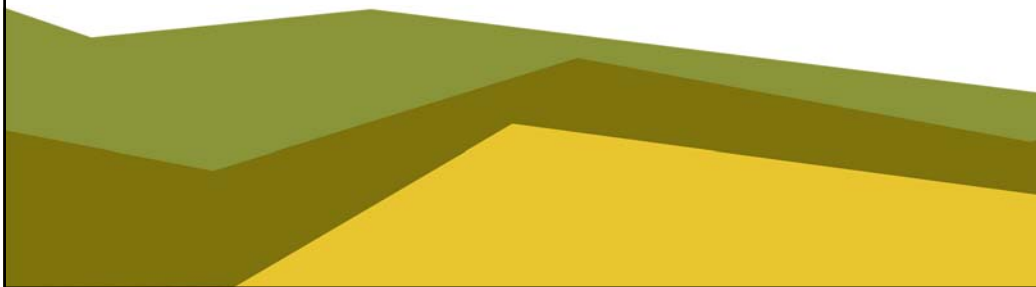


Malting Barley Market Outlook

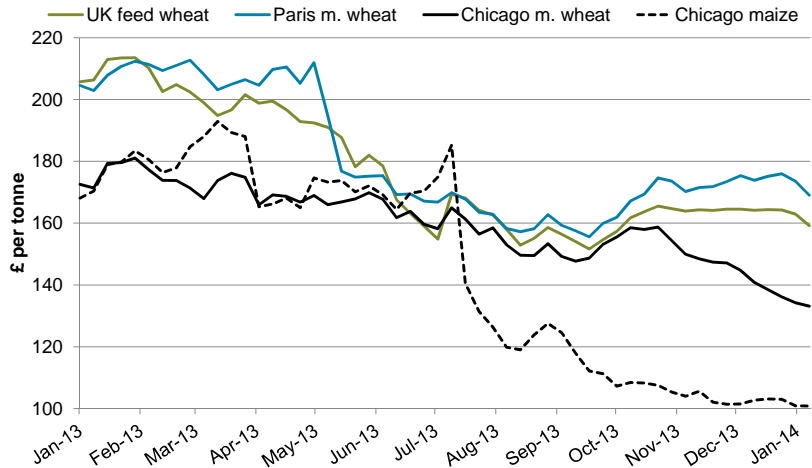
Jack Watts
Lead Analyst - Cereals & Oilseeds
AHDB Market Intelligence



