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# Trialling a route to better maize

## Technical Maize trials

The Hutchinsons maize trials in Cumbria are shedding new light on how to maximise the productivity of crops in more marginal maize-growing areas. *CPM* takes a look at the latest trials.

By Rob Jones and Lucy de la Pasture

The old adage that no two seasons are ever the same has been very evident in recent years, creating markedly different challenges for growers and agronomists alike. Managing these seasonal variations is tricky for any crop, especially one like maize when it's grown in the north-west of the country where the climate can be less conducive to warm-season crops.

While many maize crops are established under film to mitigate some of the early season risks from cooler temperatures in spring, the technique creates its own challenges and requires considerable investment. To counter this, maximising crop output is vital to secure the future of maize growing in such areas.

This aim lies at the heart of the Carlisle Regional Technology Centre at

Smalmstown Farm near Carlisle, where a range of varieties and growing techniques are being put to the test to identify what does and doesn't — vital lessons that can then be used to inform farm practices, believes Hutchinsons agronomist Jim Clark.

Speaking ahead of an open day at the Carlisle site, he's optimistic that maize will perform well this season, thanks to the favourable summer growing conditions which benefitted development and maturity.

"Crops did look quite variable early in the season when conditions were very dry, but they've really made the most of the summer. Most have put on two full cobs and have huge potential."

### Maturity

Jim notes that cob maturity in many of the plots is at least two weeks ahead of last year, which means they could be ready for harvest before plants senesce. "It's the cobs that contain the starch and energy so, once they're ready, it's time to get the crops off even if the plants are still green," he says. "That may not be something growers are used to doing."

This year, 10 different varieties are being compared at the Carlisle site, all grown under film, with some also sown in the open. Jim says popular varieties like Prospect, Cardiff and Pioneer 7034 all look good, but one of the most exciting is a new coded variety which isn't yet commercially available. "It looks noticeably bigger than the

other varieties and seems to have real yield potential, so it's definitely one to watch."

A key part of the maize trials, and one that generates particular interest among farmers, is undersowing the crop with grass to reduce erosion and build soil health. The technique is increasingly popular, but there are some concerns that residues from sulfonylurea (SU) herbicides could adversely affect grass establishment.

An informal trial in 2020 broadcast ryegrass seed onto a treated area and didn't show any significant adverse effects, but a more detailed investigation this season appears to suggest that some level of



The undersown grass in some plots are showing damage from SU chemistry, says Jim Clark, so he suggests that both herbicides and grass species will have to be carefully considered.



*The trials are looking at undersowing the maize with grass to reduce soil erosion and for its soil health benefits.*

negative impact could be occurring.

Maize plots were sown as normal in the spring and treated with two herbicide mixes containing mesotrione and either nicosulfuron or prosulfuron, both of which are SU chemistry. A Zocon Greenseeder drill was then used to undersow a Westerwold Italian ryegrass mix between the maize rows at 19.76kg/ha six weeks after drilling.

"Some of the undersown grass has been a bit disappointing this year," admits Jim. "It appears that the dry conditions early in the season meant herbicides lasted longer in the soil and when rain eventually came, it activated the chemistry. Some yellowing in the grass was clearly visible as it took up the herbicide."

Grass grew best where straight mesotrione had been applied, indicating that it was the SU element of the mixes that was having the main effect, he adds.

Indeed, the host farmer, Messrs Fisher, has 20ha of undersown maize in the ground this year, established alongside the trials. It did not receive any SU-based herbicide, and he believes the cover will be good enough to graze sheep on once the maize has been harvested.

"Undersowing research is definitely still work in progress, but that's what trials are all about," says Jim. "The plots which showed some damage from SU chemistry suggest we may need to look at the products we apply when undersowing maize is planned, but also the species of grasses we select as there are differences in their susceptibility to herbicide damage," he says.

Jim acknowledges the situation is more complex for maize grown under film, as growers must wait for the film to break down before going on with post-emergence herbicides, during which time weeds continue to grow. "Some of the more 'grass-friendly' herbicides often aren't as effective on larger weeds, so unless you're hitting weeds when they're small, products

can sometimes struggle."

The solution is therefore likely to require different approaches, so next year he plans to experiment with different grass seed mixes to see which offer greatest tolerance to any potential impact from SU residues. Fescues, for example, are thought to be more tolerant.

Initial observations from the starter fertiliser trial suggest there is once again a clear benefit from applying a targeted nutrition product with the seed, even when maize is grown under film.

Plots of P7034 maize were sown on 16 April under Samco green film using a specially modified drill fitted with a microgranule applicator. Two starter fertilisers were compared; ammonium phosphate-based Primary-P and a new developmental product called Biolite. Last season both increased dry matter yield by 3.2% and 3.1% respectively.

## Starter benefits

"We'll know more once crops have been harvested and yields analysed, but so far we're definitely seeing similar results in terms of crop development to last year, when plots that received the starter fertiliser established quickly and looked physically bigger than the untreated maize."

Jim believes there's scope for many growers to improve early maize nutrition by using starter fertilisers. He also says they negate the risk of root scorch, which can occur when granular fertiliser is applied "down the spout" and sits too close to the seed.

It's a particular risk in rough, dry seedbeds where fertiliser does not dissolve and so scorches the developing roots, he



*Same variety of maize but the cob on the left was established under film, whereas the cob on the right was established in the open.*



*Trials using a biodegradable film have been looking good and Hutchinsons are assessing its performance when using the biofilm in narrow rows to reduce the cost.*

says. "We've seen a few cases this year where crops have blown over in windy weather due to a lack of root anchorage on one side and that has been caused by root scorch."

Another trial at the Carlisle site shows promising results from crops established under a new 100% biodegradable film. "These plots performed best in 2020 and visually plants look bigger this year," he notes. The reason is not entirely clear, although it may be because the faster film breakdown means developing plants are not being held back by film sitting over the leaves.

Jim acknowledges the upfront cost is currently around £148/ha more than conventional film, which is why Hutchinsons has been trialling a narrow row version of the Bio film system to reduce overall costs. "It ticks a lot of boxes as it uses less film, is better for weed control and for sowing grass into, however I'm not yet entirely convinced crops have the same bulk."

Soil temperature assessments earlier this season indicated narrow-row plots were 4-5°C cooler than soil under the standard double-row film, which may have had a knock-on effect in slowing the rate of crop development, he suggests.

"They were all sown on the same day, and all came up quickly as there was moisture in the soil. However once we got to about week three, differences started to emerge when the double-row maize seemed to grow away faster. It'll be interesting to see whether that difference shows up in yields at harvest."

It may be possible to combine narrow-row film with a starter fertiliser to negate any drop in soil temperature, although Jim says more work is required in this area before any firm conclusions can be drawn. ■