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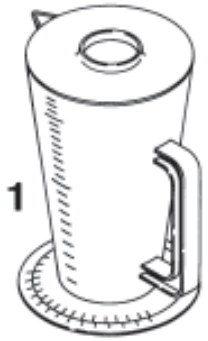
CALIBRATION KIT
Instruction book

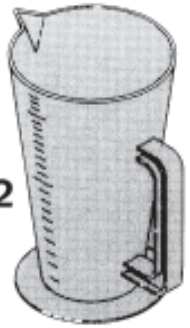
674852-GB-85/2

Description

The HARDI Calibration Kit is an aid that will help you achieve effective and safe spraying of plant protection chemicals.

The HARDI Calibration Kit consists of a:





1. Measuring jug to determine the nozzle´s capacity (liquid throughput), l/min.
2. Second jug for measuring the liquid chemical.
3. Nozzle key to align flat spray nozzles.
4. Calibrator to select correct nozzle.
5. Tape measure to set required boom height.

General recommandations

Before using any chemical, check its trade leaflet recommendation -

- for it advises dose, and often
- spray volume rate
- spraying pressure, and sometimes
- spraying speed and
- nozzle type

In the absence of this advice, the general rule for nozzle choice and spraying pressure is -

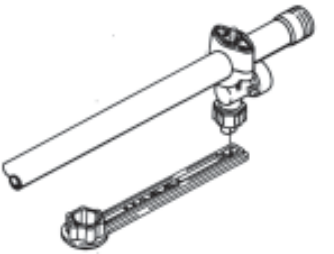
Herbicides: Flat spray nozzles at 3 bar.

Fungicides and insecticides:
Flat spray nozzles or cone spray nozzles at 5 bar.

Nozzle alignment

Flat spray nozzles are aligned with the nozzle key.

SNAP-FIT nozzle holders automatically line up nozzles.



Determining sprayer speed

Record the time taken (in seconds)
- to travel with the sprayer preferably half filled
- an accurately measured distance (in metres), not less than 100 m.

This formula calculates speed:

$$\frac{\text{Distance (m)} \times 3.6}{\text{Time (secs)}} = \text{Speed (km/h)}$$

For example, if it takes 46 sec. to travel 100 m

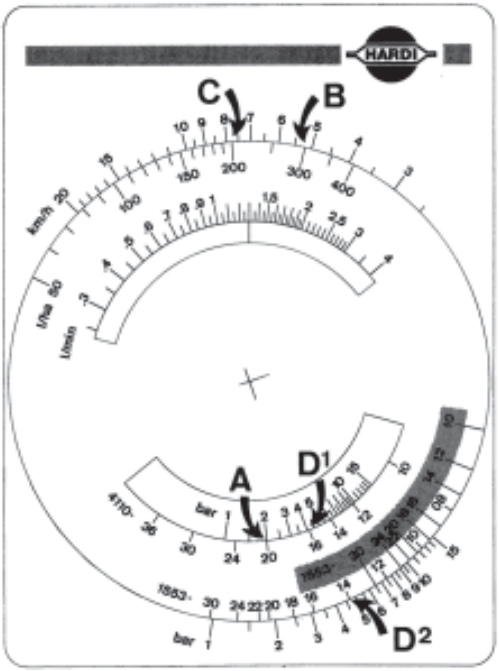
$$\frac{100 \times 3.6}{46} = 7.8 \text{ km/h is the sprayer speed.}$$

Using the nozzle calibrator

- to relate, spray volume rate (l/ha), speed (km/h), nozzles size (l/min) and spraying pressure (bar).

Example I
To calculate speed - where nozzle type and size, spray pressure and volume rate are known. Flat spray nozzle: 4110-20
Pressure: 2 bar
Spray volume rate: 300 l/ha

Turn the disc on the nozzle calibrator to line up 4110-20 with 2 bar (A). From the opposite side of the disc a speed of 5.2 km/h is seen necessary for 300 l/ha (B).



Example II
To select nozzle and pressure - where speed and spray volume rate are known. A fungicide is to be applied at 200 l/ha and 7.8 km/h at a pressure of about 5 bar.

Rotate disc to line up 200 l/ha with 7.8 km/h (C). Looking at the opposite side of the disc you will see, either

flat spray nozzle 4110-16 at 4.1 bar (D1), or
hollow cone nozzle 1553-14 at 4.6 bar (D2) can be used.

Nozzle capacity (or throughput), (l/min).

Erosion of nozzles, pressure losses between the gauge and spray emission can modify the actual nozzle capacity at the time of use. The rate of throughput has to be regularly checked.

Whilst spraying clean water, catch the spray emitted in the measuring jug, for at least one minute, and getting values for at least every fourth nozzle.

Note the average output.

