

ASSISTANT HORTICULTURE OFFICER IN THE DEPARTMENT OF HORTICULTURE

PAPER-2: SPECIFIC PAPER

**Syllabus**

**Assistant Horticulture Officer: Eligibility B.Sc. (Hort.)**

Scope and importance of Horticulture and horticultural crops – Area and Production – Imports and Exports – Nutritive value of Horticultural crops – Agro Climatic Zones of India and Karnataka in relation to Horticultural crops

Scope for Horticultural Development in Karnataka – Factors limiting Horticultural crop production – Climate (Rainfall, Temperature, Light, Humidity, Sunshine) – Soil (P<sup>H</sup>, EC, Soil depth) – Crops suitable for different soils – water (Quality and quantity) – Drainage.

Planning. Layout and Planting of orchards – fencing – wind breaks – spacing – systems of planting – cropping systems – Multitier cropping – cover crops – Intercrops – Mulching – weed control.

Manures and manuring – Organic and inorganic manures – Bio fertilizers – Fertigation – Bio Agents.

Essential Elements – Functions – Deficiency symptoms – Fertilizer schedule – Time and method of application. Physiological disorders – Control measures.

Irrigation – Water requirement of different Horticultural Crops – various irrigation methods including **Drip, Sprinkler, Fogging, Misting** and Water Stress on Horticultural Crops- Plasticulture- Mulching types.

Training and Pruning – Principles and Methods - Canopy Architecture-Planting systems and Planting densities

Flowering – Pollination – Fruit set – Fruit drop – Causes and Prevention – Unfruitfulness associated with External and Internal factors.

Maturity – Harvesting – Pre & Post Harvest Handling – Processing and Preservation.

Role of plant Growth regulators and their commercial applications in Horticulture.

Seed and Vegetative Propagation – advantages and disadvantages – Seed Treatment - Important methods of Vegetative Propagation – Cutting – Layering – Incompatibility – Grafting – Budding- Rootstock – Scion – (Stock – scion relationship) – Specialized Parts of Propagation (bulbs, corms, tubers, offsets, runners etc.) – Micro propagation

Tropical, Subtropical, Temperate and Arid zone Horticultural Crops – Climate and Soil – propagation practices spacing and planting – varieties – Nutrient water and weed management – mulching – intercropping – use of growth regulators – yield – Economics – Integrated pest and disease management – Pre and Post-harvest practices – Processing and Preservation – Marketing.

Fruit Crops : : Mango, Banana, Grapes, Citrus, Papaya, Sapota, Guava, Ber, Pomegranate, Annonas, Amla, Tamarind, Jack, Pineapple, Apple, Plum, Pear, Peach.

Spice Crops: Black Pepper, Cardamom, Nutmeg, Cinnamon, Clove, Allspice, Ginger, Turmeric, Coriander, Cumin, Fenugreek, Fennel.

Plantation Crops: Coffee, Tea, Coconut, Cocoa, Arecanut, Oilpalm, Cashew, Betelvine, Palmyrah, Rubber.

Vegetable Crops : Tomato, Brinjal, Bhendi, Chilli, Cucumber, Melons, Gourds, Pumpkin, Peas, Beans, Dolichus beans, Potato, Cassava, Sweet potato, Minor tuber crops, Carrot, Radish, Beetroot, Turnip, Cabbage, Cauliflower, Onion, Garlic, Amaranthus, other Greens, Moringa, Chow Chow, Curry leaf. Exotic vegetables - Broccoli, Brussels Sprouts, Lettuce, Globe Artichoke, Zukuni, Asparagus, Parsley, Celery, Spinach

Flower Crops : Jasmine, Rose, Chrysanthemum, Tube rose, Crossandra, Marigold, Gerbera, Orchid, Gladiolus, Anthurium, Carnation, China aster, Statice, Gypsophylla, Heliconia, Alpinia, Bird of Paradise, Filler materials like daisy, tuja.

Medicinal Plants: Commercially important Medicinal plants like Ashwagandha, Coleus, Brahmi, Isabgol, Kalmegh, Liquorice, Stevia, Shatavari, Safed Musli, Sarpagandha, Senna, Noni.

Aromatic Plants: Commercially important Aromatic plants notified by Govt. of India like Lemongrass, Citronella, Patcholi, Geranium, Mint, Ocimum, Eucalyptus, Sandalwood, Lavender, Davana.

