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# Citrus Orchard Foreman Occupational Learning

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## Work Scenario Guide

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### I5: Emergency Repairs

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|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Qualification:</b>        | 110667 – Occupational Certificate: Orchard and Vineyard Foreman                                                                                                                                                           |
| <b>Work Scenario:</b>        | <b>I5: Emergency Repairs</b>                                                                                                                                                                                              |
| <b>Learning Area:</b>        | I: Oversee the management and maintenance of production infrastructure, machinery and equipment                                                                                                                           |
| <b>Scenario Description:</b> | You need to develop procedures for, and oversee emergency repairs, to ensure that any failures in assets are dealt with as soon as possible, in a safe, effective manner, and production is slowed as little as possible. |

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**Occupational alignment:**  
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# Alignment Information

## Qualification

The content of this learner guide is aligned to the following occupational qualification:

|                                                    |                                                        |                                                |                                                  |                     |
|----------------------------------------------------|--------------------------------------------------------|------------------------------------------------|--------------------------------------------------|---------------------|
| SAQA QUAL ID                                       | Qualification Title                                    |                                                |                                                  |                     |
| 110667                                             | Occupational Certificate: Orchard and Vineyard Foreman |                                                |                                                  |                     |
| Originator                                         |                                                        |                                                |                                                  |                     |
| Development Quality Partner – AgriSETA             |                                                        |                                                |                                                  |                     |
| Primary Or Delegated Quality Assurance Functionary |                                                        |                                                | NQF Sub-Framework                                |                     |
| -                                                  |                                                        |                                                | OQSF - Occupational Qualifications Sub-Framework |                     |
| QUALIFICATION TYPE                                 |                                                        | FIELD                                          |                                                  | SUBFIELD            |
| Occupational Certificate                           |                                                        | Field 01 - Agriculture and Nature Conservation |                                                  | Primary Agriculture |
| Abet Band                                          | Minimum Credits                                        | Pre-2009 NQF Level                             | NQF Level                                        | Qual Class          |
| Undefined                                          | 147                                                    | Not Applicable                                 | NQF Level 04                                     | Regular-ELOAC       |

## Modules

The content of this learner guide is aligned to the following modules of the occupational qualification above.

| Module Code             | Module Title                                                                | Level | Credits |
|-------------------------|-----------------------------------------------------------------------------|-------|---------|
| Knowledge Modules       |                                                                             |       |         |
| 611202-001-00-KM-01     | Plant Structure and Physiology                                              | 4     | 5       |
| 611202-001-00-KM-02     | Vineyard or Orchard Establishment                                           | 3     | 2       |
| 611202-001-00-KM-03     | Vineyard or Orchard Manipulation Processes                                  | 3     | 8       |
| 611202-001-00-KM-04     | Harvesting                                                                  | 3     | 4       |
| 611202-001-00-KM-05     | Basic Principles of Plant Nutrition                                         | 4     | 4       |
| 611202-001-00-KM-06     | Crop Protection                                                             | 3     | 3       |
| 611202-001-00-KM-07     | Assets in Horticultural Production                                          | 3     | 2       |
| 611202-001-00-KM-08     | Farm Business Management and Farming Process Management                     | 4     | 8       |
| 611202-001-00-KM-09     | Human Resource Management and Processes                                     | 4     | 8       |
| 611202-001-00-KM-10     | Overseeing Farming Resource Utilisation                                     | 4     | 8       |
| Practical Skill Modules |                                                                             |       |         |
| 611202-001-00-PM-01     | Organise, Allocate and Monitor Availability and Productive Use of Resources | 4     | 5       |
| 611202-001-00-PM-2a     | Set Team and Individual Performance Goals to Enhancing Team Performance     | 4     | 10      |
| 611202-001-00-PM-2b     | Control Vineyard or Orchard Practices                                       | 4     | 10      |

|                                |                                                                      |   |    |
|--------------------------------|----------------------------------------------------------------------|---|----|
| 611202-001-00-PM-03            | Supply Accurate Daily Orchard or Vineyard and Production Information | 4 | 10 |
| <b>Work Experience Modules</b> |                                                                      |   |    |
| 611202-001-00-WM-01            | Vineyard or Orchard Resource Optimisation                            | 4 | 20 |
| 611202-001-00-WM-02            | Skilled and Motivated Work Team Output                               | 4 | 20 |
| 611202-001-00-WM-03            | Daily Orchard or Vineyard and Production Information Availability    | 4 | 20 |

## Learning Outcomes

The content of this learner guide is aligned to the following learning outcomes of the modules above.

