Fieldwise
AGRONOMY NEWS FROM HUTCHINSONS
FEBRUARY / MARCH 2016

Early fungicide strategies to maintain yield potential

Once again the UK has experienced exceptionally mild, wet weather conditions favourable to disease development. 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 suggests the best early fungicide strategy to adopt to maintain yield potential.

Influence of the weather

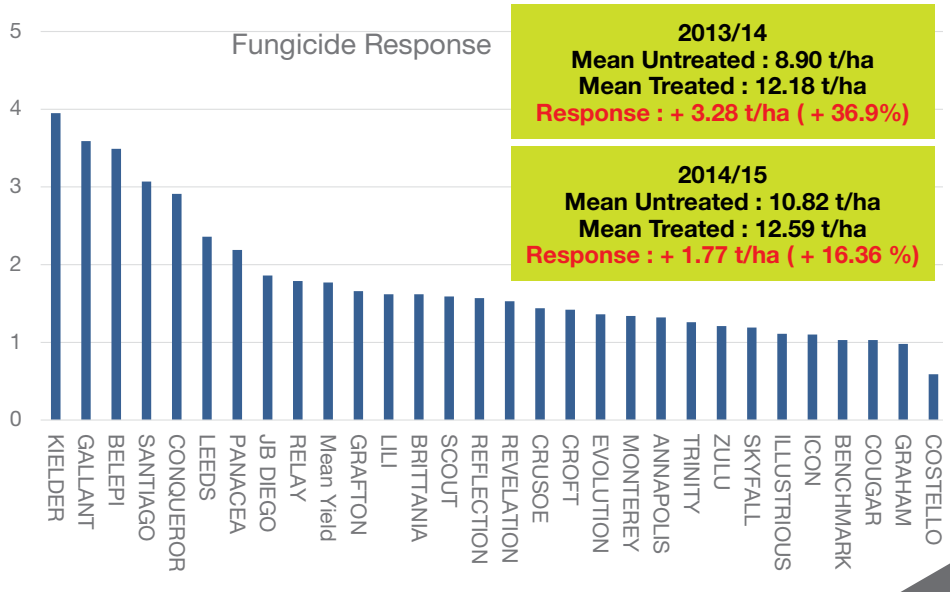
Last autumn and winter saw very mild temperatures, but average to dry moisture conditions, leading to relatively low disease levels coming in to the New Year. However, wet weather in late spring led to significant increases in disease, eventually leading to yield responses to fungicide programmes close to the long term average in AHDB variety trials.

In variety trials at Hutchinsons' Regional Technology Centres (RTCs), fungicide treatment produced yield increases averaging 1.77 t/ha (16.36%) across all sites and varieties *(Figure 1)* compared to 3.28 t/ha the previous season. However varieties such as 'Kielder', 'Gallant', 'Belepi', 'Santiago' and 'Conqueror' gave responses of between 3.0 and 4.0 t/ha. At our site at Ludlow, where disease pressure was particularly high, yield responses averaged 2.93 t/ha (24.2%) across all varieties.

In contrast to the 2014/15 season, the weather so far this winter has been even milder resulting in many well established and tillered cereal crops. This, in combination with exceptionally wet weather across the country, has resulted in significant foliar disease development including Septoria, yellow and brown rust (depending on variety) and mildew. The combination of thick crops, early disease establishment and weather conducive to further disease development has increased the chances of early disease progress this season.

continue overleaf >>>

Winter Wheat
Varietal Response to Fungicide Treatment, 2014/15



2013/14
Mean Untreated : 8.90 t/ha
Mean Treated : 12.18 t/ha
Response : + 3.28 t/ha (+ 36.9%)

2014/15
Mean Untreated : 10.82 t/ha
Mean Treated : 12.59 t/ha
Response : + 1.77 t/ha (+ 16.36 %)

Source : Mean of all RTC sites, Hutchinsons

Figure 1: Varietal response to fungicides in Hutchinsons winter wheat variety trials, 2014/15

BASIS CPD POINTS

Fieldwise has been allocated 2 BASIS Crop Protection CPD points.

