



ज्ञानमंगा घरोघरी

KrishiVigyan Kendra (KVK)

Yashwantrao Chavan Maharashtra Open University , Nashik
Maharashtra



Crop / Activity

Protected cultivation of Horticulture Nursery

2019-20



Index

Sr. No.	Topic	Page
1.	Introduction	03
2.	Rationale	03
3.	Importance of Project: Crop/ Activity	04
4.	Profile of Institute and facilities and Services	05 & 07
5.	Objectives of training Programme	08
6.	Pedagogy: Training methods / styles are:	09
7.	Outputs expected: (As on the last date of 06 days training)	10
8.	Outcomes expected (in 18 months)	10
9.	Programme in brief	11
10.	Expectations from trainee before the arrival to the Training institute	12
11.	06 Days training schedule & reference material	13-29

Training Programme Name	Entrepreneurship and Leadership Development Programme on Horticulture Nursery Management
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1. 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.

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

1. Protected Horticulture Nursery	
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Profile of the Institute:

1.1 Name of the KrishiVigyan Kendra and the parent organization to which it belongs Parent organization:

Name of KVK: KrishiVigyan Kendra, YCMOU (KVK),

Parent Institute: YashwantraoChavan Maharashtra Open University (YCMOU), Nashik is the State Open University established by Government of Maharashtra legislature of its Act XX, of 1989.

1.2 Name of the Head of the Host Institution:

Dr. E. Wayunandan, Vice Chancellor

YashwantraoChavan Maharashtra Open University (YCMOU), Nashik

Web: ycmou.digitaluniversity.ac

Name of the Head of the Lead Institution:

Mr. Raoshaeb B. Patil, Head & Senior Scientist

Postal Address of the lead Institution with PIN Code:

KVK, YCMOU, Gyangangotri, Near Gangapur Dam,
Gowardhan area, Nashik - 422222

Telephone Number (With STD Code): (0253)2230459, 2230698

Fax No. (0253) 2230459

Email Address: kvknashik@rediffmail.com

Website address: kvknashik.org

2.0 About KVK:

About KrishiVigyan Kendra, YCMOU, Nashik

The Host Institute: YCMOU

The YashwantraoChavan Maharashtra Open University, Nashik was established in 1989 through Act XX of 1989 of Maharashtra State legislature. YCMOU, Nashik is the 5th Open University in India. The goal of university is to become a "Mass University" and to provide equal educational opportunities to large sections of the society.

YCMOU, Nashik is the only university in India, which is offering need-based programmes in Agriculture sciences through distance mode of education.

The university received an international '**Award of Excellence for Institutional Achievement**' from the Commonwealth of Learning (COL), Canada on 1st August 2002 on the occasion of the 2nd Pan-commonwealth forum on Open Learning held in Durban, South Africa. YCMOU is the only university in India, which has received this prestigious award.

An extract from the citation read out on the occasion.

“...What impressed the panel particularly was the institution’s use of technology, not just to attract a wide range of learners but to provide sustained academic support to retain them in the system. To do this, the university did not adopt a ‘one-size-fits-all’ approach. It used a variety of practices in line with students’ needs, preferred learning styles & access to technology”

The KrishiVigyan Kendra:

The Indian council of Agricultural Research (ICAR), New Delhi has established the KrishiVigyan Kendra at YashwantraoChavan Maharashtra Open University, Nashik on 1st October, 1994. It is an Innovative farm science centre providing training and services to the farmers and agri- business managers. It imparts need based trainings, skills, demonstrations and various extension activities in the field of agriculture with following mandates.

1. Conducting On Farm Testing (OFT) for test verifying the technologies in the socio-economic conditions with a view to study the production constraints & to modify the technology to make them appropriate.
2. Training to update the state department extension personnel’s & non-governmental organizations with emerging advances in agriculture, horticulture and animal husbandry.
3. Impart vocational training to the practicing farmers, farm women rural youths with emphasis on learning by doing for higher production on farm & home & generating self employment.
4. Organize front line demonstrations (FLD) to generate production data, feedback information as well as popularizing the technologies being demonstrated among the clientele.

Considering the scenario in the district, more than 75 % farmers are small and marginal. It is, essential to reduce the load on agriculture and divert the farmers and rural youths to another suitable remunerative small enterprise.

The KVK operational area is hilly and having tribal population. Considering this the KVK planned to establish and demonstrate the suitable and sustainable agri- enterprises on model farm. This also helps to train the farmers and rural youths. In accordance with the situation in the district the KV has started Nursery, poultry, goat, vermicompost, high tech protected cultivation, modern irrigation systems, agro processing units as well as biocontrol and soil water testing laboratories. The institute having all relevant infrastructure and facility to provide practical knowledge to trainee.

