Research Paper

Volume : 2 | Issue : 11 | November 2013 • ISSN No 2277 - 8179

Eco-Friendly Fertilizers for Sustainable Agriculture

Home Science

KEYWORDS : eco-friendly, fertilizers, pesticides, composting.

Manimozhi.K — Associate professor, Dept. of Resource Management, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore- 641 043

Vaishnavi.N — Project Assistant, Dept. of Resource Management, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore- 641 043.

ABSTRACT

Agriculture is a major component of our Indian economy. With increased use of pesticides, the food produce contains pesticide residues, which are injurious to health. Growing awareness about the harmful effects of chemicals has shifted many farmers towards eco-friendly farming. Hence the objectives of the study were to assess the extent of application of chemical fertilizers, evolve a training curriculum to impart education on eco-friendly fetilizers and evaluate the impact of the training programme. The study was conducted in 14 villages in the Orathanadu block of Tanjore District, Tamil Nadu. Four hundred and twenty households were randomly selected to analyze the existing agricultural practices. Results revealed that cent per cent of the farmers were using chemical fertilizers. After the training programme, the adoption level of eco-friendly farming had increased. To conclude, eco-friendly agriculture ensures safe food and healthy life.

Introduction:

"Everything can wait but agriculture cannot wait"

- Pandit Jawaharlal Nehru

India is the seventh largest country in geographical level and second largest in population wise and twelfth largest country in economic wise. Agriculture is a major component of the Indian economy, more than 75 per cent of our people have their livelihood as agriculture and agriculture oriented works (http://www.articlesbase.com/self-publishing-articles/scenario-of-indian-agriculture-798281.html).

With increased use of pesticides the food produce contains pesticides residues, which are injurious to health. The pesticides get into soil and water and the environment gets affected increasing consciousness about health hazards associated with agro chemicals and consumers' preference to safe and hazard free food are the major factors that lead to the growing interest in alternative forms of agriculture in the world. The demand for organic food is steadily increasing both in the developed and developing countries. (Palaniappan and Annadurai, 2010). Therefore many farmers has shifted towards alternative types of farming like eco-friendly farming (Mooventhan *et al.,* 2012).

Eco-friendly agriculture is a production system which avoids or largely excludes the use of synthetically compounded inorganic chemicals, relying entirely on crop rotation, crop residues, animal manures, legumes, green manures off farm wastes, bio fertilizer, mechanical cultivation, mineral rearing rocks and aspects of biological control to maintain soil fertility and sustain yield and to control insects, weeds and other insects (Mandal, 2009).

Hence realizing the importance of eco-friendly practices for sustainable agriculture the present research has been undertaken with the following objectives: to assess the extent of application chemical fertilizers by the farmers, evolve a training curriculum to impart education to farmers on eco-friendly methods of fertilizers and evaluate the impact of the training programme.

Results and discussion:

a. Household survey

The study was conducted in 14 villages of Orathanadu block of Thanjavur District of Tamil Nadu state on the basis of cultivation, production and storage of food grains. Four hundred and twenty households from the selected villages were randomly selected to analyse the existing agricultural practices in the selected households.

b. Formulation of the training curriculum and organization of the training programme

Based on the data collected, the training curriculum was formulated. The major thrust areas dealt in the training programme were: agricultural situation in India, effects of chemical farming, Importance of eco-friendly agricultural practices for agricultural sustainability, eco-friendly methods of pest and disease management in pre and post-harvest period and preparation of eco-friendly fertilizers.

The training programme consisted of

i. Block level training and
ii. Village level training

i. Block level training

Fourty two women workers were trained as front line women leaders. Those front line women workers were given training at the first phase in the Block Development Office of Orathanadu Block.

The front line women leaders serve as an effective media, approaching farmers to make them aware on food grain production, educating them on eco-friendly agricultural methods and finally transfer their knowledge on eco-friendly agricultural methods to other members of their respective villages.

ii. Village level training

A five days camp at the village level was organized and conducted in 14 villages. Information was delivered through the 42 trainees to all the villagers to gather at local schools for participating in the camp, which was mainly organized to help in understanding the eco-friendly agricultural practices at the village level, especially on eco-friendly fertilizers.

