Centre for Protected Cultivation Technology

ICAR-IARI PUSA NEW DELHI 12

Model
Entrepreneurship and Leadership Development Programme for Horticulture Entrepreneurs Desirous of applying to Schemes of National Horticulture Board

Crop / Activity	Protected cultivation of Vegetables

2019-20

Become Entrepreneur	
	Lead Change and Innovation
Be creative	
	Lead Profits

Centre for Protected Cultivation Technology

ICAR-IARI PUSA NEW DELHI 12

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Training Programme Name	**Entrepreneurship and Leadership Development Programme of Horticulture for Protected cultivation of Vegetables** Tomato, Capsicum and Cucumber

Introduction: India is the second largest producer of Fruits and Vegetables globally. During 2017-18 the production of Fruits is 97 Million MT and that of Vegetables is 184 million MT and that of flowers is 2.4 Million MT. The salient features of commercial Horticulture are Perishability, intense Technology, High Profitability accompanied with high investment and High Risks including vulnerability to post-harvest losses. Overall it demands very good entrepreneurship and leadership.

Indian floriculture market was worth Rs 130 billion in year 2017 it has been projected to reach 394 billion by 2023 at CAGR of 20% during 2018-2023. GOI has identified as sunrise industry and accorded it 100% export oriented status. Owing to steady increase in demand commercial floriculture has emerged as Hi-Tech activity taking place under controlled climatic conditions inside greenhouse.

National Horticulture Board, an autonomous organisation under the Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India has been promoting and developing commercial horticulture in the country since 1984.Appreciating both the challenges and prospects of commercial horticulture, so as to mitigate constraints and risks and maximise benefits and net income, NHB has taken a number of initiatives viz., Model Detail Project Reports, conducting both awareness and technical workshops and simplification of scheme implementation process. One another measure taken up is encouraging farmers, entrepreneurs and applicants desirous of availing benefit under its schemes to have requisite entrepreneurship and leadership by undergoing a 06 days training programme at one of the best training institutes recognised by it.

Rationale for the Training: NHB projects are credit linked and back ended and are capital intensive running from several lakhs to several crores. In addition these involve good documentation and timebound activities on the part of promoter, banker and other stakeholders. So endeavour should be to ensure that the project is successful by all means be addressing all possible risks. Over the years it has been observed by NHB that most of the promoters of NHB projects are not having the required understanding of scheme documentation, timebound activities and lack knowledge and skills of handling the project themselves and thus become subjected to vagaries of others ignorance and omissions and commissions. The result is a number of projects have failed or became ineligible for subsidy consideration. Thus so as to rule out any these omissions and commissions and risks, NHB has made it mandatory for every applicant to undergo a 06 days training programme at one of the NHB recognised /approved institution, with a goal of zero rejection of a project for which IPA is issued.

Importance of Project: Crop / Activity: Global/National/State and role in horticulture development

Name of Activity
Protected cultivation of Vegetables- Tomato, Capsicum and Cucumber

Profile of the Institute: Centre for Protected Cultivation Technology, ICAR-IARI PUSA NEW DELHI 12

The Centre was established in the year 1998-99 as demonstration farm and commissioned as Indo-Israel project in January 2000 as a project undertaken jointly by the government of India, through Department of Agricultural Research & Education (DARE) & ICAR and the Government of the State of Israel, through the Centre of International Cooperation (MASHAV) & CINADCO. The project farm was aimed to demonstrate different technologies for intensive and commercially oriented peri-urban cultivation of horticulture crops for improved quality and productivity. The centre was established to act as a nodal centre of R&D work, training and transfer of technology on the above aspects. The project was established to demonstrate peri-urban, high technology methods of growing flowers, vegetables and fruits. Collaboration with Govt. Of Israel was concluded in 2004 and the unit was re-designed as Centre for Protected Cultivation technology (CPCT). Over the years, the centre has progressed considerably and diversified into various kinds of protected structures and production technologies of several crops including high tech nursery management have been standardized. Protected cultivation technology as an integral component of precision farming has the ability and potential to enhance input use efficiency to a significant level so as to achieve sustainability in food production. The infra-structure at the centre includes climate controlled & naturally ventilated greenhouses for vegetables and flower crops, net houses, nursery facilities, open fields, drip irrigation system and packaging cum training hall.

MANDATE OF CENTRE:

- To conduct R&D work to evaluate different protected cultivation technologies and make them adaptable for different categories of farmers.
- To demonstrate different technologies appropriate for intensive and commercially oriented peri-urban cultivation of horticultural crops for improved quality and production.
- To conduct training programs for HRD and technology transfer.