Basic infrastructure and collaboration to be in place

1. **Competent Faculty:** Experts and experienced faculties from, SAU, KVK, Agriculture department, NHB, Lead Banks, Private cum Corporate institutions, companies, FPO, FPC, Manufactures, Entrepreneurs etc.
2. **Research expertise and farm / Demonstration experience:**
 - A) Omgaytri Nursery, Ugaontal- Niphadhsing 12 years of expertise of Running Successfully 12 acars commercial, Nursery.
 - B) Zarvi Nursery, Bharuch, Gujrat Having Research expertise in Fruit & vegetable Grafting etc.

C) Expertise and Horticulture Nurseries of SAU, KVK, Private companies working in hi-tech horticulture Nursery will.

3. **Excellent classrooms with all Audio-visual equipment and aids including PPT facility:** Available
4. **Excellent living/ residential accommodation with Computers and internet:** Will be provided as required, Farmers hostel with 40 beds is available
5. **Has good networking with experts across India, to invite best of the faculty in a particular area of expertise:** Yes

Sr. No.	Name & Designation of The Faculty	Qualification	Experience Yrs.
01	Shri.RaosahebPatil Head& Senior Scientist , KVK, Nashik	M.Sc. (Agri) Agril. Microbiology	32
02	Shri.TusharAmre, Deputy Director NHRDF, Nashik	M.Sc. (Agri.) Horticulture	15
03	Shri.Hemraj Rajput, SMS (Horticulture)KVK, YCMOU	M.Sc. (Agri.) Horticulture	22
04	Shri.RajaramPatil, SMS (Agril. Engg) KVK, YCMOU	M.Tech. (Agri. Engg)	23
05	Shri.Dnyneshwar Hire, Jaihind Agro, Nashik	M.Tech. (Agri. Engg)	22
06	Mr. Y. L. Jagdale , , SMS (Horticulture)KVK, Baramati	M.Sc. (Agri.) Horticulture	15

6. **Has collaboration with entrepreneurs and Industry:** Yes

1. **KVK, Baramati**
2. **Jain Irrigation, Jalgaon**
3. **MPKV, Rahuri**
4. **Sahydri Farms, Nashik**
5. **Om Gaytri Nursery, Ugaon, Niphad, Nashik**
6. **Jarvi Nursery, Bharuch, Gujrat**
7. **Jaihind Agro, Nashik**
8. **KF Biotech, Pune**

7. **Willing to provide internships with FPOs/ FPCs/entrepreneurs:** Yes

Previous experience:

KrishiVigyan Kendra, Nashik Conducting short & long duration on campus vocational training program for Rural Youths on Horticulture Nursery Management from last 20 years . KVK, Nashik tained more than 250 youths. Short duration one week training programme on protected cultivation is also conducted for the farmers in the district.

Objectives of Training Programme:

- 1. Knowledge: Ensure every trainee acquires adequate knowledge and understanding of commercial Horticulture and Nursery management.**
- 2. Personal leadership and skills development**
 - a. To explore leadership roles required in horticulture nursery 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 technology to be adopted and Production practices for production of quality planting material**
 - a. How to select suitable variety/hybrid/cultivar and source quality seedas per market demand and sustainability.
 - b. Modern Technology for Nursery Raising:various kinds of protected structures with hi-tech technology-, customisation based on Agro-climatic condition, crop and pest and diseases profile; familiarisation of components and Mechanisation and Automation.
 - c. To know scientific methods of vegetative propagation using different rootstocks and seedling production, hardening and post-propagation practices,
 - d. Analyse gap with that of the current practices, technology and management of trainees.
- 4. Processing and value addition:** Recycling of used and excess media mixture. Value addition in enriched compost material for crop mulch and mixing other soil based media mixtures.
- 5. Market development**
 - a. To know and document current market scenario of horticulture nursery 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 growers.
 - e. To know importance of branding and promotion.
 - f. How to become an Exporter and know the roles of APEDA in future.
- 6. Producing quality planting material:seedlings should be Healthy, Genuine, True to type and as per norms &Standards for quality &higher yield.**
 - a. To know National and state norms, standards and certification, etc. Encourage trainees to document a roadmap for availing certification in 1 year time.
- 7. DPR and Project Management including Finance & Credit.**

- a. To empower selection of Nursery enterprise based on crop based and 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 trainee's 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 Nursery record book keeping.
- 8. To know Government organisations and Schemes related to Horticulture nursery development and laws to be complied.**
- 9. Horticulture Statistics sources including DAC&FW website and State Horticulture Dept. website.**
- 10. Technology and Entrepreneurship**

