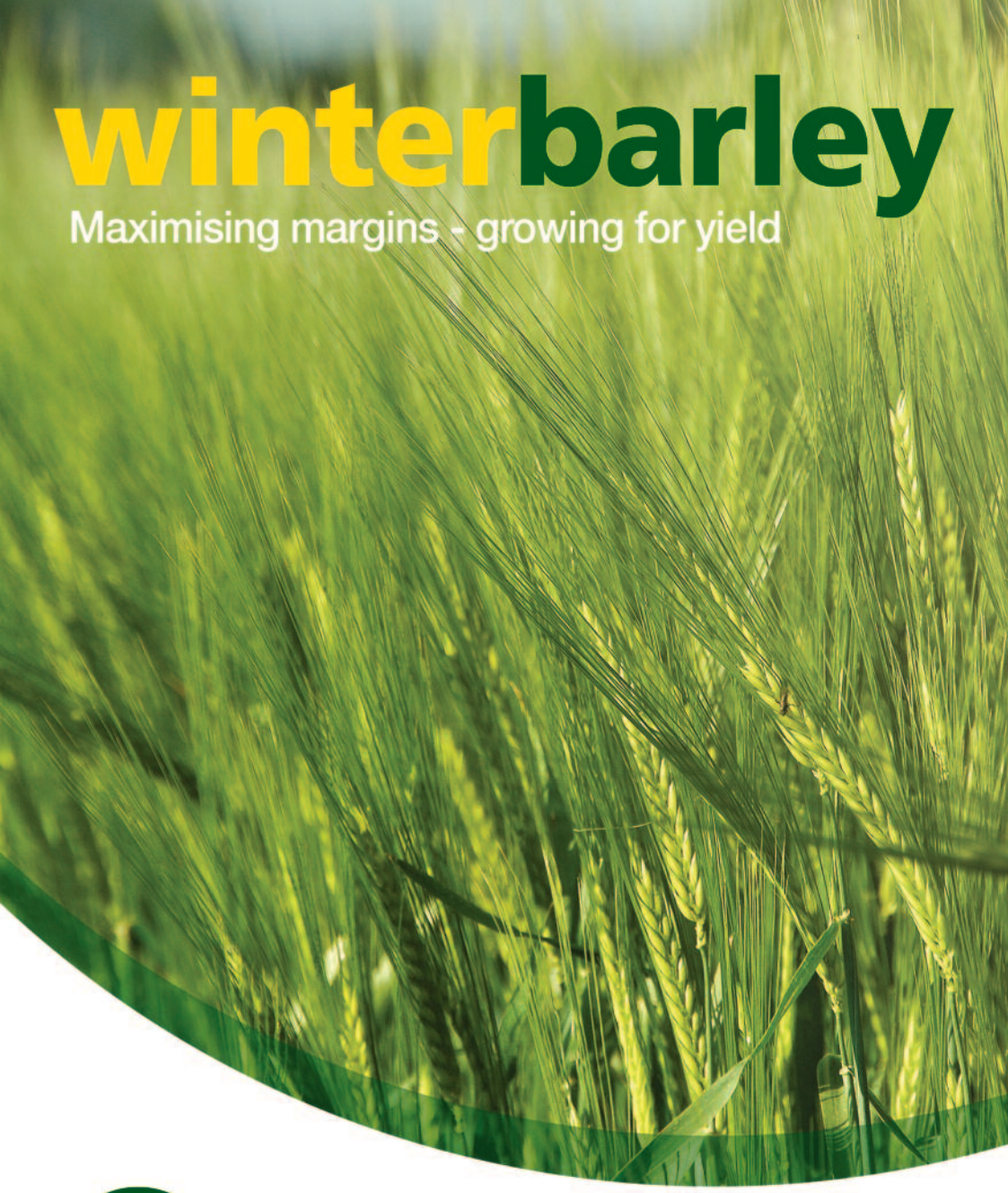
winterbarley

Maximising margins - growing for yield



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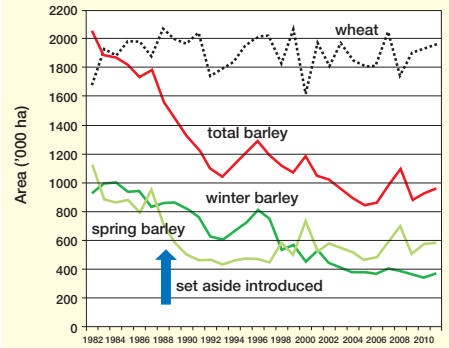
KWS

A KWS guide published in association with CPM

Introduction

Winter barley has been grown in the UK for more than 100 years and reached a peak in 1984 of over 1million ha before declining to a current level of 350-400,000ha (Figure 1).

Fig1: UK wheat and barley area



Source: Defra

Some believe this drop in production could be due to lighter 'barley land' being put into set-aside, and the increasing problems of grassweed control. Growers may also have moved out of the crop on the back of straw-strength issues or due to weed volunteer issues from older varieties.

However, winter barley has benefits in a combinable crop rotation, contributing significantly to the performance of the following oilseed rape crop. Furthermore, the HGCA Recommended List suggests growers can reasonably expect the newest varieties to yield around 0.5t/ha more than they did ten years ago and, on the back of a better knowledge of the barley genome, breeders such as KWS UK claim yield gains above this norm, approaching 0.1t/ha per year.

With this sort of progress, today's winter barleys are capable of producing some very high yields and a bold grain sample. So, on the back of this, maybe it's time to re-examine the potential of the crop and re-assess its benefits in an arable rotation. This booklet aims to help growers do just this.

Tom Allen-Stevens
Editor CPM

Winter barley development

The first barleys planted in the autumn were spring types grown between the First and Second World Wars. They were soon superseded by the first true winter barleys in 1943 allowing planting in the autumn with greater confidence.

Breeding developed apace and in the 1960s, PBI's innovative breeding team introduced Maris Otter – an exceptional malting type that is still being grown today, 48 years on. However, it wasn't until the 1970s that advances in farm machinery allowed more winter cropping and the acreage started to take off.