Research Emphasis:

- Development of production technology for growing vegetables and flowers under surface covered cultivation
- Development of design guidelines of protected structures for different agro climatic conditions
- Development of fertigation scheduling strategies for horticultural crops in protected cultivation

- Development of soil-less/hydroponics cultivation technology for protected cultivation of vegetables and flowers
- Development of solar powered protected cultivation modules for energy conservation
- Demonstration, dissemination and evaluation of proven surface covered cultivation technologies in CPCT farm and farmers fields

INFRASTRUCTURE: The 25 acre CPCT farm has following basic infrastructure facilities.

- Naturally ventilated Greenhouses
- Semi-climatic controlled Greenhouses
- Climate controlled Nursery
- Soil-less /Hydroponics equipped Greenhouse
- Walk in Tunnel/Low Tunnel
- Reservoirs
- Irrigation and Fertigation control Units
- Mulching with Drip Fertigation
- Training Hall
- Packaging Hall
- Laboratory
- Class Room with Internet

Other Important facilities available at Institute Level:

- Library
- Soil and water Testing Labs
- Pusa Produce sale counter
- Seed Sale counter
- ICAR Publication Window

1. **Competent Faculty.**

SN	Name of Faculty	Designation	Qualification	Expertise	Experience in years
1	Dr Neelam Patel	Principal Scientist & In-Charge	Ph.D	Greenhouse management/ Irrigation and Fertigation /water Resource Management	20 years Professional Research,Teaching and Training Experience in the field of water and Protective Cultivation
2	Dr Murtaza Hasan	Principal Scientist	Ph.D	Greenhouse management/ Irrigation and Fertigation /water Resource Management	20 years Professional Research,Teaching and Training Experience in the field of water and Protective Cultivation
3	Dr Naved Sabir	Principal Scientist	Ph.D	IPM, GAP, nematode management and grafting in Greenhouse	30 years Professional Research and Training Experience in the field of Protective Cultivation
4	Dr Mam Chand Singh	Principal Scientist	Ph.D	Greenhouse Flower Management	20 years Professional Research,Teaching and Training Experience in the field of greenhouse flower
5	Dr Awani Kumar Singh	Principal Scientist	Ph.D	Greenhouse Vegetable Management	20 years Professional Research,Teaching and Training Experience in the field of greenhouse vegetable
6	Dr P K Singh	Principal Scientist	Ph.D	Greenhouse Vegetable Management	20 years Professional Research and Training Experience in the field of greenhouse vegetable
Centre has 6 dedicated and experienced Technical officers to support all the training initiatives					

Training programmes Organized :

List of Training Programs Organized at CPCT, IARI (Year 2009-18)				
No	TITLE OF TRAINING PROGRAM	DURATION	No	Participants Detail
1	ष्उद्यानिकी फसलो की संरक्षित खेती तथा आधुनिक पौध उत्पादन प्रोधौगिकी"ष	4–7–2009 से 10–7–2009	30	किसान, बिहार
2	"उद्यानिकी फसलो की संरक्षित खेती तथा आधुनिक पौध उत्पादन प्रोधौगिकी""	13–7–2009 से 19–7–2009	30	किसान, बिहार
3	ष्उद्यानिकी फसलो की संरक्षित खेती तथा आधुनिक पौध उत्पादन प्रोधौगिकी""	1–8–2009 से 8–8–2009	25	Hort. Officers, Bihar
4	Protected cultivation of horticultural crops	Nov 30 to dec 5, 2009	8	Hort. Officers,/ N.E. States
5	Protected cultivation of horticultural crops	दिसम्बर 7 से 12, 2009	7	किसान/एन.ई. स्टेट
6	Protected cultivation of horticultural crops	फरवरी 4 से 6, 2010	50	किसान / कोटा
7	Protected cultivation of horticultural crops	फरवरी 22 से 26, 2010	25	किसान / उदयपूर
8	Protected cultivation of horticultural crops	Nov 08 to 13, 2010	25	Farmers / NE State (Manipur)
9	Green House Technology for Horticulture crops	May 3 – 6, 2011	30	U.P. , Farmers
10	Green House Technology for Horticulture Crops	May 7 – 10, 2011	30	U.P. , Farmers
11	Sanrakshit kheti (Protected Cultivation)	June 14-17, 2011	13	IFFCO Foundation Officers
12	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	March 16-18,2012		Farmers of Daily and NCR
13	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	August 16-18,2012	25	Farmers/भुनेश्वर

