Guide for SRUC Cereals Open Day

Drumalbin Farm, Lanark

12th July 2016

Content

Introduction FIONA

Welcome to our trials open event at Drumalbin which is themed around the principles of integrated pest management. We live in interesting times but amongst all the many uncertainties a few guiding principles remain. Our crop yield potentials in Scotland remain amongst the highest in the world driven by our plentiful rain and long summer day lengths. With this high potential come a plethora of pests, weeds and disease problems which have to be managed. We are losing some of the pesticide tools we have traditionally used through resistance development and legislative changes. Scotland sets a high value on its countryside and so methods of farming that are sensitive to this will remain a high priority. Integrated methods of managing risk can represent real win:wins. Against a globally well supplied market which depresses grain prices tailored inputs that respond to the actual risk in each crop can allow for input costs to be tuned to what is required. We all recognise that high yielding varieties which are weak for disease represent an increased risk and increased costs and better varietal resistance is a key tool in managing disease risks but varieties also have to respond to what the market demands and give consistent quality. The best up-and-coming varieties will be a key feature at this open day.

Integrated Pest Management (IPM) is a site specific, whole farm approach to maximising the efficiency of production whilst minimising negative effects on the environment. This should involve minimising pest, weed and disease risks and includes the use of crop rotations, appropriate cultivation techniques, the use of resistant varieties, tailored and efficient use of artificial inputs such as fertilisers, pesticides and fossil fuels and the enhancement of wildlife habitats. Pest monitoring and the use of thresholds for treatment are a key component in reducing reliance on pesticides.

IPM is often a fuzzy and misunderstood term but a new online planning tool has been launched to help, which has been developed by SRUC, Scottish Government, NFUS and the Scottish VI. Have a look and fill one out for your farm at http://bit.ly/pestmanagementplan. It comprises 30 simple questions (and that includes things like your name and email), takes few minutes to complete and your plan will be emailed back to you. The data is of course anonymised so your identity is protected.

Key Principles to consider today

- There are immediate win:wins with IPM in Scotland
- Look at the impact of variety and tailored pesticide programmes on disease pressure at the site
- New alternatives to pesticides might be developed
- IPM has to be tailored to your site – what have you adopted and what might you do in the future?
- We are losing tools – hear the latest on pesticides at risk and resistance management

Key Recommendations

- Make an IPM plan for your farm at http://bit.ly/pestmanagementplan
- Use the new planning tool for Scotland: http://bit.ly/pestmanagementplan
- Identify your key pest, weed and disease risks
- Where possible select varieties that reduce these risks
- Plan agronomy to minimise the main risks
- Monitor crops and tailor pesticides to the in-season issues

http://bit.ly/pestmanagementplan

NEIL GRAHAM

Field details and agronomy

Winter Barley			
GRID REF	NS905381	**PREVIOUS CROPPING:**	Winter barley
ELEVATION	230m	**1 YEAR AGO**	Spring barley
SOIL TEXTURE	Loam	**2 YEARS AGO**	Spring barley
SOIL SERIES		**3 YEARS AGO**	Grass
SOIL ANALYSIS:			
pH	6.3		
P	5.67 (mod-)		
K	68.1(Low)	**PLOT SIZE**	10m x 2m
Mg	199 (mod)		
S	8.3(Mod)	**SEED RATE**	340/m^2
Mn	3.9 (mod)		
Cu	*		
Organic Matter	8.7 %		

WINTER BARLEY ROUTINE APPLICATIONS

Date sown 25 Sept 15

FERTILISER (Kg/Ha)	**N**	**P_2O_5**	**K_2O**	**S**	**DATE**	**GROWTH STAGE**
	0	24	24	0	2.11.15	11-12
	60	0	0	14	14.3.16	15-22
	90	0	0	25	19.04.16	30

	RATE	**PRODUCT**	**DATE**	**GROWTH STAGE**
HERBICIDE:	3.0 l/ha	Picona	14.10.15	10
	20 g/ha	Ally	22.04.16	30
FUNGICIDE	0.5 l/ha	Corbel	30.3.16	25-30
	0.5 l/ha	Kayak	30.3.16	25-30
	0.75 l/ha	Siltra	9.5.16	30-31
	1.0 l/ha	Bravo	9.5.16	30-31
	0.3 l/ha	Vegas	9.5.16	30-31
	0.75 l/ha	Siltra	30.5.16	39-59
	1.0 l/ha	Bravo	30.5.16	39-59
PGR	2.0 l/ha	Cycocel	22.4.16	30
OTHER	1.0 l/ha	Manganese	22.04.16	30