German six-rows were introduced and high-yielding feed two-rows such as Sonja and then Igri swiftly followed. New, higher yielding malting barleys such as Halcyon and Pipkin came to the market in the mid to late 1980s, followed by the first "dual-purpose" winter variety, Puffin, showing that there need be no reason why high yield and malting quality shouldn't be combined.

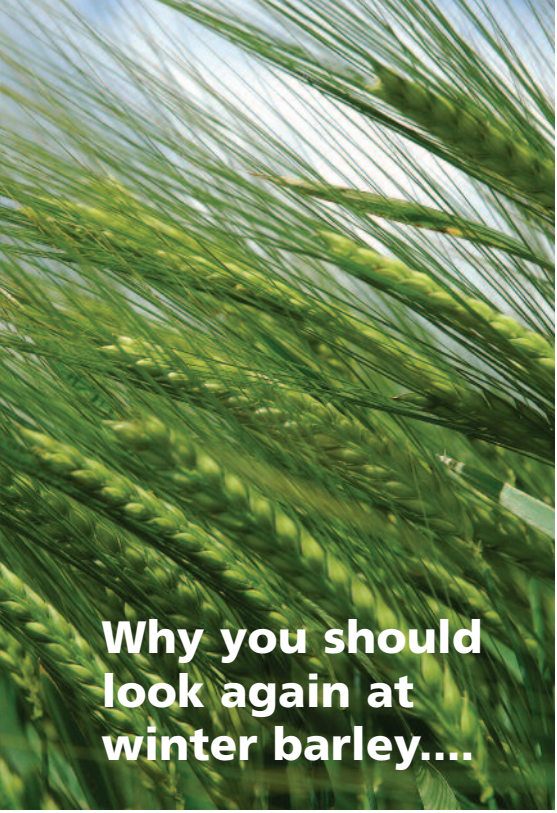
The French-bred feed barley Pastoral was dominant through the 1990s until the arrival of Regina and Fanfare, in 1996. The next really popular variety was Pearl, introduced in 1999. It was also dual-purpose and dominated the winter barley acreage for many years.

In 2000, the French-bred short and stiff-strawed Siberia showed that six-row varieties did not always have to be tall and weak. Three years later it was joined by Sequel, the first six-row with a specific weight as good as the two-rows. In 2004, the first hybrid, Colossus, made the UK Recommended List.

While these six-row introductions had around a 5% yield advantage over two-row barleys, all this changed with the arrival of Saffron in 2005, which rapidly took a substantial market share.

This pattern has been repeated over the last few years with the introduction of Retriever in 2007, then KWS Cassia in 2010 and most recently KWS Glacier.

Fig 2: UK barley timeline



Why you should look again at winter barley....

The barley market

UK barley demand is relatively stable at around 5M tonnes, with around 60% of this used for animal feed, the rest malting for beer, or distilling (Figure 3). Production matches this, with the UK growing around 5.5M tonnes every year, the balance largely being exported, or used for seed.

According to HGCA, almost 2M tonnes of malting varieties are expected to be purchased again by the sector in 2013. This sector is dominated by spring varieties (Figure 4) and in the hands of specialist growers, who are adept at producing the nitrogen specifications demanded by various markets. Even in England, less than one third of the total malting barley purchases come from winter varieties.

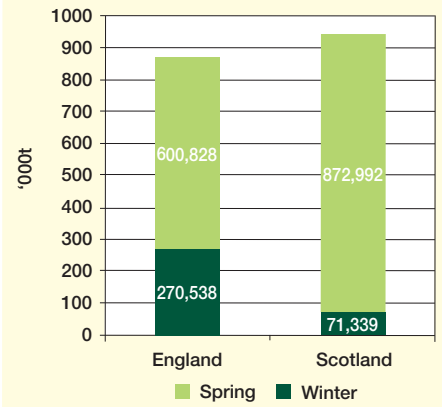
Feed barley, on the other hand, has no specific requirements and can be used within most animal feed rations. This allows growers to focus on grain and straw yield, and specific weight – all of which will add value to the barley gross margin.

Fig 3: UK barley - supply and demand

	5 year mean '000t	2012/13 (Jan 13) '000t
Opening stocks	1047	940
Production	5727	5522
Imports	123	134
Total availability	6897	6596
Human and industrial consumption	1729	1839
Animal feed	3144	3014
Seed	155	165
Other	28	28
Total domestic consumption	5058	5046
Exports/intervention	796	715
End stocks	1044	835

Source: HGCA - 5 year mean to 2011/12 and 2012/13 to Jan 2013

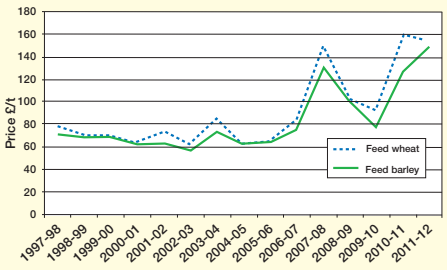
Fig 4: Malting barley purchases - England & Scotland



Source: MAGB

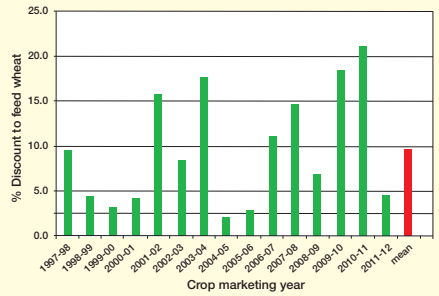
While some winter barleys will be dual-purpose varieties, with a malting potential and a reasonable yield, the RL suggests these types are increasingly off the pace in terms of yield. Now, with the leading two-row feed winter barley on the list, KWS Glacier, yielding almost 1t/ha higher than the most widely grown winter malting variety, there may be benefits for many growers to go all out for yield.

