

Early Disease Control Strategies for Winter Wheat and Oilseed Rape



Dr David Ellerton
TECHNICAL DEVELOPMENT DIRECTOR

So far this autumn and early winter, the UK has once again experienced mild weather conditions favourable to disease development and choice of varieties highly susceptible to key diseases will increase the risk of early disease onset in many crops this spring.

In this article Dr David Ellerton, (Hutchinsons' Technical Development Director), highlights some of the risks and considers early fungicide strategies designed to maintain yield potential.

Influence of the weather

Autumn and winter 2015/16 saw very mild temperatures accompanied by extreme rainfall leading to high disease pressure coming in to the New Year.

This wet weather continued into the spring, leading to significant increases in wet weather diseases such as Septoria and high levels of yellow rust in certain varieties of winter wheat, eventually leading to yield responses to fungicide programmes close to the long term average in AHDB variety trials.

In variety trials in 2015/16 at Hutchinsons' Regional Technology Centres (RTCs), fungicide treatment produced yield increases averaging 2.77 t/ha (32.97 %) across all sites and varieties (Figure 1) 1.00 t/ha more than the previous season. However, there were extremely large differences in responses with varieties such as 'Reflection', 'Santiago', 'Cordiale', 'Britannia' and 'Kielder' giving average responses of over 4.0 t/ha, while 'Belgrade', 'Revelation', 'Skyfall', 'Siskin', 'Graham' and 'Anapolis' averaged a smaller (but economically very worthwhile) response of less than 2.0 t/ha. At our Ludlow site, where disease pressure was particularly high, yield responses averaged a tonne/ha

higher at 3.7 t/ha across all varieties, with treated yields averaging a very high 15.29 t/ha.

Once again, during our current autumn and early winter, the weather has been relatively mild, resulting in significant foliar disease development in some crops, depending upon drilling date and region, including Septoria on lower leaves, along with

yellow rust and powdery mildew varying with variety. Should weather conditions conducive to further disease development continue this spring, there is a good chance of early disease progress this season - particularly with varieties prone to the two main foliar diseases - Septoria tritici and yellow rust.

[Continue overleaf >>>](#)

Winter Wheat Varieties Fungicide Responses 2015/16 Yield (t/ha)

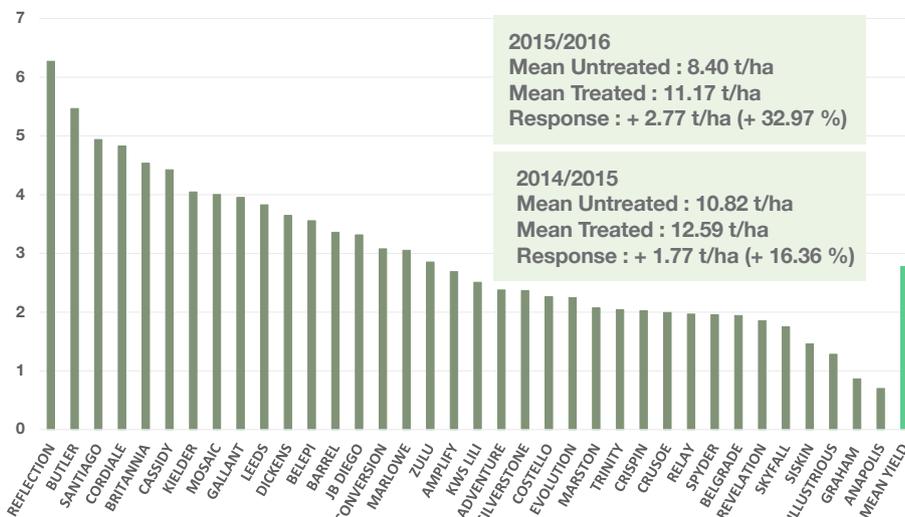


Figure 1: Varietal response to fungicides in Hutchinsons RTC winter wheat variety trials, 2015/16