Field details and agronomy

Spring Barley			
GRID REF	NS905381	**PREVIOUS CROPPING:**	Spring barley
ELEVATION	230m	**1 YEAR AGO**	Spring barley
SOIL TEXTURE	Loam	**2 YEARS AGO**	Spring barley
SOIL SERIES		**3 YEARS AGO**	Grass
SOIL ANALYSIS:			
pH	5.8		
P	4.59 (mod-)		
K	119 (mod-)	**PLOT SIZE**	10m x 2m
Mg	97.3 (mod)		
S		**SEED RATE**	340/m^2
Mn			
Cu			
Organic Matter	8.7 %		

SPRING BARLEY ROUTINE APPLICATIONS

Date sown 11 Apr 16

FERTILISER (Kg/Ha)	**N**	**P_2O_5**	**K_2O**	**S**	**DATE**	**GROWTH STAGE**
	60	0	0	14	19.4.16	Pre em
	35	0	0	0	10.5.16	15-20

	RATE	**PRODUCT**	**DATE**	**GROWTH STAGE**
HERBICIDE:	60 g/ha	Harmony M SX	30.5.16	25-30
	0.5 l/ha	Duplosan	30.5.16	25-30
	1.0 l/ha	Highload Mircam	30.5.16	25-30
FUNGICIDE	0.5 l/ha	Siltra	3.6.16	25-30
	1.0 l/ha	Bravo	3.6.16	25-30
	0.6 l/ha	Siltra	20.6.16	39-59
	1.0 l/ha	Bravo	20.6.16	39-59
PGR	0.75 l/ha	Terpal	14.6.16	32-37
OTHER	1.0 l/ha	Manganese	3.6.16	30
	340 kg/ha	Calciprill	10.5.16	15-20

Trials demonstrated at Drumalbin Open Day STEVE

Spring barley varieties: AHDB Recommended List

- Waggon and Scholar are preferred feed options, though Waggon is now longer in trials. Propino is also often grown as a high yielding feed variety. Likewise, new high-yielding malting varieties are good feed options.
- Concerto is the clear market leader for malting in Scotland, supported by Belgravia, Odyssey and Propino.
- Octavia has just received IBD Full Approval for brewing and malt distilling, whilst Sienna has IBD Provisional Approval. The new variety Laureate also has Provisional Approval for brewing and distilling.
- KWS Irina and RGT Planet are high yielding brewing varieties with Full IBD Approval.

Winter barley varieties: AHDB Recommended List

- New two-row feed varieties should be compared with KWS Cassia, recognised for its high specific weight
- KWS Glacier and KWS Tower are higher yielding than KWS Cassia, though their specific weights are not as high
- Other new two-row varieties include KWS Infinity, KWS Orwell and Surge.
- Six-rows on the AHDB list are dominated by hybrids. New varieties Bazooka and Belfry out-yield the current standard, Volume.

Wheat varieties: AHDB Cereals and Oilseeds Recommended List

- The most important choices for Scottish growers are the high yielding soft Group 4's. The leading varieties for sowing this autumn are: Leeds, Myriad, Viscount and Revelation.
- Biscuit-making varieties in nabim Group 3 that also suit distilling are Zulu and RGT Conversion. Note that the biscuit-making varieties KWS Barrel and KWS Basset are rated poor for distilling.
- For hard feed wheat the best choices are: KWS Silverstone, Evolution and Grafton.
- The requirement for Scottish-grown milling wheat is small, but high yielding varieties in nabim Groups 1 and 2 can be considered for feed use. These include: Skyfall, KWS Trinity, KWS Siskin and KWS Lili.
- There are 19 candidates in the 2016/17 RL trial. Of these, nine are being evaluated for soft feed (distilling)

The full list of barley and wheat varieties is attached to the end of this guide.

Winter barley fungicide trials

Winter barley trials have battled Rhynchosporium since the autumn and although mildew has been seen in some of the trials the major disease remains Rhynchosporium at this site. Fungicide inputs can be tailored in an integrated way to suit the varietal ratings and disease pressure in individual crops but are essential to maintain barley yield as current resistance in winter barley is at best middling, ranging from 7 to 4 with six row varieties slightly more resistant than two row varieties. The Lanark site has one of the AHDB fungicide performance trails so the effect of fungicides on disease development is monitored on an annual basis. There are reports of the appearance of strobilurn resistant isolates of Rhynchosporium in Ireland in recent years so careful monitoring is required. SDHI fungicides remain particularly effective against Rhynchosporium (especially in a protectant situation) but other options based on triazole/strobilurin mixes are available. Research at SRUC has shown that control of Rhynchosporium at GS31 is vital to protect yield. A number of spray programmes are demonstrated
Ramularia is coming into trials now. There were reports from Germany of 2 isolates with reduced sensitivity to the SDHI fungicides so control by these fungicides is being monitored.

