ORGANIC FARM PRODUCTION IN VIETNAM
CURRENT STATUS AND FUTURE PROSPECTIVE

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ABSTRACT

The total organic area of Vietnam in 2015 was 76,666 ha (0.71% of the total cropped area) of which 20,030 ha was for aquaculture and 2,200 ha for wild collection. The major organic commodities include vegetables, tea and shrimp, though efforts have been expanded to include rice, oranges, cinnamon, etc. Quality assurance is compiled differently from one company to another. The participatory guarantee system (PGS) has been employed by a limited number of farmers to produce organic vegetables for domestic markets. The production of all the export-oriented products follow the quality certification schemes set by the importers. In order to promote and regulate organic production, the Ministry of Agriculture and Rural Development (MARD) has been in the process of developing a National Standard for production and processing of organic crop products. There have been some good models used in producing organic products to meet the growing demand of local and foreign customers, suggesting greater efforts should be made from public and private sectors in research, development and international cooperation for a better development of organic production, processing, certification and marketing.

Keywords: Vietnam, organic production, certification, marketing

INTRODUCTION

Production
Modern organic agriculture started in Vietnam in the late 1990s with a small number of initiatives, primarily involving the production of specialty crops, such as spices and essential oils, which were destined for export to Europe (Simmons and Scott, 2008). The total organic area of Vietnam in 2015 was 76,666 ha (0.71% of the total cropped area), including 20,030 ha which was for aquaculture and 2,200 ha for wild collection. The major organic commodities include tea, leafy vegetables, shrimp, specialty crops such as spices and essential oils.

Marketing
The local Vietnamese market for organic products has not been developed. There is no concrete statistical data on the volume and categories of organic products produced and marketed. It is found that organic vegetables are for the domestic markets while almost other organic products such as tea, shrimp, etc. are for the export market. No data is available regarding imported organic products needed to meet the local demand though marketing of organic products is reportedly growing in big cities.

Certification
The official certification regulation for organic production is being developed. The Participatory Guarantee System (PGS) developed by Vietnam’s Organic Agriculture Association was certified in 2013 by IFOAM into the IFOAM Family of Standards (VOAA, 2013) and is employed by a limited number of farmers to produce organic vegetables for the domestic markets. The Ministry of Agriculture and Rural Development (MARD) has been in the process of developing National Standard for Production and Processing of Organic Crops Products, aiming to regulate the whole supply chain of organic crop products. Vietnam is also taking part with several other ASEAN partners in developing the ASEAN harmonized organic standards. Some private service providers recently developed competencies to support farmers in obtaining certification (organic and GAP-Good Agricultural Practice) for agricultural and fishery products.
Research and training

Though Vietnam had made great achievements in agricultural production, research and training activities to promote organic production have not been paid a considerable attention by the research and training communities. Information on organic research results and training curriculum/program documented either in Vietnamese or in English is scattered. The available research results/activities mainly focus on breeding new crop varieties and developing appropriate production technologies for such crops; producing better quality and safe crop products based on the ICM- and/or GAP-principles.

Policy

The Government of Vietnam strongly encourages any efforts on developing a more sustainable and environmentally friendly agriculture, on improving productivity and competitiveness of the agricultural products, including organic agriculture. However, there is still a lack of well directed and strong supportive policies; strategy and national action plan for organic production. In late 2011, the Government approved the foundation of Vietnam Organic Agriculture (VOAA) which becomes an official member of IFOAM in 2013. In January 2012, the Prime Minister issued a policy decision (No 01/2012/QD-TTg) to support good agricultural practices for agriculture, forestry and fisheries, including organic farming. MARD often confirms its strong support for organic farming and production through the implementation of the core scientific and technological research and development program for the period of 2013-2020 (MARD, 2013).

This fact indicates that there is a critical need to inform the public and the Government about benefits and needs to develop a sustainable organic agriculture for the country through greater efforts in research, training, planning and extension activities.

ORGANIC FARMING TECHNOLOGY FOR VEGETABLE PRODUCTION

As a case study, this paper presents some farming practices for producing organic vegetables recommended for Vietnam conditions.

