



# **Crop production**

## **Level II**

# **Learning Guide-17**

**Unit of Competence: Follow Site Quarantine  
Procedures**

**Module Title: Following Site Quarantine  
Procedures**

**LG Code: AGR CRP2M05T LO1-LG-17**

**TTLM Code: AGR CRP2M05 TTLM 0919v1**

**LO1: Prepare to work in quarantine  
site**



This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Decontaminating to ensure personal and/or work vehicles
- Reporting contact with potential contaminants
- Washing hands before planting materials and handling other products
- Using footbaths thoroughly and checking for disinfectant level

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Document personal and/or work vehicles
- Report Contact with potential contaminants
- Wash hands before planting materials and other products handled.
- Use footbaths thoroughly and check for disinfectant level



### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 4.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5, Sheet 6 and Sheet 7”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” in page - **5,7,9 and 11** respectively.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 2
	Author: Federal TVET Agency	



<b>Information Sheet-1</b>	<b>Decontaminating to ensure personal and/or work vehicles</b>
----------------------------	--

### 1.1 Introduction

In the contest of international law, Quarantine is the regulations of a country imposing a period of time during which vehicles arriving in port is forbidden to land freight or passengers, because it is suspected of being infected with contagious diseases/crop pests.

After the liberalization of regulations for import of plants and plant materials that followed General Agreement on Tariffs and Trade (GATT) ratification by participating countries, there is a potential risk of introducing several destructive pathogens and pests, especially viruses, viroids, and physoplasmas. Implementation of adequate quarantine safeguards has become imperative to prevent the introduction of new pathogens. Establishment of a post-entry quarantine facility along with expertise in propagation of plants by tissue culture techniques will lead to large-scale production of pathogen-free plants within short periods. Various methods are used for the detection of viruses, viroids, and phyto-plasmas in vegetatively propagated planting materials. The grow-out test, indicator- inoculation test, indexing method, histo-pathological test, electron microscopy, and serological tests are employed for the early detection of infection and elimination of infected materials or plants. Effective functioning of post-entry quarantines will greatly help to prevent the introduction and subsequent spread of plant pathogens.

Quarantine defines the scope of quarantine as follows: In this Act, quarantine includes, but is not limited to, measures:

(A) for or in relation to, the examination, exclusion, detention, observation, segregation, isolation, protection, treatment and regulation of vessels, installations, human beings, animals, plants or other goods or things; and

(B) having as their object the prevention or control of the introduction, establishment or spread of diseases or pests that will or could cause significant damage to human beings, animals, plants, other aspects of the environment or economic activities.

### 1.2. The Plant Quarantine System

The plant quarantine system is regulatory and operational activities that together are designed to prevent the entry establishment and spread of regulated pests in Ethiopia.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 3
	Author: Federal TVET Agency	



Inspection is conducted to check for pest infestation prior to import /export at the Plant Protection Station (which is located at seaports/airports), markets or production sites. Furthermore, laboratory tests may be conducted for nematodes and plant diseases.

### **1.3. Inspection of container vessels of personal and/or work vehicles**

Most of the cargo transported in the country is by container. Hence, inspection procedures must be adapted to this means of conveyance. The Inspector should be aware of the following:

- A high level of risk occurs when the container is opened since pests that may have been shipped with the produce can escape at the time of opening.
  - A pest could multiply rapidly during the period of confinement in the container (for example, dependent on the life-stage of the pest in/on the produce when the container is loaded, as well as on its rate of development).
  - There may also be some risk of contaminating pests both on the outside of the container and inside empty containers, especially those that may have previously held regulated cargo.
- The import inspections performed by the PQ Unit are designed to verify the conformity of imported consignments with the phytosanitary requirements in order to prevent the entry and spread of regulated pests or to ensure decontaminating. General inspection procedures include document verification, identity checking and phytosanitary verification. Specific inspection procedures for phytosanitary verification of consignments of different classes of commodities are also given.

### **1.4. Ensuring the decontaminating personal and/or work vehicles**

Decontamination involves a combination of physical and chemical procedures that are used to remove soiling and inactivate the target disease organism. An effective decontamination program is vital during all stages of any emergency disease response. The decontamination process comprises a number of stages. These are:

- Planning identification and assessment of risks, design of efficient and effective procedures, and training of personnel;
- Implementation cleaning, disinfection, and waste treatment and disposal; and
- Pesting for effectiveness.

Ineffective decontamination usually

- Fails to include adequate cleaning as part of the process;
- Uses inappropriate disinfecting agents; or
- Does not allow adequate contact time with the disinfecting agent.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 4
	Author: Federal TVET Agency	



<b>Self-Check 1</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is documentation? (3)
2. What quarantine? (3 points)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 5
	Author: Federal TVET Agency	



<b>Information Sheet-2</b>	<b>Reporting contact with potential contaminants</b>
----------------------------	--

### **2.1. Identifying and reporting the specific problem and its location**

All farmers must identify and report the disease problems and its location to the supervisor/DA or to a responsible organization. Any disease out breaks in a farm/village area should be immediately reported to the concerned bodies of the vicinity. The main issues to address the successful insecurity management program are sanitation.

#### **The report should contain**

- The place, date and time of the disease incidence
- A brief description of the incident,
- A statement of the sequence of events which preceded the incident,
- Identification of any unsafe conditions, acts or procedures which contributed in any manner to the incident,
- Recommended corrective actions to prevent similar incidents, and
- The names of the persons who investigated the incident.

What to collect and reporting.

- (i) All plant pests including – insects, mites, other arthropods, molluscs and etc
- (ii) Planting material or seed or growing media with disease symptoms
- (iii) Abnormalities on roots, stems, foliage, bulbs, tubers, corms, seeds and fruits.



