



techtalk

Weed control in spring barley

Innovation is the cornerstone upon which Corteva is built, but knowledge and application are the keys to getting the most out of the developments in crop protection chemistry. That's why Corteva is proud to sponsor this Tech Talk and put the potential of this year's spring crops in their hands.



Flexible friend in spring

The introduction of a new herbicide active three years ago has enabled a more flexible approach to weed control in spring crops. CPM finds out how to get the best results.

By Lucy de la Pasture

The warm, dry spell during February means a lot of growers have managed to get an early start this spring, with a reasonable area of spring barley in the ground by mid-March. That will provide a longer growing period than the very compact season experienced last year, when many spring crops had only around 110 days between drilling and harvest.

The extended season will provide a more open window for post-emergence weed control, with every likelihood of variable day and night time temperatures. That means going back to the fundamentals of spring weed control to get the best out of herbicide options.

CPM get advice from Scottish Agronomy's Andrew Gilchrist and Corteva's Alister McRobbie on the

fundamentals of broadleaf weed control and how to get the best out of the Arylex chemistry, particularly where tackling problem weeds such as fumitory in spring barley.

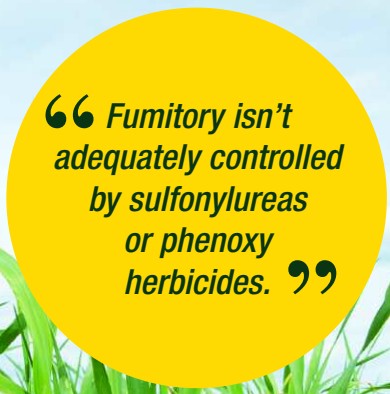
Why is spring barley important?

Spring barley has always been a major crop in Scotland, accounting for 55-60% of cropped area. Further south, it's only recently increased in area as more and more growers look to incorporate spring cropping into their rotations in an attempt to reduce populations of blackgrass, which mostly emerges during the autumn. That means growers with blackgrass problems can make good use of stale seedbed techniques before planting the spring crop and deplete the number of blackgrass seeds in the seedbank.

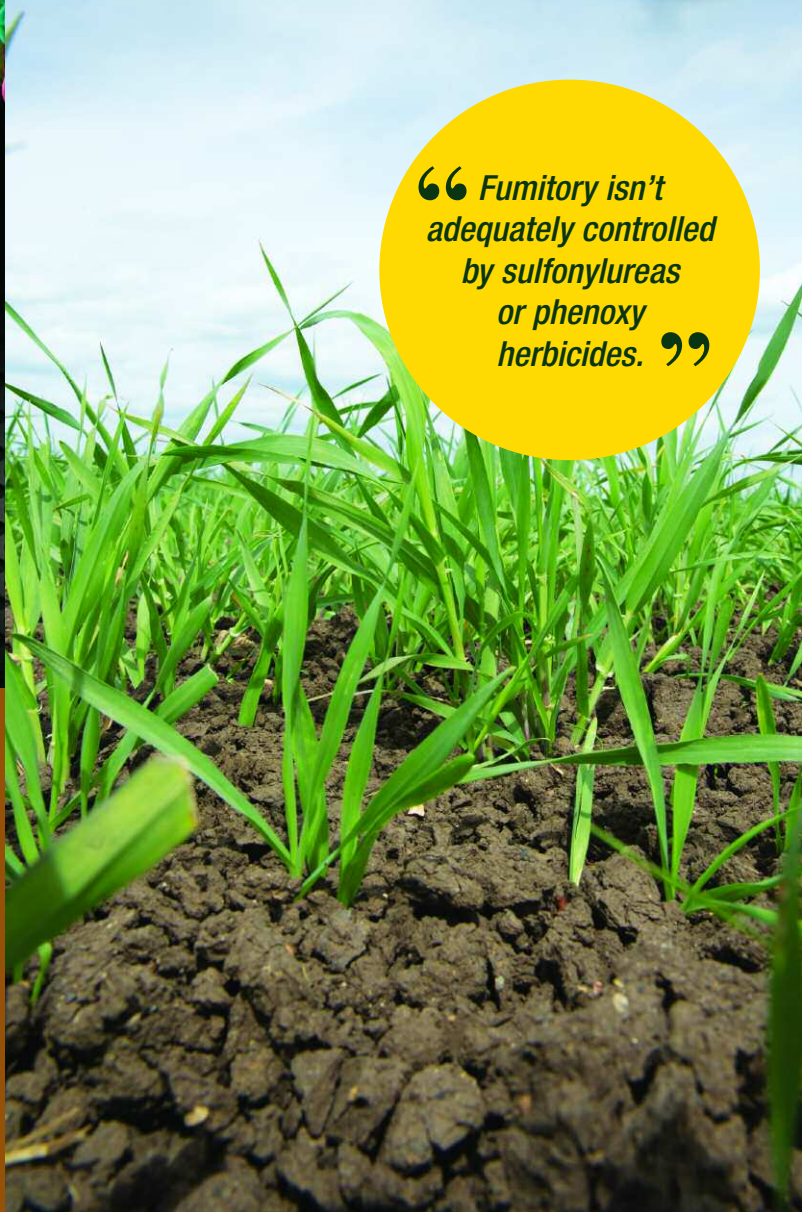
The emphasis on a stack of residual herbicides to control blackgrass in winter cereals has meant broadleaf weeds have often assumed a lesser importance. Spring cereals provide an opportunity to tailor weed control to the broadleaf weed spectrum, with any spring-emerging blackgrass taken care of by pre-emergence residual herbicides.