Trial ref: WW
Location: Mean of all 8 English sites
Sponsor: Hutchinsons

>>> The latest AHDB Recommended Lists have given more detailed information on varietal susceptibility to *Septoria tritici*. Of the winter wheat varieties on the list 'Crusoe' (6.7), 'KWS Siskin' (6.8), 'LG Sundance' (7.3), 'Freiston', 'Dunston' and 'Graham' (all 6.7) all show reasonable resistance to *Septoria tritici* while 'Gallant' (4.6), 'Cordiale' (4.8), 'KWS Barrel' (4.4), 'Leeds' (4.6), 'Viscount' (4.6), 'KWS Silverstone' (4.6), 'KWS Santiago' (4.3) and 'Dickens' (4.7) are all particularly prone to *Septoria* infection and will need to be prioritised for protection against *Septoria* at the T0 timing. As far as yellow rust is concerned, the AHDB have based current variety ratings on last years' assessments alone, with varieties such as 'Gallant', 'Cordiale', 'Britannia', and 'Myriad' all having a susceptible rating of 4, while 'Reflection' is now rated as highly susceptible to yellow rust with a score of 3. This was reflected in a huge yield response of the variety to fungicides of 6.27 t/ha in last seasons' Hutchinsons RTC variety trials. On the other hand 'KWS Trinity', 'RGT Illustrious', 'Crusoe', 'KWS Siskin', 'LG Sundance', 'LG Motown', 'Revelation', 'Freiston', 'KWS Crispin', 'Dickens', and 'Costello' all have a very high level of resistance to the disease, scoring 9 at present. It is important to recognise that mutation of the disease may allow it to overcome varietal resistance at a future date.

Growers should consult the AHDB recommended list to identify other varieties at risk of these and other foliar diseases, as well as stem based disease, such as eyespot, where most winter wheat varieties are very susceptible.

Controlling *Septoria tritici* and Yellow Rust

Trial results from both Hutchinsons and other organisations have shown the value of early season applications of multi-site fungicides such as chlorothalonil, folpet or mancozeb, in order to protect leaves from development of *Septoria tritici* later in the season. This is particularly important, bearing in mind reports of populations of *Septoria* showing resistance to the SDHI group of fungicides and the continued reduction in the efficacy of triazoles. Maintaining disease control in protectant mode is also crucial, considering the relative lack of curative activity on *Septoria* from the range of other active ingredients available.

As far as yellow rust is concerned, the disease is able to survive over winter as dormant mycelium, or as active lesions on green living tissue and can



Early *Septoria tritici* in wheat

survive down to very low temperatures (including freezing), although 10-15°C is optimum for spore production and dispersal. Once spores are produced, they are spread easily by winds which have been much in evidence over the winter period.

Growers should be vigilant in checking all wheat crops, and particularly susceptible varieties, for foci of yellow rust infection and treating promptly should the disease be found, even prior to the traditional T0 timing of GS 29/30.

Winter Oilseed Rape

As for oilseed rape, crops this season are once again at high risk of light leaf spot, as shown in the Rothamsted Light Leaf Spot forecast displayed below in Figure 2. The risk forecast will be updated in early 2017. Growers should therefore be vigilant in checking crops for light leaf spot. Although there is no threshold for treatment at this stage, consideration should be given to spraying with a suitable fungicide should the disease be found at significant levels.

For the most appropriate course of action for your crops this season – consult your local Hutchinsons agronomist.