Spring barley fungicide trials

Spring barley crops this season often got off to a late start and as a consequence have leapt through the growth stages. This means that there has been a reduced disease pressure at early growth stages but the trials show that some early treatment is beneficial in keeping crops clean until the booting sprays at T2. If diseases like rhynchosporium get established in the gap then it is hard / impossible to row back from that and harsh treatment at T2 can do more harm than good as it can stress the crop and make ramularia worse. There are various concerns about fungicide resistance in barley diseases - septoria hogs the press so some of these issues in barley have been under reported.

More integrated practices such as the use of resistant varieties and the use of fungicides tailored to the disease risks in a field can be a win:win in terms of stewarding fungicides and giving cost effective yield responses. Alternatives to fungicides such as biological controls and the use of elicitors that prime barley plants to defend themselves may become more important and the trials here look at some of the elicitor products that are amongst the most likely of these alterative contenders. The trials let you see how conventional chemistry has fared and also how these alternatives can be integrated into programmes.

Cover Crops

There is an increasing interest in the establishment of cover crops post harvest. The roots of the sown plants help to trap nutrients limiting nitrate leaching and reduce erosion. The roots keep the soil structure open and active during the autumn and winter and the resulting biomass of roots and foliage release the trapped nutrient to the following crop and help to build soil organic matter. Several plots have been sown to demonstrate some of the plant species being used in mixtures. Cover crops can also be used to meet EFA greening requirements and SRDP agri-environment climate scheme options.

Sowing Date – 24 March Fertiliser (Kg/Ha.) - 0:60:60 and Manganese

PLOT	Species	Variety	Seed Rate Kg/ha
1	Lucerne	Neptune	20
2	Mustard	Rumba	15
3	Tillage Radish	Sructurator	10
4	Phacelia	Natra	10
5	Vetch	Early English	40
6(*)	Pollen mix	See box on right	12
7	Red Clover + Oats + Barley	Merula Firth Concerto	15 50 seeds/m^2 50 seeds/m^2
8	White Clover + Oats + Barley	Aberpearl Oats + Barley	15 50 seeds/m^2 50 seeds/m^2

Plot 6 Operation Pollinator Mixture
36% Corvus Red Clover
20% Altaswede Red Clover
20% Aurora Alsike Clover
20% Sainfoin
2% Rocco Birdsfoot Trefoil
1% Lesser Knapweed
1% Musk Mallow

To comply with EFA greening requirements two or more species need to be sown before the 1st October and maintained until the 31st December (inclusive). Unfortunately they are not allowed to support any agricultural production so cannot be cut or grazed during or after the required period and need to be incorporated in advance of establishing the following spring sown crop.

Whilst EFA covers can be sown up until 1st October there is concern about the amount of benefit to be gained from later sowings. This spring SAC Consulting undertook a number of in-field evaluations of post-harvest cover crops and found a considerable range in crop biomass. Unsurprisingly sowing date is important, and as a rough guide for Lothians and Borders, dry matter yield of root and top growth falls dramatically after mid-September with little contribution from small seed plants sown at this timing. In such situations late sown mixtures need to feature large cereal seeds which are more able to establish and grow. The effects of latitude (as you move up the country) and to a lesser extent altitude (as you move up the hill) also need to be considered as can be seen in the table overleaf comparing sites in Northumberland and Lothians with Aberdeenshire. Slug feeding and site fertility were also factors affecting biomass yield.

Cover Crops in Scotland 2015 Dry Matter Yield/ha

Sowing Date	Northumberland/Lothians	Aberdeenshire
3 & 4 wk August	1510 – 1800 kg DM/ha	190 – 420 kg DM/ha
1 & 2 wk September	1630 – 1800 kg DM/ha	-
3 & 4 wk September	190 – 900 kg DM/ha	20 -30 kg DM/ha

Whilst only based on one year it would suggest that cover crops sown post-harvest are not a viable option for all arable areas in Scotland.

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BASF – Adexar, BASF 3C Chlormequat, Pictor, Terpal and Picona.

For further information about Scottish Government funded R&D at SRUC contact:

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http://www.sruc.ac.uk/crops

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AHDB Winter wheat Recommended List Trial, 2016-17

North yield 100 = 9.5 t/ha

Varieties underlined are on the SRUC List 2016

Amplify North [102] uT 72
A high yielding hard feed wheat which failed to make to recommended list, stiff straw but susceptible to eyespot and yellow rust.

Belgrade North [101] uT 94
Belgrade is a **new** high yielding hard feed variety for the East and West regions. It has moderate lodging resistance and limited data suggests it is susceptible to sprouting and eyespot.

Bennington UK 105 uT 92
A candidate soft feed variety. Good disease resistance and stiff straw.

