National Vocational Certificate Level 2 in Agriculture (Chilli Production)

Competency Standards

NATIONAL VOCATIONAL & TECHNICAL TRAINING COMMISSION

NAVTTC نیوٹک

National Vocational & Technical Training Commission
5th Floor, Evacuee Trust Complex
Sector F-5/1, Islamabad
Tel: +92 51 904404
Fax: +92 51 904404
Email: info@navttc.org

Author:
Dr. Mubarak Ahmad (Director General Pakistan Agriculture Research Council Karachi) , Dr. Saqib Arif (Director, Pakistan Agriculture Research Council Karachi) , Dr. Khalid Mahmood (Director General Pakistan Seed Accreditation and Certification Authority Islamabad)

Reviewed by:
Dr. Raimund Sobetzko (Team Leader, Component 2 TVET Reform Support Programme) , Mr. Muhammad Naeem Akhtar (Deputy Team Leader Component 2 TVET Reform Support Programme) , Mr. Ralf Strier (Senior International Technical Advisor, TVET Reform Support Program)

Layout and Design by:
Ms. Maria Arif (Freelance Consultant)

Date of approval by NCRC:
2nd -4th Oct 2013

Date of Notification:
1st Jan 2014, vide notification no F.2-1/2013-DD(VT)

This curriculum has been produced by the National Vocational & Technical Training Commission (NAVTCC) with the technical assistance of TVET Reform Support Programme, which is funded by the European Union, the Embassay of the Kingdom of the Netherland, Federal Republic of Germany and the Royal Norwegian Embassy. The Programme has been commissioned by the German Federal Ministry for Economic Cooperation and Development and is being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Table of contents

Competency Standards for Chili Production

Module A: Selection, treatment and storage of suitable seed.

Overview: These competency standards will ensure that the trainee will be able to select, treat and store suitable seed for crop production

Competency Unit	Performance Criteria	Knowledge & Understanding
A-1: Select appropriate lots for producing seeds / or procure registered seeds	**Trainee will be able to:** **P1.**Identify different varieties of chillies . **P2.**Recognize the sub types of chilli variety 'Dandi cut' **P3.**Recognize hybrid varieties of chillies **P4.**Calculate the proportion of different sub types of Dandi cut chillies within a chilli lot- Rogging of off type **P5.**Distinguish between normal and damaged pods **P6.**Identify shrivelled chilli pods **P7.**Recognize the chillies that are likely to be fungal infested, discoloured, black spotted etc **P8.**Calculate the proportion of normal pods in a lot **P9.**Calculate the proportion of damaged pods in a lot **P10.**Decide suitable chilli lots for seed production **P11.**Procure good chilli seeds that are disease free, pure variety etc from authorized / reliable dealers.	**Trainee will be able to describe and explain:** **K1.**Chilli varieties and its sub types **K2.**Hybrid varieties **K3.**Healthy pods/seeds **K4.**Damaged pods/seeds/ off-type **K5.**Shrivelled pods **K6.** Effect of good seed quality on productivity and occurrence of diseases **K7.** Procedure to determine the proportion of healthy seeds in the offered consignment **K8.** Selection of appropriate chilli field for seed production **K9.**Picnicking of healthy and diseased free pods for seed production. **K10.**Knowledge about germination test to ascertain the seed quality

