



Using Liquid Organic Fertilizer for Banana Stems for Long Bean Plants of Farmers Group at Mendalo Darat Muaro Jambi Regency

Hasriati Nasution¹, Ubaidillah², Yusfaneti³, Asmadi Saat⁴

^{1,2,3,4} Universitas Jambi, Indonesia



hasriati.nasution@gmail.com

Abstract

The type of soil planted is Ultisol soil which has many problems with low physical and chemical properties; hence the soil fertility is low. To be able to grow peanuts optimally, it is necessary to apply fertilizer to the soil. This article was to assist groups farmer in the use of liquid banana stem fertilizer for long bean plants. The method uses Participation Action Research (PAR). Some of the mentoring programs carried out were counseling on materials and practices for making liquid fertilizer which lasted for 4 months through several stages: preliminary survey, schedule determination and outreach of extension in the manufacture of liquid organic fertilizer from banana stems for long beans. The extension is carried out in two stages, namely by the method provides material related to the manufacture of liquid organic fertilizer for banana stems and also material on how to use banana stem organic fertilizer for long bean plants. After that, it was continued by carrying out a direct demonstration in the field on how to give liquid organic fertilizer from banana stems to long bean plants in farmer groups, In addition, farmer groups can make liquid organic fertilizer from banana stems and have also been able to determine the dose for long bean plants. In the appearance of long bean growth, the leaves are very green and bear fruit after adding liquid organic fertilizer. After the implementation of this service, it can be seen that the yield of long beans has increased from 10 tons to 17.5 tons per ha.

Keywords: Liquid Organic Fertilizer, Assistance Farmer Group, Banana Stems

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INTRODUCTION

Long bean is one of the annual plants that are short-lived and easy to plant. It contains a lot of nutrients because they have dual-purpose properties where the leaves and fruit can be used and the fruit can be used as fresh vegetables in addition to being cooked into vegetables (Etemadi, 2018; Wang, et al., 2021). To increase daily nutrition, long beans can be used because the long beans contain a lot of fiber, vitamin A, vitamin B, vitamin C and protein (Yadav, 2017). However, for the growth and development of the long bean plant, is needed so that the long bean stem can be wrapped around and climb or the wood is plugged into the ground, where the surface of the stem is clay and the surface is hairy and lean. Meanwhile, the appearance of long bean flowers is in the form of a purplish-white butterfly. While the young long bean fruit is dark green in color but after getting old the long bean fruit changes its color to yellowish white with brown fruit skin. size 80cm (Kon, et a., 2007; Heer & Winham, 2020). The length of the long bean fruit is

very dependent on the type and variety of the long bean itself. Examples of long bean varieties of long bean fruit intestines can reach 90 cm. Meanwhile, type long beans are only able to reach a size of 30-40 cm.

Based on data from the Ministry of Agriculture (2013), where the increase in production of long bean harvest is not followed by land area in ha. This picture can be seen based on data on harvested area from 2012 to 2013, not followed by an increase in long bean production in that year. However, production decreased by 455.562 tons to only 450.859 tons. Meanwhile, the harvested area of long beans increased in 2012 and 2013 from 75,739 ha to 76.209 ha. This increase can be done by improving soil fertility and farming methods that are in accordance with the ability of the soil. It is intended that long bean plants can bear lots of fruit and this will increase farmers' income so that long beans are one of the community's preference plants. Where these legumes can provide nitrogen nutrients. This situation is because in the long bean root system there is a symbiotic life of bacteria. Where these bacteria can fix nitrogen from soil air. This can be seen from the presence of root nodules on the roots of long bean plants. Where the nitrogen that has been fixed by the bacteria will be utilized by the long bean plant for the growth needs of the long bean plant.

In the Sumber Rezeki farmer group, there are activities to plant several types of vegetables, for instance planted on Ultisol soil. However, the the production is still very low at least 10 tons ha even though the average is per ha. Meanwhile, the yield achieved by the long bean plant should be 20 to 30 tons per hectare. From the data, it can be seen that only each long bean stem produces 0.3 to 0.7 kg (Observation Result, September 02, 2021, Farmer Group of Sumber Rezeki at Mendalo Darat Village, Muaro Jambi Regency). The long bean plant can live up to 60 days, and when the long bean plant is 30 days old, the long bean fruit can begin to be harvested. The number of long bean harvests can reach 15 to 20 harvests. However, during planting in farmer groups, the source of sustenance here is to harvest long beans at most 10 times with decreasing yields.