Pedagogy: Training methods / styles are:

- a. Lectures- with two way communication using Audio-visual aids, videos etc.
- b. Group discussion, Group work
- c. Panel discussion
- d. Skill practice
- e. Interactive field visits etc.
- f. Quiz and assignment
- g. Report writing ,case study

Outputs expected: (As on the last date of 06 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 75 % 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 protected horticulture Nursery Production, ,management, Marketing in English/Hindi/trainees' language.
 - c. Safety measures (Good Agricultural Practices), traceability, standards etc.
 - d. Documentation of analysis of current scenario of trainee's context- production, management, post-harvest, supply chain, marketing and gap analysis and possible road map.
6. Skills: by each of the trainee about propagation methods.
 - a. Curiosity and continuous learning.

- b. Modern scientific methods of propagation and seedling raising, hardening with 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 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 for successful entrepreneur.
 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

1. Successful completion of the project with right technology and processes required for successful entrepreneurship in protected horticulture nursery.
2. Reduced cost of production; improved plant health, productivity & reduced losses, mortality and improve success rate.
3. Improved plant safety, certification, standards compliance- at least process is initiated.
4. Improved infrastructure.
5. Improved profits/ net income.

Programme in Brief

Training Programme Name	Entrepreneurship and Leadership Development Programme for Horticulture Entrepreneurs in protected Horticulture Nursery			
Duration	06 working days: 1Weeks			
Participant Target Group	Individuals desirous of availing NHB benefit under Scheme No.1 or 2 and also for those who want to improve their knowledge and leadership in commercial horticulture Nursery management.			
Training Coordinator with Designation and Address Tel, Mobile and email id	Mr. Hemraj Rajput, M.Sc. (Agri), Horticulture Sms (Horticulture) Address:- KVK, YCMOU, Gyangangotri, Near Gangapur Dam, Gowardhan area, Nashik - 422222 Mob.:- 9422773602 Mail id:-rajsurabh71@gmail.com			
Languages	Marathi,Hindi,English			
Training calendar for 2019-20	Month	Last date for Registration	Training reporting dates	Training Dates
	December 2019			
	January 2020			
	February 2020			
	March 2020			
How to Apply	On line as well Off line, Email, Whats app, website,Mobile			
Next review/ revision of Training Design	February 2020			
Batch size and cost and Payment system (Per Participant)	Batch size	Course Fees	Hostel: Accommodation, Boarding: BF+L+D + Morning Tea + Afternoon Snacks	Total cost
	15 & above	4000	6000	10000
	10-15			
	5-10			
	<5			
	Payment system and address: RTGS/NEFT/DD			
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 75% marks in final assessment, the candidates are awarded completion certificate with marks.			
NHB & HTI Role	<ol style="list-style-type: none"> 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 or by any Government. 4. Upon 95% attendance and upon scoring 90% marks is considered as successful completion and then they are eligible for training completion certificate. 5. Successful completion of training programme by the applicant/s and submission of completion certificate is mandatory for obtaining the In-Principle Approval (IPA). 			

	<p>6. It is compulsory to reside in the hostel/accommodation provided by the institute in the interest of training during training period.</p> <p>7. NHB,s decision is final after getting training to issue IPA or not similarly approval or rejection of subsidy.</p> <p>8. Trainees are responsible for their conduct and wellbeing issues</p> <p>9. KVK,Nashik has no liability towards IPA and Subsidy release or non-release</p> <p>10. KVK,Nashik has no liability towards IPA and Subsidy release or non-release.</p>
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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, 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, and 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 KVK,Nashik
6. To share specific problems/ gaps / barriers in horticulture nursery 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.

