

**Richard Fry, a consultant to a number of companies and organisations within the industry, looks at the benefits of using a spray pattern indicator.**

**W**ith today's increased emphasis on environmental regulations, personal responsibility and budgetary constraints, the need to improve the quality and consistency of spray applications is more important than ever before.

Throughout the last five years, under the umbrella of COSHH, a succession of much needed legislative requirements affecting the purchase, transportation, storage, application and disposal of pesticides and associated chemical products have been implemented by golf club management committees. Their purpose has been to help make the golf course a much safer place for both players and employees, and the general public at large. Much has been



# SEE YOUR WAY TO A BETTER SPRAY

achieved in controlling the misuse of pesticides and significant steps have been taken in the fostering of a more responsible attitude to the wider environmental

needs of the course itself.

In addition, major advances have been made in chemical application technology involving such bodies as the International

Standards Organisation (ISO) and the Committee for European Standardisation (CEN). Computerised controls and safety features on modern spraying



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machine are now the norm not the exception.

Yet, despite all the legislative controls designed to protect and preserve and the technology introductions that have advanced and improved sprayer safety and application technique greenkeepers, in the final analysis, still have to rely on sight and 'experience' when judging the accuracy and direction of the spray when applied to the target surface.

Estimating accurately the correct application of chemical solutions comprising of up to 95% water is very difficult as the spray becomes virtually invisible when applied to turf. This invisibility makes it impossible for the operator to follow the spray line accurately on the return pass. It is also impossible to recognise missed areas when spot-treating with a knapsack or hand lance.

Field research surveys have shown that, on average, spray operators using boom sprayers commonly overlap their spray applications 20% more than is



necessary to obtain the desired result. This is not only a wasteful use of chemicals and a potentially damaging practice on turf, it is

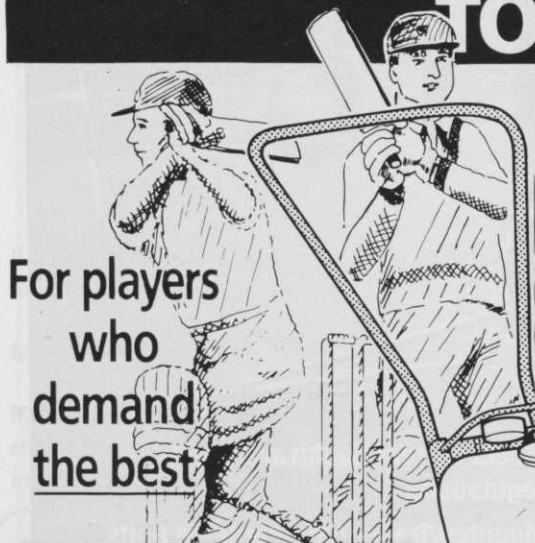
also an unnecessary contamination of the soil and the local environment. In the case of knapsack applications the overlap is consid-

Total weed control is more accurate

erably higher as it is common practice to see operators 'sweep' the same area a second or third time resulting in double dosing to factors of 200%-300%, and more! In the past, greenkeepers have relied on a range of dubious, impractical and labour intensive practices designed to minimise spray overlap and achieve a level of acceptable spray accuracy.

The drawing of lengths of chain across the grass, attached to the ends of the spray booms, was one method used to indicate the margins of the spray swath. Better than nothing it may have been but any observer watching the chains snaking across a fairway, constantly being knocked off line by every hump and hollow, soon realised that the chain markings did not reflect the true spray margin and if followed encouraged mis-application. The practice was also a potentially hazardous operation in terms of possible damage to machines and equipment and is not a practice anyone would recommend when spraying greens!

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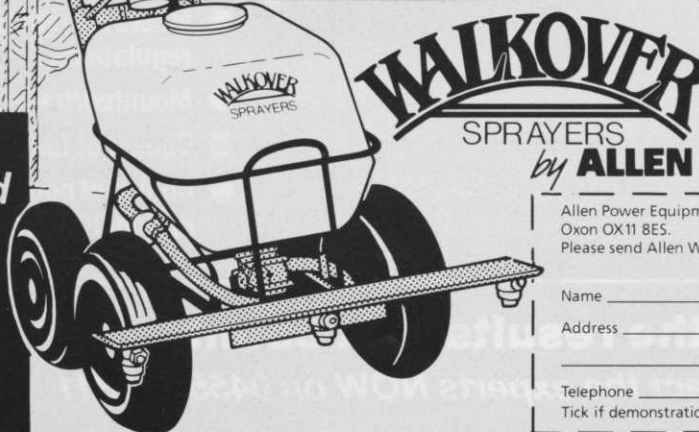
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**Greens, tees and fairways: cost savings obtained across a range of commonly used pesticides**

Product	Rovral Green	Rimidin	Daconil Turf	Super Verdone	Clovotox	Supertox 30	Twister Flow	Castaway Plus	Crossfire	Super Mosstox
Use	Fungicide Control			Selective Weed Control			Worm Control		Insecticide	Mosskiller
Rates of use	2ltr	1ltr	3ltr	10ltr	11ltr	11ltr	16.5ltr	10ltr	3ltr	50ltr
Cost of product	£57.40	£78.00	£52.22	£59.60	£54.34	£53.75	£214.00	£194.64	£74.80	£562.00
Extra (A) cost of 20% overlap	£11.48	£15.60	£10.44	£11.92	£10.87	£10.75	£42.78	£38.93	£14.96	£112.40
Total spray solution	50ltr	50ltr	50ltr	200ltr	100ltr	100ltr	1000ltr	500ltr	200ltr	600ltr
Rate of Blazon	124ml	124ml	124ml	500ml	250ml	250ml	2.5ltr	1.25ltr	500ml	1.5ltr
Cost of (B) Blazon	£1.66	£1.66	£1.66	£6.62	£3.31	£3.31	£33.12	£16.60	£6.62	£19.87
Savings on (C) chemical costs A-B=C	<b>£9.82</b>	<b>£13.94</b>	<b>£8.78</b>	<b>£5.30</b>	<b>£7.56</b>	<b>£7.44</b>	<b>£9.65</b>	<b>£22.33</b>	<b>£8.34</b>	<b>£92.53</b>

