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Evaluation of the Preliminary Knowledge of the Rural Farmers about Vermicompost Technology in Sinana District of Bale Zone, South East Ethiopia

Biology

KEYWORDS : Vermicompost, Trash, Yard waste, preliminary Knowledge

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ABSTRACT

Vermicomposting is the process of conversion of organic waste into energy rich material by the action of earth worms and its symbiotic bacteria. It is highly significant in reducing the volume of trash, yard waste and garden waste etc. The present study was undertaken to evaluate the preliminary knowledge of the rural farmers of the Sinana District of Bale-Robe, Ethiopia about the vermicompost Technology. Most of the farmers were not aware of vermicompost technology and they feel that it was unique for them. Hence, the present study indicated that the preliminary knowledge of vermicompost Technology of the farmers of Sinana District was categorized under low level. This may be due to their illiteracy and lack of exposure about the vermicompost technology. It is suggested to the farmers of Sinana District to make use of this simple technology as the Bale zone is known for its potential contribution of production of food grains in the study area.

INTRODUCTION

Vermicomposting is the process of converting the organic waste into worm castings by the action of earthworms and its symbiotic microbes. Earthworms are considered as the friends of farmers because they work as biological machines of the soil. The digging and feeding habit of earth worms improve soil fertility that favor crop production. According to Singh, 1993 and Suhane, 2007, the vermicompost produced by earthworms contains some antibiotics and actinomycetes which help in increasing the 'power of biological resistance' among the crop plants against pest and diseases. Vermicompost Technology is mainly useful for the farmers in two folds. 1. They can keep the fertility of the top soil of their agricultural lands as it is the main source of crop productivity 2. They also can make use of this technology as a small scale industry to improve their rural economy. It is easy to practice this technology as it needs only the cheap resources and every farmer can adopt it for their benefits. In Sinana district, the local Agricultural agencies, other governmental and Non-governmental organizations have been conducting so many awareness programs for the transfer of different innovative methods of agricultural practices. But, the farmers feel about the vermicompost technology as a very new and most of them are not well aware of the vermicomposting practices. Hence, this study is significant as the study area is more productive for staple food crops and farmers are needed to make use of this technology for increasing the agricultural outputs in a sustainable way.

Objective of the Study:

General Objective:

The General objective of this study is to evaluate the preliminary knowledge of the rural farmers of sinana district of bale zone in the oromia region and to inculcate the importance of vermicompost technology which is superior to other conventionally used composts.

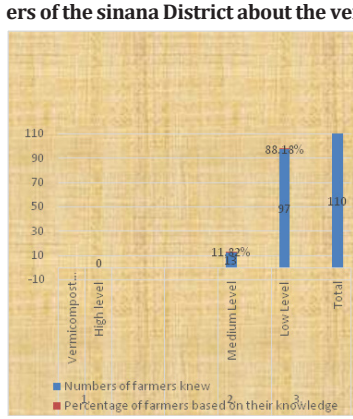
Specific Objectives: The specific objectives of this study were 1. To identify the awareness of farmers about the vermicompost Technology 2. To motivate them to practice this innovative agricultural practice for enriching the fertility and productivity of their agricultural lands 3. To extend the knowledge of vermicompost Technology with help of Model farmers. 4. To explain the farmers about the superiority of vermicompost than chemical fertilizers and other natural manures.

Study Area: Sinana is one of the districts in the Oromia Region of Ethiopia which is located in the north western corner of Bale zone. Sinana district is one of the significant areas in agricultural production of bale zone. The 2007 national census of Ethiopia reported a total population for this district was 118,594. Most of the populations are rural dwellers (CSA, 2007). According to the Oromiya regional data compiled by Degne Lemma 2009, it is also known for its richness in biodiversity with different flora and fauna. Robe is a nearby town and located in the Bale Zone of the Oromia Region in south-central Ethiopia, this town has a latitude and longitude of 7°7′N 40°0′E with an elevation of 2,492 metres (8,176 ft) above sea level. The major sources of income generation for the people of this sinana district depend up on various agricultural practices. The soil sustaining methods followed by these farmers include crop rotation, application of natural manure and chemical fertilizers.

MATERIALS AND METHODS: The study was mainly conducted in the two villages of Sinana district of Bale zone, South East Ethiopia. The local farmers of Nano Robe and Horoboqa villages are congregated at the agricultural office and interview has been conducted by using a well-organized guidelines. The results of 110 respondents were evaluated and presented in the form of percentage based on the objectives of the study.

RESULTS AND DISCUSSION: The results of Fig.1 clearly revealed that most of the farmers (88.18%) are categorized under low level of preliminary knowledge of vermicompost technology. But, only 11.82% of the farmers were categorized under medium level of preliminary knowledge of vermicompost technology. However, it was unsatisfactory that no farmer was categorized under high level of preliminary knowledge of vermicompost technology. Hence, it is clearly understood that Sinana District agricultural extension office, governmental and other non- governmental organizations of bale zone have to conduct the collaborative programs on vermicompost technology to improve the knowledge of the farmers about the vermicompost technology and to motivate the farmers to practice it for increasing the productivity of their crops and fertility of their agricultural lands. This result supports the work of Badodiya & etal (2011) to conduct the training programs to improve the knowledge of farmers.

Figure 1: Over all preliminary knowledge of the rural farmers of the sinana District about the vermicompost Technology



Sources: Personal Survey with the farmers of Sinana District in Bale Zone of Oromia Region, South East Ethiopia.