Day wise schedule

Session	Module	Learning	Expert
	Registration	Registration Prior-Assessment of knowledge, attitude and skills	
Day1 S1	Orientation / Inauguration	<ul style="list-style-type: none"> • General discipline in class room (Do's and Don'ts) • Every trainee to share their introduction with expectations.&Motivational Talk 	Successful entrepreneur
Day1 S2	Economic / Marketing Potential and Specific State/ UTs context: Scope and opportunities and Success stories.	<ol style="list-style-type: none"> 1. Introduction different horticulture Crops Origin, Botany and economic, Area, Production, Productivity, Prices & value. 2. Scope and importance of Horticulture Nursery in Horticulture Development and Production. 3. Prices & value, variation of planting material across markets.; 4. Domestic market: Supply and Demand of planting material of specific crops e.g.Vegetable, fruit and flower 5. Export and Import scenario of specific crop 6. Case study of success stories-2 7. Concerns for entrepreneurs. 	Horticulture Expert in Crop Production.
Day1 S3	Personal skills development	<ol style="list-style-type: none"> 1. Improve listening, reading, writing and communication skills, team work; reading of signs etc. 2. To learn/ improve IT/ social media and know how to benefit from Internet and newspapers/media. 3. To improve leadership / social skills common informed vision, communication, team work, negotiation skills; with an exercise and success story. 4. To explore leadership roles required in horticulture nursery business and realign and recalibrate self with new knowledge, concepts and tools. 5. Managing change and innovation and Taking charge and leading strategy. 	Motivational speaker in communication, IT, Writing ,Reading, Leadership skills
Day1 S4	Basic Guidelines for site selection Design and development for protected Horticulture Nursery	<ol style="list-style-type: none"> 1. Definition of protected Horticulture nursery 2. Different types of Protected Horticulture Nursery e.g. Fruit, Vegetable & Flower Nursery 3. Selecting the nursery site. 4. Source of irrigation and quality of water 5. Importance and principal of nursery development 6. Role of Nursery in Crop production. 7. Basic Requirements for Nursery Development and management 	Horticulture Expert in Nursery development and management.

	Quiz	Today's learning	
	Reading material for next day*	<ol style="list-style-type: none"> 1. Study Types of nursery,site selection criteria etc. 2. Reading material on protectedpropagation technologies, components and erection. 3. Reading material on basic climate management practices for protected structures. 	Training Coordinator
	Evening/Nigh Home work/ Assignment#	<ul style="list-style-type: none"> • Creation of Whats' app group of all trainees. • Joining of NHB crop specific/Project specific Whats' app group. 	
<p>*: TO be read in the night before attending next day class. #: Are evaluated/tested the following day.</p>			

<p>Day2 S1& S2</p>	<p>Protected propagation structures and climate control systems.</p>	<ol style="list-style-type: none"> 1. A study of different types of propagation structures. E.g. Types of Polyhouse, Net house, polytunnels, mist houses/chambers, Germination chambers, Packhouse, Storage structures required for nursery and its erection 2. Selection of Types of propagation structures, Site selection, Layout & Design & Size; Selection based on type of nursery, location, climate including low cost structures, Directions, Foundation, Erection, Selection of cladding material, Quality of materials. 3. Familiarise different components & equipment of GH/ Shade net etc, maintenance of required environment – RH, Temperature, light, as per crop requirement, care, operation & maintenance, automation 4. Cost and Economics of nursery production, register keeping, Annual Maintenance Contract, insurance etc. Selection of fabricator, Do's & Dont's 1. Climatic Conditions maintained in a polyhouse <ol style="list-style-type: none"> a. Lights/ shading needs and importance/ b. Climatic conditions for plant hardening c. Temperature & humidity management d. What is a fogging system? e. Why do we need a fogger? f. Type of foggers recommended for a nursery g. Foggers with sensors 	<p>Agri.Engineer + Fabricator / Erector + Successful Entrepreneur</p>
<p>Day2 S3</p>	<p>Selection of Horticulture crop type and varieties, as per growers demand.</p>	<ol style="list-style-type: none"> 1. Know -Agro-climatic, soil health, and water quality/quantity required for specific crops. 2. Know varieties and Hybrids of specific horticulture crops with their features- High yielding, Pest/Disease resistant, 3. Ascertaining market/consumer preference -choice characteristics of planting material. 4. How to select economically profitable and sustainable cultivar / variety/hybrid for plantation. 5. Quality Planting Material-How to confirm/ verify, treatment, storage etc. 6. Nursery Management/ Seedling production, transplant seedling at 	<p>Horticulturist & Nursery Entrepreneur</p>

		<p>appropriate time, stage and spacing.</p> <ol style="list-style-type: none"> 7. Sources of Quality Seeds/Planting material. 8. Knowledge of vegetative propagation in case of fruits. 	
Day2 S 4	Types of Media ,media preparation and treatments	<ol style="list-style-type: none"> 1. DifferentTypes of Media its characteristics, analysis for pH, EC. 2. Media Treatments in combination with bacterial consortium. 3. Media Sterilization, fumigation, 4. Media availability, its format, suppliers, cost. 5. Do's & Don'ts 	Horticulturist with media expert & Nursery in charge operations/Entrepreneur
	Quiz	Today's learning	
	Reading material for next day	<ol style="list-style-type: none"> 1. Reading material on types of containers, selection 2. Reading material on pre propagation input management. 	Training Coordinator