Britannia North 106 uT 85
Britannia is a high yielding nabim group 3 biscuit variety which also has the uks classification for export. Note that is rated poor for distilling. It has a good rating for yellow rust but some disease has been seen in untreated trials in 2016. Britannia is relatively late maturing and susceptible to eyespot and it is weaker strawed than other varieties in this Group

Claire UK 98 uT 76
Is the oldest variety on the list. It is a quality nabim Group 3 biscuit variety, has export potential and is rated medium for distilling. Outclassed for yield, but it remains a favourite of millers because of its processing qualities. It is a slow-developing variety that has proved useful for very early drilling. It is very susceptible to mildew and its yields are 7% lower than the highest yielding variety in its group.

Cordiale North 96 uT 71
Cordiale remains a Group 2 variety of choice for UK millers giving a consistent baking performance. It has ukp export potential. It. also gives high grain protein, good Hagberg falling number and specific weight. It is early maturing with short straw and moderate disease resistance. It is susceptible to yellow and brown rusts and it has a lower untreated yield than other varieties in the Group. It is early maturing and can be grown as a second wheat.

Costello North 103 uT 92
Costello is a hard short-strawed feed variety with high Hagberg falling number and specific weight. Its treated yield potential is 3% below that of the highest yielding varieties. It has a good untreated yield due to high resistance to mildew and yellow rust. Limited data suggest it is susceptible to eyespot.

Crusoe North 96 uT 85
A Group 1 quality bread making variety. Its good baking performance has made it a popular variety and it also has ukp export potential. It is lower yielding than Skyfall, RGT Illustrious and KWS Trinity, but higher yielding than Solstice and Gallant. It tends to produce consistently high protein levels.

Dickens North 108 uT 84
Is a high yielding hard feed variety which performs particularly well on lighter soils. It is relatively early maturing and has good resistance to mildew, yellow rust and brown rust but it is susceptible to eyespot.

Dunston UK 107 uT 95
A candidate hard feed variety.

Evolution North 107 uT 87
A very high yielding feed variety with much better disease resistance than many of the other high yielding feed varieties. However, it has a low specific weight. It has given high yields on a range of soil types and its second wheat yield is very good. It is rather late maturing. Evolution has good resistance to yellow rust and brown rust and no serious disease weaknesses. Tall moderately stiff straw and late to mature.

Freiston North 106 uT 89
A candidate hard feed variety.

Gallant North 95 uT 68
As a nabim Group 1 variety, its consistent milling and baking qualities maintains popularity with millers. Suitable for export markets. It has high Hagberg falling number and specific weight. Gallant is early maturing and has short straw but its yield potential is 4% below Skyfall and it is susceptible to yellow rust and Septoria tritici.

Grafton North 101 uT 80
Its yield is now 6% lower than the top yielding variety in this group but it has a high specific weight. It has slow primordial development and early maturity and is a useful candidate for early drilling. Its short straw is very stiff, which is advantageous on heavy land. Grafton has high resistance to mildew and eyespot, but it is susceptible to rusts. It has a good second wheat yield.

Graham North [101] uT 94
Graham is a high yielding hard feed variety which is **new** for 2016. Its UK treated yield is slightly below the best feed varieties on the list, but it yields very well as a first wheat. It is one of only two varieties with a 7 rating for Septoria tritici. Graham also has high resistance to mildew, brown rust and higher than average resistance to Fusarium head blight. Weak for eyespot. Early maturity. Currently Graham has a good rating for yellow rust but there is evidence that it could be infected by new races of the disease.

Hardwicke
A candidate soft feed variety. Data cannot be published as it has not yet completed National Listing.

Icon
A biscuit-making variety, no longer on the Recommended List.

JB Diego North 102 uT 84

JB Diego remains popular with feed growers in the north of England due to its consistent performance over years. Its yield is now 4% below the highest yielding varieties in the group, but it achieves a high specific weight and Hagberg falling number. JB Diego has reasonable disease resistance but is susceptible to brown rust. It has good resistance to yellow rust but is susceptible to eyespot. It has early maturity with good sprouting resistance.

KWS Barrel North [113] uT 80

Is a **new** biscuit-making variety and has the highest yield among the Group 3 and soft Group 4 varieties. It has uks suitability for export. Note that it is rated poor for distilling. It yields particularly well on lighter soils. It produces short, stiff straw, has high resistance to mildew and rusts and has resistance to orange wheat blossom midge. It has relatively slow early development and is likely to be well-suited to early drilling.

KWS Basset North [104] uT 84

Is a **new** group 3 biscuit wheat and has the uks classification for export. Note that it is rated poor for distilling. Basset is high yielding, and has a good early-drilling yield. It achieves high specific weights and has good resistance to yellow rust and orange wheat blossom midge.