WOSR - Rothamsted Risk Forecast for LLS, 2016/17

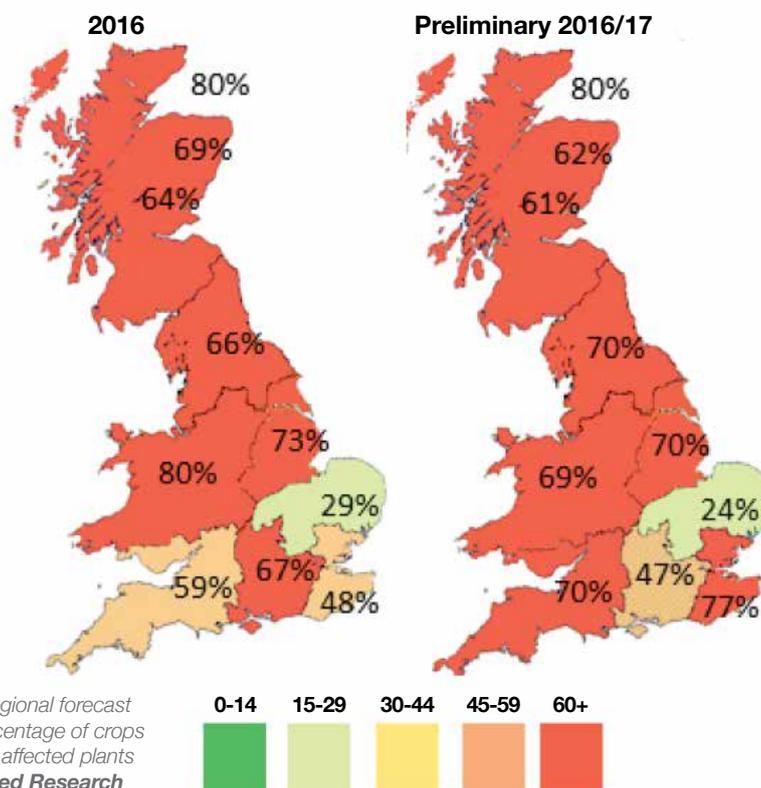


Figure 2: Rothamsted Light Leaf Spot Forecast as of 8 November, 2016

Spring barley competes aggressively with black grass

Spring Barley Early Season Agronomy



Neil Watson
SOUTHERN REGION
TECHNICAL MANAGER

Neil Watson (Hutchinsons Southern Region Technical Manager) outlines the key areas to consider, when planning to grow a successful crop of spring barley and keep on top of weeds.

Cultivations

Cultivations create weeds; minimising soil movement during the sowing process will minimise the weed seed germination. Excessive soil movement also dries out the seedbed, not only compromising crop emergence, but also affecting weed seed germination patterns and adversely affecting the impact of residual herbicides on weed control. Slow and uneven crop emergence dilutes the competitive nature of the crop itself (in terms of weed suppression).

To minimise seedbed movement at sowing, the previous autumn's cultivations should have been planned and carried out to facilitate a good, level spring tilth.

The inclusion of an appropriate cover crop, should leave the soil well-structured and drying throughout the profile, to allow the earliest possible access in the spring.

Stale seedbeds

If stale seedbeds are planned, then these must be given at least 30 days pre-sowing to be effective (there would be little point in using stale seedbeds for early sown crops, yet equally it is not these situations where black grass is likely to be an issue - i.e. the prime reason for stale seedbeds). If insufficient time is allowed (between secondary cultivations and drilling), then the weed seeds become 'primed' and able to outcompete the sown crop once sufficient moisture becomes available. Our own trials' data would suggest if enough time is not available, then delaying any cultivations to just prior to sowing would be the next best, alternative strategy.

Crop Competition

Early sowing into cold, damp soils should be resisted, particularly where black grass is a major driver. Crop growth must be rapid, to swiftly smother grassweeds in the early growth stages of development. Rapid crop development will not necessarily reduce black grass emergence, but will instead reduce seed return through increased competition impacting on the number of tillers per plant and seed per head. Barley is most able to do this, whereas wheat and oats grow more upright, allowing light into the base of the crop for longer.

Variety choice

Talk to your merchant to discuss their local requirements from a marketing perspective. Please see our previous issue of Fieldwise (December 2016/ January 2017 – available online) as a reference for this particular aspect.

Seed rates

With two row barley, it is imperative that we understand the importance of planting density from a crop physiology point of view. There is a strong relationship between grains/m² and yield. It should be recognised that two row barley crops have a limited ability to compensate for low plant stands, with increased grain numbers/ear, due to producing only a single grain per spikelet. Therefore, any increase in yield must almost exclusively come from high ear counts/ planting densities.

Hutchinsons have also carried out extensive work at our Brampton site on the interaction of seed rate/ planting density on black grass

control. The higher seed rates produce a more competitive crop, thereby reducing tillers per plant and ear size of any surviving black grass plants and hence seed return.