Soil and nutrient management

Green manure crops for improving soil fertility and productivity

Green manure crops are grown to provide ground cover and organic matter, shade out weeds and provide soil nitrogen to sustain soil fertility. In Vietnam, the following grasses and leguminous crops are commonly recommended for use:

<table>
<thead>
<tr>
<th>Name (Vietnamese)</th>
<th>Name (English)</th>
<th>Name (scientific)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ba che</td>
<td>Desmodium</td>
<td>Desmodium triangulare</td>
</tr>
<tr>
<td>Centro</td>
<td>Centro</td>
<td>Centrosema pubescens</td>
</tr>
<tr>
<td>Co Ghi-ne</td>
<td>Guinea grass</td>
<td>Panicum maximum</td>
</tr>
<tr>
<td>Co Guatemala</td>
<td>Guatemala grass</td>
<td>Tripsacum fasciculatum</td>
</tr>
<tr>
<td>Co Ruzi</td>
<td>Ruzi grass</td>
<td>Brachiaria ruziensiensis</td>
</tr>
<tr>
<td>Co voi</td>
<td>Elephant grass</td>
<td>Pennisetum purpureum</td>
</tr>
<tr>
<td>Cot khi</td>
<td>White tephrosia</td>
<td>Tephrosia candida</td>
</tr>
<tr>
<td>Dau biec</td>
<td>Butterfly pea</td>
<td>Clitoria ternatea</td>
</tr>
<tr>
<td>Dau den</td>
<td>Cowpea</td>
<td>Vigna unguicalata</td>
</tr>
<tr>
<td>Dau kiem</td>
<td>Jack bean</td>
<td>Canavalia ensiformis</td>
</tr>
<tr>
<td>Dau van</td>
<td>Hyacinth bean</td>
<td>Lablab purpureus</td>
</tr>
<tr>
<td>Dau meo</td>
<td>Velvet bean</td>
<td>Mucuna pruriens</td>
</tr>
<tr>
<td>Dau nho nhe</td>
<td>Rice bean</td>
<td>Vigna umbellata</td>
</tr>
</tbody>
</table>

To include a green manure crop in the rotation, it is good to identify and select higher profit crops that yield for longer periods (tomatoes, beans, cucumbers, egg plants etc) versus the fresh cut vegetables such as cabbage which have quick turn-around for cash flow but the unit profit per item is low unless grown in a seasonal window for a high price.
Making compost to grow crops and improve soil productivity

Method for making compost

**Step 1: Prepare compost area**

Select a site that does not flood. Choose a shaded and well-drained area which is large enough for a heap of 2 meters wide by 1.5 meters high. The heap length can vary based on the amount of compost required. Use a bare soil area rather than a hard surface as concrete.

**Step 2: Gather materials**

Gather all the materials together at the compost area. The exact amount of each material used varies on what is available. The basic mixture should include:
- Green plant material of all kinds: around 50%.
- Straw or similar carbon-rich material: 20-30%. Rice husks can also be mixed but the amount used should not be too much.
- Animal manure (best mixed as wet): 20-30%.

**Step 3: Piling the materials**

1. Make a heap in a series of layers - each layer is about 15-25 cm thick.
2. The first layer should be with coarse or woody material such as thin sticks or twigs so as to ensure good air circulation and drainage.
3. Add a layer of a more-difficult-to-compost material such as rice straw, rice husks, leaves and stems of maize.
4. Add the animal manure (wet) to cover the plant material.
5. Add the green material that is easily composed, such as fresh grass, vegetables and fruit residues.
6. Ash and urine then be lightly sprinkled onto these layers, to accelerate the process of decomposition.
7. Repeat all these layers except the first layer of coarse material, until the heap reaches a height of 1 to 1.5 m. The last top layer is again green material.

Note: Materials placed on the heap should not be too compacted to ensure sufficient air circulation during decomposing.

**Step 4: Water compost heap**

Water the whole pile well and regularly to provide enough moisture for decomposing.

**Step 5: Cover compost heap**

The heap should be covered with bags, grass or banana leaves to protect it from evaporation and heavy rain as this will wash away the nutrients.

Manage a compost heap

- Use of compost starters or compost activators such as finished compost or EM supplements or other preparation of micro-organisms to start or to speed up the decomposing process.
- Moisture: Ideally at 40-60%, so not to leave the heap too dry or too wet.
- The first turning of the heap is done after 2-3 weeks and the next after another 3 weeks. To turn a heap, take it apart, mix well all the ingredients and rebuild the heap up.
- Maintain temperature inside the heap: Ideally at some 50-55°C.
- The compost is ready in 4-6 months, depending on the rate of decomposition.

