



techtalk

Stubble management

Growers looking to establish autumn cereal crops need to clean up weeds and volunteers in stubbles as quickly as possible. Volunteer oilseed rape can cause problems by shading emerging blackgrass and some broadleaf weeds are poorly controlled by conventional glyphosate formulations.



Smart stubble strategies

Getting on-top of weeds in stubbles is a cost-efficient way of reducing their impact in the following crop and removing the 'green bridge'. CPM asks the experts for some tips on how to get the best out of their stubble management.

By Lucy de la Pasture

Increasing problems with all-manner of grassweeds in the rotation have promoted the importance of agronomy before the crop is even planted, to a level almost on a par with that in the planted crop. Many agronomists swear by stale

seedbeds as a crucial part of their blackgrass management strategy, as well as an opportunity to get on top of other troublesome weeds such as volunteer potatoes.

Certainly, the move to minimum-disturbance cultivation techniques has made the management of surface trash and absolute removal of any weeds that have got several weeks head start, absolutely crucial elements of successfully establishing a crop.

Getting the best out of stubble management is very much dependent on understanding the biology of the weeds being targeted. ADAS weed scientists, Dr Sarah Cook and Dr Lynn Tatnell explain some of the science behind successful stubble cleaning.

What's the aim of stubble management?

Stubbles offer the best opportunity to control a wide range of autumn-germinating grassweed species, particularly blackgrass, brome and volunteer cereals. This year, after the hot weather during seed ripening in June, blackgrass will be expected to have a low dormancy. This means that it will germinate as soon as conditions become favourable, allowing growers to spray off one or more flushes of the weed before planting.

Controlling weeds and volunteers will remove the green bridge between crops, reducing the risk of BYDV transmission and yellow rust inoculum on volunteer wheat plants. Cleaning the stubble

is also an effective means of removing the food sources for slugs, as well as facilitating low disturbance establishment methods.

Balanced with these considerations, stubble also provides an important source of food for seed-eating birds.

When does it start?


The start of stubble management is dependent on the target weeds, but will be pre-harvest where perennial weeds are present. Glyphosate can be used to control creeping thistle, couch and volunteer potatoes as well as any other perennial weeds in the crop.

A good even chop of straw helps with subsequent spray treatments. Straw residues that are spread evenly across the width of the combine cut are essential to minimise dense weed swaths, which may be competitive with the following crop.

Another area to pay consideration to at harvest-time is managing harvest traffic. Minimising extra wheelings, which increase the risk of compaction, is the aim.

Do cultivations help?

Should a stubble be cultivated immediately after the combine leaves the field? This is the million-dollar question and most likely will depend on the weed you're trying to control.



“A whole field uncontrolled isn't a sign of glyphosate resistance.”

If left alone, weeds will germinate successfully without the aid of a shallow cultivation and some weed seeds actually need to be left on the surface so they can ripen — rye, soft and meadow brome are examples of seeds that are immature when shed. When left on the stubble surface, birds and beetles will predate seeds that are present.

Plan your main cultivation to prepare the seedbed. Ploughing can successfully bury freshly shed



Sarah Cook points out that removing the green bridge is an important part of pest and disease control.

weed seed but it can also bring up seed that was ploughed down in previous seasons. For blackgrass, rotational ploughing every 3-4 years is the best way to control emergence from the seed bank.

No-till methods will leave weed seed on the stubble surface and these can be controlled prior to drilling with a non-selective herbicide such as glyphosate or Kyleo (glyphosate+ 2,4-D).

On the other hand, a one-pass system that mixes the soil to 10-20cm, will mix freshly-shed seed with old seed throughout the profile, making weeds more difficult to manage.

Do cover crops help?

Cover crops have many benefits, and in particular, they can improve the soil and increase soil organic matter. But as for their effectiveness for weed control, information is lacking, though some claim a beneficial effect on managing blackgrass populations.