14	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	August 21-26, 2012	25	Women Farmers /उदयपुर राजस्थान
15	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	August 27-2 Sept. 2012	25	Farmers / देहरादून उत्तराखण्ड
16	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	September 03-09, 2012	25	Farmers / देहरादून उत्तराखण्ड
17	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	September 11-14, 2012	25	Farmers/ राँची झाँरखण्ड
18	Protected Cultivation of High Value vegetables and Cut Flowers-A Value Chain Approach	September 03 and 08 2012	25	North East (Sikkim)
19	Advances in Micro Irrigation and Fertigation	05-25 Nov 2012	25	ICAR
20	फुलों की संरक्षित खेती एवं भूदृश्य	**14–16 मार्च, 2013**	**20**	दिल्ली विकास प्राधिकरण
21	Protected Cultivation of Horticulture crops	15-20 Sept 2014	20	किसान
22	Protected Cultivation of Horticulture crops	23-25 Sept 2014	20	किसान
23	Protected Cultivation of Horticulture crops	26th Dec 2014-15th Jan 2015	25	ICAR
24	Hi –Tech Horticulture	**02-06** November **2016**	**50**	Farmers/Growers
25	Training on Protected cultivation technologies	27**-**30 November **2016**	**35**	Farmers/Growers
26	Water management	03**-0**4 October **2016**	**15**	Farmers/Growers
27	Protected cultivation	15-16 December **2016**	**51**	Farmers/Growers
28	Protected cultivation	07 November **201**7	**50**	Farmers/Growers
29	More profit from Protected cultivation	14**-**15 February	**30**	Farmers/Growers

		2017		
30	Training on Protected cultivation technologies	**0**6**-0**7 March **201**7	**28**	Farmers/ Growers
31	Protected Cultivation of Horticulture crops	12-21 Nov 2017	20	ICAR
32	Protected Cultivation of Horticulture crops	28-29 Dec 2017	25	Farmers
33	HYDROPONICS TECHNOLOGY	15-17 Nov 2018	25	North East Oficial

Objectives of Training Programme :

1. Knowledge: Ensure every trainee acquires adequate knowledge and understanding of NHB Scheme Operational guidelines, Annual design and procedure viz.
    a. Eligibility of applicant including definition of family, and project, the process and steps involved in the scheme implementation, timelines, Scheme cost norms, pattern of assistance etc. Calculation of Eligible Project cost, Eligible components for subsidy, NHB standards, Basic Data Sheet & Protocols to be complied for availing subsidy,; Crop / Project specific Model DPR Template, Terms and conditions of IPA, Do's and Don'ts for Applicants /Banks/NHB officials for IPA ,
    b. List of documents(enclosed)
    c. To acquaint with NHB website including registration and modes of online application, operation of online account and contact persons, helpdesk and grievance redressal.
    d. Subsidy claim process through Bank/FI and list of documents to be submitted along with claim, JIT process, JIT Format, Documentation, Circumstances to request for and consider Re-JIT& Post-JIT process.
    e. Formats of Agenda and check list used for processing subsidy claim.
    f. How to expand understanding based on the minutes of meetings of previous IC and PAC available on website. It helps the applicant to understand how decision on subsidy is being made.
    g. To know and appreciate specific Horticultural commodity / crop economic importance and potential of fresh commodity and processed / value addition commodity; Country and Global scenario and State/UT Scenario.
    h. To learn / visit success stories / best practices including cluster development / FPOs; interact with successful entrepreneurs; and recognise key factors responsible for success and failure.
2. Personal leadership and skills development
    a. To explore leadership roles required in horticulture business and realign and recalibrate self with new knowledge, concepts and tools.
    b. Managing change and innovation and Taking charge and leading strategy.
    c. To learn/ improve IT/ social media and know how to benefit from Internet and newspapers/media.
    d. To improve leadership / social skills especially common informed vision, communication, team work, negotiation skills; with an exercise and success story.
3. Selection of cultivar, Technology to be adopted and Production practices for crop intensification and high productivity and ecological sustainability.
    a. How to select suitable variety/hybrid/cultivar and source quality planting material/ seed based on market demand and sustainability.
    b. Technology: Protection cultivation Technology-various kinds, customisation based on Agro-climatic condition, crop and pest and diseases profile; familiarisation of components and Mechanisation and Automation.

c. To know scientific production, harvesting and post-harvesting practices, technology and management and Analyse gap analysis with that of the current practices, technology and management of trainees.

