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Short Communication

Economic Analysis of Vermicompost Production in Guntur District of Andhra Pradesh

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ABSTRACT

The study was conducted to understand the economic feasibility of the vermicompost production using *Edururilles euginia.* The study was adopted both open and cage method of vermicompost production. About 550 kg of agricultural wastes and fresh cow dung was spread on the cage with dimensions of 5 m length and 2 m width with a cage depth of 30 cm. The water was sprinkled twice a day for keeping the moisture levels optimum. The study was carried about for 4 months and produced 600 kg of vermicompost manure and 4 kg of earthworms. The study revealed that total production cost was about Rs.3150/- with variable costs of Rs.2350/- and fixed costs of Rs.800/-. The gross return obtained was Rs.4400/- and thus, net profit came out to be Rs.1250/-.

Key Words: Agriculture, Aquaculture, Earthworm, Economics, Vermicompost.

INTRODUCTION

Vermicompost could contribute enormously to farm production and economic conditions of rural people, besides being an eco-friendly activity. In recent years, concerted efforts have been initiated by the state as well as private sector to create awareness among farming community about the need for application of suitable soil amendments mainly in the form of organic matter for sustainable agricultural production. In this direction, vermicompost is an important source of organic matter to the soil due to its multifunctional roles and benefits in agriculture and allied sectors (Shivakumar *et al*, 2009).

Vermicomposting is the process of turning organic debris into worm castings. The castings contain 5 times available nitrogen, 7 times available potash and 1.5 times more calcium than found in good top soil. Earthworms live in the soil and feed on decaying organic material. After digestion, the undigested material moves through the alimentary canal of the earthworm, a thin layer of oil is deposited on the castings. This layer erodes over a period of 2 months. The worm castings also contain bacteria, so the process is continued in the soil, and microbiological activity is promoted. Sunitha *et al* (1997) evaluated methods of vermicomposting under open field conditions and reported that heap system was a better method for biodegradation of wastes than the pit method. Biradar *et al* (2001) also evaluated the production of vermicompost in six different structures (2 above ground structures with flat stone wall and brick wall, and 4 belowground structures with flat stone wall, brick wall and pit lined with empty fertilizer bags and conventional pit) and found the below-ground structures with stone wall and brick wall were significantly superior in production of earthworm biomass and vermicomposts. These two structures recorded relatively more benefits compared with the heap method and other structures. The economics of vermicompost production revealed that the profit of Rs 1.51-1.69 could be realized from 1 kg of the compost. Chakraborty *et al* (2009) concluded that, the low cost of organic aquaculture system mainly depends on the use of vermicompost and vermiproducts which are produced naturally. Chanu (2018) reported that vermicompost release

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the nutrients (NPK) easily and at faster rate which are in ready to uptake form and initiate the algal bloom that ultimately enhances the fish growth.

Considering the scope and potential uses of vermicompost in aquaculture, this study was undertaken for knowing the economics of vermicompost production using earthworm species *Edrurilles euginia*.

MATERIALS AND METHODS

The present study was conducted during October 2017 to February 2018 in the premises of Matrix-ANU Advanced Aquaculture Research Centre (MAAARC), Acharya Nagarjuna University, Guntur, Andhra Pradesh. The experiment was replica of both pit and cage methods. The experiment unit consists of pit of 30 cm depth (Cage) and pit size was length of 5 m and width of 2m. The pit bed spread with palm tree husk and then fresh cow dung of 200 kg followed by coconut shells. The fresh cow dung of 200 kg was spread on the coconut shell layer in the form of cone shape. Then, 1 kg of *Edrurilles euginia* species of earthworms (Fig.1) were released to the cow dung. The top cone shaped fresh cow dung was covered with the gunny bags and water sprinkling daily twice preferably in the morning and evening hours.

RESULTS AND DISCUSSION

The vermicomposting process took about four months and vermicompost manure of 600 kg produced was filtered through the sieve. The earthworm's species of *Edrurilles euginia* was harvested about 4 kg which was sold to the local nurseries. The cost of vermicompost production was illustrated in the table 1. The variable costs components consisted of agricultural wastes and cow dung (550 kg) purchased for Rs.600/-, earthworms- *Edrurilles euginia* (1 kg) purchased for Rs.250/kg. The labours costs of Rs.1500/- was incurred for the activities such as digging the pit, collection of wastes and cow dung, filling the pit, watering, worm separation and sieving the manure. Thus, total variable costs of Rs. 2350/- were incurred for the experiment. A total fixed cost of Rs.800/- had incurred for experiment shed (Rs.300/-) and farm tools (Rs.500/-). Thus, total production costs incurred during the experiment were Rs.3150/-. The experiment continued for about 4 months and produced varmicompost manure of 600 kg and earthworms of 4 kg. Thus, total gross returns of the experiment output had realized were about Rs.4400/- by selling 600 kg of Vermicompost manure @Rs.6/Kg and 3 kg of Earthworms @ Rs.200/kg contributing to net returns of Rs.1250/ 600kg of vermicompost. The net profit was Rs.2.06 which was improved when compared with the study conducted by Chowdappa *et al* (1999) (Rs.1.51-1.69/kg).

CONCLUSION

The economic analysis of vermicompost production concluded that, net profit of vermicomposting using earthworms had been improved over the years. The vermicompost manure is cheaper and multifunctional fertilizer

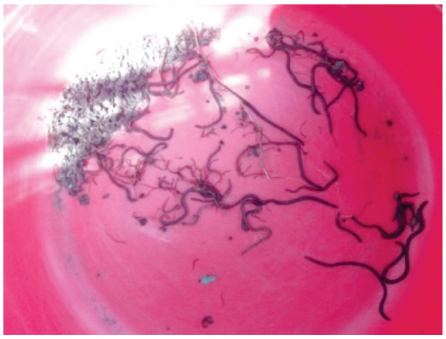

Fig.1. *Edrurilles euginia*

Fig.2. Vermicompost manure

Table 1. Cost of vermicompost production.

Sr. No.	Particular	Cost of vermicompost production (in Rs.)		
		Units	Physical quantity	Value
1	**Variable costs**			
a	Agricultural wastes and cow dung	kg	550	600
b	Earthworms- *Edrurilles euginia*	kg	1	250
c	Labour costs-pit formation, collection of wastes and cow dung, filling the pit, watering, worm separation and manure sieving	-	-	1500
	Total variable costs (a+b+c)	-	-	2350
2	**Fixed costs**			
a	Experiment shed	-	-	300
b	Farm tools	-	-	500
	Total fixed costs (a+b)	-	-	800
3	Total production costs	-	-	3150
4	Vermicompost manure @Rs.6/kg	kg	600	3600
5	Earthworms @ Rs.200/kg	kg	4	800
6	Gross returns (4+5)			4400
	Net Profits (6-3)	-	-	1250

compare with other commercial fertilizers. Hence vermicompost has greatest advantage for enhancing the productivity of both agriculture and aquaculture. However, research needs to be undertaken on the influence of vermicompost for species of algal blooms and zooplankton growth and density so that aqua farmers will be able to reduce the cost of production and improve the quality of the product. Thus, vermicomposting is the farmer friendly technique; hence it must be encouraged to fertilize the fish ponds at regular intervals. Future research may be conducted in regards to the isolation and characterization of beneficial bacteria which can work against the fish pathogenic bacteria as a bio control agent.

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