Global Grains Production - predicted to break records this year

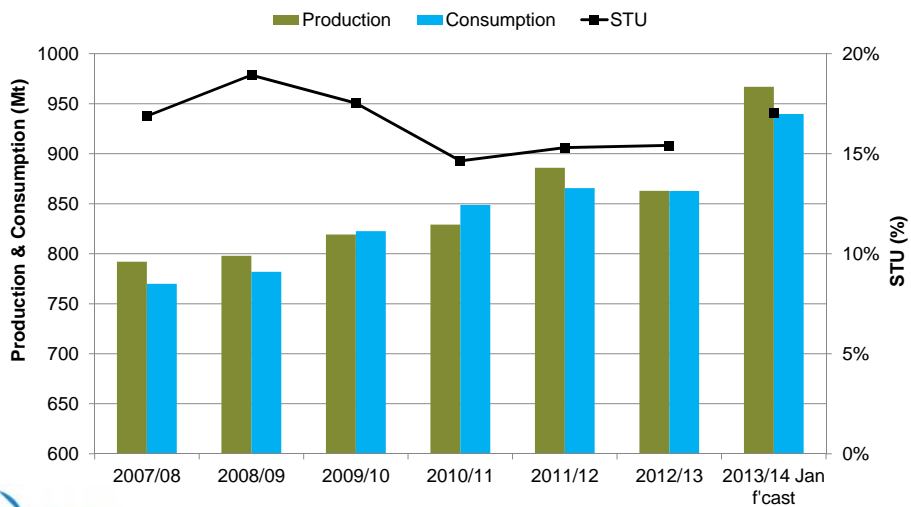


As a result, prices move lower – particularly for maize



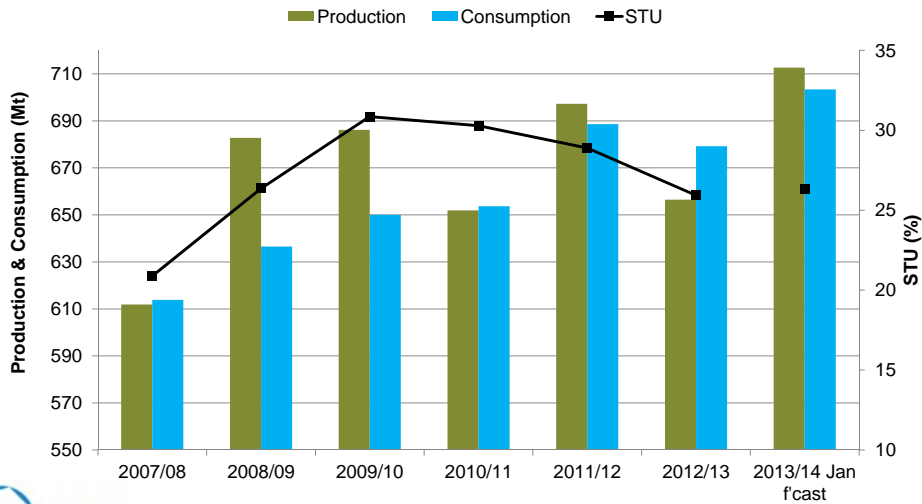
Source: AHDB/HGCA

Global Maize S&D - a much needed surplus, but not out of the woods



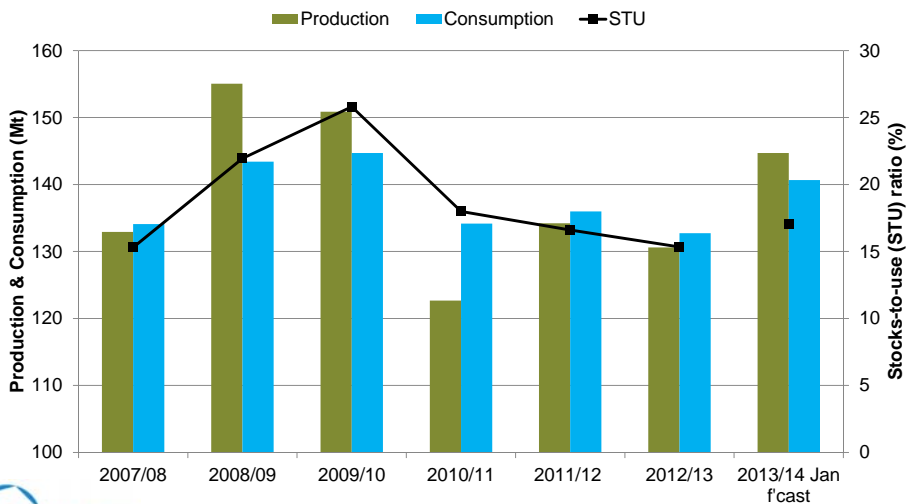
Source: USDA

Global Wheat S&D - *persistent premiums to maize could undermine feed demand*



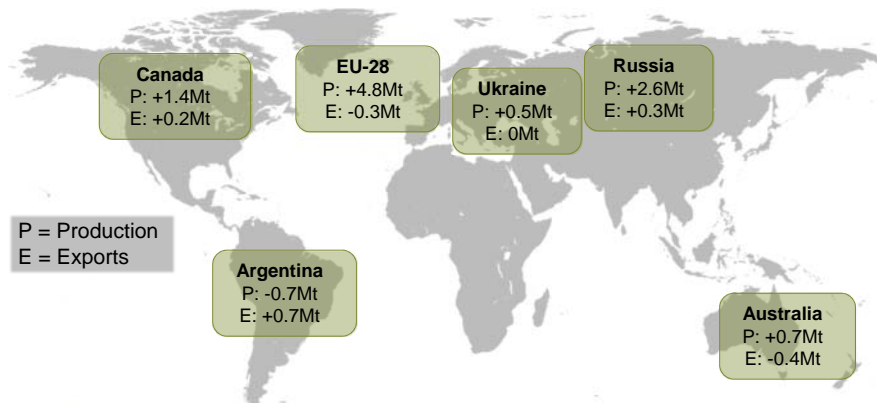
Source: USDA

Global Barley S&D - *uplift in production, but no major stock rebuild*



Source: USDA

Year-on-year change in global barley availability from main suppliers



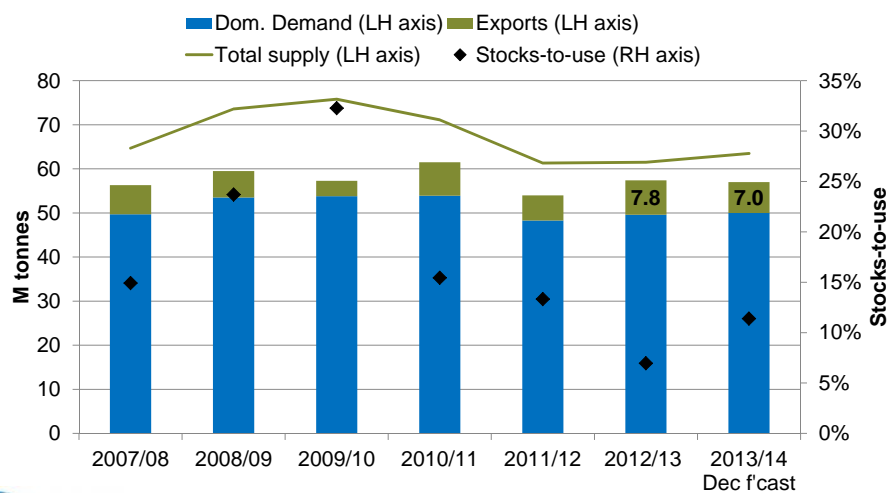
P = Production
E = Exports

Global production 2012/13: 129.5Mt; 2013/14 forecast: 142.8Mt
Total exports 2012/13: 19.5Mt; 2013/14 forecast: 19.1Mt



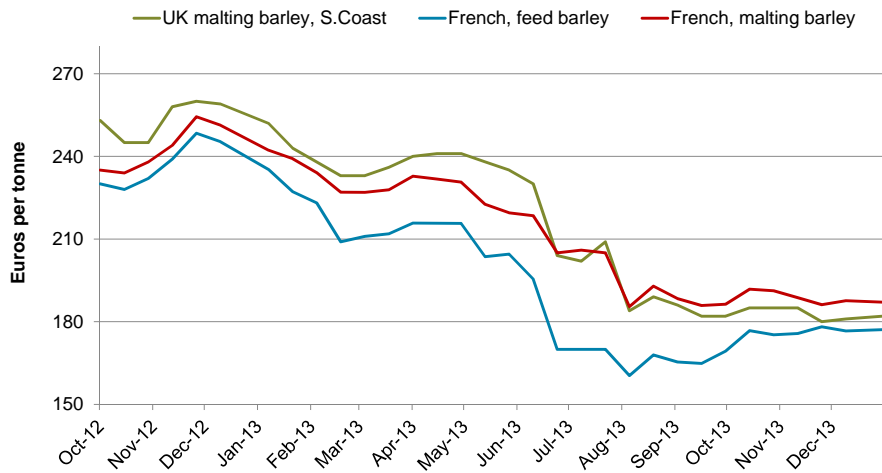
Source: IGC

EU Barley S&D – good export pace so far, but likely to slow down



Source: EU Commission

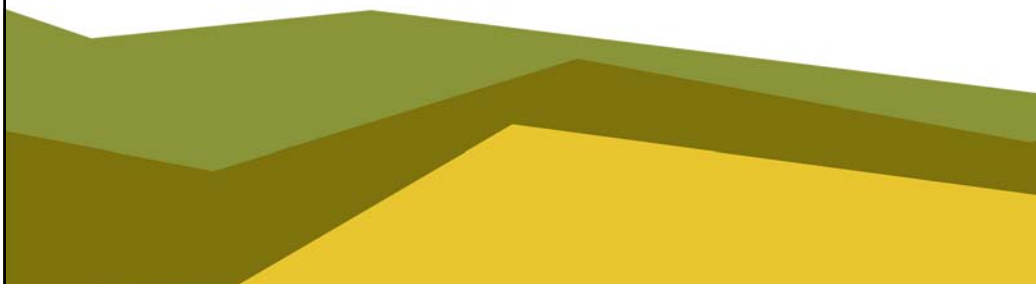
EU Malting Barley prices



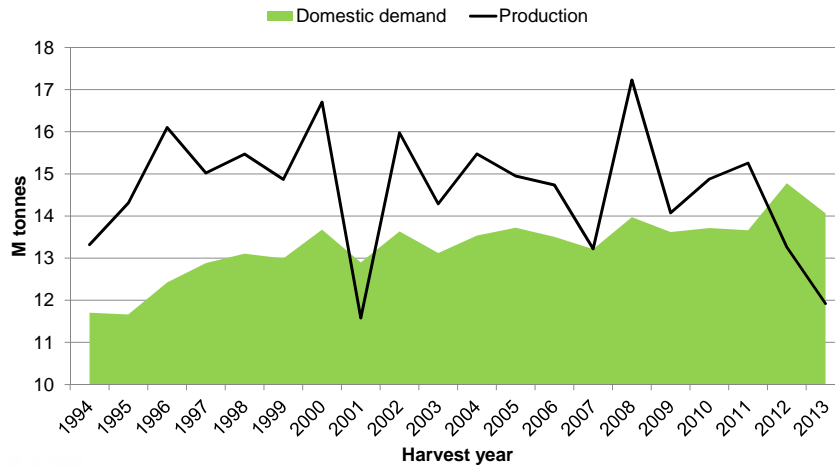
Source: RM International



UK Situation

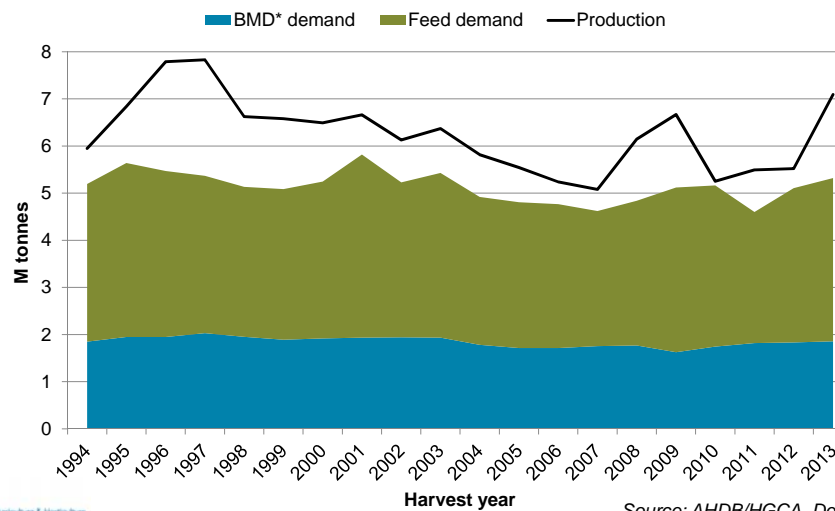


UK wheat production and demand - stocks, imports and alternative feed grains important