To claim your points, please email your name and account number, plus the reference Code : CP/43939/1516/g to martine@basis-reg.co.uk

>>> This is particularly the case with many varieties prone to the two main foliar diseases - Septoria tritici and yellow rust.

Of the established main wheat varieties only 'Cougar', with a rating of 7 on the AHDB Recommended List, shows reasonable resistance to Septoria tritici. However new varieties on the list, 'KWS Siskin' and 'Graham', also have a 7 rating, offering hope for the future. Varieties such as 'Gallant', 'Solstice', 'Cordiale', 'Viscount' and 'KWS Kielder' are highly susceptible to yellow rust, while 'KWS Trinity', 'Crusoe', 'Scout', 'Revelation', 'Evolution' and 'Relay' have a very high level of resistance to the disease at present, though 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.

Controlling Septoria tritici and Yellow Rust

Trial results from both Hutchinsons and other organisations last season showed the value of early season applications of multi-site fungicides such as chlorothalonil or folpet, in order to protect leaves from development of Septorla tritici later in the season. This is particularly important bearing in mind the recent 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 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.

Key products for early rapid disease knockdown of yellow rust should include active ingredients such as cyproconazole, tebuconazole or epoxiconazole, while the latter offers a reasonable level of Septoria control. The strobilurins pyraclostrobin and azoxystrobin can also give good control of rusts and may help avoid overusing the triazole group of products, which will be important later in the season. The addition of fenpropimorph can also help control rust, as well as early infections of mildew, and has been shown to improve uptake of triazoles into the plant.

As with last season (a record year for winter wheat yields), many cereal crops look to have high yield potential this spring and since serious yellow rust infections can reduce yield by some 50%, it is vital to control the disease before it gets established as well as protect against further Septoria development.

Winter Barley

In winter barley Rhynchosporium, net blotch, brown rust and mildew have been reported. Barley yields can be severely affected by early disease as it can impact on tiller development and early treatment should be considered where disease levels are significant.

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 2016. 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 in the crop.

Please consult your local Hutchinsons group agronomist who will be able to give guidance as to the most appropriate course of action for your crops.

