National Vocational Certificate Level 2 in Agricuture (Citrus Processing)

CBT Curriculum

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1. Introduction

Pakistan's economy has undergone considerable diversification over the years, yet agriculture is the largest sector of the economy. This sector contributes 23 per cent to GDP and employs 42 per cent of total labour force. Fruits are a vital part of Pakistani agriculture exports. Ecologically large area of the country is blessed with conducive environment contributing nearly 30 different types of fruits of which citrus, mango; apple, dates, grapes, banana, melons and guava are very remarkable and commercial. Among all the fruits, citrus area, production and exports are at the top. About 95 per cent of the citrus area is located in the Punjab. Under citrus fruits, Kinnow area, production and exports are at the top; more than 90 per cent of citrus exports are those of Kinnow. Pakistan is among the top ten citrus producing and exporting countries. However specifically in Kinnow Mandarin it is on top in production and exportation. Other major citrus producing and exporting countries are Brazil, USA, China, Spain, Turkey, Italy, Morocco etc (FAO, 2010)

Pakistan annually producing more than 2.5 million tons although having lowest average per hectare production of 9.5 tons comparing world developed countries of more than 25-30 tons. Average export of citrus of Pakistan is about 0.325 Million tons per year which is less than 10% of total production. Pakistan is getting it export share 120 Million USD annually which is a minor share of world citrus business only 1.5 percent. In Pakistan there are more than 300 citrus processing units working seasonally having more than 5 tones per hour production capacity based on regular farm supply. More than 180 units are registered with Pakistan Horticulture Development & Export Company (PHDEC) very much contributing advance technology transfer and capacity building in supply chain aspects to all stakeholders. Pakistan citrus processing industry has achieved all international standards and meeting all SPS protocols and guidelines. Currently more than 42 citrus processing units are registered and qualified in HACCP, ISO 22000:2005, BRC, IFS and about 20,000 acres of production area is certified in Global GAP.

Pakistan citrus processing industry is also significantly contributing in employment generation through various activities from production to processing and domestic and international marketing. Assuming that during citrus processing each unit engages more than 500 employees directly or indirectly all the Kinnow produced in the Punjab is domestically marketed, the employment generated from Kinnow production and marketing is estimated at about 23.48 million labour days or full time jobs for more than 75 thousand people (about 57 million labour days in

production and remaining in marketing sectors). Accordingly to a survey conducted by PHDEC more than 50,000 employees are hired on short time contract paying minimum PKR 6000 per month and engaging more than 12,000 permanent employees engaged throughout the year in citrus production at farm level it's harvesting and marketing (PHDEC, 2012)

Only PHDEC is single organization involve in the technology transferring capacity building of citrus stakeholders but it has own limitations and budgetary constraints to carry out the campaigns for meeting international standards. There is big need to improve the professionalism and expertise of people attached with this industry. Unawareness of modern citrus production technology, big loss of fruit at farm level, poor quality and lack of marketing information are the key causes of Pakistan's static export (less than 10%) and per unit lowest earning. This course of "Citrus Quality Processing and Export" will definitely furnish the expertise of participant will cause to slow down the post harvest losses and better marketing opportunities.

Specific characteristics and Potential Objectives of Training Program

This modular curricular program is designed to strengthen the expertise of citrus field workers engaged in establishment of citrus groves, citrus quality production, processing and marketing in the country. This short course will cause to generate professional, skilled and technically well-equipped group of labor which is always very much demanded in citrus industry both at farm and post-harvest processing levels. It will cause enhancement of farm production, minimizing the fruit losses and will largely contribute in marketability of citrus which will ultimately cause the prosperity of community and the country. Other salient characteristics and potential objectives of this training are as under:

- Training on citrus quality processing will cause to improve the quality by involving citrus expert involved at factory level attached with either single processor, with group of processors, association and cooperative society etc

- This training will furnish the expertise of citrus expert in designing and applying citrus inputs technically suggested and research based recommended. Research divulge that technical recommendation have great contribution in quality processing and product management.
- It will equipped the trainee to plan the needed techniques and application timing of all input involved in citrus processing which will guarantee the fruit/products production having good export quality.
- Will guide both the trainee and stakeholder in planning the costs, timely operations.
- It will cause to lower down the input cost, lower down the product waste and automatically will add the profitability of growers.
- This modulus course will cause to improve the work proficiency of involved human and other resources. Opportunities of employment will be generated which will cause the prosperity in local community.
- Through getting this training export quality of citrus will be improved and complaints from customer will be reduced.
- Strengthening the expertise of citrus processing workers engaged in citrus receiving from farm, its storage, tagging, quality inspection, processing, grading, packing, labeling cold storage and loading for shipment.
- To generate professional, skilled and technically well equipped group of labor which is always very much demanded in citrus industry both at supervisory level as well post harvest handling levels.
- Enhance quality production at pack house, minimizing the fruit losses and will largely contribute in export marketing citrus which will ultimately cause the prosperity of community and the country.

Medium of Instructions

The medium of instructions for this course will be bilingual that is Urdu and Local language for good performing of the trainee

Trainee Entry Level and Traits

Education: Matriculation will be preferred

Age: 18-35 Years

Trainee or worker should be self-confident, self-motivated, physically strong and very much willing to carry work with manually. He should be regular and punctual, honest, social and team player. He should be innovative, smooth and enthusiastic for analytical skills.

Minimum Qualification of Trainer

Masters / Honor Degree in Horticultural Sciences will be preferred along with work experience in citrus processing and export.

Class Size

Ideally the group size of this training program will be up to 20 trainees, provided all necessary resources to practice the tasks/ competencies as specified in this curriculum.

Timeframe

Duration of course:	3 months
Total Training Hours:	400 hours
	Theory: (20%)
	Practical: (80%)
	Training day per week: 5 Days

Definition of the Trade

The aim of this curriculum is to generate a skilled manpower for citrus processing at factory level which would contribute a key role in the promotion of citrus trade and to earn foreign exchange. Inspite of sufficient processing facility only 10% of total citrus production is processed for export from Pakistan. This training will facilitiate the citrus processing stakeholders Such trainings We are contributing about 20-40% post harvest losses which could be cut through such training and capacity building program to the labour involved in this sector at different levels. Minimizing the post harvest losses means improving quality, increasing the export and adding in revenue.

Key Objectives of the Course

This training program is designed to strengthen the expertise of citrus processing workers engaged in citrus receiving from farm, its storage, tagging, quality inspection, processing, grading, packing, labeling cold storage and loading for shipment. The objectives of this course are:

a. To develop technically well-equipped trained man power to meet the demands of citrus industry for supervisory at post harvest handling levels.

b. To enhance quality production at pack house, minimizing the fruit losses and improving citrus export.

Trainee Competencies Level after Completion of Course

After completion of this course the trainee would have all competencies to implement the basic principles of post harvest handling of citrus. He will be furnished with following skills and expertise of citrus handling:

- Management of product at farm for temporary storage and in pack house for processing
- Arranging and feeding in processing line
- Washing for decontamination of fruit
- Washing for decontamination of pathogens

- Sorting for grade and quality assurance
- Waxing for retarding the respiration, ethylene production and dehydration
- Drying for removal of surface water and improving the wax application
- Fruit grading ensuring quality and market demand
- Material and market based packing of the product
- Weighing and boxstripping
- Cold treatment for retarding the mould germination/ multiplication and dealing fruit fly maggots
- Fruit loading for export shipment.
- Monitoring of different critical stages of citrus processing enlisted in food safety standards including washing, waxing, grading and cold treatment.
- Trainee will be equally proficient in record keeping and stock keeping of citrus proeducts
- Checklist formation and data maintenance
- Will be able to respond during auditing and food safety inspection.

Trainee Job Opportunities

- *Government Projects and Matching Grants:* Pakistan is focusing on supply chain improvement of horticultural products especially potential fruits and vegetable in which citrus is always highlighted because of expanding production, processing, marketability in international markets. Many projects are working in Pakistan like Supply Chain Improvement Project (SCIP), ASF-USAID and Value Chain Development etc. Citrus processing expert can play a very vital role in winning and implementation of matching grants for citrus beneficiaries. Currently there is none of the qualified expert in citrus processing industry is working so all concerning bodies are aspiring for candidate carrying expertise of citrus processing and export. So it is great opportunity for trainee of this course

- *Global GAP, Pak GAP and Organic Certification:* Pakistan Horticulture Development & Export Company has introduced wonderful competitive trends of cooperative citrus farming, corporative citrus farming, Global GAP, Pak GAP and organic certification in Pakistan. For the application of these concepts stakeholders are ready to hire an export that can deliver and address these tasks.
- *Citrus Consultant and Certification Bodies:* Along with government agencies there are many private consultant agencies and certification bodies are also working in the industry which are always needed such citrus processing and export experts for system preparation and auditing of different systems like IFS, BRC, HACCP and ISO 22000:2005 etc.
- *Citrus Processing Industry:* In Pakistan more than 300 citrus processing and pack houses working having capacity of more than 10,000 tons / day for export. All units are well equipped and meeting all SPS standards but don't have any local citrus processing export expert who can be trusted part of their business.
- *Commercial Citrus Exporters:* there are more than 300 commercial exporters doing regular business in citrus getting citrus from processing units but there are always dispute between processor and commercial exporter on quality and other matter because commercial exporter has strong weakness of lack of expertise of citrus processing and quality inspection. He has involve private firms but none of the firm has expert who can tackle processing and export issue so for trainee of this course would have great opportunity of with this group also.

