

**TAMIL NADU PUBLIC SERVICE COMMISSION
SYLLABUS**

**HORTICULTURE
(DIPLOMA STANDARD)**

Code: 432

UNIT- I: BASIC HORTICULTURE AND PLANT PROPAGATION

Horticulture – Definition, scope and importance, Division and classification of horticultural crops – Horticultural zones in India and Tamil Nadu – Cropping systems - Precision farming- Planting systems –HDP and UHDP- Irrigation systems – Nutrient application methods in horticultural crops – Weed management – Training and Pruning system– Special horticultural practices – Maturity indices – Harvesting methods, pre-cooling – Packaging - Storage of horticultural crops - Protected cultivation.

Propagation - Tools and implements - Media and Containers - Types of nursery beds - Seed treatment - Sowing – Protray nursery-seedling production - Potting, depotting and repotting of plants - Methods of asexual propagation through cuttings, layering, grafting and budding - Plant propagation structures - Mist chamber and shade net – Hardening and maintenance – Polyhouse-Application Growth regulators in propagation – Nutrient management and plant protection measures – Record keeping and maintenance-nursery act and certification.

UNIT- II: SOIL AND FERTILITY, IRRIGATION AND WEED MANAGEMENT

Soil types- Physical and chemical properties- Soil organic matter and its importance- Essential nutrients for crop plants - Major, secondary and micro nutrients – Manures and fertilizers – Types of fertilizers – Straight, Complex, Compound, Mixed, Fortified, chelated and water soluble fertilizers and their reactions in soil. Soil fertility – INM practices– soil health card-Problem soils – Acid, saline and alkaline soils -Reclamation and management-Rootstocks for problem soils.

Irrigation – Sources of water for irrigation –Critical stages of water requirement – Irrigation scheduling and fertigation –Irrigation methods-water conservation methods.Study of weeds -methods of weed control–Herbicides for weed management in horticultural crops– Integrated weed management practices.

UNIT- III: PRODUCTION TECHNOLOGY OF FRUITS AND VEGETABLES

Area, production and importance of fruit crops in Tamil Nadu – Major fruit producing districts in Tamil Nadu-Layout of orchard - Physical features in orchard - Study of cultural practices of Tropical fruits – Mango, Banana, Grapes, Papaya, Sapota, Guava, Acidlime, Jackfruit, Dragon fruit. Sub-tropical and temperate fruits – Pineapple, Avocado, Mandarin orange, Apple, Pear,

Plum, Strawberry with reference to soil, climate, varieties / hybrids methods of propagation (rootstocks), nutrient, irrigation and weed management practices – Training and pruning –Growth regulators – Maturity standards for harvesting – Post-harvest handling of fruit crops – Yield – Grading – packing – Storage and value added products – HDP/UHDP- Top working, double working and rejuvenation of old orchard- Organic fruit production and certification- Good Agricultural Practices (GAP).

Dry land horticulture – Arid and semi arid zones in Tamil Nadu and India. Crops suitable for dry land production – Important varieties, climate and soil requirements, commercial propagation methods - Spacing and planting systems - Cropping systems and intercropping – Mulching – Management of nutrients, water, weeds and problem soils –Training and pruning - Use of plant growth regulators – Post-harvest handling of Aonla, custard apple, pomegranate, ber, jamun, manila tamarind and wood apple - Soil and moisture conservation methods – Anti-transpirants.

Area, Production and importance of vegetable cultivation in Tamil Nadu – Kitchen garden-roof garden-vertical garden– Truck garden and market garden –soil and climate requirement – varieties / hybrids – Seed rate –Sowing - nursery practices – Protray nursery – Transplanting – Manuring – Irrigation – Fertigation - Nutrient deficiency and their corrective measures - Use of growth regulators - Special horticultural practices (training, staking, pruning) – Physiological disorders and corrective measures – Maturity indices - Harvesting – Grading, sorting – Packing and storage and yield for important vegetable crop; Tomato, Brinjal, Chillies, Bhendi, Onion, Bittergourd, Ridgegourd, Snake gourd, Pumpkin, Water melon, Musk melon, Ash gourd,Tapioca, Yams, Colocasia, Cabbage, Cauliflower, Radish, Carrot, Beet root, Amaranthus, Moringa, Potato, Cluster beans, Lab lab, Peas and Beans.