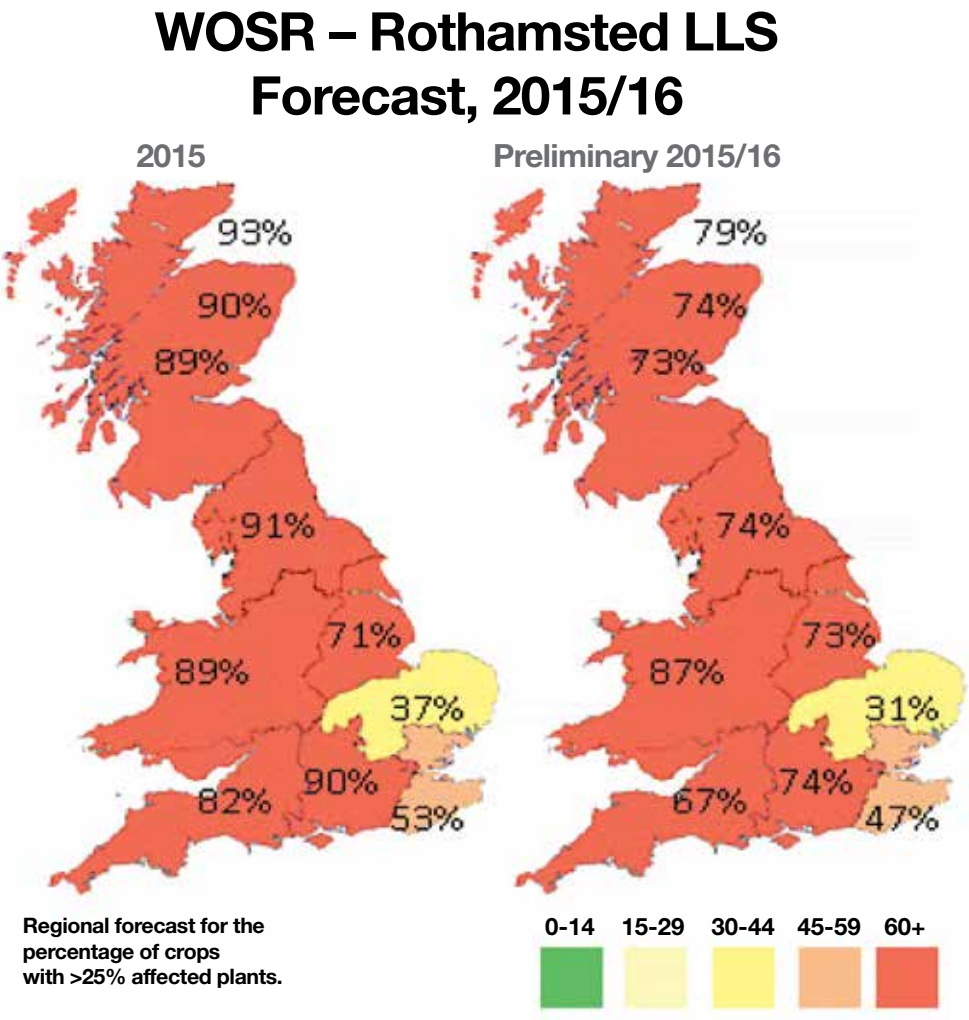


Figure 2: Rothamsted Light Leaf Spot Forecast as of October, 2015

Tyres and soil compaction

Neil Watson (Hutchinsons Southern Region Technical Manager) **looks at practical ways to manage soil disturbance and potential compaction damage to wet soils this spring.**

Neil Watson (Hutchinsons Southern Region Technical Manager)

Whether you have just experienced one of the wettest Decembers on record or not, most land is now saturated to the point that the prospect of getting spring crops drilled early, into good conditions, is not even a topic of conversation. However, there are still issues that we need to address, when we consider on average 70% of land is likely to have a tractor wheel running over it throughout the course of a season.

The correct tyre choice, ballasting and inflation pressure is critical in order to minimise compaction, whilst maximising performance. A figure of 70% of land trafficked might seem high, but let us just consider it for a minute. Even if we direct drilled land using a 3m drill, two standard rear tyres at 750mm will represent 50% of land trafficked (2 rear tyres x 750mm = 1.5m of a 3m drill) and that does not account for any further operations. We also need to be conscious that the first pass of any tractor wheel is potentially the most damaging (subsequent passes along the same wheeling will have an incremental effect).

Root development in spring crops is more crucial than winter cropping, not least as a consequence of a shorter growing season for roots to fully exploit the soil's profile. Compaction creates a physical barrier to normal root development, restricting water infiltration, water holding capacity and air exchange of the soil, ultimately impacting on yield.

The key points to remember are that compaction found in the:-

- **Top soil** is related to **ground contact pressure only**
- **Upper part of the subsoil** is created by **contact pressure and axle load**
- **Lower subsoil** is created **by axle weight alone**; which is the most difficult and costly compaction to remove.

So how do we avoid/minimise the impacts of compaction?

- Firstly reduce the number of passes required to produce a seedbed. It is in producing the seedbed that the most random trafficking is likely to occur, at a time of year when the soil is at its most vulnerable.
- Run at the lowest inflation pressure possible, consistent with the tyre's specifications
- Be conscious of machine weight and its effect on compaction. **Ballast for performance, optimising weight distribution between the front and rear axles**. Removing excess ballasting if it is not needed (e.g. front/axle weights).

Inflation pressure

It is the volume of air within the tyre that supports weight. As the weight increases, the volume of air within the tyre needs to increase accordingly - this can be achieved by one of two means:-

- Increasing the inflation pressures within the existing tyres, thereby reducing the tyres' contact footprint and increasing the potential for soil compaction.
- Alternatively, increasing a tyre's capacity to take a higher volume of air, by changing to wider tyres or tyres with taller side walls. This maintains a lower tyre pressure whilst increasing the load bearing capabilities of the tyre.

So how do we know what inflation pressure we can run at?

It depends on:-

1. tyre dimension

2. axle load weight

3. speed

You can either refer to the tyre manufacturers' charts consistent with the individual tyre, or download one of the available smartphone apps to help do the job for you.

