Controlling chickweed in spring cereals

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Uncontrolled chickweed in wheat from East Cork following herbicide application.

Herbicide resistance is the evolved ability of a plant to survive and reproduce following a herbicide dose that would normally kill it. There are two main mechanisms of resistance; enhanced metabolism and target site resistance. Enhanced metabolism resistance is where the weed can detoxify the herbicide, leading to poor control, but usually partial resistance, and is most likely to be found in resistant grass weeds.

Target site resistance is the blocking of the target site of herbicide action within the plant, resulting in the plant surviving a dose of herbicide. This usually results in complete resistance.

Two types of target site resistance have been identified, one affecting ACCase inhibitors (grass weeds) and another affecting ALS inhibitors (broadleaved and grass weeds).

Glasshouse studies carried out by Teagasc in 2008 on 20 cereal fields confirmed ALS resistance in chickweed. In the same study, all populations were controlled by CMPP, fluroxypyr, IPU and Calaris, irrespective of whether or not it was resistant to Ally.

More recently, trials carried out in Cork by Corteva confirmed chickweed resistance to ALS herbicides (Harmony M SX, Ally and Ally Max). Very poor control was achieved by Boxer (Florasulam).

The trial found that Arylex can contribute to control and that fluroxypyr is still giving good control.

Control

Chickweed is present in all tillage areas. It can survive low temperatures, germinates year-round and severely reduces yield when present in high numbers. It multiplies quickly when the crop is open, particularly after poor crop establishment. It is ideally suited to fertile, nitrogen-rich tillage fields and prefers wetter parts of fields.

Resistance testing is the only way to determine whether resistance is present or not. From a practical weed control perspective, it is better to assume that chickweed is resistant to ALS herbicides and to use an alternative mode of action.

Recent trials indicate that the most reliable control is likely to come from products containing fluroxypyr, but products containing arylex and mecoprop p can also add to control.

The maximum allowed rate of 0.75l/ha of products containing fluroxypyr 200g/l (Hurler, Fluxyr etc) should be used on small, actively growing, chickweed. Difficulties in controlling chickweed usually occur in one of two scenarios; either the weed is too big, or conditions at spraying are not conducive to good herbicide uptake.

Large chickweed is difficult to control and growers can expect reduced effectiveness once chickweed is greater than 10cm. Coverage is often an issue when herbicide application is delayed and this further decreases control.

Weather at the time of application is a critical factor in the translocation of herbicide to the target site. Weeds are more tolerant to herbicides when they are under stress caused by adverse weather conditions.

Cold conditions, like those experienced last April, result in the weed developing a thicker waxy layer on the leaf surface. This slows metabolism, leading to reduced translocation of the herbicide.

The inclusion of an appropriate adjuvant can also aid uptake in difficult conditions.

Sulfonylurea herbicides control a broad spectrum of broadleaved weeds and are a core component of weed control in spring cereals. But they should always be mixed with a partner that has activity on key weeds present in the field.

Examples of partner products to control chickweed include; Cleave 1.5l, Duplosan KV 2.3l, Galaxy 1.0l, Fluroxypyr (Hurler etc.) 0.75l, Pastor Trio 1.0l and Pixxaro 0.5l.

Minimise the risk of resistance

- Using mixtures of herbicides with different modes of activity helps to delay the development of resistance. For example, sulphonylurea (Cameo Max) mixed with synthetic auxin (Hurler).
- Crop rotation allows the use of herbicides from different herbicide groups to be applied to control weeds.
- Treat weeds when they are small and actively growing for maximum control.
- Use appropriate rate of herbicide.

Finally if there are patches of uncontrolled weeds in the field after herbicide application, consider the following;

- Did I use the correct rate?
- What were the weather conditions like at the time of herbicide application?
- Was the spraying operation carried out correctly?
- Were the weeds too big at the time of application?

If all of these were done correctly, examine if there are live plants next to dead plants in the field. Surviving plants next to dead plants is a signal that resistance may be an issue and should be investigated further.