4. Harvesting, Post-Harvest Management practices, technologies and Infrastructure
    a. Time of Harvesting, Moisture level of the produce, post-harvest practices, cleaning, sorting, grading, packing, labelling, pre-cooling, storage and transportation.
    b. To be aware of Post-harvest and storage practices, protocols and technologies.
    c. To know required infrastructure- Supply Chain/ Cold Chain and Marketing infrastructure and Gap analysis to the context of trainees.
5. Processing and value addition
6. Marketing and value chain development
    a. To know value chain and document current value chain of trainees context.
    b. To know how to source inputs from reliable and quality sources economically and explore best way / place to sell.
    c. To know market based production concept; crop planning and preparing crop calendar.
    d. Analyse market prices of various markets and causes of instability. Document market efficiency and share of grower in consumer price realisation and possible way to minimise price spread.
    e. To know importance of branding and promotion.
    f. How to become an Exporter and know the roles of APEDA.
7. Cold-chain development both for Export and Domestic Markets
8. Producing quality produce: MPS registration will be taken into account Breeders rights
9. DPR for Vegetables Capsicum, Cucumber and Tomato and their Project Management including Finance & Credit.
    a. To empower selection of crop based project based on Agro-climatic/soil/ water suitability, Market, Finance and Technical viability.
    b. To empower the trainees to prepare Detail Project Report of his/her project. In case it is already prepared with the help of external expert, the trainee is made to understand and critically analyse the same.
    c. To know about Banks/ Financial Institutions; Loan procedure-how to avail finance/ credit- challenges and prospects. Document difficulties in trainees context and facilitate in possible solutions on expeditious and easy access to credit.
    d. To know risks viz., including natural calamities in production and business and their management strategies including insurance schemes.
    e. To learn about Farm record book keeping.
10. Cluster development / Collaborative farming: What is cluster? Essential elements? To know importance of cluster approach,
11. Government organisations and Schemes related to Horticulture and laws to be complied.

12. Horticulture Statistics sources including DAC&FW website and State Horticulture Dept. website.
13. Technology and Entrepreneurship

Pedagogy: Training methods / styles are:

a. Lectures- with two way communication using Audio-visual aids, videos etc.
b. Group discussion
c. Panel discussion
d. Skill practice
e. Interactive field visits etc.

Outputs expected: (As on the last date of 6 days training)

1. 100% attendance of all Classes prescribed.
2. Daily studying of reading material provided.
3. Successful and timely completion of assignments.
4. A score a minimum of 65 % in final assessment by each trainee.
5. Knowledge: by each of the trainee
    a. Essential elements of NHB Scheme guidelines, documentation & processes and Do's and Don'ts, understanding DPR, Bank Appraisal and Sanction, identification of risks and vulnerabilities and measures to address the same, Processes and documentation of NHB scheme implementation for successful subsidy release.
    b. Essential elements of scientific and commercial Production, harvesting, post-harvest, Marketing, Exports etc. in English/Hindi/trainees' language.
    c. Good Agricultural Practices, PBR, MPS registration. Traceability and standards etc.
    d. Documentation of analysis of current scenario of trainees context- production, harvest, post-harvest, supply chain, marketing and gap analysis and possible road map.
6. Skills: by each of the trainee
    a. Curiosity and continuous learning.
    b. Crop: Modern scientific Cultivation, harvesting, post-harvest, food safety, traceability certification and standards.
    c. Project: PHM&CC: Modern scientific operations, technology, safety etc.
    d. Familiarisation of Technology, Standards, Protocols and hands on experience.
    e. Good understanding of DPR and Project Management:
    f. A 3 year Strategic action plan: A Year to Year strategy for 3 years to achieve set goal in 3 years- for improved production & productivity with economy, modern harvest, post-harvest practices, infrastructure, marketing and organisational systems for improved incomes.
    g. Problem solving- to solve existing problem being faced by the trainees.
7. Attitude: developing confidence and leadership to successfully complete NHB project timely as per NHB norms, specifications/standards, protocols etc.

8. Networking with various Government and Non-Government Agencies and mentors.
9. To know various schemes and future useful training programmes across the country.

Outcomes expected(in 18 months)

1. The proposed training completed Successfully with right technology and processes complying with all NHB Scheme requirements.
2. Cost of production reduced ; crop health improved, productivity increased & losses reduced.
3. Food safety Improved, certification / standards compliance
4. Quality infrastructure created .
5. profits/ net income increased.

