Fieldwise
AGRONOMY NEWS FROM HUTCHINSONS
SEPTEMBER / OCTOBER 2016

Successful establishment of winter cereals

Crop establishment is a vast subject, so where do you start? Perhaps by looking at the key drivers for choosing a system in the first place and reassessing if those drivers have since changed. Neil Watson (Hutchinsons Southern Region Technical Manager) explores the decision making process.

So what do we mean by key driver? Put simply, a reason for determining choice. Initially a key consideration for change in cultivation technique was cost, yet latterly it has increasingly become grass weed control.

Declining use of the plough

Looking back over time, crop establishment used to be simple - for generations it primarily revolved around the plough and secondary cultivations were largely determined by soil type. To a large extent (for over half the arable acreage) it still is - either as a consequence of soil or cropping (e.g. light soils and root crops in the rotation). It is also safe to say this method of establishment has been on the decline for some time. To understand the reasoning behind this is to appreciate how over time the key drivers have changed.

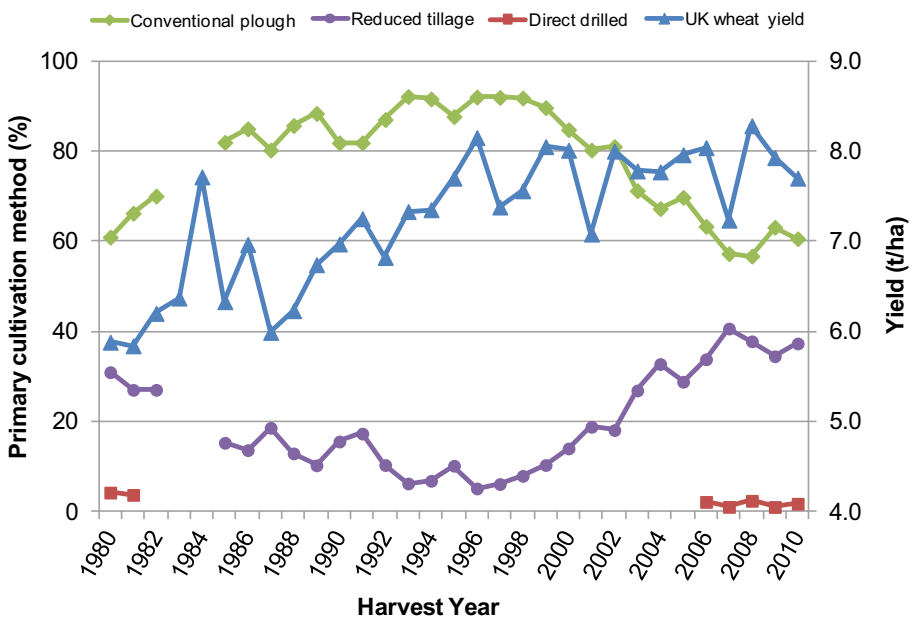

Chart 1: Proportion of winter wheat crops in England sown using different techniques, in relation to UK wheat yields – Source AHDB

Chart 1 (above) shows the changing proportion of winter wheat crops in England sown following conventional ploughing and reduced tillage, or by direct drilling, in relation to UK wheat yields. With the decline of the plough has come a plethora of new establishment techniques, yet whatever the system employed, it simply fits into one of few categories starting with inversion or non-inversion tillage,