Course Structure

This curriculum comprises 3 modules and 11 learning units with various learning elements. The course will be full time (5 days a week) and duration of the course will be 3 months. The trainers will be liberal to adopt different modes of teaching and training and to reschedule training time table. The full structure of the course is as follow:

Module Title and Aim	Theory	Practical / Workplace	Total hours
Module 1: Citrus Receiving and Record Keeping at Factory **Module Aim**: The target objectives of this module is to make necessary arrangements of citrus receiving at processing unit, storing temporary in reception hall, tagging of certified and non certified fruit, quantity confirmation and quality verification, maintain farm or supplier based stock register including quality status of the product and the other objective of this module is to maintain supplies of empty cartoons in the field for new harvesting, disinfection of plastic baskets of to ensure the quality both at farm as well in processing level	21 hours	87 hours	108 hours
Module 2: Citrus Processing **Module Aim:** The ultimate objective of this module is to carry out the quality processing of citrus fruit for export market to save it shelf life and quality, identification of important processing steps involve in citrus quality maintenance and shelf life, Performing quality characteristics of inputs involved in citrus processing, preparing citrus processing checklists to ensure the quality also needed during auditing and quality inspection internally or externally, identification of critical control points and fixing their critical limits, implementation of quality chart making quality, Performing quality parameters of citrus targeting export markets	26 hours	104 hours	130 hours

Module Title and Aim	Theory	Practical / Workplace	Total hours
Module 3: Packing and Storage **Module Aim:** The aim of quality packing material and implementation of standard procedures involved in packaging, Performing characteristics of packing materials contributing maintaining shelf life of the product, introducing legislation made regarding packing for guidance of consumer, using separation sheets and capacity filling of the fruit, introducing standard labeling of the crates mentioning all guidelines facilitating consumer of stakeholder, storing of in cold store maintaining low temperature to retard the respiration and avoiding deterioration of fruit.	27 hours	105 hours	132 hours

Sequence of Modules and Learning Units

1. **Citrus Receiving and Record Keeping at Factory**
    a. Unloading of citrus
    b. Perform counting of the baskets
    c. Ensure quality and labeling
    d. Maintain record
2. **Citrus Processing**
    a. Assure quality during process
    b. Control quality at critical control points

3. **Packing and Storage**
    a. Monitor filling and labeling of boxes
    b. Weight and quality check
    c. Stock keeping
    d. Final fruit loading for markets
    e. House keeping

2. Overview about the curriculum “Citrus Processing”

Module	Learning Units	Duration
Module 1: Citrus Receiving and Record Keeping at Factory	LU 1: Unloading of citrus LU 2: Perform counting of citrus baskets LU 3: Ensure quality and labeling LU 4: Maintain record	20 hours 18 hours 40 hours 30 hours Total time = 108 hours
Module 2: Citrus Processing	LU 1: Assure quality during processing LU 2: Control fruit quality at critical control point	70 hours 60 hours Total time = 130 hours
Module 3: Packing and Storage	LU 1: Monitoring filling and labeling of boxes LU 2: Weight and quality Check LU 3: Stock keeping LU 4: Final fruit loading for market LU 5: House keeping	42 hours 24 hours 18 hours 18 hours 30 hours Total time = 132 hours

3 Modules	**=**	**370 hours**
Module Assessment time	=	30 hours
Module 1 assessment and revision time	=	06 hours
Module 2 assessment and revision time	=	08 hours
Module 3 assessment and revision time	=	10 hours
Flexible hours for final course assessment & all leaning units selected by the trainer	=	06 hours
Total time of complete course	=	**400 hours**

3. Teaching and Learning Guide "Citrus Processing"

There is no specific methodology of teaching this curriculum. Preferable independent and responsible work action as the aim of the training are imparted in such fields of education, where it is part of the overall methodological concept. Thus every methodology can contribute to achieving the targeted objectives. Methods that directly enhance the capacity level are particularly suitable and therefore should include appropriately in the teaching. But in trade education major focus is given to demonstration and activity based methods.

3.1 Module Title: Citrus Receiving and Record Keeping at Factory

Objective of the Module

The character objective of this module to develop the basic knowledge, skills and Performance of citrus handling after farm loading in processing unit for washing, waxing, grading and storage for indoor worker of citrus industry

Duration of the Module

Total 108 hours Theory 21 hours Practice 87 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
1. Unloading of Citrus	The trainee will be able to: 1. Perform post harvest handling of fruit at unloading bay of factory premises 2. Ensure safe unloading at factory door step 3. Arrange safe parking of loaded vehicles	1. Performance of post harvest handling of fruit at factory level 2. Making arrangements for well designed and clean platform for safe parking of fruit loaded vehicles 3. Arranging ramp for easy unloading operations and	Total: 24 hours Theory 05 hours Practical 19 hours	1. Lifter (rental) 1 2. Pallet wooden or plastic 1 for each group 5 trainee 3. Drafting pad and pencil 1 for each group 5 trainee	For the theoretical learning: Class room either in field station or separate with facilities of white boards,

	4. Prepare rodent control program and scheme 5. Perform the temporary storage at factory level	lifter working 4. Sanitation of unloading premises to avoid insect, pests and birds infestation 5. Mark the unloading premises for guidance of drivers and other operational labor 6. Have changing rooms and uniform along with entrance room or receiving area. 7. Arranging hand washing and sanitation facility before start operation of citrus unloading and storing 8. Introducing and installing well defined rodent control program in unloading premises 9. Arranging screening and partitioning between receiving and feeding areas. 10. Performing safe parking premises e.g. very close to unloading plate forms, close to charging area, near temporary storage and processing line etc 11. Performing the importance of storage for smooth processing and quality maintenance			charts etc For practical learning: Citrus processing facility (Demo Processing Unit)

		12. Maintain the sanitation and Performance of food safety guidelines 13. Preparing checklists of different procedures inside the temporarily storage 14. Schematic storing of different grades and quality product harvested on export market based 15. Arranging space and labour for handling empty baskets after feeding in the feeder to avoid any mixing or data violation			
2. Perform Counting of Citrus Baskets	The trainee will be able to: 1. Perform the staking and temporary storage of fruit baskets based on grades 2. Verify the document collected from farm supervisor or supplier 3. Observe food safety guidelines at this step.	1. Selection of premises for staking and temporary storage of fruit baskets e.g. under shade, leveled and plan surface, clean and properly covered decks, screened premises from other processing line, near to feeder for easy operations of fruit processing etc 2. Performing the storage of baskets filled with different grades e.g. A, B C and D grades 3. Staking or storage of baskets considering their further shifting and processing e.g. A grade	Total: 18 hours Theory 03 hour Practical 15 hours	1. Calculator 1 for each 5 trainee 2. Drafting pad with pencil 1 for each 5 trainee 3. Stock register 1 for 5 trainee	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Citrus processing facility (Demo Processing Unit)

		baskets are stored near feeder of processing line, B grade is store near loading decks for local markets transportation and C and D grade baskets are hold in a side to load in open trucks for transportation to value addition factories 4. Confirmation of documents provided from supplier or farm supervisors e.g. quality inspection report at farm level, number of baskets based on grades and sizes, any specific instruction or observation from field staff to update or implement 5. Performing the difference of certified fruit and uncertified e.g. fruit coming from Global GAP, IFS registered orchards and organic certified orchards etc 6. Counting of baskets and storing separately both certified or non certified fruit stuff 7. Stacking of fruit baskets on pallets to handle easily by lifter for further			

		processing 8. Labeling of each grade mentioning name of orchard, name of owner, total quantity of fruit, quality of the fruit, date of harvesting, time of harvesting, fruit grade, fruit tentative size, number of baskets, carriage vehicle number and total weight in each basket etc. 9. Checking of the supporting documents of fruit picked and collected from the specified farm e.g. vehicle number, labour number and code, total empty baskets, filled baskets, weight in each baskets, it farm detail and any specific instruction from supervisor or chairman of farm responsible person etc. 10. Performing the guidelines of food safety managing systems at receiving of citrus fruit. 11. Preparing different checklists of food safety managements systems implemented in processing premises			
3. Ensure	The trainee will be able to:	1. Determine citrus fresh fruit	Total:	1. Refractometer 1	For the