Herbicides

Herbicide choice is determined by the expected dominant weed species, quality of seedbed and moisture availability. Residual herbicides are particularly worthwhile for earlier sown crops, or where resistant weeds to ALS chemistry are of concern, or in black grass situations. Pendimethalin is a mainstay of spring weed control, but used either straight or as mixtures, certain flufenacet products are also available for spring application - in both situations labels must be checked for approval on the crop to be treated.

For later crops sown in both dry and warm soils, the use of full rate pre-emergence herbicide needs to be questioned.

Remember your key driver

Finally, as the acreage of spring barley has increased dramatically on the back of black grass control, our advice to newer growers is to remember what your key driver is for growing this crop. If your key driver is black grass control and you are farming heavy land, be realistic on what is achievable in meeting the market's specifications for quality.

Do not get tied into contracts that you will have little chance of delivering and have a negative impact on your black grass control.

Soil health – a better look!

Soil health has been a popular topic of discussion over the past year, featuring in almost every farming magazine edition and a real focus on AHDB Monitor farms. Dick Neale (Hutchinsons Technical Manager) explains the need for a major change in soil health assessment.



Dick Neale
TECHNICAL MANAGER

In past years ‘soil health’ may have been regarded as a soft, open structure via ploughing or deep non inversion tillage, with subsoils loosened via deep subsoiling operations.

This approach has always been based on the mechanical manipulation of soil as a growing medium, but increasingly the need to understand the science of how soil actually functions and the interaction of the physical, chemical and biological processes that exist, are rapidly coming into focus.

Much of the mechanical inputs currently practised are a reaction to the damage caused to soil with every increasing machine size and weight, or the fact that technological advances in tyres, tracks, CVT transmissions and electronic power management allows us to be in fields working soil when its plastic limit has been exceeded.

We can ...so we do!

The need to change the way we do things in one area of agriculture is often driven by the need to change in another and the need to manage resistance in weeds is a clear example.

Aggressive cultivations both replenish weed seed banks by mixing new seed in and bring up old seeds to germinate in the established crop. Weed growth is clearly linked to soil management, so changing soil management can have a direct impact on weed control.

The impact on soil structures, biology and the soil’s ability to sustain healthy crops has been studied at our Brampton site alongside black grass control and at our Norfolk based nutrition study site.

I believe there is one clear issue - nutritional inputs cannot be fully utilised in biologically depleted and structurally inadequate soils.

There is a need to radically change the way we assess the condition of our soils, what we look for and how we measure it.

One major change needed is *when* our soil is inspected and assessed.

Traditionally soils are sampled and inspected shortly after harvest, when fields are easily accessible and the next operation will be to cultivate. It is the end of summer, it has been warm and dry and the departing crop has sucked every drop of available moisture from the upper horizons. The soil is therefore cracked and hard, penetration with a spade is nigh impossible in all but the lightest soils and the decision to break up this hard ‘compacted’ mass with steel is once again made.

But take that spade to the same soil in March or April, when active root growth from the current crop is also in play and the soil is damp from overwinter rains - the need for cultivation intervention would frequently be very different. When water is passing through the profile, roots are making good progress to depth, the soil is forming strong natural aggregates and earth worms are active and present throughout the profile. Why would any of this have changed by the end of August? The answer of course is that it will not, other than the loss of moisture to the growing crop.

Good soil assessment means inspecting all the available indicators in a logical, formalised set of steps

from the soil surface to the base of workable soil depth, inspecting each soil horizon as you go.

Are wet areas caused by surface crusting? If identified, is compaction at depth or does the subsoil clay simply rise closer to the surface in those areas? Each situation requires a different management approach.

Natural aggregation, colour and smell are all indicators of your soil’s true state and none of these are apparent in hard, dry August conditions. The same is true for earth worms; these are a strong indicator of soil health and a healthy population apparent in April will be tightly curled up conserving moisture in the hard, dry soils of August. Another clear soil health indicator overlooked with the post-harvest inspection.

