Boom sprayer calibration chart

Read vehicle/sprayer handbook, read label and note the following:

Vehicle details.....

Sprayer details.....

Application rate of product.....Spray quality.....

Water volume.....Pressure.....

1. Calculate forward speed

360 ÷ (Time to travel 100m: Seconds) = (Forward speed: KM/hour)

Now enter forward speed in the second box of Step 2 and middle box of second row in Step 5 below.

2. Calculate nozzle output required

In the first box below put in the target volume of water per hectare, chosen after reading the label.

(Target volume: Litres/HA) x (Speed: KM/hour) x (Nozzle spacing: Metres) ÷ 600 = (Target nozzle output required: Litres/Minute)

3. Select correct type of nozzle and pressure, as near to the target nozzle output required as possible, using the operator handbook:

Nozzle and pressure details.....

4. Now fit nozzles and check the actual output achieved, using a measuring jug

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
				Left side										Right side					

Enter flow readings in litres per minute for each numbered position on boom and change any nozzle giving a variation of + or – 5%.

NOTE:

Nozzles not giving the correct flow should be removed and replaced: make sure to dispose of faulty nozzles to avoid using another time.

Enter the actual average output of one nozzle obtained in the jug test in the first box of Step 5 below.

5. To find out the actual output of the machine (in litres/HA), using the nozzles and pressure selected

(Output of one nozzle: Litres/Minute) x (Number of nozzles) = (Total output of machine: Litres/Minute)

(Total output of machine: Litres/Minute) x 600 ÷ (Speed: KM/hour) ÷ (Width of boom: Metres) = (Water volume: Litres/HA) Check label

6. To calculate the quantity of concentrate required

(Water volume: Litres/HA) ÷ (Tank capacity: Litres) = (Tanks per hectare)

Product Application Rate: (Concentrate per hectare: Litres/HA) (Tanks per hectare) (Concentrate per full tank: Litres)

(Tanks per hectare) x (Area to be treated: Sq. metres) ÷ 10000 = (Tanks required) → (Part tank: Litres) (Tank capacity: Litres) (Amount of water required: Litres)

(Tanks required) x (Concentrate per full tank) = (Total concentrate required)

7. To mix a part load

(Amount of water required: Litres) ÷ (Tank capacity: Litres) x (Concentrate per full tank: Litres/ML) = (Concentrate for part load: Litres/ML)

Selective weedkillers: Finding the problem, and solving it

by Technical Consultant JON ALLBUTT

The drought of last summer has given greenkeepers many problems to solve this year. On some soils the traditional balance of grass against weed has changed and suddenly, as if from nowhere, there are large patches of Yarrow; Clover; Parsley Piert; Woodrush and others in evidence. The problem is how to tackle these weeds before they get a grip, and even worse, flower and spread seed all over the place.

The Amenity Code of Practice requires that the all important decisions about what to use and how to use it be taken well in advance of the actual spraying day so that the job can be properly planned: the days of last-minute decisions on spraying are over! The reasons for the poor performance of weed-killers is usually due to bad timing; incorrect calibration; incorrect selection of the spray volume (wrong nozzles!) and selecting the wrong product. Following the guidance in the Code ensures that the job of spraying is effective and accurate and therefore cost effective.

IDENTIFYING THE PROBLEM:

The task begins with identifying the problem. It is not enough to know the names of the weeds found; equally important is establishing the visible density of one weed in relation to the other e.g. 25% Yarrow, 40% Woodrush etc. This helps with deciding on the product to use and whether there is need for one or two applications. Remember the iceberg principle with creeping weeds in turf; for what you see may be as little as one third of what is threaded amongst the grasses. This will be important when deciding on spray volume and spray quality. Weeds that have small leaf areas and a creeping habit make difficult targets. A fine spray quality and a water volume at the lower end of the label directions will not give the penetration to make contact with the target: this results in poor control. Increasing the water volume and choosing a medium spray quality can make the difference between success and failure. The keeping of records is vital here, not just a record of what was decided but a note made three weeks ago or so after spraying of the result.

It would be nice to think that all Clubs now have staff trained according to the Regulations, who are able to make these decisions, but unfortunately many are still clinging to the myth of the 'grandfather clause'!

CHOOSING THE PRODUCT:

An important part of the decision making involves reading all about products that are available to do the job. All manufacturers produce excellent technical leaflets so there is no need to have the actual product sitting on the desk. When picking a product to control more difficult weeds it is a fact that two applications are often essential for effective control. Making this decision may require that the manufacturer is consulted further about rates and timing.