continue overleaf >>>

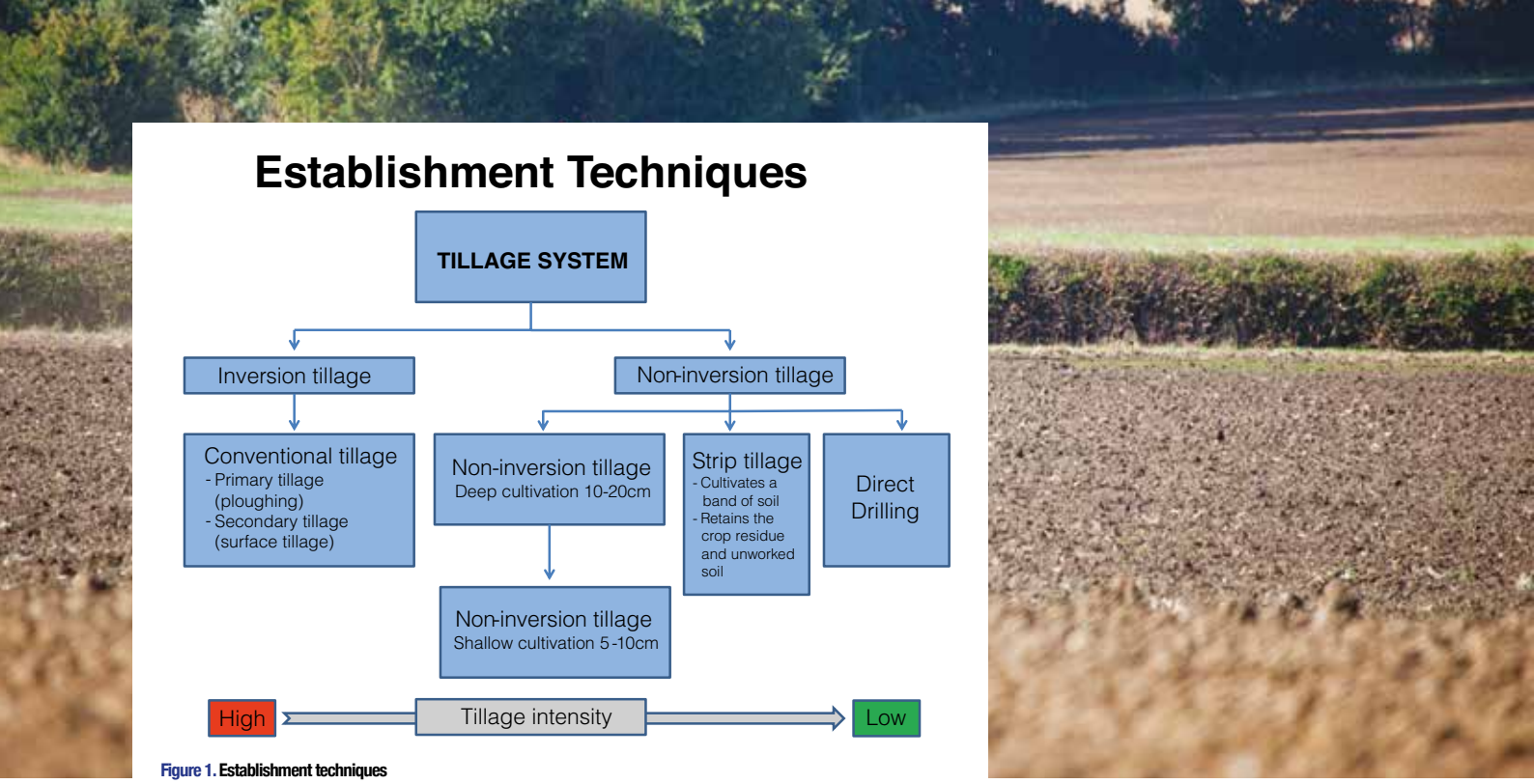

Figure 1. Establishment techniques

>>> then subdividing into sub groups beyond that (as illustrated in Figure 1 above).

Cultivation policy often generates intense discussion; everyone has an opinion and thinks their solution is best. Yet ironically what might seem a contradictory statement might also be true. We often forget that each farm, even neighbouring farms, has their own unique problems. In appreciating these individual key drivers, we also realise no one solution fits all and that is part of the problem, or part of the solution.

We are all guilty of continually seeking a panacea of the best establishment technique, without thinking; for our own farm we might already be there. As the old adage goes, "if it's not broken, why fix it?" It is only when you stand in the shoes of others that you fully appreciate their perspective and the reasoning behind the choices they have made. We also need to be aware that what may have become vogue in some parts of the world where the key driver is moisture conservation, may not always be best suited to our maritime climate - which reinforces the concept, what might be a key driver for one person is not universal for everyone.

Identifying key drivers

In coming back to this concept of key drivers - what exactly are these key drivers? There is potentially a whole host, yet historically machinery output/labour shortages were the initial key drivers.

As farms became larger, the ability to establish greater acreages of winter cereals became one limiting factor. Counting back from the optimum drilling window (assuming it should take a maximum of 10 days to drill the entire winter cereal acreage), based on what you could expect as working days available in this critical autumn period, a simple arithmetic calculation of individual machine output would easily indicate if it was possible or not to complete all the primary and secondary cultivations needed to establish the crop. Often the answer is 'not' - hence the drive to look for alternatives. Yet ironically, in recent times with increasing grass weed burdens, there has been a swing back to spring cropping taking some of the pressure from the autumn work load.

