

Spring barley varieties – research and market updates

Steve Hoad

- Barley and malt use
- Variety and quality requirements
- Research topics
- Spring barley Recommended List 2009

UK barley and malting usage



**Barley
production**

**~ 5.7 m
tonnes**

**Malting
requirement**

**~ 1.9 m
tonnes**

**Malt
production**

**~ 1.5 m
tonnes**

Brewing (< 45%)

Distilling (> 35%)

Export (16%)

Food (4%)

Scottish barley and malting usage



**Barley
production**

**~ 1.4 m
tonnes**

**Malting
requirement**

**~ 0.75
million
tonnes**

**Malt
production**

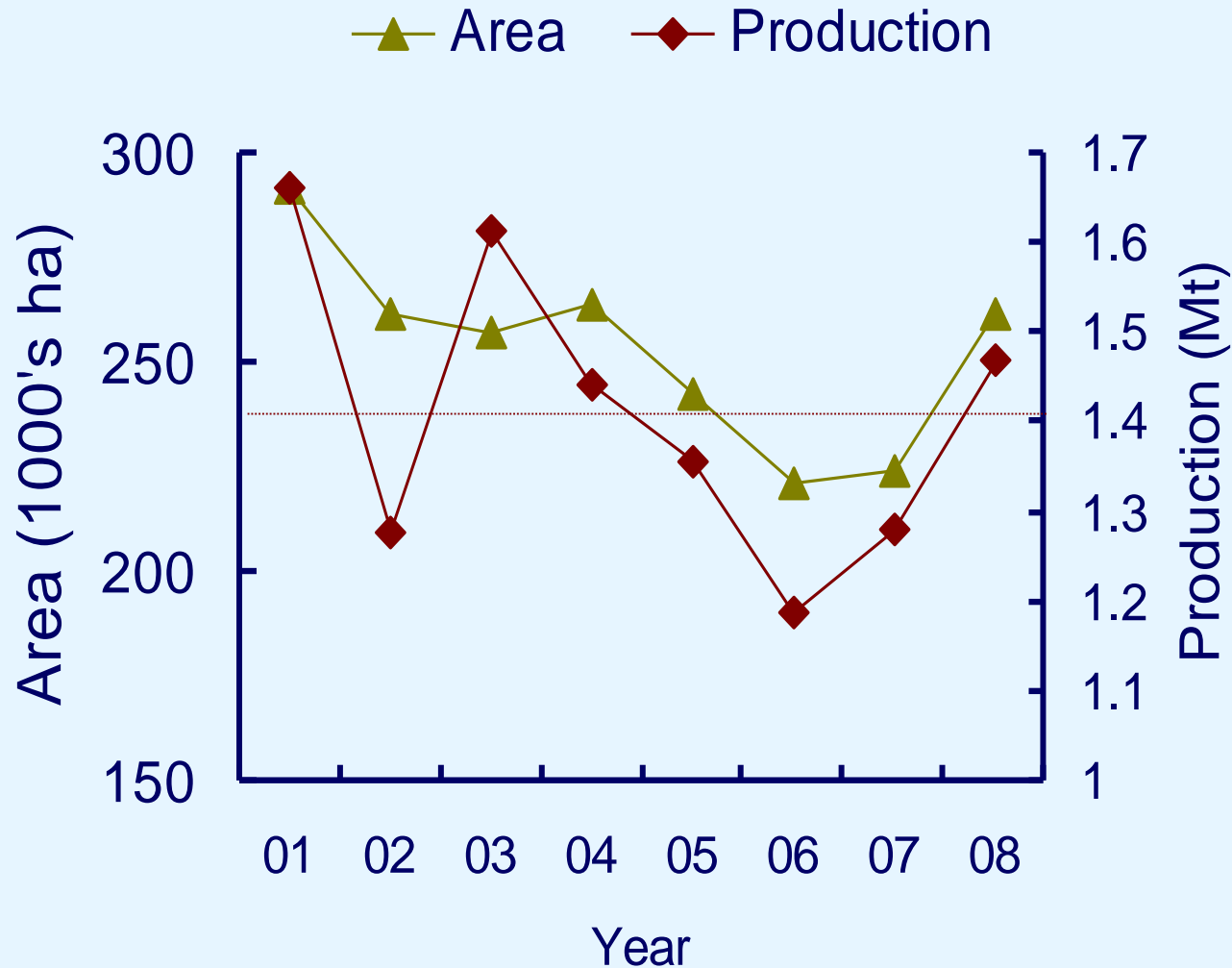
**~ 0.55 m
tonnes**

Brewing (< 5%)

