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| ***Field: Agroproduction***  **BROCHURE**  **Calibration of Backpack Sprayers**        **Author: Dr. Fatih BARUTÇU**  **2017**  **Boosting Adult System Education In Agriculture - AGRI BASE**  **Erasmus+ K2 Action Strategic Partnership** |

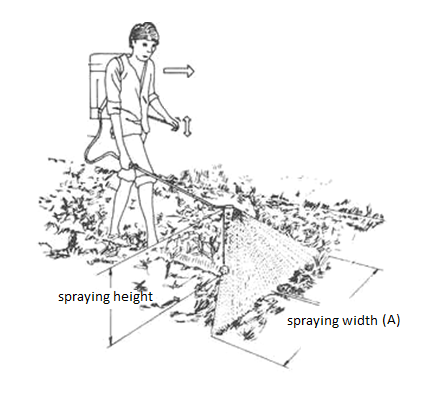
# CALIBRATION OF BACKPACK SPRAYERS

Parameters to be considered when calibrating the hand sprayers;

* Walking speed,
* Appropriate nozzle selection,
* The distance to the target from the nozzle,
* The change in spray pressure,
* Detecting nozzle wear and
* Vibration-free operation of spray bar.

**Calibration Steps**

**1- Determination of working width (B)**



After the boom height is set up correctly, spray on the dry ground and measure the working width (A) in meter (Figure 1).

The boom height should always be same during spraying.

Figure 1. Measuring the working width

**2- Determination of travel (walking) Speed (V)**

After determining a certain distance, the elapsed time at the walking speed of the operator is measured with stopwatch, the distance is divided to the time obtained then the walking speed is calculated.



Where:

V = Travel speed (km/h)

X = Distance (m)

t = Time (s)

**3- Determination of Nozzle Rate (Q)**

The amount of liquid sprayed in a minute is measured with the help of a cup and a stopwatch. Use the obtained value in the equation below.

**Calculation of Application Volume for Broadcast Spraying**



Where:

N = Application volume of sprayer (l/ha)

Q = Nozzle application rate (l/min)

B = Working width (m) and

V = Travel speed (km/h)’.

Example Problem:

Measured spray width : 80 cm

Measured distance : 125 m

Elapsed time for this distance : 2 minutes 15 seconds

Nozzle rate : 3.5 l/135 s

Calculate the application rate (l/ha)?

Solution:



Method 2

1. Fill the spray tank with water until a certain level.
2. Spray the water for a certain distance correspond to 100 square meter
3. Measure how much water decreased in the tank
4. Multiply the volume of water measured by 100 and find the application volume (l/ha) (Figure 2).

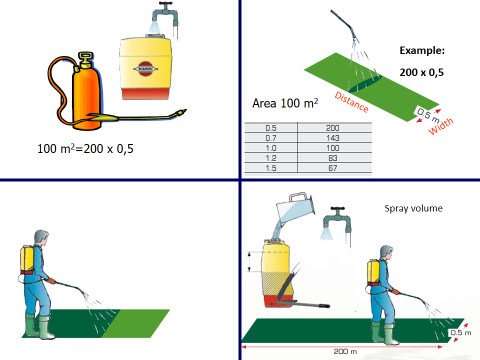


Figure 2. Determination of sprayer application volume

**Calculation Volume of Pesticide needed to put into spray tank for broadcast spraying**



Example Problem

Suggested pesticide dose : 5 l/ha

Spray application volume : 350 l/ha

Tank capacity : 15 l

Calculate the pesticide volume needed to put into spray tank?

Solution:



**Calculation of Application Volume for Band Spraying**



Where:

N = Application volume of sprayer (l/ha)

Q = Nozzle application rate (l/min)

B = distance between crop rows (m) and

V = Travel speed (km/h)’.

**Calculation of Pesticide application dose requirement for band spraying**



**Calculation Volume of Pesticide needed to put into spray tank for band spraying**