How does spring cropping help weed control?

Some broadleaf weeds emerge mainly in the autumn, others mainly in the spring and some weeds have a very lengthy germination window and will emerge in both autumn and spring. Spring weeds of particular significance include cleavers, brassica weeds, black bindweed and other polygonums, black nightshade, fat hen, umbellifers



“Fumitory isn't adequately controlled by sulfonylureas or phenoxy herbicides.”



(such as fool's parsley, cow parsley, bur chervil) and fumitory.

Some are likely to be more competitive with the crop than others and this depends on the growth habit of the weed, crop



Andrew Gilchrist says fumitory can be a real pain in spring barley if it's allowed to get away.

density and the number of weeds/m².

Preventing broadleaf weeds from producing seed is particularly important because, unlike grassweed seeds, most are able to survive for long periods of time in the seed-bank and some can emerge from considerable depth, a further factor which can limit the control from residual herbicides.

Spring cropping also provides an opportunity in the rotation to use different chemistry, a useful tool for weed resistance management, and to focus more on broadleaf weed control.

Which weeds are an issue?

In Scotland, around 50% of the population of chickweed is now resistant to ALS-chemistry (sulfonylureas), with further resistance problems found in both poppy and mayweed. It's not a new problem, having first been reported a couple of decades ago. But in recent years, the introduction of new broadleaf weed herbicides containing Arylex (halauxifen-methyl), has provided an alternative mode of action, easing the reliance and selection pressure on the sulfonylureas.

Other weeds have also become

difficult to control, although they haven't been identified as having resistance as such. Of these, fumitory has become most problematic because it isn't adequately controlled by sulfonylureas or phenoxy herbicides and can be a real pain in spring barley crops if it gets away.

Tank-mixing and timing challenges, either temperature-related or limited by crop growth stage cut-off criteria and narrow spray windows, also means that an increasing number of species aren't always reliably well controlled by older chemistry. For example, last year because of the poor weather, many crops had grown beyond the phenoxy herbicide growth stage cut-off before spraying was possible.

What control strategy is best?

There's an increasing trend to use a residual pre-em herbicide on spring barley crops. Approximately 70% of Scottish Agronomy's spring barley area receives a pre-em, with the national average being closer to 30%. This is targeted mainly at annual meadow grass and controls a few broadleaf weeds. So even where residual chemistry has been applied, a follow-up with a contact

herbicide is almost always needed, depending on spring conditions and the spectrum of weeds present.

Deciding on the best post-em strategy is dependent on the fundamental principles of matching herbicides to the weed spectrum, their competitiveness, size and density.

Competitiveness of different weed species varies considerably, so the biodiversity offered by some smaller weeds, such as field pansy, often outweighs any crop effects if the weed density isn't out of the ordinary. Other weeds, such as cleavers, can smother crops and are very competitive for light, nutrients and water so can cause considerable yield losses, as well as making harvest difficult.

Another factor to take into account when planning herbicide strategy is the effect of temperature on herbicide performance. Some active ingredients work best at warmer temperatures and their performance may be also be compromised by cold nights in the days following application — notably fluroxypyr on cleavers and sulfonylureas on other weeds.

There's a growing body of evidence that suggests a significant yield benefit can be



Alister McRobbie says Arylex chemistry offers much greater timing flexibility when compared to more traditional herbicide approaches

derived from treating weeds earlier in the season. Removing weed competition in cereals early results in more productive tillers, more grains per ear and a higher thousand grain weight. This means the best option in spring-sown crops may be a move away from the traditional timing of tank-mixing herbicide with the T1 fungicide. Early-tillering is an ideal timing, when most weeds will have emerged from the seed-bank, but it's possible to go later where cleavers and fumitory are the main targets. ▶

Spring off to a good start

The spring of 2019 couldn't be more different than last year. According to Agrii agronomist Kathryn Styan, spring barley has gone in the ground early this year on her patch in Worcs/Glos, the opposite to last spring when drilling was delayed and didn't get started until well into April because of the cold and wet weather.