KWS Crispin North [101] uT 95

Is a **new** high yielding hard feed variety with a high specific weight. It performs best in first wheat situations and has given high yields in both fungicide treated and untreated trials. Crispin has only moderate straw strength but combines orange wheat blossom midge resistance with high resistance to mildew and yellow rust. It is moderately susceptible to eyespot.

KWS Kerrin UK 108 uT 89

A candidate hard feed variety.

KWS Lili North 108 uT 83

KWS Lili is a very high yielding nabim Group 2 bread making wheat which has ukp export potential. It has a high Hagberg falling number. Careful nitrogen management is required to attain the required protein level for milling specifications. Lili has a high yield potential, performing particularly well on lighter soils and first wheat situations. It has short straw, high resistance to mildew and yellow rust and has no major disease weaknesses but it is later maturing than most other bread making wheats.

KWS Santiago North 107 uT 75

KWS Santiago is recommended for the East and West regions, performing well on all soil types and rotational positions over many different seasons. It requires a good fungicide and plant growth regulator programme to get the best from it. Santiago is stiff strawed and resistant to orange wheat blossom midge but is rather late maturing and susceptible to mildew and Septoria tritici.

KWS Silverstone North [111] uT 87

A **new** hard feed wheat, with the highest UK yield on the Recommended List, giving high specific weights. KWS Silverstone also has good resistance to mildew and rusts but susceptible to Septoria and eyespot. It has moderate straw strength and it has given its best yields on less fertile lighter soils.

KWS Siskin North [105] uT 96
A **new** bread-making Group 2 variety with ukp export potential. It has achieved the highest yields for a bread making variety and is competitive with most feed wheats. It achieves high Hagberg falling number and specific weight. KWS Siskin is one of only two varieties with a rating of 7 for Septoria tritici; it also has high resistance to mildew and the rusts and has given very good yields in untreated trials. Stiffish straw.

KWS Trinity North 104 uT 82
Is one of the two highest yielding Group 1 varieties (the other being Skyfall) and is recognised by UK millers for quality bread making wheat. It can have low protein content so will require careful nitrogen management to meet specification. It has good specific weight and Hagberg falling number with short, stiff straw and good resistance to mildew, yellow rust and brown rust. Good resistance to sprouting. Suits all soil types.

KWS Zyatt UK 105 uT 95
A candidate hard bread-making variety.

Leeds North 107 uT 78
Is the highest yielding variety in the soft milling feed Group. It is rated medium for distilling and meets the uks specification for overseas markets. Leeds is resistant to orange wheat blossom midge, has above average resistance to fusarium head blight and high resistance to yellow rust. It is susceptible to brown rust and very susceptible to mildew. It is stiff-strawed and relatively good resistance to sprouting compared with other varieties in the group, but it is late maturing.

LG Bletchley UK 102 uT 90
A candidate biscuit-making variety. Relatively early maturity and stiff straw.

LG Cassidy UK 104 uT 81
A candidate bread-making variety.

LG Motown UK 104 uT 92
A candidate soft feed variety. Early maturing and good disease resistance.

LG Sundance UK 105 uT 91
A candidate soft feed variety. Good disease resistance, but late maturing.

Marlowe UK 107 uT 80
A candidate hard feed variety with high yield and good mildew and yellow rust resistance. Tall weak straw may be susceptible to lodging.

Marston UK 104 uT 88
A candidate hard feed variety

Mosaic North 101 uT 87
A high yielding soft feed wheat, not added to the AHDB recommended list.

Moulton UK 104 uT 92
A candidate soft feed variety. Good disease resistance and relatively early, but intermediate straw strength and poor for eyespot.

Myriad North 106 uT 80

Is recommended for the North region as a soft milling feed. It has medium characteristics for distilling and meets the uks specification for export markets. Myriad has moderate lodging resistance but responds well to plant growth regulators. It has intermediate ratings for most diseases. It is resistant to orange wheat blossom midge and has a good rating for yellow rust although some disease has been seen in untreated trials in 2016.

Reflection North 107 uT 88

Is a hard Group 4 with very high treated yield stiff straw, early maturity and a good specific weight. It has yielded very well as a first wheat. Reflection has resistance to orange wheat blossom midge and high resistance to mildew and brown rust. High levels of yellow rust have been seen in this variety in untreated trials in 2016.

Relay North 102 uT 85

Is a hard-milling feed variety recommended for the East and West regions. Good all-round disease resistance but lacks midge resistance. High resistance to yellow rust and brown rust but is susceptible to eyespot. It has short, stiff straw.

Revelation North 103 uT 87

A soft milling variety rated good for distilling and it also meets the uks specification for export markets. It has good resistance to lodging and has slow primordial development that could make it a useful candidate for early drilling but it is late maturing. Revelation has high resistance to yellow rust, brown rust and eyespot and above average resistance to fusarium head blight and has a high untreated yield making it a relatively low risk variety in this market. It has stiff straw. It is not midge resistant, and is very late maturing.