Quality and Labeling	1. Check the quality standards / characteristics of citrus fruit 2. Develop quality inspection sheet 3. Perform the labeling procedures 4. Grade and store the fruit based on quality	quality required for export markets 2. Developing the quality inspection checklist including quality parameters: - Blemish citrus fruit - Fruit rottenness - Fruit puncture - Rind pitting - Long stem - Button loss - Soft skin - Skin loss - Skin bruising - Fruit puffiness - Mechanical damage - Aesthetic value - Sensory characteristics - Physiochemical characteristics - Marketable grade/size 3. Performing of physical characteristics needed for processing and packing for export markets e.g. button should be present on fruit, complete and strong without pulpiness and pressed, dryness without moisture water of rain or fog, disease insect pest infestation free, juicy and aromatic, without any	40 hours Theory 08 hour Practical 32 hours	for 5 trainee 2. Calculator 1 for each 5 trainee 3. Thermometer 1 for 5 trainee 4. Sizer ring 1 for 5 trainee 5. Drafting pad with pencil 1 for each 5 trainee	theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Citrus processing facility (Demo Processing Unit)

		injury either of thorn, pedicle, nails or any picking knife cut during harvesting etc 4. Performing the grades categories preferred for different export markets e.g. small size of citrus fruit is preferred for central Asian states, middle size for Iran, Iraq and Far East markets and big one for Arab States 5. Performing the size and weight base quality of citrus e.g. 5-6 piece of fruit per kg deal as big fruit, 6-7 pieces as mid size and more than 7 in small size fruit. 6. Performing the rind development based on color and thickness e.g. complete orange color of whole fruit, without de-greening systems, thin and shiny rind, strong and completely developed rind etc 7. Useing of different quality parameters determination tools e.g. refracto meter, thermometer, magnifying lens and ring sizer etc. 8. Ensuring the traceability			

		of fruit for coding and SPS compliance implementation 9. Carrying out quality inspection of picking baskets and their sanitation 10. Fumigation of picking baskets and other packaging material 11. Installing of insect pest traps and catcher inside the fruit receiving areas 12. Calibration of weighing machines used in receiving areas for verification of the baskets weights and total quantity 13. Verifying sizes of fruit using ring sizer or any other mechanized. 14. Hanging instructions of labour working and stock handling inside fruit receiving areas 15. Labeling of different lots coming from field e.g. Global GAP certified or non certified, organic or inorganic, variety based like Kinnow Mandarin, Feutrel's Early, Orange and grape etc 16. Stacking of harvested fruit in different location			

		facilitating the inspector and other staff for further operation 17. Labeling the specified quantity and quality of specified variety collected from different farms for the facilitation of record keeping and developing stock sheet			
4. Maintain Record	The trainee will be able to: 1. Maintain data collection sheets 2. Keep and update data/record of citrus fruit 3. Tag different varieties with grades 4. Maintain baskets and harvesting tools records 5. Understand comments and instructions of harvesting supervisor 6. Maintain stock register in fruit reception hall 7. Handle emergency / accident	1. Introduction of data collection methods and formats 2. Preparation of data sheet based on data collection including: - Produce name - Baskets size weight - Rotten percentage - Rind pitting percentage - Disease insect attack - Birds injuries - Citrus greening and improper shape - Size based grades and percentage - Random per fruit weight - Mites and other any 3. Performing presenting the data sheet and documents 4. Maintenance of record for audit purposes and	Total: 30 hours Theory 06 hours Practical 24 hours	1. Drafting pad 1 for each trainee 2. Pencil 1 for each trainee 3. Stock register 1 4. Different tagging cards 5 for each group	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Citrus processing facility (Demo Processing Unit)

		other system updates 5. Introduction of tags on fruit stock e.g. tagging of certificated and non certified fruit, tagging of different sizes and grade fruit, tagging of organic and inorganic fruit, tagging of different varieties Kinnow, Orange varieties, Feutrell's Early and Grape Fruit etc 6. Update the picking baskets records either empty or filled sent in the field for picking. 7. Verifying baskets received and loaded during start of harvesting of fruit. 8. Recording of fuel consumption transportation vehicles used for carrying of fruit from farm to pack house 9. Record the time of picking and receiving of fruit from farm to pack house 10. Recording the comments coded by the harvesting supervisor and field staff 11. Conveying of the comments to production manager and other			

		incharge responsible for production, processing and exportation 12. Maintaining the record register variety and farm based also having weight, grade, time, quality and weight loss 13. Maintain stock register of all equipments tools and accessories used in receiving hall e.g. filled and empty baskets, lifters and pallets etc. 14. Develop the maintenance checklist of machinery used in receiving hall 15. Introduction of first aid kit and dealing of emergency 16. Introduction of different work instructions inside the fruit receiving hall for training of labour working in the hall.			

3.2 Module Title: Citrus Processing

Objective of the Module

The potential aim of this module is to develop the basic knowledge, expertise, skills and performance of citrus processing for export and high end local markets for a citrus expert in side processing unit conditions.

Duration: 130 hours Theory: 26 hours Practice 104 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
1. Assure Quality during Processing	The trainee will be able to: 1. Identify and select certified citrus processing facilities with international standards 2. Recognize the citrus quality parameters and standards 3. Identify important processing steps critical for quality assurance 4. Identify quality characteristics of inputs 5. Investigate the time frame of each processing step 6. Examine physicochemical sensory characteristics of citrus 7. Develop the quality parameters checklist of fruit for export. 8. Carry out the standard procedures of processing steps	1. Selection of advance citrus processing facility well equipped with separate reception area, screening of feeder from unloading area 2. Selection of citrus processing units of maximum capacity of 52 fingers fitted with two drying burners, blowers for natural drying after each washer and wax chamber 3. Selection of processing unit preferable fitted with conveyor belts arranged in both feeder chamber and after packaging for sticking. stripping and weighing 4. Identify the different	Total: 70 hours Theory 14 hours Practical 56 hours	1. Class will be arranged in processing hall of demo pack house during the season machinery will be available for introduction and trial operation. 2. Following machinery would be needed 3. Lifter one for whole class 4. Weighing machines 1 for 10 trainee 5. Molding machine 1 for whole class	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Field, demo citrus processing line

	9. Maintain stock register of inputs in processing hall 10. Use of first aid kit in emergency	chambers and steps of citrus processing and execute important informations at each step regarding operation and critical limits. 5. Introduction of feeder operation having smooth speed conveyor belt for transferring of fruit into washer. It is best if dipping tank is fitted and fruit is dropped into tank for washing and removal of dust and insect pest attach effects 6. Identification of washer and introduction of CCP (Critical Control Point) on this chamber because of using different types of fungicide and chlorine for disinfection and cleaning of the fruit 7. Introduction of (CL) critical limits of each CCP to avoid any deterioration of fruit quality and following the standards of using any chemical 8. Demonstrate the quality benefits of natural drying of fruit. Introduction of blowers after washing chamber to carry out the		6. Stripping machines 1 for 5 trainee 7. Sticking taps 1 for 5 trainee	

		natural drying inspite of raising temperature of drying burner. Maintaining low temperature of fruit during whole chain of processing gives guarantee of fruit quality and shelf life. 9. Introduction of dryer and burner temperature e.g. 45-65C. It varies with the surrounding temperature during foggy and cold nights it is raised up to 65C but during normal days after December mostly it ranges 45-50C 10. Introduction of second step sorting after washing chamber to ensure quality of fruit if over locked in early sorting steps either on farm or after feeding 11. Introduction of wax application on citrus fruit mixed with standard doze of fungicide e.g. Benomil, TBZ etc 12. Fixing of CCPs and CLs at this processing step to avoid over or under dosage of fungicide and wax directly affecting the			

		quality of fruit and shelf life especially for long destinations. 13. Introduction of sorting grading or sizing of citrus fruit based on size. Fixing the CCPs and CLs. In advance processing lines more than 9 citrus grades are collected in different basins ranging different sizes. Arranging partitioning between each basin to avoid mixing of the different grades and sizes. 14. Selection of packaging material e.g. wooden crates, corrugated boxes, EPS packaging, plastic bags, polythene bags etc 15. Selection of packaging material based on size and export material e.g. for local markets mostly wooden crates having size of 10, 12, 14, 16 kg are used while corrugated boxes of 6, 8, 10, 14 are used for different countries. Most of the investor used big packing for storage purposes at the end of season.			

		16. Collection of rejected citrus grade and quality and filling into plastic baskets or for local markets into wooden crates. 17. Arrangements of open loading vehicles for juice factories and value addition industry 18. Updating of stock register of incoming fruit and processing quantity based on size and variety 19. Introduction of packaging molding and providing upper bottom at packing points. In international markets gum sticking of packing parts is preferred in spite of stapler molding etc 20. To operate molding machine either automatic or mechanized 21. Maintenance of stock register of all inputs used in processing hall after feeding of the citrus fruit into processing line e.g. packaging cartoons, wax drums, fungicides either liquid or powder, sticking taps, thumb stickers, decoration papers and			

		processing labour items etc 22. Monitoring of inputs including packaging material, separation sheets, stickers, stripping roles and sticking tap etc 23. Developing of checklists of machinery used in processing hall e.g. lifters, weighing machines, stripping and sticking machines 24. Calibration of different operating tools e.g. weighing machines, temperature recording devices installed on burners, light intensity in working space and nozzles of washer and wax 25. Utilization of first aid kit using of different first aid kit medicines and dealing emergency occurring in processing hall			
2. Ensure Fruit Quality at Critical Control Point	The trainee will be able to: 1. Identify the critical points involved in citrus quality 2. Identify critical control points(CCP) in whole citrus processing line 3. Illustrate control limits (CLs)	1. Identification of critical control points and their importance e.g. selection of important steps where inputs are involved and violation of any case cause product	Total: 60 hours Theory 12 hours Practical 48 hours	1. Practical session will be conducted in model citrus processing unit where line will be spared for	For the theoretical learning: Class room either in field station or separate with