"Autumn-planted crops are looking extremely well, with wheat in particular looking forward after the warm weather in Feb. Some crops need to steady up because too much soft growth in the bottom of the crop will increase the risk of lodging," she says.

"Some winter crops have some strong broadleaf weeds present after the kind winter, though on the whole my crops are pretty clean. Anyone with over-wintered cleavers or cranesbill in wheat will need to apply Arylex at T0,

especially if no grassweed sulfonylurea herbicide is being used, but most winter barley won't receive a follow-up herbicide until the T1 timing.

"Spring barley has gone in early and into good moisture so most of it has received a pre-em herbicide. This has been based around a mixture of Liberator (flufenacet+ DFF) — which has an EAMU for spring barley — and Picon (pendimethalin+ picolinafen)," she says.

That means in spring crops any follow up with a post-em herbicide will probably be later rather than earlier this year, either at T1 or as an extra pass between T1 and T2, she points out.

In spring crops, the most likely weeds to trigger a post-em based on Arylex (in either Pixarro or Zypar) are cleavers, poppy, cranesbill and fumitory in Kathryn's region. "Arylex is

particularly strong on these weeds. If the aim is to cover a broad spectrum of weeds, using one of the Arylex products along with a sulfonylurea is the best approach. This is needed for increasingly difficult weeds like bur chervil and wild carrot" she says.

Both products have a long list of compatible tank-mix partners which eases the pressure at a time when there's a lot going on in a short period of time.

"As a general rule, the more products you have in the tank, the higher the water volume needs to be," she says. "Where fungicide and PGR are applied together, I'm happy with water volumes of 130-140 l/ha. But as soon as you introduce a herbicide into the equation, the water volume needs to be at least 180 l/ha to get the spray penetration through the crop canopy



As soon as you introduce a herbicide into the equation, the water volume needs to be at least 180 l/ha, advises Kathryn Styan.

and good coverage on to the target weeds," she comments.

When Kathryn is tank-mixing Arylex products with fungicide and a PGR, she tends to use the multi-functional adjuvant Kantor in the knowledge this helps deliver the active ingredients to where they're needed, aiding coverage and product penetration into waxy leaves of some weeds.

Weed control in spring barley: top tips

- **Match dose rate to weeds present** – aim to treat when weeds are small and actively growing. Some species won't be controlled at low rates.
- **Tailor to weed spectrum** – broad tank-mix compatibilities allow the addition of partner products to strengthen control of some weeds.
- **Early weed control removes competition** – though some weeds, such as cleavers and fumitory, can be controlled up until flowering.

▶ How does new chemistry help?

The introduction of the Arylex product range has opened the door to an earlier approach to herbicide applications because of their good performance in cooler and more variable conditions. Arylex is a synthetic auxin, but it's from a completely new class of chemistry — the arylpicolinates — which differ completely in their structure and properties from other synthetic auxins, such as fluroxypyr (a pyridinyloxyacetic acid), which means it has a much wider window of application.

Last spring, Arylex was put to the test when it was applied in Scotland just after the Beast from the East blasted across the country. With conditions still cold, it worked extremely well on a broad range of weeds, while remaining kind to the spring barley crop.

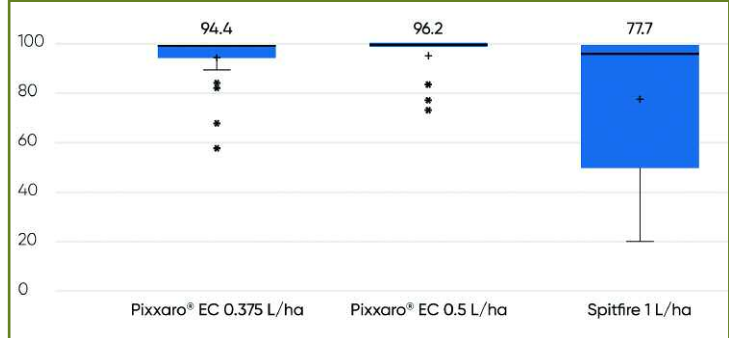
Synthetic auxins work on a number of receptors in the plant, and some of these are key to processing herbicides. Because of this, it's very difficult for a plant to evolve resistance to them. By contrast, ALS-inhibitors, such as the sulfonylureas, work on a single site so resistance can and does develop rapidly.

