Tyfu Cymru: Technical Advice Sheet
Weed Control in Ornamentals

Cultural Control – Prevention is Better Than Cure

Your first line of defence against weeds should be cultural controls; no herbicide programmed will work effectively without good nursery hygiene. Any established weeds around the crop that are allowed to set seed will create huge pressure that can reduce the effectiveness of herbicides. Non-crop areas and paths should be kept clean and free of weeds that could run to seed. Past work has shown that a little-and-often approach with a weekly hand weeding routine is more effective and requires fewer labour inputs overall compared with a periodic purge; the ultimate aim should be to avoid any weed setting seed. In production areas plug and liners should be kept clean, and remove all weeds prior to potting. Woven plastic bed covers (e.g. MyPex) should be maintained and replaced when required. Beds should be well draining to help kept them clear of liverwort and moss, helping to prevent further weed establishment. Gravel or sand beds can be sprayed with residual herbicides like Chikara prior to standing crops down on beds. Chikara can give up to five months residual weed control, as a rule of thumb most residual herbicides persist for up to twelve weeks. Plan your irrigation schedule to maintain a dry regimen and avoid excess irrigation to reduce leaching of residual herbicides and reduce the weed pressure for species like willows *(Salix)* that require damp surfaces to germinate. Keep old and new stock separate as older stock generally has a heavier weed burden which can easily spread. You may also wish to consider how long you wish to retain old stock as the costs of cleaning up older stock can outweigh the costs of disposal and starting from scratch.

Residual Herbicides

AHDB Horticulture have funded many years of research on crop safety screening of residual herbicides – crop safety information is available in AHDB publications such as ''Practical weed control for nursery stock' When using herbicides under EAMU where crop safety is not known test spraying a small area of the crop to check crop safety is advisable prior to widespread use.

Herbicide Options for Protected Cropping

Residual herbicides are an essential tool for weed control, and there is only a limited risk of damage to the crop if used properly. Even where damage is seen (typically within two weeks after application) the crop will normally grow through it within 6 – 12 weeks. Individual products usually offer good control of a narrow band of key weeds. Residual weed control can be improved by tank mixing complementary products to broaden the weed control spectrum. When considering the crop safety of herbicide options it is advisable to check with a consultant for susceptible crops. These primarily work by forming a protective layer on the surface of the soil or growing media which kills weeds during germination.

Pre-emergence Chemical Control Options in Protected Ornamentals

Product	Description
Devrinol (napropamide)	Suitable for use in outdoor and protected ornamentals for the control of chickweeds, groundsel and grasses, although has poor control for bitter cress. Max one application per year, at a maximum rate of 7L/Ha between 1st November and end of February. This photodegrades in sunlight and so should be applied on grey, drizzly days to avoid breakdown and promote washing down into the soil. If you are applying on a dry day, light irrigation (e.g. 10 mm) can be applied to aid soil penetration and reduce risk of crop damage (although avoid heavy rain).
Venzar 500SC (lenacil)	Outdoor use for the control of mosses, liverworts, hairy bittercress, willow herb and chickweeds. A maximum dose of 0.4 L/ha (200 g/ha), up to a maximum of 500g/ha every

EAMU 4263/19	third year. This has short persistence (up to a month) but has low risk of damage as is applied at a low rate.
Flexidor (isoxaben)	Suitable for outdoor and protected use for the control of chickweed, hairy bittercress and pearlwort, although this has poor control of willow herb and groundsel. This can only be applied once per crop, although this is 4x the strength of the old 125 formulation. Plan the timing of application to fit in with other alternatives in your program – for example, alternatives exist for roses that can be used in February that would be damaging for use later in the season, so save Flexidor for a later application.
Dual Gold (s-metaloachlor) EAMU 0501/12	Suitable for use in outdoor ornamentals for the control of willow herb, grasses and (partially) groundsel. This can only be applied during May, but can be tank mixed with Flexidor to broaden the spectrum of control. This can slightly damage tips.
Springbok (dimethenamid-p + metazachlor) EAMU 2108/15	Suitable for outdoor ornamentals only, this can only be applied by tractor-led equipment up to a maximum dose of 1.66 l/ha. This has broader action than metazachlor alone, but you cannot enter the crop for 6 days after application. When handling the crop gloves are needed for 50 days.
Stalwart (metazachlor)	This has no restrictions on use in container production like some other formulations of metazachlor, and can be applied from late summer onwards on hardening foliage to avoid crop damage up to 0.66L/ha annually. This can be a very effect post-budding treatment in crops in combination with Flexidor.
Sunfire (flufenacet)	Suitable for outdoor and protected ornamentals, this offers good control of annual meadow grass. This can only be used in a single application, but this can be mixed with Flexidor to improve range of action. While this is a good candidate for annual meadow grass.