Programme in Brief

Training Programme Name	**Entrepreneurship and Leadership Development Programme for Horticulture for Protected cultivation of Vegetables Tomato, Capsicum andCucumber**			
Duration	6 working days: 1 Weeks (total day required : 7 Days including arrival and departure)			
Participant Target Group	Individuals desirous of availing NHB benefit under Scheme No.1 and also for those who want to improve their knowledge and leadership in protected Vegetable cultivation .			
Training Coordinators with Designation and Address Tel, Mobile and email id	Dr M Hasan, Dr Awani Kumar Singh, Dr P K Singh and Dr Neelam Patel Principal Scientist Centre for Protected Cultivation Technology, ICAR-IARI PUSA NEW DELHI 12 Incharge_cpct@iari.res.in hasaniari40@gmail.com M-9868060358			
Languages	English/Hindi			
Tentative Training calendar for 2019-20	Month	Last date for Registration	Training reporting dates	Training Dates
	December 2019	5 December 2019	8 December 2019	9 to 14 December 2019
	January 2020	1January 2020	5January 2020	6 to 11 Jan.2020
	February 2020	30 January 2020	2 February 2020	3 to 8 February2020
	March 2020	27 February 2020	1March 2020	2 to 7 March 2020
How to Apply	By E mail			
Next review/ revision of Training Design	February 2020			
Batch size and cost and Payment system (ICAR-IARI norm) Accommodation in the guest house is restricted to availability	Batch size	Course Fee with accommodation per trainee	Course Fee without accommodation	Total cost for 6 days (approx)
	To be decided			
Enrolment	Is voluntary on the part of trainee and on his/her submission of willingness in writing to undergo training.			
Certificate	Upon successful completion of training with 65% marks in final assessment, the candidates are awarded completion certificate with marks.			
NHB & HTI Role	1. The training programme is voluntary for any individual or trainee. 2. The cost of training is to be borne by trainee him/herself. 3. The training is not sponsored by NHB nor by any Government.			

	4. Upon 100% attendance and upon scoring 65% marks is considered as successful completion and then are eligible for training completion certificate. 5. Successful completion of training programme by the applicant and submission of completion certificate is one of the requirement for obtaining In-Principle Approval (IPA). 6. It is compulsory to reside in the hostel/accommodation provided by the institute in the interest of training. 7. The training institute has no say in NHB decision making either in approval or rejection of IPA or sanction or not sanction of Subsidy. 8. Trainees are responsible for their conduct and wellbeing issues 9. NHB has no liability towards IPA and Subsidy release or non-release 10. HTI has no liability towards IPA and Subsidy release or non-release.

Expectations from trainee before the arrival to the Training institute:

1. Study NHB scheme guidelines of all schemes with emphasis on specific component for which application is being/ is made including General conditions, Basic structure, Applicant eligibility, Technical standards, Basic Data sheet and Protocols, Budgetary allocation for his/her state/UT, Guidelines for submitting application, cost of application, various prescribed formats,FAQs, Dos and Don'ts, Agenda and Checklist, List of documents to be submitted both for Pre-IPA and IPA available in NHB website and as received in their online account.
2. Study one's own Detail Project Report along with Model DPR available in NHB website.
3. Visit NHB website and study various services available- especially Scheme guidelines, Model DPRs, Technical Standards, Statistics, NHB interactive, Minutes of meetings (past), Public circulars to the extent possible.
4. Should see him/her self whether he/she is satisfying NHB Scheme requirements.
5. To cooperate with Horticulture Training Institute.
6. To share specific problems/ gaps / barriers in horticulture growth and profits in his area.

Material to be brought by each of trainee:

1. Hardcopy of application already submitted to NHB if any.
2. Hardcopy of DPR already submitted to NHB or prepared if any.
3. Hardcopy of Model NHB DPR if possible.
4. Hardcopy of copy of Dos' and Don't's, Agenda and Checklist, List of documents to be submitted.
5. Hardcopy of applicants' eligibility and General conditions.

Day wise schedule

Session	Module	Learning	Expert
	Registration	**Registration** Prior-Assessment of knowledge, attitude and skills	
Day1 Session 1	**Orientation / Inauguration**	• General discipline in class room (Do's and Don'ts) • Every trainee to share their introduction with expectations. • Motivational Talk	Course coordinators CPCT IARI
Day1 S2	Economic / Marketing Potential and Specific State/ UTs context: Scope and opportunities and Success stories.	1. Greenhouse Vegetable Crop Origin, Botany and economic products of Tomato, Cucumber and capsicum Area, Production, Productivity, Prices & value. In context with India & state 2. Global: Area, Production, Productivity, Prices Export and Import scenario 3. Domestic market : Supply and Demand 4. Case study of success stories-2 5. Concerns for growers / entrepreneurs!	CPCT IARI Faculty & Successful entrepreneur
Day1 S3	Personal skills development	1. Lecture on soft skill development & leadership required in horticulture business	**Guest Faculty**
Day1 S4	NHB Scheme Guidelines, Annual Design and Processes of successful implementation and DPR, Bank Appraisal and Sanction of own Project	Group Discussion and Presentation by each group: 1.Scheme guidelines 2.Flow chart 3.Dos and Donts, List of documents to be submitted and Agenda and Checklist. 4.Technology standards/ Specifications etc. 5.Issues with Banks. 6.Common reasons for rejection of Projects at NHB. 7.Q& A on Queries.	**DD NHB**
	Quiz	Today's learning	
	Reading material for next day*	1. Study of NHB Scheme guidelines and come up with queries. 2. Reading material on Protected cultivation technologies, components and erection. 3. Reading material on Agronomic practices.	
	Evening/Nigh Home work/ Assignment #	• Creation of Whats' app group of all trainees. • Joining of NHB crop specific/Project specific Whats' app group.	