Fig 5: Mean annual UK feed wheat and feed barley prices



Source: HGCA

Fig 6: Mean annual % price discount UK feed barley to UK feed wheat



Source: HGCA

Winter barley vs winter wheat

There are strong economic arguments to consider the use of winter feed barleys as an alternative to winter wheat, particularly in the second cereal situation.

Over the past 15 years, the feed barley price has tracked the feed wheat price (Figure 5), generally trading at a discount for use in animal feed rations with a mean price around 10% behind than that of feed wheat (Figure 6).

Virtually all of this UK winter barley crop will be grown as a second cereal, sown after wheat. So if growers are to assess the potential of winter barley on their own farms, it should arguably be compared with a second wheat.

Fig 7: Percentage yield decline feed barley vs second wheat

1999	13.1
2000	8.8
2001	5.5
2002	8.8
2003	4.5
2004	4.2
2005	5.1
2006	8.2
2007	7.2
2008	11.5
2009	7.6
2010	0.9
2011	3.4
2012	-18.7
10 year mean	4.4

Source: HGCA UK Recommended Lists

Using RL data as a base, the average winter feed barley yield has been around 4.4% below that of a second wheat over the past 10 years (Figure 7).

However, feed barley costs less to grow. Over the last ten years, Nix' Farm Pocketbook suggests that winter barley costs just £241/ha compared to a second wheat at £319/ha – a saving of nearly £80/ha.

Factoring all these figures into a gross margin equation and comparing Defra data on actual farm yields, on paper at least, feed barley produces an average gross margin over the last decade that is just £12/ha behind second wheats (Figure 8). However, add on the extra value of barley over wheat straw of £30-40/ha, and barley becomes the more profitable crop.

Given this, the highest yielding feed barley varieties, treated with the same care and attention as a winter wheat, have the potential to deliver a better gross margin on farm.

Fig 8: Financial performance - UK feed barley to UK second wheat

	Gross margin 2nd wheat £/ha	Gross margin feed winter barley £/ha	Gross margin +/- 2nd winter vs feed winter barley £/ha
2008	501	472	£29
2009	146	148	-£2
2010	713	583	£129
2011	616	667	-£50
2012	599	786	-£187
10 year mean	419	407	£12

Source: KWS UK based on DEFRA yields, mean annual grain price and Nix variable costs

Second cereal trials

While the 'paper' exercise in the previous section gives a good indication of the performance of wheat and barley in the second cereal situation, caution needs to be exercised as none of the crops have been grown in the same field and season.

In order to test the performance of the best modern varieties, KWS commissioned ADAS to design and carry out a three-year trial series that did just this.

They tested the best second wheat varieties and best feed barleys side by side in replicated plots in the same field, subjecting each to a belt-and-braces crop production programme, including giving wheats take-all protection by using Latitude (silthiofam) treated seed.

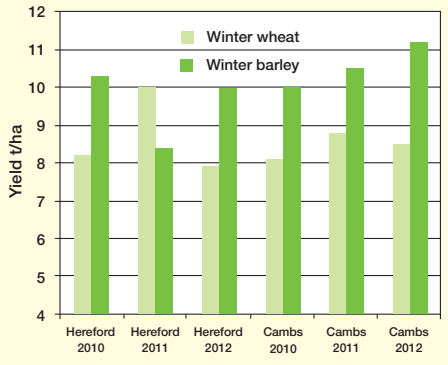
The second cereal trial series was replicated at two sites – at ADAS Rosemaund, Herefordshire and the KWS Product Development site at Fowlmere, Cambs – and tested the best varieties across three contrasting seasons – 2010 to 2012.

Winter wheats received 220kgN/ha, and the barleys were given 40kgN/ha less. Winter wheats had T0, T1, T2 and T3 sprays costing approximately £90/ha, the barley's three fungicides at £60/ha. The aim was to ensure inputs weren't limiting and the crops were pushed hard for yield. Neither trial site was on heavy soil and blackgrass was not an issue.

Across all but one of the six trial comparisons, winter barley outyielded winter wheat on the same second cereal field (Figure 9). Across the three years, the winter barleys were 1.5t/ha ahead of the second wheats (Figure 10).

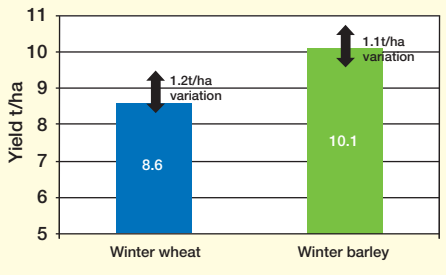
Across all sites over the three years, applying a mid-Sept delivered price for the crops across the three years, winter barley gave a gross

Fig 9: Second cereal yield



Source: ADAS and KWS UK
Note: All winter wheats were Latitude treated

Fig 10: Three-year mean yield - Cambridge and Hereford



Source: ADAS and KWS UK

margin £270/ha ahead of second wheat, without factoring in the value of any straw (Figure 11).

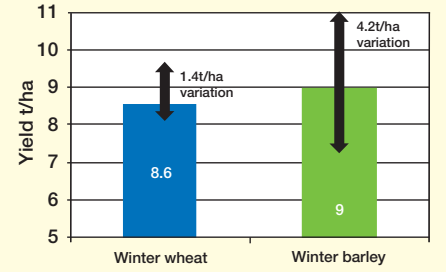
In 2012, KWS took this same work out into large-scale 0.6ha field plot work at their Product Development Site on the Yorks Wolds. Here, while there was much more variation in yields, winter barley again outperformed winter wheat, this time by 0.4t/ha (Figure 12), giving a mean gross margin advantage for barley of £37/ha (Figure 13).

The value of barley straw

Both of these sets of calculations only take into account the value of the grain that is harvested and illustrate the importance of price and season. However, if straw is included, the value of barley as a second cereal improves still further.