The Hutchinsons healthy soils programme aims to deliver a hands-on soils assessment report and future strategy, through a dedicated team of trained agronomists. Soils will be scored against a set of assessment benchmarks to allow clear identification of soil issues and recommendations for soil improvement, plus rectification of identified physical, biological and structural concerns.

The healthy soils programme will be a progressive tool for measuring improvements from season to season and across the rotation, helping growers to establish a long term soil improvement plan, based on the individual requirements of a farming business.

For further details, please email information@hlhlt.co.uk or contact your Hutchinsons agronomist.

Yield Enhancement Networks 2017

Dr Bob Bulmer (Hutchinsons Trials and Research Manager) gives an update on the 2016 wheat YEN results and outlines new yield enhancement project work with other crops.



Bob Bulmer
TRIALS AND RESEARCH MANAGER

Winter Wheat YEN

Entering its fifth year, this project is going from strength to strength with 100 entries in 2016 including submissions from Denmark and Holland. Wheat yields have been disappointing in 2016 compared to 2015. The winner of the 2015 competition achieved a yield of 16.5t/ha compared to 13t/ha in 2016. Average YEN yields were also lower: 12.7t/ha in 2015 compared to 10.3t/ha in 2016. Despite this there has been a lot to learn this year about how crops use the basic resources of light and water. Light has been the main limiting factor in 2016, but surprisingly overall light levels have been similar to the long term average. It is the dull June weather that has had a major impact on wheat yields, reducing the crop's ability to accumulate biomass and restricting grain size. Water has also influenced yield in 2016 - normally lack of water limits yield potential, but in 2016 the reverse is true with excess water in the winter period restricting rooting, coupled with wet soils in June decreasing the crop's ability to maintain ear numbers and produce stem carbohydrates. High temperatures in June and July also depleted the crop's carbohydrate stores and a large number of crops finished quickly because of high July temperatures.

The high performers in the 2016 competition came from the North of the UK and Denmark and this is explained by better light levels in June in these areas compared to southern and central England.

These findings reinforce the importance of good soil management, nutrition, plant protection and informed variety choice in moderating the impact of adverse climatic conditions. The farmer's and the agronomist's understanding of the processes affecting yield and how to influence yield positively have also been

highlighted as a major influence on yield performance. Most farmers are joining yield enhancement projects to understand how they can improve crop performance on their own individual site. It is interesting to compare variety yield performance at eight of the Hutchinsons research centres. On average, choosing the best variety for the site will have a positive effect on yield of 1.34t/ha, whereas site differences, which will include factors like soil type, rotation and soil management result in much larger yield differences of 5.52t/ha. It is understanding the drivers behind this that is motivating farmers to get more involved with YEN projects.

The Wheat YEN competition is open for entries in 2017 and it will include a quality wheat category this year. For more information, contact your local agronomist or use the link at the end of this article.



Oilseed Rape YEN

An oilseed rape YEN project has been launched for harvest 2017. This project is being managed along similar lines to the wheat competition. There is plenty to learn about the factors which influence oilseed rape yield; the national average for this crop has been 3.5t/ha for the last five years - just compare this to the UK record of 7t/ha and a calculated yield potential figure of 10t/ha.

Beet Yield Competition

Following a pilot study in 2016, access to this competition will be more widely available in 2017. This competition is focused on performance against site yield potential rather than yield and prizes will be awarded for the best performance in a factory area and also an overall country champion. Site potential will be determined using the BBRO crop model which includes sowing date, along with soil and climatic factors.

This competition will enable sugar beet growers, agronomists and researchers to work together to find out how best to improve sugar beet yields and share best practice, to contribute to the future success of the UK sugar beet crop.

- In the UK, sugar beet crops have produced 145 tonnes per hectare, but the national average is less than half of this.

To register your interest, please email your name, contact details and grower number to: BYC@bbro.co.uk

Pea YEN project

Pea yields, based on Defra data, appear not to have improved for thirty years. Part of the accepted reasoning behind this; is the crop is more vulnerable than most to the vagaries of the climate. However, there is still a gulf between the highest yielding crops and the average nationally recorded yield, which would indicate there is considerable room for improvement in factors that are under our control. Although only in its inaugural year in 2016, the YEN Pea project is aiming to benchmark, through farmer involvement, the key attributes that determine yield and to understand their relative importance. The starting point is to determine if the crop is predominantly light or water limited. In common with the cereal crop, early indications would suggest biomass and secondly its partitioning between seed and straw might have a major and consistent bearing on yield.

