

Vegetable Advisory Note 9th March 2010

Herbicidal control of broad leaved weeds without propachlor and trifluralin

Broad leaved weed control in transplanted Brassicas

Pre-planting

Pendimethalin is sprayed at up to 3.3 l/ha just before transplanting. It improves control of some weeds on which metazachlor is less effective: fat hen, pansy, knotgrass and small nettle.

Pre-emergence

Metazachlor (various including Butisan S) is the standard herbicide used in brassicas, applied at 1.5 l/ha, after hardening off but before weed germination. Weed control is most effective if the soil is damp and not cloddy. Metazachlor is weak against cleavers, knotgrass, pansy, black nightshade, fat hen and fumitory.

Clomazone (Gamit 36 SOLA1275/09) is increasingly often tank mixed with metazachlor to improve control of several weeds including cleavers. Allowing the transplants to harden off before spraying is particularly important for the Gamit. If it is applied separately after the metazachlor small weeds may have emerged and Gamit has some post-emergence effect, particularly on chickweed. The maximum rate allowed is 0.25 l/ha, but 0.2 l/ha is more common, both to save money and avoid crop damage. In short season pointed cabbage 0.15 l/ha is advisable.

Pendimethalin as Stomp Aqua, post planting has a SOLA (2914/09) permitting application of up to 2.9 l/ha up to seven days after transplanting of cabbage. The manufacturer states that this formulation is gentler on the crop than standard pendimethalin which is only suitable pre-planting. Note that the total pendimethalin applied pre and post planting must not exceed 1.5kg a.i. per hectare

Propyzamide (Kerb Flo) is a contact and residual herbicide which may be sprayed up to 10 days after transplanting of broccoli and cauliflower (SOLA 1902/09). The SOLA permits use at up to 3.1 l/ha, but it would be safer to use 1.25 l/ha. Kerb Flo controls weeds on which metazachlor is weak; black bindweed, black nightshade, fat hen, knotgrass, redshank, and small nettle. It is weak on cleavers.

Contact herbicides

Clopyralid (e.g. Dow Shield) is approved on-label at 0.5 l/ha. Spray after the transplants are growing well, for all Compositae such as mayweeds and groundsel. See label instructions for treatment of creeping thistle.

At up to the crop six leaf stage the contact herbicide **pyridate** (Lentagran) can be applied to cabbage and Brussels sprouts on-label and broccoli and cauliflower under SOLA 0786/09. It is most effective on black nightshade, cleavers and fat hen at the 6-8 leaf stage, when there is enough leaf area to absorb a significant quantity of the chemical, but is most effective on fumitory and sow thistles at the cotyledon-2 leaf stage. Ensure crop plants are fully hardened off before using pyridate as some instances of yellowing/bleaching have been noticed.

Note that although chlorthal-dimethyl (Dacthal W-75) has off-label approvals for brassicas, in practice it is only appropriate for protected crops.

Weed control in kale and spring greens (otherwise known as pamphery or collards)

The rate of metazachlor has been restricted so that the maximum rate of Butisan on-label is 1.5 l/ha. But a Butisan SOLA (0344/05) for use in kale and spring greens is still valid and permits application at 2.5 l/ha. It may be applied either up to 10 days after transplanting or up to 8 true leaves in drilled crops. When used post emergence Butisan controls chickweed, red dead nettle, groundsel, mayweeds and meadow grass. It only controls the following weeds pre-emergence; cleavers, poppy, shepherds purse, parsley piert, small nettle.

There is scope to use Butisan both pre and post weed emergence under this SOLA. For example with a drilled crop apply 1.0 l/ha Butisan plus Gamit (SOLA 1275/09) or plus Stomp. Then at 6-8 true leaf stage 1.5 l/ha Butisan can be applied if necessary.

Weed control in Swedes

There are very limited options, with the standard being pre-emergence **metazachlor** (e.g. Butisan) at 1.0 l/ha, often with the addition of **Clomazone** (Gamit SOLA 1275/09) at 0.2 l/ha. To avoid crop damage, especially from the metazachlor, it should be applied before the crop seed chits and is most effective on damp soil without clods.