Day 3 S 1	Types of Trays, Containers	<ol style="list-style-type: none"> 1. Different types,size& shapesof nursery propagation containers/trays/plugs, and bag. No. of cavities per pro-tray, 2. Manufactures & suppliers and availability of nursery propagation containers 	Horticulturist & Nursery in charge operations/Entrepreneur Tray manufacture, supplier or operator
Day 3 S 2	Preparatory operations, & Mechanizations for containers	<ol style="list-style-type: none"> 1. Preparation of media, manual Media filling, Mechanisation in Pro Tray feeling with media & Seed Sowing, 2. Selection of Media filling & sowing machine, know its operational methodology. 3. Seed Treatment, Manual/mechanical Seed Sowing, 4. Incubation, Germination chamber erecting size &dimension. 5. Climate management in germination chamber as per specific crops. 6. Conveyer for nursery tray shifting operations 7. Precautionary measures, Do's & Don't 	Horticulturist with media expert & Nursery in charge operations/Entrepreneur
Day 3 S 3 & S 4	Propagations Methodology for Vegetable / fruits crops	<ol style="list-style-type: none"> 1. Different types of propagation methods as per specific Horticulture crops. 2. Seed Propagation, Vegetative propagation, Micro propagation, Runners, Suckers, Cutting, Grafting, 3. Types of rootstock, selection & propagation of rootstock and its management for grafting. 4. Different species of rootstock and its characteristics for specific horticulture crops. 5. Research and development 6. Do's &Don'ts 	Horticulturist specialization in Specialisation in propagation methodology of Fruits & vegetables
	Quiz	Today's learning	

Day 4 Full day	Exposure visits	Exposure visit to KVK/ Demonstration Farm & Horticulture Nursery, Horticulture Training Centre of SAU, ICAR institutes, Commercial Tissue Culture Laboratory, Containers & Pro Tray Manufacturing Unit and suppliers , Exposure to Different Nursery with modern propagation Structures, Do's & Don'ts	Training Coordinator & Nursery entrepreneur
	Discussion	On Exposure visit finding ,learning experience and observations	Training Coordinator
	Quiz	Learning on yesterday and today	
	Assignment	Exposure Visit Report.	

Day 5 S 1 & S 2	Human Resource development & Management	<ol style="list-style-type: none"> 1. HRD, Operational Labour Management, Time and Efficiency Development 2. Evaluation of Labour Production Management, Input Management , 3. Service to the Farmer, 4. Types of labour, Training , distribution of operational labours as per expertise, Labour Health and Safety, 5. Do's & Don'ts 	Training Coordinator & Nursery entrepreneur Agro input, human resource & labour management Expert
Day 5 S 3 & S 4	Irrigation, Fertigation & Micro climate Management in Nursery propagation	<ol style="list-style-type: none"> 1. Water Management at different stages. requirement, critical stages, Irrigation / fertigation, PGR & drainage/ irrigation schedule; mechanisation & Automation, Integrated Nutrient Management / Bio-fertilizer 2. Types of water sources, water requirement analysis of different crops, 3. Efficient use of water in scarcity conditions. water conservation/rainwater harvesting, storage and saving mechanisms. 4. Different types and grades of fertilizers, classification. 5. Fertigation schedule of specific crops for healthy plant development. 6. Nutrient deficiency symptoms at seedling growth stages. 7. Selection of fertigation system pumps & booms. Automation 8. Micro climate requirement, management of specific crops at critical seedling development stages. 9. Climate management Automation Temperature & Humidity 10. Use Do's & Don'ts 	Agriculture Engineer Expert from commercial irrigation company
	Quiz	Today's learning	

Day 6 S1	Plant Protection and Integrated Pest Management	<ol style="list-style-type: none"> 1. Pest, Disease & Management- identification of major pest & diseases, symptoms, stages of attack and preventive & curative measures & precautions, 2. IPDM, 3. Use Bio-pesticides, promotion of natural enemies. 4. Safe and judicious use of chemical inputs 5. Mechanisation in pest and diseases control & management. 6. Do's & Dont's 	Entomologist & pathologist
	Hands on Training for Propagation Techniques	Practical training from Skilled person/Expert, Propagation techniques for vegetative methods	Training Coordinator & Nursery entrepreneur
S2	Post Propagation Handlings of Saplings	Skill full & Safe Handling of saplings, Hardening, packaging, Transportation practices,	Horticulturist & Nursery entrepreneur
	Certification Standard ,Quality measure, Accreditations, Acts	<p>Nursery Certification & identification, tagging of sapling with detail information. Pre seed sowing analysis. Seed treatment etc.</p> <ul style="list-style-type: none"> • Seed sale/Nursery licence/Seed Act • NHB Accreditation • ISO- 9001 • IEC certification. • Plant quarantine 	Quality control officer from Agriculture, Horticulture department /NHB
S3	Marketing chain development	<p>Marketing Basics:</p> <ol style="list-style-type: none"> 1. Supply Chain Management for planting Material 2. Identification and differentiation of markets- 3. Market Driven Production- 4. Promotion strategy: Branding; Differentiation of product 5. e-marketing 6. Participation in exhibition, seminar, workshop, symposia, kisanmela, 7. Celebration of nursery/Kisan day. 8. Market Intelligence / Transparency in Market prices/ Assimilation of Market Information / <ol style="list-style-type: none"> 1. Knowing end market prices- Local market and distance market; 2. Analyse market information season wise. 3. Use market information to decide on crop, area and no to be sown, 4. Arranging cost effective transportation. 	Marketing Expert