<b>Self-Check 2</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What report should contain? (5)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 3 points**

**Unsatisfactory - below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 7
	Author: Federal TVET Agency	





<b>Information Sheet-3</b>	<b>Washing hands before planting materials and handling</b>
----------------------------	---

Wash your hands and personal protective equipments before and after handling of products. Keep soap and water with you wherever you are working with crop work. Never smoke, eat, drink or use the toilet after handling contaminates products without first washing your hands. Because of the great diversity of crops required quarantine procedures, the institution should follow the guidelines stated in the above sections to fashion a quarantine program best suited to their needs.

### **Sanitation**

- The sanitation component of biosecurity addresses the issue of the disinfection of people, equipment, animals, and material entering the ranch/farm and maintained cleanliness of people and equipment.
- Cleaning of facilities and equipment during crop production is a good management practice to reduce pathogen transmission.

### **Checklist for Sanitation**

- Attempt to prevent contamination manure and equipment.
- Always clean equipment, tools and machineries used.
- Regularly evaluate activities to assess the potential for contaminating crop site.
- Clean contaminated vehicles and equipment before use.
- Routinely clean and disinfect cropping equipment.
- Routinely clean and disinfect equipment used.



<b>Self-Check 3</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. List points include in sanitation checklist? (8)

Answer

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory – 4 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 9
	Author: Federal TVET Agency	



<b>Information Sheet-4</b>	<b>Using footbaths thoroughly and checking for disinfectant level</b>
----------------------------	---

#### **4.1. Put on appropriate clothing and footbaths**

- ❖ Staff entering the isolation premises (quarantine) must always change into protective clothing and footwear.
- ❖ On leaving, the overalls and footwear must be removed and left within the isolation area, and the footwear must be disinfected.
- ❖ Hands should be washed, or otherwise disinfected, on entering and leaving area or site.
- ❖ The guidelines are designed to alert growers and operators to the possible dangers associated with picking, and how to prevent accidents.

#### **4.2. Clothing and personal protective equipment**

- Wearing appropriate clothing and using protective equipment where necessary can reduce the risk of an accident occurring.
- Wear close fitting shirts, trousers or shorts. Wear fitting clothing during work in quarantine site.
- Wear sturdy, fully enclosed shoes with a good grip on the sole.
- Wear a wide brimmed hat to prevent sunburn.
- Tie up long hair and remove any jewellery.
- Personal protective equipment such as eye goggles, dust masks and earmuffs should be worn when needed, e.g. when cleaning.



<b>Self-Check 4</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. Why wearing appropriate clothing while working on crop site? (6pts)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 11
	Author: Federal TVET Agency	



# Crop production

## Level II

# Learning Guide-18

**Unit of Competence: Apply Basic Leveling  
Activities**

**Module Title: Applying Basic Leveling Activities**

**LG Code: AGR CRP2M05T LO2-LG-18**

**TTLM Code: AGR CRP2M05 TTLM 0919v1**

## LO2: Work in quarantine site

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 12
	Author: Federal TVET Agency	



<b>Instruction Sheet</b>	<b>Learning Guide 18</b>
--------------------------	--------------------------

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Handling and storing chemicals and/or medications appropriately
- Keeping and marking different soils and/or growing media
- Identifying and reporting any cases of disease or pest infestation
- Identifying and reporting any breaches of quarantine procedures
- Identifying any OHS hazards and taking appropriate actions.
- Disposing all waste products.
- Disposing all deceases of unwanted biological material or damaging /infecting plant stock
- Recording information relating to work in quarantine sites.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Handle and store chemicals and/or medications appropriately.
- Separate soils and/or growing media and/or other products are kept separate and appropriately marked
- Identify and report disease or pest infestation
- Identify and report any breaches of quarantine procedures
- Identify any OHS hazards and take appropriate action
- Dispose all waste products.
- Dispose all deceased unwanted biological material or damaged/infected plant stock
- Record Information relating to work in quarantine site



### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 4.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5, Sheet 6 and Sheet 7”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, Self-check 5 , Self-check 6, Self-check 7 and Self-check 8” in **page -16,18,21, 24,27,29,31,and 33** respectively.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 14
	Author: Federal TVET Agency	



### 1.1. Safe handling of Chemicals and/or medications used in quarantine

There are many chemicals on the farm and some of them could be dangerous. Common agricultural chemicals include fuels, pesticides, herbicides, fungicides and veterinary chemicals. Exposure to chemicals leads to headache, poisoning, respiratory illness, burns, cancers and birth and different flaws. Always follow manufacturers' instructions for storage, transport, use and disposal of chemicals. Keep all chemicals locked and out of reach of children and wear appropriate protective clothing.

Chemicals should be treated with caution and only used according to the instructions. Hazardous chemicals are required by law to include Material Safety Data Sheet (MSDS) and label. The MSDS gives valuable information on how to safely handle the chemical. Before using any farm chemical, read the label, understand the MSDS and follow usage instructions. To further decrease the risks, hazardous chemicals are replaced by less toxic chemicals. For example, pellets instead of powder. It is important that you research chemicals prior to purchase to ensure that you buy the most suitable and least dangerous chemical available. MSDSs can be found online to assist in safe chemical choices and should be thoroughly read before use and kept in an accessible place for reference.





<b>Self-Check 1</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. List the safe handling techniques of chemicals and/or medications used in quarantine?(5 points)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory – 4 below 4points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 16
	Author: Federal TVET Agency	



<b>Information Sheet-2</b>	<b>Keeping and marking different soils and/or growing media and/or other products separately and appropriately</b>
----------------------------	--

### 2.1. Soils and/or growing media quarantine

When the growing media are imported, the importer or its representing agent must submit an export phytosanitary certificate issued by the plant quarantine authority of the exporting country to prove that it is new and unused, and is free of soil. The product name and manufacturer's name and address on the label of the smallest packaging unit of the product shall be consistent with the phytosanitary certificate issued by the plant quarantine authority of the exporting country.

