

Tim Scott – Barton Trials site, Cambridgeshire

Tim Scott farms 600 acres of arable land in Cambridgeshire, including the site of the Syngenta Black-grass Innovation Centre, at Barton. Some of this land is farmed on behalf of the Countryside Restoration Trust (CRT).

The Countryside Restoration Trust was established in 1993 by the Chairman, Robin Page and the late artist and conservationist, Gordon Beningfield. Launched in response to concerns about intensive and industrialised farming, the CRT initially aimed to purchase land which had been intensively farmed in order to restore it to a living countryside. As the CRT has grown, its aims have broadened to encompass purchasing farmland and woodland where traditional farming methods, wildlife habitat and biodiversity are under threat.

The Syngenta Black-grass Innovation Centre at Barton is now in its third year. It continues to generate useful insights into the short- and long-term impact of cultural, chemical and application methods on grass weed control and crop yield.

The Cambridgeshire site was chosen to study black-grass because of its very high background population – 650 heads per m² which equates to 65,000 seeds per m² being returned to the soil. Over a number of years, trials have been carried out to assess the impact of different management techniques on black-grass populations. Trials data and results are available by clicking here.

Choosing the appropriate product to control pests, weeds and diseases is hugely important. However, even when the correct product is used, efficacy can be affected by application technique and conditions.

Good application relies on balancing efficiency, efficacy and environment – by optimising distribution of droplets on the target and minimising drift. Product, timing, weather, forward speed, pressure and nozzle selection all play an important role in maximising results. Trials over the last three years at Barton have shown



that water volumes can also affect efficacy, with better and more consistent black-grass control achieved when higher water volumes of 200 l/ha were used.

Pre-emergence herbicides are at high risk of drift because they are applied to bare soils. No crop is present to intercept small droplets, which are particularly susceptible to spray drift. This not only reduces the efficacy of the product applied, but also puts pressure on crop protection chemistry that is already under significant political and public scrutiny. Controlling drift is key to protecting products for the future and minimising impacts on the wider environment.

Sprayer operators need to consider:

- Forward speed needs to balance work rate and efficiency
- Boom height is the single biggest controllable factor to prevent drift
- Nozzles which produce coarser droplets will help reduce drift and increase accuracy
- Even in perfect conditions spray drift can occur

There are four main areas to consider for drift reduction:

- Weather
- Forward speed
- Boom height
- Nozzle choice

Weather

The biggest influence on drift is the wind speed. Ideal wind conditions are Force 1-2 on the Beaufort scale (1.2-4 mph or 2-6.5 kph; 0.6-1.8 m/sec). Higher speeds can cause spray to be carried away from its target. Even on a good spray day there are frequently large variations in wind speed resulting from gusts – on an ideal day at Barton last autumn, which had an average wind speed of 4 kph, on-site weather station data highlighted there were only 2.25 hours where wind gusts were below 7.2 kph.

However, it is also important to avoid spraying in completely still conditions which could cause spray to hang in the air and potentially be lost.

Forward speed

Excessive speeds can lead to decreased boom stability and create turbulence behind the boom, which may lead to increased drift and reduced product efficacy. The optimum speed for applying pre-emergence herbicides has repeatedly been shown to be below 12 kph, which delivered the best balance of work rate and efficacy.

Boom height

With a steady forward speed, the next step is to ensure correct boom height. In trials reducing the boom from 100 cm above the crop to 50 cm increased efficacy from 70%, up to 87% control. Operators' actions to aid stable and correct boom height include:

- Ensure correct tyre pressure

- Grease the boom suspension
- Lubricate bushes and bearings and check wear
- Attach a cable tie to the boom which guides 50 cm boom height
- Set up sensitivity of boom-levelling system for minimal drift.

Nozzle choice

90% drift reduction nozzles minimise the risk of drift. Wind tunnel testing at Silsoe Spray Application Unit demonstrates how some 90% nozzles mitigate against the effect of unexpected gusts during spraying, keeping product on target and maintaining efficacy.

Good application practice

Syngenta trials identified, under the same conditions, a switch to best practice, of using 90% drift reduction nozzles, operated at 50 cm boom height at 12 kph to apply 200 l/ha, delivered 10% improvement in black-grass control, compared to spraying with flat fan nozzles, operating at 1 metre boom height at 16 kph to apply 100 l/ha.

Given that the target is 97% control just to maintain black-grass populations; this highlights the importance of attention to detail with application technique to keep grass weeds in check.