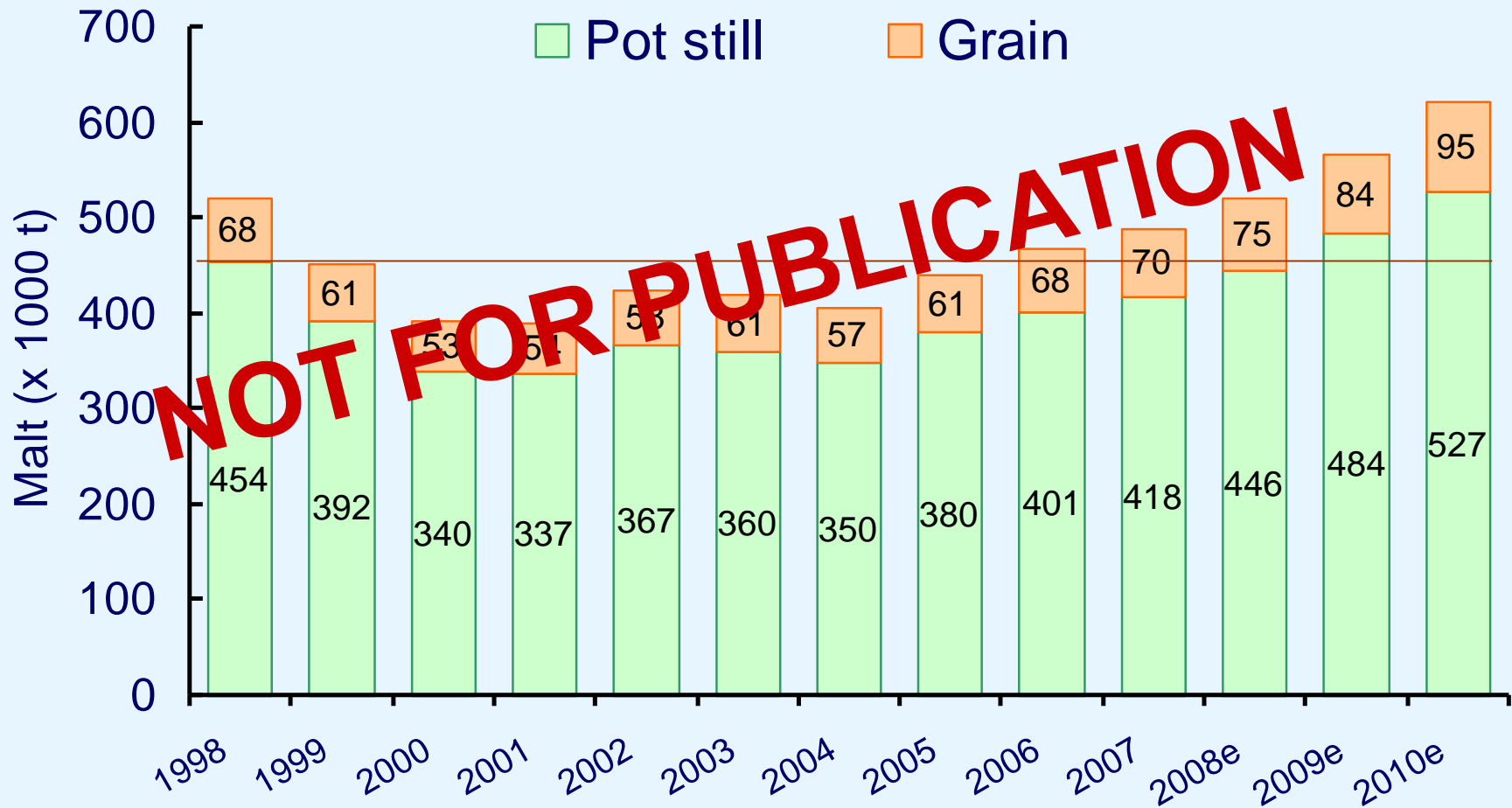
Distilling (> 90%)

**Export & Food
(5%)**

Spring barley production in Scotland



Distilling malt consumption



[Scotch Whisky Industry Review 2007]

