

Managing herbicide resistance in broad-leaved weeds

Herbicide resistant broad-leaved weed populations are still relatively uncommon in the UK, but they are on the increase.

First confirmed in 2000, herbicide resistance in broad-leaved weeds in the UK is target site and is mainly confined to the acetolactate synthase inhibitor (ALS) group of herbicides, namely the sulfonyl-ureas and the triazolopyrimidines. For example metsulfuron-methyl and florasulam respectively.

Both the sulfonyl-ureas and triazolopyrimidines are extremely important for cereal broad-leaved weed control in the spring and represent more than 50% of the area treated. Currently, control of ALS resistance weeds is dependent on the continued availability of alternative herbicides with different modes of action. However, as products come up for regulatory renewal, there is always a risk that some effective active ingredients may be lost, making control of resistant broad-leaved weeds more difficult. In addition, new herbicide modes of action are often slow to come to market, further increasing the pressure on existing products.

How does weed resistance develop?

- Repeated use of herbicides with a single mode of action.
- Not tank-mixing with other herbicide modes of action.
- Mono cropping.
- Ignoring instances of poor weed control.

Poppy Resistance

Mainly confined to the east of England, ALS resistant poppy populations have been found in 13 counties. Studies of these UK populations has confirmed that resistance is conferred by the ALS target site mutations Pro-197-Leu and Pro-197-His. These populations can no longer be controlled by the sulfonyl-urea herbicides metsulfuron-methyl and tribenuron-methyl.

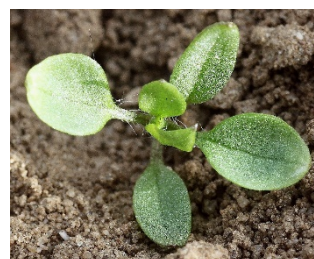


Controlling Resistant Poppy

Pendimethalin, MCPA and the more recently introduced herbicides containing Arylex™, namely Pixxaro™ EC and Zypar™ are all effective against ALS resistant poppy.

Chickweed Resistance

More widespread than poppy resistance, more than 50 ALS resistant chickweed populations have been identified across 13 counties in England, Scotland and Northern Ireland. It is believed that the high frequency of resistant Chickweed in Scotland and Northern Ireland may be linked to continuous spring barley cropping and an over reliance of the sulfonyl-urea herbicides for broad-leaved weed control.



In chickweed, two different ALS target site mutations have been identified; Pro-197-Gln and Trp-574-Leu. The Pro-197-Gln mutation is the most common and is associated with the sulfonyl-urea group of herbicides only.

The Trp-574-Leu mutation however confers resistance to both the sulfonyl-ureas and triazolopyrimidine group of herbicides.

Controlling Resistant Chickweed

Fluroxypyr (as in Spitfire® or Starane® Hi-Load) and mecoprop-p remain extremely effective at controlling both strains of ALS resistant Chickweed in the UK.

Scentless Mayweed Resistance

Confirmed cases of resistant scentless mayweed populations are small in number and confined to two counties in England and Scotland. The extent of mayweed resistance is probably under-reported currently. Analysis of the Scottish population confirmed resistance was conferred by the Pro-197-Gln target site mutation.



Controlling Resistant Mayweed

Clopyralid containing products such as Galaxy® and Dow Shield® 400 will control resistant populations of Mayweed.

How do I minimise the risk of developing resistance?

- Always tank-mix ALS herbicides with herbicides of different modes of action.
- In multi-way tank mixes, don't be tempted to split out herbicides if there are too many products in the tank. Keep the herbicides together in the tank.
- Try and minimize use of ALS herbicides in the rest of the rotation.
- Use cultural control methods wherever possible, including non-cereal crops where alternative modes of action can be used.
- Always investigate cases of poor weed control and maintain good spray records.
- Collect and test seed or tissue samples if resistance is suspected.
- Consider spraying off patches of poorly controlled weeds before seed is set, as many broad-leaved weed seeds may persist for greater than 10 years in the soil.