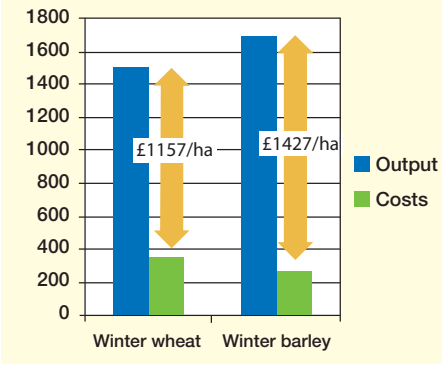
While values will vary according to season and crop location, figures from John Nix suggest that the average additional value of barley over wheat straw over the last ten years is worth an extra £37/ha.

Fig 12: Mean yield of all varieties



Source: KWS UK - PDF North - 2012

Fig 11: Three-year mean yield - output vs input and gross margin



Source: ADAS and KWS UK using HGCA mid-Sept delivered prices and Real Variable Costs

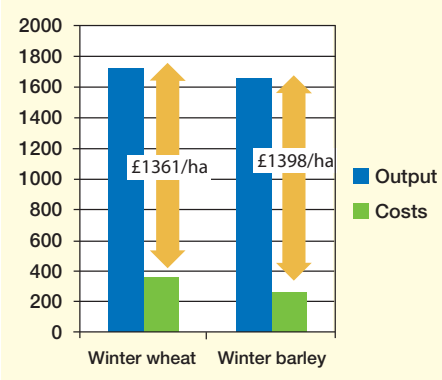
Factor this into the equation across both sets of trials and the gross margin from a feed barley crop increases and generates significantly more than that secured by the best second wheat varieties.

Conclusions

Both trials highlight what can be achieved from today's modern varieties and demonstrate that winter barley can be a more profitable second cereal.

They also show that, given the attention to agronomy and inputs many routinely give to wheats, today's winter barleys can also perform to a very high level.

Fig 13: Mean of all varieties - output vs input and gross margin



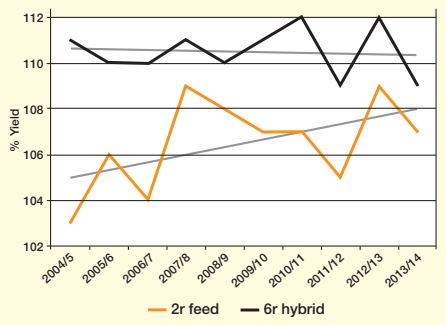
Source: ADAS and KWS UK using HGCA mid-Sept delivered prices and real variable costs

Better barley varieties

While farm yields have been relatively static, significant advances have been made by plant breeders, particularly over the past ten years, giving growers plenty of options to select from.

RL data shows that hybrid barleys, introduced in 2004, have maintained a very high yield potential over the period and that advances in two-row breeding are now matching this level (Figure 14).

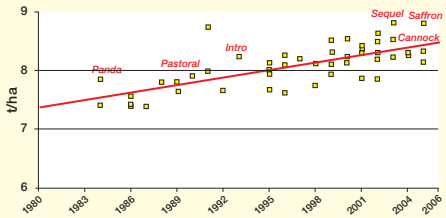
Fig 14: Top two-row and six-row hybrid yield (% control)



Source: HGCA UK Recommended List

Over the past ten years, an industry collaboration team under the guise of the Association Genetics of UK Elite Barley (AGOUEB) confirms that there's been a 0.5t/ha yield gain in barleys due to the introduction of new higher yielding varieties (Figure 15).

Fig 15: UK barley yield gain



Source: AGOUEB consortium, Professor Bill Thomas, James Hutton Institute

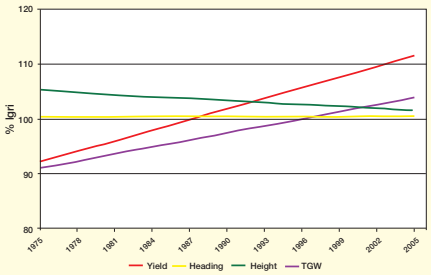
Taking Igri – a popular barley from the 1970s as the comparator – AGOUEB data shows that there's been a 20% yield increase in the last 35 years (Figure 16). At the same time, this yield has been supported by a 10% improvement in specific weight and a reduction in variety height. Thus, modern barleys produce a bigger berry on a stronger canopy.

These advances in traditional two-row breeding are not static. New technology is allowing the industry to determine the particular variation shown across the barley genome far quicker than they could in the past. This enables them to bring new traits and better varieties to farmers at a much faster pace.

Today's two-rows compared to 10 years ago

>>>>>>> Higher yielding
>>>>>>> Larger grained
>>>>>>> Shorter, stronger strawed
>>>>>>> More consistent yields

Fig 16: UK winter barley breeding progress



Source: AGOUEB consortium, Professor Bill Thomas, James Hutton Institute

Rotational benefits

Looking across the complete rotation and farm operation, there are other potential benefits of winter barley that are worth considering. These include:-

1 Better oilseed rape crops

Winter barley allows you to get the next crop established into a good seedbed in good time. It is, quite simply, a more reliable entry crop for OSR than winter wheat.

2012/13 has highlighted this, with some big differences in OSR establishment based on drilling date (Figure 17).

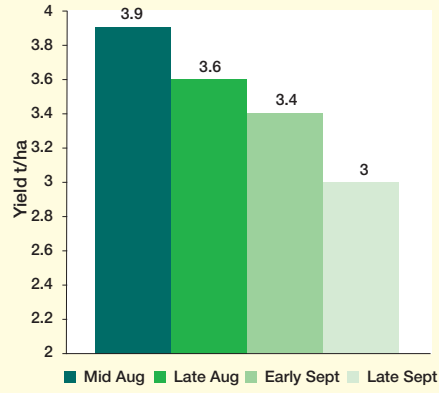
Fig 17: OSR drilling date and establishment

Source: Agrovista Trials - Morley, Norfolk - 2012 (Photos taken Dec 3)

Farm yield data from Sentry Farming confirms that the yield decline for every week's delay in drilling OSR past an optimum timing is 0.15t/ha. Indeed the company's survey, focusing on southern crops, suggests that crops planted in late-Sept can be 0.9t/ha lower yielding than those drilled in mid Aug (Figure 18).