The growing media must be free of pests, diseases and noxious weeds and be accompanied by a shipping certificate issued by the quarantine inspection authority. All growing media stock originating from other states must be accompanied by a shipping certificate issued by the plant regulatory agency of the state of origin. Additionally, all plant materials subject to oregon plant quarantine regulations must meet all inspection and documentation conditions required by each specific quarantine.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 17
	Author: Federal TVET Agency	



<b>Self-Check 2</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is the importance of inspecting growing media?(5 points)

**Answer**

<b>Score =</b> _____
<b>Rating:</b> _____

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 18
	Author: Federal TVET Agency	



<b>Information Sheet-3</b>	<b>Identifying and reporting any cases of disease or pest infestation</b>
----------------------------	---

**Definition:** Pests can be defined as any form of plant or animal life, or any pathogenic agent, which is injurious or potentially injurious to crop or crop products. Detection and identification of microbial plant disease or pests rapidly, reliably, and accurately will be required in various contexts. Accurate identification is the cornerstone for success of all crop disease management strategies, whether advisory or statutory aimed at prevention, control, or eradication and irrespective of use of chemical, biological, or administrative means.

Pest inspection and quarantine measures to be followed:

If pests are encountered during inspection;

- (i) Follow with sample collection and submission procedures and remit to the appropriate laboratories for identification.
- (ii) If no pests are encountered release for use.
- (iii) The quarantine inspector informs the senior quarantine inspector immediately of interceptions, and if further technical measures are required, the appropriate authorities are informed.
- (iv) The senior quarantine inspector assesses pest risk situations and recommends safeguards to mitigate any dissemination before the specific technical quarantine measure to eliminate the risk is recommended by the Plant Health Department or dictates the appropriate and recognized quarantine measure to resolve the situation.
- (v) The Quarantine Inspector assigned at the apson, supervises or technicians or he/she applies the technical quarantine measure by abiding with the set procedures.

Importing countries may request exporting countries to certify the following status:

- (1) Plants are free from quarantine pests (especially, fungal, bacterial or virus diseases)
- (2) Production sites are free from quarantine pests. As it is difficult to check whether exported plants are infected with these diseases at the time of export inspection, field inspection is carried out during the growing period when symptoms are most easily detectable.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 19
	Author: Federal TVET Agency	



**Field inspection**



<b>Self-Check 3</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. Why Importing countries request the exporting countries to certifying certificate?(8)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 6 points**

**Unsatisfactory - below 6 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 21
	Author: Federal TVET Agency	



#### **4.1. Keeping records**

Keep recording sampled crop disease or pest by year, season and crop as a reference tool to help with future identification. You can also refer to your pest scouting records from previous years to predict when key pest and beneficial insects will be present. As you learned in the “Cultural Practices for Managing Pests” module, knowledge of key pests and beneficials and when they occur is key in development of preventative pest management strategies.

#### **4.2. Reporting**

We should report the any breaches or plomlems of quarantine procedures to supervisor. On-site supervision to insure high quality work and provide are important.

##### **Inspection reports**

The inspection report can draw attention to possible problems or hazards. Inspection report also is essential to determine whether previous recommendations implemented or not.

##### **Types of inspection reports:**

1. Ongoing
2. Pre-operation
3. Periodic

##### **1 Ongoing inspections**

Supervisors and workers continually conduct ongoing inspections as part of their job responsibilities. Such inspections identify hazardous conditions and either correct them immediately or report them for corrective action.

##### **2. Pre-operation**

Pre-operation checks involve inspections of new or modified equipment or processes. Often checks are done after workplace shutdowns.

##### **3. Periodic inspections**

Qualified persons periodically inspect some types of equipment, such as elevators, boilers, pressure vessels, and fire extinguishers, at regular intervals.

##### **What should the final report have in it?**

To make a report, first copy all unfinished items from the previous report on the new report. Assign a priority level to the hazards observed to indicate the urgency of the corrective action required. For example:



- ❖ Major (requires immediate action)
- ❖ Serious (requires short-term action)
- ❖ Minor (requires long-term action)

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 23
	Author: Federal TVET Agency	





<b>Self-Check 4</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. Why record keeping?(6)
2. List inspection reports?(4)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 8 points**

**Unsatisfactory - below 8 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 24
	Author: Federal TVET Agency	



<b>Information Sheet-5</b>	<b>Identifying any OHS hazards and taking appropriate actions</b>
----------------------------	---

### 5.1. Hazard identification

Crop farms (workplaces) can be dangerous. There are many hazards that have the potential to kill, injure or cause disease. Exposure to the hazard is depending on the type of activities carried out in different farms. In plants, then, disease can be defined as the malfunctioning of host cells and tissues that results from their continuous irritation by a pathogenic agent or environmental factor and leads to the development of symptoms. Transmit from one plant to other plant; Caused by biological organisms. Proper handling techniques are essential in preventing crop disease. Crop diseases are among the most common conditions that adversely affect crop yields. Certain procedures should be routinely followed in order to prevent the development of crop disease. Crop should be housed, as well as manipulated and/or handled, in extremely well sanitized areas. Gloves and protective clothing should always be worn to prevent direct exposure to disease in work site. Although latex gloves are effective in preventing transmission of infectious diseases and allergens, latex itself contains proteins which have recently been shown to cause allergy. Latex allergy is a reaction to certain proteins in latex rubber. The amount of latex exposure needed to produce sensitization or an allergic reaction is unknown. Increasing the exposure to latex proteins increases the risk of developing allergic symptoms. In sensitized persons, symptoms usually begin within minutes of exposure; but they can occur hours later and can be quite varied. Mild reactions to latex involve skin redness, rash, hives, or itching. More severe reactions may involve respiratory symptoms such as runny nose, sneezing, itchy eyes, scratchy throat, and asthma.