One of the efforts to maximize the ability of the soil or to increase it is to improve the soil properties of Ultisol so that it is fertile and good by giving organic matter into the soil, both in solid and in liquid form. Usually organic matter in solid form can be in the form of litter or compost, while in liquid form it is a mixture of water with liquid organic matter. Giving organic fertilizer to Ultisol soil is very good in increasing soil fertility because decomposed organic matter such as compost or liquid organic matter in the soil will provide nutrients to the soil. Therefore, the extension team felt compelled to be able to help the obstacles faced by farmers as a source of sustenance so that the long bean plants that were planted could bear more fruit per stem and would also provide a way to make liquid fertilizer from banana stems that are useless. used for fertilizer, then later in its application in this farmer group there will be guidance on how to apply liquid fertilizer from banana stems to long beans, so that it can bear fruit so that farmers here can get maximum results, and can increase the income of long bean vegetable farmers. Hence, the purpose of this service is to assist groups in the use of liquid banana stem fertilizer for long bean plants of Sumber Rezeki Farmer Group at Mendalo Darat Village, Muara Jambi Regency

METHOD

The method uses Participation Action Research (PAR) as an alternative research method in empowerment studies and actions Public. Action research is based on the assumption that research should linked to a change agenda in society (Arieli, et al., 2009; Ottosson, 2003). The social change in question is how in the empowerment process can realize three benchmarks, namely the existence of commitment, together with the community, the existence of local leaders in the community and the existence of institutions in a society that is built on needs (McIntyre, 2007). In conducting research,

the facilitator with multi stake holder done some programs assistance at farmer group of Sumber Rezeki at Mendalo Darat Village, Muaro Jambi Regency. In participation of research, the facilitator solve their problem thorough providing counseling and planting demonstrations as well as making liquid organic fertilizer from banana stems for long bean plants with the aim of bathing the community. Some stages in conducting program, involve Preparation Program, Implementation Program, Evaluation Event, and Final Report Preparation.

Preparation Program

This stage preparation of extension schedule and the place where it will be held as well as the preparation of materials including long bean plant seeds, banana stems, covered buckets, water, scales, machetes, plastic, EM4,

Implementation Program

The counseling was carried out by providing extension materials and explaining the material as well as conducting demonstrations on how to make liquid organic fertilizer from banana stems. then a demo is conducted on how to apply liquid fertilizer for banana stems for long beans in the field or on farmers' land

Evaluation Program

An activity was to review the results of planting at the Sumber Rezeki Farmer's group in Mendalo Darat Village, Muaro Jamb Regency. It is reviewed every 3 days, starting from how to make liquid organic fertilizer from banana stems, providing planting assistance to the application of liquid fertilizer from banana stems for long bean plants and until harvesting long bean plants.

Final Report Preparation

This is a form of final service document that contains all the results of counseling at the Sumber Sustenance farmer group in Mendalo Darat Village, Muaro Jambi Regency

RESULTS AND DISCUSSION

Activities and mentoring activities for the farmer group in Mendalo Darat village, Muaro Jambi district. The service is carried out from October 2021 to January 2022. The purpose of this activity is to provide education and skills on the use of liquid organic fertilizer for long beans from banana stems to groups of farmers who source Sustenance whose raw materials are banana stems that are no longer useful. The method used in this service is the participation observation method.

The process of making this liquid fertilizer uses banana stem waste that is around the Sumber Rezeki farmer group's land. Where are the stages in the manufacture of liquid organic fertilizer banana stems. The first step is to make the banana stem skin until it is white, then cut it into small pieces and place it as big as 4 cm. Split rods that have been cut into small pieces with a size of 4 cm are inserted into a bucket with a lid. Then added about 1 kg of granulated sugar and 4 spoons of EM 4 which functions to give reforming organisms. Then given as much as 30 l of water. Stir the solution to mix the banana tree. Close the bucket for 1 week or until the water appears a clear white color. Every day for 5 to 10 minutes the lid is opened and the banana stem solution is stirred evenly so that the gas that arises will evaporate into the air. After one week, the banana stem waste is filtered. Put the banana stem waste liquid into the bottle and close the lid. Where later in the use of fertilizer, first dilute it with water in a ratio of 1:2.