Coming to harvest at the end of July through to mid-Aug, winter barley is often at least two

Fig 18: OSR drilling date and average farm yield



Source: Sentry Farming - OSR development group

weeks ahead of winter wheat on the same farm. This could make all the difference to turning the field round and getting the next OSR crop in the ground, in order to ensure the establishment needed for high yields.

2 Spread of workload

Winter barley can help to stagger your field operations across your cereal acreage (Figure 19).

Drilling can commence from mid-Sept, and while this can clash with early wheat drillings, most other farm operations can be staggered with those needed for winter wheat.

Usually requiring just three fungicides, winter barley sprays slot in well alongside wheat with the appropriate T0, T1 and T2 fungicide timings often 2-3 weeks apart from those for winter wheat. In addition, fertiliser use can often be timed earlier than that with wheat and spread across fewer applications.

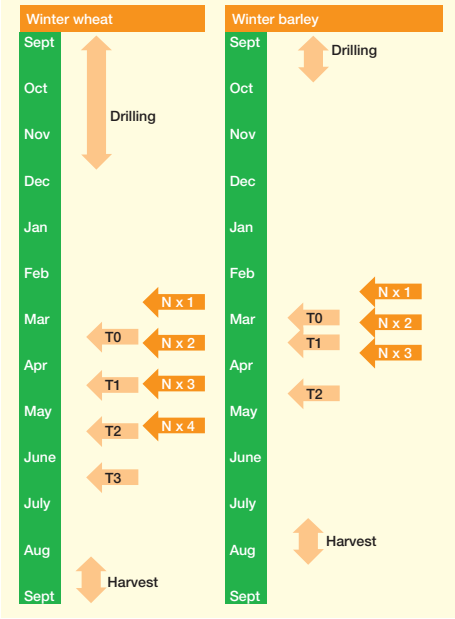
This takes pressure off the whole rotation, ensuring a better opportunity to time inputs more accurately to match crop needs across all crops, compared to where the focus is on a larger area of wheat.

3 Reduced inputs

Winter barley requires fewer sprays and fertiliser inputs than winter wheat. In this respect, it is a lower input crop, helping to reduce overall spend and easing cash-flows.

Figures illustrated earlier in this guide show just how advantageous this can be when

Fig 19: Typical work programmes for eastern counties

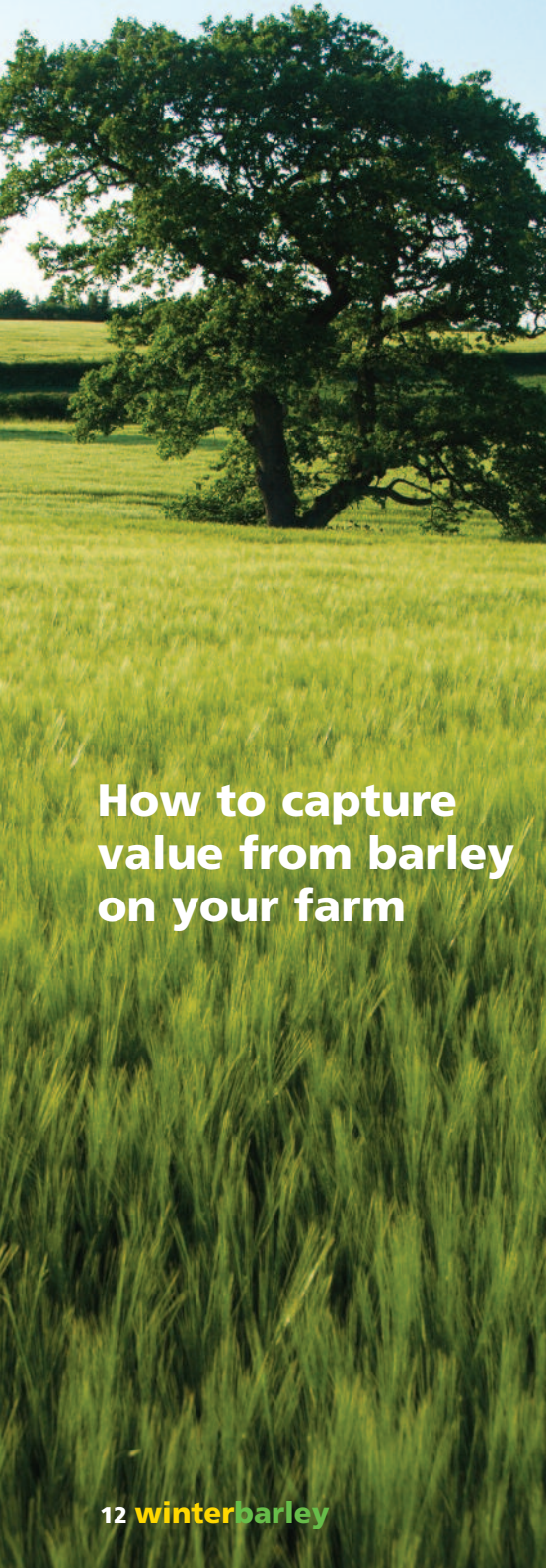


Source: KWS UK

comparing winter barleys versus second wheats.

Winter barley is generally thought to be immediately less prone to take-all compared to wheat in the second cereal slot in the rotation and this can also bring savings in seed-treatment needs.

While it is relatively easy to compare the costs of one crop against another, putting a financial value on these additional management benefits from barley is more difficult. However, they should not be ignored when considering the potential of the crop in your own situation.



How to capture value from barley on your farm

Maximising yield through best practice agronomy

1 Sowing date and seed rate

Compared with winter wheat, winter barley has a relatively narrow sowing date window. With a low vernalisation requirement it is less suited to very early sowing.

