

Boomspray Calibration

Factsheet

Boomsprays need to be calibrated regularly to work efficiently and economically. Regular calibration ensures the right amount of chemical will be applied to the target without costly wastage.

The following template will enable you to calculate how much chemical and water to use.

In the template, enter the information asked for such as spray tank capacity, chemical rate and ground speed in the space provided in the right hand column. You will need this information to perform the calculations. The numbers that are highlighted (**1**) tell you which figures you need to perform the calculations. For example, to work out your water application rate, you need to know your total spray output, your effective spray width and your actual round speed. The highlighted numbers in the formula show you where to get these figures.

Recording

What is the minimum water application – if any (from the chemical label)?	L/ha
Select the correct chemical application rate from the label	L/ha 4
Select an appropriate ground speed	gear rpm
Record spray operation pressure.	bar Or kPa
Record nozzle type and size in the spray unit. Check the rated 'water output' using the manufacturer's nozzle charts Rated output	Type Size mL/min
Record minimum boom height above target for these nozzles.	cm

General Information

Item of equipment to be calibrated	
Spray tank capacity (litres)	L 5
Area to be sprayed (hectares)	Ha 7
Chemical used	

Measuring

Record the output from every nozzle for 1 minute	Total spray output (add all nozzles)
1..... 2..... 3..... 4..... 5..... 6..... 7..... 8..... 9..... 10..... 11..... 12..... 13..... 14..... 15..... 16..... 17..... 18..... 19..... 20..... 21..... 22..... 23..... 24.....	L/min 1
Replace any nozzles that vary 10% or more from the manufacturer's correct nozzle output. (Nozzles with both higher and lower outputs must be replaced).	
Record actual effective spray width in metres by measuring the distance across the outside nozzles and adding the distance between two adjacent nozzles.	m 2

Calculating

Actual Ground Speed*
$\frac{\text{Distance covered (m)} \times 3.6}{\text{Time taken (seconds)}}$
$\frac{(\quad) \times 3.6}{(\quad)}$
=..... Km/hr 3



Follow the steps below:

1. Copy the answers you worked out on the previous page into the boxes below. You will need these numbers to do the calculations on this page. (The numbers in black circles (eg. 2) tell you the step where the answer is on the previous page.

Total Spray Output	Effective Spray Width	Actual Ground Speed
..... litres/minute 1 metres 2 km/hr 3

2. Work out the water application rate by using the numbers you have recorded above. Put these numbers in the correct place in the calculation below.

Water Application	1 x 600	() x 600	= ()	6 Litres/ha
Rate	2 x 3	() x ()	()	
Does this water application rate meet the chemical label requirements? (See Part B above)				Yes No
If not, how could you change this rate to meet this requirement?				

3. Now that you know the water application rate you can calculate how much chemical you need to mix in each tank.

Chemical Application Rate		Spray Tank capacity
..... Litres/ha 4	 Litres 5
How much chemical to mix in each tank?	4 (L/ha) x 5 (L) 6 (L/ha)	() x () () =litres

4. Finally, you can now work out how many tank loads you will need to do the job.

Spray mix needed for the job	7 ha x 6 (L/ha) () x ()	=litres 8
Number of tanks needed	8 (L) () 5 (L) ()	=tanks

(To crosscheck your calculations:
Number of tanks x Volume of chemical per tank = Area to be sprayed x Chemical rate)

Source: SMARTtrain Chemical Reference Manuals, 2005
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Calculating

'3.6' in the calculation is a conversion factor to convert metres to kilometres (metres ÷ 1000) and seconds to hours (seconds ÷ 3600): $D/1000 \div S/3600 = D/1000 \times 3600/S = D/S \times 3600/100 = D/S \times 3.6$.

*To calculate your actual ground speed :

- Measure a set distance, for example 100 metres.
- Make sure that the spraying conditions are like those in the area that you will be spraying.
- Record how long it takes using the appropriate gears and revs.

Now you can calculate the water application rate, how much chemical you will need to mix in each tank and how many tank loads you will need to do the whole job.

'600' in the calculation is a conversion factor to convert litres per minute to litres per hour (minutes x 60), and kilometres to metres (km x 1000), then square metres (m x km x 1000 = m²) to hectares (m² ÷ 10000): $60 \div 1000/10000 = 60 \div 1/10 = 60 \times 10 = 600$.