Sharps are commonly encountered in quarantine involving in crop production. Puncture-resistant and leak proof containers for sharps are available in the store rooms and in laboratories. Basic rules to remember when working with sharps:

- Always follow the manufacturers' instructions for proper disposal of chemicals and rinses from equipment.
- Audit chemical store regularly and dispose unnecessary or outdated chemicals in the appropriate manner.
- Return empty containers to manufacturer or discuss with your local authority to dispose

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 25
	Author: Federal TVET Agency	



## 5.2. Risk assessment

A risk assessment is simply a careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent harm. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures.

## 5.3. Control measures

### Sanitation

Sanitation practices help to prevent and suppress some plant diseases by removing the pathogens themselves or their sources of food and shelter. Disinfecting equipment and tools

### Pathogen-free seed stock

Important way to reduce the spread of plant disease. Seeds are often grown in arid areas where the amount of moisture is controlled by an irrigation system. This eliminates infection by diseases that require high moisture and humidity levels.

### Pathogen-free propagation

Plant disease pathogens are frequently carried in or on vegetative propagation materials (such as roots, bulbs, tubers, corms, and cuttings). Use of clean planting stock is especially important in the culture of certain high-value agricultural and ornamental crops.

### Pathogen-free storage

To control disease in food and feed storage areas, you must first have good sanitation in the facility before storage. Then be sure the crop is relatively pathogen-free at the time it is put into storage.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 26
	Author: Federal TVET Agency	



<b>Self-Check 5</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. What is risk assessment?(6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 27
	Author: Federal TVET Agency	



<b>Information Sheet-6</b>	<b>Disposing all waste products.</b>
----------------------------	--------------------------------------

## 6.1. Disposed off quarantine wastes

### A. Purpose

Quarantine waste poses a significant risk to Country's biosecurity. Current practices see this risk managed through strict control measures imposed on the collection, transport, storage and treatment of quarantine waste.

### B. Scope

The quarantine waste management technical requirements for the collection, storage, transport and treatment of quarantine waste and applies to all animal and plant quarantine waste management activities. Wastes should be removed regularly and frequently. All waste should be collected and disposed of in safe and sanitary manner. The most preferred method of waste disposal is incineration. Incinerators should be in compliance with all central, state, and local regulations. Waste cans containing plant byproducts, pesticide, and hazardous wastes should be lined with leak-proof, disposable liners. If wastes must be stored before removal, the waste storage area should be separated from other storage facilities and free of flies, cockroaches, rodents, and other vermin. Cold storage might be necessary to prevent decomposition of biological wastes. Faecal material produced by animals in the initial stages of their quarantine detention must be destroyed as quarantine waste, primarily to address imported weed seed concerns. The duration of this requirement is determined by the relevant import program. Waste collected during this period must not be held for longer than 30 days.

### **Pesticide disposal**

A good farm practice is to discard leftover chemicals. Expired chemicals should be discarded because they are no longer effective. First, ask in the chemical store where you bought the pesticides if they will take back unused portions or expired chemicals. It may be the law that they accept these chemicals. Burning chemicals or their containers is not safe disposal. Never reuse chemical containers. Frequently, the only way to dispose of chemicals is to dig a hole and put the chemicals and their full or empty containers in it. The hole should be at least 3 m deep; it must be far away — at least 800 m from where people live and at least 1 km from any water sources. It should always be on the slope below the well, pond or river. You may have to leave the nursery to find an ideal spot, but you must make sure nobody will dig up the hole to plant food crops for the next 10 years, if possible! It is your responsibility to dispose of pesticides in a responsible manner, avoiding harm to people, especially children.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 28
	Author: Federal TVET Agency	



<b>Self-Check 6</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List the advantage of disposed off quarantine wastes?(6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 29
	Author: Federal TVET Agency	



<b>Information Sheet-7</b>	<b>Disposing all deceases of unwanted biological material or damaging /infecting plant stock</b>
----------------------------	--

### 7.1. Dispose off

Remove farm waste often enough and in a manner to prevent cross-contamination and avoid attracting pests.

- Dispose of all materials according to municipal by-laws and provincial regulations.
- If farm waste can be used by other sectors, store and ship them so as not to pose a food safety hazard. Unless properly sanitized, vehicles used for transporting farm waste should not be used to transport food products and farm inputs.
- Remove compost or bury all regulated dead animals according to provincial regulations.
- Locate dead stock burial pit and composting site away from:
  - Animal housing,
  - Fruit or vegetable production areas,
  - Areas of high livestock or human traffic, and
  - Any sources of water.
  - Protect all stored dead stock from other livestock, poultry and predators and away from public view.
- Pick up by a provincially licensed Dead stock Pick-Up Service;
- Composting at least 15 m from any watercourse and 30 m from any source of water used for domestic purposes;
- Burial at least 30 m from any source of water used for domestic purposes and pits constructed to prevent pollution.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 30
	Author: Federal TVET Agency	



<b>Self-Check 7</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. What is disposing off?(6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 31
	Author: Federal TVET Agency	





<b>Information Sheet-8</b>	<b>Recording information relating to work in quarantine sites.</b>
----------------------------	--

### **8.1. Record keeping and reporting quarantine activities**

Records of the health of newly imported planting materials and growing media or fertilizers should be consulted if clinical signs of disease are seen, or if any symptom is found. Complete inspection records should be maintained and available for all crop seed during the quarantine period.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 32
	Author: Federal TVET Agency	



<b>Self-Check 8</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List the importance of recording quarantine activities?(6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 33
	Author: Federal TVET Agency	



# Crop production

## Level II

# Learning Guide-19

**Unit of Competence: Apply Basic Leveling**

### Activities

**Module Title: Applying Basic Leveling Activities**

**LG Code: AGR CRP2M05T LO3-LG-19**

**TTLM Code: AGR CRP2M05 TTLM 0919v1**

## **LO3: Assist in maintaining site quarantine procedures**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 34
	Author: Federal TVET Agency	



This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Informing all visitors of the quarantine procedures and providing with appropriate clothing and foot wear.
- Noting and reporting any observed breaches of quarantine procedures by visitors
- Keeping gates and doors locked where require by enterprise.
- Maintaining security fencing where installed.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Informing all visitors to the quarantine procedures and a provid with appropriate clothing and footwear
- Note and report any observed breaches of quarantine procedures
- Keeping gates and doors locked where require by enterprise
- Maintain security fencing where installed.



### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 4.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5, Sheet 6 and Sheet 7”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” in **page -38, 40, 43 and 45** respectively.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 36
	Author: Federal TVET Agency	



<b>Information Sheet-1</b>	<b>Informing all visitors of the quarantine procedures and providing with appropriate clothing and foot wear</b>
----------------------------	--

### **1.1. Informing all visitors about the quarantine procedures**

- Visitors must not be allowed to enter the isolation unit.
- If personnel apart from the designated attendants need to enter for essential maintenance etc., they must be required to wash thoroughly on entering and leaving, and wear protective clothing which shall be put on prior to entering and removed prior to leaving.
- There must be a visitors' book to record the dates, names and addresses of all visitors.
- The overalls and boots provided for entry to the quarantine should completely cover the attendant's body, and suitable masks, goggles and gloves should also be provided

### **1.2. Personal Protective Devices**

Visitors members should be wear appropriate clothing to protect site from quarantine and visitors from splashes and splatters by adhering to careful work practices and rigorous use of personal protective devices. Face shields provide protection for eye and mucus membranes. Biological safety cabinets provide near sterile work environments that offer protection to the worker, the materials they are manipulating, and the work area itself. Lab coats or work uniforms will help prevent contamination of street clothes and should be changed whenever visibly soiled. Staff members should autoclave lab coats before disposal or laundering; soiled lab coats should go to on site or professional cleaners only. Latex or vinyl gloves provide barrier protection for hands. Staff must change gloves that are torn or visibly contaminated, and should autoclave them before disposal. Gloves and other protective devices cannot prevent needle sticks or other unintentional injuries caused by sharp instruments, broken glass, etc.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 37
	Author: Federal TVET Agency	



<b>Self-Check 1</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. What procedures visitors follow during work site visiting? (6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 38
	Author: Federal TVET Agency	



<b>Information Sheet-2</b>	<b>Noting and reporting any observed breaches of quarantine procedures by visitors</b>
----------------------------	--

## 2.1. Noting and reporting any observed breaches of quarantine

Regulations, policies and guidelines are several that govern the healthy, safety and environmental activities of crop producers.

### Safety requirements

Laboratories that mail or transport samples by air, sea, rail, and road between local, regional, and reference laboratories or between laboratories in other countries must adhere to a number of regulations. These regulations are designed to deal with transportation accidents and spills, reduce biohazards, and keep samples intact for testing.

### Regulations

Regulations for transporting samples come from several sources, including:

- ✓ National transport regulations;
- ✓ International Civil Aviation Organization (ICAO), as conveyed by the International Air Transport Association (IATA);
- ✓ Rail and road traffic agencies;
- ✓ Postal services.

Private courier companies may have their own requirements.

Compliance with industry standards and regulations is mandatory. Heavy fines may be imposed on personnel who violate these regulations. At risk are: the safety of courier, carrier, and laboratory personnel, as well as passengers.

All visitors respect the regulations, policies and guidelines of the country in order to ensure the healthy, safety and environmental activities of crop producers.

All concerned person must identify and report any unsafe condition or breaches or problems related to pest or disease problems by visitors, responsible to reporting to the supervisor/DA or to a responsible organization.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 39
	Author: Federal TVET Agency	







<b>Information Sheet-3</b>	<b>Keeping gates and doors locked where require by enterprise</b>
----------------------------	---

### 3.1. Store for chemicals should be:

- Separated by means of fire resistant material with fire resistance of two hours
- Constructed of fire resistant material with fire resistance of two hours.
- Constructed of non-porous and non-combustible material.
- Ventilated area; this includes ventilation from floor to ceiling with exhaust above roof level, and ventilated to the open air so that vapor cannot be accumulated inside the store.
- Clearly marked with sign indicating that it is such store and also indicating the maximum amount of liquid material that may be stored there.
- With enough facilities where personal protective tools for the users can be kept to remove contamination.
- With washing facilities
- To store chemicals by compatibility means for example those oxidizers should not be stored with organics: air/water reactive must be kept dry and inorganic cyanides should not be stored with acids.
- Volatile toxic chemicals should be stored in ventilated storage cabinets.
- Chemicals which are highly toxic or other chemicals whose containers have been opened must be in unbreakable secondary containers. For example, place containers of concentrated acids or bases into plastic tubs to help contain any leakage.
- Do not store chemicals near heat sources like ovens or steam pipe or in direct sunlight.
- Always containers must be kept closed.
- Do not store chemicals in glass containers on the floor.
- Date chemicals when received and first opened. This will assist you in using the oldest chemicals first
- Inspect chemicals routinely for signs of deterioration and for the integrity of the label. Chemicals must be clearly labeled.
- Chemicals that require refrigeration must be sealed with tight-fitting caps and kept in lab safe refrigerators. Lab safe refrigerators/freezers must be used for cold storage of flammables.
- Do not store chemicals above eye level. If the container breaks, the contents can fall onto face and upper body.



- Do not store excessive amounts of chemicals in the lab. Buying chemicals in large quantities creates fire hazard and limits work space. The disposal costs far exceed any cost savings from large quantity purchasing.

