Annual broad-leaved weed control in sugar beet

In 2013 United Phosphorus Ltd (UPL) commissioned a number of sugar beet herbicide trials and, here, UPL's technical support manager Pam Chambers presents the findings from the annual broad-leaved weed (ABLW) control site, Mendlesham, Suffolk.

UPL technical support manager Pam Chambers.

Weather conditions have a considerable impact on weed control in sugar beet and the key decisions it can affect are: time of spraying; spray intervals; active/product choice; rates of products used and the number of sprays required.

Last season cold conditions were experienced early on and in some situations poor crop establishment and growth were experienced; herbicide programmes needed to be 'kind' to the crop but still effective on the weeds.

The sugar beet crop at Mendlesham was drilled on the 9th of April in 2013, much later than normal but it avoided the earlier cold period which had an impact on the emergence of many crops. Climatic conditions for spray timings are summarised in Table 1.

First sprays applied on 1st May occurred during a period of warm days but very cold nights; in many areas night frosts were recorded. Some herbicide treatments did have an adverse effect on the crop and this was visible for three to five days depending on the products and tank mixes that were applied. In situations where the newly emerging crop can be put under stress, consider using products that are known to be kinder to the crop, and omit adjuvant oils.

The 16th of May (timing of the second post-emergence spray) was a superb day for spraying sugar beet herbicides; the Mendlesham crop was growing well, soil moisture was adequate and the relative humidity was high. Results from this spray timing were excellent. Under conditions like this where weeds are relatively soft and small, the inclusion of oil shows little benefit and there is an opportunity to use cheaper mixes at appropriate rates. In Graph 1 the number of weeds/m^2 at the end of the season are shown from a Betasana Trio (desmedipham + ethofumesate + phenmedipham) programme with and without oil.

For many of the plots the last spray was on the 25th May. Sprays again worked well with air temperatures not being too high. Very high temperatures can cause crop damage especially when they are above 21°C as they were in early May 2012, so take care with mixtures and oil rates in these situations.

Spray decisions

At the Mendlesham site there was a large range of ABLWs present, and by the end of the season untreated plots had 104 weeds/m^2.

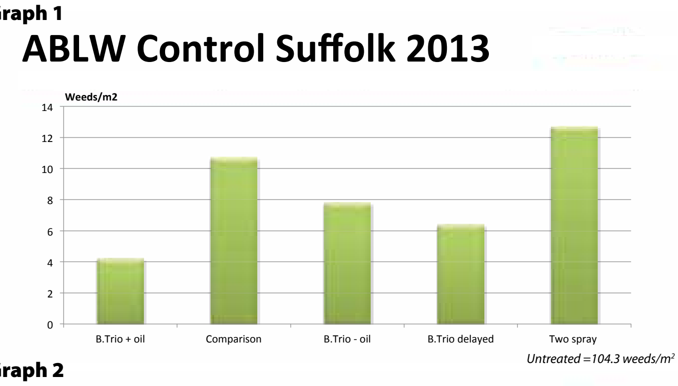
Fields rarely have more than five key weed species and at Mendlesham there were four dominant species – volunteer oilseed rape, field pansy, black-bindweed and common field speedwell. Other weed species were present in very low numbers and not in all plots, and some weed species have a higher impact on yield than others. At Mendlesham the key weed to control was volunteer OSR.

Graph 2 provides a summary of weed numbers/m^2 at the end of the season at eight different trials sites from 2012 or 2013, highlighting the variation in numbers that can occur. Graph 2 also shows adjusted yield information from five of those sites for Betasana Trio-treated plots compared with untreated ones. It can be seen that the yield benefits are, as would be expected, highest from the most 'weedy' sites.

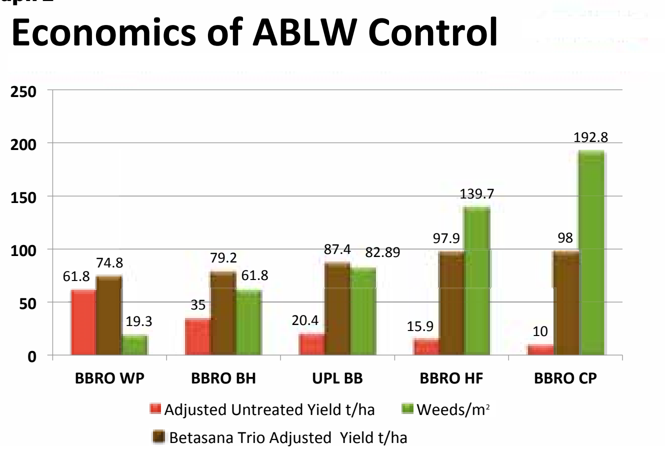
Where a field's weed spectrum is known there is scope to plan in advance a herbicide programme that will be most cost effective. A site with low weed numbers and species that do not have a high impact on yield can have herbicide programmes costing half that of a 'weedy' site.

At Mendlesham a conventional timed Betasana Trio programme was compared with a delayed timing; dates of sprays are given in Table 1. The results illustrated in Graph 1 indicate no significant difference between the two programmes. Not obvious from Graph 1 is that the conventional programme controlled field pansies best and the delayed programme was better on volunteer OSR.

Graph 1



Graph 2



In recent seasons volunteer OSR has been germinating late and has often required a fourth 'tidy up spray'. It may be feasible to use a 3-spray delayed programme or a 2-spray approach where volunteer OSR is the dominant weed, depending on other weed species present.

The 2-spray programme was based on the 'DuPont Broadacre' approach using UPL products. Similar to the delayed programme the Broadacre approach gave very good control of volunteer OSR but struggled with field pansy which was large at the time of spraying. Results are included in Graph 1. As field pansy are not large 'yield robbers' a 2-spray programme would have been acceptable on this field – saving a pass with the sprayer. In situations where time and labour are stretched then 2-spray programmes can be beneficial but be careful if difficult-to-control weeds such as persicaria or knot-grass are present, as these can be difficult to control once they obtain their first true leaves.

Taking into consideration weather, herbicide actives, weed populations and species can lead to savings and/or improved weed control and consequently optimum sugar beet crop yields; however that has to be weighed up against management and spray operator time. Sometimes the 'easy option' is required and, in that case, a conventional programme using formulated products such as Betasana Trio can be useful. The key to a successful and economic herbicide programme is forward planning and discussion between the spray operator, farmer and agronomist.

*A full report on the results from all UPL 2013 sugar beet trials including a technical update on black-grass control can be found on the UPL sugar beet website; www.uplsugarbeet.co.uk. ■

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Table 1: Application timings and weather conditions – Mendlesham, Suffolk 2013

	1st post-em	2nd post-em	3rd post-em	4th post-em
Date of application	1 May	16 May	25 May	16 June
Air temperature °C	15.2	9.7	14	17.6
Soil temperature at 10cm °C	14	15	10	16
Relative humidity %	29	73	40	64