		<p>9. Data management</p> <p>10. Demand assessment and management:</p> <ol style="list-style-type: none"> 1. Need to consolidate demand from all farmers, SHG, FPO, FPC, NGO, Farmers association, Co-operative, ATMA, Government agencies etc. 2. To know a balance sheet: demand and supply of commodity if possible. <p>11. Causes of market instability and measures to address</p> <ul style="list-style-type: none"> • Causes: Low cost supplies from new production areas, Fluctuating demand. • Measures: Building brand loyalty, Services after sale. Efficient supply chain with dedicated transport on pre-determined schedules <p>12. Marketing models / Measures to minimise price spread / enhance price realisation.</p> <ol style="list-style-type: none"> 1. Direct- 2. Bulk or retail outlets- owned/ franchisee. 3. Through wholesale trader 4. Private partnership-B to B model. <p>13. Exposure/Networking visits/Trade Fairs/ Exhibition/s. India & Abroad</p>	
	After Care Operation	Sanitation & Hygiene, Weed management & Mulching, Drainage System, Planning & Scheduling Daily operations Do's & Don'ts	
S4	Evaluation 1 Hour	<p>Training evaluation /Test on</p> <ol style="list-style-type: none"> 1. Knowledge 2. Skills 3. Attitude <p>Marks in the test are</p>	Horticulturist & Training Coordinator
	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.	<p>Horticulture Statistics at a glance: http://agricoop.gov.in/statistics/publication-reports</p> <p>World fruit and vegetable map: 2018: Robo Bank https://research.rabobank.com/far/en/sectors/regional-food-agri/world_fruit_map_2018.html</p> <p>APEDA AGRIEXCHANGE: http://agriexchange.apeda.gov.in/</p> <p>ICAR institutions publications on specific crop CII / FICCI/ASSOCHAM/ PHDCC reports</p> <p>http://www.fao.org/docs/eims/upload/210971/global_issues_paper.pdf</p> <p>Success stories: http://agritech.tnau.ac.in/success_stories/sstories_horti_2015.html</p>	
2.	Personal skills development	Internet and youtube	
3.	Selection of cultivar and Production practices for high productivity	<p>ICAR institutions publications on specific crop Package of practices of specific crop (s).</p> <p>e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions. ICAR e-courses: https://ecourses.icar.gov.in/</p>	
4.	Marketing and value chain development	<p>Directorate of Marketing and Inspection website: http://agmarknet.gov.in/</p> <p>Crop specific market information sources</p>	
5.			
6.	Finance, Credit & Farm/ Project & Risk Management	<p>Model DPR Templates for NHB Schemes www.nhb.gov.in</p>	
7.	Cluster development : Collaborative farming/ FPOs/ FPC	<p>NHB Website: Proposed scheme: Horticulture Business Cluster and Supply chain development Programme</p> <p>FAO (2010) Agro-based clusters in developing countries: staying competitive in a globalized economy http://www.fao.org/docrep/012/i1560e/i1560e.pdf</p> <p>World Bank: Agriculture Clusters https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Agricultural_Clusters.pdf</p> <p>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</p> <p>Crop specific Producers Society and company online authentic sources</p>	
8.	Government organisations and	<p>http://agricoop.gov.in/ http://mofpi.nic.in/ http://apeda.gov.in/</p>	

	Schemes	http://nhb.gov.in/ http://coconutboard.nic.in/Scheme.aspx	
9.	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	
10	Technology and Entrepreneurship	Visit ICAR – Institutions / Directorates/ Bureaux/ NRCs: https://icar.org.in/ <u>Innovation in Agriculture</u> : 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	
11	Protected (/Greenhouse / Shade net / Walk in Tunnel) cultivation:	National Committee on plasticulture Agriculture with the Horticulture https://www.ncpahindia.com/ Agriculture Skill Council of India: Curriculum and Occupational / Qualification standards: http://asci-india.com/National%20Occupation%20Standards.php	
12	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/ DACFW/ 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 entrepreneurs/ experts for interaction session with the trainees.
 - f. Identification of 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 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.

