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No.13690/CS(Agri)/A1/AO/2022
GOVERNMENT OF PUDUCHERRY
CHIEF SECRETARIAT(AGRICULTURE)

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Puducherry, dated 18-11-2022

**Date and time for
submission
of online application
21.11.2022 (10.00 a.m.)
to
20.12.2022 (05.45 p.m.)**

NOTIFICATION

Applications are invited from the eligible Indian Citizens who are Natives/Residents of Union Territory of Puducherry for the Competitive Examination to be held for Direct Recruitment to the post of **Agricultural Officer** (Group 'B' Non-Gazetted, Non-Ministerial) in the Department of Agriculture and Farmers Welfare, Puducherry as detailed below:-

Name of the post and Level in the Pay Matrix	No. of vacancies	Reservation				
		Vertical				Horizontal
		UR	EWS	OBC	SC	PwBD
Agricultural Officer Level 6	23*	11	2	7	3	1

*Subject to variation

Abbreviations :

UR-Un-reserved, **OBC**-Other Backward Classes (includes MBC-Most Backward Classes/EBC-Extreme Backward Classes/BCM-Backward Classes Muslim/BT-Backward Tribes), **SC**-Scheduled Caste, **EWS**- Economically Weaker Sections, **PwBD**-Persons with Benchmark Disabilities.

Note :

(i) The vacancies notified are existing as well as anticipated. However, Government reserves the right either to enhance or to reduce the number of vacancies notified depending upon the actual requirement at the time of selection and also to cancel the recruitment process. No interim enquiry will be entertained.

(ii) Reservation and its inter-se exchange for Persons with Benchmark Disability(PwBD) would be made as per para 8.1 to 8.3 of the O.M. No.36035/02/2017-Estt(Res), dated 15.01.2018 of the DoPT, New Delhi.

1. Educational qualifications for eligibility:-

Degree in Agriculture/Horticulture from a recognized University / Institution or equivalent.

Note: The candidates possessing equivalent degrees shall produce the Equivalency Certificate from the concerned University, at the time of Certificate Verification.

Srinivasan P

2. AGE LIMIT

Between 18 and 30 years of age as on 20/12/2022. Age limit is relaxable in respect of OBC (includes MBC/EBC/BCM/BT), SC, Persons with Benchmark Disabilities, XSM and In-service officials as detailed below :-

Category	Relaxation of Upper Age Limit **
OBC (includes MBC/EBC/BCM/BT)	3 years
SC	5 years
Ex-servicemen (XSM)	Period of military service plus 3 years
Ex-servicemen and Commissioned Officers including ECOs or SSCOs who have rendered at least five years military services and have been released on completion of assignment (including those whose assignment is due to be completed within one year) otherwise than by way of dismissal or discharge on account of misconduct or inefficiency, or on account of physical disability attributable to military service or on invalidment	5 years
Disabled Defence service personnel	3 years
Disabled Defence service personnel – SC	8 years
Persons with Benchmark Disabilities (PwBD) (for Physical requirements & categories of disabilities suitable for this job, refer Part-II of General Instructions to candidates)	10 years (in respect of reserved applicants, over and above the admissible relaxation of 5 years for SC and 3 years for OBC (includes MBC/EBC/BCM/BT))
In-service applicant (Refer para 11)	5 years (for posts which are in the same line or allied cadres and where a relationship can be established that the services rendered by them in the Department will be useful for efficient discharge of duties of post for which selection is made).

**Requirement of age for candidates belonging to various categories are given in Part III of this Notification

3. NATIVITY / RESIDENCE :

Those who are the native of the Union Territory of Puducherry or who have continuous residence in the Union Territory of Puducherry for the last 5 years immediately preceding the date of notification only are eligible to apply for the post. The applicant can apply without a certificate but ON SELECTION should furnish the fresh Nativity/Residence Certificate issued by the Officer of the Department of Revenue and Disaster Management, Puducherry not below the rank of Deputy Tahsildar at the time of Certificate Verification.