Source: AHDB/HGCA, Defra

UK barley production and demand - largest crop in 15 yrs = more feed demand / exports

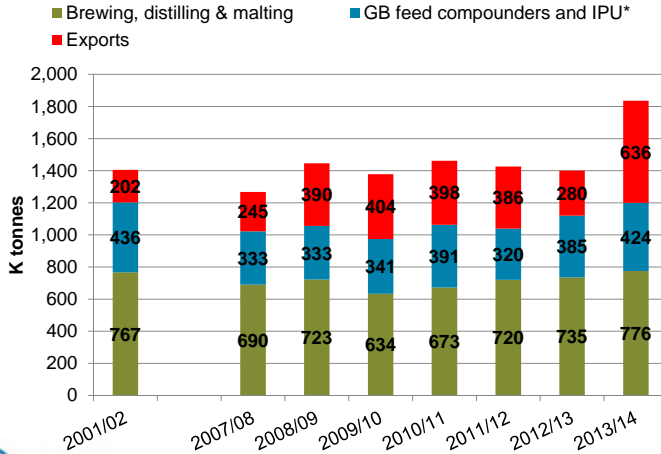


Source: AHDB/HGCA, Defra

How are we dealing with the biggest barley crop in 15 years?



Barley usage (Jul-Nov)



Other key areas

On farm feeding

End season stocks

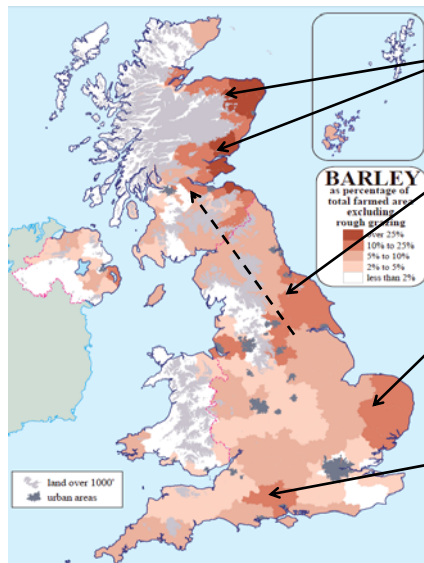
~~International~~



*Integrated Poultry Units

Source: Defra, HMR&C

The geography of UK malting barley—strong distilling demand using more English barley



Strong distilling demand

Northern England moving toward spring distilling varieties

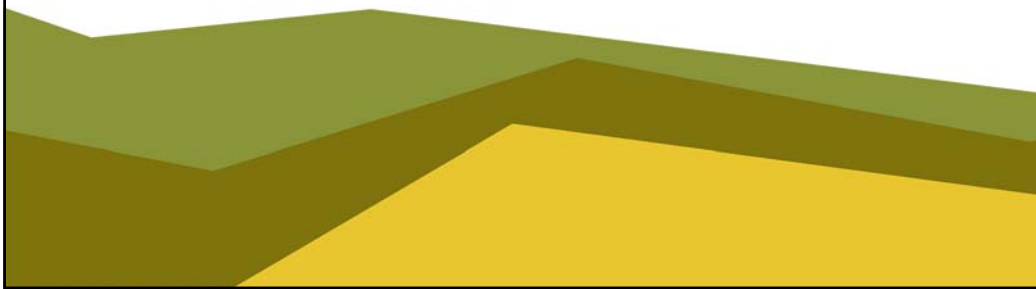
E. Anglia typically in deficit, but looking at distilling demand

South of England remains key for exports and regional 'buffering'

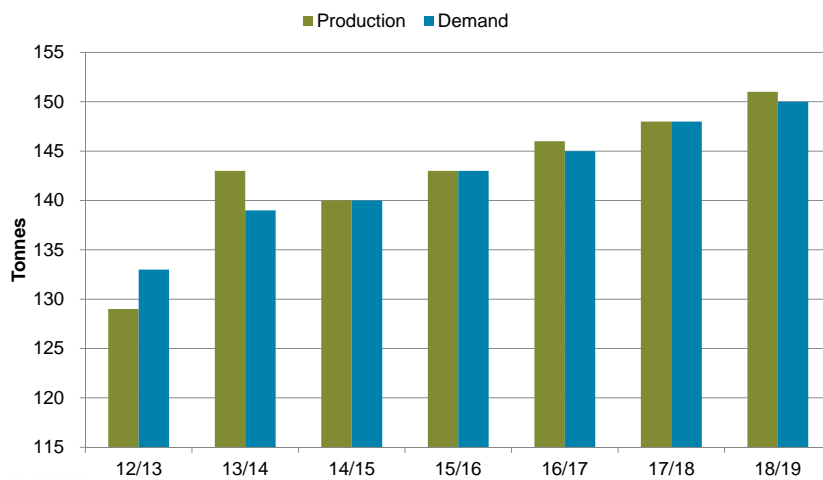


Source: AHDB/HGCA

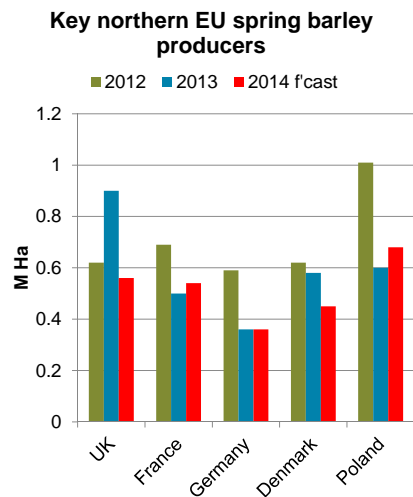
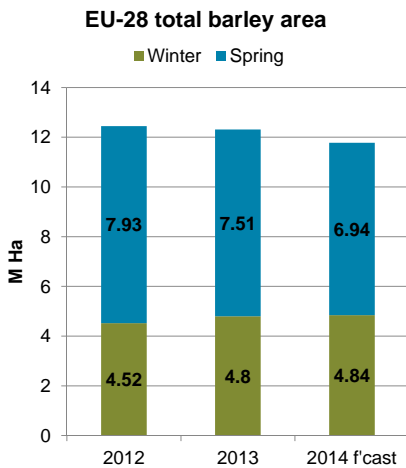
Outlook



Five-year global outlook for barley - 1.8% average increase in production



EU barley prospects for 2014 - forecast 8% drop in spring area could be useful



Source: Strategie Grains

Summary



- Grain prices are lower due to record global production this year
- However, recovery in global grain demand and strong EU exports have helped provide some support
- UK barley exports to non-EU countries are important to deal with the largest crop in 15 years - but face competition due to higher global production
- 2014 may provide better opportunities with lower EU/UK spring barley areas expected





Thank you

Jack.watts@ahdb.org.uk



Grain skinning: What can growers do to help hit malting specification?

