Stopping grass weeds in their tracks

Jimmy Staples
Teagasc Crops, Environment and Land Use Programme

Know your enemy. Early identification and a good understanding of weed biology are critical to early and effective control. The adoption of an Integrated Pest Management (IPM) strategy that targets the weaknesses in a plants life cycle, combined with the use of targeted herbicide applications, will give you the best chance of effective control.

This approach should be maintained over the full length of a rotation. Unfortunately, this isn't always possible and we have found that, particularly in the case of black-grass, populations are already exceptionally high before the problem is correctly diagnosed.

Experience in the UK suggests that 95% to 100% control is required to prevent populations of black-grass increasing year-on-year. It is not uncommon for black-grass populations to increase 30-fold in a single year, where no control has been achieved.

One single black-grass head can contain approximately 100 seeds and with typically 10 heads per plant, that's 1,000 seeds. A black-grass population of one plant/m² per hectare will produce 10m seeds per hectare in one season. As well as this fecundity, you have the high level of resistance present in black-grass populations, which further exacerbates the problem.

The situation is not hopeless.

Blackgrass seed has a relatively short persistency within the soil. Average seed decline in the soil is between 70% and 80% per year. As a result, if seed return is prevented, a 90% reduction in the seed bank is possible after two seasons. Preventing seed return is one of the most effective ways of controlling black-grass and preventing seed return should also help to minimise the evolution of resistance within a population.

Timing is key to effectively prevent seed return. Autumn-germinating black-grass will usually begin to flower towards the end of April and seed will start to set in the head towards the end of May. From mid-June onwards, seeds will start to shed. By knowing these important timings, you can make an informed decision about what course of action is needed.

There are a number of actions you can take to prevent weed seed return. Rogueing where populations are low enough to make it practical is one option. This will more than likely take a number of visits to the crops, as late-germinating plants may appear above the crop later in the season.

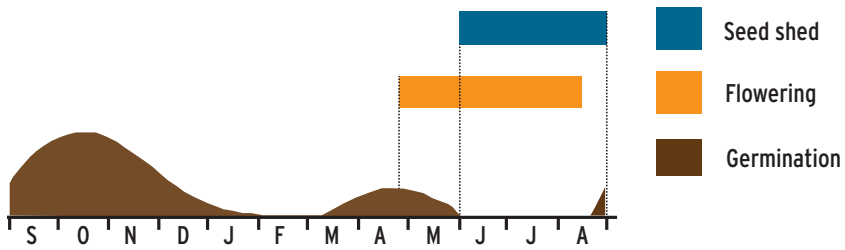
Where you have a heavier infestation, there are a couple of options available. Mowing and baling, or whole-cropping, is one. This should only be considered where you are confident that the crop will be removed before seeds start to shed. The other option where heavy infestations are concerned is crop destruction.

This means spraying out a patch with glyphosate, ideally before the end of May. This may sound drastic, but a zero tolerance approach to black-grass has to be taken in order to ensure that it doesn't become a major problem in the years ahead. The alternative is to take the field out of arable production and put it into grass for a minimum of five years.

Conor's experience is typical of what we are encountering where black-grass has been identified. In most cases, it is not identified in the first or even second year, but only after there is a significant population that is beginning to reduce crop yields. As mentioned, early and accurate identification gives the best chance at achieving effective control at the least cost.

Crop destruction or taking fields out of production are options that people may have to consider, but every farm is different and whatever control options need to be undertaken should be tailored to the circumstances of the specific farm.

Figure 1: Black-grass life cycle (Source AHDB).



Conor O'Callaghan.

Crop destruction with glyphosate, where a heavy population of black-grass was identified.

Advisor Experience

Conor O'Callaghan, Teagasc Crops Advisor, North Dublin

During a routine walk in a crop of winter oats, I spotted a long, slender, dark-coloured grassweed head just peeping out from below the crop canopy. After examining the plant, I could confirm that it was black-grass. It had emerged along one strip in the field parallel to the boundary hedge and, after walking the entire farm, I couldn't find it anywhere else on the 400ac farm.

The farmer was amazed and shocked at the discovery and could not work out where the black grass had come from. The usual causes were considered – the first potential culprit was a combine that was bought from the UK a few years ago, but this was ruled out after walking the fields the combine harvested on the farm in its first year.

The baler was also ruled out, as the infected area was half way down the field. Other possible causes, such as seed, grain and bale trailers along with the neighbouring farm, were also eliminated.

Regardless of the still-unidentified source of infection, we had to come up with a plan to try to control and eradicate the black grass. Firstly, we estimated the area of black grass – a patch of 4ac was infected with 700-800 heads per metre square. The best and most effective course of action in this case was crop destruction.

The following morning, the farmer applied glyphosate to prevent seed return, as the seeds were not yet viable.

He continued to monitor the rest of the farm and hand rogue any remaining black-grass before destroying it to eliminate seed return or contamination of other parts of the farm.

Going forward from here, a control and eradication strategy begins with building a resistance profile for the black-grass.This involves sending samples to Teagasc Oak Park to be tested for levels of resistance to herbicides and then forming a rotation around the results, which are due back early next year.

For the remainder of the year, the farmer will use stale seedbeds to try and reduce the seed bank as much as possible, in addition to increased machinery hygiene around field work and harvest.