



Sprayer calibration for accurate application

Accurate sprayer calibration is essential to know what volume of spray is being applied. Calibration is a straightforward process that, once established as a routine, takes just a few minutes and can make a significant difference to accuracy and results.

Calibration is a three stage process:

- Establish the accurate forward speed used when spraying
- Identify the output per nozzle
- Calculate the application rate per hectare

Checking sprayer speed

1 Accurately measure out a run of 100m on a turf surface, using a cane to mark each end

2 Using a stopwatch, start timing as you drive over the first cane at full spraying speed; stop the clock as you drive over the second cane (it's easier and more accurate if a colleague can assist with the timing)

3 **Divide 360 by the time taken to drive the 100m in seconds = speed in km/h**

4 Repeat if different spraying speeds are used for different areas, e.g. greens and fairways



Newbury & Crookham Case Study:

Green spraying – Progator first gear

Time taken for 100m: 1 minute 34 seconds

$$360 \div 94 = 3.8 \text{ km/h}$$

Fairway spraying – Progator third gear

Time taken for 100m: 57 seconds

$$360 \div 57 = 6.3 \text{ km/h}$$



Calibration record sheets on GreenCast

The dedicated Application Zone on the GreenCast website holds a selection of downloadable forms to record nozzle calibration results, along with other sprayer and spraying records.

GreenCast also provides:

- On-line advice and the latest information to help you achieve more accurate application
- Disease Risk forecasting gives up to five days advance warning of disease attacks, to enable better timing of fungicide applications
- Spray window forecasts let you know when there will be a chance to spray
- Podcasts for advice on spraying techniques



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Checking nozzle output

Check nozzle output at least twice a year, and possibly each month during busy spraying periods. **First refer to the manufacturers nozzle output chart to establish expected flow rate.** Check for visible signs of damage, then measure output from each nozzle.

TOP TIP

Always use a calibration cylinder for checking nozzle output; measuring jugs are good for measuring product, but are not sufficiently accurate for checking nozzles



Calculating application rate

With the knowledge of the forward speed of the sprayer and the output from nozzles, the calculation to work out the volume of spray being applied per hectare is:

$$\text{Nozzle output (l/min)} \times 600 \div \text{forward speed (km/h)} \div \text{nozzle spacing (m)} = \text{spray volume (l/ha)}$$

Spray volume output can be adjusted by:

- Changing the forward speed
- Altering the operating pressure
- Changing to different sized nozzles

Any changes can be calculated and checked with the manual method, or using the on-line sprayer calculations available free on the Syngenta GreenCast Application Zone.

Newbury & Crookham Case Study:

With a flow rate per nozzle of 1.36 litres per minute and nozzles at 0.5 m spacing, the water volume application rate when spraying greens at 3.8 km/hr would calculate as follows:

$$1.36 \times 600 = 816 \div 3.8 = 215 \div 0.5 = 430 \text{ l/ha}$$

1 Fill the tank with clean water, set the pump to the standard operating pressure and collect the output from each nozzle for 30 seconds, using a Syngenta Sprayer Checker calibration cylinder

2 Note down the output from each nozzle. Add up the total and divide by the number of nozzles, to give the average output per nozzle across the boom

3 Calculate the difference from average for each nozzle. If the output from any nozzle is +/- 4% of the average, nozzles are unacceptably worn and the complete nozzle set should be replaced

TOP TIP

If you have collected nozzle output for 30 seconds in your nozzle check, don't forget to double it to get the output per minute for the spray volume calculation

Putting it into practice

With the knowledge of the water volume application rate for any given speed and nozzles, operators can work out the correct product inclusion rate.

If the calibration process establishes, for example, an application rate of 450 l/ha and there is one hectare of greens to be sprayed with Instrata at 9 l/ha using a 300l capacity sprayer, first fill the sprayer to 225 litres; add 4.5 l of Instrata and spray the first nine greens; return to the yard and add a further 225 litres to the remaining spray mix; add another 4.5 l of Instrata and complete spraying.

With thanks to Alec MacIndoe, Course Manager at Newbury & Crookham Golf Club in Berkshire and sprayer operator, Andy Thrift

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