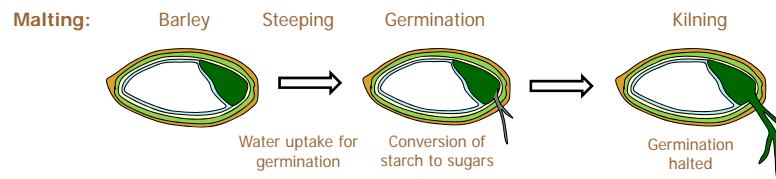
Maree Brennan and Steve Hoad – SRUC Crop Science Team

Grain skinning & UK malting



Detachment of the barley husk (**skinning**) reduces malting efficiency

- wasted time coping with variability
- over-modification, loss of sugar to plant



The whole supply chain is affected:

Breeders → Growers → Maltsters → Brewers & Distillers

“Despair”

“Extra work”

“Hassle”

“Unbelievable”



What are we doing?

Helping industry to grow varieties with no physical defects

Variety Improvement – funded by BBSRC’s Crop Improvement Research Club

- Characterise varieties
- Grain structure and genetics
- Grain assessment and variety screening

Industry intelligence – funded by HGCA

- Industry samples and data
- Field screening tests
- Industry protocols
- Identify risk factors



from: Mairee Brennan & Steve Hoad (SRUC)



Outputs so far...



- Development of variety screens for breeders
- Developing a new scoring protocol for industry
- Identifying risk factors to inform growers

1. <20%

2. ≥20% <50%

3. ≥50% <100%

4. 100%



"Skinned"

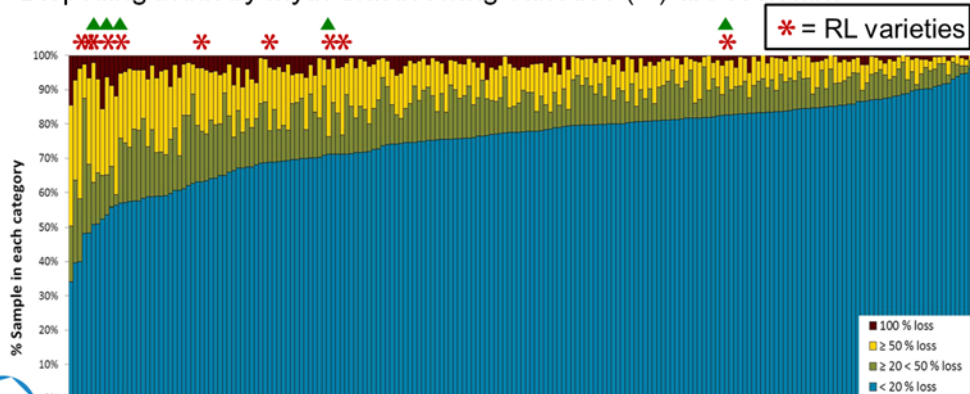


from: Maree Brennan, Steve Hoad, Linda McCloskey and Kairsty Topp (SRUC)

Skinning weakness was evident in 2012



- Wide range of skinning (4% to 67%) recorded in field trial
- Many Recommended List varieties (*) performed poorly
- Dispelling industry myth that brewing varieties (▲) are resistant



from: Maree Brennan & Steve Hoad (SRUC) and Bill Thomas (JHI)

Screening for grain skinning



Controlled environment screens are being compared to help the industry identify resistant and susceptible varieties

- misting post-anthesis simulated a summer with wet and dry spells
- shading post-anthesis simulated low light and poor grain-filling (2012)

Misting



Shading

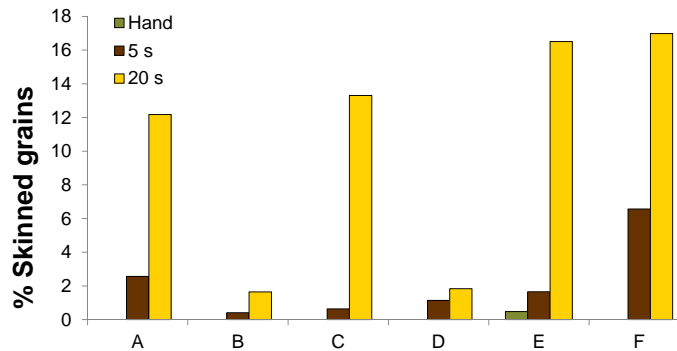


Tests for grain skinning



Grains must be subjected to mechanical force to distinguish varietal susceptibility to skinning (coded A to F)

In this test, hand-harvested ears were mechanically threshed for 5 or 20 seconds

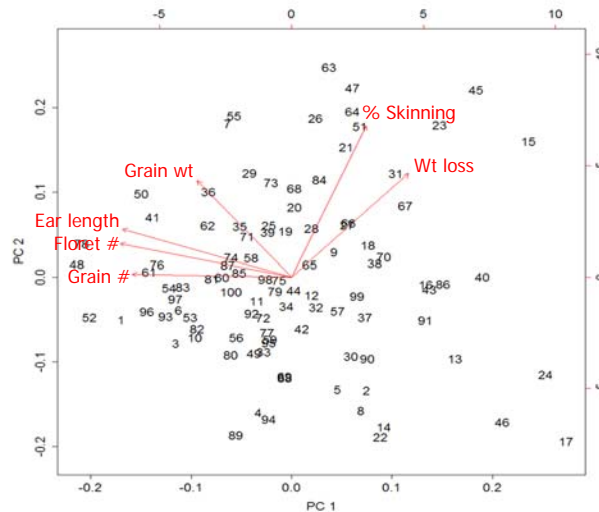


Results from the misting screen



Varieties with larger grains are not more susceptible to skinning

Varietal differences must be caused by other factors



Identifying high- and low-risk varieties



Phenotypic expression among contrasting environments

- 2012 field trial at JHI, Dundee (poor grain filling)
- 2013 field trial at SRUC, Edinburgh (more typical season)
- Glasshouse post-anthesis misting screen (wetting and drying effect)

