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Organic Vegetable Production

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Introduction:

Organic vegetable production is a farming method that involves raising vegetable crops by using organic waste such as animal wastes, plant wastes, crop wastes, farm wastes, and biological materials to keep the soil alive. The primary goal of organic vegetable production is to optimize health and productivity of the interdependent communities of plant, soil, people and animals. Organic farming is an age-old practice in Indian agriculture which is based on the minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony. However in the process of modernization, particularly after green revolution the consumption of chemicals namely fertilizers, pesticides, growth regulators etc., has increased substantially in the production system. Excessive application of fertilizers, pesticides and synthetic hormone causing severe damage to the soil and environment as well as harvested produce. The residues of pesticides and fertilizers that persisted in the soil destroy the beneficial microorganisms, earthworms and other soil habitat.

Lampkin (1990): Organic Farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, growth regulators and livestock feed additives.

Funtilana (1990): Organic Farming is giving back to the nature what is taken from it.

Need for Organic Farming in Vegetables

- The enhancing production cost of the chemical farming such as investments in the manufacturing pesticides, fertilizers, irrigation etc.
- Due to heavier environmental pollution.
- In India, most of the vegetable farmers are poor, small or marginal.
- Land productivity gets decline because of increased chemical fertilizers.
- As most of the vegetable are eaten raw there is a need to reduce the contamination that causes health hazards.

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- Organic vegetable fetches more income through saving the cost of production or through international exports.

Principles of Organic Farming

A set is outlined by the International Federation of Organic Agricultural Movements (IFOAM) for the guiding principles of organic farming. This is as follows:

1. Principle of health

Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible. This principle points out that the health of individuals and communities cannot be separated from the health of ecosystems - healthy soils produce healthy crops that foster the health of animals and people.

2. Principle of ecology

Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them. This principle roots organic agriculture within living ecological systems. It states that production is to be based on ecological processes, and recycling.

3. Principle of fairness Organic

Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities. Fairness is characterized by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings.

4. Principle of care

Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.

Minimum requirements for organic vegetable production:

A. Selection of Site

The best quality of the produce can be obtained through planting the vegetable at correct location. The field or the garden must be located at the open field or southern exposure if possible. Location selected must receive at least 6 to 8 h of sunlight directly every day. The water resource should be nearby the production area. More than 1.5% slope should be avoided to minimize the soil erosion and run off. Proper drainage facilities must be ensured.

B. Conversion period

The interim period required for the establishment of organic management system and soil fertility are termed as conversion period. For vegetable crops the minimum conversion period of 12 months are required before to the start of production cycle. Based upon past use of ecological and land situations, the certification agency might reduce or extend the minimum period for conversion. The time

between the start of organic management and certification is called conversion period.

C. Choice of the Crops and Varieties

The planting materials used must be certified organic, resistance to various stresses and climate resilient. If certified planting materials are not available then care should be taken that it should be chemically untreated one. The use of genetically engineered pollens, seeds and transgenic plants are restricted. The most needed criteria to select the vegetables are based on the market demand. The vegetables are classified into two categories viz., the warm and the cool season vegetable crops.

D. Soil Preparation

The production of organic vegetables requires some long-term outlook for soil preparation. Soil must be friable, porous and well drained with good organic matter content as the soil organic matter releases the nutrient and have a good water holding capacity. For weed control soil solarization is preferred.

E. Planting

Location size and the problems in size mainly determine the methods used for planting. Raised beds are laid in smaller sites to minimize the compaction, to hold organic matter and for ease of harvest. For larger sites tractors and other equipment's are used in one or other way. Vegetable production mainly relies on the clean cultivation where old crops residues have been turned into the soil. This is done to avoid the allelopathic effect of the previous crop residues.

F. Irrigation

The successful vegetable cultivars are determined by water application at the correct time and at correct growth stage. Drip and sprinkler method of irrigation are most commonly used in vegetables.

G. Crop Rotation

Crop rotation is a common practice in organic vegetable production that involves growing different crops in a planned sequence on the same piece of land over time.

H. Weed Control

Effective weed management in organic vegetable production is the most challenging aspects to incorporate locally available organic manure to maintain fertility in the soil. The competition of weeds for high organic vegetable production should be suppressed during the critical period of crops. Crop rotation is an effective for suppressing weeds in vegetable production. Also, in addition to the different mechanical methods viz., use of black plastic mulch, deep ploughing in summer, hand weeding different cultural practices such as composting of manures and cover cropping with other crops are the simplest method to reduce weed pressure in organic vegetable production.

I. Nutrient Management

The nutrient management in the organic farming mainly depends upon the nutrients that are been derived biologically as the use of the synthetic fertilizers/ chemicals are abandoned. The uses of organics have been practiced. Green manuring is the incorporation of the living biomass into the soil to supply nutrients. The crops used in the methods are turned as green manure crop. The nature of green manuring crop should be non-woody, fast growing and short duration in nature. The manure prepared using cow urine, dung and farm waste in the backyard space is termed as farm yard manure. Soil fertility, soil organic matter and crop yield increases with the application of crop residues. Vegetable crop generates a huge quantity of crop residues after the harvest of their economic part. The nutrients that are embedded in residues are a potential source of the organic nutrition. They can also be used to produce vermi-compost.