Trials suggest that optimum sowing dates for the highest yields are from mid to the end of Sept. Earlier drilling – in early Sept – may be appropriate on land at higher altitude and on drought prone soils, providing a better chance of good establishment and strong tillering in the autumn.

The crop completes most of its tillering prior to winter, but drilling too early in other situations will encourage excessive early biomass and could result in winter kill.

Shallow, late sowing, low seed rates and poor supply of micronutrients such as manganese will increase the risk of plant losses.

Barley is less adept at compensating for poor plant establishment or low seed rates compared with winter wheat as there is only one floret in each spikelet.

The target spring population should be around 300 plants/m^2. Sowing rate will depend upon local conditions, soil type and experience, but for two-rows should be in the range 320-365 seeds/m^2.

In higher tillering two-rows such as KWS Glacier, lower seed rates such as 300 seeds/m^2 may suffice, but this depends on local conditions and seedbeds.

Six-row barleys have a higher ear weight and thus require a lower ear density for optimum yield. As a result, growers should consider reducing seed rates to 225 to 250 seeds/m^2, aiming for 550-600 ears/m^2. These lower six-row seed rates are particularly important on more fertile soils.

The breeder's advice with six-row hybrids is to lower seed rates still further, to 200 seeds/m^2, for crops drilled in Sept and in good conditions.

A firm seedbed will ensure better moisture and nutrient availability and reduce the risk of frost heave and plant loss.

Most barley varieties can be sown up to the end of Feb, but yield potential will be severely compromised as a result.

2 Seed treatments

Most currently available winter barley seed treatments will provide adequate control of seed-borne diseases. For details, consult your agronomist or the *HGCA Barley Disease Management Guide*.

3 Barley Yellow Dwarf Virus (BYDV)

BYDV control has traditionally relied on pyrethroid sprays. However, in recent years the grain aphid – one of the main vectors that transmit the virus – has developed a level of resistance to this group of insecticides.

This places greater reliance on seed treatments such as Redigo Deter (clothianidin+ prothioconazole). Bayer CropScience's recommendation for Redigo Deter is to use a seed rate no lower than 100kg/ha (see Figure 20).

Rates of application lower than this will mean that you have to take much greater care with following foliar insecticide treatments.

In areas where grain aphids are considered a main vector, achieving optimal performance of the seed treatment becomes more important and it may be necessary to increase seed rate to maintain performance of the seed treatment.

Drilling early also increases the potential pressure from BYDV and in this situation, crops will again potentially benefit from a follow-up foliar spray.

Fig 20: How to use Deter-treated seed

Drilled middle two weeks in Sept	Considerably increased BYDV risk and need for follow-up sprays. Use a minimum of 100kg/ha of seed followed by a well timed aphicide spray. Here Redigo Deter provides the vital initial BYDV protection at a very busy time of year, before monitoring of aphid activity needs to begin.
Drilled late Sept or after	A minimum seed rate of 125kg/ha will normally provide equivalent protection to two well timed aphicide sprays.

Source: Bayer CropScience Drilling Guidelines (http://www.bayercropscience.co.uk/product/seed-treatments/redigo-deter - drilling guidance)

NB: With earlier drillings, in seasons and/or localities where aphid fly-in extends beyond the first week of Nov, an additional spray is likely to be required.

4 Barley Yellow Mosaic Virus (BaYMV) and Barley Mild Mosaic Virus (BaMMV)

BaYMV is the more common of two agents that cause yellow mosaic disease in barley - the other being BaMMV.

The virus is soil-borne and transmitted by the fungus *Polymyxa graminis* which has resting spores that survive in soil and is now wide-spread in the main UK barley-growing regions.

Both viruses occur, either separately or together, in autumn-sown barley and cause similar symptoms.

Yellow patches appear in winter or early spring and the leaves of infected plants have elongated, pale green or yellow flecks, typically on the youngest (unfurling) leaves. Leaves may be curled, giving the plants a spiky appearance. Sometimes the leaves show complete yellowing with necrotic patches and the plants are stunted.

Growers with BaYMV or BaMMV need to ensure they select BaYMV-resistant varieties. Most modern varieties offer resistance – only 5 out of 24 on the 2013/14 RL don't have BaYMV resistance.

5 Weed control

There's a wide range of herbicides available for a broad spectrum of weeds in the winter barley crop. However, without the Atlantis

(iodosulfuron+ mesosulfuron) option in barley, blackgrass control can be challenging particularly on heavier ground.

HGCA trials (AHDB Project Report 509) confirm that the best approach to controlling blackgrass is to use a stacked herbicide approach. Pre-emergence chemistry, based on herbicides such as flufenacet and tri-allate, can sometimes give 70-80% control on its own. When this is supported by early post-emergence chemistry, 80-97% blackgrass control was secured in the trials.

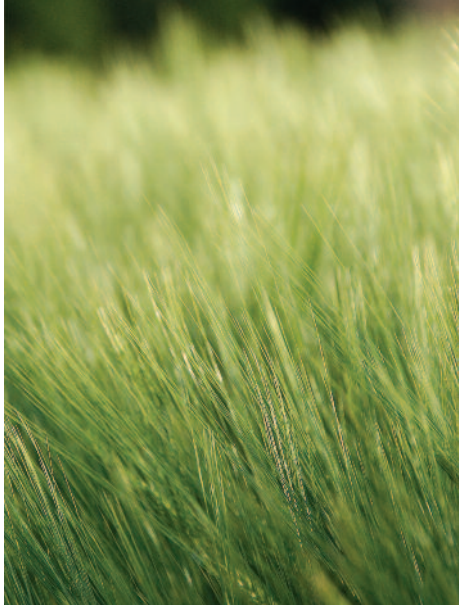
6 Crop Nutrition

Nitrogen

Growers and their advisors will need to take into account variety yield potential, site requirement and capability.

Canopy size is directly related to N uptake. Rate of uptake increases as warmer conditions from mid-March stimulate canopy expansion. Maximum uptake is by the flag leaf stage, GS39, when as much as 3kgN/ha is taken up every day.

