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|  | **Unit ID:** | | **ORG6** |
| **Domain** | **PLANT HUSBANDRY** |  | |
| **Title:** | **Apply pest, diseases, disorders and**  **Weeds treatment in crops** |  | |
| **Level: 2** |  | | **Credits:3** |

Purpose

This unit standard specifies the competencies required to intervene and apply pests, diseases, disorders, and weeds management in crops. It is intended for those who work in agriculture as well as people in other occupations that work with plants. It includes:

* Use personal protective equipment
* Control pests, diseases and disorders with cultural and biological practices
* Control weeds mechanically
* Prepare equipment
* Treat pests, diseases and disorders with natural plant protection products
* Housekeeping and cleaning up.

**Special Notes**

1. Entry information:

Prerequisites:

* *ORG1 - Demonstrate knowledge of organic agriculture*
* *ORG3 - Produce organic plant protection products*
* *ORG4 - Prevent pests, diseases, disorders and weeds in crops*
* *ORG5 - Monitor pests, diseases, disorders and weeds in crops*
* *Unit 1379 - Operate simple farm machinery*
* *ORG15 - Apply soil sampling techniques, organic fertilizers and soil conditioning amendments and practices*
* *Unit 1312 - Produce compost*

1. This unit standard is to be delivered and assessed in the context of agricultural operations and can be assessed in conjunction with other relevant technical unit standards.
2. The evidence required to demonstrate competency in this unit must be relevant to workplace operations.
3. Practical assessment evidence at a minimum requires evidence in the application of Elements and performance criteria of this Unit standard when the level of pests, disease or weeds requires repeated controls in the crops that there is evidence that anti resistance recommendations (where available) are followed to maintain the effectiveness of PPPs.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers’ guidelines and instructions.
5. Demonstration of competence, at a minimum, requires evidence to at least apply two cultural and biological practice, one mechanical weed control and two organic natural plant protection treatment.
6. Glossary of Terms
   * *‘Integrated Pest Management (IPM)’* is the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment.
   * *‘Intervention’* as the third pillar of IPM may include, but is not limited to, prevent economic impacts on the crops. It includes placing mating disruption dispensers, conserving natural enemy populations, etc. If further monitoring indicates that control is insufficient, then the use of chemical plant protection products can be considered. In such cases selective pesticides that are compatible with an IPM approach should be selected and the products should be applied in a selective way.
   * *‘Plant Protection Products (PPPs)'* may include, but are not limited to, biological pesticides and herbicides that can be applied against the relevant pests, diseases, and weeds in situations that adversely affect the economic value of a crop.
   * ‘*Measures*’ may include, but are not limited to, the use of substances and cultural methods of pest, disease, disorder and weed management.
   * 'Application equipment' may include, but is not limited to, backpack sprayers, handheld sprayers, granular dispensers, simple herbicide applicators (e.g., weed wipes and spray hoods) and paint brushes.
   * ‘S*ubstances'* may include, but are not limited to, insecticides, fungicides, herbicides, nematicides, rodenticides and growth promoters and regulators that are commercially available or preparations made on the production unit from plants or other natural organic and mineral sources and acceptable to sustainable, ecological and organic agriculture. The latter would include botanical pesticides and natural mineral preparations.
   * ‘*Hazards*’ may include, but are not limited to, toxic and/or hazardous and/or flammable substances, fumes, health hazards, damage to non-target organisms, environmental damage, residues in food or feedstuffs, uneven surfaces, manual handling, solar radiation, tools and equipment, moving machinery and vehicles, dusts and hazardous noise.
   * *'Personal Protective Equipment'* (PPE) may include, but are not limited to, boots, rubber boots, hat, overalls, chemical resistant gloves, eye and hearing protection, respirator, face mask and sun protection.
   * *'Safety requirements'* may include, but are not limited to, safe systems and procedures for handling, transporting and storing substances, safe operation of machinery, tools and equipment, safe procedures for applying substances and following manufacturer’s instructions, hazard and risk control, manual handling, maintaining personal hygiene, safety procedures for protecting others, outdoor work and the use of personal protective equipment.
   * *'Workplace procedures'* may include, but are not limited to, work notes, plans, product labels, manufacturer’s specifications, operator’s manuals, safety plans, fire control, waste disposal, recycling, re-use guidelines and supervisor’s oral or written instructions.
   * *‘Seedborne’* refers to carried on or in the seed, usually referring to a pathogen or disease
7. Regulations and legislation relevant to this unit standard include the following:
   * Labour Act, No. 11, 2007
   * Regulations relating to the Health and Safety of employees at work, 1997
   * National Agricultural Policy, 1995
   * Standards Act 18, 2005, Standards Regulations: Standards Act, 2005 and relevant Namibian Standards as established
   * All current sets of *Good Agricultural Practices (GAP)* to which Namibia subscribes and Global GAP that regulate agricultural products entering a country to which Namibian producers may export
   * Global Organic Standards: European Union (EC 2018/848), United States of America (NOP), Namibia (IFOAM Norms).

and all subsequent amendments to any of the above

**Quality Assurance Requirements**

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority on www.namqa.org and the Namibia Training Authority on www.nta.com.na

**Elements and Performance Criteria**

1. Use personal protective equipment

**Performance Criteria**

* 1. Personal protective equipment (PPE) is checked in accordance with producer’s specifications and safety requirements.
  2. Personal protective and preparation equipment are selected and used in accordance with safety requirements.
  3. Hazards are identified and risks are assessed and reported to the supervisor.

