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A CALIBRATION PROCEDURE FOR BOOM SPRAYERS

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BOOM SPRAYER CALIBRATION

Calibration should be carried out:

- at the beginning of each season
- after every 100 hectares
- after changes of tractor or wheels,
nozzle tips or operating pressure

Calibration Equipment Check List

- | | |
|---|---|
| * Tractor | * Test pressure gauge |
| * Sprayer (having undergone pre-season preparation) | * Set of nozzle tips, spares and nozzle flow charts |
| * Tractor instruction book | * Small measuring vessel or nozzle flow meter |
| * Sprayer instruction book | * 100 m tape and two canes |
| * Supply of clean water | * Large calibrated vessel or hose flow meter |
| * A typical field with space for a 100 metre run | * Stop watch |

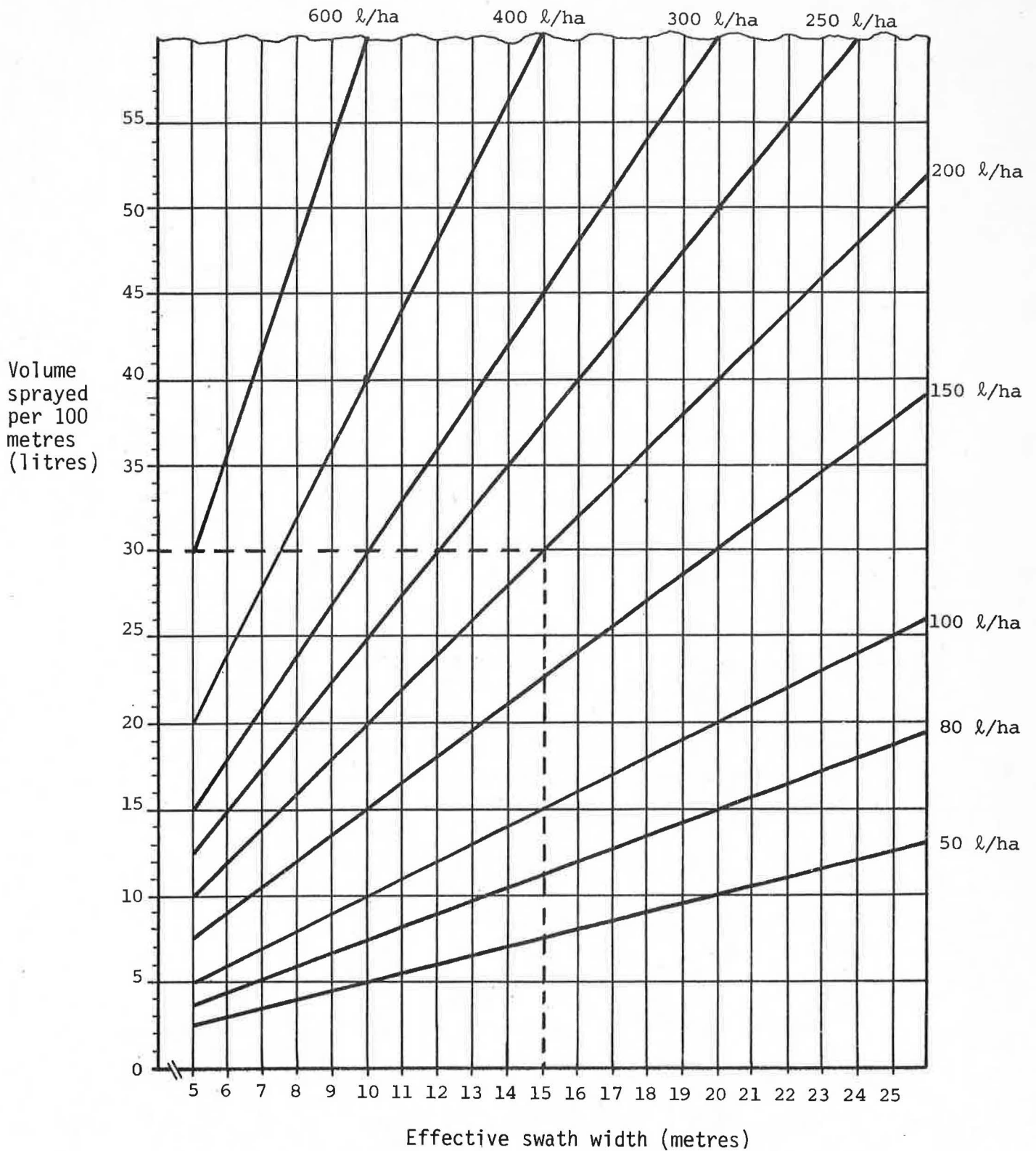
1. Check chemical packs for any special instructions, then choose an application rate within those recommended, eg. 200 litres per hectare.
2. Choose and fit nozzle tips to operate in their recommended pressure range appropriate for the chosen application rate and anticipated forward speed. The type of nozzle is selected according to the application.