Sandeep P

4. COMMUNITY CERTIFICATE (for OBC & SC Candidates) :

a) The selected applicants should submit a fresh Community Certificate for SC/OBC obtained in the prescribed form issued by an Officer of the Department of Revenue and Disaster Management not below the rank of Deputy Tahsildar **at the time of certificate verification.**

b) Candidates selected under SC quota should furnish Community Certificate issued under **“The Constitution (Puducherry) Scheduled Castes Order, 1964”** and **“The Constitution (Puducherry) Scheduled Castes Order, 2002”** in respect of **“Puthirai Vannan”**. OBC candidates shall produce Non-Creamy Layer Certificate.

c) Candidates belonging to the communities of OBC U.T. of Puducherry, MBC, EBC, BCM, and BT categories of UT of Puducherry will be considered under the one umbrella of OBC for the purpose of reservation. Hence, the posts earmarked for OBC in this notification applies commonly to all the above communities viz., OBC UT of Puducherry, MBC, EBC, BCM and BT categories of UT of Puducherry.

5. CERTIFICATE FOR EWS CANDIDATES:

The candidates selected under EWS category should submit Income & Asset certificate obtained in the prescribed form issued by an Officer of the Department of Revenue & Disaster Management not below the rank of Deputy Tahsildar at the time of certificate verification.

6. Document to be produced by candidates claiming age relaxation under Ex-Servicemen/Ex-Servicemen Commissioned Officers & Disabled Defence Service Personnel Category:

Applicants claiming age relaxation under Ex-servicemen, Ex-Servicemen Commissioned Officers and Disabled Defence Service Personnel category should produce original discharge book/discharge certificate issued by the Competent Authority during their Discharge from Military Service at the time of certificate verification.

7. Disability Certificate to be produced by Persons with Benchmark Disability (PwBD):

The applicants who apply against the horizontal reservation provided for Persons with Benchmark Disability (PwBD), on selection should necessarily submit the Medical Certificate issued by District Medical Board, Government of Puducherry at the time of certificate verification. Certificate received from any other authority will not be accepted. The categories of disability suitable for the post are detailed in Part-II of General Instructions to candidates.

Sundarajan P

8. MODE OF RECRUITMENT/PATTERN OF EXAMINATION :-

The vacancies in the above said post will be filled up through a Competitive Examination consists of two papers (Paper - I and Paper – II) as follows:

Paper I (Forenoon) :

The question paper will be Objective type as per the syllabus in Part IV of 2 hours duration having 100 questions carrying 1 mark for each question.

Paper II (Afternoon) :

The question paper will be of objective type with a duration of 2 hours having 100 questions carrying 1 mark for each question from General Mathematics, General Science, General English, Indian History & Geography, Indian Economics, Constitution of India, General Knowledge and Current Affairs.

The Question Paper will be in bilingual (except General English) i.e. in English and in any one of the regional languages namely, Tamil or Telugu or Malayalam. Therefore the candidates should indicate the choice of the language in which they prefer to write the examination, in the online-application.

Answering would be in the form of shading the correct answer by using **BLACK BALL POINT PEN** only and the applicants are permitted to take the carbon copy of their answer sheet along with their question booklet.

Negative mark of 0.25 will be awarded for every wrong answer and multiple answers will be treated as a wrong answer. Candidates are, therefore, advised to keep this aspect in mind while answering the questions.

The answer key will be published in the recruitment website <https://recruitment.py.gov.in> and also in the official website of the Department of Personnel and Administrative Reforms (Personnel Wing) viz., <https://dpar.py.gov.in> after completion of the examination process.

Minimum qualifying marks prescribed for the written examination:

A list of candidates will be provisionally shortlisted from the merit list based on the marks obtained by the applicants in the Written Examinations subject to reservation as per rules in force. Minimum qualifying marks to be secured by the various category of candidates are as follows:-

UR	:	35%
OBC / EWS	:	30%
SC / PwBD	:	25%

Note:

1. Candidates are required to appear for both Paper-I and Paper-II for consideration for selection. Failure to do so will result in rejection of their candidature
2. Select list will be drawn based on the marks obtained by the applicants in the competitive examination subject to reservation as per rules in force.