*: TO be read in the night before attending next day class.

#: Are evaluated/tested the following day.

Day2 S1	Protected Cultivation Technologies	Types of greenhouses , Site selection, Layout & Design &Dimensions Structure Selection based on crop, location, climate, Foundation, Erection, Selection of cladding material, Quality norms of Greenhouse erection materials. Familiarise different components & equipment of GH/ Shade net etc, Climate Control in greenhouse – RH, Temperature, light, as per crop requirement, operation & maintenance, automation in greenhouses Cost and Economics of Protected cultivation, register keeping, Annual Maintenance Contract, insurance etc. Selection of fabricator, Do's and Don'ts	**CPCT Faculty**
Day2 S2	Visit to Poly house / Shade net/ Tunnel/ etc. & Agronomic practices regarding media preparation	Familiarise technology and components of protected cultivation, practical on erection/ fabrication, challenges and suitability. • Collective erection of Poly house / Shade net /Tunnel. Soil & Water testing- PH & EC Concept, treatment and its importance. • Bed preparation and proper site/ field lay out / design • Fumigation & Mulching • Basal dose preparation Plantation	**CPCT IARI,**
Day2 S3 & 4		• Soil less Media in Protected cultivation: • Coco peat , Rock wool, Perlite, Vermiculite • Media Bag Selection Soil and Soil less cultivation &Importance in Flower cultivation	**CPCT FACULTY**

Day 3 **S.1 & 2 Sessions**	CropProduction Technology- Class room	**Crop production technology of** Tomato, Capsicum and cucumber	**CPCT FACULTY**
S.3 & 4	Visit to Poly house / Shade net/ Tunnel/ etc.	Practical sessions involving all the issues related to crop production technology of Tomato, Capsicum and cucumber	**CPCT FACULTY**
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on 3 days	
	Reading for next day	• Cultivation of Tomato, Capsicum and cucumber Bed preparation and support system	
	Assignment	Cultural practices in Tomato, Capsicum and cucumber	

Day 4 **S.1 & 2 Sessions**	Crop Production Technology- Class room	**Crop production technology of** Tomato, Capsicum and cucumber	**CPCT FACULTY**
S.3 & 4	Visit to Farm- of Farmer /Field visit to successful entrepreneur	Practical sessions including support structure, Media for Tomato, Capsicum and cucumber	**CPCT FACULTY**
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on 4 days	
	Reading for next day	• Irrigation management • Fertilizer management.	
	Assignment	Study of import varieties and types of Tomato, Capsicum and cucumber	

Day 5 S1	**Irrigation Management**	**Irrigation and fertilizer management in** Tomato, Capsicum and cucumber Water requirement,water quality for irrigation, treatment, critical stages of crop , irrigation schedule 1. Irrigationsystem (Drip / foggers/ misters),design specifications , maintenance 2. Care to be taken in procuring inputs	**CPCT FACULTY**
Day5 S2	**Nutrient management**	1. Fertigation-meaning, methods equipments. 2. Nutrient Management (Macro & Micro) 3. Role of nutrients, deficiency and toxicity symptoms 4. Use of organic Manures in protected cultivation including Bio-fertilizer: Vermi compost production- Identify correct species of earthworm, quality production technique, finances and market linkage, food safety issues etc. 5. Care to be taken in procuring input	**CPCT FACULTY**
Day5 S3 & 4	**Crop protection Pest management**	**Crop protection in** Tomato, Capsicum and cucumber 1. Introduction to major pest in protected cultivation 2. Identificationknowing of pestssymptoms, stages of attack , precautions and control measures-mechanical, cultural , Biological & chemical 3. Integrated Pest Management- Bio-pesticides, promotion of natural enemies. 4. Availing extension services at regular intervals with the visit of experts to fields.	**CPCT FACULTY**
	Disease management	1. Introduction to major Disease in protected cultivation 2. Identification knowing of diseasesymptoms, stages of attack ,	**CPCT FACULTY**

		precautions and control measures- mechanical, cultural , Biological & chemical 3. Integrated Pest Management- Bio-pesticides, promotion of natural enemies. 4. Availing extension services at regular intervals with the visit of experts to fields.	