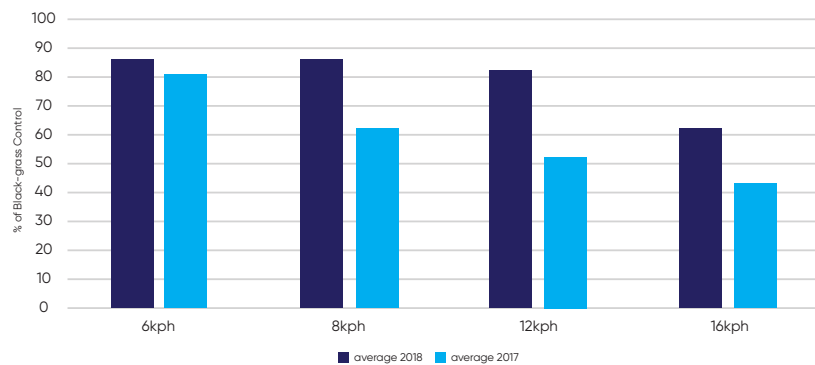
To download Syngenta's advice guidelines on pre-em application, including results from the Barton trial site, please see the further information box below.

Any equipment that is used to apply pesticides must be tested. The National Sprayer Testing Scheme (NSTS) provide testing for all types of Pesticide Application Equipment (PAE) and fertiliser spreaders.

You can also become a member of the National Register of Sprayer Operators (NROSO); a central register of sprayer operators that use Continuing Professional Development (CPD) as a means of ensuring training is ongoing.

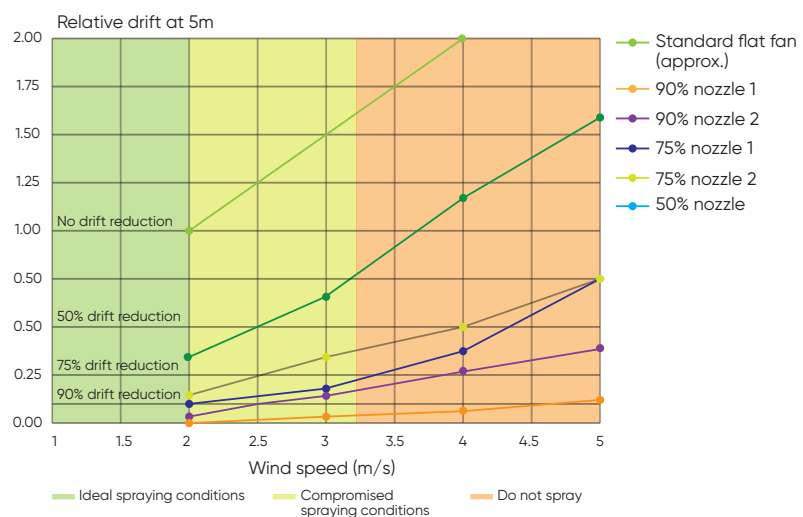
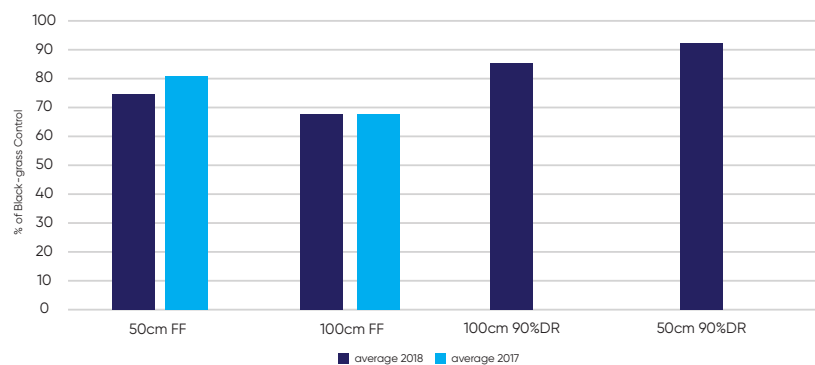
Effects of forward speeds on black-grass control

Increasing forward speed increases drift through greater turbulence behind spray boom



Effects of boom height on black-grass control

Increasing boom height from 50cm to 1m increases drift by up to 10 times



FOR FURTHER INFORMATION:

[Countryside Restoration Trust](https://www.ssau.co.uk/drift-reducing-nozzles)

<https://www.ssau.co.uk/drift-reducing-nozzles>

<https://www.syngenta.co.uk/application/pre-em-application>

[Syngenta's informative videos on good application processes.](https://www.syngenta.co.uk/application/pre-em-application)

Nearest Test Centre: www.nsts.org

www.nroso.org.uk

www.basis-reg.co.uk