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9. DATE AND VENUE OF EXAMINATION :

The Competitive Examination will be held in **Puducherry region** only. The exact date, time and venue of the examination will be intimated to the eligible candidates in due course in the recruitment website & also in leading newspapers.

10. HOW TO APPLY AND LAST DATE FOR APPLICATION :

Applicants fulfilling the eligibility criteria as mentioned above may apply by online only through the official website <https://recruitment.py.gov.in> from 21.11.2022 (10.00 a.m.) to 20.12.2022 (05.45 p.m.)

11. PROCEDURE FOR IN-SERVICE CANDIDATES:

Only the candidates working as Assistant Agriculture Officer and Field Man under the cadre control of Department of Agriculture and Farmers Welfare, Puducherry will be considered as feeder cadre for the post of Agriculture Officer and allowed to appear as In-service candidates by availing the permissible age relaxation mentioned in the statement under "para 2 - Age Limit" of this notification.

Applicants working in the Government Departments/Offices and applying as In-service Applicant with age concession should forward a copy of the online generated application through their respective Heads of Department /Office within the due date i.e. on or before 05.45 p.m. on 20.12.2022 to "The Deputy Secretary to Govt. (Agriculture), Chief Secretariat, Puducherry – 605 001". The applications of In-service candidates which are not duly forwarded by the Head of Departments/Offices within the due date and time of 05.45 p.m. on 20.12.2022 will be summarily rejected. Advance copy of application for In-service candidates will not be entertained.

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GENERAL INSTRUCTIONS TO THE CANDIDATES

PART-I

Applicants should read the following instructions carefully before applying :

1. Mode of applying for the Competitive Examination for Direct Recruitment to the post of Agricultural Officer is **through online only**. Applicants shall not send the online generated application in physical form (Except in case of in-service Applicants).
2. Avoid registering multiple online applications and register only a single application. All multiple online applications will be rejected summarily and the candidates will lose their chance to appear for the exam.
3. Applicants shall upload their Photograph and Signature using either option 1 or 2 provided in the recruitment portal as given below:-

Option 1 (Scanned Photograph and Signature as a single image)

Applicants are instructed to scan their recent passport size colour photograph & signature in an A4 sheet with 200 DPI resolution, dimensions should be minimum of 600 x 600 pixel and the file size should be less than 150KB. (as shown in guidelines video for uploading and cropping your photograph and signature during online application)

Option 2 (Scanned Photograph and Signature as separate images)

Applicants are instructed to scan their Photograph in JPEG format with 238 x 306 pixel dimension and the file size should be less than 50KB.

Signature file format should be JPEG, dimensions should be 350 x 150 pixel and file size should be less than 30 KB.

4. The applicants have to register their Mobile Number in the online portal <https://recruitment.puducherry.gov.in> for applying through online. Then they will be receiving Username and Password through SMS in the mobile number provided while registration. Thereafter, the applicants have to login into the online portal using the Username and Password for applying to the post of Agricultural Officer.
5. The applicants are also advised to change the default password received in their mobile at first login. It is the applicant's responsibility to take ownership of the password and it should not be disclosed to anyone. Otherwise, the liabilities arose upon will be at the applicant's risk.
6. The applicants will be allowed to view, print & check the status of their application and download the Hall Ticket by login into the online portal using the username and password. Hence, they are advised to keep the user name and password safe for future reference until the recruitment process is over.
7. The applicant after applying can also make corrections in their on-line application, if any error occurred while entering the data. They are allowed to avail this facility till the last date for submission of application.