| <b>Knowledge Topics</b> |                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Outcome Code</b>     | <b>Module Title</b>                                                                                                     |
| <b>KM-05-KT05</b>       | <b>Irrigation</b>                                                                                                       |
| IAC0510                 | Irrigation system maintenance plans and emergency response procedures are outlined                                      |
| <b>KM-07-KT03</b>       | <b>Maintenance of on-farm infrastructure, systems, tools, equipment and machinery</b>                                   |
| IAC0304                 | Breakdown of machinery and equipment and the effect of down time is analysed                                            |
| IAC0311                 | Methods of monitoring the condition of infrastructure and determining the need for repairs or maintenance are evaluated |
| <b>KM-10-KT02</b>       | <b>Management of Agricultural Assets</b>                                                                                |
| IAC0211                 | The breakdown of machinery and equipment is discussed in terms of corrective actions that should be taken               |
| <b>Practical Skills</b> |                                                                                                                         |

# Chapter 1

## Emergency Repairs

### learning outcomes

The content of this chapter is aimed at helping you to:

- Repair equipment and tools in emergencies.

## 1. Emergency Repairs

In an operation like a commercial fruit farm, there are dozens, if not hundreds of different pieces of tools and equipment being used. Unfortunately, even if you only buy the highest quality tools and equipment, properly maintain them, and use them only as intended, it is most likely that something will break.

This can happen for a variety of reasons, from worker error to low quality to wear and tear to unforeseen events like a natural disaster. As many of these tools and pieces of equipment are necessary to the functioning of the farm, it is recommended that you know how to perform basic emergency repairs to allow the equipment to keep working, at least for a little while.

This is especially the case for something like harvesting equipment. Harvesting cannot wait the days, weeks, or even months it may take to get a certain tool or piece of equipment replaced. This means that you need to learn to be able to keep them going.

## 2. Common Causes of Emergency Repairs

Before we discuss the specific process of performing emergency repairs, let's discuss the causes of breakdowns or other forms of failure. Understanding the causes of failures may help you and your workers identify potential problems before they worsen.

The most common types of failure that require emergency repairs are:

- Mechanical Failures
- Electrical Failures
- Hydraulic Failures
- Irrigation System Failures
- Structural Failures

### 2.1. Mechanical Failures

Mechanical failures are failures in machinery such as tractors, harvesters, and sprayers. These can be a significant cause of unplanned downtime, especially on smaller farms where there are no backup machinery or vehicles available to quickly take over.

These failures can happen for hundreds of reasons, so we cannot list them here, but some common examples are engine malfunctions, transmission issues, or damaged parts like belts and brakes.

## **2.2. Electrical Failures**

Electrical failures are failures in electrical systems. These systems can be big (such as the power system for the whole farm) or very small, such as the electronics inside a thermometer. Since many of these systems are required to run essential equipment like pumps, conveyors, and other machinery, electrical failures can be very costly if not addressed quickly.

There are many possible ways for the many possible systems to fail, but common examples include short circuits, wiring issues, blown fuses, or battery problems.

## **2.3. Hydraulic Failures**

Hydraulic failures are failures in hydraulic systems. These systems are usually found in vehicles such as tractors, bulldozers and harvesters. Issues can include hydraulic fluid leaks, clogged filters, or damaged seals. These failures are often difficult to diagnose or fix without specialized knowledge of hydraulics, and can seriously delay important production practices.

## **2.4. Irrigation System Failures**

As you well know, the irrigation system is an incredibly important part of a farm's functioning. A breakdown in irrigation, especially a long-term one, can lead to massive losses for a farm. The maintenance and repair of an irrigation system is too big a topic to cover here, so we have covered it separately in the material covering irrigation and maintenance.

## **2.5. Structural Failures**

Structural failures refer to issues having to do with infrastructure, such as buildings or roads. If there is major damage to infrastructure (such as from a heavy storm tearing the roof off a building), this damage will go beyond an emergency repair and probably require outside contractors or at least a long period of repairs.

We will therefore only examine small emergency repairs that may be necessary for infrastructure. These are issues such as roof leaks, broken doors, or damaged flooring, which can usually be repaired by one worker fairly easily.

# **3. Emergency Repair Procedures**

As you can see above, many of the tools and equipment used on the farm, particularly the larger, more complex ones, cannot easily be repaired on the farm. This is why the first thing you should do when you encounter a major failure is to contact an expert (if available).

This expert may take different forms, such as a mechanic for tractors, an engineer for an infrastructure failure, etc. It is important that you contact an expert since, with an issue like structural damage to a road, an inexperienced worker may do far more damage while trying to fix the road.