	of each CCP 4. Follow quality fruit chart displayed in the processing hall 5. Execute the quality parameters for export markets 6. Prepare the checklists of all CCPs and CLs 7. Monitor the CCPs and CLs during processing of citrus fruit 8. Take corrective action of any violation of CCPs	deterioration and shorten its shelf life. 2. Determining the criteria control point in whole citrus processing line 3. Determination of critical limits on each critical control points involved in citrus processing line. 4. Fixing of critical limits of each critical control point based on characteristics of input operation involved in processing line 5. Performing the factors deteriorating the fruit quality during citrus processing and packing in processing hall. 6. Learning of different steps involved in citrus processing line contributing different role for maintaining citrus quality required for export markets e.g. feeding, washing, drying, waxing, sizing, weighing, sticking and stripping etc. 7. Sorting of fruit on quality based on aesthetic and physiological characteristics needed		trainee 2. Temperature or sensor 1 for 5 trainee 3. Needle like thermometer for citrus pulp temperature 4. Ring sizer 1 for each trainee 5. pH meter 1 for 5 trainee 6. Complete processing and packing uniform 1 for each trainee 7. Stop watch 1 for 5 trainee 8. Calculator 1 for 5 trainee 9. Fruit cutter 1 for 10 trainee	facilities of white boards, charts etc For practical learning: Field, demo citrus processing line

		for marketing e.g. sound and compact fruit, blemish free, having marketable size and shape etc 8. Performing quality maintenance during fruit washing after feeding in processing line e.g. fresh tap water is used having microbial load at minimum levels and heavy metal free. In advance processing technology 100-200ppm chlorination is carried out in water to avoid any biological infestation. Fresh water washing also removes external durst present on the fruit and residues of insect pest attacks e.g. citrus psylla, mealy bug etc. fruit, washing removes dust form bark pores and improves application of wax to slow down respiration of fruit, washing improves skin shining helps to sort due blemish and other defects 9. Performing quality maintenance during			

		drying, post drying and after waxing e.g. high temperature causes high rate of respiration and chemical conversion into fruit conversion of sugar etc. high rate of respiration causes quality deteriorate , poor presentation and shorten shelf life 10. Maintaining the quality maintenance of citrus fruit at critical control point of both burner e.g. first burner after washing used for drying temperature ranges 35-45C depending upon indoor and outdoor environment and temperature, during the start of Kinnow processing season temperature is maintained on lower ranges while mid season end December and start January it ranges up to 65C similarly at the end of season it again drops down on up to 35C. 11. Ensuring fruit quality			

		maintenance in wax chamber e.g. wax slows down respiration and stop gas exchange from rind of the fruit, wax improves shining of the fruit bark, past on minor blemish incidence, improves colour of the rind and clean it etc. 12. Determining critical control point and fixing the critical limits e.g. food grade wax is used having mixed with fungicide recommended against different fungus stains causing to deteriorate fruit for long storage, fungicide concentration recommended is 2000-5000ppm, wax application is third critical control point in citrus processing line in most of existing technology involved in citrus processing and sorting. 13. Maintaining citrus fruit quality at grading level e.g. fix the fingers or sizer on recommended instructions to grade			

		citrus fruit in prescribed range of sizes required in export markets e.g. in 52 figures 9-10 grades are collected in separate catch basins which are packed in separate packing crates specified for different markets e.g. fruit pieces in 10 kg ranges 36-110 having different marketing places, 10 kg cartoon having citrus fruit 36-56 is best marketed in Middle East, Afghanistan, Iran and Iraq, For East, Europe, Siri Lanka, Bangladesh, Philippine and Mordacious while pieces 60-110 mostly marketed in Central Asian States mostly used for value addition along with fresh serving. 14. Ensuring the stock of inputs needed during processing of fruit e.g. wax, fungicide, fuel in burners, empty baskets for sorted and rejected fruit, chlorine if needed, crates and cartoons at packing desks, sufficient			

		light in side processing hall and continuous water supply of fresh water 15. Recording and maintaining stock register of incoming fruit and packed fruit cartoons 16. Preparing the checklists of each critical control point and critical limits e.g. monitoring of mixing of fungicide in washing water, burner temperature, wax concentration and mixing of fungicide in wax, grader maintenance, etc needed during inspection and auditing of SPS compliances 17. Performing of corrective actions if any step in fruit processing perform improper e.g. flow of water nozzles, spray nozzles of wax applicator, conveyor belts speed and direction, burner temperature and grader speed and direction etc.			

3.3 Module Title: Packing and Storage

Objective of the Module

The potential aim of this module is to develop the basic knowledge, expertise, skills and performance of citrus packing and storage for high end local markets and export in side citrus processing unit conditions.

Duration: 132 hours Theory: 27 hours Practice 105 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
1. Monitoring filling and labeling of boxes	The trainee will be able to: 1. Classify different types of citrus packing 2. Use different methods of packing 3. Distinguish different characteristics of packing material 4. Label the product/ boxes	1. Performing different methods of packing e.g. crates packing, open top packing, loose packing bulk packing etc. 2. Identification of different packaging materials e.g. - wooden crates - corrugated boxes - EPS packaging - plastic baskets and - plastic poly bags etc 3. Determining the criteria of selecting packing martial based on different parameters e.g. availability of packing material, marketing destination, customer requirements, legally documented either by buyer or suppliers etc	Total: 42 hours Theory 08 hours Practical 34 hours	Practical session will be conducted in model citrus processing unit where line will be spared for trainee and all process of filling and labeling will be monitor and instructed	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Field, demo citrus processing line

		4. Evaluating the characteristics of packaging material based on performance e.g. - water resistance - shock absorbent - light weight - recyclable - vitamin c retention - printable - moldable - aeration - easy to handle - stock able - fumigation etc 5. Introduction of international standards and legislation designed for packaging materials and packaging methods e.g. selection of non hazardous packaging material, packaging material carrying product specification packed in it, printed information in native language of consumer market 6. Performing filling methodology e.g. - Citrus is packed either horizontally or collar side button should not			

		puncture the rind of next fruit - Packing each layer having equal number of fruits - Using separation sheets to avoid weight and packing pressure on rest of fruit - Avoid over filling and weight of fruit - Open the aeration ducts of cartoons - Standard filling of recommended number of fruit and size of each fruit 7. Filling of citrus fruit following instructions printed on packaging e.g. category I, citatory II or class I and Class II, 8. Filling and packing of citrus fruit pieces with exact number of counts e.g. 36, 42, 48, 54, 60, 66, 72, 80, 100 and 110 etc with relaxation of about5%, also within relaxation of weight of ± 100 grams if relaxation granted. 9. Following labeling procedures and labeling components of citrus			

		fruits e.g. total number of counts in each box, category of product packed e.g. - Labeling the exact name of the product packed - Labeling category and counts packed - Data of harvesting and processing - Organic or inorganic - Country of origin - Necessary instruction of utilization and dietary level - Global certification status - Food Safety Management Standard certification status - Traceability code - Net weight when packed etc			
2. Weight and Quality Check	The trainee will be able to: 1. Identify standard packaging weights. 2. Select weighing machine and calibrate it. 3. Ensure the maintenance of weighing machine 4. Maintain data collection sheet of citrus fruit 5. Observe quality monitoring	1. Following the procedure of fruit weighing 2. Selecting mechanized weighing machine fitted with digital data screen and having capacity of required weight 3. Performing the calibration process of weighing machine and	Total: 24 hours Theory 05 hours Practical 19 hours	1. Practical session will be conducted in model citrus processing unit where line will be spared for trainee. 2. Electric weighing	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc

	sheet for verification of fruit quality	its importance 4. Adjusting weighing machine subtracting standard cartoon or packaging weight to maintain the net weight of packed fruit 5. Performing of mechanical operation of weighing machines 6. Ensuring quantity confirmation by weighing random samples picked from processing line or from store both untreated and treated or stored 7. Developing data sheet of citrus fruit confirm the actual status of weight of packed cartoons required for both auditor of FSMS and some time buyer 8. Developing quality check data sheet enlisting all physicochemical and sensory parameters e.g. - Freshness and shining - Puffiness % - Rottenness % - Rottenness % - Blemish %		machine 1 for whole class 3. Computer system 1 4. Printer 1	For practical learning: Field, demo citrus processing line

		- Skin injury - Skin splitting - Rind colour % - Bruising % - pH of juice/pulp - Brix % - Taste and aroma etc 9. Preparing check list of citrus fruit inspection will be needed during auditing and buyer complaints 10. Preparing checklist of weighing machine maintenance needed during audits FSMS and quality inspections			
3. Stock Keeping	The trainee will be able to: 1. Use different methods of stock keeping 2. Maintain stock register and prepare the report	1. Learning different method and systems of stock keeping and their importance e.g. - Online computerized system - Paper based systems - Custom built stock solution etc 2. Performing the detailed status of product quality, Guiding in identification of marketing trends, solution and control over finances and product quality 3. Ensuring and avoidance of theft	Total: 18 hours Theory 04 hours Practical 14 hours	1. Practical session will be conducted in model citrus processing unit where line will be spared for trainee. 2. Stock register 1 for 5 trainee 3. Computer software and computer 1 4. Drafting pad 1 for each trainee	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Field, demo citrus processing line

		4. Stock keeping of fruit processed and un processed, helps in managing the loading and supply orders for different destinations, 5. Developing balance sheet of stocked fruit which helps in waste manage and control 6. Preparing stock report of different grades store in the stock help to manage the marketing and export of citrus fruit, guiding in maturing orders with buyers, report guides fruit grade status e.g. A, B, C size status and quality picture 7. Calculating the wages of labour and other contractor per unit based on stock keeping			
4. Final Fruit Loading for Market	The trainee will be able to: 1. Maintain the stocked fruit for export 2. Manage stock for loading 3. Carryout final quality inspection 4. Find out different modes of transportation 5. Observe standard loading procedures	1. Finalizing fruit stock ready for exportation e.g. having completed cold treatment time needed for exportation, pallets stocking, collecting data logger record for documents and phytosanitary certificates issuance and	Total: 18 hours Theory 04 hours Practical 14 hours	1. Practical session will be conducted in model citrus processing unit where line will be spared for trainee. 2. Class will be arranged for	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc

	6. Assess the loading capacity of each container	standardize pulp temperature etc 2. Cleaning of decking area and arranging inspected fruit pallets near decking area for loading for exportation 3. Maintaining cooling chain from cold room to loading in container 4. Carrying out final quality inspection against standard checklist which will be part of exporting documents. 5. Arranging open truck loading and big loader for land transportation without cold treatment preferably fresh processed fruit 6. Monitoring of store temperature, fruit pulp temperature, moisture percentage and physical condition of citrus fruit 7. Examining different transportation facilities and their capacities e.g. refer containers 20 feet and 40 feet, refer container fitted with data logger device, containers with auto join set and recharging		practical learning when container loading will be started 3. For open truck and loose loading all system will be available in demo unit in loading areas.	For practical learning: Field, demo citrus processing line

		facility, refrigerated vans, open truck of different loading capacities, big capacity loaders suited for road transportation and open carts, trolleys for C grade supply etc 8. Practicing different methods of loading into fruit transportation vehicles e.g. palletized and non palletized loading, channel fixing along the column and without channels, stocking of pallets to use maximum space and good cooling effect etc. 9. Stocking pallets into refer container leaving at least 1 feet along with the container wall for better air circulation and cooling 10. Leaving some space between pallets lines facilitating cool air circulation and maintaining the shelf lif of the fruit 11. Loading of fruit under capacity to ensure the fruit supply and transportation			

		12. Fixing of container on loader with good strengths that road shocks do not affect the fruit 13. Updating the stock citrus fruit and planning for next loading and shipment			
5. House Keeping	The trainee will be able to: 1. Ensure housekeeping of citrus storage and loading premises 2. Ensure the sanitary and phyto-sanitary practices directed in FSMS and other food legislations 3. Implement Integrated Pest Management System in the processing and storage	1. Performing the concept of housekeeping e.g. cleaning of loading premises, removal of used items from loading and decking areas, preparing the deck for next loading and transportation, refreshing and restoring the loading labour etc 2. Implementation of sanitary and phytosanitary guidelines in citrus loading and decking areas. 3. Ensuring blocking of rodent entry into the cold treatment areas of processing unit 4. Developing checklist of SPS guidelines needed in audit and quality inspection 5. Cleaning of area to avoid insect pest	Total: 30 hours Theory 06 hours Practical 24 hours	1. Practical session will be conducted in model citrus processing unit where line will be spared for trainee. 2. Recommended fungicide broad spectrum 500 grams 3. Spray machine 1 for 10 trainee 4. fly catcher 1 for 10 trainee	For the theoretical learning: Class room either in field station or separate with facilities of white boards, charts etc For practical learning: Field, demo citrus processing line

		infestation and fungal multiplication 6. Cleaning of hidden and ignored points mostly insect can use for hibernation and their multiplication 7. Arranging fly catcher or light traps to control flies and other flying insects 8. Installation of air cutter to stop the entry of any foreign participle and dust 9. Arranging fumigation of loading processing facility for sanitation to avoid any biological rearing and multiplication			

Trainee and participants can be assessed preferably during the theoretical session as well as during practical working otherwise at the end of each module must separately sessional assessment can be conducted for each particular module.

4. General Assessment Guidance for the Curriculum of Citrus Processing

The word assess comes from the Latin term “assidere” which means to sit beside. Santopietro (1991) describes the assessment process as educators “sitting beside” learners to get information about trainee proficiencies, backgrounds and goals and in doing so to immerse themselves in the lives and views of their students.

Assessment or modulus evaluation may be defined as "any method used to better perform the current knowledge that a student possesses." This implies that course assessment can be as simple as a teacher's subjective judgment based on a single observation of student performance or as complex as a five-hour standardized test. The idea of current knowledge implies that what a student knows is always changing and that we can make judgments about student achievement through comparisons over a period of time. Assessment may affect decisions about grades, advancement, placement, instructional needs, and curriculum. Generally teachers and policymakers, administrators and schools, parents and guardians carryout the assessment having salient purposes set standards, focus on goals, monitor the quality of training and education, formulate policies and rewards, identify training strengths and weaknesses and allot the grades to the students.

Good assessment information provides accurate estimates of student performance and enables teachers or other decision makers to make appropriate decisions or a lot the grades. Assessment actually measures what it is intended to measure, and permits appropriate generalizations about trainee skills and abilities. The result of an assessment practice represents something beyond how students perform during the training session either in class room or during the practical in the field. Consistency and reliability of trainee performance is a focused and salient character which is assessed through comprehensive module of assessment that trainee should perform equally good gathered in different circumstances and with different raters.

Assessment of student learning is a participatory, iterative process that provides data/information you need on your students’ learning, engages you and others in analyzing and using this data/information to confirm and improve teaching and learning, produces evidence

that students are learning the outcomes you intended, Guides in making educational and institutional improvements, evaluates whether changes made improve/impact student learning and documents the learning and your efforts.

Types of General Assessment

1. Formative Assessment/ Sessional Assessment
2. Summative Assessment / Final Assessment

In Pakistan formative and summative assessments techniques are used to evaluate learning achievements of the trainees. It also facilitates the trainers to assess the training techniques short falls of textual material and equipments.

1. Formative Assessment/ Sessional Assessment

Formative assessment is some sort of sessional assessment done during the training program. Classroom assessment is one of the most common formative assessment techniques in all sort of training either formal or informal system of education or trainings. The purpose of this technique is to improve quality of training and should not be evaluative or involve grading students. This can also lead to curricular modifications when specific courses have not met the student learning outcomes. Classroom assessment can also provide important training information when multiple sections of a course are taught because it enables programs to examine if the learning goals and objectives are met in all sections of the course. Formative assessment directs trainers to update the course components understanding and trainee perception regarding specific module or component of the module. Citrus Processing Module comprises of many leaning units and learning outcome can be test in sessional assessment for effective training program. It always makes vigilant to the trainee keeping him attentive and involved in class activity.

2. Summative Assessment / Final Assessment

Summative assessment is comprehensive in nature, provides accountability and is used to check the level of learning at the end of the program. For example, if upon completion of training trainee will have the knowledge to pass an accreditation test, taking the test would be summative in nature since it is based on the cumulative learning experience. Program goals and objectives often reflect the cumulative nature of the learning that takes place in a program. Thus the program would conduct summative assessment at the end of the program to ensure students have met the training course goals and objectives. Attention should be given to using various methods and measures in order to have a comprehensive plan. Ultimately, the foundation for an assessment plan is to collect summative assessment data and this type of data can stand-alone.

It is clear that different kinds of information must be gathered about trainee by using different types of assessments. The types of assessments that are used will measure a variety of aspects of student learning, conceptual development and skill acquisition and application. In Pakistan if we pick the examples of different national teaching and trainings institutes including vocational training providers both methods of assessments used very commonly to produce final qualification result. For this specific modulus training assessor needs to devise formative or sessional assessments for both theoretical and practical work. Guidance is provided in the assessment strategy.

Methods of Assessment

Methods include direct assessment, which is the most desirable form of assessment. For this method, evidence is obtained by direct observation of the student's performance.

Examples for direct assessment of a Citrus Processing include:

- Work performances, for example unloading of citrus and staking of citrus baskets inside the processing area, counting of filled and unfilled baskets, labelling and pelletization of processing stock etc
- Demonstrations, for example demonstrating the quality inspection following citrus export quality standards, demonstration of sizes having marketing demand, blemished fruit, rind colour developed and injury free fruit, nutritionally and aesthetically acceptable fruit, sound and compact fruit etc.
- Direct questioning, where the assessor would ask the student how washing of fruit is carried out inside the processing hall, what are the criteria of inside quality sorting of citrus fruit, how wax is applied and what are the tentative benefits of wax coating, what is the role of drying before and after waxing.
- Paper-based tests such as multiple choice or short answer questions of sorting, grading, sticking, stripping, packaging and storage.

Direct and Indirect Assessment

In direct assessment actual sample of work is observed produced during the training program while in indirect assessment different information collected through other means rather than looking for the actual sample of work produced during training program or unit. Advantages and Disadvantages of Indirect Assessment are as under:

Advantages

- Indirect method are easy to administer
- Indirect methods may be designed to facilitate statistical analysis only
- Indirect methods many provide clues about what could b assessed directly

- Indirect methods are particularly useful for ascertaining values and beliefs
- Surveys can be given to many respondents at a same time
- Surveys are useful for gathering information alumni, employers and graduate program representatives
- Exit interviews and focus groups allow faculty to question students fact to face
- External receivers can bring a degree of objectivity to the assessment
- External reviewers can bring a degree of objectivity to the assessment;
- External reviewers can be guided either by questions that the Department wants answered or by discipline-based national standards.

Disadvantages

- Indirect methods provide only impressions and opinions, not hard evidence
- Impressions and opinions may change over time and with additional experience;
- Respondents may tell you what they think you want to hear;
- The number of surveys returned are usually low, with 33 percent considered a good number;
- You cannot assume those who do not respond would have responded in the same way as those who did respond;
- Exit interviews take time to carry out;
- Focus groups usually involve a limited number of respondents;
- Unless the faculty agrees upon the questions that are asked in exit interviews and focus groups, there may not be consistency in the responses.