**Recommended rate applied to crop (ton/ha)**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Rate (ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese cabbage</td>
<td>12</td>
</tr>
<tr>
<td>Chili</td>
<td>35</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>18</td>
</tr>
<tr>
<td>Chinese cabbage</td>
<td>12</td>
</tr>
<tr>
<td>Cucumber</td>
<td>18</td>
</tr>
<tr>
<td>Broccoli</td>
<td>12</td>
</tr>
<tr>
<td>Long bean</td>
<td>20</td>
</tr>
<tr>
<td>Eggplant</td>
<td>22</td>
</tr>
<tr>
<td>Tomato</td>
<td>12</td>
</tr>
</tbody>
</table>

**Preparation of nutrient solution for foliage supply to crops**

1. Preparation of indigenous microorganism (IMO)
   1. Use
      As starter or activators for making compost.
   2. Raw materials
      White rice, brown sugar at the rate of 1:1
   3. Steps
      1. Preparing the IMO culture media by putting leaf-over white rice in a close wooden box container.
      2. Close the rice box and place under a tree shade. Cover the box with plastic to avoid rainfall water to get in.
      3. After 3-4 days, the IOM is formed.
2. Preparation of fermented plant stems/leaves for foliage spray

1. Use
Foliage sprays are fermented plant extracts and used as a source of soluble nutrients to stimulate plant growth.

2. Raw materials
Morning glory (kangkong), Ngai cuu (*Artemisia vulgaris* L), Banana stem, Brown sugar

3. Steps
1. Slice or chop each kind of plant material into 2-3 cm piece and keep it separately.
2. Mix each kind of plant material with brown sugar at the rate 1:0.5; put in a ceramic jar and add some brown sugar and place a flat stone on the top plant material to reduce the volume. Close the container and leave for 5-7 days.
3. Extract the plant juice of each kind and mix all with the others for later use to apply to crops (after diluting). The fermented plant residues can be used to make compost or apply directly to crops.

3. Preparation of fermented fruit residue for foliage spray

1. Use
Foliage sprays are fermented fruit residue extracts and used as a source of soluble nutrients to stimulate plant growth.

2. Raw materials
Ripen banana, papaya fruits, brown sugar

3. Steps
1. Slice or chop banana fruit into 2-3 cm pieces; cut each papaya fruit into 3-4 longitudinal sections and keep each kind of fruit material separately.
2. Mix each kind of sliced fruit with brown sugar at a ratio of 10 kg of fruit and 0.5 kg of brown sugar. Put each kind of fruit mixture in a separate ceramic jar; add some brown sugar on the top; close the container and leave for 5-7 days.
3. Extract the fruit juice of each kind and mix all with the others for later use to apply to crops (after diluting). The fermented fruit residues can be used to make compost or apply directly to crops.

4. Preparation of fermented fish extract for foliage spray

1. Use
Foliage sprays are fermented fish extracts and used as a source of soluble nutrients to stimulate plant growth.

2. Raw materials
Small fish or left-over fish residues after processing, brown sugar

3. Steps
1. Slice or chop fish into 2-3 cm piece and mix with brown sugar at a rate of 1:0.5. Put the mixture in a close ceramic and leave for natural fermentation in 2-3 weeks.
2. Extract the fish juice and put into a plastic container for later use (after diluting). The residues after extract can be used to make compost.

### Pest and disease management

1. Use
Used as bio-insecticide to protect crops.

2. Raw materials
Ginger, garlic, rice wine and brown sugar

3. Steps
1. Slice or chop ginger and garlic into small pieces and keep each kind separately.
2. Put sliced ginger or garlic into a separate jar and add rice wine at the rate of 1 litter of wine for 1 kg of ginger or garlic.
3. After 12 hours, add brown sugar into each kind of mixture at the rate 0.3 kg brown sugar for every kg of initial ginger or garlic. Mix well.
4. Add rice wine again into the jar at the rate 5 litter of wine for each kg of initial ginger or garlic, close the jar and leave for 15 days.
5. Extract the juice and put into a close container for later crop spray (after diluting). The residues can be used to mix with compost.

### Cultivation practices

- The basic soil preparation technique involves ploughing, then leaving the soil open for a short while, then breaking the clods and shaping the raised beds with hand hoes.
- There are various measures that can be employed to conserve soil moisture. Mulching with rice straw or similar is also an option.
- Plant spacing is largely determined by experience and the types of vegetables being grown.

SUCCESSFUL CASE

One good example of the successful case involving small farmers to produce organic vegetable for affording better income is the case of Gua Hamlet of Cu Yen Commune which is one of the three villages in Luong Son District of Hoa Binh province where the Field Crops Research Institute (FCRI) has been assisting small farmers to establish model for organic vegetable farms. The village started to organize its organic vegetable production since the middle of 2014 and started production in early 2015; however in 2016, it has set up its organic vegetable production on a farm of 12,800m² of which 7000 m² has been PGS-certified and the other 5,800 m² is in the conversion period; and involves 12 farmer households to participate. The participated farmers have employed the following practices in their organic vegetable production:

- Reusing the farm recourses such as rice straw, green manure, cow and buffalo dung to make compost.
- Employing land preparation and cultivation practices, crop rotation, mixed cropping, use of local made bio-pesticides … in crop production.
- Producing year around 33 kinds of vegetables in the demonstration farms, of which 9 are brassica (cabbage, Chinese cabbage, green choysum, choysum, cauliflower, kohlrabi, Indian mustard, wrapped heart mustard, pak choi); 6 are cucurbitaceous (wax gourd, pumpkin, bitter gourd, luffa, ridged skin luffa = angled luffa, pear shape melon); 3 are solanaceae (tomato, eggplant, local small fruit eggplant Solanum undatum); and 15 other kinds of vegetables (yard long bean, French bean, kangkong, sweet potato leaves; ceylon spinach, sweet leaf Sauropus androgynus; tassu jute, lettuce, Indian lettuce, moringa, carrot, shallot…)
- The farmers groups have also been assisted in developing their collaboration and partnership with some private enterprises for marketing their organic vegetables.

The farmers group can now self-operate their organic vegetable production through the year, covering all steps from farm management, on-the-job Training of Trainers (TOT) training, preparing of compost from the village available materials, employing PGS principles and rules in ensuring their organic vegetable quality and certification. The village has been able to produce year round more than 30 kinds of vegetables; totaling 7,050 kg in 2015 and 16,570 kg in 2016. It also developed partnerships with some private enterprises for marketing their organic vegetables.

Factors for this case success include the technical assistance from the FCRI; the financial support from the local government authorities; the eagerness of farmers in producing high quality and safe vegetable for their own consumption; marketing and improving their income.

DISCUSSION

Through the cultivated area, total production and value of organic agriculture are still a small proportion of the whole agricultural sector, several good points can be perceived from this organic movement. It has improved the public awareness on the potential benefits of organic farming in several aspects. It has also attracted the growing attention/ concern from Government authorities in working out better policies/ regulations to support organic production, research and training.

Organic farming have several advantages: i) Reducing overuse of chemical fertilizers and pesticides; ii) Diversifying indigenous specialty and high quality products; iii) Conserving the environment, biodiversity and soil fertility; iv) Maximizing use and recycling crop residue and organic fertilizers, reducing risk for residue burning; v) More jobs, especially for women.

Nevertheless, the movement is also exposing several disadvantages: i) Land resources are limited in quantity and fertility (Global land per capita average is 1.20 ha while that of Vietnam is only 0.104 ha, equivalent to 8.7% of the world average). This forces farmers to increase crop yield; ii) Public awareness: Farmers are reluctant to convert to organic agriculture due to high cost of production, more labor work (weeding, cultivation and crop management...); high risk of crop failure due to attack of pests and diseases; iii) Market problem: Lack of established and sustainable markets; un-secured increased income/ profit when a farmer has to make decisions for his organic production; iv) Complicated system of certification.

For better improvement of organic farming in Vietnam, the following should probably be addressed:

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- Promulgating policies to encourage organic production and marketing;
- Setting up long-term programming for organic production areas in different agro-ecological regions and localities in order to support farmers and organic agriculture more sustainable development.
- Prioritizing and implementing research activities and international cooperation on organic agriculture.
- Providing further training and fine tuning of existing organic production systems to enable them to be organically certified.
- Developing the domestic market for safe and organic foods.
- Formalizing national standards on organic agriculture and put in place an effective system of certification.

CONCLUSION

Organic farming has not yet played an important role in Vietnam’s agriculture sector. There is still lack of government specific policies to support the development of organic agriculture. As a result, there is still little attention on organic farming from research, training and the extension service. MARD lately confirms its stronger support for organic farming and production through the implementation of the 2013-2020 core scientific and technological research and development program for the period of 2013-2020:

- There have been some good models for organic production in Vietnam of which the organic vegetable production farm in Luong Son District of Hoa Binh province is one good example on how to develop a model group of farmers for organic vegetable production.
- Quality assurance for organic products is compiled differently from one company to another. The PGS has been employed by a limited number of farmers to produce organic vegetables for the domestic markets. The production of all the export-oriented products follow the quality certification systems of the imported countries. Some foreign companies are collaborating with the local ones to produce such certified products for export; however, the production scale is still small due to unstable markets and profitability.
- To promote a significant organic production in Vietnam, much greater efforts should be made from the government in setting up long-term programming for organic production areas in different agro-ecological regions and localities in order to support farmers and organic agriculture more sustainable development; prioritizing and implementing research activities and international cooperation; and providing further training and fine tuning of the existing organic production systems to enable them to be organically certified.

REFERENCES

Prime Minister’s policy decision (No 01/2012/QD-TTg) to support good agricultural practices for agriculture, forestry and fisheries, including organic.