Ballasting for performance

The pulling power that a tyre can exert is proportional to the weight it carries. The higher the tyre load, the greater the traction it can exert. However, this needs to be balanced by the compaction it is likely to cause.

Steps to improve optimum performance include determining the:-

1. Tractor's actual weight and distribution (manufacturers' handbooks are a useful starting point)
2. Optimum ballasting and distribution of weight per axle.
3. Need for (or otherwise) additional front and rear axle weights, and an understanding of how we compensate for the effect of weight transfer by adding or removing weights.

As a rough and ready rule, the guide below gives some indication of the amount of ballasting required, depending on the work the tractor is likely to do:

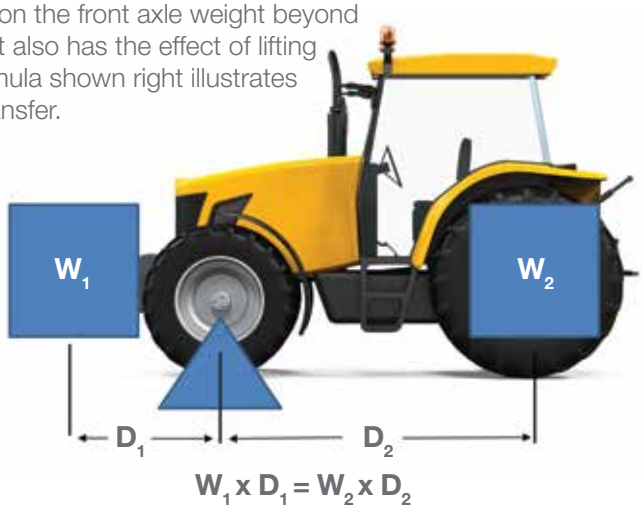
Type of cultivation		Optimum weight required (kg/hp)
Heavy work	Primary cultivation work	55
Medium work	Light/ secondary cultivations	45
Light work	Transport work, PTO work	35

For example, a 200hp tractor would require to be approximately 9 tonnes for medium work (200hp x 45kg/hp = 9000kg)

However it is not just about overall ballasting but how weight is distributed between the forward and rear axles. For a normal four-wheeled drive tractor (front wheels smaller than the rear) this would equate to a 40:60 split (front to rear). It is then a matter of determining the tractor's overall weight between front/rear axle and adding/removing weights to compensate.

Adding weights in front of the fulcrum point (in this case the front axle) not only has an added effect on the front axle weight beyond the actual weights added, but also has the effect of lifting weight from the rear. The formula shown right illustrates the point regarding weight transfer.

The effect of the weight transfer is seen more clearly in diagrammatical form with a simple see-saw effect.



$$W_1 \times D_1 = W_2 \times D_2$$

Treading lightly on all soils this spring will be of vital importance. While many tractors, trailers, harvesters and implements now have flotation tyres fitted, it is worth a little time spent to ensure you are getting the best from your equipment and minimising soil compaction.

YEN 2016 competition

The Yield Enhancement Network (YEN) competition is open for entrants for harvest 2016. Anyone can benefit from taking part, irrespective of the site's yield potential.

Although very high crop yields attract the greatest attention, most farmers have joined the YEN initiative as a way of improving their understanding of the factors affecting yield on a particular farm and to develop more robust growing systems that improve both yield performance and yield stability.

The most interesting part of the YEN process is the initial planning session to review the current growing system and to identify areas where improvements can be made. New ideas are then subsequently tested on the YEN area. After harvest, entrants also get a full analysis of the growth and development of the crop and how well it utilised the main resources of light, water and nutrients - this information can be used to refine growing systems for the future.

The more ambitious aim of YEN is to investigate the correlation between yield and yield components: ear numbers, grain numbers, grain size and biomass. This could lead to methods of monitoring crop growth early in the season, to identify areas which need intervention to correct nutritional or other problems. Low yielding crops are as important as high yielding crops in terms of their contribution to this process.

For an opportunity to find out more, Hutchinsons is planning a YEN meeting near Cambridge, on 25th February, starting at 10.00am.