Example: The output from 4 nozzles on 8 metres boom were 1.60, 1.57, 1.68, and 1.62 l/min. The average is:

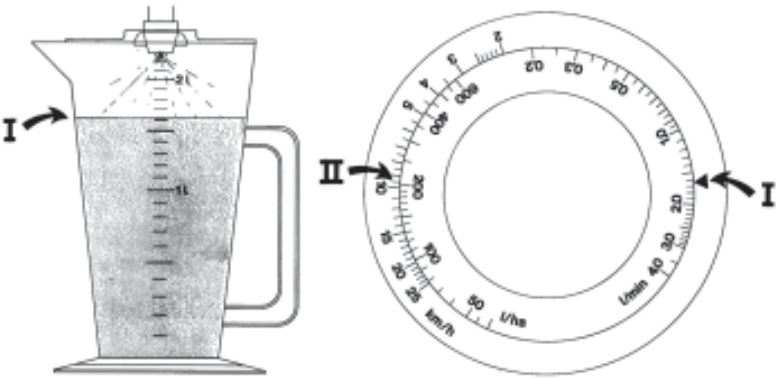
$$\frac{1.60 + 1.57 + 1.68 + 1.62}{4} = 1.62 \text{ l/min}$$

Spray volume rate (l/ha).

The calibration disc on the bottom of the measuring jug is now rotated, so that the red arrow points to this average output. On the opposite side of this disc identify your measured spraying speed and at this point, read-off the spray volume rate (l/ha).

Conversely you can read-off a required spraying speed, necessary to achieve a predetermined spray volume rate.

Example: The nozzles give 1.62 l/min (I), and on the other half of the disc you can see that at a speed of 9.7 km/h the spray volume rate will be 200 l/ha (II).

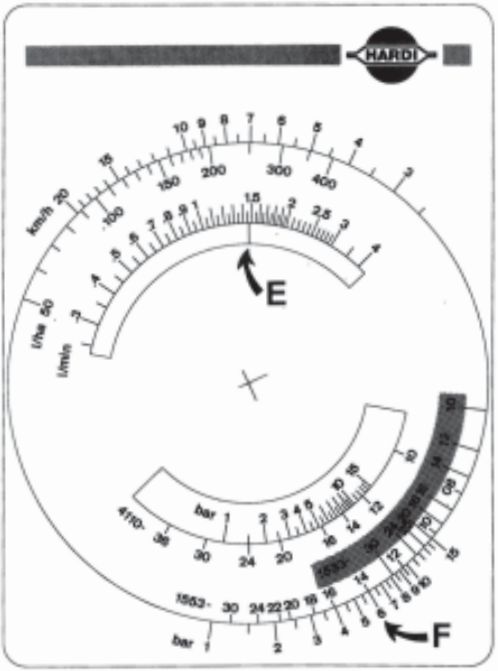


Note: All nozzles should be within +/- 5 % of the capacities stated in the tables. Deviations greater than 20 % may result in a poorer distribution and inferior quality of spray. We always advise replacements of nozzles in complete sprayer sets.

Deviations are calculated in the formula:

$$\frac{\text{Actual throughput - stated throughput}}{\text{stated throughput}} \times 100\ \%$$

Example: Cone spray nozzle 1553-14 with grey swirl has been measured to give 1.80 l/min at 6 bar. The nozzle calibrator shows the output should be 1.47 l/min (E and F).



The deviation is

$$\frac{1.80 - 1.47}{1.47} \times 100 = 22\%$$

and all nozzles in this sprayer set should be replaced.

Preparation and addition of chemicals

Fill the tank 2/3 with water and connect the pressure agitator before adding the chemical.

Liquid chemicals are added using the chemical filling device, or direct into the tank using the chemical measuring jug.

Powder should be thoroughly mixed with water before adding in the tank.

Clean the measuring jug thoroughly after use.

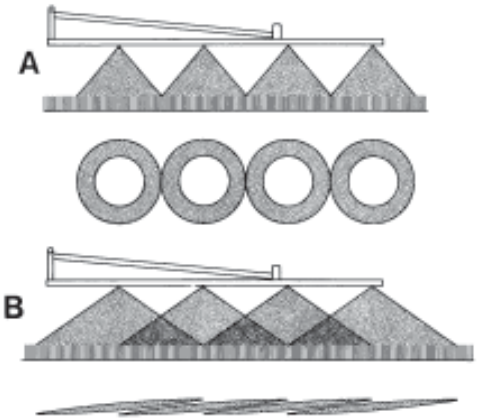
The Height of the Boom

To ensure the correct pattern of the spray, it is important to adjust the height of the boom accurately using the tape measure.

If the boom is equipped with cone spray nozzles the height should be set so that the distance between nozzles and the top of the crop is about 60 cm.

When using flat spray nozzles the height should be about 50 cm.

The spray pattern should
be as illustrated:
A: Cone spray nozzle
B: Flat spray nozzle



Safety Regulations

Take care when working with plant protection chemicals.

Personal Protection

The following protective clothing/equipment should be worn:

- Gloves
- Wellingtons
- Headgear
- Respirator
- Safety goggles
- Suitable overall

This equipment should be worn to avoid any chemical contact with the skin.

Protective clothing equipment should be used when preparing the spray liquid, during the spray work or when cleaning the sprayer.

It is always advisable to have clean water available especially when filling the sprayer with the chemical.

Do not eat, drink or smoke during work with plant protection chemicals.

Always wash hands etc. after handling chemicals.