UNIT -IV: PRODUCTION TECHNOLOGY OF FLOWER CROPS AND LANDSCAPING

Importance of commercial flower crops – Area and production - Study of cultural practices of commercial loose flowers – Rose, Jasmine, Tuberosa, Chrysanthemum, Marigold, Crossandra, Celosia, Nerium and Gomphrena. Floral concrete and pigment extraction from loose flowers -Protected structures for cut flower production – Study of cut flower production techniques of Rose, Carnation, Gerbera, Chrysanthemum, Orchids, Anthurium, Liliium, Alstroemeria, Lisianthus, Heliconia, fillers (Asparagus, limonium, gypsophylla) and foliage (dracaena and xinadu). Post-harvest management of cut flowers – Floral decorations, bouquets and dry flowers – Grading, packing and marketing of flowers-Flower Auction centres in Tamil Nadu.

Importance of ornamental gardening, landscaping and nursery business– Principles and styles and types of garden - Features of garden - Garden components and adornments – operations in planting and maintenance of

trees, annuals, shrubs, climbers, creepers, herbaceous perennials, ferns, cacti and succulents, palm and cycads – Sunken garden, roof garden, rockeries, vertical garden and plant choices-Bonsai making- Lawn and lawn making – sports turf- Flower arrangements and dry flower making.

UNIT-V: PRODUCTION TECHNOLOGY OF SPICES, PLANTATION CROPS, MEDICINAL AND AROMATIC CROPS

Area, production and Importance of spice crops in Tamil Nadu – Study of production techniques of important spice crops Pepper, Cardamom, Turmeric, Ginger, Clove, Nutmeg, Cinnamon, Tamarind, Curry leaf and Coriander. Harvesting and processing – grading and packing – Organic farming and GAP in spice production.

Area, production and Importance of plantation crops in Tamil Nadu - Study of cultural operations for Tea, Coffee, Rubber, Cocoa, Cashew, Coconut, Arecanut, Oil palm and Palmyrah – Harvesting and Processing – Grading and packing - Organic farming and GAP in plantation crops.

Area, production and Importance of medicinal and aromatic plants in Tamil Nadu - Contract farming - production technologies – Medicinal crops : Glory lily, Medicinal Coleus, Senna, Periwinkle, Gymnema, Ashwagandha, Phyllanthus, Kalmegh and *Aloe vera*. Aromatic plants: Japanese mint, Rosemary, Lemon grass, Citronella, Palmarosa, Vettiver, Geranium, Patchouli and basil.

UNIT- VI: INSECT PEST AND DISEASES OF HORTICULTURAL CROPS AND THEIR MANAGEMENT

Pest - Categories – Pest management - Principles and components. Natural enemies. IPM – different types of traps - Management strategies for important insect pests groups – Chewing insects - Stem borers – Fruit borer – Sap feeders of important fruit, vegetable, spices, medicinal and plantation crops- Special pest management strategies in storage pests and poly house. Management techniques for plant parasitic nematodes – Etiology, symptoms and integrated management of important diseases.

Important pest and diseases of Fruits: Mango, Banana, Citrus, Grapes, Guava, Sapota, Pomegranate, Papaya, Jack, Pineapple, Ber, Apple, Pear, Plum
Vegetables: Brinjal, Tomato, Bhendi, chilies, Cucurbits, Moringa, Crucifers, Beans, Peas, Potato and Cassava. Spices and condiments: Onion, Garlic, Chillies, Cardamom, Pepper, Turmeric, Ginger, Coriander, Clove and Nutmeg. Plantation crops: Tea, Coffee, Cocoa, Rubber, Ccoconut, Arecanut and Cashew. Flowers: Jasmine, Rose, Crossandra, Chrysanthemum, Tube rose, Medicinal plants: Gloriosa, Senna, Coleus, Aloe vera, Solanum nigrum and Aswagandha.

