

Documentation of Soil Fertility Management Practices in Outstanding Certified Organic Farms

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Authors' Background

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Summary

Recognizing that there is a need to study the different soil management practices in third party certified organic farms, which have received the national award as outstanding organic farms from 2010-2013, the Bureau of Soils and Water Management (BSWM) through its Organic Agriculture Program (OAP) documented soil fertility management practices using the modified World Overview of Conservation Approaches and Technologies (WOCAT) questionnaire as documentation instrument, in four (4) farms, namely: a) Master's Garden Farm, La Trinidad, Benguet (2010); b) Lao Integrated Farm, Bansalan, Davao del Sur (2011); c) Costales Nature Farm, Majayjay, Laguna (2012) and d) Leonie Agri-Corporation, Sta. Rosa, Nueva Ecija (2014). These organic farms implemented an integrated nutrient management approach in enhancing soil quality. Moreover, in three (3) out of four (4) organic farms, vermicompost is applied as the major source of nutrients in combination with other allowable organic inputs based on the Philippine National Standards on Organic Fertilizer. Improvement in soil pH and organic matter were observed a few years after implementing soil fertility management practices in the farms.

Background

In 2010, the Republic Act 10068 or Organic Agriculture Act (OAA) was signed to promote and further develop the practice of organic agriculture in the Philippines. The BSWM is one of the implementing agencies of the OAA and National Organic Agriculture Program (NOAP). Several provisions of the law emphasized soil quality and health, and organic fertilizer production as the basis of sustainability of organic agriculture. In Section 2 of the OAA, the policy statement highlights the importance of enriching the fertility of soil and the need to undertake a comprehensive program for the promotion of community-based organic fertilizers together with a nationwide educational and promotional campaign for the use and processing, as well as the adoption of organic agricultural system as a viable alternative to conventional production system. Moreover, in Section 4, it is encouraged to establish facilities, equipment and processing plants that would catalyze the production and commercialization of organic fertilizers. With these provisions in the law, the BSWM plays a pivotal role in conducting researches and promoting different soil management strategies and production inputs, particularly, fertilizers, microbial inoculants and soil amendments.

Enhancement of soil quality is one of the critical provisions indicated in the Philippine National Standards (PNS) on Organic Agriculture (OA). Some of the soil management practices mentioned in the PNS on OA include crop rotation, green manuring, intercropping and use of cover crops. Use of soil conservation measures such as grass waterways, contour strips, buffers and cover crops were also emphasized. Further, to improve the fertilization strategies under organic farming systems and protect the soil from contamination, the PNS on Organic Fertilizer was also finalized which discussed in detail the allowable, restricted and prohibited production inputs in organic farming.

In view of the importance cited in the PNS on soil management and fertilization under organic production systems, the BSWM implemented the project "*Documentation of Best Practices on Soil Fertility Management and Organic Fertilizer/Vermicompost Production*" under its Organic Agriculture Program (OAP) in CY 2013 with an aim to develop a compendium of best practices on enhancing soil fertility and production of organic fertilizer, compost, soil conditioner and other soil amendments. Inasmuch as the above-mentioned organic farms are national winners of the Gawad Saka Search for Outstanding Achievers in Agriculture and Fisheries-Organic Farming Category and have undergone a rigid selection process, it is crucial to document their soil fertility management practices and disseminate it to other organic farmers.

Main chapter

Documentation of soil fertility management practices focused on the winners of the Gawad Saka (National/Presidential) Search for Outstanding Achievers in Agriculture and Fisheries-Organic Farmer Category because the farmers and their farm have been evaluated based on the following criteria set by the Gawad Saka-National Technical Committee: a) farmer's management skills, technical knowledge (compliance to the PNS on Organic Agriculture and Organic Fertilizers) and record keeping; b) implementation of soil fertility management and conservation strategies; c) farm resource management; d) farm condition; e) degree of integration, sustainability and replicability of farming system; f) social impact/contribution to the community.

The farms of national winners are certified organic by DA-accredited certifying bodies (i.e. Organic Certification Center of the Philippines-OCCP and Negros Integrated Certification Services-NICERT) and/or foreign certification bodies like the USDA-NOP. The Outstanding Organic Farms from 2010 to 2013 are the following:

2010: (Master's Garden, La Trinidad, Benguet) *Mr. Ambrosio Acosta*;
 2011: (Lao Integrated Farm, Bansalan, Davao del Sur) *Mr. Benjamin Lao*;
 2012: (Costales Nature Farm, Majayjay, Laguna) *Mr. Ronald Costales*;
 2013: (Leonie Agri-corporation, Sta. Rosa Nueva Ecija) *Mr. Alexander Parducho*

These are the steps that were undertaken to carry-out the documentation process.