Summary of grain quality requirements across malting sectors



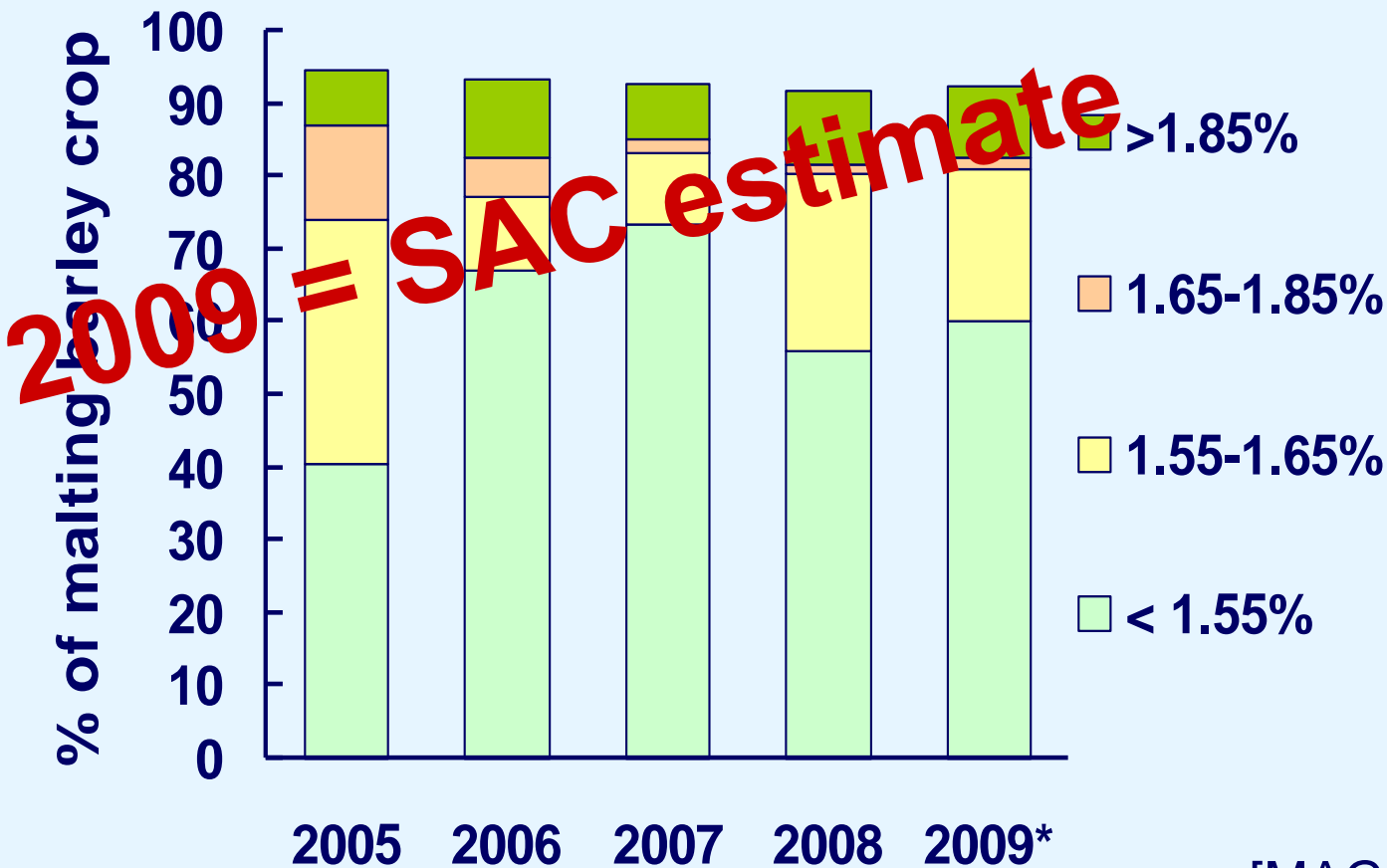
	Malt distilling	Grain distilling	Brewing
Non GN producer	✓ ✓	✓ ✓ ✓	✓
High spirit yield	✓ ✓ ✓	✓ ✓	✓
High enzymes	✓ ✓	✓ ✓ ✓	✓ ✓
High hot water extract	✓ ✓	✓ ✓	✓ ✓ ✓
Nitrogen %	< 1.65	> 1.85	1.65 – 1.85