The process in making organic liquid organic fertilizer using organic waste from banana stems is carried out by fermentation. Where during its manufacture, EM 4 micro-organisms are added which consist of bacteria, fungi and actinomycetes and energy in the form of granulated sugar and palm sugar. With the provision of microorganisms in the production of liquid organic fertilizer, it is hoped that the overhaul can be fast and smooth so that the nutrient elements are available in the liquid fertilizer solution. These bacteria consist of 2 groups, namely an aero and aerobes. Organic fertilizer in fresh form or in a

form that has been engineered in liquid organic form will have an important role to be able to improve the physical, chemical and biological properties of the soil

Community service counseling was carried out in Mendalo Darat village at the Sumber Sustenance farmer group. This farmer group grows various vegetables such as spinach, long beans and kale, as well as sweet potato, cassava and banana plants. However, the majority of this farmer group is planting long beans because the yield of long beans takes up to 2 months. However, from the results of interviews with the management of the farmer groups, the yield of peanuts is still low. The low yield of long beans was caused by being planted on Ultisol soil and the application of little fertilizer. For that they asked how the yield of long bean plants could be increased and more abundant. From this problem, the agricultural extension team of Unja took the initiative to increase the yield of long bean harvests in the farmer group as a source of sustenance. By providing knowledge on how to make liquid organic fertilizer from banana stems for long bean plants and how to use liquid organic fertilizer and the dose that must be given to long bean plants. The way to do it in making liquid organic fertilizer during fermentation is to open the lid of the bucket and stir it with wood for 5 minutes. After that, the bucket is closed again where the liquid organic fertilizer is made. The next hold is the filtering stage to separate the solid material contained in liquid organic fertilizer of banana stems which can be used as plant compost. The liquid result from filtering banana stems is put into an aqua bottle and tightly closed.

After the liquid organic fertilizer from banana stems is finished, the next step is to apply it to the long bean plants planted on the farmer group's land as a source of sustenance. Where is the method of giving this water organic fertilizer must first be added clean water with a ratio of 1: 2 water mixed well. Spraying of long bean leaves or soil has just been done. The application of organic liquid fertilizer is repeated once a week until the plants bloom 7 times.

From the observations obtained after counseling and assistance to farmer groups as sources of sustenance, it can be seen that the farmers already have in-depth knowledge about how to grow long beans. And also know about how to make liquid organic fertilizer from banana stem waste. In the field, it can be seen from the side of the appearance that the long bean plant thrives with dense leaves and bears a lot of fruit. In addition, the yield after conversion increased from the previous 10 ton per hectare to 17.5 tonnes per hectare of fresh string beans. This is in accordance with the opinion that liquid organic fertilizer is easier for plants to absorb because it has been in solution (Hasanuddin, 2017). In addition, liquid organic fertilizer can stimulate leaf and stem vegetative growth (Wardati et al., 2018). While the high yield of long bean plants achieved according to Chayuno (2003) in Firiani, et al. (2019) the wet weight of a plant is highly dependent on the results of photosynthetic accumulation in plants. After the long bean plant bears fruit, the fruit is large and long, the leaves become dark green. Because plants get fertilizer that suits their needs. Where this liquid organic fertilizer is easy to administer, namely directly given to plant leaves in low doses. And fertilization is repeated once a week.

Other results obtained by farmer groups are sources of sustenance, apart from being able to make liquid organic fertilizer, they can also acquire knowledge in long bean cultivation, starting from harvesting, harvesting seeds, tillage, planting, manning and maintenance. Fiber how to harvest long beans. This can be seen from the enthusiasm of the farmers in following the counseling process and the direct demonstration process carried out by the agricultural extension staff.

Opening insight to the Sumber Rezeki of farmer group at Mendalo Darat Village, Murao Regency, Jambi, in the form of planting long beans which are given liquid organic fertilizer, banana stems in the field. It is hoped that it will increase the income of farmer groups as a source of sustenance from the long bean business. In addition, long bean

plants can meet the family's nutrition and also increase income. In addition, the knowledge gained from the Sustenance source farmer group in Mendalo Darat Village can also be developed with other farmer groups. In the utilization of wasted banana stems, it can be used for liquid organic fertilizer for plants. So that farmers no longer buy too many inorganic fertilizers.