If you would like to attend this meeting, or are interested in taking part in the 2016 competition, please contact your local agronomist, or Dr Bob Bulmer by emailing: information@hlhltd.co.uk

N.B. PRIOR BOOKING FOR THIS YEN MEETING IS ESSENTIAL, AS PLACES ARE LIMITED.

Fieldwise Nutrition
early season maintenance

Tim Kerr (Hutchinsons Fertiliser Manager) looks at how the record crop yields and rainfall events of 2015 may affect Potash and Nitrogen levels in the soil this season.

2015 is already in the history books for a number of reasons – some more welcome than others.

For the largest recorded yields of wheat and oilseed rape - we should no doubt celebrate that these are home-grown records - literally. **For the catastrophic rainfall in parts of England and Scotland** in December, we will have records of a different and most undesirable kind.

What might we learn from this? That we have a climate which offers up the potential to attain great yields of crops and in the same breath the ability to surprise us all with its severity and destructive powers.

Bumper yields and torrential rain

When considering the impact of these scenarios – bumper yields and torrential rain, in relation to soils and crop nutrition – there are some similarities in their effects.

Firstly let us consider the effect of a harvest that, according to ADAS, had 12% higher cereal yields than the rolling 10 year average. Each tonne of wheat or barley will remove around 6kg of Potash (K) and 8kg of Phosphate (P). These might seem small, inconsequential numbers, but care must be taken not to overlook the impact of them.

An increased yield needs a greater maintenance dressing in the following crop, if we are going to maintain soil reserves. The index system is proven to work – at index 0 and 1 crops will underperform and there is a yield benefit. At target indices, trials demonstrate a return on investment well in excess of the cost of applying sufficient P and K to preserve soil levels at Index 2 (P) and 2 (K).

Most fertiliser recommendations are made in advance, with estimates of yield and assumptions as to whether the straw is removed or not. This year, more than most, it would be wise to take a retrospective look at last year's fertiliser applications and review how they compare with the attained yield and final destination of the straw. Where straw is removed, it almost doubles the offtake of potash (see RB209 page 228 – appendix 5). As mentioned earlier, higher yields will remove proportionately more phosphate and potash, which should be accounted for when planning future applications.

There is a report produced by PAAG (Professional Agricultural Analysis Group) each year providing a fascinating insight into the state of UK soil reserves:- the latest figures reveal that 30% of all (measured) arable soils are below the target index for potash, therefore we know that 3 in 10 fields need more than just a maintenance dressing. These figures do not correlate with the fact that recorded levels of potash applied to arable fields in the UK are 25% lower than they were 20 years ago (source: British Survey of Fertiliser Practice) and on average are sufficient for a 6 tonne crop.
Did someone mention a yield plateau?

Phosphate & Potash calculator app

One very useful (free) service is offered by the Potash Development Association (PDA) – their on-line or mobile app, the Phosphate and Potash nutrient calculator. This provides two calculations – one for nutrient offtake and one that allows you to calculate suitable applications to build soil P and K levels to target indices – depending on soil type and the time scale.

Potash occurs in the soil as a positively charged particle – which can be held within the soil where there are negatively charged sites for the K+ ions to be held. This capacity to hold positive ions – referred to as the Cation Exchange Capacity (CEC) - will be greater the higher the clay content and the organic matter percentage. Some soils will be naturally rich in potash and as a result be able to sustain crop requirement. However, most soils need annual applications of K in order to keep up with crop demand. Remember that K is required in greater amounts than any other nutrient – including nitrogen.

Muriate of Potash (MOP) remains an extremely cost effective fertiliser – although many organic manures can supply very valuable levels of K, as well as boosting organic matter content. It is worth stressing that taking a potash holiday, when or if you have fields that are below target index, then the likelihood is that the gross margins on those fields will be lower than if you apply K according to the recommendations in RB209 or the PDA PK calculator – it is that simple.

What effects can we expect following the excessive and in some cases record breaking rainfall events in December?

Soils with high CEC should be able to retain potash without too much leaching, although the K will have moved down the soil profile – worth bearing in mind with shallow rooted, winter sown crops and on planning cultivations prior to spring drilled crops. Light sandy soils with low CEC will be prone to K leaching out of the rooting zone. This risk is best managed by applying the majority of the potash, if not all, in the early spring months.