- ✓ ✓ ✓ essential
- ✓ ✓ useful
- ✓ less important / not important

Maltsters requirements by nitrogen bands

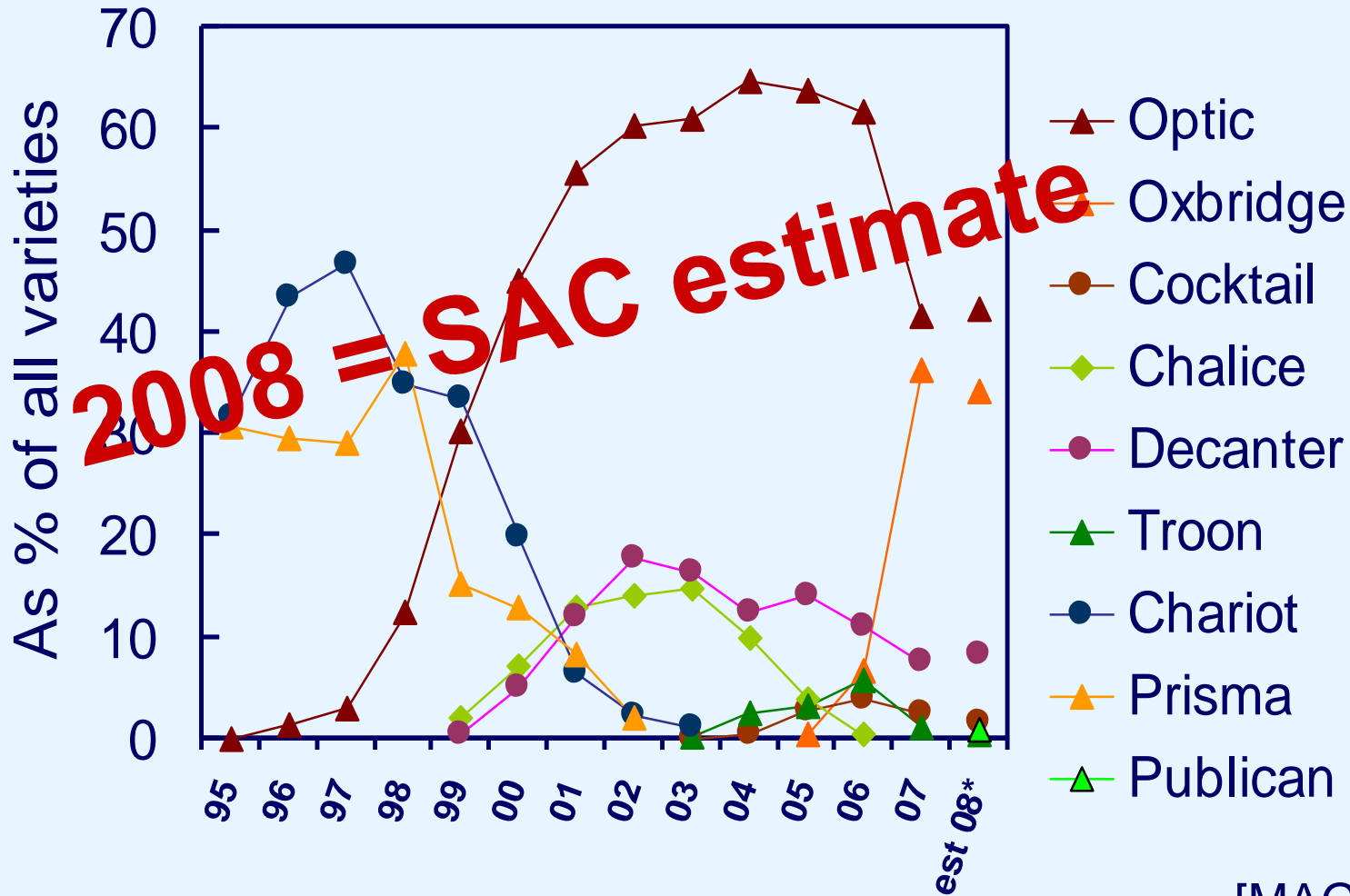


Requirements for Scottish intake



[MAGB/SAC*]

Maltsters intake by variety



[MAGB/SAC*]

- Growing for the market – current varieties
- Targets for future varieties
- Coping with site and seasonal variability

Optimising ear population gives a crop the best chance of meeting the spec



- Ideally, a crop should produce 700 - 800 ears per m² from a plant population of 250-300 plants per m²
- Plants produce 2.5 to 3.5 fertile shoots (ears)
- The range of seed rates is wide but under good conditions use 325-375 seeds per m²
- Early sowing or adverse seedbed may reduce % establishment, but early crops tiller better
- Adjust seed rate according to sowing date, seed bed condition and expected establishment