Defra's RB209 guidelines recommend up to 210kgN/ha on the worst soils for a winter barley crop (Figure 21). However, on the most fertile of soils, yields of 10-11t/ha are possible and higher rates of 220kg/ha could be justified.



Where the total nitrogen rate is less than 100kgN/ha, apply it all as a single dressing by early stem extension, but not before late March.

Where the total nitrogen rate is 100kgN/ha or more, split the dressing with 40kgN/ha in mid-Feb/early March and the rest by early stem extension, but not before late March.

Fig 21: Winter barley - nitrogen

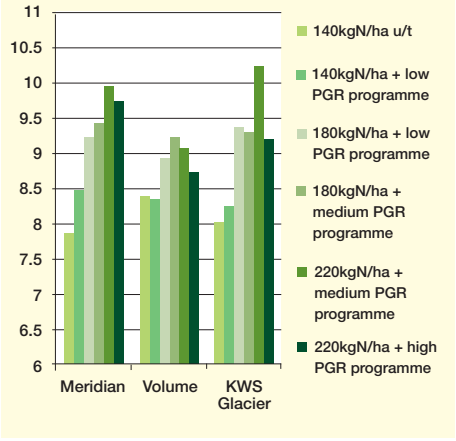
	SNS index						
	0	1	2	3	4	5	6
	kgN/ha						
Feed barley							
Light sand soils	150	120	90	60	30-60	0-30	0
Shallow soils	210	190	150	120	60	20-60	0-20
Medium and deep clay soils	190	170	140	110	60	20-60	0-20
Deep fertile silty soils	160	140	110	70	30	0-20	0
Organic soils				110	60	0-40	0
Peaty soils						0.40	
Malting barley (up to 1.78% grain N)							
Light sand soils	120	80	40	0-40	0	0	0
Other mineral soils	160	130	100	70	0-40	0	0
Organic soils				70	0-40	0	0
Peaty soils						0	

Source: Defra - Fertiliser Manual - RB209 - 8th Edition (2010)

These recommendations assume appropriate measures are taken to control lodging; if risks are high, reduce the rate by 25kgN/ha.

Trials by Scottish Agronomy show that under high rates of nitrogen, there is a benefit from a more robust PGR programme in the highest yielding varieties (Figure 22).

Fig 22: Winter barley - N x PGR interaction



Source: Scottish Agronomy 2012

Phosphorus and potassium

Adequate available potash is essential for the production of high-quality marketable grain with good specific weight and well filled grains.

A shortage will result in premature ripening with significantly lower individual grain size and weight, and will also prevent some potential grain sites from developing, thus reducing the number of grains/ear. Potash also improves stem strength.

Potash supply needs to be balanced with that of nitrogen – with inadequate K, N use is more limited and yields suffer. Uptake during establishment is low and even the most advanced winter barley crops will only contain 80kg K_2O/ha.

As the crop reaches tillering and vegetative growth stages, potash and nitrogen uptake increases and K needs may be as high as 10kg/ha per day. On light, low K soils this may outpace the soils natural capability to supply and spring N and K top dressing may be needed.

This is also good practice on these sandy, low K-retentive soils because split autumn and spring application minimises the risk of potash loss under excessive winter rainfall.

Peak potash uptake with cereals occurs around late flowering stage when there may be more than 250kg/ha of potash in a high yielding crop.

Other nutrients

Barley reacts strongly to magnesium deficiency resulting in leaf chlorosis, especially on chalks, so magnesium supplies need to be maintained for high yields.

Barley is particularly sensitive to manganese deficiency and growers should ensure deficiencies of this and other trace elements are not limiting, utilising appropriate seed treatments or foliar sprays.

7 Tiller management

Growers should review tillering and tiller numbers in the spring. Delaying nitrogen use will help the crop reduce tiller numbers in forward crops.

Early sown crops tiller for longer and can compensate for lower plant populations. Early nitrogen availability can encourage tillering.

8 Disease control

There is a wide range of fully effective fungicide actives available that provide strong preventative and curative action against the main barley diseases.

A programme based on a good triazole fungicide such as prothioconazole has proven effective in recent years. Supplementing these products with strobilurin and SDHI chemistry provides additional yield on top of the triazole chemistry by offering better disease control.

The addition of protectant products such as chlorothalonil can improve control of diseases such as ramularia. Such an approach will also help minimise fungicide resistance pressure on the triazole and other fungicide actives.

By utilising a 2-3 spray programme approach, disease control is often cheaper and easier than winter wheat.

Fig 23: Fungicide timing

Autumn	Occasionally useful if autumn growth is poor or tiller survival is under threat.
T0 (early spring)	To protect against earlier foliar diseases during tiller and spikelet formation.
T1 (stem extension)	To protect against tiller and spikelet death. T1 sprays tend to improve yield through increasing grain numbers and provide the greatest yield responses.
T2 (flag leaf)	T2 sprays at flag leaf emergence also increase grain numbers. Treatment at booting may extend canopy duration, boosting grain-fill.

Source: Adapted from the HGCA Barley Disease Management Guide

Growers should work alongside their agronomists to devise a simple and cost-effective fungicide regime that is matched to variety, season and locality. Also, consult the *HGCA Barley Disease Management Guide*.

9 Plant growth regulation

Barley is generally more at risk of lodging than wheat, tending to suffer more from stem-based lodging as well as brackling or necking.

A chlormequat, trinexapac-ethyl based PGR approach should provide the base for good lodging control in fertile situations.
Also, consider including a Terpal-type follow up (mepiquat chloride+2-chloroethylphosphonic acid) in certain high lodging risk situations.

Inappropriate or excessive PGR use can lead to problems from late formed green tillers, so it is

important to work with your agronomist to define the best programme for site and season.

Good disease control can also help reduce the impact of brackling, so a strong fungicide programme is important.