	P12. Ascertain the quality of seed offered for procurement by undertaking physical observation/germination test **P13.**Perform germination test on seeds offered for procurement **P14.**Perform moisture test or get the sample tested from laboratory **P15.**Perform aflatoxin test or get the chilli sample analyzed for aflatoxin from laboratory	**K11.**Role of moisture in chilli quality **K12.**Role of aflatoxin in chilli supply chain **K13.**Permissible limits of aflatoxin in various countries and prevailing situation in Pakistan **K14.**Impact of mixing of damaged pods with healthier pods
A2. Segregate the appropriate pods on the basis of their physical appearance	**Trainee will be able to:** **P1.**Separate the healthier and damaged pods from selected chilli lots **P2.**Separate the various types of damages including discoloration, shrivelling, immaturities etc. **P3.**Recognize the extent of damage in the chilli pods e.g. minor, moderate and severe. **P4.**Test the damaged pods using appropriate tests like visual analysis **P5.**Handle severely damaged chilli pods properly **P6.**Identify the suitable pods from selected lots for seed production **P16.**Segregate the sub types within Dandi cut on the basis of physical characteristics	**Trainee will be able to describe and explain:** **K1.**Damaged pods including discoloured, immature, cracked, shrivelled, viscera bored, viscera opened, black spotted and fungal damaged. **K2.**Impact of appropriate/healthier/damaged pods on crop productivity **K3.**Extent of damage in chilli pods **K4.**Procedures to safely handle the damaged pods **K5.**Procedure to determine the proportion of various damaged pods in chilli lot **K6.**Procedure of segregating sub types of Dandi cut variety **K7.**Physically damaged and Infested chillies

	P7. Separate shrivelled chilli pods **P8.**Separate infested chillies from the chilli lot	
A3. Extract the seeds from selected chilli pods and separate the undersized seeds using appropriate procedure	**Trainee will be able to:** **P1.**Select the site for extraction of seeds from chilli lots **P2.**Optimize the conditions of extraction site **P3.**Transfer the chilli lots to the extraction site **P4.**Perform cleaning and other necessary arrangements at extraction site **P5.**Select suitable means of crushing of chilli pods **P6.**Perform mechanical crushing of chilli pods to obtain the seeds **P7.**Operate extraction equipments **P8.**Perform crushing of chillies manually- Skilfully handling such material **P9.**Recognize the undesirable materials in crushed chillies **P10.**Select suitable means of separating undesirable materials **P11.**Separate the undesirable materials from seeds such as inorganic materials, debris etc.	**Trainee will be able to describe and explain:** **K1.**Knowledge about the appropriate procedures for seed extraction **K2.**The merits and demerits of various procedures for crushing the chilli pods for separation of seeds **K3.**Impact of under sized/damaged seeds on crop productivity **K4.**Knowledge about the optimum conditions for selecting the site of seed extraction **K5.**Impact of proper selection of extraction site **K6.**Maintenance of extraction equipments **K7.**Knowledge about the importance of good seed in chilli production **K8.**Importance of separation of undesirable materials from crushed chillies- Handling measure carefully **K9.**Proper use of measure balance

	P12. Recognize the under sized seeds **P13.**Select suitable means of separating undersized seeds from normal seeds **P14.**Screen the extracted seeds to remove the under size seeds **P15.**Calculate the seed yield from the given chilli lot	
A4. Undertake seed treatment	**Trainee will be able to:** **P1.** Select suitable means of treating the seeds **P2.**Select suitable fungicide and /or insecticides for treating the screened seeds **P3.**Obtain fungicide or insecticide from reliable source **P4.**Calculate the dosage of fungicide or insecticides for larger and smaller batches **P5.**Treat seeds of larger and smaller batches at recommended doses using appropriate application procedures **P6.**Handle the equipment used for seed treatment **P7.**Select the suitable means after seed dressing **P8.**Proper post-treatment handling of seeds such as drying of seeds	**Trainee will be able to describe and explain:** **K1.**Importance of seed treatment **K2.**Components of seed treatments and dressing **K3.**Impact of treated seeds on plant germination **K4.**Information about suitable fungicide/insecticide application for chilli seed treatment **K5.**Impact of application of inappropriate dosage of fungicide/ insecticide during seed treatment **K6.**Safety measures for the usage of sprayers **K7.**Cleanliness and calibration of equipment for seed treatment
A5. Pack and tag the seeds	**Trainee will be able to:** **P1.** Segregate the chilli seeds according to their date of	**Trainee will be able to describe and explain:** **K1.**Merits and demerits of various packaging material

