

Tamil Nadu Public Service Commission

Syllabus

Code No.171

Subject: Horticulture (Degree standard)

Unit 1- Fundamentals of Horticulture

Scope and importance of horticulture in the economy of India and Tamil Nadu –Area and Production – Imports and Exports – Nutritive value of Horticultural crops- Climatic zones of India and Tamil Nadu in relation to horticultural crops-National and Regional agencies involved in promotion of horticultural industry in India-National Horticulture Board, APEDA, Commodity boards-Kitchen gardening-- Market gardening- Truck gardening- Production for processing- Production for seed production- Hydroponics

Unit 2- Growth and Development of Horticultural crops

Factors limiting horticultural crop production – Climate and edaphic factors– Classification of fruits, vegetables and flowers- Classification based on life cycle into annual, biennial and perennial (woody and herbaceous perennials)- Causes and prevention of unfruitfulness associated with external and internal factors.- bud dormancy-dormancy breaking- parthenocarpy- parthenogenesis- polyembryony-stenospermocarpy-vivipary- apomixis – fruit drop –monoecious, dioecious- dichogamy- Protandry and protogyny –Seed dormancy-Physiology of flowering, fruit set, ripening and senescence

Unit 3 – Propagation of horticultural crops

Propagation-definitions- seed propagation- merits and demerits- crops propagated through seeds-presowing treatment, stratification, scarification, seed priming-vegetative propagation- merits and demerits-cutting, layering, grafting and budding-root stock influence-stock/scion relationship-Specialised parts of propagation (bulbs, tubers, offsets, runners, suckers, slip, corms)-specialised structures for propagation-mist chamber, net house, hardening chamber- Micro propagation – Applications- Infra structure requirements- Media-stages of micro propagation-hardening

Unit 4 Management Techniques for horticultural crops

Planning- Layout and Planting of orchards – fencing – wind breaks – spacing – systems of planting – cropping systems – Multitier cropping – cover crops – Intercrops – Mulching – sod culture, weed control, Manures and manuring – organic and inorganic manures – Bio fertilizers –vermicomposting-Irrigation-Conventional and micro irrigation systems- Essential elements – functions – deficiency symptoms –physiological disorders- Training methods- leader, open centre modified leader, head, hedge- bearing

habits- pruning methods- heading back, pinching, dis budding, de-shooting, notching, bending and smudging- Role of pollinators in horticultural crops.- Role of plant growth regulators in horticultural crops- Organic plant protection- Neem Seed Kernel extract- Botanical preparations- Bordeaux Mixture- Neem oil emulsion.

Unit 5 Production technology of fruit crops

Climate and soil requirement- varieties- propagation methods- planting system including High density planting- spacing- training and pruning- intercultural practices -water and nutrient management- pre-bearing age- harvest indices and yield of important fruit crops like Mango, Banana, Citrus, Grapes, Papaya, Guava, Sapota, Pineapple, Pomegranate, Annona, Ber, Aonla, Apple, Pear, Plum, Peach, Strawberry, Jack, and Phalsa.

Unit 6 - Production technology of vegetable crops

Climate and soil requirements- seasons- seed rate- containerized seedling production- varieties & hybrids- spacing -water and weed management, nutrient requirement and management- Training system for vegetables - harvest and yield of important vegetable crops Tomato, Brinjal, Chillies and Capsicum (Sweet Pepper), Bhendi, Leguminous vegetables (Beans, Peas, cluster beans - cowpea, - dolichos bean); bulbous vegetables (Onion) Tuber crops - (Tapioca, sweet potato, yams); cucurbitaceous vegetables (cucumber, bittergourd, snakegourd, ashgourd, musk melon, watermelon, coccinea, pumpkin and chow-chow), cruciferous vegetables (Cabbage, Cauliflower and knolkhol), root vegetables (Carrot, radish, beet root, turnip,); Leafy vegetables (Spinach, chekurmanis, palak, amaranthus), Drumstick, Potato, Curry leaf-organic vegetable production-protected cultivation of vegetable crops-precision farming of vegetable crops

Unit 7 -Floriculture & Landscape gardening

Climate and soil requirement- Species and varieties- Propagation, spacing and planting methods- water and nutrient requirement and management- training and pruning- pre-bearing age and duration- harvest index and yield – for important loose flower crops like Jasmine, rose, tuberose, chrysanthemum, marigold, and crossandra-Cut flowers-Rose, carnation and gerbera - Principles of Landscape designing–Styles of gardening like formal and informal- types of gardening like English, Mughal, Japanese, etc.- Garden components – flowering, foliage and Avenue trees – shrubs – creepers and Climbers.- cacti and succulents-hedge and edge plants -flowering annuals- Indoor plants – Garden adornments-Rockery-arboriculture- Lawn – types of grasses – laying and maintenance-Principles and styles of flower arrangements- Ikebana- Moribana and bonsai.