In order to reduce lodging risks, particularly on fertile sites:-

- Ensure good soil structure to maximise rooting capabilities
- Select varieties with the best lodging resistance
- Avoid excessive, early nitrogen
- Drill early to improve rooting and shorten straw
- Reduce seed rate to improve the anchorage of more widely spaced plants

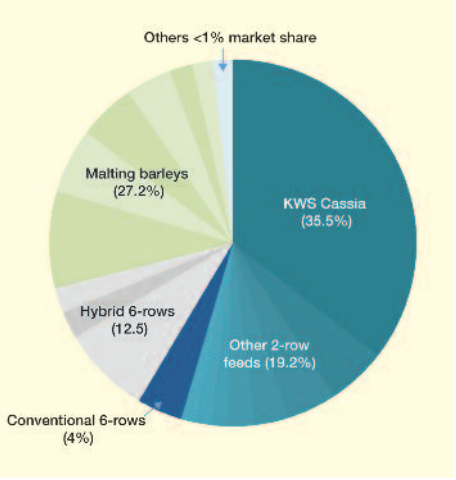
10 Harvest management

Glyphosate may be appropriate where ripening is variable in the field. It can also be used as a tool to increase your specific weight in six-row crops.

11 Variety selection

Two-row varieties continue to dominate the winter barley area (Figure 24) at over half of the certified UK crop area. Currently, one variety, KWS Cassia is grown in one in three winter barley fields.

Fig 24: UK winter barley - seed sales



Source: seed Certification Figures- March 2013

KWS Cassia has been joined on the 2013/14 RL, by the two-row KWS Glacier with the potential for a 3% yield advantage and the production of similarly high specific weight grain.

Conventional six-row varieties such as KWS Meridian and Escadre offer similarly high yields and have now superseded Sequel. These varieties are most commonly grown in the north and west of the UK.

The highest yield on the RL comes from the hybrid variety, Hyvido Volume. Hybrids can offer improved vigour bringing benefits in more difficult growing environments, particularly where establishment can be compromised, e.g. colder, wetter regions of the UK.

They require a more professional approach to ensure that the lower seed rate advocated by the breeder provides the desired plant stand.

The breeder also advises:-

- Ensuring that early N is not limiting to support the high tillering capacity – using 30% of the total N at GS25 (5 tillers).
- Use of the fungicide isopyrazam to protect larger leaves against disease and maintain grain-filling.
- Utilising the PGR trinexapac-ethyl, with its ability to enhance rooting as well as reduce lodging.

Work with your agronomist or seed merchant to ensure you have the right variety combination to suit your needs, and to ensure your agronomy suits the variety you choose.

Fig 25: Winter barley - feed varieties

	KWS Glacier	Retriever	Matros	KWS Cassia	California	Florentine	Saffron	Suzuka	Volume (hybrid)	KWS Meridian	Escadre	Sequel
Variety type	**Two-row feed**								**Six-row feed**			
Scope of recommendation	UK	UK	East	UK	West	UK	UK	UK	UK	UK	UK	UK
Fungicide treated grain yield as % treated controls												
UK treated yield as % controls (8.8 t/ha)	107	105	104	104	103	102	99	99	109	105	102	99
East region with fungicide (8.7 t/ha)	109	105	106	103	104	102	100	100	109	103	101	99
North region with fungicide (8.6 t/ha)	105	106	102	105	(101)	100	96	99	110	107	103	100
West region with fungicide (9.1 t/ha)	[104]	102	102	104	104	102	100	96	109	106	102	100
Light soils (8.4 t/ha)	105	107	104	103	104	102	98	100	108	104	103	100
Heavy soils (8.5 t/ha)	111	105	106	102	102	102	101	101	109	106	100	98
Grain quality												
Specific weight (kg/hl)	69.9	66.9	68.1	71.1	69.2	68.6	70.5	69.5	68.9	66.0	70.1	69.5
Screenings % through 2.25 mm	[1.7]	-	2.0	1.1	(0.7)	1.4	1.2	-	3.4	1.8	1.5	2.8
Screenings % through 2.5 mm	(5.7)	-	5.3	3.1	(2.7)	5.0	4.2	-	14.2	5.2	6.4	11.4
Agronomic features												
Resistance to lodging	7.0	6.1	6.9	7.5	8.1	8.2	7.6	7.3	6.0	7.1	6.6	6.2
Straw height (cm)	81	84	93	87	88	87	86	90	99	102	96	99
Ripening (+/- Pearl, -ve = earlier)	-1	-1	0	0	-1	-1	0	-2	-2	-2	-2	-2
Lodging % without PGR	4	14	5	4	1	1	3	4	13	6	8	15
Lodging % with PGR	4	8	4	2	1	1	2	2	11	2	5	5
Disease resistance												
Mildew	4.1	6.1	7.4	4.3	5.8	5.7	2.6	5.0	5.5	7.6	4.8	4.5
Yellow rust	[7]	8.8	[5]	5.3	[6]	7.8	7.4	8.5	6.2	[7]	7.5	5.5
Brown rust	6.0	4.8	6.5	6.9	5.4	6.0	6.6	[6]	5.4	6.0	5.1	5.3
Rhynchosporium	6.4	5.6	6.9	4.1	6.3	6.9	4.1	6.4	7.9	6.1	7.7	7.0
Net blotch	6.2	5.7	5.4	7.0	7.2	6.9	7.7	6.8	5.9	6.8	7.7	5.8
BaYMV	R	R	-	R	R	R	-	R	R	R	R	R

Source: HGCA Recommended Lists - 2013/14

Conclusions

Winter barley has come of age. High yielding modern varieties can perform as well as the best wheats in a second cereal situation and improve gross margins.

The crop also provides significant benefits across the rotation, most notably as a better, early entry for OSR.

Winter barley also eases management pressures, particularly during busy spraying and harvest bottle-necks, providing benefits in terms of better timing across all crops.

All in all, winter barley stacks up well – in trials and on-farm – as a profitable second cereal. But it is also a more flexible option than wheat on lighter soils.

As a result, growers and their advisors should look again at the crop and its potential in a range of positions on farm.

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