	entry, quality etc **P2.** Select appropriate packing material **P3.** Select suitable means of packaging the chilli seeds **P4.** Pack the seeds properly **P5.** Design the label for chilli seeds to include date of entry, person involved, variety name, germination %, purity %, source involved, expiry date (2-3 Years) **P6.** Label different chilli lots with identity, quantity, dates etc. **P7.** Register the details of chilli lots including date of procurement/entry/treatment, names of person involved in the process etc.	**K2.** Impact of appropriate packaging on storability of seeds **K3.** Storage of different varieties/ types in separate lots **K4.** Knowledge about the proper registration of different chilli lots **K5.** Tagging/labelling of seeds for identification **K6.** The rules of FSC&RD
A6. Inspect and select the site for storage of seeds and store the seeds under proper conditions keeping their germination intact	**Trainee will be able to:** **P1.** Examine the storage conditions **P2.** Select the suitable storage area **P3.** Recognize the presence of pests in storage area **P4.** Identify the type of pests (like rodents, insects etc) present in storage area **P5.** Calculate the extent of damage caused by pests **P6.** Select the suitable means of disinfestations of storage area	**Trainee will be able to describe and explain:** **K1.** Prerequisites of good storage management **K2.** Factors effecting storage of seeds **K3.** Preventive, protective and corrective measures for control of insects and mites during storage **K4.** Identification of insects and mites that infests stored seeds **K5.** Impact of temperature, humidity, packing material etc. on seed viability during storage **K6.** Periodic Inspection of stores and produce

	P7. Calculate the dosage required for disinfestations of stores **P8.** Disinfest the store from any pre-existing infestation using contact insecticides and ensuring the hygienic conditions-Annually spraying the store according to SOP to escape from any wrong doing **P9.** Fumigation of seeds if and when required to ascertain insect infestation during storage **P10.** Inspect the site of chillies to ensure the proper storage **P11.** Maintain the storage conditions unfavourable for growth and development of fungi and insects ensuring proper ventilation **P12.** Perform the viability test prior to sowing using ready to use methods	**K7.** Importance of seed viability **K8.** Procedures to test seed viability **K9.** Criteria for acceptability of seeds on the basis of viability test **K10.** Determination of seed rate on the basis of germination test

Module B: Carryout land preparation and sowing of seeds

Overview: These competency standards will ensure that the trainee will be able to prepare land for sowing of chili seeds using appropriate procedures.

Competency Unit	Performance Criteria	Knowledge & Understanding
B1: Prepare the land as per required procedures including LASER land leveling and preparation of ridges	**Trainee will be able to:** **P1.** Recognize different types of weeds and other unwanted materials in the field . **P2.**Select suitable means for removal of unwanted material in fields Manage weeds and other unwanted material using chemical and physical methods **P3.**Evaluate physical conditions to determine the type and texture of soil **P4.**Level land by using appropriate procedure **P5.**Preparation of uniform ridges at recommended distances **P6.**Calculate the size of the growing field for application of weedicide, fertilizer, pesticide etc.	**Trainee will be able to describe and explain:** **K1.**Ploughing to remove the debris of previous crop **K2.**Importance of removing weeds before sowing **K3.**Impact of weeds on productivity **K4.**Land levelling with and without laser leveller **K5.**Importance of levelling and merits and demerits of using laser leveller **K6.**Importance of ridge formation in the field. **~~K7.~~**Importance of maintaining appropriate ridge-to-ridge and plant-to-plant distance keeping in view the variety, soil and water availability. **K8.**Impact of altering plant to plant and row to row distances as per SOPs advised by agricultural experts **K9.**Land preparation by appropriate plough by use of machinery like tractor, cultivator, mould board etc.
B2: Sow the seeds either by direct	**Trainee will be able to:** **P1.** Select the method for the sowing of seeds (direct	**Trainee will be able to describe and explain:**