NOTE: in the case of Rovral, Rimidin and Daconil savings have been made over an area of 1,000 sq.m. (1,200 sq.yd). For all other products the savings are over 10,000 sq.m. (12,000 sq.yd). In every example, across a range of commonly used pesticides, major savings have been achieved by adding a spray pattern indicator, in this case Blazon, to the spray solution. By reducing unnecessary and wasteful spray overlap application is more accurate, effective and environmentally responsible.

Another highly inaccurate method of spray pattern marking, still widely used today, is for an assistant member of the green-keeping staff to follow the spraying machine around and position himself, in sight of the operator holding up a cane to mark the margin of the spray swath. Not only does this practice tie up a valuable labour resource that could be better utilised in more productive areas but also exposes the person to unnecessary risk of spray contamination. At the very least this person, to ensure his personal protection and comply with current Health and Safety legislation, must be fully kitted out with all the protective clothing as that required to be worn by the spray operator.

A further method of marking of the spray swath, widely used in agriculture, is the foam bout marker or 'blob' marker. A specialist piece of equipment is mounted on the spraying machine and when filled with a foam making mixture dribbles out, at intervals, 'blobs' of foam which mark the edges of the boom. Though clever in its conception, this method is more suited to the extensive fields of agriculture rather than recreational turf. Golfers do not take kindly to seeing their fairways festooned with dribbles of foam everywhere and the method is completely impractical for obvious reasons on greens. An additional constraint to using this machinery is cost. A typical price paid for a foam bout marker would be £650. Added to this price is the cost of the foam making chemical, set-up and clean down time of the equipment and its on-going maintenance. Even if a case could be made that the 'blob' method provided the operator, on wide open fairways at least, with some guidance on spray bout width, it does not identify any skips or misses due to uneven ground or reveal problems due to faulty spray nozzles.

It may have been argued in times past that the chain, cane or 'blob' method of spray identification was better than nothing. However, none of these alternatives have widespread appeal and each have their detractors who see them as flawed.

An alternative to the methods previously described is the use of a spray pattern indicator which

when added to the spray solution and applied to the turf can be easily seen by the spray operator. This method has the attraction of being simple, highly effective, provides no risk to either the operator or the environment, requires no capital investment and in the majority of instances will pay for itself in the savings made on reducing the amount of chemical applied.

Major formulation advances have been made in colourant technology since the early 1980s when greenkeepers, fed up with the impractical and uneconomical alternatives of spray swath marking, were obtaining industrial dye products as spray indicators. Unfortunately, all of these dyes were based on formulations used in the industrial textile process and were found to be totally unsuitable as they caused not only long-term staining of golf shoes, balls, adjacent walkways, fencing and stone work but also the equipment and the operators themselves. Similar formulations are still being sold today.

It was around this time that Milliken Chemical, a USA research based company, identified the problems associated with the industrial dye products and, through the technology at their disposal, formulated 'Blazon', a speciality, water soluble, organic polymeric colourant. 'Blazon', now one of several spray pattern indicators on the market, is not a dye, does not stain and is easily washed from hands and clothing if accidental contact is made with the concentrate. When added to

the spray solution a temporary dark green colour of the turf is produced, allowing operators to easily see where they have - or have not - sprayed. The colour disappears completely and naturally following rain, dew, irriga-

tion - or even sunlight alone.

Modern spray pattern indicators can simply be added to the spray solution directly as a liquid, with the advantage that the operator can select the dilution rate best suited to the conditions and

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his personal colour preference or, as a liquid in pre-measured water soluble sachets. By monitoring the visual pattern made by the spray indicator on the turf the operator can ensure that problems of missed areas, repeat spraying, turf damage and double dosing due to overlap are eliminated. In addition the operator will be able to detect immediately any problems such as worn, faulty or clogged nozzles. By eliminating spray overlap alone the cost of the spray indicator is offset by the amount of chemical saved (see table on Page 47).

From an environmental point of view, the use of a spray pattern indicator is an invaluable aid in eliminating the wasteful use of pesticides and preventing excessive build-up of undesirable chemicals in the soil. For instance, a spray pattern indicator is an ideal aid to spot treating areas that would normally require an overall spray as the operator can selectively treat only those areas in need of treatment,



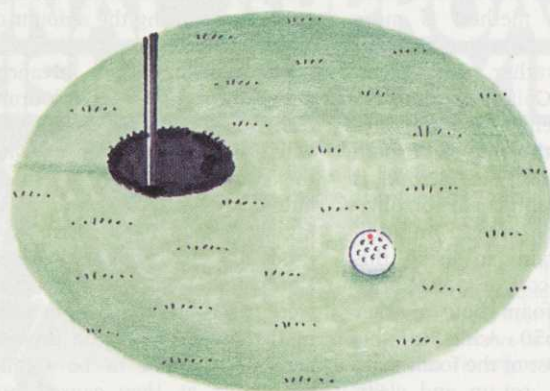
one of the best ways to reduce the amount of chemical applied.

In addition, these products can assist with cleaning out spray equipment after use because when the colour has disappeared

from the water pumped through after spraying, the operator can be confident that the equipment has been completely flushed through the system.

Spray pattern indicators are

also ideal training aids for greenkeepers taking their Spray Operators Training examination and should be regarded as standard practice for all spray applications on turf.



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