Interested in participating in a YEN project this season? Please read updates on our website www.hlhld.co.uk and email Dr Bob Bulmer at information@hlhld.co.uk





Tim Kerr
FERTILISER MANAGER

Fieldwise Nutrition - potash

Tim Kerr (Hutchinsons Fertiliser Manager) highlights the preservation of soil quality and focusses on the importance of potash in spring nutritional requirements.

As Donald J Trump settles into the Oval office, it is worth reflecting on the insight of one of its earlier occupants.

In a letter to the State Governors in 1937, the 32nd President of the United States of America, Franklin D Roosevelt wrote "a Nation that destroys its soil destroys itself".

The 45th President favours the medium of Twitter to share his political acuity, but 80 years on the words of wisdom from his predecessor ring just as true in the UK in 2017... and the **Healthy soils programme** discussed in this edition of Fieldwise is a result of Hutchinsons recognition of the need for common sense advice and decision support in managing this fundamentally precious resource.

Sadly one of our own domestic resources has been depleted to the point that the owners of the Boulby Mine in the North East of England, the UK's deepest mine, have announced that they will cease to extract potassium chloride, or MOP as it is commonly known, in the next two years. Boulby supplies over half of the UK's potash – however it is becoming uneconomical to continue mining potassium chloride. The mine will continue and will focus on polyhalite production – a valuable fertiliser containing sulphur, potash, magnesium and calcium.

Thankfully there are plentiful global supplies of potash and there are other European sources of MOP – Russia, Germany and Spain all have working potash production facilities.

Polyhalite will undoubtedly become a more familiar product to farmers in the near future, not only will the

existing potash mine convert its production over to this product (marketed as Polysulphate) but also Sirius Minerals are pursuing an ambitious project to develop a brand new mine producing polyhalite further down the coast from the existing Boulby mine.

As we approach the first round of spring nitrogen applications, it is worth reminding ourselves of the importance of other nutrients such as potash in contributing to yield.

Nitrogen is a key driver of yield, in part through its role in cell initiation and expansion. Increased cell numbers and size have a positive impact on capturing and converting the energy of the sun into dry matter. More, larger plant cells will consequently require more water to maintain turgor – and potassium is the key element in maintaining the cell tissue's water content. Remarkably, a wheat crop which is not limited by nitrogen will contain between 10 and 15 tonnes per hectare more water than a crop with limited N supply. In order to maintain the benefits of the nitrogen that is increasing the crop's yield potential, correspondingly more potassium will be needed by the crop.

I am indebted to another very valuable domestic resource – Dr Johnny Johnston, for this information about the extra water in crops that are not limited by nitrogen. It helps us to understand, in part, the influence of potash on the nitrogen use efficiency.

The phosphate and potash recommendations in the tables in the Fertiliser manual (RB209) refer to specific yields (e.g. 8 tonnes per ha of winter wheat) and it should be stressed that if your expectation

is greater than that, then it is worth paying careful attention to balancing the potash requirements of the crop.

Early spring is as an ideal time for applying potash, so it is a good idea to check the levels of plant available K in your soil by having a sample analysed and ensure that sufficient K has been, or is, applied to meet the crop *potential*... **Yield will be compromised where soil K levels cannot meet the demand of the crop.**

Considering that the peak uptake can reach 10kg/ha per day in cereals through the late spring, it pays to understand the capabilities of your soil and its ability to replenish the K in the water being taken up by the roots.

This brings us back to the topic of soil and understanding its properties and how to look after it. **Soil really is the farmer's most precious resource - we should therefore take heed of the words of Mr Roosevelt, and do our best to improve and preserve it.**

Questions on this article, or planning nutrition for your crops this spring?

Please contact us at information@hlhlt.co.uk

For more information on any of our products or services please contact your local Hutchinsons agronomist or contact us at:

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