seeding or through nursery transplantation	seeding or nursery transplantation) **P2.** Sow the seeds properly in case of direct seeding **P3.** Select the site for nursery **P4.** Prepare the nursery beds using appropriate distances **P5.** Cover the seed with appropriate material and procedure **P6.** Showering the nursery at suitable intervals e.g. 3-4 days **P7.** Maintenance of nursery plants for transplantation **P8.** Recognize the emergence stage **P9.** Recognize the stage for the saplings to be transplanted from the nursery to the growing field **P10.** Uproot unhealthy saplings from the nursery after a suitable period e.g. 2weeks **P11.** Uproot and transplant the saplings from nursery in the main field	**K1.** Merits and demerits of direct seeding and nursery transplantation **K2.** Calculating the seed requirements sowing rates for nursery and for direct seeding **K3.** Differentiate between sowing through direct seeding or transplantation **K4.** Precautions during seed sowing **K5.** Development of nursery properly **K6.** Maintenance of the nursery plants **K7.** Method of transplantation of seedlings to the field **K8.** Precautions during transplantation
B3 : Check, perform and maintain the irrigation of crop	**Trainee will be able to:** **P1.** Select the appropriate irrigation system on the basis of availability, water quality (e.g. pH, hardness, SAR,TDS etc) **P2.** Draw water sample for pH, hardness and TDS testing- for complete water analysis required for	**Trainee will be able to describe and explain:** **K1.** Different irrigation systems **K2.** Suitable irrigation system for chilli production **K3.** Check the performance of available irrigation system

	irrigation purpose **P3.**Determine hardness of water for irrigation **P4.**Check the irrigation system **P5.**Irrigate the land by adapting suitable procedures **P6.**Managing irrigation intervals as per crop requirement **P7.**Managing the unsuitable water using appropriate procedures	**K4.**Adaptation of recommended procedures to irrigate the crop **K5.**Importance of proper irrigation system to chilli crop **K6.**Knowledge about irrigation management **K7.**Impact of suitable frequency of irrigation **K8.**Determination of the crop requirement for irrigation according to the condition of the crop

Module C: Carryout weed management

Overview: These competency standards will ensure that the trainee will be able to apply suitable weedicides and removal of weeds from the chilli fields

Competency Unit	Performance criteria	Knowledge & Understanding
C-1 : Select and apply suitable weedicides for chilli crop	**Trainee will be able to:** **P1.** Select the suitable weedicides **P2.**Get the selected weedicide from registered certified/ reliable dealers **P3.**Apply the weedicide at weeds **P4.**Determine the proper timings of weedicide application at weed growth stage **P5.**Select appropriate sprayers **P6.**Select appropriate nozzles for sprayers **P7.**Calibrate the selected sprayers **P8.**Select appropriate methods of weedicide application	**Trainee will be able to describe and explain:** **K1.**Types of weed **K2.**Impact of weeds on the production of chilies **K3.**Types of weedicides commonly used in chilli crops **K4.**Knowledge regarding the mode of action of different weedicides **K5.**Recommended application procedures and dosage of weedicides **K6.**Types of sprayer **K7.**Importance of usage of different sprayers **K8.**Calibration of selected sprayers
C-2: Identify weeds in the chilli field and apply procedures for their removal	**Trainee will be able to:** **P1.** Recognize the weeds in the chilli field **P2.**Select the appropriate method to prevent weed	**Trainee will be able to describe and explain:** **K1.**Types of weeds commonly grown on the chilli field **K2.**Knowing the difference between the types of weed

	P3. Apply the appropriate preventive measures for weeds **P4.**Select appropriate method of weed removal **P5.**Remove the weeds at appropriate timings **P6.**Remove weeds manually **P7.**Remove weeds physically **P8.**Remove weeds chemically	**K3.**Merits of prevention and control of weeds in the field **K4.**Information about the different methods of weed control **K5.**Importance of weed removal at proper timings Knowledge about Integrated Weed Management Practices (IWMP)