RGT Conversion North 105 uT 82

A quality nabim group 3 variety with uks export potential and rated good for distilling. It meets the quality requirements for a biscuit wheat. It has short, stiff straw and gives its best yield performance in the north. It has high resistance to mildew, yellow rust and brown rust. Its relatively slow growth and development may make it suitable for very early sowing.

RGT Illustrious North [96] uT 90

A **new** Group 1 quality bread wheat. It has shown good baking performance and good gluten quality even at lower protein levels. Illustrious is stiff strawed, yields 2% higher than Crusoe and only 1% below Skyfall and KWS Trinity. It is slightly later maturing than other quality bread wheats but has a good disease package with high ratings for mildew, yellow rust, brown rust and eyespot.

RGT Knightsbridge UK 107 uT 82

A candidate soft feed variety that is the highest yielding in its class. Intermediate straw strength and disease resistance.

RGT Marlborough

A soft wheat that was not added to the AHDB Recommended List for 2016.

RGT Paddington UK 105 uT 76

A candidate hard feed variety, for the East region.

RGT Pembroke

A soft wheat that was not added to the AHDB Recommended List for 2016.

RGT Westminster UK 105 uT 85
A candidate soft feed variety. Agronomic features are intermediate to strong, with good resistance to eyespot and mildew.

Savello UK 105 uT 85
A candidate soft feed variety. Relatively early maturing. Good resistance to mildew, yellow rust and eyespot.

Scout North 98 uT 80
Scout is a quality nabim Group 3 biscuit variety with export potential. It is rated poor for distilling. It has a high specific weight. It remains popular with many millers having similar quality attributes to Claire; it has resistance to orange wheat blossom midge and good resistance to the rusts but it is late maturing and yields 8% lower than the highest yielding variety in its group. Scout has slow primordial development making it suitable for early sowing, but it is a later maturing variety.

Shabras UK 107 uT 86
A candidate hard feed variety.

Skyfall North 103 uT 87
Is one of two high yielding nabim Group 1 wheats, the other being KWS Trinity. Its milling and baking qualities remain consistently good making it popular with millers. It has lower protein content so will require careful nitrogen management to meet specification. It is the only quality bread winter wheat which is resistant to orange wheat blossom midge. It has good resistance to brown rust and has no major weaknesses to the other common diseases.

Spyder North [98] uT 91
A **new** Group 3 biscuit wheat for the East and West regions. It is rated poor for distilling. It meets nabim's criteria for a biscuit wheat but check with your end user that it meets their requirements. Spyder has moderate straw strength but responds well to plant growth regulators. It has high resistance to mildew and brown rust but limited data suggests it is susceptible to eyespot. It has a good rating for yellow rust but there is evidence that it could be infected by new races of the disease. It performs better as a first wheat.

Stratosphere UK 105 uT 88
A candidate soft feed variety. Agronomic features are intermediate to strong.

Viscount North 105 uT 77
Viscount is recommended for the North region where it achieves a high yield and is considered to be the benchmark variety for distilling. It also meets the uks specification for export markets. It is a short stiff strawed variety but it is susceptible to sprouting and tends to give low Hagbergs.

Zulu North 105 uT 82
Is a nabim Group 3 soft biscuit wheat with uks export potential and medium distilling potential. It has orange wheat blossom midge resistance and high resistance to mildew and yellow rust but it is susceptible to brown rust and eyespot. It has given good yields in the north and although it has moderate resistance to lodging it responds well to plant growth regulators.

North yield 100 = 8.8 t/ha

Varieties underlined are on the SRUC List 2016

Bazooka North 108 UK 107
A **new** hybrid six-row with a specific weight better than Volume, plus lower screenings. Good disease resistance, including very good resistance to Rhynchosporium. It has tall, stiff, straw. It has similar maturity to Volume. It yields well in all regions and is especially suited to lighter soils.

Belfry North 107 UK 106
A **new** hybrid six-row with a specific weight not quite equal to Volume but it has fewer screenings. It has stiff straw with height intermediate to Volume and Bazooka. Disease resistance is slight better than Volume (Mildew, brown rust and net blotch); it has good resistance to Rhynchosporium. It has similar maturity to Volume. It yields well in the North region and is suited to lighter soils.

California North 97 uT 81
Recommended for the West for its tall stiff straw. It has early maturity. With the exception of Rhynchosporium disease resistance is good. It is suited to heavier soils.

Cassata North 91 uT 75
No longer in trials and removed from the IBD List. It was a specific recommendation for growers wanting a malting variety with resistance to barley mosaic virus. Yield is 4% lower than SY Venture. Stiff-strawed. Susceptible to mildew and very susceptible to yellow rust and net blotch. Market share continues to decline.