Day 6 S 1 & 2	Harvesting, Post-Harvest Management / Infrastructure- to enhance holding life and to reduce post-harvest losses	1. Post-Harvest Management of Tomato, Capsicum and cucumber Pre harvest care 2. Harvesting – time stage & method 3. Post harvest handling practices like deleafing , precooling sorting grading bunching ,packaging, storage and transport 4. Quality standards for export and domestic market 5. Post harvest solution and value addition in flowers 6. Packaging material and stadandars 7. Proper technique & do's and don'ts of Harvesting;	**PHM Expert**
	Value Addition	1. Fresh product: Minimal processing. 2. Value Addition • By product utilisation- •	
Day 6 S 3	Marketing and value chain development	Marketing Basics: 1. Value Chain Analysis of product / commodity in State / UT- Current scenario and the best possible solutions 2. Identification of markets- Export, Distant Market, Local markets- Mandis/ Traders, Processing units. 3. Demand – seasons / days etc. 4. Market Driven Production- Concept: What? How? Challenges? Solutions 5. Promotion strategy: Branding; Differentiation of product e-marketing	**Marketing Expert**
S4	Evaluation 1 Hour	Training evaluation /Test on 1. Knowledge 2. Skills 3. Attitude Marks in the test are	**3-4 Successful entrepreneurs**
	Total Marks Final Assessment	1. Class room participation — 25%	
		2. Timely submission of assignments — 25%	
		3. Final evaluation — 50%	
		Total Marks (Are recorded in Completion Certificate)	
	Feedback 30 Min		**3-4 Successful entrepreneurs**
	Discussion on Feedback		
	Valediction		

Trainers' Material: to be used for preparing Participants Handbook first in English and then in local language as far as possible.

The following weblinks are illustrative. Training Institute is requested to explore more and the best fit material for the trainees socio-economic condition, crop and enterprise.

S.No	Module	Reading Material	
		For the Trainer	For the trainee
1.	Economic Potential and Specific State/ UTs context and Success stories.	Horticulture Statistics at a glance: http://agricoop.gov.in/statistics/publication-reports World fruit and vegetable map: 2018: Robo Bank https://research.rabobank.com/far/en/sectors/regional-food-agri/world_fruit_map_2018.html APEDA AGRIEXCHANGE: http://agriexchange.apeda.gov.in/ ICAR institutions publications on specific crop CII / FICCI/ASSOCHAM/ PHDCC reports http://www.fao.org/docs/eims/upload/210971/global_issues_paper.pdf Success stories: http://agritech.tnau.ac.in/success_stories/sstories_horti_2015.html	
2.	Personal skills development	Internet and youtbue	
3.	Selection of cultivar and Production practices for high productivity	ICAR institutions publications on specific crop Package of practices of specific crop (s). e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions. ICAR e-courses: https://ecourses.icar.gov.in/	
4.	Harvesting, Post-Harvest Management / Infrastructure	Analysis of FPO model for Vegetables https://nccd.gov.in/PDF/Analysis_FPO_model.pdf Doubling of Farmers Income Report: Vol.III and IV http://agricoop.gov.in/doubling-farmers	
5.	Processing / Value Addition	ICAR / Any reputed R&D Institution publications e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions.	
6.	Supply/ Cold-chain development both for fresh and processed produce	Cold Chain Awareness program https://nccd.gov.in/PDF/Cold-chain%20Awareness%20Booklet.pdf Analysis of NDDB Model for Vegetables https://nccd.gov.in/PDF/Analysis_NDDB_veg_model.pdf All India Cold Chain Infrastructure Capacity : Gap Analysis https://nccd.gov.in/PDF/CCSG_Final%20Report_Web.pdf	
7.	Marketing and value chain development	Directorate of Marketing and Inspection website: http://agmarknet.gov.in/ Crop specific market information sources	
8.	Maintain quality of produce: Health & Food Safety /	TNAU AgriTech portal on Food Safety: http://agritech.tnau.ac.in/gap_gmp_glp/gap_fresh%20_%20fruits%20&%20veg.html http://agritech.tnau.ac.in/food_safetyindex.html	