Optimising ear number



Ear number = Seeds sown × Establishment × Tillering

e.g. 350 seeds × 0.8 × 2.5

= 280 plants per m²

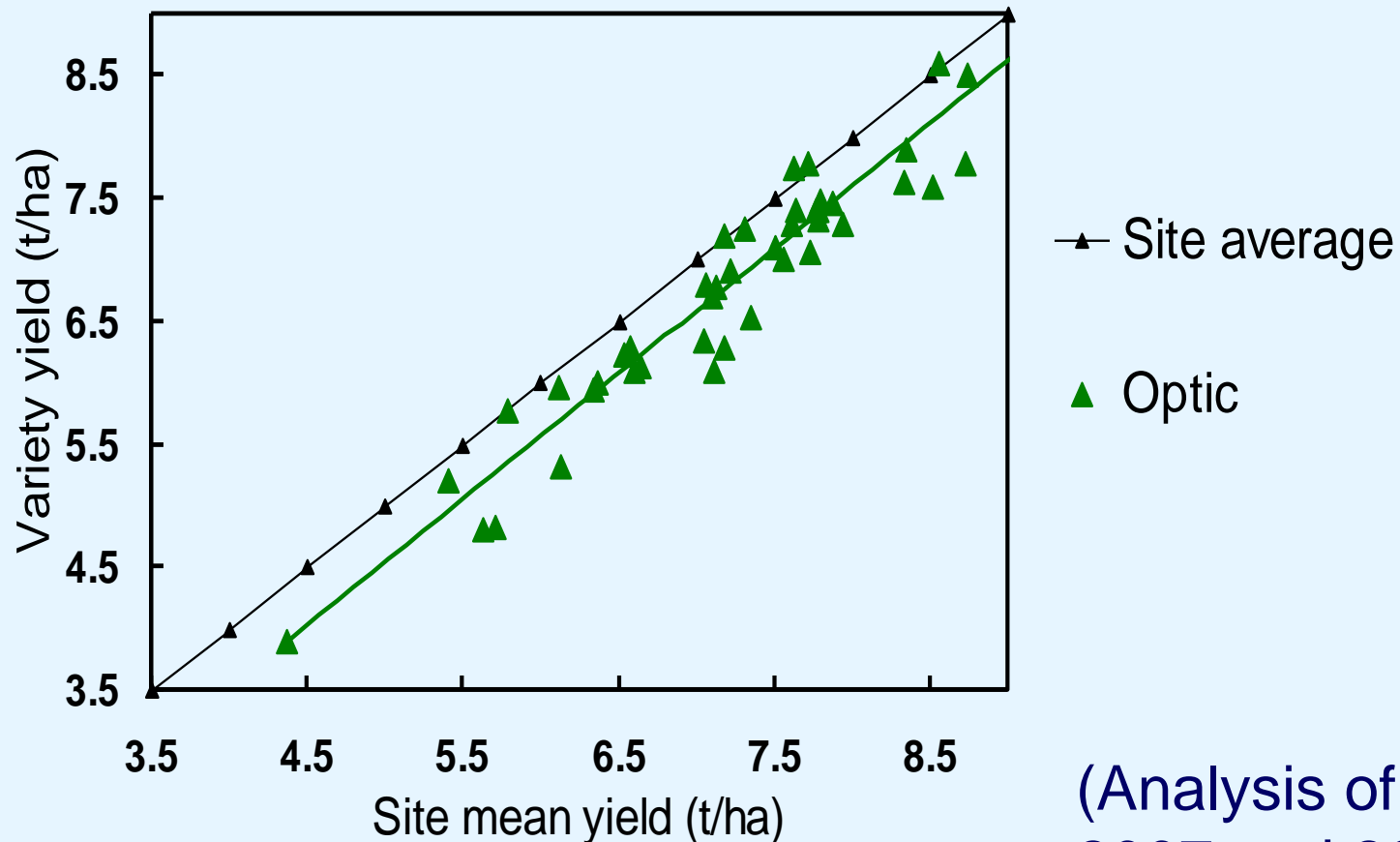
= 700 ears per m²

Seed rate = Plants per m² × TGW (g)
(kg/ha) Establishment (%)