Sundarajan P

8. The information/data furnished by the applicants in the online application are final and cannot be altered later after last date for applying i.e. 20.12.2022 .
9. Applicants are advised to keep a copy of the application generated online for their reference.
10. Applicants except In-service candidate need not send the printout of the application or any other supporting document to this Department.
11. The applicants who are applying as In-service candidates should send the duly signed copy of the online generated applications through their respective Head of Department/Head of Office within the due date and time of 05.45 p.m. on 20.12.2022 to the Deputy Secretary to Govt. (Agriculture), Chief Secretariat, Puducherry. The applicants should also ensure that the Head of Department/Office have duly signed the "Certificate by the Head of Department/Office" provided in the online generated applications. "The online generated applications" received after the due date and time i.e. 05.45 p.m. on 20.12.2022 will be summarily rejected. Transit delay will not be entertained.
12. Original certificates are required to be produced by the provisionally short-listed candidates after the notification of result of this recruitment at the time of certificate verification.
13. All communications with regard to this recruitment will be published in the website <https://recruitment.py.gov.in> Applicants are advised to access the above website and watch news and dailies regularly for information. They are advised to keep the mobile number given in the online application active for sending SMS connected with this recruitment.
14. After scrutiny, the status of the application will be indicated in the website <https://recruitment.py.gov.in> The applicants are advised to check the official website to know their application status.
15. The decision of the Government as to the eligibility or otherwise of the applicant for admission to the examination shall be final.
16. This Secretariat will not undertake detailed scrutiny of applications for the eligibility and other aspects at the time of written examination and therefore, candidature will be accepted only provisionally. Candidates must go through the requirements of educational qualification, age, physical and medical standards etc. and satisfy themselves that they are eligible for the post. Copies of supporting documents will be sought at the time of Certificate Verification. When scrutiny is undertaken, if any claim made in the application is not found substantiated, the candidature will be cancelled and the Departmental Recruitment Committee's decision shall be final.
17. Candidates seeking reservation / age relaxation benefits available for SC/OBC/EWS/XSM/PwBD must ensure that they are entitled to such reservation/relaxation as per eligibility prescribed in the notification. They should also be in possession of the certificates in the prescribed format in support of their claim.
18. No correspondence will be entertained with regard to the recruitment process. Candidates are advised to verify the status of their application/Hall Ticket through online only.

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19. A separate press note will be issued in leading regional news dailies regarding the issue of Hall tickets through online. The eligible applicants can download their Hall tickets from the website <https://recruitment.py.gov.in> by using the "User Name and Password".

20. The admission to the examination is only provisional. Success in the examination confers no right to appointment. The appointment is subject to verification of educational qualification/residence/community and any other special category claimed by the individual including Medical Fitness.

21. Change of address & Mobile Number, if any, after submission of application should invariably be intimated to the Department by registered post with acknowledgement due. Otherwise the Department will not be responsible for any delay/non-delivery of letters/SMS message.

22. No TA/DA will be paid for attending the Competitive Examinations except SC/ST candidates who will be paid TA as per rules.

Help Line :

For any clarification, if needed, please contact the Help line number (0413)-2233246 on all working days between 09:30 a.m. to 05:00 p.m.

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PART-II

(Annexure-II to G.I., Min. of Social Justice and Empowerment, Notification No.38-16/2020-DD.III, dated 4th January, 2021)

Physical requirement for the post of Agricultural Officer for the category of Persons with Benchmark Disability:

Sl.No.	Physical Requirement
1.	Sitting
2.	Standing
3.	Walking
4.	Manipulation by fingers
5.	Reading & Writing
6.	Seeing
7.	Communication.
8.	Bending

Categories of Disabled suitable for the post of Agriculture Officer:

Sl.No.	Code	Category of Disability
1.	D	Deaf
2.	HH	Hard of Hearing
3.	OA	One Arm
4.	OL	One Leg
5.	OAL	One Arm and One Leg
6.	DW	Dwarfism
7.		Multiple disabilities involving 1 to 6 above

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PART-III

REQUIREMENT OF AGE FOR CANDIDATES BELONGING TO VARIOUS CATEGORIES

Sl.No	Category	Candidates must have born	
		Not earlier than	Not later than
1	General/Unreserved	21-12-1992	20-12-2004
2	OBC (MBC/OBC/EBC/BCM/BT)	21-12-1989	
3	SC	21-12-1987	
4	Persons with Benchmark disabilities General/Unreserved/EWS	21-12-1982	
5	Persons with Benchmark disabilities OBC (MBC/EBC/BCM/BT)	21-12-1979	
6	Persons with Benchmark disabilities - SC	21-12-1977	
7	In-service (Feeder cadre)	21.12.1987	
8	Ex-Servicemen ECO / SSCO	21-12-1987	
9	Disabled Defence service personnel	21-12-1989	
10	Disabled Defence service personnel - SC	21-12.1984	