Examples for indirect assessment of a citrus processing worker:

a. Sorting of citrus fruit inside processing and packing unit: sorted fruit collected in B-grade basin observations will disclose the actual knowledge and learning levels of trainee worker e.g. mechanical injury will cause fungus multiplication during storage and shipment. Required size sorting will ensure the quality packing of fruit for targeted markets

b. Sorting in standard size will facilitate the packing in well designed cartoon supposed to be filled for specified market. e.g. for Central Asian States always small size citrus fruit is accepted so during packing machine is adjusted on very accurate size levels to sort the standard fruit sizes to facilitate the market.

c. Similarly setting of thermostat of burner directly depends of the micro and macro environment of processing unit during much foggy day high temperature is required to dry the fruit while during high temperature especially end of the season low temperature is required for dying the waxed fruit.

Indirect assessment should only be a second choice. (In some cases, it may not even be guaranteed that the work products were produced by the person being assessed.)

Assessing Qualities of Trainee

When choosing assessment items, it is useful to have one eye on the immediate task of assessing student learning in a particular unit of study, and another eye on the broader aims of the program and the qualities of the graduating student. When considering assessment methods it is particularly useful to think first about what qualities or abilities you are seeking to engender in the learners. There are eight broad categories of learning outcomes which are listed below.

- Thinking critically and making judgments
- Solving problems and developing plans

- Performing procedures and demonstrating techniques
- Managing and developing oneself
- Accessing and managing information
- Designing, creating, performing
- Demonstrating knowledge and Performing
- Communicating

Principles of assessment

All assessments should be valid, reliable, fair and flexible:

a. Reliability means that the assessment is consistent and reproducible. For example if the work performance of preparing a compost for filling whole during transplanting a citrus nursery plant method adapted and assessed another assessor (e.g. the future employer) should be able to see the same work performance and witness the same level of achievement.

b. Validity means that a valid assessment assesses what it claims to assess. For example, if the ability to harvest citrus fruit from fruit tree in the orchard is to be assessed and certified, the assessment should involve selection and performance criteria that are directly related to citrus fruit and orchard. An interview about harvesting and picking of different crops would not meet the performance criteria.

c. Fairness means that there should be no advantages or disadvantages for any assessed person. For example, it should not happen that one student gets prior information about the type of work performance that will be assessed, while another candidate does not get any prior information.

d. Flexibility means that the assessor has to be flexible concerning the assessment approach. For example, if there is a power failure during the assessment the assessor should modify the arrangements to accommodate the trainee needs.

Assessment Strategy for the Citrus Processing Curriculum

This curriculum consists of 3 modules and 12 learning units:

- **Module 1**: Citrus Receiving and Record Keeping at Factory

  LU 1: Unloading of the citrus

  LU 2: Perform counting of citrus baskets

  LU 3: Ensure quality and labeling

  LU 4: Maintain record

- **Module 2**: Citrus Processing

  LU 1: Assure citrus quality during processing

  LU 2: Control quality at critical control point

- **Module 3**: Citrus Packing and Storage

  LU 1: Monitoring, filling and labeling of citrus fruit

  LU 2: Weight and quality check

LU 3: Stock keeping

LU 4: Final fruit loading for market

LU 5: House keeping

Sessional Assessment

The sessional assessment for all modules shall be conducted in two parts: theoretical and practical assessment. The sessional marks shall contribute to the final certificate qualification. Theoretical assessment for all learning modules must consist of a written paper must have the timing of 30 mints per module. This can be a combination of multiple choices and short answer questions. For practical assessment, all procedures and methods for the modules must be assessed formulating a comprehensive assessment sheet based on practical performance and quality of output. Guidance is provided below in planning of the assessment.

Final Assessment

Final assessment shall be in two parts, theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification and certificate allocation. The final theoretical assessment shall consist of a 3 hour paper, consisting of multiple choice and short question answer (MCQs) types. For final practical assessment trainee class will be distributed into 5 groups comprising of 5 trainees in each group and each group will be allotted different tasks and assignments to perform. During performance involvement of each trainee, his confidence, performance expertise can be visualized for graded and marking. However individual trainee can also be assessed by allotting a separate task in a module and performance can be graded and marked. It depends upon the choice of the trainee how he suits to conduct the assessment considering the situation.

Assessment Team

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five trainees per assessor. In this example, a group of 25 students shall therefore require assessments to be carried out over a five days period.

Planning for Assessment

Sessional Assessment: Assessors need to plan in advance how they will conduct sessional assessments for each module. The tables on the following pages are for assessors to use to insert how many hours of theoretical and practical assessment will be conducted and what the scheduled dates are.

Final Assessment: Training providers need to decide ways to combine modules into a cohesive five days final assessment program for each group of five students 25 in total. Training providers must agree the settings for practical assessments in advance.

Planning aid for Sessional Assessment

Duration: 6 hours **Theory:** 2 hours **Practical:** 4 hours

Module: 1 Citrus Receiving and Record Keeping at Factory				
Learning Units	**Theory Days Hours**	**Practical Days Hours**	**Recommended Sessional Assessment**	**Schedule Dates**
LU 1: Unloading of citrus	30 Minutes	60 Minutes	A trainee will go through a theory assessment and will perform unloading of citrus transported from field, stocking and temporary	

			storage based on citrus quality, certification, grade, farm and harvesting date etc. He will be ensuring the microenvironment of storage required for quality maintenance and will confirm no entry of rodents in the hall.	
LU 2: Perform counting of baskets	30 Minutes	60 Minutes	After theory assessment trainee will go through practical assessment and perform counting of the baskets collected from field in temporary storage.	
LU 3: Ensure quality and labeling	30 Minutes	60 Minutes	Each trainee will be assessed theoretically by developing quality checklists ensuring citrus physical characteristics and quality like species, variety and brand, pieces per baskets, average grass weight of basket, average size in mm and quality parameters. Checklist will also include the percentages of blemishes, mechanical injuries, under sizing, rind colour development percentage, olliosis, puffiness and greening etc	
LU 4: Maintain record	30 Minutes	60 Minutes	Trainee will be assessed theatrically asking short questions regarding benefits of record keeping, method of record keeping e.g. FIFO (first in first out) and FILO (first in last out). Developing stock register practically having different details like purchasing price per unit weight, farm based quantity and quality et.	

Duration: 8 hours **Theory:** 3 hours **Practical:** 5 hours

Module: 2 Citrus Processing				
Learning Units	**Theory Days Hours**	**Practical Days Hours**	**Recommended Sessional Assessment**	**Schedule Dates**
LU 1: Assurance quality during processing	60 Minutes	60 Minutes	Each trainee will go through a theoretical assessment by answering short questions regarding citrus quality and its maintenance. After wards will be assessed theoretically by assuring citrus quality during processing line inspecting each step including feeding, sorting, washing, drying, waxing and grading chambers. He will ensure the quality by developing checklists and ensuring the standard procedures of processing line. Trainee will be assessed in knowing the export quality parameters proving implementation of food safety managements systems and standards	
LU 2: Control quality at critical control points	120 Minutes	240 Minutes	Trainee will be assessed theoretically in following parameters: - What are critical control points (CCPs)? - What is the criteria of determining the critical control points (CCPs) are determined? - What are critical limits (CLs)? - What are the parameters of fixing critical limits (CLs) are determined?	

			- What are standard procedures following critical control points? - What is the importance of fixing CCPs and CLs in ensuring the food safety and quality control etc? - Understanding the effects of violating the CCPs CLs with citrus quality reference - Understanding the corrective actions of each CCP and CLs After theoretical assessment each trainee will undergo the practical exercise in - Specifying the critical control points (CCPs) in citrus processing line covering all steps and units - Fixing and following the standards food safety to ensure the quality during ensuring the quality. - Determining and fixing the critical limits (CLs) following the food safety management standards and SPS guidelines etc - Developing checklists of different CCPs and CLs facilitating in inspection and system implementations. - Carrying out the corrective action in violation of any CCPs and CLs standards parameters	

Duration: 10 hours **Theory:** 2 hours **Practical:** 8 hours

Module: 3 Citrus Packaging and Storages				
Learning Units	**Theory Days Hours**	**Practical Days Hours**	**Recommended Sessional Assessment**	**Schedule Dates**
LU 1: Monitoring filling and labeling of the fruit boxes	30 Minutes	120 Minutes	Trainee will go through sessional assessment of monitoring filling and labeling of citrus fruit boxes. He will be evacuated through asking different short questions regarding monitoring filling and labeling of boxes e.g. why monitoring is important in making quality of citrus? What are different sizes of boxes required in international markets? What are filling methods and procedures of the citrus fruit boxes? What is the role separation sheet in filling of citrus boxes? What are criteria of box labeling? What are recommended informations should be present on citrus boxes etc. After theoretical assessment trainee will go in practical section and will perform the activity directed by the trainer or assessor. He should how cartoon is filled and how number of fruits be packed in different sizes like in 10Kg box 36- 90 number of fruits are packed trainee should know the sizes of the citrus fruit and their filling number in the boxes. He should know what type of labeling is done on the cartoon e.g. if cartoon is packed for European countries category II will be label and Global GAP certified fruit is packed. For rest of the world normal routine packing with labeling is used.	