Unit 8 - Production technology of Spices and Plantation crops

Importance and scope of spices and plantation crops in India- Climate and soil requirements- varieties- seasons, seed rate/ propagation method-spacing- planting system,

-High density multiple cropping system- Shade and canopy management-water, nutrient and weed management- harvesting, yield and processing of important plantation and spice crops- Tea, Coffee, Rubber, Cocoa, Coconut, Oilpalm, Cashew, Palmyrah, black pepper, cardamom, turmeric, ginger and tamarind

Unit 9 Production technology of medicinal and aromatic crops

Importance and scope of medicinal and aromatic crops-Current status & Herbal trade-*Ex situ* and *in situ* conservation-Production systems-Contract farming-GAP-Organic production and certification-Soil & Climate-Botany-Varieties-Propagation-Nursery practices-Planting methods- Manuring & fertilizers-Irrigation-Intercropping-Harvest & Yield- Distillation methods of essential oil-Value addition-Organisational support for promotion of medicinal and aromatic crops- medicinal crops: senna, periwinkle, glory lily, aswagandha, medicinal coleus, aloe, isabgol, Phyllanthus, Aromatic crops: lemon grass, citronella, vetiver, ocimum, mint, geranium, patchouli, and eucalyptus

Unit 10- Post- harvest technology of horticultural crops

Importance of post-harvest handling in horticultural crops- Maturity indices – Post-harvest handling methods-washing- grading- waxing – grade standards- packing- types of containers and their advantages and disadvantages- Storage principles and methods of refrigerated and gas storage- storage method- pre-cooling- Controlled atmospheric storage, Modified atmospheric –low pressure storage and cold chain concept -Importance and scope of processing industry in India, general principles of fruit and vegetable preservation like canning, dehydration, freezing, fermentation-Use of chemicals (preservatives) and irradiation.

Reference books

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2. Bose, T.K. 1986. Vegetable Growing in India, Naya Prakash Publication, Calcutta.
3. Bose, T.K. 1988. Fruits of India- Tropical and Sub – tropical, Naya Prakash Publications, Calcutta.
4. F.A.O. 2003. Fruit and vegetable processing Scientific book suppliers, New Delhi.
5. Farooqui,A,A and Sriram.A 2000 Production technology of medicinal and aromatic crops
6. Giridharlal. G.S. Siddappa and G.L. Tandon, 2000. Presevation of fruits and vegetables, ICAR, New Delhi.
7. Hartman. H.T. and D.E. Kester. 1986. Plant Propagation- Principles and Practices. Prentice Hall of India Ltd., New Delhi.

8. Jitendra Singh. 2004. Basic Horticulture. Kalyani Publishers, New Delhi.
9. K.L.Chadha, 2001- Hand Book of Horticulture- ICAR, New Delhi-12
10. Kumar, N. J.B.M. Abdul Khader, P. Ragasamy and I. Irulppan, 1993. Introduction to spices, plantation crops, medicinal and Aromatic plants, Rajalakshmi Publications Nagercoil.
11. Peter, K.V. 2002. Plantation crops – National Book Trust of India – New Delhi.
12. Randhawa, G.S. and A. Mukhopadhyay. 1986., Floriculture in India., Allied Publishers (P) Ltd., New Delhi.
13. Srivastava,R.P and Sanjeev kumar ,1998. Fruits and vegetable preservation – Principles and practices, International Book Distributing Co., Lucknow
14. Veeraraghavathatham, D. M. Jawaharlal, S. Jeeva, R. Rabindran and G. Umopathy. 2004. Scientific fruit culture. Suri Associates, Coimbatore.
15. Veeraraghavathatham, D., M. Jawaharlal and Seemanthini Ramadas. 1996., A guide on vegetable culture, A.E. Publication, Coimbatore.
16. Lenka,D Commercial crops. 2006 Kalyani Publishers, New Delhi
17. Razdan,M,K 2003 Introduction to plant tissue culture Oxford & IBH Publising Co. Pvt Ltd, New Delhi

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