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PART-IV

SYLLABUS FOR AGRICULTURAL OFFICER

PAPER-I

UNIT- I: IMPORTANCE OF AGRICULTURE

Importance of Agriculture in Indian Economy and its sectoral relationship - Agricultural Development through five year plans in India and Puducherry - Growth pattern of crops in India and Puducherry in terms of area, production and productivity - Government Agricultural Policies.

UNIT - II: FUNDAMENTALS OF CROP PRODUCTION

Factors of Production - Agricultural seasons of India and Puducherry - Cropping patterns in India and Puducherry - Package of practices of different crops - Agro-Climatic zones of India and their features - Weather and Climate - Weather forecasting - Climate change and its impact — Minimal tillage practices — Stress mitigating technologies including microorganisms — Nanoparticles and their applications.

UNIT - III: NATURAL RESOURCE MANAGEMENT

Soil - Soil structure - Factors influencing soil structure - Physical and Chemical properties - Effect of nutrient availability and plant growth - Problem soils and their management - Soil survey - Its objectives and scope - Soil fertility and productivity - Dry farming - Rainfed agriculture - Conservation of soil and water - Watershed and waste land development. Land use pattern and planning - Size and distribution of holdings - Types and systems of farming - Water resources development and management - Command area development - Ground water Development and Conjunctive use - Water use efficiency - Quality of irrigation water - Its effect in soil and crops - Management of poor quality water for crop growth.

UNIT - IV: CROP MANAGEMENT & ALLIED AGRICULTURAL ACTIVITIES

Cropping systems and integrated farming - Recycling of agricultural waste - Organic manures, green manures, bio fertilizers - Balanced usage - Integrated nutrient management - Physiological disorders in crop plants and their management- Irrigation management of different crops Mushroom cultivation, bee keeping, silkworm rearing etc., Energy in Agricultural production - Sources - Solar, wind, animal, biomass and biogas - Mechanization in agriculture - Tractors & tillers - Agricultural implements and Machineries and their usage - livestock and poultry rearing.

UNIT - V: CROP IMPROVEMENT

Principles of breeding - Breeding methods in self , cross and vegetatively propogated crops - Modern tools in crop improvement — Heterosis breeding and Hybrid seed production technologies - Latest varieties of major crops - Breeding for climate resilience varieties — Variety release procedures - Application of bio technology in agriculture - Tissue culture & its significance - Transgenic Plants. Plant Genetic Resources: Collection conservation and exchange- Crop varietal protection-PPV& FR authority and its role.

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UNIT - VI: SEED SCIENCE AND TECHNOLOGY

Seeds - Importance of quality seeds in agriculture — Nucleus, breeder, foundation, certified and labelled seeds - Seed certification techniques and processing - Seed testing — Seed testing laboratories-ISTA standards for seed testing - Seed village concept Seed Act - Seed coating and priming technologies - Seed enhancement technologies.

UNIT - VII: CROP PROTECTION PRINCIPLES AND PRACTICES

Importance of pest, disease, nematodes and weed management in agriculture — categories of pests, diseases, nematodes and weeds - Pest and disease surveillance and forecasting weather on pest and disease incidence - Symptoms of damages and control measures of pest, disease and nematodes of major crops - Integrated pest, disease and nematode management in crop production - Pesticides and their use in IPM — Mode of action - Pattern - Plant protection equipments and their use - Plant quarantine. Storage pests, disease and nematodes and their management. Importance of biological control in pest, disease and nematode management. Weeds - Major weeds and their control.