1. Collect relevant materials (i.e. scrapbooks, videos, etc.) of identified national winners for outstanding organic farms;
2. Preparation of documentation instrument using the WOCAT (*World Overview of Conservation Agriculture Technologies*) Questionnaire: A Framework for Documentation and Evaluation of Sustainable Land Management Technologies (2008);
- 3) Pre-testing of documentation instrument;
- 4) Conduct desk review to identify and initially evaluate practices and technologies;
- 5) Carry out field validation to verify the implementation and sustainability of identified practices and technologies;

Table 1. Soil Fertility Management Practices

Outstanding Organic Farm (Year)	Organic Farm and Crops Planted	Soil Fertility Management Practices
2010	Master's Garden Farm (<i>organic vegetables</i>)	<ul style="list-style-type: none"> • Application of compost from crop residues and weeds sprayed with indigenous micro-organisms (IMO) made from forest soil and molasses; • Organic mulching (<i>A layer of about one inch of mulch should be applied in the entire bed wherein a total of 1 ton fresh grass and weeds is needed to mulch an area of 200 m²</i>)
2011	Lao Integrated Farm (<i>organic coconuts</i>)	<ul style="list-style-type: none"> • Application of vermicast/vermicompost (<i>using 30% goat manure, 40% combination of sugarcane bagasse or mudpress, coconut coir dust and meal ash and 30% pre-decomposed farm and kitchen wastes</i>); • Use of two (2) kilogram sodium chloride (common salt) in between the four points of the coconut tree three months after vermicast application; • Use of seaweed concoction, fish amino acid, calcium phosphate, fermented plant juice and fermented fruit juice as foliar fertilizers

2012	Costales Nature Farm (<i>organic vegetables</i>)	<ul style="list-style-type: none"> • Application of bokashi, vermicompost and traditional compost; • Use of natural farming inputs (i.e. fermented plant extract/juice, fermented fruit extract/juice, fish amino acid, calcium phosphate); • Spraying of bokashi tea and vermi tea every other day.
2013	Leonie Agri Corporation Farm (<i>organic medicinal plants, organic rice, organic vegetables</i>)	<ul style="list-style-type: none"> • Application of vermicast/vermicompost ; • Use of natural farming inputs (i.e. indigenous micro-organisms, fermented plant juice, fermented fruit juice, fish amino acid, oriental herbal nutrients, calcium phosphate)



Figure 1. Organic mulching in Master's Garden Farm



Figure 2. Vermicomposting in Lao Integrated Farm Inc



Figure 3. Vermitea sprayed in lettuce and other vegetables in Costales Nature Farm



Figure 4. Natural farming inputs (i.e. FPJ, OHN, FFJ, FAA, CAL, IMO) in LAC Farm

Core Messages and Conclusions

Integrated nutrient management is an essential strategy in ensuring soil health in organic crop production systems. Four (4) implemented crop rotation, cover cropping, mulching and intercropping. The organic farms varied in the type and amount of organic fertilizer, compost, microbial inoculants and other amendments applied in the soil. In three (3) out of four (4) outstanding organic farms that were documented, vermicomposting is carried out using crop residues, grasses, animal manure and other locally available substrates. Vermicast/vermicompost is the major source of nutrients for the crops planted and its application is basal. Rate of application depends on the crop. For rice, it is 3 tons per hectare in LAC Farm and 5-10 tons per hectare for vegetables in Costales Nature Farm, and LAC Farm. In addition to vermicompost/vermicast, traditional compost and bokashi are also applied in the farms. Vermicast/vermicompost, compost and bokashi are also brewed to prepare tea and used as foliar spray.

Natural farming inputs such fermented fruit juice, fermented plant juice, oriental herbal nutrient, calcium phosphate, fish amino acid and indigenous micro-organisms serves as organic plant supplements which have total NPK of not lower than 0.5% and not higher than 2.5% and could modify some physiological processes in crops. All farms applied NFIs as foliar spray at varying rates. Noticeably, farms have different methods of preparation and packaging. It is crucial that a separate fermentation or incubation room should be established in the farm to prepare the NFIs. Proper labeling should be carried out to indicate the date of preparation and raw materials used.

Improvement in soil pH and level of organic matter was observed in the organic farms based on soil analysis. It is suggested that vermicompost/vermicast, compost, bokashi and other natural farming inputs should be analyzed periodically to determine the level of nutrients (total NPK) and organic matter.

References

- Philippine National Standards on Organic Agriculture (2003) PNS/BAFPS 07:2003 ICS 65.020
- Philippine National Standards on Organic Fertilizer (2013) PNS/BAFPS 40:2013
- The Philippine Recommends for Soil Fertility Management (1999). Series No. 36-D. Philippine Council for Agriculture, Forestry and Natural Resources Research and Development.