UNIT-VII: POST HARVEST HANDLING AND VALUE ADDITION OF HORTICULTURAL CROPS

Scope and importance of post harvest technology in horticultural crops - Washing, grading, sorting - pre cooling and pre treatments - Blanching and peeling methods - Post-harvest handling methods: Dehydration, Canning of fruits and vegetables - Thermal processing - Low temperature processing - Cold storage - Controlled and atmospheric storage - Refrigeration truck, ripening chamber, packaging for horticultural crops - Value addition in horticultural crops. Fruits : Jam, Jelly, Squash, RTS and Candy. Vegetables : Pickle, chutney, sauce and ketchup. Spices - Oleoresins, masala powders and mix - Food safety standards, National : Agmark, BIS, FSSAI and HACCP, International - Codex and ISO.

UNIT - VIII: LIVESTOCK MANAGEMENT AND POULTRY PRODUCTION

Significance of Livestock and Poultry - Various systems of livestock production - Important cattle Breeds - Artificial Insemination - Housing management - Feeds and fodder - Major cattle diseases and management. Sheep and Goat farming - Important breeds - Economic traits - Systems of rearing - Housing management - Nutrition - Common diseases, Ecto and endo parasites - Prevention and Control.

Poultry farming - Commercial strains of layer and broiler-backyard poultry-country birds - Housing management - Brooding management - Deep litter - Cage system - Nutrition of Chick - Grower and Layer and Broiler - Diseases - Causative organisms - Symptoms - Vaccination - Disease control and Prevention.

UNIT - IX: COMMERCIAL AGRICULTURE

Seed Production - varieties - Hybrids - emasculation and Pollination - isolation distance - roguing - planting ratio - seed production techniques of Tomato, Brinjal, chilli, bhendi, onion, gourds, cluster bean, moringa, Amaranthus - Extraction techniques - Seed processing - Seed treatment - Seed packaging - Seed storage - Seed act - Seed inspection and Certification.

Bio-Control Agents - Importance - Examples of bio-control agents - Role in pest and disease management - Categories of bio-control agents - Spawn and Mushroom Production - Oyster and button - Organic Composting - Enriched FYM - Vermi compost - preparation of vermi beds - coir compost - quality standards.

UNIT - X: FARM MANAGEMENT, MARKETING AND EXTENSION EDUCATION

Farm Management - types and systems of farming - collective farming - farm planning and budgeting - risk and uncertainty - Horticultural Marketing - demand and supply - Marketing costs and marketing margins - Warehousing - Processing - Cold storage - Marketing agencies and institutions - Cooperative marketing societies - Role of regulated markets - NAFED - TANFED - NHB -

Commodity boards - Marketing of agricultural inputs - Market information and intelligence - AGMARKNET, DEMIC, DMI, Uzhavar Sandhai- Farmers Producers Organisation.

Agricultural Extension – methods of Communication mass contact methods. Participatory Rural Appraisal techniques. Audio - Visual aids –Farm Journalism –writing for media. Information and Communication Technology (ICT) – Computer networks, internet, video conferencing, agriportals, Kisan Call Centre, mobile apps. Geo tagging, Photography – Basic concepts, advancements.

New governmental schemes, flagship programmes, policy notes, Duties and responsibilities of AHO's, Calamity mitigation and enumeration- crop compensation - Crop Cutting Experiment and Crop Insurance- Revenue records of Farmers, Drones in Horticulture crop production-AI based weather forecasting and farm advisory-GIS mapping- Major Research Institutes in Horticulture.

Note: Medium of instruction is only in English.

Dated 27.09.2023