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| Title | **Selection, treatment and storage of suitable seed** | | |
| Level | **2** | **Credits** | **20** |

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

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| Classification ISCED | 0811 Crop and livestock production |

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| Available grade | Competent / Not yet competent |

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| Modification history | N/A |

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| **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 |

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|  | **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 |

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|  | **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 |

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|  | **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 |

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|  | 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 |

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|  | **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 |