1. Control pests, diseases, and disorders with cultural and biological practices

**Range**

Pre-operational checks may include, but are not limited to, nozzles, hoses, regulators/gauges, filters, respirator cartridges, protective clothing and equipment.

Cultural and biological methods may include, but are not limited to, traps (pheromones, sticky bands and boards, bait traps, light traps), companion and repellent plants, sanitary measures (removal and/or destruction of infected material, tool disinfection, hot water treatment of seeds), biological agents and beneficial organisms and habitat interventions (hedge plantings, companion planting, growing of trap plants).

**Performance Criteria**

* 1. Pre-operational checks of application equipment are carried out in accordance with producer’s specification and workplace procedures.
  2. Instructions for using or establishing cultural methods of pest, disease and disorder management are confirmed.
  3. Materials and inputs are selected, prepared, handled to minimise damage and maximise viability.
  4. Cultural and biological methods are applied.
  5. Tools and equipment are cleaned and stored in accordance with workplace procedures.

1. Control weeds mechanically

**Range**

Mechanical weed control may include, but is not limited to, using simple farm machinery, tractor and hands.

Weed management and controlling methods to reduce weed pressure may include, but are not limited to, crop rotations, mulching, use of crop residues, maintaining weed free conditions, controlling weeds in adjacent non-crop areas, composting of manure to kill weed seeds, removal, and disposal of weeds, under sowing - and cover cropping.

**Performance Criteria**

* 1. The effects of weeds in crops are described.
  2. Optimal weeding times with respect to crop and weed growth are explained.
  3. Preventative methods to reduce weed pressure are described.
  4. Instructions for weed management are confirmed.
  5. Tools and simple equipment are selected and prepared for the task being undertaken.
  6. Safety requirements are followed in accordance with safety plans and policies.
  7. Weeds are managed.
  8. Tools are cleaned and stored in accordance with workplace procedures and instructions.

1. Prepare equipment

**Performance Criteria**

* 1. Safety requirements are followed in accordance with safety plans and policies.
  2. Label information regarding precautions for the product mix/substance being used is applied.
  3. Personal protective and mixing equipment are selected and used in accordance with safety requirements and product labels.
  4. Checks are undertaken that output of application equipment is correct and in accordance with workplace procedures.
  5. Substances are measured, mixed and loaded in accordance with directions on label and/or supervisor’s instructions.

1. Treat pest, diseases and disorders with organic plant protection products

**Range**

Meteorological conditions may include, but are not limited to, rain, wind, temperature, relative humidity and inversion or stable air conditions.

Interventions must be made with non-chemical plant protective products. PPP can be applied whist preventing the development of resistance.

Botanical preparations may include, but are not limited to, permissible extracts of neem, hot peppers, rotenone, pyrethrum and nicotine.

Mineral preparations may include, but are not limited to, preparations of sulphur and certain compounds of sulphur, lime sulphur and permissible copper and micronutrient compounds.

Permissible components are in accordance with regulations relevant to specific organic or other types of production.

**Performance criteria**

* 1. Meteorological conditions and forecasts are assessed and recorded prior to and during application.
  2. Instructions for botanical and mineral preparations are confirmed.
  3. Materials are selected.
  4. Checks are undertaken to ensure that substances prepared are correct.
  5. Substances are handled and stored in accordance with workplace procedures.
  6. Plant protection products are applied in accordance with the product label and supervisor’s instructions.
  7. Tools and equipment are cleaned and stored in accordance with workplace procedures.

1. Housekeeping and cleaning up

**Range**

Application records may include, but are not limited to, time, date, quantity and type of product, weather conditions, application equipment, host and pest.

Withdrawal periods may include, but are not limited to, re-entry to grazing areas and period before the crop can be harvested.

**Performance Criteria**

* 1. Personal Protective Equipment (PPE) and application tools and equipment are cleaned and stored in accordance with manufacturer's specification and workplace procedures.
  2. Excess PPPs are disposed of, and containers are treated in accordance with label requirements.
  3. Application records are completed.
  4. Unused products are stored in accordance with safety and product label requirements.
  5. All re-entry and withdrawal periods are adhered to.

Registration Data

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| **Subfield:** | Organic Agriculture |
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| **Date first registered:** |  |
| **Date this version registered:** |  |
| **Anticipated review:** |  |
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| **Body responsible for review:** | Namibia Training Authority |