Test for significance of rank order among environments

- Kendall's coefficient of concordance, W



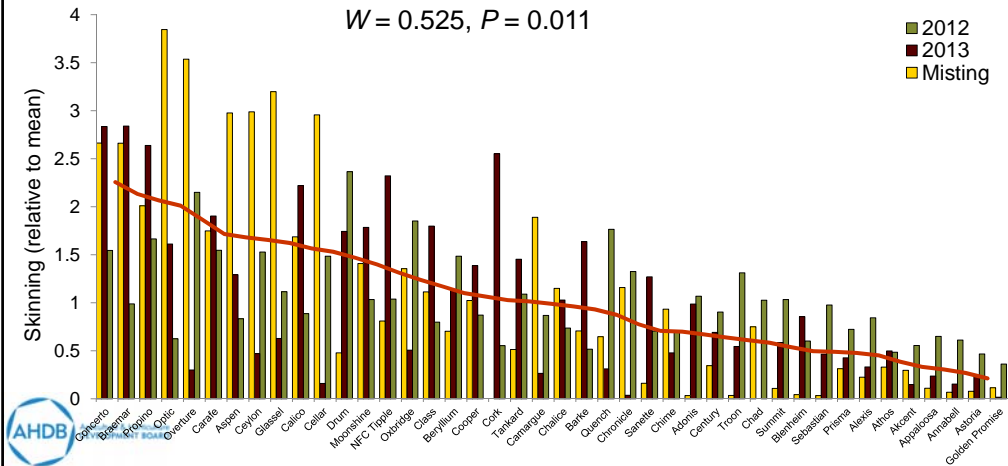
High- and low-risk varieties



Skinning expressed relative to the population mean

The final order is based on the average rank across environments

$W = 0.525, P = 0.011$

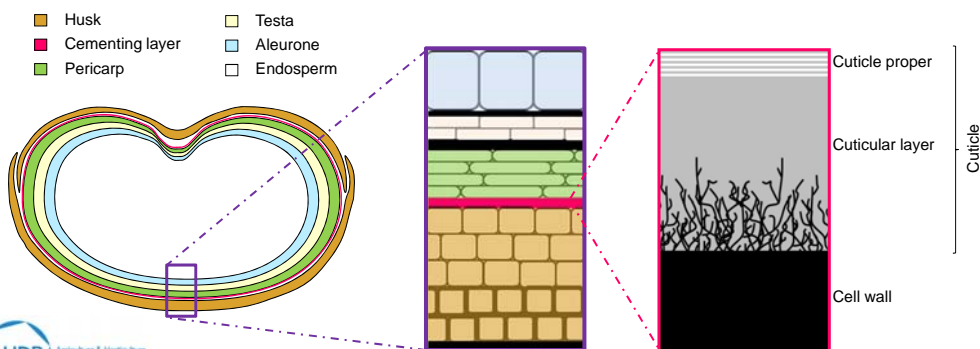


Understanding the husk adhesion process

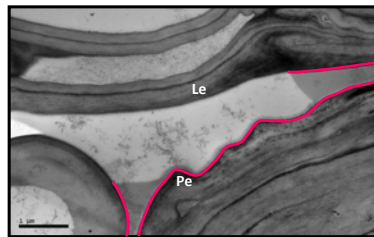
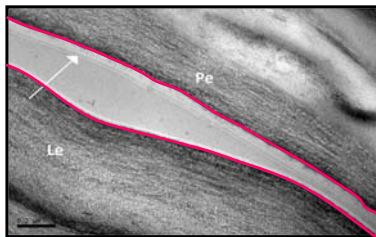
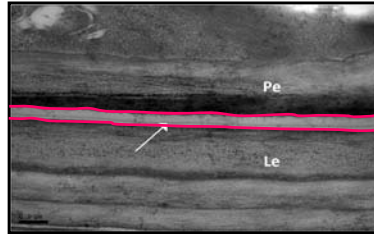
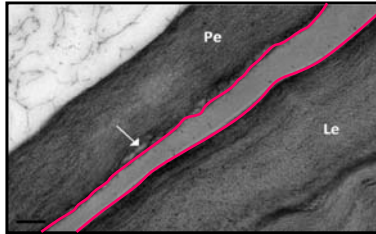


A lipid **cementing layer** is required for husk adhesion

The structure of this layer gives insight into varietal differences in husk-caryopsis adhesion



Have we found the glue?



Summary of findings so far ...



- Most current varieties had some weakness in 2012, a year of poor grain filling and a prolonged harvesting period
- Crops were much less susceptible in 2013, though weaker varieties skinned under SRUC under lab tests
- Skinning can be induced by repeated (prolonged) wet-dry spells
- Dispelled the myth that brewing varieties were less susceptible to skinning
- Variety and environmental influences on a glue-like material are being investigated



from: Maree Brennan & Steve Hoad (SRUC)

Industry engagement



- Industry requests to address grain skinning in malting barley
- HGCA-funded project '*Supporting UK malting barley with improved market intelligence on grain skinning*', started October 2013
 - Identify varietal, regional, climatic and agronomic factors influences grain skinning
- Liaison with Scottish and English Micro-Malting Groups
- HGCA SRUC Agronomy Workshops 2014
- Field events e.g. *Cereals in Practice*
- SWRI activities e.g. Raw Materials KT Seminar, October 2013
- Ongoing discussions with BBSRC Crop Club barley breeders
- Engagement with AIC



What can growers do?



- It is too early to recommend a low risk variety, but some variety differentiation is emerging
- Follow the HGCA Project on '*Supporting UK malting barley with improved market intelligence on grain skinning*'
 - A variety guide to skinning will be an output from this project
- Ideally, grow more than one variety to reduce risk in a bad year
- Liaise with maltsters on revised thresholds in a difficult season
- Consider changes to combine settings to reduce abrasive/handling effects on weaker varieties
- Attention to plant health: Although too soon to confirm, avoidance of plant stress before flowering and during grain filling should help to offset any mismatch between husk and grain development





Project Team

Maree Brennan	SRUC, Post-Doctoral Research Assistant
Christine Hackett	JHI, Data Management
Pete Hedley	JHI, Genome Facility
Steve Hoad	SRUC, Principal Investigator
Monika Lentz	SRUC, PhD Student
Linda McCloskey	SRUC, Technical Support
Brian Pool	SRUC, Glasshouse
Tom Shepherd	JHI, Lipid Analysis
Bill Thomas	JHI, Principal Investigator
Kairsty Topp	SRUC, Data Management

Thank you, Any Questions?