The counseling participants were very enthusiastic in participating in the counseling given. This can be seen from the questions from members of the Sumber Rezeki farmer group on the material presented by the service extension team from the UNJA faperta. The implementation of this counseling, in principle, is easy to understand, it can be seen that there are many participants in the Sumber Rezeki farmer group who are present, always wanting to understand the material presented so that the members of the Sumber Rezeki farmer group intend to continue this activity well.

In addition, farmers who are the source of sustenance have been able to make liquid fertilizer from banana stems, apart from being used for long beans, it can also be used for other vegetable crops. It is also possible for farmers to sell liquid organic fertilizer to the market in addition to selling long bean vegetables so that they can increase the income of farmer groups as a source of sustenance.

The implementation of the service was held at the Sumber Sustenance farmer group in Mendalo Darat Village, Muaro Jambi Regency, carried out for 3 months in 2022. The implementation time is based on an agreement between the extension team and members of the farmer group as sources of sustenance. There is a Sumber Sustenance farmer group. Yartu planting peanuts that are given liquid organic fertilizer from banana stems.

From the discussion before the extension was conducted, many farmers in farmer groups asked how to plant peanuts in a good way so that their crop yields a lot. There were some who asked because fertilizers were expensive, how to make their own fertilizers, and many questions were asked by members of the farmer groups from how to cultivate the soil, make fertilizers, how to find fertilizer and the proper spacing for peanuts and how to treat pests and plant diseases. long beans . All the questions asked by the farmer groups, your team concludes that it is necessary to add knowledge and insight to the subsistence farmer groups by providing counseling in making cheap fertilizers and materials available and friendly to the environment, so we choose that liquid organic fertilizer is banana stems. The

Implementation of the service is carried out in two ways. The stages are through counseling on how to expand organic liquid fertilizer, how to make liquid organic fertilizer for banana stems, how to cultivate long beans, how to determine the dose for application to apanjanh bean plants, then care for panjanh beans and determine the yield of long beans. For the second tapa is to do a direct demonstration of how to make liquid organic fertilizer, and how to cultivate pea plants, how to give retailing of liquid organic fertilizer on banana stems given to the leaves of long bean plants through the method of spraying liquid fertilizer. The source of sustenance in Mendalo village can feel the direct benefits in making liquid organic fertilizer which is used for long bean fertilizer. And believes that organic fertilizers are no less important than chemical fertilizers which can produce an increased harvest of long beans before the counseling was carried out.

The future hope of the extension team towards the achievements of knowledge gained by members of the farmer group is a source of sustenance. Where can produce liquid organic fertilizer from banana stems made by themselves. And can carry out good long bean cultivation. Can take advantage of waste banana stems that exist around the farms of farmer groups as a source of sustenance which is a source of natural materials that are environmentally.

After the counseling was carried out, we evaluated and discussed the material that we had provided whether we understood it or not with discussion and question and answer. Here, the team can conclude that the knowledge of the farmers in the source of

sustenance group has followed the counseling by the team well. Where their knowledge and insight improves. We got this from the answers that were given to the questions the team asked about the long bean plant and how to make fertilizer and how to apply it to the long bean plant.

The future hope of the extension team towards the achievements of knowledge gained by members of the farmer group is a source of sustenance. Where can produce liquid organic fertilizer from banana stems made by themselves. And can carry out good long bean cultivation. Can take advantage of banana stem waste that is around the farmer group's farm, a source of sustenance which is a source of environmentally friendly natural materials. The number of members of the farmer group for the source of tezeki has increased and they will continue to ask in the future to be able to practice again in other planting topics.

CONCLUSION

After providing counseling through assistance in making liquid organic fertilizer from banana stems for long beans, it can increase the knowledge and skills of the Sumber Sustenance farmer group. In Mendalo Darat Village so that it can increase income. Further service needs to be carried out so that Sumber Sustenance farmer groups can be more skilled in growing long bean plants by means of other fertilizer counseling. Acknowledgments to the Faculty of Agriculture, Jambi University who have provided moral support and the Sumber Sustenance farmer group in Mendali Darat village, Muaro Jambi Regency

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