Craft North 98 uT 80
A **new** recommendation with Provisional IBD Approval for malting and brewing. Its hot water extract is high and screenings are relatively low. It is stiff, with good disease resistance, especially for net blotch and brown rust. It has average maturity.

Daxor
A high yielding conventional six-row variety that is no longer on the Recommended List. Early maturing with medium length but stiff straw. Its specific weight is relatively low.

Escadre
A conventional six-row variety that is no longer on the Recommended list. It is susceptible to mildew and has a low specific weight.

Funky UK 105 uT [92]
A candidate six-row feed variety. It has good agronomic features including early maturity and good specific weight.

KWS Cassia North 100 UK 98
Was widely grown as a successor to Saffron with interest now moved to more recent recommendations. It has a very high specific weight and good resistance to lodging. Mildew and Rhynchosporium resistance is weak, net blotch and brown rust resistance are relatively good. It has average maturity.

KWS Creswell North 103 uT [80]
A candidate two-row feed variety. It has a competitive yield and intermediate agronomic features.

KWS Glacier North 101 uT 81
A widely grown successor to KWS Cassia, though specific weight not quite as high. Straw is both weaker and shorter than Cassia. It is very weak for mildew and slightly better for Rhynchosporium. Early maturing. Better suited to heavier soils.

KWS Infinity North 102 uT 80
Its specific weight is below both KWS Cassia and KWS Glacier. Straw characters and maturity are similar to KWS Tower; it is stiffer than KWS Glacier. Rhynchosporium resistance is intermediate. Other disease resistance is similar to or weaker than KWS Glacier. It is very weak to mildew.

KWS Meridian
A conventional six-row variety with a high yield, no longer on the Recommended List. Good disease resistance, a low specific weight and barley yellow mosaic virus resistance. Tall with moderate straw strength.

KWS Orwell North 102 uT 83
A **new** recommendation with a rather low specific weight, that is well below KWS Cassia. Stiff straw. It has good resistance to Rhynchosporium but is very susceptible to mildew. It is suited to lighter soils.

KWS Tower North 102 uT 80
A widely grown successor to KWS Cassia, though its specific weight is intermediate. Straw is similar for length and strength to Cassia. It is weak for net blotch and intermediate for other main diseases. It is suited to lighter soils.

Retriever North 101 uT 75
No longer in trials. Has performed best in North region. Moderate straw strength and moderate disease resistance, but rather low specific weight.

Rubinesse UK 95 uT [84]
A candidate with potential for brewing.

Sunningdale UK 107 uT [91]
A candidate six-row hybrid feed variety.

Surge North 99 uT 89
A **new** recommendation with a good specific weight. It has a very high untreated yield. It has average resistance to lodging with rather short straw. Other than net blotch, disease resistance is good, especially Rhynchosporium and brown rust.

SY Venture North 92 uT 74
Fully Approved by the IBD for brewing. Its hot water extract exceeds Cassata and Pearl, though screenings are slightly higher. Resistance to lodging is similar to Pearl. Mildew resistance is intermediate. It is weak for Rhynchosporium weak but good for Net blotch. It is BaYMV resistant. It has average maturity and suits heavy soils.

Talisman North 95 uT 79

Fully Approved by IBD for malting and brewing. It has a good hot water extract but is prone to higher screenings. Other than Net Blotch, disease resistance is as good. It is relatively early and suits lighter soils.

Volume North 105 uT 83

High yielding six-row hybrid with good specific weight. Screenings are higher than Bazooka and Belfry. It has average straw strength and is taller. Mildew and brown rust resistance are intermediate, but Rhynchosporium and Net blotch are good. It suits lighter soils.

North yield 100 = 7.0 t/ha

Varieties underlined are on the SRUC List 2016

Acorn UK 103 uT 90
Candidate with potential for malt distilling and brewing.

Belgravia North 93 uT 80
Has IBD Full Approval for malt and grain distilling. The latter requires grain with high nitrogen content and enzyme activity. Its market share has declined, but it remains the standard grain distilling variety while the industry considers if the high yielding Olympus or modest yielding Fairing have a place in this sector. It is tall, vulnerable to Rhynchosporium and brown rust with ripening earlier than Concerto.

Chanson UK 108 uT 91
Candidate with potential for brewing, but not malt distilling.

Concerto North 95 uT 81
Fully Approved by the IBD for both brewing and malt distilling. It continues to dominate malting purchases, with three-quarters of the Scottish intake from harvest 2015. Agronomically it is outclassed on yield, but its quality in terms of extract, spirit yield and processability is strong. It is very vulnerable to husk loss in high skinning seasons such as 2012 and 2015. Straw is rather weak and tall, but good for brackling resistance. It is very vulnerable to Rhynchosporium.

