

# NORTH WEST DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT. FARMER SUPPORT SERVICES.

## Calibration of the Boomsprayer

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Date: 02 February 2021  
Venue: Mogwase LAO

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# PRESENTATION OUTLINE

1. INTRODUCTION
2. REQUIREMENTS
3. PREPARATION BEFORE CALIBRATION
4. CALIBRATION PROCESS
5. CONCLUSION



# 1. INTRODUCTION

- **Boom sprayer** is equipment used to spray agro-chemical solution such as the herbicides to control weeds.
- **To calibrate** simply means, to adjust a sprayer equipment in a correct way in order to spray the right quantity of the herbicide solution.
- **Incorrect** calibration of the boosprayer may result **in under or over application of the herbicide solution leading to:**
  - **Waste of time**
  - **Waste of herbicide.**
  - **Herbicide injury on both human and Crops**
  - **High input cost**
  - **health and environmental hazard**
  - **Poor weed control.**



# 1. REQUIREMENTS

- A tractor in good working condition.
- Boomsprayer with working pressure gauge.
- Tape measure or measuring wheel to measure a distance of 100 meters under application conditions on the ground.
- Stop watch to determine the time taken by a tractor to cover a distance of 100 m.
- Calculator, work book and a pen for working out basic calculations.
- Measuring beaker for harvesting water from the nozzles.



# 2. REQUIREMENTS

- Herbicide label or a book (Guide to the use of herbicide which is available from AVCA) which is used to provide information on the herbicide to be used.
- Clean water which mixes well with the herbicide to be applied.
- Workers at least three more people who can help in the calibration process.
- Provide enough time in order to carry out the process without any mistake.



# 3. PREPARATIONS

- Fill the the boomsprayer tank with clean water and run the pump at 300 kpa or 3 bars.
- Open the valve and allow the nozzles to spray water while the tractor is not moving.
- Inspect the whole boomsprayer system for any leaks (oil and water).
- Inspect all the nozzles for any blockages or inconsistency of water output.
- Attend to all the problems before the actual calibration process takes place



# 4 CALIBRATION PROCESS

- Measure a distance of 100 meters on a ground with a measuring tape and mark this clearly by white tags so that you can clearly see the beginning and ending of a tractor's strip.
- Run a tractor at a recommended constant speed (8 to 9 km/h) over the measured distance. Repeat this exercise not on the same wheel tracks made during the previous trip, as this will influence a speed of a tractor. After a second trip, record the average time taken to cover the trips.
- Now with a tractor in stationary, operate a pump of the boom sprayer at a recommended pressure of 300 kpa or 3 bars and allow the nozzles to operate.



# 4 CALIBRATION PROCESS cont.

- Randomly select a representative number of nozzles over the width of the boomsprayer and determine volume of water per nozzle (each nozzle output) using a plastic beaker, under application pressure within a given time. Determine the average output of the selected representative nozzles.
- **Determine the working or spray width (WW)** by measuring the width of a boomsprayer using the measuring tape or using the following calculation: (Width = Number of nozzles (NN) on boomsprayer X spacing in between the nozzles).



# 4 Calibration process cont.

- Calculate the complete coverage (quantity of water to be sprayed per hectare) using the following formula)

- Volum of water per ha = 
$$\frac{100 \times NN \times NO}{WW}$$

NN = Number of nozzles on the boom

NO = Nozzle output

WW = Working width

- Calculate the quantity of herbicide required to be mixed in a tank full of water using the following formula:

$$\text{Quantity} = \frac{\text{Tank capacity} \times \text{Recommended herbicide dosage rate}}{\text{Volume of water application per hectare}}$$





# THE END



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