The expert may not be needed to perform the repair themselves, but will be able to give you advice on what to do and what not to do, and this may save you a lot of money and trouble in the long run.

Unfortunately, experts are not always available, either not in your area at all, or at certain times of the year. This means that workers may sometimes be forced to perform a repair according to their own knowledge, as waiting for an expert may simply be too expensive.

Now, let us discuss how to actually do repairs. As with most technical practices, there should be a clear plan with a clear set of steps in place to perform the repairs effectively. The goal is to resolve the problem as quickly as possible while ensuring the safety of workers and minimal downtime, cost, or damage.

First things first, you (or the worker) should quickly assess the situation of the repair. You need to identify which piece of equipment has broken, and the severity of the problem. This might involve checking machinery performance, performing visual inspections, or using software.

Remember to not make assumptions or attempt repairs if the problem is highly specialised or presents a danger to the workers or repairman. No worker's life or safety is worth a quick repair.

After the problem has been diagnosed and you are confident that you know how to and are able to fix it, you can begin to set up. Firstly, you must clear the area as much as possible, and switch off nearby machinery and equipment. For electrical failures, you should immediately cut power to the affected area.

For example, if the problem is a broken box rail in a packhouse, the packhouse (or at least the section where the problem is) should stop packing while the repair-work is performed.

Once the area is clear, every worker involved in the repair must be given appropriate PPE, such as gloves, goggles, or hearing protection. The necessary PPE will be different for different problems, but remember it is always better to be safe than sorry. For dealing with chemical spills, leaking fuel, or hazardous materials, refer to the material on agrochemical management.

Once the area is clear and secure, the problem is diagnosed, and workers properly equipped, the repair can start. We will not discuss specific repair steps here as they will vary widely even for the same piece of equipment from different manufacturers. When purchasing a tool or piece of equipment, ensure that you also ask about repair procedures and keep them on file.

While emergency repairs are in progress, you (or other managers) should try to disrupt farm operations as little as possible. For example, if a harvester breaks down during peak harvest time, you may need to deploy backup equipment or reassign workers to other tasks temporarily to keep harvest going.

When dealing with irrigation failures, alternative water sources, such as temporary tanks or pumps, may be used until the primary system is restored. By having these backups in place, you can keep the farm running smoothly while repairs are underway.

The repairs must be supervised to ensure that the correct replacement parts are used, and that proper procedures are followed during the repair. Remember that these tools and equipment can be very dangerous, even deadly, to workers, and you need to make sure they are properly looked after.

After the repair is completed, you need to test the equipment or system to ensure it is working properly. For instance, after fixing an irrigation system, you should run the system to check for leaks or flow irregularities. For machinery, the equipment should be run through a full cycle to ensure it is functioning as expected. After the repair, you should monitor that specific tool or piece of equipment for a short while to detect any issues that may not have been addressed.



## summary

### Chapter 1 – Emergency Repairs

- Tools and equipment often break, for many reasons, from worker error to low quality to wear and tear to unforeseen events.
- Workers need to be able to repair important tools and equipment to keep them functioning during intense periods of production.
- The most common types of failure that require emergency repairs are mechanical, electrical, hydraulic, irrigation system, and structural failures.
- Mechanical failures are failures in machinery, and can be a significant cause of unplanned downtime.
- Electrical failures are failures in electrical systems, both big and small, and can be very costly if not addressed quickly.
- Hydraulic failures are failures in hydraulic systems, usually found in vehicles, and often require specialised knowledge to repair.
- Structural failures refer to issues having to do with infrastructure, and can be big problems that require outside contractors or at least a long period of repairs.
- During a major emergency, you should first contact an expert if available.
- The expert may not be needed to perform the repair themselves, but will be able to give you advice, which may save you a lot of money and trouble.
- The goal of emergency repairs is to resolve the problem as quickly as possible while ensuring the safety of workers and minimal downtime, cost, or damage.
- Firstly, you should quickly assess the situation of the repair to identify which piece of equipment has broken, and the severity of the problem.
- Next, the area must be cleared and production stopped where necessary.
- For electrical failures, you should immediately cut power to the affected area.
- Once the area is clear, every worker involved in the repair must be given appropriate PPE.
- The repairs must be supervised to ensure that the correct replacement parts are used, and that proper procedures are followed during the repair.
- After the repair is completed, you need to test the equipment or system to ensure it is working properly.

## assessment activities

- ✓ **Activity P1:** Complete this activity to test your knowledge of emergency repairs.
- ✓ **Activity F1:** Complete this activity to test your knowledge of the entire module.