UNIT — VIII: FARM BUSINESS AND FINANCE MANAGEMENT

Farm business management - Principles of farm business management — Types and systems of farms-Classical production functions - Cost concepts - Management of resources - Farm Planning and budgeting - Investment analysis — Risk and uncertainties in agriculture - Agricultural credit system in India - Multi credit delivery system - Role of nationalized banks, NABARD and Regional Rural Banks - Lead Bank Scheme - Service area approach - Scale of finance-Credit Worthiness-3 Rs,5Cs and 7Ps of credit- Crop Insurance - Kisan Credit Cards (KCC) - Agricultural Insurance Company.

UNIT - IX: AGRICULTURAL MARKETING AND MARKET INTELLIGENCE

Marketing - Agricultural marketing - Market structure — Marketing efficiency - Price Spread-Market Integration-Market Risk-Speculation and hedging - Market Institutions- Warehouses and rural godowns - Agmark-Cooperatives - Commodity Boards — Agri business management — Principles of Management-Entrepreneurship Development - Forms of Business organizations - Agricultural Price Policy - CACP-MSP - FRP- Procurement Price- Policies for agricultural development - Economic liberalization - WTO and its impact on agricultural export -

UNIT - X: AGRICULTURAL EXTENSION: PRINCIPLES AND METHODS

Extension methods for transfer of technology - AV aids-Communication models - Use of ICT in transfer of technology-Diffusion and adoption- Pre and post independence rural development initiatives: key features, strength and weakness of individual programmes - Programme planning and evaluation methods- Rural sociology - Key features of Indian rural system-Value system-Social change- Rural migration. Role of women in agriculture.

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SUBJECT: HORTICULTURE

UNIT - I: FUNDAMENTALS OF HORTICULTURE

Scope and importance - State, National and Global scenario of horticultural crops - Area and production - Import and export - Nutritive value of horticultural crops - Horticultural zones of India - National and regional agencies involved in promotion of horticultural Industry in India (NHB, APEDA and Commodity Boards) - Classification of horticultural crops - Factors limiting horticultural crop production - Role of season - Soil and climate requirements - Physical and chemical properties of soil - Climatic factors - Light, temperature, photoperiod, relative humidity, rainfall, altitude, microclimate - Kitchen gardening - Nutrition gardening - Truck gardening - Market gardening - Vegetable forcing - protected and precision horticulture - Hydroponics, Aeroponics - Nutrient Film Technique - Horticulture therapy.

UNIT - II: GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS:

Important phases of growth and development - Bearing habits - Classification of horticultural crops based on life cycle - Annual, biennial perennial (woody and herbaceous perennials) - Fruitfulness and unfruitfulness - External and internal factors associated with unfruitfulness - Physiology of flowering, fruit set, ripening and senescence - Fruit drop - Causes and control measures - Plant growth regulators - Functions and role in horticultural crops - Bud dormancy - Dormancy breaking - Parthenocarpy - Parthenogenesis - Polyembryony - Stenospermocarpy - Vivipary - Apomixis.

UNIT - III: PROPAGATION OF HORTICULTURAL CROPS

Propagation - Definition - Establishment of nursery - Site selection - Tools and implements propagation structures - Mist chamber, phytotron - Humidifiers - Greenhouse - Glasshouse - Polyhouse - Shade net, glass house, poly tunnels, cold frames and hotbeds, pit nursery - Media and containers - Soil sterilization - Sexual propagation - Merits and demerits - Crops propagated through seeds - Seed viability, longevity, dormancy, germination - Pre-sowing treatment - stratification, scarification, seed priming, seedling vigour - Raised seed bed and pro-tray nursery - Asexual propagation - Merits and demerits - Methods of vegetative propagation - Identification of plus trees - Mother block, scion bank - Clonal nursery - Cutting - Layering - Grafting, budding types - Anatomical and physiological basis of grafting - Stock scion relationship, graft compatibility - Budwood selection and certification - Propagation through specialized plant parts (bulbs, tubers, offsets, runners, suckers, slip, crown, rhizomes, corms) - Quality management and nursery certification - Micro propagation - Application - infrastructure requirements - Types of media - Stages of micro propagation - Micro grafting - *in vitro* propagation of important horticultural crops.