Other drivers might be yield stability (so as not to compromise output). Having said that, time is needed to allow for a transitional change in cultivation policy (expectations are often akin to football management, where immediate improvements are anticipated, which are rarely delivered without sufficient time for a new system to bed in). Yet in recent times, rather than looking at cultivations in isolation, there has been a greater convergence in looking at soil health/ nutrition and stability as one.

For many, grass weed control has now become the key driver of cultivation strategy, which is then dependent on the key grass weed.

For brome control the plough is still king, with stale seedbed technique being dependant on species. For black grass, minimal, shallow soil disturbance has become more dominant.

So whatever cultivation system you presently employ, there are a number of key points you need to ask yourself in order to determine if your cultivation policy is still fit for purpose:

Summary key points

Be clear in knowing what your "key drivers" are in determining your cultivation policy.

- List them and prioritize them.

Having determined which system is best for you, having accepted whatever system chosen, it needs to be flexible.

- Have a plan of what you are going to do and where (fail to plan, plan to fail!)
- Be aware of the limitations of your plan, so what is your 'plan B'?
- Be prepared to be flexible and not dogmatic in terms of cropping, as well as cultivations - should circumstances change, be prepared to adapt and change with them.

Above all, whatever system you choose, remember the difference between success and failure is all about **attention to detail.**

Effective Slug Control Strategies

Dr David Ellerton (Hutchinsons Technical Development Director) **looks at the most effective strategies for slug control this autumn and considers the best approaches to help protect water courses this coming season.**

Wet weather this summer in many parts of the UK has led to large slug populations and means growers need to be extra vigilant in monitoring crops for damage from slugs this coming autumn, to ensure crops are protected during early stages of growth.

Once more, use of metaldehyde-based slug pellets last autumn led to exceedances of the Drinking Water Directive limit of 0.1 ppb in many areas and this has highlighted the need for close adherence to industry stewardship guidelines on metaldehyde use this coming autumn.

Although the overall threat from slugs is potentially high this autumn, field monitoring and judging the risk of slug damage on a field by field basis remains critical to avoid unnecessary pellet applications, whilst still protecting crops from slug attack.

Monitoring with traps & baits

Ideally, bait trapping for potential slug problems in oilseed rape should commence in the previous crop and also in stubbles for cereals. The thresholds for oilseed rape are four or more slugs per trap in the previous crop and one slug per trap in the previous stubble. The cereal threshold is four or more slugs per trap. However, trapping is only an effective means of monitoring slug activity when the soil surface is moist and slugs are active.

Crops are most vulnerable to slug damage in the first four weeks of growth - the cut off point for monitoring cereals is the start of tillering and for oilseed rape the four leaf stage.

A risk assessment for slug damage, including the current and previous crops, field history, soil type, seedbed quality, weather conditions and planting date, can be used in conjunction with trapping to judge the need for chemical control.

Effective treatment

Slug pellets will continue to be the most important means of controlling slugs this autumn, ideally aiming for a minimum of about 40 pellets per square metre, but other measures including seedbed cultivations with adequate consolidation, seed dressings and depth of drilling can have a significant impact. There are now only two main active ingredients available for slug control - metaldehyde and ferric phosphate.

For many years, metaldehyde has been the main active ingredient that farmers choose to use for slug control. Nevertheless it needs to be managed carefully to avoid problems with drinking water contamination.

An industry led initiative coordinated by the Metaldehyde Stewardship Group (MSG) has established clear guidelines (see table 1 opposite) for operators to follow – the aim being to avoid this product being restricted or possibly withdrawn from use completely.

Metaldehyde has four routes by which it can enter water:

- **Direct** – e.g. inadvertently spreading pellets into watercourses
- **Point source** – e.g. spills on hard surfaces which eventually get into drains
- **Surface run off** from fields following heavy periods of rain
- **Water moving through the soil** that carries metaldehyde with it into the field drainage system.

