



NETAJI SUBHAS OPEN UNIVERSITY
Certificate Course in Organic Agriculture and Horticulture
SYLLABUS

Course Structure

Paper I: Organic Agriculture (Theory)

Paper II: Organic Horticulture (Theory)

Paper III: Organic Agriculture (Practical)

Paper IV: Organic Horticulture (Practical)

Full marks:400

Detailed syllabus

PAPER – I: Organic Agriculture (Theory)

THEORY:

Total: 54 hrs

1. A. What is Organic Farming? (4 hrs)
B. Why Organic Farming?
Detrimental effects of currently chemical dependent farming.
 - i) Reduction of crop production due to depletion of soil Health.
 - ii) Pesticide contamination and human health hazard.
 - iii) Contamination of food products by pesticides & chemicals.
 - iv) Environmental (soil, water, air) pollution.
 - v) Reduction of natural enemies of crop pests.
 - vi) Threat to Bio diversity.

2. i) Historical development of Organic Agriculture in India. (4 hrs)
ii) Present status of Organic Agriculture in West Bengal.
iii) Feasibility of adoption of organic Agriculture in West Bengal and its difficulties.

3. Types of Farming (Advantage & disadvantage of each system): (4 hrs)
 - Pure Organic Farming – Definition, Concept & Benefits
 - Integrated Farming system (Combination of Organic and Inorganic)
 - Mixed Farming

4. Concept of different cropping systems in relation to Organic Farming (Inter cropping etc) (4 hrs)

5. Organic Farming (Process) (8 hrs)
 - Concept of farming system
 - Developing organic farms
 - Important steps & methods

6. Plant Nutrients: (4 hrs)
 - Name of plant Nutrients
 - Functions of Nutrients in plant growth and Development

7. Nutrient uptake and Utilization by plant: (2 hrs)

- From Organics
 - From Inorganics
8. Balanced Nutrients supply: (4 hrs)
- a) For Organic Farming system using nutrients from Organic sources.
 - b) For conventional Farming system using nutrients from Organic and inorganic sources.
9. Sources of nutrients for Organic Agriculture: (2 hrs)
- Organic Manure –
 - FYM/Rural compost, City compost, Oil cakes,
 - Animal wastes, Vermi composts, etc
 - Characterization and Nutrients content of the above sources (Data Chart)
 - Green Manure –
Green Manure with Leguminous crops in crop rotation. In-situ incorporation of crop residues -Benefits (2 hrs)
 - Liquid Manure (2 hrs)
 - Bio fertilizers and their method of use (4 hrs)
 - Nitrogenous
 - Phosphatic
 - Potassic
 - Availability of Nutrients from above sources
 - Other Nitrogen contributing plants
10. Recycling of Organic matter in organic Agriculture (2 hrs)
- Transformation of organic substances in soil
11. Preparation of Compost: (4 hrs)
- Different Methods
 - Enrichment of compost
 - Nutrient composition
12. Preparation of vermin compost: (4 hrs)
- Pit construction
 - Raw materials
 - Availability of specific species of earth worm
 - Method of preparation
 - Quality improvement of finished vermin compost

PAPER –II: Organic Horticulture

THEORY:

Total: 42 hrs

1. Soil: (6 hrs)
- Definition
 - Soil formation

- Composition and characteristics
 - Types of soil according to composition
 - Distribution of soil groups in W.B.
2. Acidic, Alkaline and Saline soils (2 hrs)
- How they affect Agriculture
 - Method of reclamation
3. Soil productivity: (4 hrs)
- Meaning & Concept
 - Difference between Soil Fertility and Productivity
 - Method of Increasing productivity and fertility
4. Crops: (2 hrs)
- Classification of crops according to use
 - Their Growing requirements (in brief)
5. Crop Cultivation: (2 hrs)
- Rice cultivation with organic Inputs with special emphasis on SRI, Drum Seeder etc.
6. Cultivation of crops with organic inputs: (4 hrs)
- Field crops
 - Leguminous crops
7. Cultivation of Horticultural crops with organic inputs: (6 hrs)
- Vegetable
 - Fruits
 - Flowering plants
8. Plant Protection Measures: (8 hrs)
- Integrated pest & disease managements.
 - Organic pesticides, bio-pesticides.
 - Inorganic pesticides, disadvantages of their use.
 - Seed, seedling and soil Treatment measures.
 - Feasibility of complete dependence on organic sources.
9. Importance of Neem in organic Agriculture (4 hrs)
10. Organic Agri-Horticulture in Urban & Semi urban areas (2 hrs)
11. Quality Control and certification procedures of Organic products (2 hrs)

PRACTICAL
(Participatory Hands on Training)

Total: (54 hours)

PAPER-3

1. **Soil:** (4 hours)
 - Soil and its physical characters
 - Soil types:-Alluvial, Laterite, Clay, Loam etc..
 - Physical testing and assessment of soil types, weighment, water movement, etc.