Services by the Horticulture Training Institute

1. Facilities to Participants during training

- a. Safe and joyful learning environment.
- b. Classrooms are :
- c. Safe hostel accommodation and healthy Boarding.
- d. Accommodation/Hostel is at:
- e. Hostel check in: One day before training
- f. Hostel check out: following day of completion of course.
- g. Internet and computer systems.

2. Material to be made available to Participants by Horticulture Training Institute

- a. Training Brochure before training
- b. Reading Material during training

3. Faculty:

4. Post-training activities:

1. Take written feedback on each of session with respect to content, clarity and delivery style, opportunity for Q&A, accommodation, food, other facilities, suggestions for improvement etc. and share action proposed in future trainings, during valedictory session.
2. Submission of training report to be submitted within 15 days of completion of EDP:
 - a. Objectives, outputs and outcomes of training.
 - b. Training schedule
 - c. Trainee's / participant list with postal address and contact numbers.
 - d. Photographs and Video (Also to be hosted by training institute and NHB)
 - e. Analysis of feedback and action taken report.
 - f. Action taken on networking with trainees local R&D Institution / experts for regular extension and entrepreneurship development activities.
 - g. Utilisation Certificate.

Photographs of Campus/ Class rooms / Hostel / Technology / Infrastructure

KVK Farm (An Integrated Model)

Our University: The Host Institute
 The Yashwantrao Chavan Maharashtra Open University, Nashik was established in 1989 through Act XX of 1989 of Maharashtra State legislature. The university received an international **'Award of Excellence for Institutional Achievement'** from the Commonwealth of Learning (COL), Canada on 1st August 2002. The Indian council of Agricultural Research (ICAR), New Delhi has established the Krishi Vigyan Kendra at Yashwantrao Chavan Maharashtra Open University, Nashik on 1st October, 1998.

On Farm Activities: technology display for farmers

Model Farm... Golden Harvest

- Model demonstration farm on 100 acres
- Demonstrated high density plantation, micro irrigation, low cost technologies, organic fruit production
- Fresh orchards include Mango, Grapes, Sapota, Guava, Coconut, Amla, Cashew, Litchi, Custard apple, Avocado, Coffee, Jackfruit and Coconut.

Horticultural Nursery... Solution for alternative horticulture

- Quality planting material, precursor to the success of horticulture development
- Annual production of one lakh grafts of Mango, Guava, Sapota, Litchi and Dragonfruit
- Hi-tech protective structures
- Mother plant blocks reserved crop cultivars

Vermicompost Unit... Towards organic production

- Adopted a holistic production management approach which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity
- Annual production of 80 tons of vermicompost
- Providing Worm-culture to the farmers

Modern Irrigation System... more crop per drop

- Installed automated systems on 100 acres plantation
- Sustainable water management (Minimized the water requirement and operation cost of the irrigation)
- Highlights: Drip, In-line drip, sprinkler forms of micro irrigation as per its suitability
- Encouraged the farmers among farmers for adoption

High density plantation... solution for small farmers

- Increased pressure on land owing to depletion of orchard lands
- Higher productivity from limited space
- Combination of tree arrangement and graft form
- Mango, Sapota, guava are low resources in high density planting
- Specialized planting geometry, growing systems, and cultivation practices specified to farmers to avoid negative impact

Precision farming... technology hub

- High focus on training in an alternative, energy husband in health
- Growing demand of technical know-how and skills in protected cultivation
- Commercial production of Rose, Verbena, Camellia and Capsicum in the poly-houses
- Developed skill manpower through trainings

Goat Rearing

- Practiced by a large section of population in rural areas
- Sheep and goats have huge domestic demand
- Breed up-gradation through goat rearing unit and pure line Chomabadi bear supply
- Created employment among rural poor families effectively utilizing unpaired family labour

Backyard poultry

- Dominated business but poorly remunerated
- Intensified effort was breed among BDO (Bantam) families
- Due to multiple colours, looks like indigenous birds and fetch better price

Social Forestry

- Developed forest on 35 acres of land
- Control extremes of heat and cold, rendering the climate more equable

Farm Pond Development

- Utilize of ground water recharging by harvesting rainwater
- 2 major water reservoirs having capacity of 7 billion litres of water

Soil and Water Testing Lab

- Advanced services, soil testing reports and soil health cards for farmers
- Indispensable tool for Crop specific fertilizer recommendations
- Services are closely linked to the extension and advisory services of the Kendra.