Varieties vary in their sensitivity to changes in growing conditions



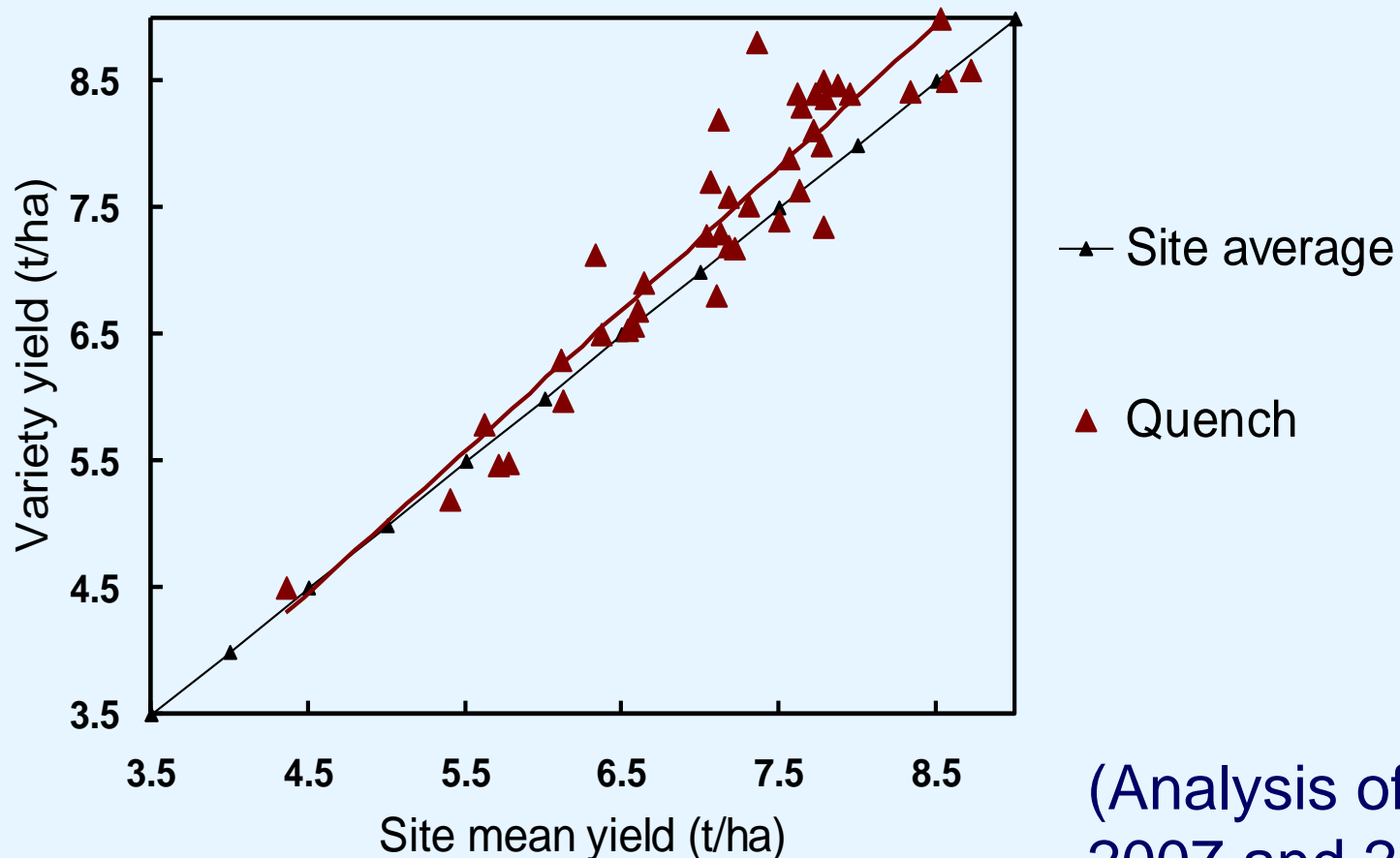
e.g. Optic is consistent across sites



(Analysis of RL
2007 and 2008) 13

Varieties vary in their sensitivity to changes in growing conditions

e.g. Quench responds to higher yielding conditions

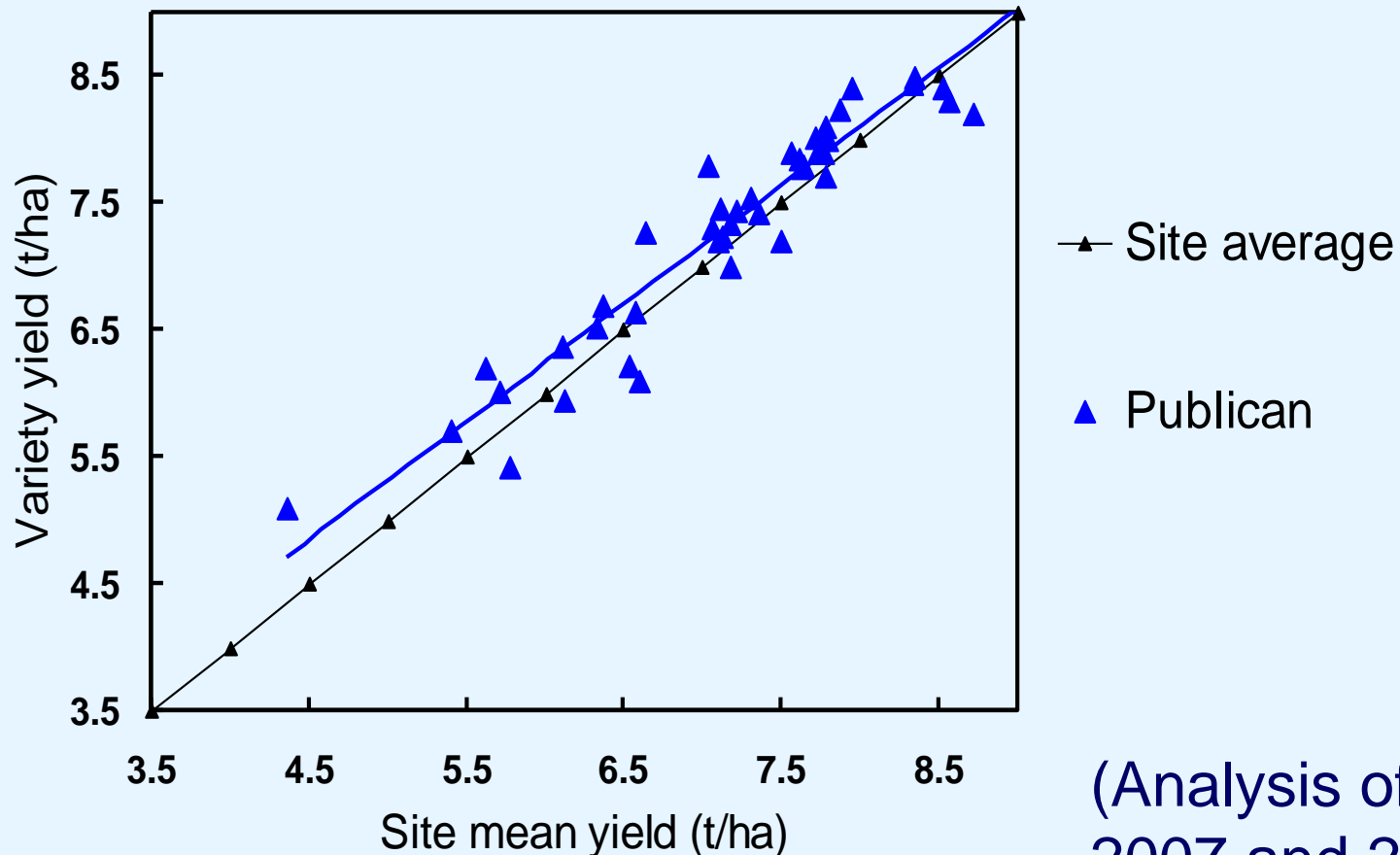


(Analysis of RL
2007 and 2008) 14

Varieties vary in their sensitivity to changes in growing conditions



e.g. Publican also performs well at lower yielding sites



(Analysis of RL
2007 and 2008) 15

Summary of varieties responses to changes in site conditions



	Yield	Sensitivity	Comments
Optic	6.80	1.02	Consistent across sites/seasons
Oxbridge	6.91	0.97	Fairly consistent, but seasonal variability
Decanter	6.83*	0.82*	Good at lower yielding sites
Publican	7.39	0.93	Good at lower yielding sites
Belgravia	7.37	1.02	Consistent across sites