J. Pest management and disease management

The pest control strategies in organic farming are targeted in reducing and preventing the aggregation of the insect population. The risks in pest outbreaks are minimized by enriching the soil with compost, crop rotation, inter-cropping and conservation tillage (Niggli, 2010). Strategy for the pest control in the organic farming limits the use of chemical pesticides and promotes the use of organically derived pesticides. The effective control for pest population are achieved through field scouting, trap crops, insect trapping and application of some biological control methods like introduction of the beneficial insects and by using natural enemies for reducing pest population.

K. Contamination control

Contamination control is an important aspect of organic vegetable production to ensure the integrity and quality of organic crops. Organic certification standards prohibit the use of synthetic chemicals, genetically modified organisms (GMOs), and irradiation in organic production, which means that organic farmers need to use alternative strategies for managing contamination risks. Here are some key considerations for contamination control in organic vegetable production:

Soil management: Organic farmers rely on practices such as composting, green manure, and cover cropping to build and maintain healthy soils. Proper soil management practices can help reduce the risk of soil contamination from synthetic chemicals, heavy metals, and other contaminants. Regular soil testing can be used to monitor soil quality and detect any potential contamination issues.

Harvest and post-harvest handling: Proper harvest and post-harvest handling practices are crucial in organic vegetable production to

prevent contamination. Harvesting equipment and containers should be cleaned and sanitized regularly. Care should be taken to avoid cross-contamination during harvest, packing, and storage. Organic farmers may also need to follow specific protocols for cleaning and sanitizing equipment and facilities to meet organic certification requirements.

L. Labelling

The label should convey clear accurate information about the organic status of the product. (i.e., conversion in progress or organic). The details like name of the product, quantity of the product, name and address of the producer, name of certification agency, certification lot number etc. are to be given in the label. Lot number is helpful in tracing back the product particularly the field no. in which it is grown in case of contamination. For e.g.:

Crop: OC (organic tomato)

Country: I (India)

Field No.: 05

Date of harvest: 32 (1 st Feb)

Year: 1999

Lot number: OC I 0532 1999.

M. Market suitability

Market research is an essential part for organic vegetable production, which selection of crop and variety is generally depending on the consumers. It is also important to find out which vegetable is required in the market at particular time and when it is required because sometimes vegetables may be undersupplied. It will be possible to fill the seasonal gap in restaurants vegetables for example cherry tomato, yellow capsicum and red capsicum. Some processing factories are preferred cultivars for processing and for the fresh-food market.

N. Certification

This is process of certification for organic food produce and other related organic products. Any person doing organic food production can be certified, including farmers, food processors, suppliers of seed and retailers. It has a production standard for growing of crops, their storage, convert into processed products, packaging and transportation that exclude genetically modified organisms and the use of synthetic chemical inputs (Such as fertilizer, pesticides, food additives, antibiotics etc). This generally allows for chemicals free farming for three or more than three years. This keeps record in detail for production and sales and strictly maintaining non-certified products and organic products.

Purpose of certification

Organic certification is essential for increasing worldwide demand of organic vegetable produce. It necessary for prevention from fraud products and also assure product quality. Organic producers identify suppliers of approved products for use in certified

operations for certification. Many certification bodies operate organic standards that meet the minimum requirements of the National government. Procedure of Certification Farmer is required to participate in new activities for farm certification: (Source: NPOF, Agriculture and Cooperation Department, Government of India) Advanced Farming 136 Application form is given by the applicant with details in the prescribed format to the certification agency. Screening of application by certification agency. Cost estimate including certification fees, laboratory fees, inspection fees, reporting cost and travel cost etc is sent for acceptance. Acceptance of cost by the organic vegetable producer. Signing of agreement between organic vegetable producer with certification agency.

Certification agency calls for cropping/production/cultivation/processing scheme and provides a copy of the standards for the producer to follow. Certification agency asks the organic vegetable producer to release 50 percent of the certification cost in advance. Organic vegetable producer pays the 50 percent fees. Inspection is carried out at one or more than one times. Inspection report submitted to the certification agency committee. Certification agency asks for final payment and organic vegetable producer pays the final payment. Certification agency gives certificate to organic vegetable producer. Organic vegetable producer releases the stock for sale with Certification Mark (India Organic Logo).

Conclusion

Thus in countries like India, the adoption of pure organic farming is possible partially, especially for exporting to International market. On the other hand, adoption of the Integrated Green Revolution Farming is one of the options for adopting Organic Farming in a large scale. The basic of green revolution are increased use of the external inputs, developing high yielding and hybrid varieties, farm mechanization that limits the damage to human health and environment. For this purpose, some of the organic techniques have been developed and combined with some high input technology for creating integrated systems like INM (Integrated Nutrient Management), IPM (Integrated Pest Management) and biological control methods that reduces the chemical needs. Further researches on some proper technology (time saving and less cost) for organic vegetable production are needed in near future.