Dioptric
Candidate with potential for grain distilling, but not for brewing or malting distilling. Data cannot be published as it has yet completed National Listing.

Fairing North 97 uT 85
A special new recommendation aimed at the grain distilling market, it has IBD Provisional Approval. At this stage it can be considered as a back-up variety should Olympus fail to gain Full Approval for grain distilling. Fairing is unlikely to be supported for malt distilling. Straw is similar to Olympus but with better resistance to brackling. It has excellent resistance to Rhynchosporium. It is early maturing.

Hacker North 101 uT 88
Recommended as a feed variety suitable for the West with a yield of 103. It has stiff straw of intermediate length and excellent brackling resistance. It is later to mature than Waggon, but earlier than Scholar.

KWS Irina North 107 uT 90
Fully Approved by the IBD for brewing with a hot water extract superior to Propino but not as good as Concerto. It has stiff short straw and very good brackling resistance. Vulnerable to Rhynchosporium and brown rust but has good resistance to Ramularia. Ripening is similar to Propino and earlier than Concerto.

KWS Sassy North 108 uT 90
Newly recommended and Provisionally Approved by the IBD for both brewing and distilling. Its tall straw looks weakish with below average brackling resistance. Vulnerable to Rhynchosporium and brown rust.

Laureate North 109 uT 94
Newly recommended, and provisionally Approved by the IBD for both brewing and distilling. It is very high yielding at 14% above Concerto and has intermediate specific weight. Straw strength and brackling resistance are good. Given its very high untreated yield, it has no apparent disease weaknesses. Ripening is similar to Concerto.

LG Okapi
Candidate with potential for grain distilling. Data cannot be published as it has yet completed National Listing.

LG Opera UK 107 uT 90
A malting candidate that looks promising for malt distilling and brewing.

Octavia North 105 uT 87
Recently granted IBD Full Approval for both brewing and distilling with a hot water extract even better than Concerto. It also provides a yield improvement of 10% over Concerto. The straw is rather weak, with mediocre resistance to brackling. It has intermediate resistance to Rhynchosporium and good resistance to Ramularia. Ripening is earlier than Concerto.

Odyssey North 101 uT 85
Fully Approved by the IBD for brewing and distilling. It outyields Concerto by 6%. Straw is rather weak, and slightly shorter than Concerto, but with good resistance to brackling. It has intermediate disease resistance, but is vulnerable to brown rust. Ripening is similar to Concerto.

Olympus North 105 uT 88
It has IBD Provisional Approval (stage 2) for malt and grain distilling. Its agronomic yield is a big improvement on Belgravia, at 12% in the north. Its straw is of average strength, shorter than Belgravia with mediocre resistance to brackling. It has intermediate disease resistance. Ripening is similar to Concerto.

Origin
A potential malting variety that has now been withdrawn from trials.

Ovation North 108 uT
A **new** recommended as a feed variety with yields both treated and untreated not superior to the highest yielding malting varieties. Its straw is shorter than Waggon and of average strength. It has good resistance to, but a low rating for brown rust. Ripening is later than Waggon and the same as Scholar.

Propino North 102 uT 85
Fully Approved by the IBD for brewing. It has been an important brewing variety in England, but its Scottish malting intake from harvest 2015 was less than 1%. It has been weak for grain skinning in difficult seasons such as 2012 and 2015. It has average straw strength with good brackling resistance. It is relatively vulnerable to mildew. Slightly earlier than Concerto.

RGT Planet North 107 uT 92

Fully Approved by the IBD for brewing. Has a hot water extract better than Propino. Straw strength and length are average; brackling resistance is good. It is vulnerable to Rhynchosporium but has very good resistance to Ramularia. Ripening is similar to Propino and earlier than Concerto.

Sanette

This malting variety is no longer on the AHDB recommended list.

Scholar North 107 uT 90

A recommended feed variety yielding much more than Waggon and Westminster. Straw strength is average and short with very good brackling resistance. It is vulnerable to Rhynchosporium but with good resistance to Ramularia. Maturity is similar to Concerto and later than Waggon.

Sienna North 103 uT 89

Provisionally Approved by the IBD for both distilling and brewing; its hot water extract is close to Concerto. It has a very high specific weight at 70.7. It has tall straw of average strength with good brackling resistance. It has intermediate resistance to Rhynchosporium and Ramularia. Ripening similar to Concerto.

Waggon North 100 uT 84

Is no longer in trials, but has been a popular choice for this market and performs well in most feed areas. It is very susceptible to Rhynchosporium, especially in the West of Scotland. In the East its infection levels have been lower and it has appeared to be more resistant. Its straw is of average length and stiff with a good rating for brackling resistance. Apart from Rhynchosporium, disease resistance is good and so is its green leaf area retention. It is early maturing and maintains its yield over a range of soil fertility situations and sowing dates.