Often establishment of cover crops can be difficult, which means careful consideration and crop choices are required to

achieve the right balance between weeds and crop competitiveness, which is not always easy. In some cases, to assist with weed management it's best to keep seed rates lower to allow weeds to emerge. In other cases, a very competitive cover crop is favoured to suppress and out-compete the weeds preventing emergence.

When it comes to destroying the cover crop, this should be done before any weeds set seed.

What about dormancy?

Dormancy is a mechanism to prevent germination during unsuitable ecological conditions, when the probability of seedling survival is low.

Innate or primary dormancy is a natural condition that develops as the seed matures. It prevents premature germination of the seed whilst the seed is attached to the plant, or just after shedding. A period of dormancy also allows for dispersal of the seed to avoid possible poor growing conditions around and competition from the parent plant.

Enforced or secondary



Stubble cleaning is an ideal time to deal with volunteer potatoes and other broadleaf weeds.

dormancy takes place when environmental conditions e.g. temperature or light are unfavourable. This type of dormancy can be long-term and seeds remain in the seedbank to germinate in future years.

If the weather during seed ripening (June) is hot, then dormancy will be low. In practice, this means that any freshly shed seed will germinate rapidly if moisture is present. In contrast, when this period is cold then dormancy will be high and germination will be protracted.

Moisture is key for dormancy ▶

Fools rush in

Stubble management provides the ideal time to pick up on a multitude of sins, believes Dick Neale, Hutchinsons technical manager.

The rain at the end of June provided a short but hefty dose of rain in many areas in what is turning out to be a predominantly dry season. That has left many growers uncomfortable with a flush of late weeds emerging in crops that have looked pristine up until now, he points out.

"Although it's not pleasing to look at, these late weeds aren't going to affect yields and are a perfect candidate for some pre-harvest glyphosate. It's a key time to get on top of weeds such as thistles, volunteer potatoes and late-emerging weeds after the rain, such as fat-hen, groundsel, charlock and OSR.

"Tackling weeds in the stubble is a key time to get on top of increasingly difficult broadleaf weeds. The question whether or not to cultivate really depends on whether you're targeting

perennial weeds. These need to be intact or have re-growth to get enough glyphosate uptake," he advises.

Dick Neale highlights semi-glyphosate tolerant thistles as a tough kill, along with small nettle and annual mercury on light land and chrysanthemum on the Fens.

"When targeting these weeds, you get an enhanced kill from Kyleo. Its formulation is a step-on from standard glyphosate," he says.

When it comes to dealing with grassweeds in stubbles, there's no generic solution, he believes.

"We have to sit down with the knowledge we have and make a plan. Last season, we learned that with high temperatures and dry conditions, it's best to leave as much blackgrass seed on the surface as possible and let UV light do its work — it desiccates very quickly."

One attribute Dick Neale suggests is needed when looking at stubbles is patience. Even growers who have

moved to shallow tillage struggle to get out of the mindset that they must cultivate as soon as the combine comes out of the field, he points out.

"If you're only moving the top 5cm of soil, you can make a seedbed straight away so it's best to sit back and let the sun do its work. Let any green that comes through take the moisture out of the soil, like a cover crop. Then you can pick and choose how you manage your stale seedbed — incorporate glyphosate usage with cultivations for mechanical death."

As far as blackgrass is concerned, he's expecting a low dormancy season. "If you get in too early with the cultivator then all you will do is protect the blackgrass seed by burying it away from sunlight. So stand back and think 'I can afford to wait'," he advises.

He firmly believes it's best to create a seedbed when all conditions are right, and then go straight in with the drill.

"Some growers still knock down their seedbeds ready for mid-Sept,



One attribute Dick Neale suggests is needed when looking at stubbles is patience.

even if drilling in Oct. But that extra month of weathering creates a seedbed that's too good and then can get wet. If you are going to work soils early, you need to leave a rougher seedbed to avoid this," he adds.