APPLICATION	NOZZLE	
<u>GROUND</u> eg. herbicide application to ground and small weeds	Impact Fan Even spray fan	Use at low pressure. Avoid drift; guard to protect crop
<u>WALL or FLAT SURFACE</u> required residual spray	Fan Even spray fan	Medium pressure. Avoid splashing and too high pressure.
<u>FOLIAGE</u> Ground crops Tree crops	Cone Cone	Use 200-300 kPa, direct spray to site of infestation. Try to obtain underleaf cover. Increase pressure only if penetration is poor or when spraying low volume to improve atomisation.

3. Carry out a trial run with the sprayer tank half full of water spraying on a surface similar to the average on which you will spray. Check that the proposed forward speed gives an acceptable level of boom bounce and boom yaw (back and fore movements) and the gear selection gives a pto speed of about 540 rpm.

4. On the same surface check tractor speed:
 - (a) In midfield mark out a distance of 100 m with two canes, pacing is not accurate enough - use a tape.
 - (b) Select the gear and engine rev/min as in (3).
 - (c) Measure the time taken to travel 100 m spraying at the selected engine rev/min. Start and stop timing as tractor knocks canes over.
 - (d) Calculate the speed $\text{Speed (km/hr)} = \frac{360}{\text{time to travel 100 m (sec)}}$
 - (e) Record tractor registration number, tyres fitted, gear, engine rev/min, time for 100 m, and forward speed.
5. Adjust spraying pressure to the level recommended in the chemical instructions and/or within the nozzle chart range.
6. Check nozzle spray patterns and alignment visually, replace any rogue nozzle with a nozzle matched to the flow rate of others in the group.
7. Compare individual nozzle outputs with a nozzle flow meter or record the volume collected in a predetermined time - suggest 30 sec. Replace any nozzles more than ± 5 percent from the average.
8. Turn 'SPRAY ON' to clear air from the boom, then 'SWITCH OFF' pump. Ensure the tank is level and fill it with clean water to halfway up the neck of the tank; mark the level inside the neck front and rear.
9. With the sprayer stationary and the engine rpm at the setting used when the forward speed was checked, spray out for the time taken to travel 100 m in 4 (c).
10. Refill the sprayer to the marks in the neck with clean water, using a calibrated measuring vessel or flow meter.
11. Establish the effective swath width of the sprayer in metres, i.e. the distance between a pair of nozzles x the number of nozzles.
12. Compare the quantity of water required with that shown on the calibration chart for the chosen application rate and the effective spraying width of the sprayer.
13. If the quantity is not correct:
 - make small adjustments by varying pressure. NB. Do not go outside chemical and/or nozzle tip recommendations.
 - make large adjustments by changing nozzle tips.
14. Re-check after each adjustment until correct.
15. Record for future use:
 - nozzle tips fitted
 - application rate
 - spray pressuretogether with information from 4(e), and date of check.

CALIBRATION CHART



Example (see dotted line):- A sprayer with a swath width of 15m at 200 l/ha should deliver 30 litres in a 100m run.

This calibration procedure is a revised version of that agreed and adopted by the AEA Chemical Application Machinery Manufacturers Group in September 1979.