology

Level of adoption	Adoption score	Frequency	Percentage
Low	25.74	30	25
Medium	25.75-34.70	72	60
High	> 34.70	18	15

Comparatively higher number of respondents (MPS 64.76) adopted the scientific recommendations of making beds under natural shade (Table 2). This was followed by (MPS 62.50) number of respondents constructed beds near water source as per the recommendation. It is encouraging to note that more than half of respondents (MPS 55.91) followed the recommendation and prepared raised beds to produce good vermicomopost. The data further, indicated that maximum adoption gap (51.67%) was found in following the practice of preparing beds without treatment. Similarly, 50 per cent of the respondents did not follow recommendations regarding preparing raw material free from plastics, glass pieces and hard sticks. It was lucid from the data that the respondents had maximum adoption of scientist's recommendations regarding covering agricultural waste with thick layer of cow dung and sprinkling water on bed at regular intervals (Saxena *et al*., 1997). These aspects accorded first rank with adoption gap of 30.21 per cent each. This was followed by the practice of using 2 inches thick layer of agriculture waste with MPS 66.63 leading to the adoption gap of 33.67 per cent. Similarly, the recommendation of placing thick layer of earthworm on top side of bed was adopted by considerable number of respondents (MPS 61.25), consequently the adoption gap in this aspect was reported to be 39.75 per cent. Alam *et al.* (2007) reported this technology is very important for getting good quality compost from worms. It is discouraging to note that nearly half of the respondents did not use mild insecticide or neem leaves for pre-

Table 2: Adoption of scientific recommendations regarding preparation of beds and raw material for composting (N =120)

S.No.	Practice	MPS	Rank	Adoption gap (%)
(A)	**Preparation of beds and raw material for composting**			
1.	Raised Beds	55.91	3	44.09
2.	Beds Under Natural Shade	64.76	1	35.24
3.	Beds near Water Source	62.50	2	37.50
4.	Preparation before treatment of beds	48.33	5	51.67
5.	Treatment of raw materials	52.67	4	47.33
(B)	**Process of beds filling**			
1.	Pre-treatment of beds before filling	57.91	5	42.09
2.	Use of mild insecticide or neem leaves for pre-treatment of beds	50.83	7	49.17
3.	Use of 2 inches thick layer of agriculture waste on beds	66.63	3	33.67
4.	Use of thick layer of cow dung for covering agricultural waste	69.79	1	30.21
5.	Sprinkling water on beds at regular intervals	69.79	1	30.21
6.	Keeping beds moist for 2-3 days	49.81	8	50.19
7.	Placing thick layer of earthworms on one side of bed	61.25	4	39.75
8.	Covering surface of bed with waste material	55.83	6	44.17
(C)	**Proper maintenance of beds**			
1.	Watering beds for maintaining temperature & humidity	54.16	1	45.84
2.	Filling beds up to a recommended level	37.91	4	62.09
3.	Keeping beds free from unwanted plants	47.90	3	52.10
4.	Keeping beds and surroundings clean	50.83	2	49.17
(D)	**Care before using vermicompost**			
1.	Stop watering over prepared vermicompost at appropriate time	55.33	4	44.67
2.	Separating earthworms	68.37	2	31.63
3.	Putting vermicompost on pucca / plastic / rocky floor	48.05	8	51.95
4.	Keeping vermicompost away from sunlight before 4-5 hours for separation of earthworm	49.16	7	50.84
5.	Re-filling of beds same day	-	9	100
6.	Using vermicompost in different crops including vegetables and fruits	70.43	1	27.57
7.	Drying of vermicompost for 3-4 days under the shares before storage	50.08	6	49.92
8.	Storage of vermicompost at cold place or under shades	59.64	3	40.36
9.	Watering and giving soft organic feed to earthworms during transportation	52.83	5	47.17

treatment of beds. Similarly, the recommendation of covering surface best with waste materials was adopted by more of the respondent (MPS61.25), leading to a gap of 39.75 per cent. The adoption gap of 45.84 per cent existed for the recommended practice of regular watering for maintaining temperature and humidity in the bed. It is alarming to note that filling of beds to a recommended level was an area with highest adoption gap i.e. 62.09 per cent. Likewise, nearly 50 per cent adoption gap was observed for the practices *viz.* keeping beds free from unwanted plants and keeping beds and its surroundings clean. Table further shows that the respondents had maximum adoption for the recommendation of using vermicompost in vegetable and fruits plants which was accorded first rank with MPS 70.43, leading to very low adoption gap of 27.57 per cent. This was followed by the

practice of separating earthworms from vermicompost with MPS of 68.67 and consequent adoption gap of 31.63 per cent. Similarly, the recommendation of storing prepared vermicompost at cold place or under shade was adopted by considerable number of respondents (MPS 59.64). Similar kind of importance was reported by Arancon *et al.* (2004). It was further noted that more than half of the respondents followed the recommendation and stopped watering on prepared vermicompost at appropriate stage. The adoption gap in this aspect was reported to be 44.67 per cent (Thyagarajan *et al*., 2001). It was disheartening to note that none of the respondents were aware of refilling the bed on the same day and thus the adoption gap is wholesome 100 per cent. But by adopting this simple technology can faster the composting and increase the quality of the compost. It is discouraging to note that nearly 50.84 per cent of the respondents did not kept vermicompost on pucca / plastic / rocky floor, after its preparation as suggested by the scientists.

CONCLUSION

Planning global organic farming and sustainable agriculture can truly bring 'economic prosperity' for the farmers, 'ecological security' for the farms and 'food security' for the people. This will require embarking on a 'Second Green Revolution'- and this time through 'Vermiculture Revolution'- by the earthworms. It can be concluded that there existed a significant gap in adoption of all the practices. This may be due to poor knowledge of farmers or lack of skills in performing different practices recommended by the scientists. Focused training programmes and exposure visits on scientific production of vermicomposting is necessary to impart necessary skill to the farmers. It is therefore suggested that the knowledge and competencies of farmers who are using vermiculture technology may be improved by various means of transfer of technology.

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