#### Chemical Storage in the Laboratory

Laboratories are not storerooms. This applies to the storage of chemicals and tools. For chemical storage, use these criteria:

- Small amounts, not stockpiled
- Secure
  - ❖ Do not overcrowd shelf.
  - ❖ Do not store too high
  - ❖ Store solvents in flammable liquids' cabinet, and keep it closed.
  - ❖ Use appropriate containers for solvents and waste.
  - ❖ Store highly toxic or controlled substances in secure or locked cupboard.
- Describe or label
  - ❖ Label contents clearly.
  - ❖ Do not overwrite labels.
  - ❖ Label and regularly check peroxidizable chemicals.
- Sealed
- Make sure chemical containers are intact.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 42
	Author: Federal TVET Agency	



<b>Self-Check 3</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List things under consideration during store agro-chemicals?(8)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating – 10 points**

**Unsatisfactory - below 10 points**

**You can ask you teacher for the copy of the correct answer**

<b>Information Sheet-4</b>	<b>Maintaining security fencing where installed.</b>
----------------------------	--

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 43
	Author: Federal TVET Agency	



#### 4.1. Fences and foot baths at the quarantine site

- Footbaths should be available not only at the entrance/exit of the quarantine premises, but also between individual holding rooms within the premises.
- Personnel should use the footbaths as they pass from one room to another.
- After use all equipment including work surfaces should be effectively cleaned and disinfected.
- Because of the aerosol risk power hoses should not be used, except with the agreement of the approved veterinarian
- The quarantine site must be fenced to prevent the entrance of wildlife and stray persons and to prevent the escape of quarantined from the quarantine facility

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 44
	Author: Federal TVET Agency	



<b>Self-Check 4</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List at least two main purposes of fencing quarantine?(6)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating –3 points**

**Unsatisfactory -3 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 45
	Author: Federal TVET Agency	



# **Crop production**

## **Level II**

# **Learning Guide-20**

**Unit of Competence: Apply Basic Leveling  
Activities**

**Module Title: Applying Basic Leveling Activities**

**LG Code: AGR CRP2M05T LO4-LG-20**

**TTLM Code: AGR CRP2M05 TTLM 0919v1**

**LO4: Respond to site quarantine  
breach or problem**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 46
	Author: Federal TVET Agency	



This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Identifying and reporting the specific problem and its location.
- Securing problems
- Cleaning and disinfecting quarantine site and location of breaches.
- Isolating and monitoring plant stock suspected
- Treating and/or disposing all contaminating stock/materials.
- Recording information about the breach or problem.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Identify and report the specific problem and its location.
- Secure problems
- Clean and disinfect quarantine site and location of breaches.
- Isolate and monitor plant stock suspected
- Treating and/or disposing all contaminating stock/materials.
- Record information about the breach or problem.





## Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 4.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5 and Sheet 6”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, Self-check 5 and Self-check 6” in **page -50, 52, 57, 59, 61 and 63** respectively.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 48
	Author: Federal TVET Agency	



<b>Information Sheet-1</b>	<b>Identifying and reporting the specific problem and its location.</b>
----------------------------	---

### 1.1. Identifying and reporting the specific problem and its location

- All farmers must identify and report the pest or disease problems and its location to the supervisor/DA or to a responsible organization.

#### The report should contain

- the place, date and time of the pest or disease incidence
- a brief description of the incident,
- a statement of the sequence of events which preceded the incident,
- identification of any unsafe conditions, acts or procedures which contributed in any manner to the incident,
- recommended corrective actions to prevent similar incidents, and
- The names of the persons who investigated the incident.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 49
	Author: Federal TVET Agency	



<b>Self-Check 1</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List contents of the report of specific problems/diseases identified in a farm/quarantine?  
(6 points)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating –3 points**

**Unsatisfactory -3 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 50
	Author: Federal TVET Agency	



<b>Information Sheet-2</b>	<b>Securing problems</b>
----------------------------	--------------------------

## 2.1. Securing problems in crop site

- Attempt to prevent manure contamination of feed and equipment used orally.
- Always clean equipment used during work site.
- Use clean or pure planting materials
- Attempt to prevent cross contamination between healthy and disease infected plants.
- Regularly evaluate activities on my operation to assess the potential for contaminating work site.
- If manure accidentally contaminates with pests, an immediate remedy is provided.
- Use clean equipments and tools.
- Sometimes leave manure–hauling equipment in pens with different groups of animals.
- Clean contaminated vehicles and equipment before use.
- Routinely clean and disinfect pesticide equipment and crop work equipment.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 51
	Author: Federal TVET Agency	



<b>Self-Check 2</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. How to securing farm site problems?(4 points)

**Answer**

<b>Score =</b> _____
<b>Rating:</b> _____

**Note: Satisfactory rating –2 points**

**Unsatisfactory -2 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 52
	Author: Federal TVET Agency	



<b>Information Sheet-3</b>	<b>Cleaning and disinfecting quarantine site and location of breaches.</b>
----------------------------	--

**Cleaning** is the removal of dirt and organic substances, such as fat and protein particles from surfaces of walls, floors, tools and equipment. Through the cleaning procedures, high numbers of microorganisms (90% and more) present on the mentioned objects will be removed. However, many microorganisms stick very firmly to surfaces, in particular in tiny almost invisible layers of organic materials, so called biofilms, and will not entirely be removed even by profound cleaning but persist and continue multiplying.

Inactivation of those microorganisms requires antimicrobial treatments, carried out through hot water or steam or through the application of disinfectants.

Plant pathogens can persist on pruning shears, knives, and other implements used for cutting and pruning operations. Making a cut on an infected tree is sufficient to contaminate the cutting tool; subsequent cuts on other trees will introduce the viroid and infect the tree. Viroids (small pieces of RNA similar to a plant virus but lacking the protein coat) are extremely difficult to remove from tools and are not inactivated by most disinfectants or high heat.

**Disinfectants** are chemical substances, which kill microorganisms but should not affect human health through hazardous residues and not cause corrosion of equipment. The application of disinfectants is called disinfection.