Eco-friendly fertilizers

Farmyard Manure:

Good quality farmyard manure is perhaps the most valuable organic matter applied to a soil. The manure is produced in the farm chiefly with animal excreta. It is also called as dung and cattle manure. The manure consists of a mixture of cow dung, the liquid excreta (or) urine, the bedding material used in the stable and any remnants of the straw and plant stalks fed to cattle.

Sheep and goat manure:

The droppings of sheep and goat provide valuable manure. Penning of sheep and goat in the fallow field is the common practice in India. It has been estimated that by stocking 1000 sheep for a night will add about 2 tonnes of droppings. The manure contains 3% N, 1% P_2O_5 and 2% K_2O.

Home Composting:

a. Mud pot:

The mud pot was designed. It has divided by two parts. Down and up part can carry each 14 kg waste. The height of the pot is 3 ½ feet and wideness is 1 ½ feet. For covering the compost one round dome shape lid was designed for better airation because

compost need humid atmostphere. After 40 days, the household can utilize or sell 10 kgs of good manure. The cost of the mud pot is Rs.1500/-.

b. Plastic bin:

The families are disposing the organic waste in the plastic bin every day. The home makers are instructed to cover the waste after disposal with the small amount of excavated soil every day in order to avoid foul odour from the waste. When the plastic bin is full the bin may be left undisturbed and the entire waste may be converted into manure due to anaerobic action. After filling the first one, the homemakers are instructed to dispose the organic waste to a second plastic bin. The same plastic bins can be used for the routine process. The plastic bin would serve for a family for period of two years and the cost of the plastic bin is Rs. 420/-

Vermi composting

Silipaulin vermin bed:

Vermi compost is a nutrient-rich organic fertilizer and soil conditioner in a form that is relatively easy for plants to absorb. Earthworms grind and uniformly mix minerals in simple forms, plants need only minimal effort to obtain them. The worms› digestive systems also add beneficial microbes to help create a «living» soil environment for plants. The cost of the silipaulin vermi bed is Rs.1200/-.

Compost pit:

Home composting is a novel method of disposing the garbage in the rural areas. To carryout home composting, a pit of 90cmx-90cmx1.5 meter in the available space in the households. The labour cost of compost pit is Rs. 1300/-.

c. Evaluation of the impact of the training programme conducted

The impact of the training was assessed in order to find out the effectiveness of the training programme on eco-friendly agricultural practices to conserve every food grains produced.

Results and discussion:

a. Household survey:

It is encouraging to note that cent per cent of the home makers in the selected households were literate. Fourty three and fifty four per cent of marginal and large farmers respectively were belonging to the age group of 41-50 years. Sixty six and 51 per cent of marginal and small famers were lived in nuclear family. Agriculture was their main occupation by 81, 80 and 99 per cent of marginal, small and large farmers respectively.

Invariably all types of farmers expressed that they had problem due to insects, pests, water shortage, labour and high cost of fertilizer and pesticides. The common insects and pests identified in the crops were white worm, green worm, caterpillar, stem borer and leaf folder.

Cent per cent of the farmers were adopting chemical methods to control insects and pests. Chemicals that used by the farmers were Copper sulphate, deltamethrin, Glyphosate and aluminium phosphide.

b. Conduct of the training programme

The farmers were trained and demonstrated on eco-friendly methods of fertilizers preparation. The number of farmers benefitted by the training programme is given in Table 1.

Table 1
Total number of farmers benefitted by the training programme

S.No	Category	Number of participants			
		Women	M en	Youth	Total
1.	Large	176	87	65	328
2.	Small	232	143	123	498
3.	Marginal	154	117	76	347
	Total	562	347	264	**1173**

The above Table implies that women's participation was found to be higher while compared to men and youth. It reflects the fact that, the women were more interested in learning and adopting new concepts and techniques.

c. Evaluating the impact of the training programme

The impact of the training programme was assessed in terms of:

i. Extent of adoption of eco-friendly fertilizers

After providing training on eco-friendly fertilizers, the farmers were encouraged to use the eco-friendly fertilizers effectively. Effective use of eco-friendly fertilizers by the trainers is given in Table 2.