	Traceability and Standards	Global Gap: https://www.globalgap.org/uk_en/ INDGAP: http://www.qcin.org/CAS/INDGAP/ Global gap India facilities: http://agriexchange.apeda.gov.in/Market%20Profile/Market_Inteligence/Annexure_III.pdf Food Traceability in Inda: http://face-cii.in/sites/default/files/final_report-version_2.pdf FAO International Code of Conduct on Pesticide Management http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/ TRACEABILITY IN FOOD AND AGRICULTURAL PRODUCTS: ITC, Switzerland publication at http://www.intracen.org/ GRASP: Global GAP Risk Assessment on Social Practice The Global Social Compliance Programme GSCP https://www.gscpequivalenceprocess.com/	
9.	Finance, Credit & Farm/ Project & Risk Management	Model DPR Templates for NHB Schemes ww.nhb.gov.in	
10.	Cluster development : Collaborative farming/ FPOs/ FPC	NHB Website: Proposed scheme: Horticulture Business Cluster and Supply chain development Programme FAO (2010) Agro-based clusters in developing countries: staying competitive in a globalized economy http://www.fao.org/docrep/012/i1560e/i1560e.pdf World Bank: Agriculture Clusters https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Agricultural_Clusters.pdf How Can the Poor Benefit from the Growing Markets for High Value Agricultural Products? FAO / UN Paper https://papers.ssrn.com/sol3/papers.cfm?abstract_id=944027 Crop specific Producers Society and company online authentic sources	
11.	Government organisations and Schemes	http://agricoop.gov.in/ http://mofpi.nic.in/ http://apeda.gov.in/ http://nhb.gov.in/ http://coconutboard.nic.in/Scheme.aspx	
12.	Knowledge and Statistics	ICAR Indian Horticulture Magazine: https://icar.org.in/node/9420 IIHR: https://iihr.res.in/documentary-video-clips-for-farmers FAO: http://www.fao.org/e-agriculture/stub-28	
13.	Technology and Entrepreneurship	Visit ICAR – Institutions / Directorates/ Bureaux/ NRCs: https://icar.org.in/ Innovation in Agriculture: http://www.fao.org/3/CA2460EN/ca2460en.PDF Specific technologies: https://icar.org.in/content/agricultural-technologies e-learning: https://ecourses.icar.gov.in/ ICAR Publications: https://krishi.icar.gov.in/jspui/ Local University publications Local University success stories	
14.	Protected (/Greenhouse /	National Committee on plasticulture Agriculture with the Horticulture https://www.ncpahindia.com/	

	Shade net / Walk in Tunnel) cultivation:	Agriculture Skill Council of India: Curriculum and Occupational / Qualification standards: http://asci-india.com/National%20Occupation%20Standards.php	
15.	Cold Storage / Cold Chain Development:		

Reading material for the trainee is to be prepared by the Training Institute based on trainers' reading material in local language either in brief or in detail based on the module and need. May share booklets or print out of detailed scientific package of practices recommended locally.

Success Stories: Illustrative

IARI	http://iari.res.in/index.php?option=com_content&view=article&id=539&Itemid=1516 http://www.iari.res.in/files/Pusa_Hydrogel.pdf
IIHR	https://iihr.res.in/success-stories
CISH	http://www.cish.res.in/success_story.php
CCRI Nagpur	https://www.youtube.com/watch?v=QwE6oFkq3F8
NRC Banana	http://nrcb.res.in/success-stories.php
CITH Srinagar	http://www.cith.org.in/index.php?option=com_content&view=article&id=83&Itemid=11&lang=en
IIVR	https://iivr.org.in/success-stories
Grapes	https://rkvy.nic.in/Uploads/SucessStory/TAMILNADU/2018/20180440133.%20GRS%20Success%20story.pdf

https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Agricultural_Clusters.pdf

Activities prior to training by Horticulture Training Institute:

The training institute shall undertake

1. Desk Analysis:
    a. About specific commodity: State/ UT and District's Area, Production, Productivity, cost of cultivation, production, post-harvest and marketing problems etc.
    b. Road map formulated by State/UT government to develop the area/ crop / farmers income of the area including State/UT Economic Survey, Annual Report of Agriculture/Horticulture Dept., District website etc.
    c. Explore various research articles on crop production, marketing etc. of the State/ Area.
    d. Examine various study reports of Government agencies- State/ DAC&FW/ APEDA/ SFAC/MoFPI and private agencies- CII /FICCI/ASSOCHAM/ Others for the horticulture Development of the State, Specific location, India etc.
2. Preparation of training design and teaching-learning material.
    a. Preparation of training schedule with good mix of theory, practicals (both in class room and field visits) and home work (After class hours) and also physical fitness and site seeing.
    b. Participants Handbook: A brief note on each of teaching module in local language for circulation to each trainee, with the help of local technical expert.
    c. Preparation of case studies/ exercises for class room discussion / brain storming / homework.
    d. Access to internet and computers to explore the potential of technology.
    e. Identification of the best experts for each of the session and invitation of successful FPOs/ entrepreneurs/ experts for interaction session with the trainees.
    f. Identification of FPOs/Entrepreneurs/Firms/ Organisations for internship with clear Do's and Don'ts.
    g. Every trainee to come with 2 problems with respect to each of the session.
    h. Use of Audio-visual aids for teaching-learning& Good logistics for field visits
3. Identification of fields, FPOs, enterprises and operations etc. for the visit of trainees.
4. Good preparation of trainees accommodation, food (of trainees cultural context as far as possible), primary health care etc.

Photographs of CPCT IARI


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