After the two true leaf stage **Clopyralid** can be sprayed at 0.5 l/ha to kill Compositae such as groundsel, pineapple weed and mayweed and to suppress black bindweed and redshank. Spot treatment with Clopyralid is used for volunteer potatoes.

Chlorthal-dimethyl is approved on swedes, but is not economically viable to use.

Weed control in drilled leeks

Pre-sowing

The programme is often based on diquat (e.g. Retro) or glyphosate to clean up stale seedbeds pre-drilling.

Pre-emergence

With the removal of Propachlor from 18th March the standard pre-emergence treatment for leeks will be pendimethalin, sometimes plus chloridazon (Pyramin DF).

Pendimethalin (e.g. Stomp 400) can be applied at up to 3.3 l/ha

Chloridazon (SOLAs e.g. Pyramin DF 0672/10) is a residual herbicide applied either pre-emergence or up to two true leaves of the crop at a maximum of 1.4 kg/ha. Chloridazon controls some of the more difficult weeds such as charlock, knotgrass, fat hen, redshank, black bindweed and black nightshade; but the rate of 1.4 kg/ha may not be sufficient for complete control.

A possible alternative to pendimethalin/Pyramin is pendimethalin/linuron.

Linuron is applied under SOLAs e.g. Linurex 2472/09) at 1.2 l/ha pre-emergence. Local evidence is lacking for its value and safety in leeks, but there are several pointers to its safety. It is physically compatible with pendimethalin, the rate of linuron is low and the SOLA was applied for by HDC which has considerable experience in the area. Linuron has a broad weed spectrum except for black bindweed, black nightshade, knotgrass and pansy.

Contact herbicides

Repeated low doses of either ioxynil or fluroxypyr are required.

Ioxynil (Totril) is the most commonly used contact herbicide.

Totril usually gives best results applied four times up to a total of 2.8 l/ha, to eliminate weeds as cotyledons. The first application should not be before the crop two true leaf stage and is safest if only 0.5 l/ha, with the subsequent applications at 0.7 l/ha.

Fluroxypyr (Starane 2 SOLA 0390/10) is a contact herbicide with potential for greater use due to its cheap price and strong activity on certain weeds. Its spectrum is narrow, but it is very good against black bindweed, cleavers, fumitory and mayweed. The maximum individual dose is 0.3 l/ha at up to five applications.

Mixtures of contact and residual herbicides are sometimes used in leeks to widen the range or deal with problem weeds. For linuron/prosulfocarb or linuron/ioxynil the following SOLAs and rates should be observed.

linuron -	Linurex SOLA 2472/09	0.6 l/ha
prosulfocarb -	Defy SOLA 2744/09	2.0 l/ha
ioxynil -	Totril	0.1 l/ha

There is little experience of the linuron/Defy combination in leeks although in onions a mix of linuron at 0.75 l/ha plus Defy at 2.0 l/ha is in common use.

The following mixtures are suggested by Syngenta for use in onions between the 1st and 5th leaf stages.

Defy 2.0 l/ha plus Stomp 0.8 l/ha plus Pyramin 0.5 l/ha, or

Defy 2.0 l/ha plus Pyramin 0.5 l/ha plus Totril 0.1-0.2 l/ha.

Syngenta suggests that the same combinations are likely to be appropriate for leeks, but since leek leaves are broader than onions the risk of crop damage is clearly greater and only a small area of crop should be treated initially.

Clopyralid (Dow Shield SOLA 2638/06) is useful where Compositae weeds such as mayweed are a problem.

Weed control in Carrots and Parsnips

Pre-emergence herbicides

1.0 l/ha **linuron** plus 4.0 l/ha **pendimethalin** is a commonly used pre-emergence treatment after drilling. A lower rate of pendimethalin is possible on lighter land. In GB a three way mixture is common with 1.0 l linuron, 3.0 l pendimethalin and 0.2 l clomazone per hectare. On very light land the pendimethalin is reduced to 2.0 l/ha and the clomazone to 0.15 l/ha. This three way mix is still weak on mayweeds.