2. **Soil Conditioners:** (2 hours)
 - Lime, Dolomite, Gypsum, Basis slag, Organic Manures, etc.
 - Use of soil conditioners for better management of soil, dosages by soil types,etc.
 - Interaction

3. **Preparation of FYM/Rural Compost / vermicompost** (8 hours)
 - Preparation of compost pit at appropriate location.
 - Lining of pit with brick, polythene sheet
 - Collection and accumulation of raw materials
 - Aerated /Non aerated pits for quality manure production
 - Collection of rotten manure and post treatment
 - Interaction

4. **Preparation of seed bed & raising of seedlings:** (4hours)
 - Wet seedbed, manuring, sowing (broadcasting)
 - Dry seed bed, bed size,manuring, soil treatment ,actual sowing in line/broadcasting, weeding, watering, hardening of seedling, time requirement for seedling growth, uprooting seedlings

5. **Land preparation:** (8 hours)
 - Opening of land, removal of stubbles, weeds and other unwanted materials
 - Preparation of final plot for sowing/transplanting & Drum Seeder
 - Transplanting - i) General Method ii) SRI Method
 - Other methods

6. **Raising Seedlings in pots/seed pans:** (4hours)
 - Preparation of potting mixture, its treatment.
 - Seed treatment, making seeds ready for planting in seed pans.
 - Seed sowing, very small seed, medium and large seeds.
 - Aftercare – germination till seedlings are ready for planting through hardening

7. **Undertaking Pot/Container Culture of Flowers, Vegetable and Fruit plants:** (4 hours)
 - Preparation of potting mixture, planting seedlings, sapling and their maintenance for performance.

8. **Practice Training on Interculture operations including:** (8 hours)

- Field crops
- Pot grown crops for optimum growth and water use efficiency

9. **Performance Trial of Pot grown Vegetables & Flowers by the Students** (12 hours)

PAPER-4

Total: (56 hours)

1. **Familiarization of Crop Seeds / Propagules:** (4 hours)

- Identification
- What seeds and propagules are and what do they do?
- Main Cereals - Rice, Wheat, Maize
- Major & Minor Millets - Sorghum (Jower), Pearl millet (Bajra), Ragi, etc.
- Common Pulses - Green Gram (Mung), Lentil (Masur), Pigeon Pea (Arhar) Gram, Black Gram (Kalai), Pea, Lathyrus (Khesari), etc
- Oilseeds - Mustard, Rai, Groundnut, Sunflower, Sesamum (Til),etc
- Vegetables - Brinjal, Potato, Tomato, Okra (Bhindi), Cucurbits and Gourds, Cabbage, Couliflower, Luffa, Carrot, Beet, Turnip, Chilli, Radish, Beans Pea, Basella (Pui), Spinach, Lettuce, Amaranthus, etc
- Common Flowers
- Common Fruits - Mango, Papaya, Jackfruit, Guava, Coconut, Sapota (Chiku), Bael, Banana, Citrus fruits, etc.
- Common Spices -Turmeric, Ginger, Onion, Garlic, Coriander, Chilli, Fenugreek (Methi), Fennel (jeera), etc
- Medicinal and Aromatic Plants – Basak, Basil (Tulsi), Kalmegh, Thankuni, Datura, Gurmar, Neem, Nishinda, Akanda, etc

2. Plant food: (8 hours)

- Familiarization of Manures and Fertilizers according to source of plant nutrients
- Requirement of nutrients of different crops (Govt. recommendations)
- Soil Testing (Sample collection and processing for analysis)
 - a) Laboratory method
 - b) By soil Testing kits

Sources:-

(a) Organic

- FYM/Rural Compost
- Urban Compost
- Oil Cakes
- Vermi Compost
- Crop, Plant and Animal wastes, etc.

(b) Inorganic

- Chemical fertilizer- Nitrogenous, Phosphatic, Potassic
- Straight and Complex/Compound fertilizer.
- Secondary and Micronutrients

(c) Organism Based

- Azotobactor, Rhizobium/Azospirillum
- PSB (Phosphate Solubilising Bacteria)
- Potash Mobilizing Bacteria
- Estimation of fertilizer needs of crops according to recommendation
- How to meet the need of nutrients from various sources
- Interaction

3. Plant growth Regulators: (2 hours)

- Why the need?
- Familiarization and actual application according to need.
- Interaction

4. Preparation of Vermicompost : (4 hours)

- Erection of Vermicompost structure with cover
- Drainage arrangement and collection of the liquid.
- Raising leguminous crops around the pit
- Collection of raw materials & Processing
- Putting active worms (specific sps.) and processed raw materials in the pit
- Collection of final product(Vermicompost)

- 5. Training on Plant Protection:** (8 hours)
- Identification of visual symptoms of pest attack along with the pests(Insects, Fungi, Virus, etc) as far as possible.
 - Acquaintance of common Fungicides, Insecticide , (Chemical, Botanical and Organism based)
 - Training on application of pesticides by hand spraying, hand dusters etc.
 - Safety measures towards application of pesticides.
 - Viral disease symptoms – approach for control.
 - Interaction
- 6. Training on:** (8 hours)
- Preparation of Neem Kernel powder
 - Neem Kernel Aquaous Extract (N.K.A.E.)
- 7. Physiological Diseases / Disorders:** (4 hours)
- Identification, cause and effect
 - Ameliorating measures (soil/spray application)
 - Soil amelioration
 - Interaction
- 8. Herbicides in Agricultural Practices** (2 hours)
- Acquaintance of Herbicides and their specificity
 - Application of herbicides in field and monitoring the result with repeat visit
 - Interaction
- 9. Familiarization of Farm Equipments & Implements:** (4 hours)
- Equipments & Implements, their actual operation by working and practicing
 - Maintenance
 - Interaction
- 10. Crop Sowing, Harvesting, Processing and Storage of Produce at Farm Level:** (12 hours)
- Practicing and experiencing in Farmer's Fields.