Cocktail	7.33	1.11	Responsive to increasing site yield
Westminster	7.34	0.95	Maintains yield well at lower yielding sites
Waggon	7.74	1.04	Maintains yield well, especially at HYS
Riviera	6.85*	0.72*	Good at LYS, less responsive to better sites
Quench	7.50	1.12	Responsive to increasing site yield

Review of variety blends in spring barley (for feed)

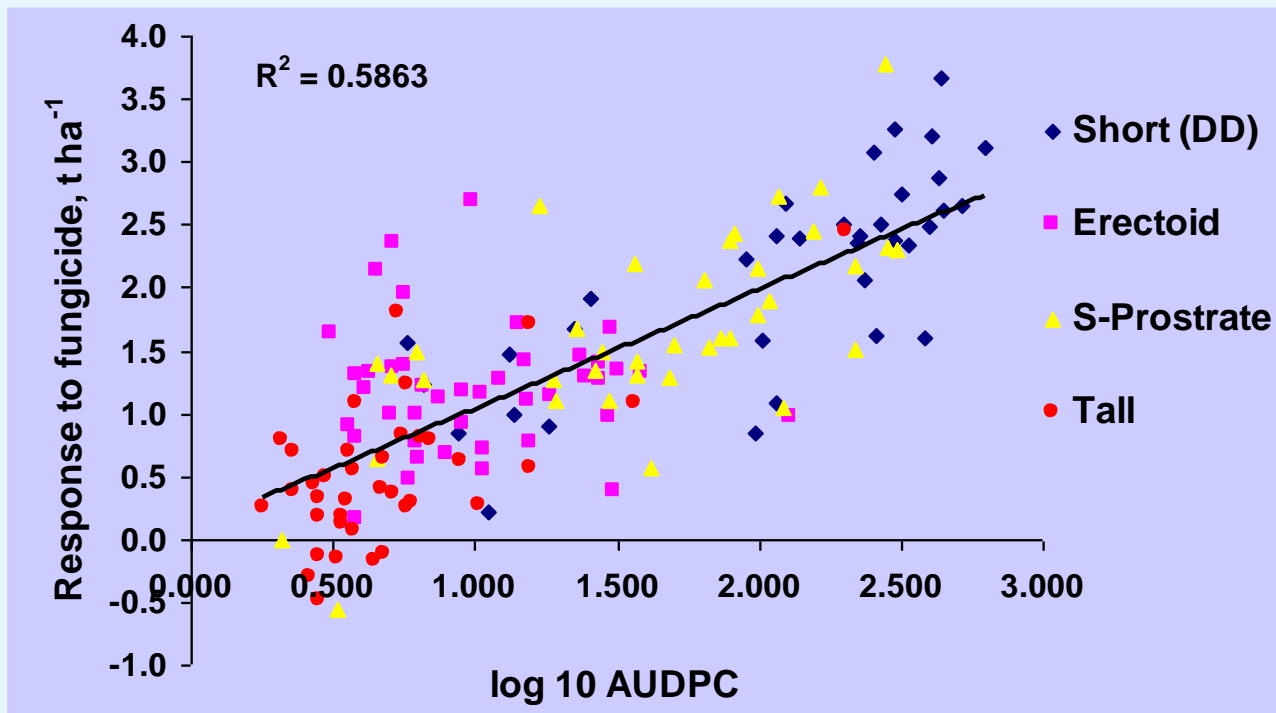


- The best varieties out-yield blends (though some blends are consistently good, especially in winter cereals)
- Small yield improvements (2-3%) in untreated crops
- Blends provide yield stability
- Mixtures reduce disease infection e.g. 20% less *Rhynchosporium* and 27% less mildew
- Blends have small benefits for screenings and specific weight
- Blends are better at buffering against poor crop establishment
- Uneven blends are superior in performance to even blends
- Soil cultivation has little effect on performance of blends