The Arylex molecule is available in formulation with fluroxypyr as Pixxaro and with florasulam as Zypar. Both have strong activity against cleavers and fumitory. Pixxaro is particularly useful for control of resistant chickweed because it includes fluroxypyr as an alternative mode of action. Zypar has a broader spectrum, adding control of brassica weeds, dead nettles, mayweed and cranesbill.

What results have been achieved in Scotland?

Arylex's particular strengths are three of the most problematic weeds in spring barley, namely cleavers, fumitory and chickweed,

Early season cleaver control with Pixxaro



Mean of 20 trials, applied between GS24-29 of the crop. Pixxaro contains halauxifen-methyl+ fluroxypyr and Spitfire contains fluroxypyr+ florasulam
Source: Corteva, 2019

all of which can be taken out when quite large. It also provides effective control of cranesbill and is a useful addition to the battle against resistant chickweed and poppy, providing an alternative mode of action to the sulfonylurea herbicides.

Performance against cleavers is reliable under a range of environmental conditions, offering much greater timing flexibility when compared with more traditional herbicide approaches, allowing the early removal of this extremely competitive weed. This is especially useful in Scotland, where in spring conditions can often be colder than further south.

How is it best used?

Depending on the species of weeds present, Arylex products may be used alone, or tank-mixed with other herbicides to complete the weed spectrum.

If there are pansies, umbellifers,

volunteer potatoes or polygonum species present, then the addition of a low rate of a sulfonylurea herbicide, such as Harmony M SX (metsulfuron-methyl+ thifensulfuron-methyl), should be considered. Larger polygonums may require a higher rate of the sulfonylurea.

Both products may be applied from GS13 to GS45 of the crop and work well early in the season when conditions are marginal. Using standard or low drift nozzles, the recommended spray volume is 100 to 400 l/ha of water. Lower water volumes should only be used in open crops where weeds are small. Denser crops will require a higher water volume.

Both products have a wide range of tank-mix compatibilities, including products such as graminicides, sulfonylurea herbicides and fungicides, giving growers flexible choice when it comes to tank-mixing. ■

Weeds controlled by Pixxaro

	Pixxaro EC 0.5 l/ha	Pixxaro EC 0.375 l/ha
Black bindweed	S up to 15cm	S up to 10cm
Chickweed	S before flowering	S up to 25cm
Cleavers	S before flowering	S before flowering
Cranes-bill	S up to 10cm	S up to 5cm
Docks	S up to 5cm	No information
Fat hen	S up to 25cm	S up to 15cm
Fools parsley	S up to 4lf	S up to 2lf
Fumitory	S before flowering	S up to 20cm
Poppies	S before rosette	S up to 10cm
Red dead nettle	S before flowering	S up to 18cm
Small nettle	S up to 6lf	S up to 4lf
Volunteer beans	S before flowering	S up to 8lf
Hemp nettle	S before flowering	S up to 10cm
Redshank	S up to 3lf	S up to 3lf
Shepherds purse	S up to 10cm	S up to 10cm
Forget me not	S up to 10cm	MS up to 10cm
Knotgrass	S up to 10cm	MS up to 10cm
Black nightshade	S up to 4lf	MS up to 4lf
Scarlet pimpernel	S before flowering	MS before flowering
Wild carrot	S up to 4lf	MS up to 4lf
Common field speedwell	MS up to 4lf	MS up to 2lf
Ivy leaved speedwell	MS up to 4lf	MS up to 2lf
Pale persicaria	MS up to 4lf	MS up to 4lf
Groundsel	MS up to 4lf	
Orache	MS up to 4lf	
Volunteer potatoes	MS up to 20cm	

Weed control key
 ● S = Susceptible
 ● MS = Moderately susceptible

Source: Corteva, 2019

Sponsor message

UK cereal growers need manufacturers of crop protection products to deliver genuinely game-changing solutions to tackle the challenges they face in the field. Arylex Active from Corteva Agriscience is one such innovation.

In 2016 it was the first new molecule in over 20 years to be launched in the UK to provide a new level of dependable and flexible weed control from spring applications to all cereals. It's a product well suited to the

needs of the UK grower, who often competes with cold and variable weather conditions during the optimum application periods.

Crucially, Arylex products perform in cold and variable temperatures and have a variety of tank-mix partners, providing users with more spray days and reliable performance.

Those qualities build on top of the inherent properties of Arylex chemistry to take out key target broadleaf weeds, such as chickweed, poppy, cranesbill, cleavers and fumitory.