More likely is the risk that soil nitrogen levels will be lower than on average coming into the spring.

High yields would remove more nitrogen in the harvested crop, therefore many soils would be lower in mineral N coming into the autumn. It has to be expected that high rainfall will have further reduced the soil reserves of nitrogen. It is definitely worth considering measuring soil N now – the CF NMin test is well proven – to help ascertain the impact of what was an extraordinary 2015.

Weed Control in Spring Crops

Picture 1: Oats, peas & beans as a cover crop

Weed control in spring crops is not a complicated subject, but an absence of spring crops in rotations for many years has resulted in a knowledge gap for many growers and agronomists alike. Dick Neale (Hutchinsons Technical Manager) **offers his thoughts.**

The starting point should be what weeds will you see?

The product choice in spring crops is limited and the soil and weather conditions in spring often compromise the effectiveness of pre-em herbicides, as soils, once moved, can dry rapidly and rising temperatures are the completely opposite scenario required to optimise performance.

This may mean that, for some weeds, effective control in spring crops is simply not possible, and understanding that fact before choosing individual crops is important.

Cultivations create weeds

The second point is in understanding that cultivations create weeds; minimising soil movement during the sowing process will minimise the germination of weed seeds in the soil. Weed seeds within the top 50mm of soil may germinate later as soils warm, but the sown crop will be up and away and in a better situation to compete effectively.

Excessive soil movement will also allow drying of the soil, and in the spring this can occur so rapidly that germination of not only weeds, but the sown crop can be compromised, leading to patchy growth, poor herbicide performance and poor weed control.

In order 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. Cultivations that require excessive spring tillage to level seed beds should be avoided and in all soils, but particularly heavy clay soils, the use of appropriate 'conditioning crops' should be practised to leave the soil well-structured and drying throughout the profile, to allow the earliest possible access in the spring.

Effective cover crops

Cover crops are gaining much interest and publicity - there is no doubt they have the potential for huge benefits, but equally, the wrong choice of cover without having thought through the 'exit strategy' can have a frustrating impact on the establishment of following crops.

Covers can also be selected and planned in for weed control, prior to sowing the next crop. Using oats as a major proportion of the cover mix will impact massively on populations of groundsel, charlock, small annual nettle and mayweed, with populations noticeably lower (or non-existent) compared to uncovered ground. Covers also provide food for earthworms and the cultivation value of the root and worm combination should not be under estimated.

In this case (picture 1), on heavy clay soil, the cover crop (oats, peas & beans) has been established to feed the soil, retain nutrients and keep the soil friable via root activity. While biomass for improved organic matter levels is desirable and will be achieved to a limited extent, the over-riding factor here is allowing sun and wind to reach the surface clay in February and March to create an ideal sowing seedbed. Spring varieties have been used to promote upright growth and this was sown via spreader prior to the final autumn seedbed pass on 16th October, after initial black grass flushes had been sprayed off.

Upright open covers, such as this, also allow the spring crop to be sown with most conventional drills.

The cover will receive glyphosate around 5 weeks pre sowing.

Spring crop herbicides

For earlier sown spring crops, wheat, barley and spring beans, the use of residuals is worthwhile, particularly where black grass control is a key driver in the spring cropping decision.

Pendimethalin is a mainstay of spring weed control, but used either straight or as mixtures, labels must be checked for approval on the crop to be treated.

Flufenacet mixtures are also available for spring application in some crops. EAMU's may apply across the herbicide range and should be checked and a copy obtained. 'Defy', for example, has now lost the EAMU for use in spring wheat, while use in spring barley remains.

For crops sown later as soils both dry and warm, the use of full rate pre-emergence herbicide has to be questioned. Post emergence applications of herbicide in peas and linseed are almost always required and frequently in spring beans, so a degree of spend should be held back for these applications.

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

HUTCHINSONS

H L Hutchinson Limited • Weasenham Lane
Wisbech • Cambridgeshire PE13 2RN

Tel: 01945 461177

Fax: 01945 474837
Email: information@hlhltd.co.uk

www.hlhltd.co.uk