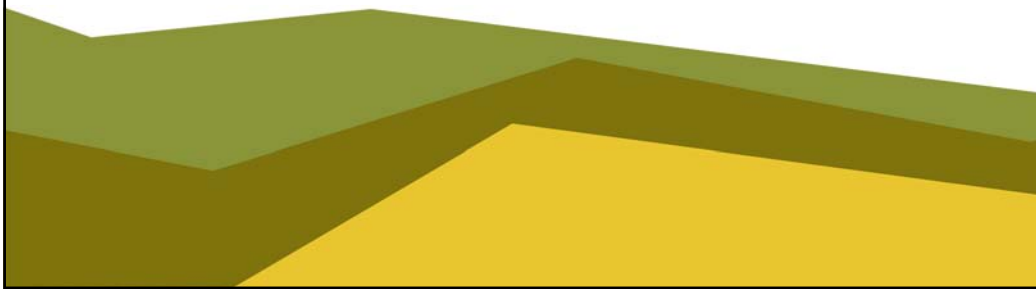


Market requirements from a maltster's perspective

**Eddie Douglas - Commercial Director
Bairds Malt Ltd**



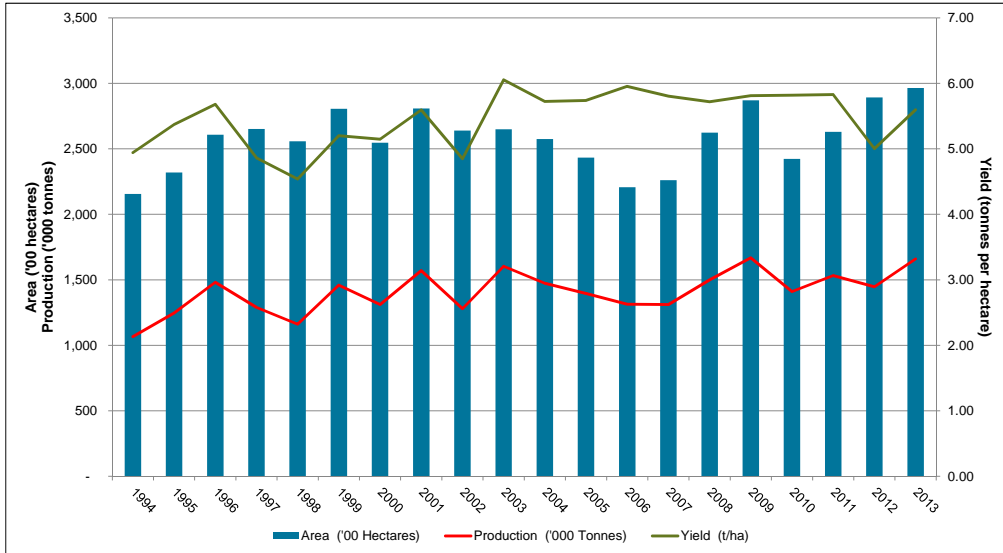
Malting Barley Production and Purchases



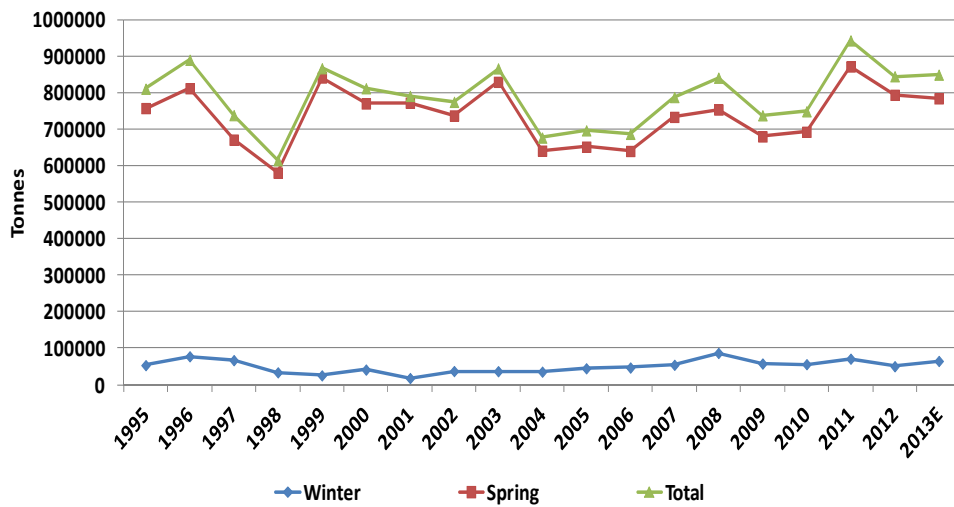
Scottish Cereal Production



Scottish Spring Barley (area/yield)

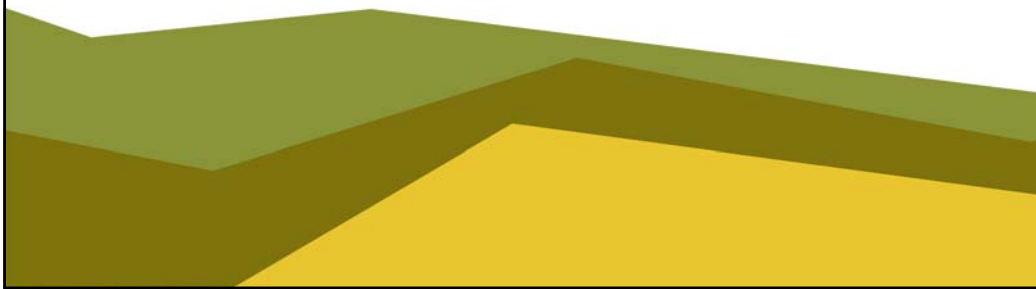


MAGB Scottish Malting Barley Purchases

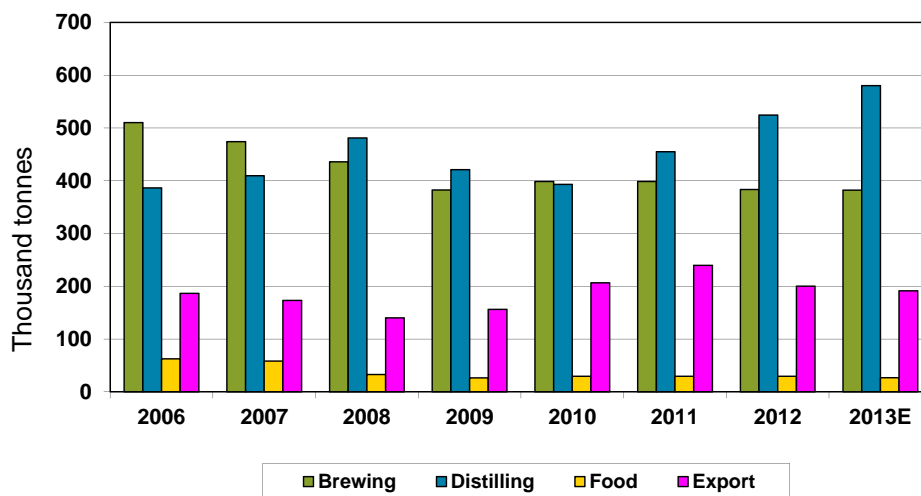




Malt Market

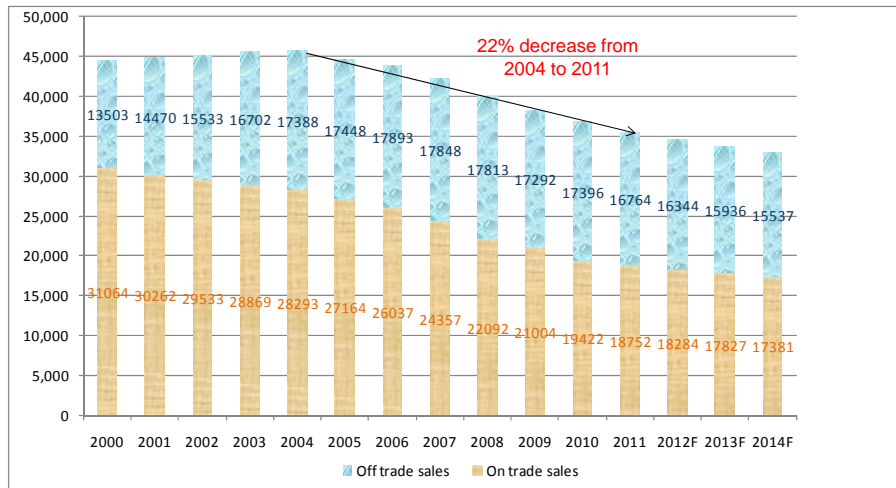


UK malt supply by sector – Free market



Source: MAGB Industry data

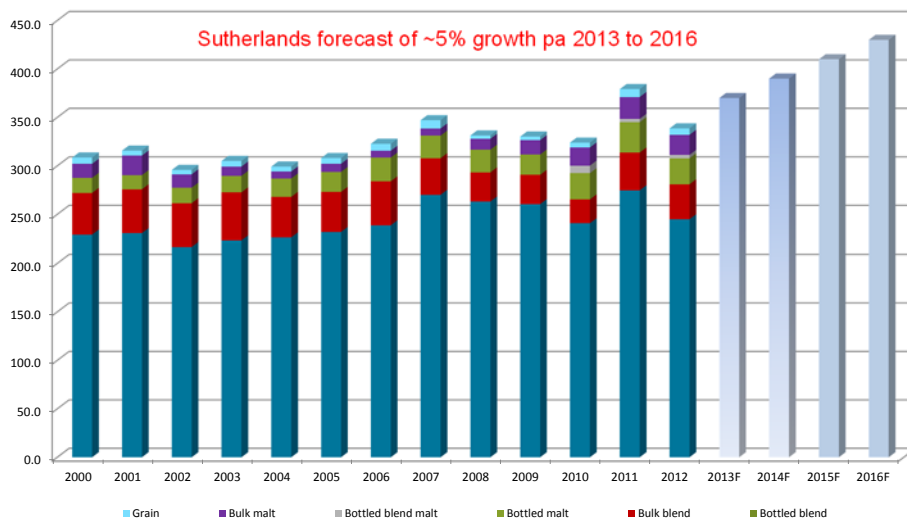
UK Beer sales (,000hl)