The term **Sanitation** refers to the inactivation of microorganisms through disinfectants, but also includes combating pests such as insects and rodents through chemical substances (insecticides and rodenticides). In general, the term “sanitation” usually refers to disinfection and pest control.

Periodic cleaning and sanitation is an integral part of good hygienic practice. Cleaning and sanitation can even be considered as one of the most important activities, as these measures provide the necessary environment for proper handling and processing.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 53
	Author: Federal TVET Agency	



## How to carry out Cleaning and sanitation

### a) Preconditions for efficient cleaning and sanitation

- Premises and equipment must be “Cleaning -friendly” , which means
  - Easy and practicable access to all contaminated areas,
  - Smooth surfaces and adequate materials for building structures and equipment to be cleaned.
- Proven methods for cleaning and sanitation must be available.
- Personnel must be regularly instructed and trained in cleaning and sanitation methods.

### Methods of Cleaning

1. **Physical Cleaning** with pressurized water may stir up dirt or produce contaminated water droplets (aerosol), which could contaminate anything present in such rooms.
2. **Chemical Cleaning** /disinfection may produce toxic residues when in contact with remaining meat or meat products. The same applies to insecticides and rodenticides for pest control.

Cleaning and disinfection procedures are complex processes depending on the surfaces to be treated and the kind of contamination to be removed. Selection of suitable chemicals for Cleaning or for disinfection may require special knowledge. All these factors can make correct Cleaning and disinfection a difficult task for the personnel involved. However, staff must be made aware that efficient Cleaning and disinfection is of utmost importance for product quality and safety.

### b) Cleaning procedures

The first step in equipment cleaning is to physically remove scrap, i.e. coarse solid particles, with a dry brush or broom and shovel. This is usually referred to as “**dry Cleaning**”. Using large amounts of water to remove this material would be extremely wasteful and eventually cause drains to clog and waste water treatment facilities to become overloaded. More profound clean-up procedures require water in sufficient quantities. **Manual Cleaning** using brushes or scrapers is widely applied in small-scale operations although labor and time-intensive.

High pressure water is efficient for surface cleaning after dry- Cleaning of scrap. It serves for the removal of remaining small solid parts, blood and dirt from the entire floors and walls of processing sections as well as for the removal of meat and fat particles and layers of protein from tools and equipment. As hot water has a much better Cleaning effect than cold water, hot water should be available for this purpose.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 54
	Author: Federal TVET Agency	



Cleaning with equipment producing a pressurized steam/water-mix is even more efficient as impact temperatures of approx. 100°C can be achieved. The disadvantage of this method is the intense fog and aerosol formation, which may not only cause unwanted microbial spreading by water droplets (aerosol) but also affect installations and equipment through high humidity and excessive condensation. For these reasons a steam/water-mix is not suitable for meat processing facilities and cold or hot pressurized water cleaning is preferred. Application can be by hand using brushes or scrapers for dismantled equipment or in general for smaller surfaces to be cleaned. Mechanical Cleaning with high pressure equipment together with cleaning solutions is used for larger containers and equipments.

### **Types of cleaning agents**

#### **1. Alkaline Cleaning agents:**

Generally suitable for removing organic dirt, protein residues and fat.

#### **2. Acid Cleaning agents:**

Used particularly for removal of encrusted residues of dirt or protein or of inorganic deposits (“scaling”) such as waterstone, milkstone, lime etc.

#### **3. Neutral Cleaning agents:**

Have much less effect than alkaline or acid Cleaning agents, but have mild impact on skin and materials and are useful for manual Cleaning of smooth surfaces without encrusted dirt.

In practice alkaline and acid Cleaning substances should be used alternatively. The alkaline agent should be the substance used for routine Cleaning, but every few days an acid substance should be employed instead in order to remove encrusted residues, scaling etc.

Cleaning substances together with the suspended dirt particles must be rinsed off using potable water. A relatively new cleaning method in the larger-scale plants, is foam Cleaning. Water foam containing detergents and other cleaning agents is sprayed on wetted walls, floors and surfaces of equipment. The foam does not immediately run off but clings to the surfaces. This allows a longer term contact on the surfaces to be cleaned. After a sufficient impact period (min. 15 minutes) the foam is washed down with water (water hose or low-pressure water spray). As no high pressure water spraying is needed for washing off the foam, the spreading of water droplets (aerosol) in the room to be cleaned is minimized.

### **Disinfection techniques**

Cleaning reduces a substantial amount of microorganisms (Fig. 492b) but it does not have the potential to completely eliminate all surface contamination. Persistent microorganisms will continue to grow in number by using remaining protein as nutrients and pose a further risk to the foods to be processed.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 55
	Author: Federal TVET Agency	





The elimination of microorganisms is achieved through disinfection<sup>1)</sup>, either by using hot water (or better steam) or chemical disinfectants (Fig. 492c). Chemical disinfectants are preferred for most applications in the meat industries as they are easy to use and do not involve the risk of accidents or other negative side effects such as damage to equipment by generating high humidity or water condensation, which may occur when using steam.

Best disinfection results are achieved when chemical disinfection is preceded by intensive dry/wet Cleaning. Disinfection without pre cleaning is not fully efficient as many microorganisms remain embedded in encrusted dirt, protein and fat, which cannot be properly dissolved by disinfection chemicals. Therefore microorganisms remain protected against the disinfection chemicals. Moreover, remaining protein may inactivate chemical disinfectants.

Adequate rinsing with water after Cleaning and prior to disinfection is also indispensable, as chemical disinfectants may be neutralized by remaining Cleaning substances. All this has to be taken into account, otherwise the disinfection procedures may be inefficient and a waste of money.

A compromise on this issue is proposed by the chemical industry by offering so called combined disinfection/ cleaning agents. They are made on the basis of *quaternary ammonium compounds*, which have surfactant and disinfectant properties. The combined method should be considered only in cases of very little dirt contamination.