Module D: Carryout fertilizer management as per soil condition

Overview: These competency standards will ensure that the trainee will be able to select and applysuitable fertilizers at right time and at required level

Competency Unit	Competency Unit	Knowledge & Understanding
D-1: Determine the soil suitability for growing chillies	**Trainee will be able to:** **P1.**Use suitable equipment for soil sampling **P2.**Draw the representative soil samples **P3.**Perform randomized sampling of soil **P4.**Label the soil sample with all required information e.g. date of sampling, sampler name and initials etc **P5.**Select the suitable and reliable laboratory for soil testing **P6.**Get soil tested from a laboratory **P7.** Determine the soil fertility by examining the soil test report **P8.** Recognize typical soil types for determining the suitability for chilli production	**Trainee will be able to describe and explain:** **K1.** Type of soils and their suitability for chilli production **K2.** Knowledge about drawing the soil samples **K3.** Storage of soil samples to conserve moisture and other factors **K4.** Importance of randomized soil sampling **K5.** Equipment requirement and their utility for sampling **K6.** Basic soil requirements for production of chillies **K7.** Important components of a soil analysis report **K8.** Interpretation of soil analysis report
D-2: Select and apply suitable fertilizers on the	**Trainee will be able to:** **P1.**Select appropriate fertilizers for the soil on the basis of soil and crop requirement	**Trainee will be able to describe and explain:** **K1.**Knowing the different properties of soil

basis of soil composition	**P2.**Obtain selected fertilizers from certified/ reliable dealers **P3.**Apply the required dosage of fertilizer using appropriate procedures **P4.**Identify the optimum timings of fertilizer application for best results **P5.**Calculate the fertilizer dosage **P6.**Determine the mode of action of selected fertilizer **P7.** Interpret the soil test report	**K2.**Soil deficiencies and their management **K3.** Interpretation of soil testing reports to determine soil fertility **K4.**Importance of fertilizers **K5.** Role of fertilizers in crop production **K6.** Types of fertilizers and their utility **K7.** Calculating the fertilizer dose requirement in the light of soil analysis report **K8.** Method of applying fertilizer at the time of soil preparation **K9.** Reasons to apply fertilizers **K10.** Proper timing of fertilizers application **K11.** Impact of timings of fertilizer application timings on crop productivity **K12**. Impact of fertilizer dose on crop productivity
D-3: Use organic fertilizers and fertilizer supplements	**Trainee will be able to:** **P1.** Select appropriate organic fertilizers such as cattle manure, cereal and legume stovers and wood land litter on the basis of soil and crop requirement, cost and availability etc. **P2.** Compost the organic fertilizer by utilizing various materials such as straw, tree leaves, farmyard manure etc.	**Trainee will be able to describe and explain:** **K1.**Importance of organic fertilizers **K2.**Difference between organic and chemical fertilizers **K3.**Proper application of organic fertilizers **K4.**Difference between nutrients and minerals

	P3. Use of organic fertilizer as per requirement by adopting appropriate procedures like broad casting, banding and spot application (or side-dressing) **P4.** Apply nutrients /minerals for supplementing fertilizers **P5.** Use organic fertilizer at proper time **P6.** Calculate the ratio of different nutrients for fertilizer supplementation	**K5.** Type of nutrients and minerals essential for soil **K6.** Importance of nutrients and minerals in improving the soil fertility **K7.** Procedures to apply nutrients and minerals. **K8.** Determination the soil requirements of nutrients and minerals **K9.** Importance of application of organic fertilizer at proper timing **K10.** Impact of fertilizer supplementation

Module E: Carryout pest management

Overview: These competency statements will ensure that the trainee will be able to monitor the crop and control of insect pests.

