

Impact of Training Programmes on Vermicomposting; Production, Revenue and Employment Generation of Farmer

ABSTRACT

Available agricultural technology does not serve its purpose till it reaches and adopted by the ultimate users, the farmers. The present study was undertaken to discover the impact of training and farmers awareness on vermicomposting production, in revenue and employment generation of farmer. To enhance the income and employment of farmers of Cuddalore district, ICAR-Krishi Vigyan Kendra, Vriddachalam organized several training programmes on composting and vermicomposting technologies. Vermicomposting is an easy and faster process of converting organic materials into valuable compost than other conventional methods and is a very good source of creating self employment and revenue generation. Vermicompost is a fine granular, dark brown/black coloured organic product, has adequate amount of micronutrient and macronutrients depending on sources of earthworm's feedstock. A farmer V.Sekar, Kodukoor Vriddachalam block of Cuddalore district attended the trainings organized by Krishi vigyan Kendra, Vriddachalam about vermicompost and composting technologies and he opted vermicompost production in his farm for his own use and to get additional income. He started from a very small scale and became a successful producer of quality vermicompost. He reported that his product is demanded by nearby farmers for paddy, vegetable cultivation, kitchen gardeners and NGO's of Cuddalore district. Moreover, he sold vermicompost alone or mixing with *Azospirillum*, *Phosphobacteria* and *T.viridie* based on the farmers need, so that farming community can be benefitted. He is earning an annual net income of Rs. 98,000/- from vermicompost alone and Rs.1,15,500/ year from vermicompost and earthworm. Also found that vermicompost is suitable from the point of employment generation per unit utilization of recourses. It provided about 426 mandays throughout the year. It was concluded that training is the most viable technology transformation tool, which is effective in creating awareness, interest and adoption of improved technology.

Keywords: Vermicomposting; Awareness; Training; Farmer's Income and Employment Generation.

32 INTRODUCTION

33

34 In the past few decades, chemical fertilizers have widely spread throughout the world
35 focusing that the soil is inert medium for plant roots, rather than as a living biosphere in
36 which the crop is only one of hundreds or thousands of interacting species. However, it is
37 now realized that in field under intensive monoculture which receive heavy applications of
38 chemical fertilizers alone, there is a slow decline in productivity [7]. Because, applications of
39 nitrogen fertilizers are responsible for emissions of green house gases like nitrous oxide
40 (N_2O) and ammonia (NH_3). Besides supplying nitrogen, ammonia can also increase soil
41 acidity. Excessive nitrogen fertilizer applications lead to pest problems by increasing the birth
42 rate, longevity and overall fitness of certain pests [3]. Excessive use of phosphotic fertilizers
43 leads to accumulation of large amounts of P in the soil and it can leads plant toxicity and
44 immobilization of trace elements in the soil, as well as ground and surface water pollution
45 through runoff [4]. To overcome such kind of problems, farmers are advised to use organic
46 manures along with recommended inorganic fertilizer.

47 Due to high water content (WC) of up to 99% (wet weight) for liquid manure and
48 70% for solid manure, long range haulage of fresh manure from a livestock operation is
49 uneconomical. Therefore, most of the manures are applied in land at high application rates
50 close to source, thereby diminishing its potential use as a soil amendment. High application
51 rates are unsustainable in the long-term and lead to degradation of soil, water and air quality
52 as well as public perception issues. Chemical, physical and biological properties of fresh
53 manure are also highly variable, making its use in cropping systems more of a challenge than
54 commercial fertilizers [6]. Under such circumstances composting has gained increased
55 attention as a means of reducing the environmental impact of livestock manure [4].
56 Composting is a simple biotechnological process, which could provide a 'win-win' solution
57 to tackle the problem of safe disposal of waste as well as the most needed plant nutrients for
58 sustainable productivity is described [9].

59 Vermicomposting is a simple biotechnological process of composting, in which
60 certain species of earthworms are used to enhance the process of waste conversion and
61 produce a better end product is also called as vermicast. Earthworms consume various
62 organic wastes and reduce the volume by 40–60%. Each earthworm weighs about 0.5 to 0.6
63 g, eats waste equivalent to its body weight and produces cast equivalent to about 50% of the
64 waste it consumes in a day. Vermicast is popularly known as Black gold because of rich in
65 nutrients, growth promoting substances, beneficial soil micro flora, having properties of

66 inhibiting pathogenic microbes and synergistic relationship in plant rhizospheres [2]. Various
67 workers reported that vermicompost contain 17-36 % humic acid and 13-30% fulvic acid of
68 total concentration of organic matter and vermicompost can promote growth 50-100 per cent
69 than compost and 30-40 per cent over chemical fertilizers. Keeping in view the above facts
70 and properties of vermicompost, Krishi Vigyan Kandra, Vriddachalam, Cuddalore district
71 decided to conducted several oncampus and vocational training programmes to promote the
72 production of vermicompost in farmers field. The approach was also aims at increasing
73 income and employment generation by vermicompost production within the farm itself. The
74 present investigation was under taken to study the adoption of vermicompost production on
75 income and employment generation of farmer Mr. V. Sekar, a progressive farmer, adopted
76 vermicompost production as an occupation for his livelihood and generated employment for
77 numerous agog farmers of nearby areas through training programmes.