Bio-agent production Lab

- Reduction over increased cost of production and harmful residues in produce
- Trichoderma, verticillium and bacteria multiplied scientifically and provided to the farmers

Post Harvest Technology Lab

- Bring vegetable and fruit based enter: Glass in markets resulting in better prices
- Training on processing surplus produce self-employment opportunity
- Mango, Amla, Cashew, pomegranate, custard processing



Hitech polyhouse Flower Cultivation



Mango Mother Orchard



Mango Protected Nursery



Class Room cum Training Hall



Protected Cultivation



Adminstrative Building and farmers Hostel



Soil and water testing Lab



University Library



Mother Orchard- Cashew



Mango Orchard var-Kesar



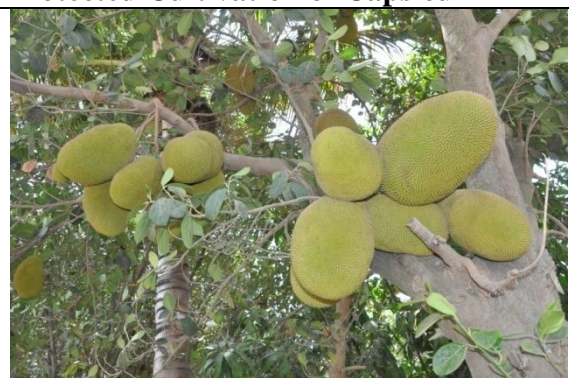
Farm Pond



Protected Cultivation of Capsicum



Fruit Orchard-Cashew



Fruit Orchard-Jackfruit

**What is cluster ? When a group of individual growers or farms are called as Cluster?
Essential elements / components of a cluster:**

Cluster sprout: Large scale areas where a particular crop is under cultivation already, but lack all the characteristics of Cluster.

Cluster: A cluster is a geographic concentration of firms that work in a related value chain. (Professor C. Leigh Anderson 2015: Univ. Washington)

Principle (s):

1. Firms that operate close to related firms and supporting institutions are often more innovative and, therefore, more successful in raising productivity than firms that operate in isolation.
2. To counter increasing fragmentation in farm holding size, by promoting collaboration in land holders. This is expected to regain economy of scale- on inputs and on outputs.

The essential characteristics / elements of a horticulture cluster are :

1. Geography: Located within an identifiable & as far as practicable, contiguous area.
2. Specialisation: Similarity in the commodity (s) production and complementarity in the methods of production, Channels for communication among the members, quality control and testing, technology and marketing strategies/practices energy consumption, Common challenges and opportunities etc.
 - i. In case of Fruits: Commodity specific
 - ii. In case of Vegetables: 4-5 crops of similar nature capable of rotation.
 - iii. In case of Floriculture: Commodity /Similar commodity specific
3. Intensive linkages viz., Horizontal, Vertical and Support relationships
 - a. Horizontal relationships among producers:
Cooperatives / FPOs/ Companies/Smallholder business consortia but for the NHB scheme it is within the FPC model.
 - b. Vertical relationships -among
 - i. Agricultural producers,
 - ii. Production Input Suppliers,
 - iii. Production, Harvest and Post-Harvest Service providers
 - iv. Financial Institutions,
 - v. Processors and exporters,
 - vi. Logistics/ Supply Chain providers
 - vii. Branded buyers and retailers;

Colocation of actors at multiple parts of the value chain is one of the defining features of agribusiness clusters. In such contexts co-location through agribusiness clusters can reduce transaction costs, and increase productivity and innovation.
 - c. Support relationships between producers and facilitating organizations:- that reinforce the quality, efficiency and sustainability aspects of the chain
 - i. Governments, business service providers,
 - ii. Research institutes, universities and
 - iii. non-government service organizations).

- iv. Cluster members may benefit from linkages from supporting institutions that provide specialized training, education, information, research and technical support (Porter, 1998). Clusters also often involve private sector financial firms who provide access to financial services and investment.
- 4. Critical mass of Actors: Number of growers and size: Critical mass of actors, resources and competencies necessary for a cluster to effectively lower transaction costs, facilitate information flows, provide access to specialized factor markets and interact effectively with local, regional and national consumers. Area of willing growers with produce volume capable of viable capacity use of the post-harvest infrastructure components while retaining priority to reach distant markets.
- 5. Producer ownership: Holds ownership of trading / marketing of produce: Removes intermediary traders/Bypass wholesale traders. Deals with buyers / retailers directly.
- 6. Shall serve identified Targetted Market (s).
- 7. Undertake promotion of produce with collective branding
- 8. Evolution and diversification of commodity trade with time and entrepreneurship.
- 9. Inclusiveness: have provision for enrolling new members to enable prospective entrepreneurs and utilise facilities / services within set limits.
- 10. Generate innovation and promote evolution of the business model.