LU 2: Weight and quality check	30 Minutes	120 Minutes	For all trainees a short questionnaire will be designed to assess the trainee understanding in weight and quality check of citrus e.g. what is the procedure of weighing of citrus cartoons filled with different grade fruit? What is calibration and what is its importance how it is carried out before starting the weighing of citrus boxes. Trainee should know about the quality parameters of citrus and how quality checking is carried out before storage of the boxes. How net weight is calculated after packing of citrus fruit? What are the benefits of palettization of citrus boxes? What is standard method and weight of a pallet? How pallets are labeled, stocked and marked in processing hall?	
LU 3: Stock keeping	20 Minutes	90 Minutes	Theoretical session for assessment of trainee will be conducted covering different aspects of citrus stock keeping its importance and how it is maintained after processing weighing, sticking. stripping and palettization. In practical session a stock register will be designed and trial entries should be entered for better understanding and expertise learned during training program. Trainee should understand the balance sheet of stock received in feeder and packed in cartoons should be balance adding sorted quantity of citrus. Trainee should know all systems of stock keeping and store facilities for quality maintenance. He should understand the physiochemical and quality deterioration of citrus fruit during late storage and cold	

			treatment. Trainee should know the reading of different thermometers and deta logger device and record	
LU 4: Final fruit loading for markets	20 Minutes	60 Minutes	Trainee will be assessed through short questions like what is role of empty decking room in maintaining fruit quality. How rodent entry is controlled in storage areas especially during loading of the fruit? What is role of air cutter how it works and how it can be maintained? For practical assessment trail loading of citrus boxes either palletized or non palletized should be carried out. Usage of fork lifter for pallets shifting and loading should be assessed during this stage.	
LU 5: House keeping	20 Minutes	60 Minutes	For end activity trainee will be assessed similarly asking different short questions regarding housekeeping. What is importance of housekeeping? What are general guidelines of housekeeping in fruit processing unit? Preparation of checklist of housekeeping in a citrus processing unit? Preparing the layout for controlling the rodents in processing line?	

Suggestions for Final Assessment

Final assessment shall be in two parts, theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification and certificate allocation. The final theoretical assessment shall consist of a 3 hour paper, consisting of multiple choice and short question answer (MCQs) types.

For final practical assessment trainee class will be distributed into 5 groups comprising of 5 trainees in each group and each group will be allotted to perform different tasks and assignments. During performance involvement of each trainee, his confidence, performance expertise can be visualized for marking and grads. However individual trainee can also be assessed by allotting a separate task in a module and performance can be graded and marked. It depends upon the choice of the trainee how he suits to conduct the assessment considering the situation.

Assessment Team

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five trainees per assessor in a day. In this example, a group of 25 students shall therefore require assessments to be carried out over a five days period. Few examples that examiner may use for the assessment are given below:

MODULES	PRACTICAL	THEORY
Module 1	**Citrus Receiving and Record Keeping at Factory**	
LU-1: Unloading of the citrus	Trainee should be able to: 1. Perform post harvest handling of fruit at unloading deck / area of factory premises 2. Ensure safe unloading measures at factory door step 3. Arrange / monitoring safe parking of loaded vehicles 4. Install rodent control program and scheme 5. Perform the temporary storage at factory level	Trainee will be asked for: 1. Performance of post harvest handling of citrus fruit 2. Making arrangements of well designed and clean platform for unloading of fruit and safe parking of fruit loaded vehicles 3. Safe parking premises e.g. very close to unloading plate forms, close to charging area, near temporary storage and processing line etc 4. Scheme and control program for rodent control both in unloading and processing premises

		5. Changing rooms, hand washing and sanitation facility before start operation of citrus unloading and storing 6. Arranging screening and partitioning between receiving and feeding areas. 7. Importance of storage for smooth processing and quality maintenance. Maintain the sanitation and Performance of food safety guidelines 8. Checklists of different procedures inside the temporarily storage and their importance 9. Schematic storing of different grades and quality product harvested on export market based 10. Arranging space and labour for handling empty baskets after feeding in the feeder to avoid any mixing or data violation
LU-2: Perform counting of citrus baskets	1. Perform the staking and temporary storage of fruit baskets based on grades 2. Verify the document collected from farm supervisor or supplier 3. Implement and observe food safety guidelines at this step. 4. Using of different handling machinery and equipments like lifter, conveyer etc	1. Selection of premises for staking and temporary storage of fruit baskets in receiving areas. 2. Data maintenance and storage of baskets carrying different grades e.g. A, B C and D grades 3. Size, grade based staking or storage of baskets inside the processing premises 4. Checking and confirmation of documents provided from supplier or farm supervisors e.g. quality inspection report at farm level, number of baskets based on grades and sizes, any specific instruction or observation from field staff to update or implement 5. Stacking, storage and data maintenance of certified and non certified fruit lots e.g. fruit coming from Global GAP, IFS registered orchards and organic certified orchards etc 6. Labeling of each grade mentioning name of orchard,

		name of owner, total quantity of fruit, quality of the fruit, date of harvesting, time of harvesting, fruit grade, fruit tentative size, number of baskets, carriage vehicle number and total weight in each basket etc. 7. Performing the guidelines of food safety managing systems at receiving of citrus fruit. 8. Preparing different checklists of food safety managements systems implemented in processing premises
LU-3: Ensure quality and labeling	1. Develop quality inspection sheet and checklists 2. Confirm the quality standards / characteristics of citrus fruit e.g. - Rind colour - TSS - Blemish level - Citrus required grade etc 3. Perform the labeling and traceability codes etc 4. Grade and store the fruit based on quality	1. Developing the quality inspection checklist including quality parameters: - Blemish citrus fruit - Fruit rottenness - Fruit puncture - Rind pitting - Long stem - Button loss - Soft skin - Skin loss - Skin bruising - Fruit puffiness - Mechanical damage - Aesthetic value - Sensory characteristics - Physiochemical characteristics - Marketable grade/size

		2. Physical characteristics needed for processing and packing for export markets e.g. - Button should be present on fruit - Complete and strong without pulpiness and pressed, dryness - Without moisture water of rain or fog - Disease insect pest infestation free, juicy and aromatic - Without any injury either of thorn, pedicle, nails or any picking knife cut during harvesting etc 3. Performing the grades categories preferred for different export markets e.g. - Small size of citrus fruit is preferred for central Asian states - Middle size for Iran, Iraq and Far East markets and - Big one for Arab States 4. Performance of size, weight, rind colour, disease free and injury packing 5. Usage of different quality parameters determination tools e.g. refracto meter, thermometer, magnifying lens and ring sizer etc. 6. Traceability coding of citrus fruit and SPS compliance implementation 7. Fumigation of picking baskets and other packaging material 8. Installing of insect pest traps and catcher inside the fruit

		receiving areas 9. Calibration of weighing machines used in receiving areas for verification of the baskets weights and total quantity 10. Labeling of different lots coming from field e.g. Global GAP certified or non certified, organic or inorganic, variety based like Kinnow Mandarin, Feutrel's Early, Orange and grape etc 11. Labeling the specified quantity and quality of specified variety collected from different farms for the facilitation of record keeping and developing stock sheet
LU-4: Maintain the records	1. Maintenance of data collection sheets 2. Keep and update data/record of citrus fruit 3. Tag different varieties with grades 4. Maintain baskets and harvesting tools records 5. Understand comments and instructions of harvesting supervisor 6. Maintain stock register in fruit reception hall 7. Handle emergency / accident	1. Introduction of data collection methods and formats 2. Preparation of data sheet based on data collection including: - Produce name - Baskets size weight - Rotten percentage - Rind pitting percentage - Disease insect attack - Birds injuries - Citrus greening and improper shape - Size based grades and percentage - Random per fruit weight - Mites and other any 3. Performing presenting the data sheet and documents 4. Maintenance of record for audit purposes and other system updates

		5. Introduction of tags on fruit stock e.g. tagging of certificated and non certified fruit, tagging of different sizes and grade fruit, tagging of organic and inorganic fruit, tagging of different varieties Kinnow, Orange varieties, Feutrell's Early and Grape Fruit etc 6. Update the picking baskets records either empty or filled sent in the field for picking. 7. Verifying baskets received and loaded during start of harvesting of fruit. 8. Recording of fuel consumption transportation vehicles used for carrying of fruit from farm to pack house 9. Introduction use of first aid kit, dealing of emergency and introduction of different work instructions inside the fruit receiving hall for training of labour working in the hall. 10. Maintain stock register of all equipments tools and accessories used in receiving hall e.g. filled and empty baskets, lifters and pallets etc.
MODULE 2	**Citrus processing**	
LU-1: Assurance of quality during processing	1. Identification and selection certified citrus processing facilities with international standards 3. Recognize the citrus quality parameters and standards 4. Identify important processing steps critical for quality assurance 5. Identify quality characteristics of inputs 6. Investigate the time frame of each processing step	1. Selection of citrus processing units of maximum capacity of 52 fingers fitted with two drying burners, blowers for natural drying after each washer and wax chamber 2. Identification of washer and introduction of CCP (Critical Control Point) on this chamber because of using different types of fungicide and chlorine for disinfection and cleaning of the fruit 3. Introduction of dryer and burner temperature e.g. 45-65C. It varies with the surrounding temperature during foggy and cold nights it is raised up to 65C but during normal days after December mostly it ranges 45-50C