78 **METHODS AND MATERIALS**

79 A study was conducted to discover the effect of training and awareness on income and
80 employment generation of farmers due to vermicompost production by the adoption of
81 vermicompost production at farm level. Mr. V. Sekar, S/o Velmurugan born in 1977 and
82 completed his education up to M.Sc., in Microbiology, is resident of Kodukoor village under
83 Vriddhachalam block of Cuddalore district, Tamil Nadu. Agriculture is a main occupation for
84 his livelihood and is involved in cultivation of sugarcane and paddy at large scale and pulses
85 at very small scale. He always tried to incorporate recent technologies in farm practice.
86 During 2012, he approached our KVK to start vermicomposting production unit in his own
87 farm. Then he attended a vocational training on vermicompost production and has initiated
88 vermicompost unit with the technical guidance of ICAR-KVK, Vriddachalam at very small
89 level with two production units in 2012 and during 2013 he expanded vermicompost
90 production unit into 4 units with the capacity of 1.5 t/unit in his farm and producing over 36
91 tons of quality vermicompost per annum. He started during 2013 onwards to supply surplus
92 amount vermicompost to the nearby farmers by non-governmental organizations and farmers
93 community. Now, he is a leading farmer involving vermicompost production as well as
94 biofertilizer production unit with the technical guidance of KVK, Vridhachalam, Cuddalore
95 district. His success story on vermicompost production is inspiring to the farmers working in
96 agriculture and allied sectors. Keeping in view of his devotion and contribution, different
97 funding agencies decided to give financial assistance in expanding vermicompost unit and
98 biofertilizer production unit. Observations on income and employment generation by the
99 adoption of vermicompost production were recorded as per the standard procedure.

Method adopted in vermicompost production

Vermicompost production unit (size 6x2x2 feet) was established in a cool, moist and shady place provided under thatched shed. Number of units increased according to availability of raw materials and requirements. Pressmud, cow dung and chopped dried leafy materials were mixed in the proportion of 1:3:1 and EM solution @2 lit/tonne was mixed and kept for 40-50 days for partial decomposition. During this period, heap was kept moist by sprinkling of water so that temperature can be favorable to worms. Each bed contained 1.5-2 tonne of raw material. Now 10 kg of *Eudrilus eugeniae* (night crawler) released on the upper layer of the pit/bed and covered with gunny bags so that worms can be saved from predators. Water sprinkled immediately after releasing worms and kept it moist by frequent sprinkling as per need. First harvesting of vermicompost will be done on 20 days after the worms release, then subsequently every weeks harvesting will be done according to the quantity of castings appeared on the surface of the bed. A reddish colour liquid, with an alkaline reaction having dissolved nutrients, called vermiwash also collected in the small chamber connected through drainage pipes fitted at the bottom of the bed. By this way vermicompost was collected and amounting by weight 55-60 per cent of the raw materials used. For value addition of vermicompost, *Azospirillum*, *Phosphobacteria* and *Trichoderma viride* (each @ 1 kg/ tonne) added accordingly.

Preventive measures during production:

- According to purpose, vermicompost floor was prepared and it kept compact to prevent downward migration of worms.
- Coconut leafy thatched shed was established to provide cool, moist and shady environment.
- Avoided fresh dung and fresh leaves because worms would die due to generation of temperature during composting period.
- The organic wastes were free from plastics, glass, stones, chemicals, pesticides and metals etc were taken for vermicompost production.
- Aeration was maintained throughout the period for proper growth and multiplication of earthworms.
- Preventive measures were taken to protect worm from ant, rat and birds.

RESULTS AND DISCUSSION

The success of any production system is basically depend on need, availability of inputs and marketing channels by which one can marketed with remunerative price by using locally available resources. The key to the success of organic farming system is the production of all inputs like, manures, plant protection etc., and on-farm utilizing the local resources wherein animal husbandry plays a catalytic role [1]. The study on economics of vermicompost production indicated that direct marketing of vermicompost from producer to consumer was found to be the strongest marketing channel however marketing through cooperatives and trader was also found in few instances. Economics of vermicompost production was carried out in to compare benefit cost ratio and observed 2.19 in vermicompost alone and 2.40 including earthworm respectively. Specialized market for vermicompost was not observed in the study area but obvious that about 75 % vermicompost was marketed directly from producers to local consumers. It is essential to clearly define a national policy on organic farming by supporting private sector groups, NGOs or associations and encouraging farmers to produce their own fertilizer in respective country [4]. The results indicated that production of vermicompost provided about 426 mandays throughout the year, which helps in reducing migration of rural youth to urban areas. Data collected from farmer's field and its statistics is depicted in (Table-1) which clearly indicated that production and benefit and cost ratio is 2.19-2.40 which is profitable enough for farmers.

Table-1 Benefit and Cost ratio of vermicompost production.

S.No	Products	Quantity produced (kg/yr)	Production cost (Rs./yr)	Gross income (Rs./yr)	Net income (Rs./yr)	B.C. Ratio	Employment generation (man days/yr)
1.	Vermicompost	36000.0	82000.0	180000.0	98000.0	2.19	426
2.	Earthworm	50.0	-	17500.0	17500.0	-	
	Total	36050.0	82000.0	197500.0	115500.0	2.40	426

CONCLUSION

Data collected from Mr. V.Sekar indicated that benefit and cost ratio (2.19 to 2.40) of vermicompost production is significantly higher and can boost-up eco-friend Indian economy which is today's essential need. On the basis of the above findings, it is clearly indicated that the technology transformation plays a central role in gain in knowledge and skill of farmers.

The investigation has revealed that KVK intervention helped him in overall knowledge and adoption of vermicompost production. It is evident from the study it can be concluded that dashing people like Mr. V.Sekar are selecting vermicompost production, enhancing their livelihood status, improving soil health and production of agricultural produce. This could be due to the transfer of technology mechanism played by the KVK scientists in the operational areas especially for the benefit of farmers. Some of the deal with the problem related to marketing of farmers produce is that policy must be formulated to create marketing channel by which one can marketed with remunerative price for their sustainable livelihood development.

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