It is very important that disinfection chemicals are strictly used according to the specifications given by the suppliers. Lower concentrations and shorter impact periods than prescribed will considerably reduce the efficacy of disinfection or make it totally inefficient. Surfaces should be dried after Cleaning and rinsing before starting disinfection. This is important, as the concentration of the disinfection solution would be lowered with remaining water on the surfaces and possibly ineffective when becoming too highly diluted.

The application of chemical disinfectants is done with stationary or mobile spraying devices. In medium or small scale meat plants, mobile spraying devices are sufficient. The disinfectant is applied by means of spraying lances and manual or electrical pumps. One important rule is, that the disinfectant solution must be applied from top to bottom, i.e., first upper parts of walls, then lower parts of walls and the floor last. The same applies to equipment.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 56
	Author: Federal TVET Agency	





<b>Information Sheet-4</b>	<b>Isolating and monitoring plant stock suspected</b>
----------------------------	---

### **Isolation**

- The most important step in disease/pest control is limiting contact, and movement of suspected plant stock. This is importance activities to prevent the dissemination of infected or suspected plant stock to crop farm site. Even co-mingling between established groups of crop on the farm/ranch should be minimized by isolation.

### **Monitoring suspected plant stock**

- The sanitation component of biosecurity addresses the issue of the disinfection of plant/crop/crop residues, equipment, animals, and material entering the ranch/farm and maintained cleanliness of crop site or nursery/orchard and equipments(tools).
- Avoid using infected planting materials /seeds, tools, equipments and disinfected tools and equipments. Monitoring all infected planting materials and crop residues and removes all contaminated plant stock from crop site.
- Cleaning of facilities and equipment during crop production processing is a good management practice to reduce pathogen transmission.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 58
	Author: Federal TVET Agency	



<b>Self-Check 4</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List the purposes of isolation? (3)
2. What are the importance of monitoring suspected plant stock?(5)

**Answer**

**Score = \_\_\_\_\_**

**Rating: \_\_\_\_\_**

**Note: Satisfactory rating –6 points                      Unsatisfactory -6 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 59
	Author: Federal TVET Agency	



<b>Information Sheet-5</b>	<b>Treating and/or disposing all contaminating stock/materials</b>
----------------------------	--

- ❖ workers handling chemicals pesticides perform with great care, special attention a precision
- ❖ strictly observe instruction and personal hygiene rules
- ❖ do not drink eat while handling or working with pesticides or in the chemical store and premises
- ❖ Take food before beginning works with toxicants .this reduce the harmful effects of chemical substance that may netter the blood system.
- ❖ Appropriate cleaning, disinfecting and storage of equipment after the end of plant pest and disease treatment equipments should be put properly. it include knapsack sprayer, spray tank, fertilizer spreader, pesticide applicator etc.

**Waste management** is the collection, transport, processing, recycling or disposal, managing and monitoring of waste materials.

### **Pesticide disposal**

Pesticides are hazardous wastes and cannot be disposed of in sanitary landfills or by burning. To dispose of pesticides:

Return unopened and leftover product to the dealer for a refund.

If you are unable to use opened pesticide supplies, offer them to neighbours.

Pesticides that have no further use must be disposed of as hazardous waste.

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 60
	Author: Federal TVET Agency	



<b>Self-Check 5</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. What is disposing off?(4)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating –2 points**

**Unsatisfactory -2 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 61
	Author: Federal TVET Agency	



<b>Information Sheet-6</b>	<b>Recording information about the breach or problem</b>
----------------------------	--

### 6.1. Recording information site breaches/problems

Records of the health of newly imported planting materials and growing media and should be consulted if symptoms of disease are seen, or if any symptom is found. Complete treatment records should be maintained and available for all crop seed during the quarantine period. Symptoms that die during quarantine should have a necropsy performed under the supervision of quarantines and representative team submitted for inspection or examination. Inspection records will be maintained to document test results and all other relevant health information.

Record keeping is an important part of monitoring and review.

Systematic records will help to identify hazards and review the effectiveness of risk controls:

- ❖ Details of work kplace inspections
- ❖ Worksheets/checklists used to identify hazards
- ❖ Methods used to assess risks
- ❖ Control measures implemented

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 62
	Author: Federal TVET Agency	



<b>Self-Check 6</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Directions:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers

1. List the importance of recording information ?(4)

**Answer**

**Score =** \_\_\_\_\_

**Rating:** \_\_\_\_\_

**Note: Satisfactory rating –2 points**

**Unsatisfactory -2 below points**

**You can ask you teacher for the copy of the correct answer**

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 63
	Author: Federal TVET Agency	





## REFERENCES

Collins, CH. 1993. Laboratory-Acquired Infections. Elsevier Publishers, Boston, MA.

DC: National Academy Press. Guide for the Care and Use of Laboratory Animals. 1985. National Institutes of Health, Bethesda, MD.

Fox JG and NS Lipman. 1991. Infections transmitted by large and small laboratory animals. Infectious Disease Clinics of North America. 5(1):131-63.

*Occupational Health and Safety in the Care and Use of Research Animals.* 1997. Washington,

Schlossberg, D. 1994. Infections of Leisure. Springer-Verlag, New York, NY.

Telford, SR, RJ Pollack, and A Spielman. 1991. Emerging vector-borne infections. Infectious Disease Clinics of North America. 5(1):7-17.

The Merck Veterinary Manual. "Zoonoses." 8th Ed. Ed. Susan E. Aiello. Whitehouse Station, NJ: Merck & Co., Inc., 1998: 2161.

<http://www.merckvetmanual.com/mvm/index.jsp> (search "zoonoses"). (29 May 2003)

TTLM:AGR CRP2M060919 Revision: 1	TVET Program: CROP PRODUCTION Level II	Page 64
	Author: Federal TVET Agency	