Future traits for 'escape' disease: New work with SCRI using barley 'lines'



- Tall 'lines' had much less disease and less yield loss
- Short 'lines' had most disease and greatest yield loss



(Ian Bingham, SAC
Bill Thomas, SCRI)

IBD Approved List, harvest 2009



Fully Approved for brewing and distilling use:

Optic, Cocktail

Fully Approved for distilling use:

Oxbridge, Appaloosa, Decanter, Publican

Provisional Approval 1 for distilling use:

Belgravia, Tartan

Fully Approved for brewing use:

NFC Tipple, Westminster

Provisional Approval 2 for brewing use:

Quench

Distilling (D or GD) varieties

- Braemar (D)
- Tartan has IBD Provisional Approval 1 (GD)
- SW Catriona, SW Markof and Toucan (all GD)

Candidates in 2009 with distilling potential

- Cairn (NFC 406-131)
- Benchmark (NSL 06-4657)
- Mirage (NSL 06-4662)

Guide to the Recommended List, 2009



- Malting and feed options
- Yield, quality and disease resistance

Market and quality characteristics

	Use	GN	HWE	Screenings
Optic	B, D	Low	313	7.5
Oxbridge	D	Non	316	4.4
Decanter	D, GD	Non	312	8.3
Publican	D, (B)	Low	314	4.8
Belgravia [P2]	<i>D, GD</i>	Non	313	6.5
Concerto [P1]	<i>B, D</i>	Non	317	5.1
Forensic [P1]	<i>B, D, GD</i>	Non	314	5.8

Malting varieties



Yield and maturity

	Yield	Yield loss untreated (%)	Maturity	Brackling	Ear loss
Optic	96	17	+1	5	6
Oxbridge	98	12	0	8	7
Decanter	94	10	0	8	8
Publican	103	10	+2	7	6
Belgravia [P2]	101	9	+1	7	8
Concerto [P1]	104	14	0	7	(8)
Forensic [P1]	102	17	0	8	(7)

Malting varieties



Disease resistance

	Mildew	<i>Rhyncho</i>	<i>Ramularia</i>	Yellow rust	GLA retention
Optic	5	4	5	8	5
Oxbridge	7	7	6	5	5
Decanter	9	6	8	8	7
Publican	8	8	7	3	7
Belgravia [P2]	9	7	7	7	8
Concerto [P1]	9	4	(5)	-	5
Forensic [P1]	5	5	(7)	-	4

Agronomics

	Yield	Yield loss uT (%)	Height	Straw strength	Mat.	Brack.	Ear loss
Waggon	107	14	73	8	-1	8	8
Scout [P2]	107	13	71	6	0	8	8
Rebecca	102	16	79	5	0	4	7
Westminster	101	9	81	6	+1	6	7
Riviera	96	10	78	6	-1	7	6

Disease resistance

	Mildew	<i>Rhyncho</i>	<i>Ramularia</i>	Yellow rust	GLA retention
Waggon	9	3	7	6	7
Scout [P2]	8	5	6	(2)	7
Rebecca	6	8	7	4	7
Westminster	9	8	7	6	7
Riviera	8	5	8	6	5

Variety messages

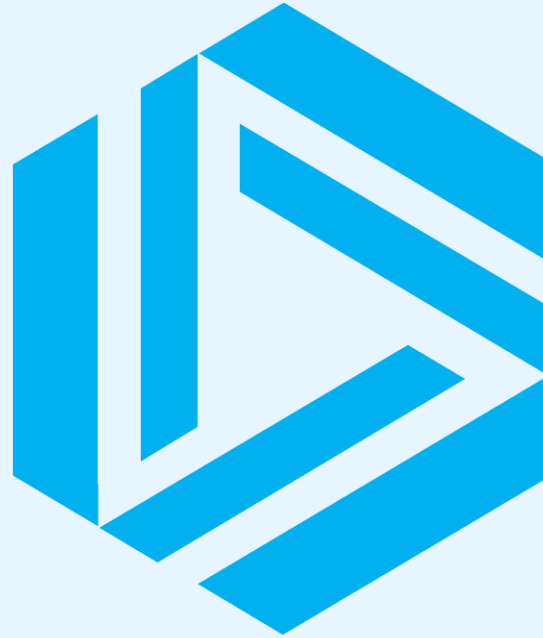


- Grow for your (local) market specification and use
- Optic and Oxbridge have main market share with smaller requirements for several other varieties
- No single replacement for Decanter: but potential over next two years
- Options for high yielding feed but identify weaknesses
- Make use of HGCA and SAC RL and technical notes / topic sheets / research notes

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SAC

S✓**ccess** through **Knowledge**