Table 2
Use of eco-friendly fertilizers
N=42

Eco-friendly fertilizers Marginal		Percentage of households *		
		Small	Large	
Farmyard Manure	Before	34	42	23
	After	100	100	100
Sheep & goat manure	Before	24	36	44
	After	98	99	99
Home composting a.Mud pot	Before	12	21	23
	After	42	49	52
b.Plastic bin	Before	17	32	34
	After	54	62	76
Vermi composting – silpaulin sheet	Before	5	9	12
	After	12	25	32
Compost pit	Before	12	19	23
	After	24	32	46

*multiple responses

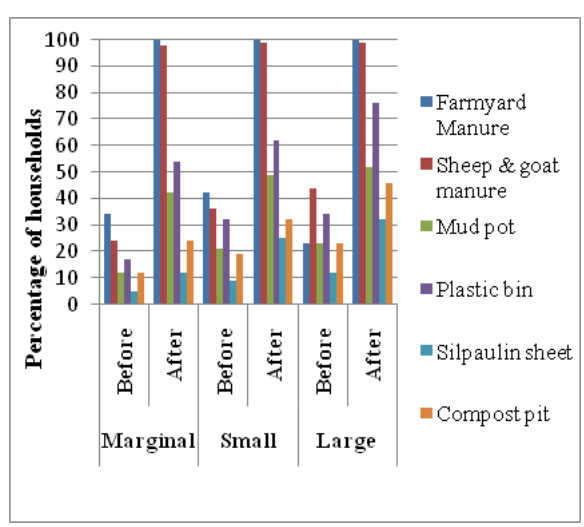

Figure 1

Table 2 and Figure 1 reveals that the adoption level of farmyard manure and sheep & goat manure were almost cent per cent since, it is easily available and easy to adopt too. But, although there was an improvement in the adoption of home composting through mud pot and plastic bin, Silpaulin sheet vermi composting and compost pit, this improvement in not as that of the adoption of farmyard manure and sheep & goat manure since, they are comparatively high cost.

Volume : 2 | Issue : 11 | November 2013 • ISSN No 2277 - 8179

Economic benefits incurred by adoption of eco-friendly fertilizes

Table 3 shows that an average economic benefits incurred by adoption of eco-friendly fertilizers.

Table 3
Economic benefits

Category	Amount spent for purchase of fertilizers		Amount saved (Rs)
	Before training	After training	
Marginal	1500	500	1000
Small	3000	1500	1500
Large	10,000	7000	3000

From the above Table it is clear that, after the utilization of eco-friendly fertilizers the farmers derived economic benefits by way of reducing their percentage of expenditure on chemical fertilizers. On an average, they can able to save Rs. 1000 – 3000/- per cropping.

Conclusion:
Farmers faced difficulties in using high cost chemical fertilizers. After the training programme on eco-friendly methods of fertilizer preparation, farmers put into practice those methods in their agricultural fields. The farmers also reported that the training programme helped them to get rid of the high cost chemical fertilizers through the application of cost effective eco-friendly fertilizers.

Acknowledgement:
The Research Awardee gratefully acknowledge University Grants Commission for sponsoring the project under Post Doctoral Fellowship Scheme and for the support rendered to carry out this study. The Research Awardee is also thankful to the Panchayat Union officers and the farmers of the adopted villages for their co-operation and support.

REFERENCE

Mandal, J.P. (2009) Organic methods of safe and simple storage, Vol. 10, Pp.57-90. | Mooventhan, P. and Philip, H., (2012), Journal of Extension Education, Vol. 24 (1). Pp. 4762, 4763, 4776, 4794, 4798, 4799. | Palaniappan S.P. and Annadurai K, (2010), Organic farming, theory and practice, published by pawan kumar, scientific publishers, India. Pp.1-2, 8-9, 20-21, 89-90. | Websites: | http://www.articlesbase.com/self-publishing-articles/scenario-of-indian-agriculture-798281.html