From the results of the table 1, it clearly implied that 57.27% of the farmers accepted that earth worms are the friends of farmers. But, 42.73% of farmers did not know that earthworms are the friends of farmers. So, it indicates that still the farmers need to know about the role and biology of earthworms in the soil. It is clear from the second point that only 25.45% of the farmers knew that earth worms produce vermicompost by using the organic debris but it was inadequate that 74.55% of the farmers did not know about it. Only 10% of the farmers were known that earthworms preserve the topsoil by enriching the humus but 90% of the farmers were unfamiliar. After the introduction of the earthworms a dark top soil layer will be formed, and crop growth can be increased substantially (Anonymous, 2008). Hence, farmers are needed to be well advised to inculcate the role of earthworms in enriching the fertility of soil and to conserve the top soil which is significant in crop production.

Table 1: Guidelines used to evaluate the preliminary Knowledge of Vermicompost Technology by the rural farmers of Sinana District of Bale Zone, Oromia Region, South East Ethiopia.

S. NO	Guidelines	PERCENTAGE OF FARMERS KNOWN	PERCENTAGE OF FARMERS NOT KNOWN	RANK
1	Earthworms are called as the friends of farmers	57.27%	42 .73%	1
2	Earthworms produce vermicompost which is superior than other natural manures	25.45%	74.55%	3
3	Earthworms can convert the garden waste and yard manure into energy rich material	13.63%	86.37%	4
4.	Is the top soil of your agricultural land is important for crop production	56.36%	53.64%	2
5.	Vermicompost can preserve the fertility of the topsoil	10%	90%	5

According to the results obtained from table 2, there were only 8.18% of the farmers who accepted that vermicompost can protect the crops from certain plant diseases caused by various organisms which was followed by the same result that 8.18% of farmers accepted that vermicompost is useful in the elongation of the root system of the crops. Edwards and Arancon (2004) have observed that use of vermicompost in crops inhibited the soil-born fungal diseases. They also found statistically significant suppression of plant-parasitic nematodes in field trials with pepper, tomatoes, strawberries and grapes. According to Canellas & etal (2000), who found that humic acids isolated from vermicompost enhanced root elongation and formation of lateral roots in maize roots. Hence, the farmers have poor knowledge about the importance of vermicompost which should be improved with the transfer of knowledge by the agricultural agencies. There was also unsatisfactory result that 86.37% of the farmers did not know that vermicompost increases the porosity of the soil.

Table 2: Guide lines to assess the Knowledge of farmers about Vermicompost in influencing the Crop production and to know their Interest to practice

S. NO	GUIDELINES	PERCENTAGE OF FARMERS KNOWN	PERCENTAGE OF FARMERS NOT KNOWN	RANK
1.	Vermicompost can protect the crops from some diseases	8.18%	91.82%	5
2.	Vermicompost produced by earth worms can elongate the root system of the crops	8.18%	91.82%	5
3.	Vermicompost produced by the earthworms increases the porosity of the soil	13.63%	86.37%	4
4.	Vermicompost produced by earthworms increases high level of beneficial soil microorganisms that promote plant growth	6.36%	93.64%	7
5.	Vermicompost technology as a promising technology for the productivity of crops	30.90%	69.10%	3
6.	Knowledge of the requirements for the vermicompost practice	---	100%	8
7.	Willingness to check the efficiency of local earthworm for vermicompost practice	76.36%	23.64%	2
8.	Need to conduct the awareness programs to extend the transfer of vermicompost Technology	90%	10%	1

Sources of Table 1 & 2: Personal survey with 110 farmers of Sinana District, Bale Zone, South East Ethiopia.

It was also discouraged that only 6.36% of the farmers recognized that vermicompost is significant in increasing the soil microbes which stimulate plant growth. Parle (1963) reported that bacterial count of 32 million per gram in fresh vermicast compared to 6-9 million per gram in the surrounding soil. All the farmers did not know the knowledge of the required conditions for the vermicompost practice which is taken as thoughtful note. The main encouraging issue was 90% of the farmers are very much interested to practice the vermicompost technology to increase the productivity of the crops.

CONCLUSION: Vermicomposting technology is widely accepted and promising one for the benefit of farmers to protect their topsoil which plays a vital role in the crop production. This study concludes that most of the farmers of Sinana District of Bale zone were not aware of the vermicompost technology. Hence, their preliminary knowledge of vermicompost Technology was categorized under low level. But, most of them are interested to practice the vermicompost technology to use it as a fruitful source in order to enrich the nutrient contents of their agricultural lands. Hence, it is suggested that the agricultural extension programs should be conducted with the collaboration of governmental and non-governmental organizations to expand the awareness of the farmers about this innovative technology

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that brings spectacular improvement in the soil biology which in turn favor the farmers in reducing the usage of chemical fertilizers which may only give temporary benefits but exhausts the soil without nutrients in long run and pollutes the water bodies and the surrounding ecosystem. Hence, vermicomposting technology is an effective alternative than chemical fertilizers which shows its positive influence by providing all the required nutrients to the crops and enhance the activity of beneficial soil microorganisms and also helps the poor farmers in many folds by reducing their spending for agrochemicals as well as minimizing their usage.

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APPENDIX

Direct Interview with the Rural farmers of Nano Robe and Horoboqa villages of Sinana District at the Agricultural extension office, Bale Zone, Oromia Region, South East Ethipia

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