Avoiding water contamination

Scientific studies have highlighted field drainage as the main route by which metaldehyde reaches water courses. Moisture moving down the soil profile will take metaldehyde

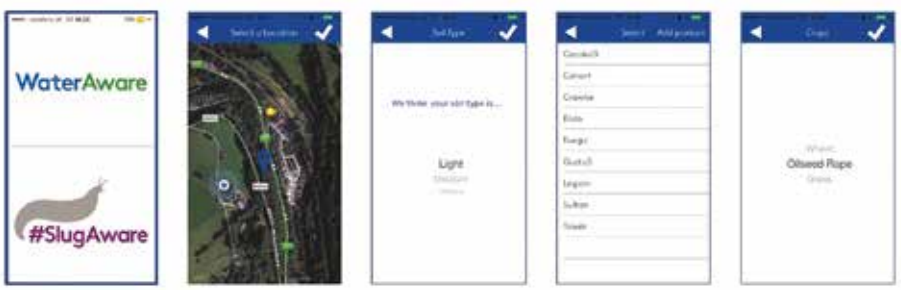

Figure 1: WaterAware and SlugAware App from Adama

down into the drainage system and from there into ditches and streams. In order to limit water contamination, the annual maximum metaldehyde dose for the calendar year has been set at 700g of active ingredient per hectare and a maximum total dose of 210g ai/ha between 1st August and 31st December, the period when there is the greatest risk of metaldehyde peaks occurring.

Table 1: Metaldehyde Stewardship Group (MSG) best practice application guidelines

- Use minimum active per hectare to avoid drainage and run-off losses
- Maximum application rate 210g metaldehyde/ha*
- Maximum total dose from 1st August to 31st December: 210g metaldehyde/ha* for additional protection of water, suppliers/ BASIS advisors may recommend rates reduced to 160g a.s./ha or less*
- Maximum total dose rate: 700g metaldehyde/ha/calendar year*
- No pellets to be applied within 6 metres of a watercourse
- Do not apply when heavy rain is forecast
- If drains are flowing do not apply metaldehyde based slug pellets

**from any combination of metaldehyde products*

A decision support tool to identify high risk situations for water contamination from a range of active ingredients including metaldehyde is the 'WaterAware' App which has been developed by Adama and has now been amended and upgraded for autumn 2016 to include SlugAware.

It helps growers to assess the risk of water pollution from key products based on current and future weather forecasts, soil type and water deficit at specific locations and is available to download onto Apple or Android smart phones and tablets (Figure 1 left). This helps growers to identify the potential risk of water contamination from chemical applications and should be used to help avoid peaks appearing in water from metaldehyde and a range of oilseed rape herbicides.

Helping Water Companies

An additional way in which Hutchinsons agronomists are helping to reduce the movement of metaldehyde to watercourses is to provide information to water companies on molluscicide application timing, enabling them to predict high risk periods for metaldehyde reaching water. Those companies which abstract water from rivers into reservoirs are then able to only divert water when the risk of metaldehyde peaks are low, thereby reducing exceedances and the likelihood of restrictions on the use of metaldehyde in future.

Subsequent to requests from water companies for such information, the Metaldehyde Stewardship Group (MSG) launched the 'Get Pelletwise!' Agronomic Update system last autumn, providing a number of water companies with weekly electronic reports from agronomists. The reports detail regional agronomic information to help them anticipate metaldehyde usage and inform water abstraction decisions. This initiative will be extended this autumn to cover some 14 water companies, an increase of some 20% on last season and will look to include over 40 counties throughout the UK.

Currently the MSG and a number of water companies have set up metaldehyde pilot catchments in which high risk fields have been identified. Farmers with these fields are being requested to refrain from applying metaldehyde in order to protect water and levels in nearby water sources will be monitored to assess the impact of these measures. There have been encouraging results to date, although the success or otherwise is largely dependent on the involvement of farmers in the catchment.

In the meantime, more needs to be done to ensure there is no repeat of metaldehyde peaks appearing in water this autumn. Clearly minimising the amount of active ingredient applied to fields will make a significant difference. Selection of high quality pellets to reduce breakdown and minimise dust during application may also help. Yet one of the key methods would be switching to other products with different modes of action, where there is a high risk to water.

Alternative product – Ferric phosphate

The only other viable alternative for broad acre crops now is ferric phosphate which was launched in the arable market in 2009, the first new molluscicide for 30 years.