The confusion over the permitted uses of Ioxynil has resulted in many Clubs deciding to stop using this chemical. Ioxynil when combined with others such as Mecoprop and Dicamba is still the best to use against the finer leaved weeds. Ioxynil is approved for use in vehicle mounted boom sprayers and there are no proposals to further restrict its approvals.The choice of water or oil based formulations is also important – the advantages of using a shower-proof weed-killer are obvious – but improved droplet retention and more efficient diffusion into the leaf of the target weed are factors that can make all the difference.

New developments in formulations are slow to reach the amenity turf sector. There are CDA selective weed-killers available and they can be very efficient, however they require skillful use and may not give the essential penetration into the dense canopy of fine turf to give a good leaf coverage. The introduction of Isoxaben as Knotout is a very interesting development; the use of a residual weed-killer to take out the germinating weed seedlings at the critical stage of early grass growth on renovated or re-seeded areas will give a great advantage to rapid establishment of a new sward. Hopefully this is the first of a new range of novel formulations to come in the future. An important part of

The trick is to get the timing right

product selection is to be sure that a risk assessment has been carried out in accordance with the COSHH regulations (see article: April Greenkeeper International).

TIMING:

There are two factors to consider in the timing of applications.

(1) As a general rule it is vital to treat weeds when they are growing strongly and making new leaf. In this condition they are much more receptive to weed-killer and a more complete 'kill' can be expected. The spring is usually regarded as the ideal time, however there are other occasions when weeds are in a more vulnerable state. Conditions in the autumn are often more suitable and some very good results have been obtained during a late flush of growth. Some weeds are almost impossible to kill once they commence flowering: Speedwell, Woodrush, Yarrow and many others become tough and leathery, making spraying a waste of time and money.

(2) The effective control of a bad weed problem can leave the site with large bare patches just when it is required to be at its best! Think a month or so ahead and consider whether the results of a good 'kill' might just be an embarrassment? There are times when the greenkeeper is grateful for anything green! Following a major weed control operation with top dressing or over-seeding may also be an important factor to consider in the seasonal programme. There will be a rush by opportunist weeds to occupy those bare spaces and if you are unlucky it is even possible to remove a large patch of clover and see it replaced by Poa annua! It may be more suitable to wait until autumn before spraying and follow this with renovation and seeding or even turfing in severe cases. Remember that the choice of product may restrict the period between spraying and re-seeding. When all else fails; read the label!

GETTING IT RIGHT!

It must be accepted that all sprayers are inclined to have minor leaks. In accepting this fact the wise operator will have a supply of spare 'O' rings; washers; check valves etc. ready to use when setting up. Don't expect to be able to use the sprayer within minutes of fitting it to the machine, plan ahead and give it a thorough check including a pressure test to show up those inevitable problems.

Some greenkeepers are still adding wetters to weed-killer in the mistaken belief that it will enhance the effectiveness of the product. In fact it can have the opposite effect: entirely wasting the product. If you are unlucky it might also cause severe scorch as the droplets cling stubbornly to the blades of grass. Occasionally a label will recommend the addition of an adjuvant to control particular weeds and in this case there should be no problem, providing the exact amount is mixed – you know – use a measuring jug! The use of unauthorised adjuvants and tank mixes is also a breach of the Regulations.

All the above decision making is of course a waste of time if the sprayer is not calibrated to accurately apply the product. Fitting the nozzles, deciding on speed and pressure and then carrying out a flow test to determine the actual output of the sprayer is the first part of calibration. The second part is to calculate the number of tanks (including part tanks) to do the job; the exact amount of product that is to be added to the spray tank (including the part tank) and finally how much product is needed to do the job.

There are many ways to do this, but what is certain is that the Code of Practice requires it to be done as part of the whole decision making process, well before the job is to be done. This allows for adjustments and changes of nozzle to ensure that the job will be done with due regard for the safety of all concerned.

We have developed a calibration sheet that is short on text and has the space to calculate and record all the information needed to accurately calibrate the sprayer. It is printed here for the guidance of those who may be confused and need a simple procedure to follow. If it confuses you even more, let me know!

There is no substitute for training to make us competent in the eyes of the Law. The greenkeepers who return to work after attending our training courses on the use of pesticides and checked their figures for products; spray quality; and pressures previously used – not to mention the general condition of their sprayers – were suitable embarrassed. The sprayer is also an important tool in the accurate application of soil conditioners, liquid iron and fertilisers. Calibration is just as important here to avoid the embarrassment of striped fairways. It's never too late to learn the right way to do the job!