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UNIT - IV: MANAGEMENT TECHNIQUES FOR HORTICULTURAL CROPS

Planning - Layout and management of orchards - Fencing - Wind breaks and shelter beds - Spacing - Planting system - Physical and chemical properties - Soil reaction - acid, saline and alkaline soils - Soil fertility - Essential elements - Functions - Organic manures and inorganic fertilizers, bio-fertilizers, vermi-composting - Applications and management - Nutrient deficiencies and corrective measures - Physiological disorders and remedies - Irrigation - Critical stages of water requirement - Effect of water stress on crop yield - Anti-transpirants - management of irrigation water quality - Conventional and micro irrigation - Fertigation - Mulching - Sod culture - Weed management - Application growth regulators - Training and pruning principles and methods - Rejuvenation of senile and old orchards - Cropping systems - Cover cropping - Multitier cropping - Intercropping - Special horticultural techniques (pinching, thinning, disbudding, blanching, smudging, notching, ringing) - Principles of organic horticulture - GAP and GMP.

UNIT - V: PRODUCTION TECHNOLOGY OF FRUIT CROPS

Scope and importance of fruit crops - Composition and uses - Origin and distribution - Species - Season - Climate and soil requirement - Varieties and hybrids - Propagation techniques - Planting systems and planting density - Including high density planting (HDP) and ultra high-density planting (UHDP) - spacing - Water and nutrient management - Fertigation - Weed management - Canopy management - Training and pruning - Intercultural practices - Off season production - Special horticultural techniques - Use of plant growth regulators - Maturity indices - Harvest and yield - Nutrient deficiencies and physiological disorders and its corrective measures and management of important pest and diseases of important fruit crops - Mango, Banana, Acidlime, Sweet orange, Mandarin, Grapes, Papaya, Guava, Sapota, Pineapple, Jackfruit, Pomegranate, Aonla, Annona, Ber, Apple, Pear, Plum, Peach, Strawberry, Litchi, Avocado, Walnut and Almond and minor tropical, arid and temperate fruit crops.

UNIT - VI: PRODUCTION TECHNOLOGY OF VEGETABLE CROPS

Scope and importance of vegetable crops - Composition and uses - Origin and distribution - Area and production - Soil and climate requirements - Varieties and hybrids - Propagation methods - Seed rate - Sowing and nursery practices - Containerized seedling production - Season - Planting methods - Water, nutrient and weed management - Fertigation - Training for vegetables - Intercultural practices - Maturity indices - Harvest and yield - Nutrient deficiencies and Physiological disorder and its corrective measures of important vegetable crops: Tomato, Brinjal, Chilli and Capsicum (Sweet Pepper), Bhendi, Leguminous vegetables (Beans, Peas, Cluster beans, Cowpea, Dolichos bean); Bulbous vegetables (Onion, Garlic); Tuber crops - (Potato, Tapioca, Sweet Potato, Elephant footyam, Colocassia); Cucurbitaceous vegetables (Cucumber, Bittergourd, Snakegourd, Ridgegourd, Ashgourd, Muskmelon, Watermelon, Pumpkin) - Cruciferous vegetables (Cabbage, Cauliflower and Knolkhol); Root vegetables (Carrot, Radish, Beetroot, Turnip) - Leafy vegetables (Spinach, Lettuce, Palak, Amaranthus) - Perennial vegetables (Drumstick, Coccinea) - Protected cultivation of vegetable crops - Precision farming of important vegetable crops and seed production.