Its key benefits are that it is as effective as metaldehyde, but is very specific to target only slugs and snails and so presents no threat to wildlife. It is also virtually insoluble in water and therefore may be used in situations at high risk of metaldehyde entering water, such as:

- Vulnerable water catchment areas
- Catchment sensitive farming areas
- Headland treatments adjacent to watercourses (where other pellets may not be used)
- Poorly drained heavy soils.

It is important to remember that, unlike metaldehyde, slugs which ingest ferric phosphate do not die on the surface of the soil where they can easily be found, but will crawl underground to die. However, they will rapidly stop feeding and so the crop will quickly recover following treatment.

Preserving active ingredients

In summary if growers adopt sustainable slug control policies of:

- only applying high quality slug pellets where risk of slug damage is high
- abiding by the MSG guidelines
- switching into an alternative mode of action in situations where there is a risk of metaldehyde entering water

then it should be possible to preserve the remaining molluscicide active ingredients in the market place.

It is crucial that the agricultural industry joins together in adopting best practice strategies to minimise the risk of metaldehyde reaching water courses and so maintain this vital active ingredient in the battle against slugs.

Please discuss optimum slug control strategies with your Hutchinsons agronomist to protect both the crop and water sources.

Crop Yields and Quality 2016

Winter Barley and Winter Oilseed Rape

Crop yields and quality have disappointed some growers this season. We review how weather patterns have been the key determining factors behind the below average yields achieved in winter barley and winter oilseed rape.

Weather patterns have a huge influence on crop yield and this is particularly true of the low yields experienced so far in 2016. Cool bright years like 2015 produce very high yields; whereas warm, dull wet years like 2016 have the opposite effect on crop performance. This fact was further compounded this year by water logging in parts of the country during late spring.

The map below (Figure 1) shows the sunlight hours during June this year which were typically 30 to 60% lower than the average.
The northern parts of England and Scotland have been less affected by lack of light than the rest of England.

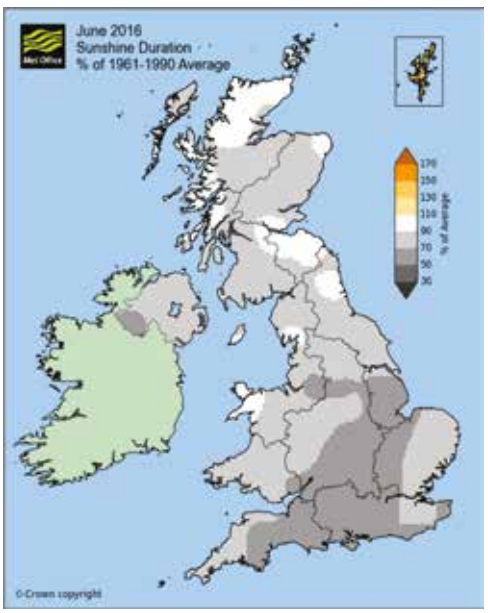

Figure 1: June 2016 Sunshine duration as % of 1961-1990 average
Source – Met Office

This weather pattern has had a negative effect on crop yields, particularly winter barley and oilseed rape which need good weather during June to yield well.

Winter barley

One way of estimating winter barley's yield potential is to divide a typical specific weight by the actual specific weight achieved and multiply by the actual yield. Typical results are shown in Table 1 below:

Average specific weight	Actual specific weight	Yield achieved t/ha	Potential yield t/ha
66	54	8	9.76
66	54	7	8.54
66	54	6	7.32

Table 1: Calculating potential yield in winter barley

This indicates that the crop had a reasonable yield potential in the early part of the season but because of low light availability the crop was not able to fill all of the grain sites produced and hence yield and specific weight suffered.

In addition average temperatures were 0.5°C higher than normal (see Figure 2 below) and high temperatures mean higher respiration rates and lower yields. We know from the YEN project in wheat that biomass is correlated with high yielding crops; higher temperatures will reduce the crop's ability to accumulate biomass.