Competency Unit	Performance criteria	Knowledge & Understanding
E-1: Recognize insect pests and diseases, and access their nature of damage at various chilli production stages	**Trainee will be able to:** **P1.**Identify the insect pests of chillies and diseases **P2.**Relate insect pests and diseases with climatic factors **P3.**Calculate losses due to insect attack **P4.**Determine the economic threshold level for different insect pests **P5.**Recognize the insect species and diseases that attack at particular stages of crop production-knowing the mode of action of insect and pest **P6.**Monitor the crop for determining the level of insect activity **P7.**Collect samples for insect identification and their comparative occurrence **P8.**Recognize mouldy pods **P9.**Separate mouldy pods **P10.**Select the appropriate fungicide according to mould attack	**Trainee will be able to describe and explain:** **K1.**Knowledge about insect pests and diseases **K2.**Insect pests and their relationship with climatic factors **K3.**Identification of various pest species **K4.**Losses due to insect pest attack **K5.**Insect pests and diseases of chillies and their timings of occurrence **K6.**Role of insects as a vectors of bacterial, viral and fungal diseases **K7.**Developmental stages of insect pests **K8.**Feeding sites of insects **K9.**Sampling for detection of insects and their relative abundance **K10.**Determining economic threshold levels(ETL) for different insect pests **K11.** Determining the timing of pesticide application keeping in view their ETL

	P11. Identify different growth stages of insect pests	
E-2: Determine the dosage and method of application of pesticides	**Trainee will be able to:** **P1.** Differentiating the types of insecticides/fungicides **P2.**Selecting appropriate insecticides/fungicides **P3.**Obtaining insecticides/fungicides from reliable source **P4.**Prepare the solution insecticides/fungicides before applying to the crop **P5.**Use the knap sack sprayer and its adjustment for crop spraying **P6.**Determine the frequency and interval of pesticide application, keeping in view infestation levels **P7.**Apply pesticide using safety measures **P8.**Select the appropriate sprayer **P9.**Calibrate the sprayer **P10.**Select proper nozzle of sprayer **P11.**Inspect the crop at different stages of production for insect pest and diseases attack	**Trainee will be able to describe and explain:** **K1.**Types of insecticides and their use **K2.**Mode of action of different types of pesticides **K3.**Differentiation between generic and branded pesticides **K4.**Concept of active ingredient in calculating the dose **K5.**Preparation of suspension for crop spraying **K6.**Impact of pH on insecticidal activity **K7.**Knowledge regarding the knap sack sprayer **K8.**Importance of the usage of knap sack sprayer **K9.**Adjustments in knap sack sprayer for its optimum use **K10.**Determining the need of pesticide applications **K11.**Timings and frequency of pesticide application **K12.**Procedures of applying pesticides **K13.**Principles of the safe usage of pesticides- selection of pesticide/insecticide having minimal residual effect and minimum with drawl period e.g. DDBP **K14**. Advantages of applying precautionary measures for operators

Module F: Carryout harvesting and post harvesting management

Overview: These competency standards will ensure that the trainee is able to pick the ripened chilli and their subsequent drying and storage

Competency Unit	Performance criteria	Knowledge & Understanding
F-1: Recognize the picking stage and pick the ripened chillies properly	**Trainee will be able to:** **P1.** Identify picking stages on the basis of ripening of pods **P2.** Decide on the picking time **P3.** Determine the number of pickings required **P4.** Differentiate between mature and immature pods **P5.** Distinguish between damaged and normal pods **P6.** Understand the different types of damages to chilli pods **P7.** Manage immature and damaged chillies **P8.** Pick chillies properly **P9.** Adopt precautionary measures during picking **P10.**Handle the mature chillies while picking from the plant **P11.**Recognize the damaged pods on the chilli plant **P12.**Handle the damaged chillies separately	**Trainee will be able to describe and explain:** **K1.** The importance of picking in determining chilli quality **K2.** The number of possible pickings **K3.** Importance of suitable timing of picking **K4.** Difference between ripened, damaged and immature pods **K5.** Procedures to handle immature and damaged chillies **K6.** Types of damages in chillies **K7.** Impact of damaged pods on the quality of chilli lot **K8.** Procedures for picking without causing damage to pods **K9.** The impact of improper picking on the quality of chilli produce ultimately **K10.**Impact of handling damaged chillies separately