Chemical Control Options in Field-Grown Ornamentals

Contact herbicides options have become more limited in recent years so to achieve the best results you need to read product labels carefully and think about conditions at application. For broadleaf weeds, Shark can be a good option (under EAMU 0099/16) but is not effective for grass weeds or Groundsel. Finalsan/Kouton Gold (pelargonic acid) are another option, but require weeds to be actively growing. Dow Shield can be considered but avoid drift or contact with the crop and is best used as a spot treatment for Groundsel and Creeping thistle. Starane Hi Load HL can be applied under EAMU (1268/17) to target actively growing weeds and volunteer potatoes although this can volatise in hot weather and impact the crop. Glyphosate is available under a variety of product names, but this must be used with care. It's very damaging to Rosaceous crops, and can cause catastrophic and persistent damage within the plants. This can be effectively used to control both annual and perennial weeds before planting and cultivation. For contact grass control Fusilade Max (under EAMU), Laser and glyphosate are also good options for control. In addition to the residual herbicides given above, the following can be used for field-grown ornamentals.

Product	Description
Sencorex Flow (metribuzin) EAMU 3099/19	Sencorex can be effective and persistent, but can be damaging at high rates (although experience shows the crop should recover) and is a good dormant season treatment on trees at rates up to 1.15 L/ha, but lower rates should be used on roses. This is best tank mixed with other residual herbicides such as Stomp Aqua and Sunfire to broaden the weed control spectrum. The EAMU is flexible and so is not bound to a single application if you are using a lower dose to suit the crop.
Stomp Aqua (pendimethalin)	Useful for control of a range of broadleaf and grass weeds (including some useful activity against Fat Hen), but there are gaps on the weed control spectrum. This can be

EAMU 2919/09	addressed by tank mixing with other herbicides such as Sencorex Flow and Sunfire. This is safe as a dormant season treatment in a range of crops. Stomp Aqua is also a useful as a pre-emergence treatment in tree seedbeds. Consider application timings as this can only be used once in the year.
Samsung Extra 6% (nicosulfuron) EAMU 1054/14	Suitable for use in overwintered crops up to mid-June, this is more persistent than Dual Gold, although tank mixing the two can broaden both the persistence and weed control spectrum. Dual Gold can only be used during May – so tank mixing Samsung Extra 6% with Dual Gold limits its use to during May. This active can be damaging to the crop, and is likely to be safer as an inter-row spray.
Goltix 70 SC (metamitron) EAMU 1175/15	This has pre- and post-emergence activity on seedlings to control important weeds such as grasses and groundsel, and can be used in seedbed production. Goltix 70 SC has relatively low persistence in the soil.
Betanal Flow EAMU 2824/08 **Corzal SC** EAMU 0376/18 **(**phenmedipham**)**	These products are available for post emergence control of small seedling weeds within the crops. These can cause temporary leaf yellowing. Up to 2 – 3 applications per year are available depending on the product and rate applied.

Cultural Control Options

In addition to chemical control, other cultural control options are available. Pot mulches applied immediately after potting can reduce weed pressure, particularly from moss and liverworts growing on the surface of the media. Residuals can also be used with mulches as they will generally move through bark mulches into the surface of the substrate. A variety of products are available including container mulch (Klassman), Pot Topper (Sinclair) and Ecobark (Melcourt). Some of these products contain a binding agent which is activated by post-potting watering in, binding the mulch together to help keep it in place compared with raw bark alone. Pot toppers prevent seeds from reaching the substrate surface to prevent germination and establishment. This can also improve water use by limiting drying of the substrate.

Electric Weeding Control

Innovative technology has been developed using electric weeding apparatus. Physical contact with the weeds causes biological disruption by passing a charge through the weed leading to wilting and checked growth, or death. These show the best systematic action against fleshy perennials like creeping thistle. Electric weeding has a smaller energy input that flame weeding, and less collateral damage than a weed wiper although these need direct contact with the weeds for action. New designs enable users to achieve greater contact through closer contact with smaller weeds. Systems can either be tractor mounted for large areas of treatment, or hand applied for spot treatments. A hand-held device from ubiqutek is commercially available as ‘Rootwave.pro’ (www.rootwave.com). Field prototypes for horticulture are under development by several suppliers although Zasso already has a tractor mounted system available in Germany. This is new technology is shows strong potential for non-chemical, organic control of weeds in the future.

Disclaimer

Every effort is made to ensure the accuracy of information and recommendations given in these notes. All applications of crop protection chemicals should be made in accordance with label recommendations, which should be consulted before spraying. Some of the pesticides mentioned in these notes may not be supported by label recommendations for their use on crops but are permissible via Extension of Authorisation for Minor Use (EAMU) in the UK under 'The Revised Long Term Arrangements For Extension Of Use (2002)'. In these cases, the use of the pesticide is at the risk of the user and Tyfu Cymru does not accept liability for any loss or damage caused by such use. The references to on-label approvals and EAMUs for use of pesticides in crops and are correct at the time of writing. These are subject to change and approval may be withdrawn at any point. It is the grower's responsibility to check approvals before use of pesticides. If in doubt a grower should seek advice from a BASIS qualified advisor - this is available free of charge for eligible growers through the Tyfu Cymru program, please contact us to arrange an appointment – email/telephone advice is also available.