- Forecast volumes declining by 2.5% per annum

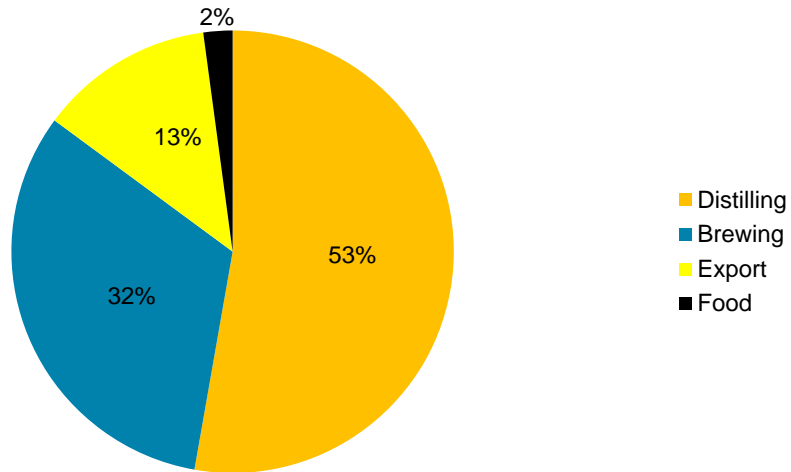
Source: Plato logic

Scotch Whisky sales (million litres of pure alcohol)

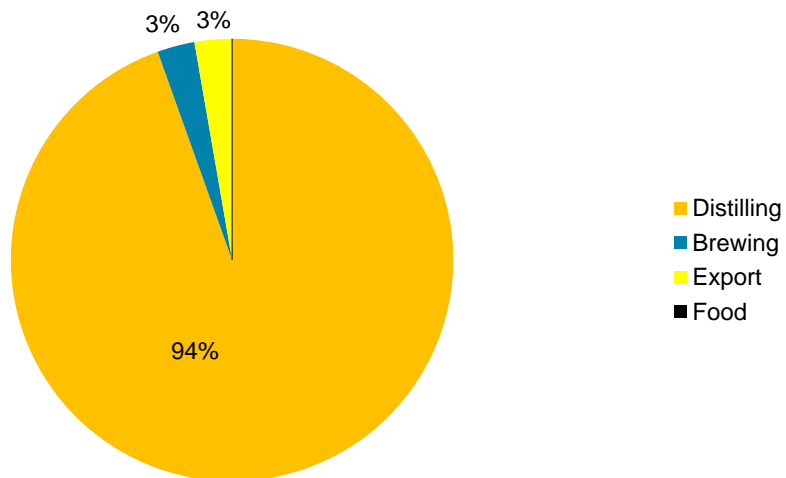


Source: Sutherlands

Usage of UK Produced Malt (2013 Est.)

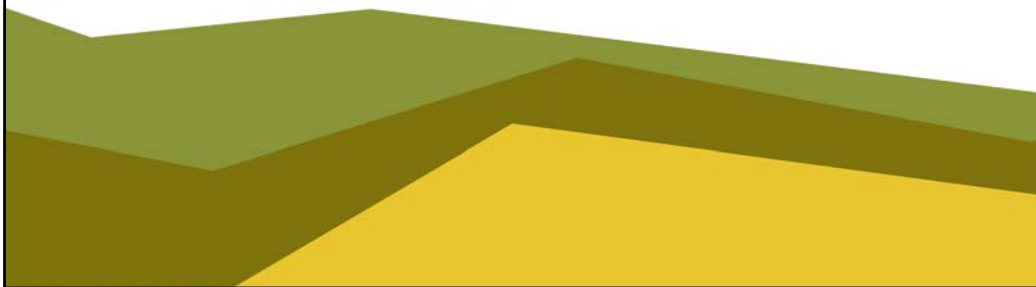


Usage of Scottish Produced Malt (2013 Est.)





Malting Barley Specifications



Importance of Barley Specification



- High quality malt requires high quality malting barley
- Malting barley specification ensures that customer malt specification requirements can be achieved
- Ensuring that the malting barley delivered meets specification is key control activity

Quality Requirements



- Germination - 98% min
- Grain size - <10% thru 2.50mm
- Grain nitrogen – Wish list
- Admixture
- Food Safety

Importance of Germinative Capacity



- Germinative capacity measures the viability of the barley
- The changes that convert barley to malt wholly dependent on the grains ability to germinate
- Non-viable grains do not germinate and pass through the malting process unchanged
- These non-germinated grains will have a significant detrimental effect on malt quality

Importance of Moisture Content



- Risk that high moisture barley may have damaged germinative capacity
- Storage of high moisture barley for even short time period can result in fungal growth and possible mycotoxin formation – see HGCA Grain Storage Guide and Safe Storage Matrix
- Legal limits in place for ochratoxin A (OTA) which may be result from fungal growth

Importance of Grain Size



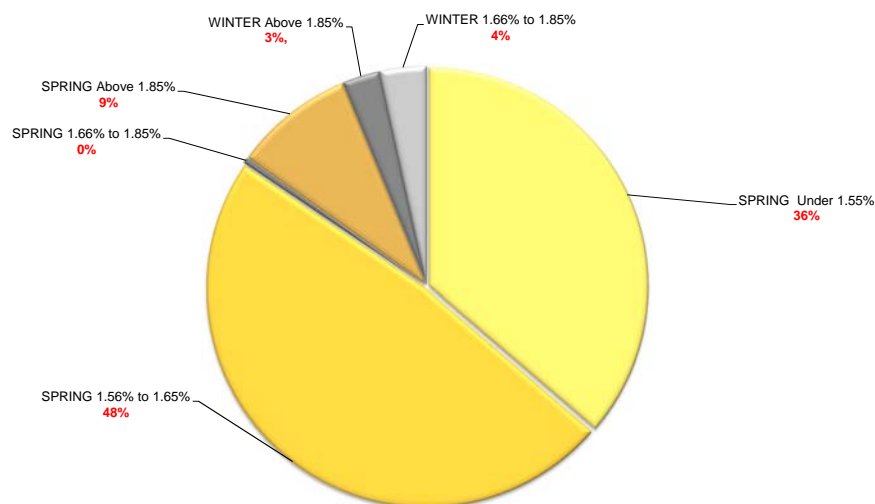
- Small grains will be lost during pre processing grading of the malting barley
- Small grains higher in nitrogen, low in extract
- Small grains hydrate rapidly so would give uneven moisture levels if steeped along with std malting barley grains
- Uneven steeped moisture levels would result in uneven modification levels in the germinated malt

Importance of Nitrogen Content



- Correct nitrogen content of resultant malt important for distilling/brewing performance
- Customer sets acceptable malt nitrogen range based on their product type and process

'Wish List' 2014 Scotland



Importance of Other Specification Items



- Admixture
 - Important to keep foreign material out of the malting and brewing process
- Varietal purity
 - Individual varieties will require specific processing conditions to optimise malt quality
- Pregerminated/split/skinned grains
 - Damage of this nature renders the grain problematic to handle and malt leading to poorer malt quality