F-2: Pack and transport the chillies to the drying area	**Trainee will be able to:** **P1.** Select suitable containers for carrying fresh/mature chilies like wooden/plastic baskets, cotton/jute bags **P2.** Calculate the cost effectiveness of freshly harvested chilli carrier **P3.** Determine the impact of carrier on damaging of chilli **P4.** Bag the chillies properly to minimize damages during transportation **P5.** Select suitable means of transport like self carry, donkey cart etc to reduce damages on the basis of distance, cost etc. **P6.** Calculate the cost effectiveness of different types of transport for freshly harvested chillies **P7.** Determine the impact of transport on inducing any damage to chilli pods **P8.** Transport chillies from growing field to the drying area **P9.** Manage the freshly picked chillies during unusual weather e.g. rains	**Trainee will be able to describe and explain:** **K1.** Impact of suitable collecting containers for chilies **K2.** Suitable procedure of chilli bagging **K3.** Appropriate means to transport chillies to the drying area **K4.** Impact of improper transport on the quality and physical injury of chilies **K5.** Calculations to determine the cost effectiveness of freshly harvested chilli carriers and its transportation to drying areas **K6.** Type of damages likely to be occurred during transportation **K7.** Information about weather forecasting at time of transportation **K8.** Handling of fresh chillies in unusual weather
F-3: Undertake drying by following suitable procedures	**Trainee will be able to:** **P1.**Identify the suitable areas for the drying of chillies **P2.**Identify the suitable drying surface that may help	**Trainee will be able to describe and explain:** **K1.**Introduction to drying surfaces

	the removal of moisture and maintain the hygiene of produce **P3.**Prepare a suitable drying surface or use of other means of drying **P4.**Identify the surface which is unhygienic for drying purpose **P5.**Dry chillies on green net or other sheets **P6.**Distinguish between saline and non-saline surfaces **P7.**Dry chillies upto the suitable moisture level by following Good Drying Practices (GDP). These may include minimize human/animal interference at drying field, ensure single layer of produce during drying etc. **P8.**Handle chillies during night at the time of drying **P9.**Recognize the undesirable chillies such as discoloured, cracked, viscera open, viscera bored and black spotted pods **P10.**Separate the undesirable chillies from the drying field **P11.**Determine moisture content in chillies during and after drying **P12.**Maintain hygienic conditions during drying **P13.**Recognize the completion of drying period on the basis of moisture, colour etc	**K2.**Effects of different drying surfaces on chilli quality **K3.**Identification and best utilization of drying surface **K4.**Impact of optimization the drying practices **K5.**Good Drying Practices (GDP) **K6.**Effect of improper drying on chilli quality **K7.**Knowing the completion stage of drying **K8.**Relationship of environmental factors with drying period **K9.**Importance of sorting the damaged pods Importance of handling of damaged pods separately

F-4: Pack the dried chillies in suitable material and transport to the godowns or market	**Trainee will be able to:** **P1.**Select suitable packing material for dried chilies like jute /cotton bags etc that may help to prevent any possible damage to dried pods during transportation **P2.**Pack chillies by using appropriate procedures to avoid over filling, damaging etc **P3.**Transport chilli bags from drying field to storage godowns and/or markets with precautionary measures to avoid overloading, delay etc. **P10.**Calculate the cost effectiveness of dried chilli carrier **P11.**Determine the impact of carrier on physical injury to chilli **P12.**Bag the chillies properly to minimize damages during transportation **P13.**Select suitable means of transport like self carry, donkey cart etc to reduce damages on the basis of distance, cost etc. **P14.**Calculate the cost effectiveness of transport **P15.**Determine the impact of transport on physical injury to chilli pods **P16.**Transport chillies from drying area to godown/markets	**Trainee will be able to describe and explain:** **K1.**Suitable packing materials for chillies **K2.**Good practices for packing of chilli pods **K3.**Importance of packaging in maintaining chilli quality **K4.**Proper transportation of chillies from drying field to godowns **K5.**Calculation of cost effectiveness of dried chilli carrier and its transportation **K6.**Impact of improper transportation on prevention of damage to chilli