	7. Examine physicochemical sensory characteristics of citrus 8. Develop the quality parameters checklist of fruit for export. 9. Carry out the standard procedures of processing steps 10. Maintain stock register of inputs in processing hall 11. Use of first aid kit in emergency	4. Introduction of second step sorting after washing chamber to ensure quality of fruit if over locked in early sorting steps either on farm or after feeding 5. Introduction of wax application on citrus fruit mixed with standard doze of fungicide e.g. Benomil, TBZ etc 6. Fixing of CCPs and CLs at this processing step to avoid over or under dosage of fungicide and wax directly affecting the quality of fruit and shelf life especially for long destinations. 7. Maintenance of stock register of all inputs used in processing hall after feeding of the citrus fruit into processing line e.g. packaging cartoons, wax drums, fungicides either liquid or powder, sticking taps, thumb stickers, decoration papers and processing labour items etc 8. Developing of checklists of machinery used in processing hall e.g. lifters, weighing machines, stripping and sticking machines 9. Calibration of different operating tools e.g. weighing machines, temperature recording devices installed on burners, light intensity in working space and nozzles of washer and wax
LU-2: Ensure fruit quality at critical control point	1. Enlistment of Critical Control Points 2. Identify critical control points(CCP) in whole citrus processing line 3. Illustrate control limits (CLs) of each CCP 4. Follow quality fruit chart displayed in the processing hall 5. Execute the quality parameters for export markets	1. Determination and fixation of critical limits on each critical control points involved in citrus processing line. 2. Performing the factors deteriorating the fruit quality during citrus processing and packing in processing hall. 3. Learning of different steps involved in citrus processing line contributing different role for maintaining citrus quality required for export markets e.g. feeding, washing, drying, waxing, sizing, weighing, sticking and stripping etc.

	6. Prepare the checklists of all CCPs and CLs 7. Monitor the CCPs and CLs during processing of citrus fruit 8. Take corrective action of any violation of CCPs	4. Sorting of fruit on quality based on aesthetic and physiological characteristics needed for marketing e.g. sound and compact fruit, blemish free, having marketable size and shape etc 5. Performing quality maintenance during drying, post drying and after waxing. 6. Maintaining the quality maintenance of citrus fruit at critical control point of both burner e.g. first burners after washing used for drying temperature. 7. Ensuring fruit quality maintenance in wax chamber e.g. wax slows down respiration and stop gas exchange from rind of the fruit, wax improves shining of the fruit bark, past on minor blemish incidence, improves colour of the rind and clean it etc. 8. Determining critical control point and fixing the critical limits. 9. Maintaining citrus fruit quality at grading level e.g. fix the fingers or sizer on recommended instructions to grade citrus fruit in prescribed range of sizes required in export markets. 10. Recording and maintaining stock register of incoming fruit and packed fruit cartoons 11. Preparing the checklists of each critical control point and critical limits. 12. Performing of corrective actions if any step in fruit processing perform improper e.g. flow of water nozzles, spray nozzles of wax applicator, conveyor belts speed and direction, burner temperature and grader speed and direction etc.

MODULE 3	Citrus Packing and Storage	
LU-1: Monitoring filling and labeling of boxes	1. Classification of different types of citrus packing 2. Use different methods of packing 3. Distinguish different characteristics of packing material 4. Label the product/ boxes	1. Identification of different types of packaging e.g. - wooden crates - corrugated boxes - EPS packaging - plastic baskets and - plastic poly bags etc 2. Introduction of different characteristics of packaging material based on performance e.g. - water resistance - shock absorbent - light weight - recyclable - vitamin c retention - printable - moldable - aeration - easy to handle - stock able - fumigation etc 3. Filling methodology of citrus in different packaging e.g. - Citrus is packed either horizontally or collar side button should not puncture the rind of next fruit - Packing each layer having equal number of fruits

		- Using separation sheets to avoid weight and packing pressure on rest of fruit - Avoid over filling and weight of fruit - Open the aeration ducts of cartoons - Standard filling of recommended number of fruit and size of each fruit 4. Filling of citrus fruit following instructions printed on packaging e.g. category I, citatory II or class I and Class II, 5. Labeling procedures and components of citrus fruits e.g. total number of counts in each box, category of product packed e.g. - Labeling the exact name of the product packed - Labeling category and counts packed - Data of harvesting and processing - Organic or inorganic - Country of origin - Necessary instruction of utilization and dietary level - Global certification status - Food Safety Management Standard certification status - Traceability code - Net weight when packed etc
LU-2: Weight and Quality Check	1. Identification of standard packaging weights. 2. Selection of weighing machine and its calibration 3. Maintenance of weighing machine	1. Selection and adjusting of mechanized weighing machine fitted with digital data screen and having capacity of required weight 2. Ensuring quantity confirmation by weighing random

	4. Preparation of machinery maintenance checklist 5. Data collection on prescribed data sheet 6. Observe quality monitoring sheet for verification of fruit quality	samples picked from processing line or from store both untreated and treated or stored 3. Developing data sheet of citrus fruit confirm the actual status of weight of packed cartoons required for both auditor of FSMS and some time buyer 4. Developing quality check data sheet enlisting all physicochemical and sensory parameters e.g. - Freshness and shining - Puffiness % - Rottenness % - Rottenness % - Blemish % - Skin injury - Skin splitting - Rind colour % - Bruising % - pH of juice/pulp - Brix % - Taste and aroma etc 5. Preparing check list of citrus fruit inspection will be needed during auditing and buyer complaints 6. Preparing checklist of weighing machine maintenance needed during audits FSMS and quality inspections
LU-3: Stock Keeping	1. Preparation of stock register 2. Maintenance of stock register 3. Preparation of stock reports	1. Learning different method and systems of stock keeping and their importance e.g. - Online computerized system

		- Paper based systems - Custom built stock solution etc 2. Stock keeping of fruit processed and un processed, helps in managing the loading and supply orders for different destinations, 3. Developing balance sheet of stocked fruit which helps in waste manage and control 4. Preparing stock report of different grades store in the stock help to manage the marketing and export of citrus fruit, guiding in maturing orders with buyers, report guides fruit grade status e.g. A, B, C size status and quality picture 5. Calculating the wages of labour and other contractor per unit based on stock keeping
LU-4: Final Fruit Loading for Market	1. Preparation and managing of stocked fruit for loading and export 2. Carryout final quality inspection 3. Select ideal transport facility 4. Observe standard loading procedures 5. Assess the loading capacity of each container	1. Finalization fruit stock ready for exportation 2. Cleaning of decking area and arranging inspected fruit pallets near decking area for loading for exportation 3. Maintenance of cool chain from cold room to loading in container 4. Carrying out citrus fruit quality inspection 5. Monitoring of store temperature, fruit pulp temperature, moisture percentage and physical condition of citrus fruit 6. Examining different transportation facilities and their capacities. 7. Different methods of loading into fruit transportation vehicles e.g. palletized and non palletized loading, channel fixing along the column and without channels, stocking of pallets to use maximum space and good cooling effect etc.

		8. Stocking pallets into refer container leaving at least 1 feet along with the container wall for better air circulation and cooling 9. Leaving some space between pallets lines facilitating cool air circulation and maintaining the shelf lif of the fruit
LU-5: House Keeping	1. Housekeeping of citrus storage and loading premises 2. Ensure the sanitary and phyto-sanitary practices directed in FSMS and other food legislations 3. Implement Integrated Pest Management System in the processing and storage	1. Citrus processing facility housekeeping e.g. cleaning of loading premises, removal of used items from loading and decking areas, preparing the deck for next loading and transportation, refreshing and restoring the loading labour etc 2. Implementation of sanitary and phytosanitary guidelines in citrus loading and decking areas. 3. paring the deck for next loading and transportation, refreshing and restoring the loading labour etc 4. Ensuring blocking of rodent entry into the cold treatment areas of processing unit 5. Developing checklist of SPS guidelines needed in audit and quality inspection 6. Arranging fly catcher or light traps to control flies and other flying insects 7. Installation of air cutter to stop the entry of any foreign participle and dust 8. Arranging fumigation of loading processing facility for sanitation to avoid any biological rearing and multiplication

5. Tools and Equipments

Sr. #	Items	Quantity
01	Processing line 52 Fingers (Demo Processing Unit)	01
02	Fork Lifter (Demo Processing Unit)	01
03	Computer	01
04	Stapler	05
05	Thermometer for both pulp and open air temperature measuring	20-25
06	Refractometer	02
07	Ring Sizer (complete set)	20-25
08	Spray Machine (12-16 liters)	01
09	Weighing Machine (Demo Processing Unit)	02
10	Molding Machine (Demo Processing Unit)	02
11	Stripping Machine (Demo Processing Unit)	02
12	pH meter	01
13	Stop Watch	05
14	Calculator	05
15	Fruit Cutter Knives	20-25
16	Spray Machine	01
17	Magnifying lens	01
18	Microscope	01
19	White board	01
20	Multimedia	01

6. List of Consumable Items

Sr. #	Items	Quantity
01	Drafting pads	25-30
02	Pencils	25-30
03	Wooden pallets	02
04	Stock Register	05
05	Tagging cards	100
06	Uniform	25-30
07	Fungicide	As required
08	Food Wax (mixed with fungicide)	1 Liter
09	Filter paper	50
10	Gloves	50
11	Head Covers	50

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