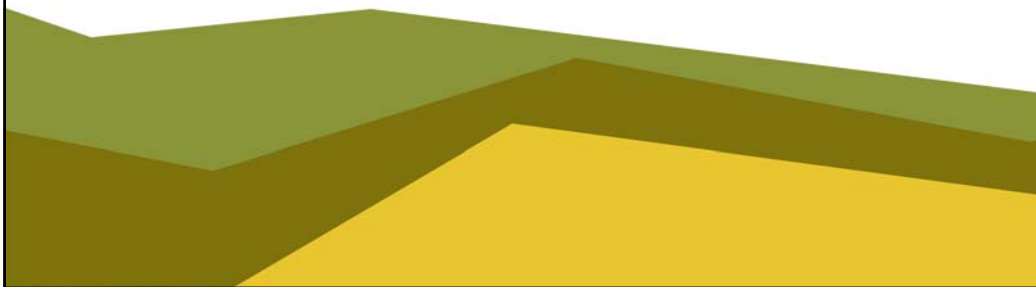
Field mycotoxins



- Legal maximum levels apply to DON and ZEA when cereals are offered to the market – due diligence analysis programmes are run by malting companies
- Maltsters are also participating in UK data collection of levels of T-2 and HT-2 mycotoxins



Varieties



IBD Approved List Harvest 2014



	WINTER VARIETIES FOR BREWING USE	SPRING VARIETIES FOR BREWING USE	SPRING VARIETIES FOR MALT DISTILLING USE	SPRING VARIETIES FOR GRAIN DISTILLING USE
Full Approval	Pearl Flagon C assata Venture	NFC Tipple Concerto Propino	Optic Belgravia Concerto Moonshine Odyssey	Belgravia
Provisional Approval 2	Archer	Odyssey Overture	Overture	
Provisional Approval 1	Talisman	Sanette	Glassel	

HGCA Recommended List 2014

Spring malting varieties



Variety	Breeder	Parentage	HGCA Recommendation	IBD Approval
Sanette	Syngenta	Summit x Yard	Full UK	Prov 1 brewing
KWS Aurelia New	KWS UK	(Conchita x Quench) x Quench	Full UK	Under evaluation
Odyssey	Limagrain	Concerto x Quench	Full UK	Full brewing & Prov 1 malt distilling
Propino	Syngenta	Quench x NFC Tipple	Full UK	Full Brewing
Hacker New	Secobra	Quench x Belgravia	Full UK	Under evaluation
Overture	Limagrain	Concerto x Quench	Full UK	Prov 1 brewing & malt distilling
Glassel	Syngenta	Summit x Belgravia	Full UK	Prov 1 malt distilling
Quench	Syngenta	Sebastian x Drum	Full UK	No longer approved
KWS Irina New	KWS UK	Conchita x Quench	Full UK	Under evaluation
Concerto	Limagrain	Minstrel x Westminster	Full UK	Full brewing & malt distilling
Shaloo New	Syngenta	SY Taberna x Marionette	Full UK	Under evaluation
Moonshine	RAGT	Toucan x Class	Full N East	Full malt distilling
NFC Tipple	Syngenta	(NFC 497 x Cork) x Vortex	Full UK	Full brewing
Belgravia	Limagrain	Minstrel x Westminster	Full N East	Full malt & grain distilling use
Optic	Syngenta	Chad x (Corniche x Force)	Full UK	Full malt distilling / No longer approved for brewing

HGCA Recommended List 2014/15

Winter malting varieties

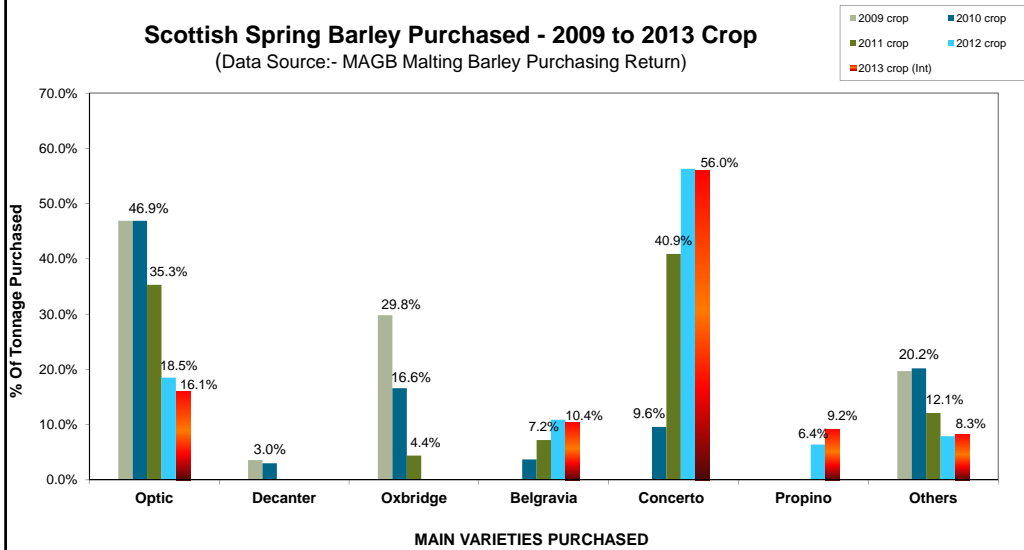


Variety	Breeder	Parentage	HGCA Recommendation	IBD Approval
Talisman	Senova	Flagon x Retriever	Full UK	Prov 1 Brewing
SY Venture	Syngenta	DH9525 x Retriever	Full UK	Full Brewing
Archer	Limagrain	NSL01- 8026 x Jonathan	Full UK	Prov 2 Brewing
Winsome	Syngenta	Flagon x NFC 7169-01	Full UK	No longer approved
Cassata	Limagrain	Opal x NSL 96/7517	Specific (BaYMV)	Full brewing
Flagon	Syngenta	(NFC296-7 x Rifle) x Pearl	Full UK	Full brewing
Pearl	Limagrain	Puffin x Angora	Full UK	Full brewing

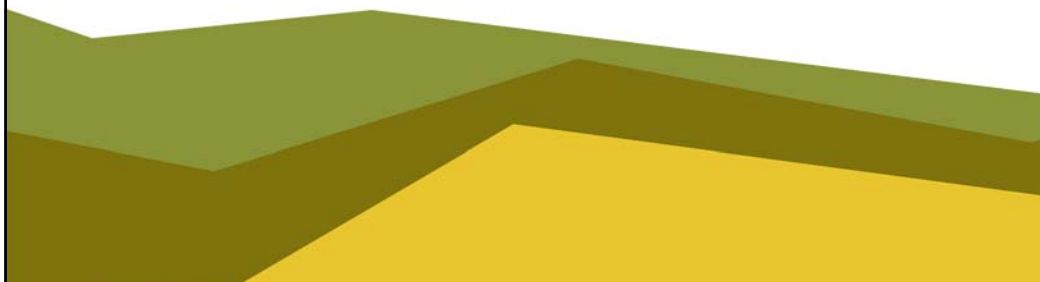
Malting variety purchases



Scottish Spring Barley Purchased - 2009 to 2013 Crop
 (Data Source:- MAGB Malting Barley Purchasing Return)



Malting Barley Prospects 2014



Scottish Malting Barley Prospects 2014 crop



- Increased Spring barley demand due to distilling expansion.
- Variety and nitrogen will depend on target market
 - **Distilling**
 - Pot still malt - Spring barley, low nitrogen - below 1.65N₂
 - Grain malt – Spring barley, high nitrogen - above 1.85N₂
 - **Brewing**
 - Brewing can use both Winter & Spring with a range of nitrogen up to 1.85N₂
- Distillers prefer zero GN varieties
 - – Concerto, Belgravia, Odyssey etc.
- Each maltings/intake point will have their own specific variety requirements – please check with your merchant



Thank you