F-5: Store chillies under proper conditions	**Trainee will be able to:** **P1.**Inspect the storage site to check its suitability for the storage of dried chillies **P2.**Check the site for insect pests **P3.**Identify insect pest species at storage site **P4.**Identify type of rodents presence at storage site **P5.**Inspect the storage site for proper ventilation **P6.**Check that the storage area is suitable for fumigation **P7.**Ensure that acceptable levels of humidity and temperature **P8.**Measure the total storage area **P9.**Apply suitable contact insecticide to disinfect/disinfest the storage site if required **P10.**Pack and tag the chilli lots to include the details like date of entry, persons involved etc. **P11.**Store chillies under proper conditions to retain chilli quality and wholesomeness and to keep them free from insects, rodents and microbial infestation etc. **P12.**Undertake the periodic inspection of stores to ensure chilli quality	**Trainee will be able to describe and explain:** **K1.**Impact of storage conditions on chilli quality **K2.**Inspection and selection of the site for storage of chillies **K3.**Packing and tagging the chilli lots **K4.**Storage of chillies under proper conditions **K5.**Management of periodic inspection of stores **K6.**Importance of periodic inspection of stores to ensure chilli quality **K7.**Influence of humidity and temperature on storage of chillies

LIST OF TOOLS AND EQUIPMENTS

S. No.	Description	Quantity
1.	Sampler	03
2.	Soil sampler	03
3.	Triple beam balance	02
4.	ELISA reader for mycotoxin analysis	02
5.	Photographs of normal and damaged chilli pods (available in research reports)	
6.	Sieves	
7.	Sprayer for applying fungicides/insecticides	03
8.	Phosphine meter	10
9.	Knap sacks sprayer	03
10.	Laser leveller	02
11.	Ridger	02
12.	Photographs of common weeds	
13.	Photographs of various pest insects	

14.	pH meter	10
15.	TDS meter	10
16.	Sickles	10
17.	Mould board plow	05
18.	Inch tape	03
19.	Thermometer	10
20.	Moisture meter	10
21.	Tool used for turning of chilli pods during drying	03
22.	Donkey cart	02
23.	Pick axe	10
24.	Tractor	02
25.	Sheet cover for chilli during night at drying stage	
26.	Nozzles	12
27.	Magnifying glass	05

28.	Khurpee	10
29.	Water sprinkler	10
30.	Cultivator	02
31.	Magnet	05
32.	Seed counter board	03
33.	Chilli cursher	03

LIST OF CONSUMABLES

- Varieties of chilli
- Blotter paper
- Petri dishes
- Sample collection bags
- Gloves
- ELISA test kits for aflatoxin analysis
- Mask
- Fungicides/Insecticides
- Tags
- bags
- Phosphine tablets
- Green net
- Plastic sheet
- Blotter paper
- Petri dishes
- Sample collection bags
- Chilli seeds
- Pots
- Weedicides
- Precautionary kit for applying weedicides including mask, gloves etc.
- Soil sample collection bags

- Fertilizers
- Dehydrants like Victoria oil
- Pesticides
- pH strips
- First aid box
- Farmyard manure
- Organic and inorganic fertilizers
- Fertilizer Supplement
- Straws
- Pots
- Chilli seeds
- Diesel
- Mobile oil
- Tetrazolium powder
- Stationery items e.g. pen, pencil, calculator etc.

National Vocational & Technical Training Commission (NAVTTC)
5th Floor Evacuee Trust Complex Sector F-5/1,
Islamabad.
T +92 51 904404
F +92 51 904404
E info@navttc.org
I http://www.navttc.org/