In parsnips a metamitron/ linuron mixture is an alternative to linuron/pendimethalin. The metamitron is used under SOLAs e.g. Goltix (1637/06) or Skater (3522/09).

Isoxaben (Flexidor 125 SOLA 0895/05) is permitted pre-emergence at 0.6 l/ha and may be employed where certain weeds, such as charlock and mayweed, have become a chronic problem. Flexidor can be tank mixed with either pendimethalin or linuron, but no evidence is available on the three way mix. There is increasing interest in Flexidor because of the restrictions on linuron rates, but no local reports of its use, so a small area should be treated first in case of crop damage.

Contact herbicides

At the crop two to three leaf stage **metribuzin** (Sencorex WG, SOLA 1887/03) at the low rate of 0.5 kg/ha is an effective contact and residual herbicide, particularly used where mayweeds are a problem. Metribuzin at the higher rate of 1.0 kg/ha is sometimes used as a last resort later on, when all else has failed. At this higher rate it has a wider host range, though cleavers are resistant. Metribuzin should never be used on parsnips.

At the crop 2-5 leaf stage a mixture of 0.6 l/ha **linuron** and 2.5 l/ha **prosofocarb** (Defy) has become a standard treatment, giving good control of ground keeper potatoes, cleavers, thistles, fumitory, groundsel and even knotgrass.

Note that the maximum total rate of each linuron product has been restricted, for example to 1.2 l/ha for Alphalinuron. When linuron is applied both pre-emergence and combined with Defy post-emergence different products must be selected to keep within the rules. Such dual application relies on a loophole in the regulations and was presumably not intended. Weed control in carrots would currently be difficult without this loophole.

Where volunteer potatoes grow tall the use of glyphosate in a weed wiper has the advantage of avoiding any of the overall contact sprays which can harm the crop.

Flumioxazine as Digital (SOLA 1114/09) or Sumimax (SOLA 1111/09) first gained SOLAs last year and was tried locally and in GB as a contact treatment for a range of weeds in carrots and parsnips. Results were disappointing. Crop toxicity was slight, but weeds were checked rather than killed. The sprayer must be cleaned with exceptional care after flumioxazine.

Weed control in Parsley

Pre-emergence

Apply a mix of linuron, pendimethalin and clomazone (Gamit 36, SOLA 0130/10) at 1.0 + 2.0 + 0.2 l/ha. If on light soils reduce the rates to 0.15 + 1.0 + 1.5 l/ha to be safe.

Alternatively apply a mix of prosulfocarb plus linuron. The prosulfocarb is under SOLA (Defy 2073) which permits rates up to 5.0 l/ha. Half rate is more commonly used in mixtures, but note that higher rates of Defy are safe when used pre crop emergence than when used post emergence.

Post-emergence

Clopyralid (Dow Shield SOLA 0473/05) is used where Compositae weeds area a problem.

Mechanical weeding in all vegetables

In GB the use of interrow weeding using precision hoes has increased and is now an established part of weed control in carrots, especially where fools parsley, hemlock and wild carrots occur. Precision hoeing is also used in leeks and brassicas when weather permits.

Hand weeding remains a viable part of weed control in even the most sophisticated systems

Use of Specific Off Label Approvals (SOLAs)

Remember that SOLAs are used at growers' risk. SOLAs are not applied for by the manufacturer, but by the HDC or growers' groups so little information is

available on tank mixes or precise stage of application. In this situation it is very helpful and important for growers to share their experiences. Many things are legal, but not all are advisable.

When using a herbicide under a SOLA a copy must be held, either a paper copy or downloaded onto the farm's computer. Read the SOLA before filing it.

Combinations with grass herbicides

Chemicals to control grasses are not covered in this advisory notes because there have been no major changes. But remember that any herbicide attacks the natural waxy leaf covering of the crop, to a greater or lesser extent. Grass herbicides should be applied separately from broad leaved herbicides with 7-10 days between the sprays to allow time for restoration of leaf wax.

Any questions?

To add your experience to the advice given above, or with further queries, please contact Anne Stone on 02894 426 683 or mobile 07500 957895 or e-mail anne.stone@dardni.gov.uk