England Weather Patterns 2015/16 Season

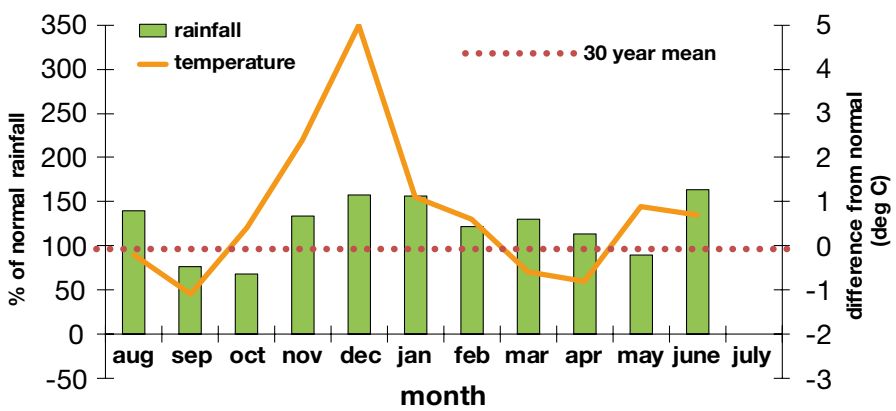

Figure 2: England weather patterns 2015-2016 Source – Met Office

Waterlogging timing effects

This information relates to wheat, but is more applicable to winter barley this year.

- Waterlogging during stem extension seems to be far more damaging to yield than during the equivalent time period in the winter.
- The yield loss from waterlogging during early May is likely to have reduced grains per ear and Thousand Grain Weight (TGW). This may be attributed to waterlogging causing a reduction of nutrients and water supply to the developing ear.
- Losses during grain filling are likely to have been substantial due to water logging and also due to a reduction in photosynthesis leading to grain abortion and shrivelled grain.

continue overleaf >>>

>>> Barley yield more influenced by grains per unit area than wheat

Cold, wet soils and lack of Nitrogen will have affected tillering, leading to thinner crops this spring, and then the low light levels impacted on grain fill, leading to low specific weights. The chart below shows the relationship between grains/m^2 and yield, which is very important in barley.

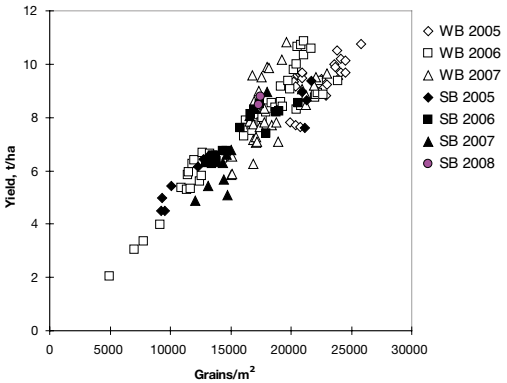

Chart 1: Grains/m^2 and yield for winter and spring barley industry partner sites 2005-2008 Courtesy AHDB

Benefits from delaying senescence

Factors that delay the senescence of the canopy had a positive effect on barley yields this year. These factors include soil management, fungicides and nutrition. This was evident in Hutchinsons yield and specific weight trials' results from sites at Stowbridge and Grayingham, studying nutrition in winter barley.

Winter Oilseed Rape

The yield of oilseed rape has also been affected by the poor light availability in June. It was noticeable that flowering was very protracted this year, suggesting a crop that was trying to compensate for low light availability. Other factors have also contributed to low crop yields:

Cabbage Stem Flea beetle has had a major impact on crops in the Eastern counties and Verticillium has been much more frequent as a result of the wet cold soil conditions in the spring. The wet spring affected rooting in WOSR and we would therefore expect the more backward crops to be worse affected.

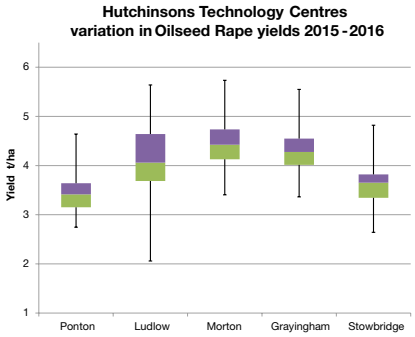

Chart 2: Variation in oilseed rape yields – Hutchinsons trials 2015-16

In Hutchinsons' regional crop trials, the yield of oilseed rape has varied by approximately 1 t/ha when the different sites are compared (see chart 2 above). There has also been an even greater variation in yield between varieties at individual sites:

on average 2 t/ha. Clearly choosing the right variety for local conditions is absolutely critical.

A new Yield Enhancement Network (YEN) project will be launched for oilseed rape this autumn, which will aim to look at these differences in oilseed rape yield in more detail. We will provide further information on this project in future editions of Fieldwise.