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UNIT - VII: FLORICULTURE & LANDSCAPE GARDENING

Scope and importance of flower crops production – Uses – Origin and distribution – Area and production – Climate and soil requirement – Species and varieties – Propagation, season – Spacing and planting methods – Irrigation, nutrient management – Fertigation – Weed management – Training and pruning – Intercultural operations – Special horticultural techniques – Growth regulators – Off season production – Maturity indices – Harvest and yield and management of important pest and diseases for important loose flower crops: Jasmine, rose, Tuberose, Chrysanthemum, Marigold, Nerium and Crossandra – Cutflowers – Rose, Carnation, Anthurium, Orchid and Gerbera – Cutfoliage and fillers. Principles of Landscape designing – Styles of gardening – Types of gardening viz., Hindu, English, Mughal, Japanese, Persian, Italian, French gardening – Garden components – Tree foliage flowering and avenue trees – Buriapping – Shrubs – Flowering annuals, creepers and climbers – Cacti and succulents – Lawn – Astroturf – Types of grasses – Layout, planting and maintenance of lawn – Hedge and edge plants – Indoor plants and interior scaping – Garden adornments – Principles and styles of flower arrangements – Bonsai styles and culture – Industrial, Institutional, Public and Private landscaping – Special types of gardening – Bog garden, dish, terrarium, bottle, roof, vertical gardening and greenwall.

UNIT VIII: PRODUCTION TECHNOLOGY OF SPICES AND PLANTATION CROPS

Scope and Importance of spices and plantation crops – Composition and uses – Origin and distribution – Area and production – Climate and soil requirements – Species and varieties – Season, seed rate / propagation methods – Spacing – Planting system – High density planting – Irrigation and nutrient management – Fertigation and weed management – Training and pruning – Cropping systems – Multitier cropping – Cover cropping – Inter cropping – Growth regulators – Mulching – Shade and canopy regulation – Maturity indices, harvest, yield and management of important pest and diseases and processing methods of important plantation and spice crops: Major - seed, tree, herbal spices and minor spices – Black Pepper, Cardamom, turmeric, Ginger, curry leaf, Clove, Nutmeg, Cinnamon, Coriander, Fenugreek, Cumin, Tamarind, all spice and vanilla – Plantation crops – Tea, Coffee, Rubber, Cocoa, Coconut, Oilpalm, Cashew, Palmyrah, Arecanut.

UNIT - IX: PRODUCTION TECHNOLOGY OF MEDICINAL AND AROMATIC CROPS

Scope and importance of medicinal and aromatic crops – Composition and uses – Origin and distribution – Area and production – Ex situ and insitu conservation – Classification of medicinal and aromatic crops – Constraints in medicinal plant cultivation – Climate and soil – Varieties – Propagation – Nursery practices – Planting methods – Cropping systems – Manures & fertilizers – Irrigation – Intercultural operations – Harvest indices – Harvest & yield and management of important pest and diseases – Production systems – Contract farming – GAP – GCP – GMP – Organic production and certification – Classification and distillation methods of essential oils – Secondary metabolite production – Value addition – Organisational support for promotion of medicinal and aromatic crops – Medicinal crops: Senna, periwinkle, Glory lily, Aswagandha, Medicinal coleus and Solanum, Sweet flag, Aloe, Isabgol, Phyllanthus, Stevia, Opium poppy. Aromatic crops: Lemon grass, Citronella, Vetiver, Ocimum, Davana, Mint, Geranium, Patchouli and Eucalyptus.

Sudamjan P

UNIT - X: POST - HARVEST TECHNOLOGY OF HORTICULTURAL CROPS

Importance of post-harvest handling in horticultural crops - Maturity indices - Post-harvest handling methods - Washing - Grading - Waxing - Grades and standards - Methods of packing - Types of containers and their advantages and disadvantages - Storage - Principles and methods of refrigerated and gas storage - Storage methods - Pre-cooling - Controlled atmospheric storage, Modified atmospheric storage - 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 - GMP - Food safety and quality control.

UNIT XI - HORTICULTURE

Definition and classification - scope, area and production - economic, nutritional, medicinal and aesthetic importance of horticultural crops - International and National Organizations / Agencies in Horticultural Promotion - horticultural zones - soil and climatic requirements - plant propagation methods and propagation structures - propagation media - invitro propagation techniques - planning and layout of orchard - planting systems - cropping systems in horticulture - principles and methods of training and pruning in horticultural crops - orchard rejuvenation - fertilizer and irrigation management - production technology for major horticultural crops - physiological disorders and their remedial measures - unfruitfulness - protected cultivation - principles of landscape gardening - harvest indices - post harvest management in horticultural crops - organic farming in horticultural crops.



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