Ornamental gardening : Landscaping – design and principles – Types of gradens – Layout – garden components – flowering, foliage and Avenue trees – Arboretum – shrubs – creepers and Climbers. Cacti and succulents, hedge and edge plants. plants for rockery and water garden – Flowering annuals, Indoor plants – Garden adornments - arches and pergolas. Lawn – grasses – Making and maintenance. Terrace gardening, topiary, Bonsai preparation, flower arrangements, Urban & Peri-urban Horticulture, Kitchen garden, aeroponics, hydroponics and Herbal garden.

### **DRY LAND HORTICULTURE AND WATERSHED MANAGEMENT:**

Dry land horticulture farming, introduction, definition, dry climate and their classifications with reference to India in general and Karnataka in particular. Importance of horticultural crops in dry land, yield potential of horticulture crops in dry lands. Fruits and vegetables crops suitable for dry land farming. Adaptive features of dry land fruit crops for drought and salinity.

Watershed management, objectives, approaches, steps in watershed development planning, land use capability, classification, soil and rain water conservation, water harvesting measures in watershed area. Problems and prospects under water shed. Alternate water use system. Choice of crops. Cultural practices like planting, training, pruning, nutrition and water management and

harvesting of important dry land fruits viz., ber, pomegranate, custard apple, phalsa, fig, aonla, jamun and tamarind.

#### **SOCIAL AND FARM FORESTRY:**

Introduction – forests in India, forest policy and law, gap between demand and supply of forest products. Principles of general silviculture and tree species under silviculture.

Social forestry – need, objectives and scope, choice of species for fuelwood, fodder, smaller timber and timber, their culture, propagation, application of agro-techniques and economic benefits, management of social forestry plantations nurseries and their practices.

Afforestation on different problematic sites. Voluntary organizations, Joint farm management (JFM) and their role in promoting afforestation programmes. Maintenance and conservation of village woodlots. Energy plantations. Social forestry for watershed management.

Farm forestry – objectives and role, need for shelter belts and wind breaks, types of farm forestry. Agro/ Horti. forestry – need, objectives, scope, principles and practices of agro/ horti. forestry systems, choice of the tree species, and management implications. Forest products, their processing and use including minor forest products.

Irrigation – Water requirement of different Horticultural Crops – various irrigation methods including **Drip, Sprinkler, Fogging, Misting** and Water Stress on Horticultural Crops- Plasticulture- Mulching types.

#### **Special Topics**

##### **1 Organic farming:**

Definition of organic farming, scope of organic farming in Horticulture Crops. Certification procedure and inspection of organic production of Hort. Crops. Scientific use of microbial inoculants in Horti. Crops. Preparation and use of organic manures viz. Enriched compost, Vermi compost, Green manuring, Beejamrutha, Jeevamrutha, panchagavya, Biodigester, Vermi wash, Cow urine, Neem cake, BD-500, etc. Use of Biofertilizers viz., *Rhizobium*, *Azotobacter*, *Azospirillum*, phosphate solubilizers, *Azolla*, plant growth promoting rhizobacteria, VAM in different Horticulture crops. Methods of application of biofertilizers. Use of microbial consortia in composting of Agri/ Horticultural wastes and enrichment of compost. Microbial biocontrol agents viz., pseudomonas, Bacillus, PGPR etc. Crops suitable for organic farming.

2. Precision farming: Definition and implementation in Horticulture crops. Definition of IFS, its principles and practices of IFS. Cultivation of Mushrooms

### 3 Seed Science and Technology:

Types of seeds, concept of seed quality and factors affecting it. Role and Goal of seed Technology. Generation system of seed multiplication, classes of seed. Different organization involved in seed production and certification. Principles of seed production, seed certification, and processing. Seed testing methods (Germination test, physical purity test, moisture test, TZ test etc.). Principles and methods of seed storage, IPR and its utilization, PPVR & FR, Techniques of seed production in important vegetables (tomato, brinjal, onion, cucurbits, root vegetables etc.)

### 4 Soil Science and Agricultural Chemistry:

Importance of soil testing, Soil sampling procedure for horticultural crops and interpretation. Plant nutrients – Introduction, Definition of Nutrients, nutrient accumulation, nutrient uptake and nutrient removal. Stout criteria of essentiality. Classification of essential nutrients as primary, secondary and micronutrients. Functions and deficiency symptoms of nutrients and remedial measures. Organic matter, importance of organic matter, humus, types of humus, importance of humus and organic manure. Fertilizers- Definition, differences between organic manures and fertilizers, Classification of fertilizers. Problematic soils: Causes and reclamation methods. Quality of irrigation water and management and Integrated plant nutrient management