



North County Dublin tillage farmer Derek Rodgers with his Teagasc advisor Conor O'Callaghan.

# Fungicides: it's all about the timing

It costs a fortune to fill your sprayer at this time of year, so it's vital that fungicides are applied when they can be most effective

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**D**isease control in May and June will determine crop yield and grain quality. The latter is crucial where you are growing high value crops for human consumption which usually have very specific quality criteria without which you won't achieve the premium.

The whole rogues' gallery of mildew, rychnosporium, net blotch, septoria and others can, if uncontrolled, have a devastating effect on crops particularly at this time of year. In most cases, we have chemical options to control them, though timing of application is extremely important.

In winter wheat we normally have

a three spray strategy at leaf 3 fully emerged, flag leaf fully emerged and mid flowering. In some high septoria, or yellow rust, pressure situations a leaf 4 application may also be needed.

In recent times we have seen quite a bit of confusion around these timings with the result that farmers and indeed many agronomists became confused about the correct time to apply the appropriate fungicide mixes. Given that you will spend about €250/ha on disease control in winter wheat this could turn out to be very expensive should the applications go on at the wrong times.

We have seen in the recent years that the efficacy of certain chemis

tries has become 'challenged', especially if there is high disease pressure. Therefore, to make the best use of the available chemistry, which are mainly preventative, their application to the crops must be timed correctly.

## Greater accuracy

Teagasc is aiming to achieve greater accuracy by using a more descriptive system, based on the target leaf, e.g. leaf 4, leaf 3, flag leaf or head to identify timings rather than the old system of T0, T1, T2 and T3.

The time gap between the leaf 3 spray and the flag leaf is usually about three weeks. If the leaf 3 application has been timed correctly, when the flag leaf is fully emerged it should be free from septoria.

Each leaf takes approximately 120 degree days to emerge, so if the average day and night time temperature is 10°C, each individual leaf will take 12 days to fully emerge meaning the time taken for leaf 2 and leaf 1 to emerge will be about 24 days i.e. three weeks approximately.

More importantly, septoria generally takes about 300 degree days to cycle or almost 30 days, therefore leaf 1 or flag leaf should emerge 5-6 days before the septoria completes its cycle. As the available fungicides have limited curative activity on septoria they will perform better when they are applied before the septoria infection hits the flag leaf.

## Barley

In barley, similarly, timing of the final fungicide has long been a debate among farmers and agronomists. Some are still of the opinion that, as for wheat, we must keep the barley crops as green for as long as possible into June and July.

However, unlike wheat, the upper canopy in barley does not contribute as much to final yield. Barley generally has enough energy within the crop to fill each grain site so facilitating the movement of the energy within the crop is the aim.

Ramularia is the target disease that will eventually take over in barley and it is made worse by stress on

the crop. It usually spreads from the bottom leaves up to the top of the crop as it matures and there are no curative fungicides which can kill an infection. Therefore preventative fungicides must be applied at the correct timing to delay the spread of the disease.

Teagasc has completed a number of trials over the years looking at the most effective fungicide timings on both winter and spring barley and we have seen that the final application on barley at the awns peeping stage GS 49 gives the best response when trying to control ramularia.

## Final application

In the graph (below) we can see that where the final application of a fungicide is delayed to flowering i.e. GS 59 or approximately two weeks post awns peeping that there is a 0.4t/ha yield loss.

This 0.4 t/ha loss results in the delay in the control of the spread of the ramularia up through the canopy of the crop and up onto the flag leaf

and awns.

At current prices that 0.4 t decrease in yield would cost a grower in the region of €80/ha which is more than the cost of the fungicide applied.

Similarly in oats the fungicide programme is very descriptive when it comes to the correct timing of the fungicides with the early season mildew and crown rust being controlled at GS 30/31 followed by a second application at GS 32.

These applications coincide with the applications of growth regulators and help to keep the crops clean. However with the final fungicide, we try to target the crop when the head or panicle is about half emerged, this timing gives us good control of the diseases present at the time of application.

Not only that but it also gives us good persistence into the season, keeping the crop greener for longer and also helping to reduce brackling of the crops coming up to harvest and helps to achieve the key quality parameters for food grade specifications.

## CASE STUDY: Derek Rodgers, Ballyboughal, Co Dublin

Derek farms alongside his father David and they grow a variety of crops including wheat, barley, oats and potatoes. Attention to detail when it comes to fungicide timings is something that Derek is keenly aware of.

This year Derek is growing varieties such as Graham, Champion, Gleam and Dawsum winter wheat; Joyou, Intergral, Molly and Orcarde winter barley; Geraldine, Hurler and Spinner spring barley, along with Isable spring oats.

Some of these varieties can be at risk from various diseases throughout the season so it is crucial for his business that he applies fungicides when they are most effective. "Fungicides are expensive" says Derek, "but they are even more costly if they are not applied correctly and at the correct time. We aim to apply the fungicides at the correct time to benefit our crops when we apply them".

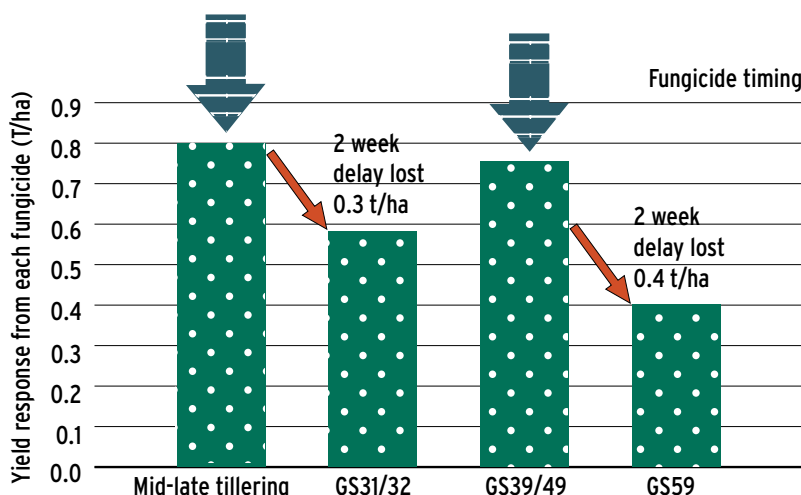
**Figure 1. Spring Barley Fungicide Response**

**Trial locations:** Carlow, Kilkenny, Wexford, Wicklow

**Varieties:** Snakebite, Quench Taberna, Propino

**Product applied:** 1.0l/ha Siltra

**Years:** 2012-2015



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