Stubble management: top tips

- **Know which weed is the prime target** – devise an approach to take account of its dormancy
- **Prevent survivors** – apply the right dose, at the right time under the right condition.
- **Monitor your success** – identify reasons for any poor control and adapt approach if necessary



Lynn Tatnell says distinct patches of uncontrolled weeds may be a sign of glyphosate resistance.

► break. No moisture equates to non-emergence of weeds or crops. Rolling is good, this consolidates the soil, retaining moisture and improving soil to seed contact.

What about glyphosate resistance?

There is no known glyphosate resistance in the UK. However, due to the risk of resistance WRAG produced guidelines in 2015 to help prevent glyphosate resistance and a two-page summary of the guidelines (AHDB Information Sheet 03) is available from the AHDB website — ahdb.org.uk



This season, blackgrass dormancy is expected to be low so the first flush may be early.

The current guidelines are based on four key resistance management principles:

- 1. Prevent survivors:** Avoid repeat applications to surviving plants.
- 2. Maximise efficacy:** Apply the right dose rate (reduced rates increase the risk of reduced efficacy), at the right timing, in the right conditions.
- 3. Use alternatives:** Use non-chemical options (such as cultivation), where practical, and use other herbicides in sequence.
- 4. Monitor success:** Remove survivors and report potential resistance issues to your advisor and/or the product manufacturer.

On production of the guidelines it was evident that there were data gaps for optimum blackgrass control from glyphosate, so a 5-year project has begun, led by ADAS Boxworth, 'Minimising the risk of glyphosate resistance in the UK' (2015-2020), funded by AHDB Cereals & Oilseeds (project 6131), Syngenta, Monsanto, FMC, Albaugh Europe, NuFarm, with support from Agrii, Agrovista, Frontier, and Hutchinsons.

So what are the signs of possible glyphosate resistance in stubbles? Contrary to what you might expect, a whole field uncontrolled isn't a sign of glyphosate resistance. If small, distinct patches are starting to be troublesome, that's where you should be more concerned and immediately remove all plants. To do this, hand rogueing is probably the best option.

How is the herbicide best used?

As the guidelines suggest, the best use of glyphosate is to achieve complete control and prevent any survivors. Keeping the rates up and considering the growth stage of the target weed is essential for effective control. Don't be tempted to do lots of repeated low doses to cut costs. All this will do is to increase the risk of glyphosate resistance developing.

Weather conditions around application are an important factor in. Glyphosate doesn't favour colder conditions and



Should the stubble be cultivated after harvest? This is the million-dollar question and most likely will depend on the weed you're trying to control.

under these it may be slower to work effectively.

Another consideration is to look at other ways of spraying off crops to take the pressure off glyphosate. For example, an alternative way to destruct cover crops could be by using a crimper roller, and trials are underway with this technique as part of the Innovative Farmers field lab run by the Soil Association.

How do you monitor success?

Monitoring your success is key when using stubble cleaning herbicides. Walk fields regularly, assessing for plant death and new emergence. Look out for shading, this can be seen when high populations of weeds have been treated. Some broadleaf weeds, such as oilseed rape, can protect grassweeds from receiving any herbicide and a second application may need to be made. Shading can also happen

where only grassweeds are present and it's important to identify this as a cause of lower levels of kill than anticipated. It isn't herbicide resistance. But if there is a concern that glyphosate hasn't worked effectively on the first application, it may be beneficial to cultivate then apply a robust dose for the target weed growth stage (540g a.i. — 1.5 l/ha of the 360g a.i. glyphosate product — or above) when a new flush of weeds has emerged. ■



No-till methods will leave weed seed on the stubble surface and these can be controlled prior to drilling with glyphosate.

Sponsor message

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of the glyphosate in Kyleo was taken-up by the plant within 48 hours, compared to just 74% with conventional glyphosate.

Repeated use of a single active can lead to resistance problems. Kyleo will help to reduce the risk of resistance to broadleaf weeds, however no more than two glyphosate-containing products should be applied to target stubbles. Kyleo as a first spray should ensure better performance from a follow-up with conventional glyphosate.



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