

# Profitable Organic Cereals and pulses

Choice of crop and variety: Cereals

Birnam Arts Centre, 24<sup>th</sup> January 2008

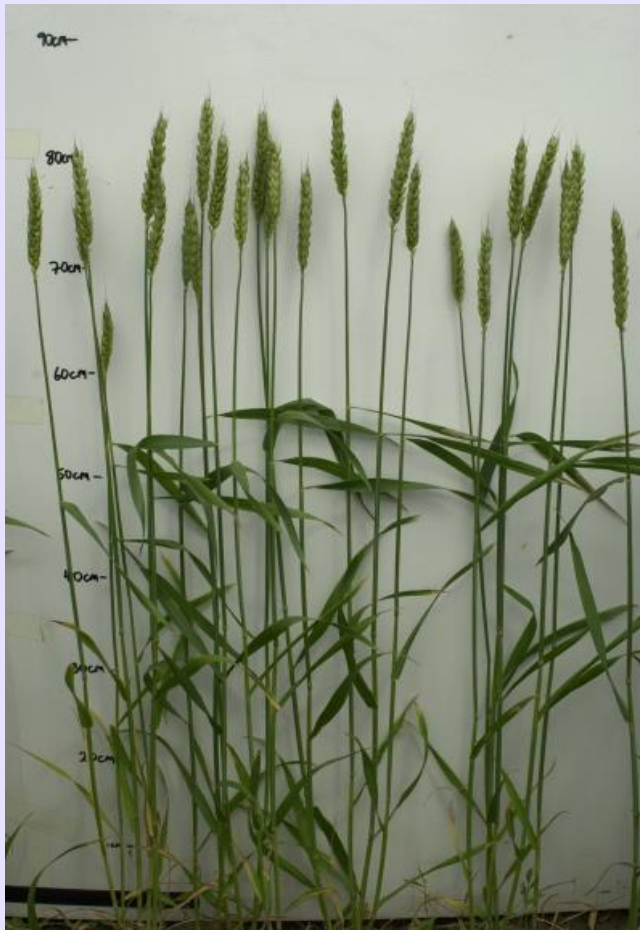
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Crop & Soil Systems

- Options for variety selection
  - Barley
  - Wheat
  - Oats
- Agronomic requirements for organic cereals
  - Identifying competitive and robust varieties
  - Recent R&D in OF

# Plant types suited to organic farming

## Chablis Planophile



## Maris Widgeon Erectophile to planophile



# A combination of characteristics are important

## Rialto Planophile to erectophile



## Zyta Erectophile



# Characteristics for organic cereal varieties



- High yield potential (in organic farming)
- Good disease resistance
- Early vigour and good establishment
- Rapid development
- High tillering ability
- Increased plant height
- Large leaf canopies
- Competitiveness against weeds

# Options for selecting varieties



- Spring cereals
  - barley, wheat, oats
- Winter cereals
  - wheat (milling, soft, feed), barley, oats

# Spring barley ~ preferred varieties



	<b>Yield (RL uT)</b>	<b>Spec. wt</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Westminster	94	70.2	8	82	0
Doyen	93	68.9	9	70	-1
Cocktail	90	69.9	9	68	-1
Riviera	89	70.6	7	78	-3
Optic	80	69.9	8	74	0

# Spring barley ~ preferred varieties



	<b>Mildew</b>	<b>Yellow rust</b>	<b>Brown rust</b>	<b>Rhyncho</b>
Westminster	9	6	5	8
Doyen	7	3	7	7
Cocktail	7	4	7	5
Riviera	8	6	4	5
Optic	5	9	5	4



# Spring barley ~ potential for OF



	<b>Yield (RL uT)</b>	<b>Spec. wt</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Publican	96	69.2	8	73	0
Quench	96	67.9	8	69	0
Waggon	95	67.8	9	72	-2
Scout	94	68.9	8	71	[-1]
Rebecca	91	66.9	8	79	-1

# Spring barley ~ potential for OF



	<b>Mildew</b>	<b>Yellow rust</b>	<b>Brown rust</b>	<b>Rhyncho</b>
Publican	8	3	5	8
Quench	9	3	3	8
Waggon	9	6	7	4
Scout	8	[2]	7	5
Rebecca	6	4	5	8

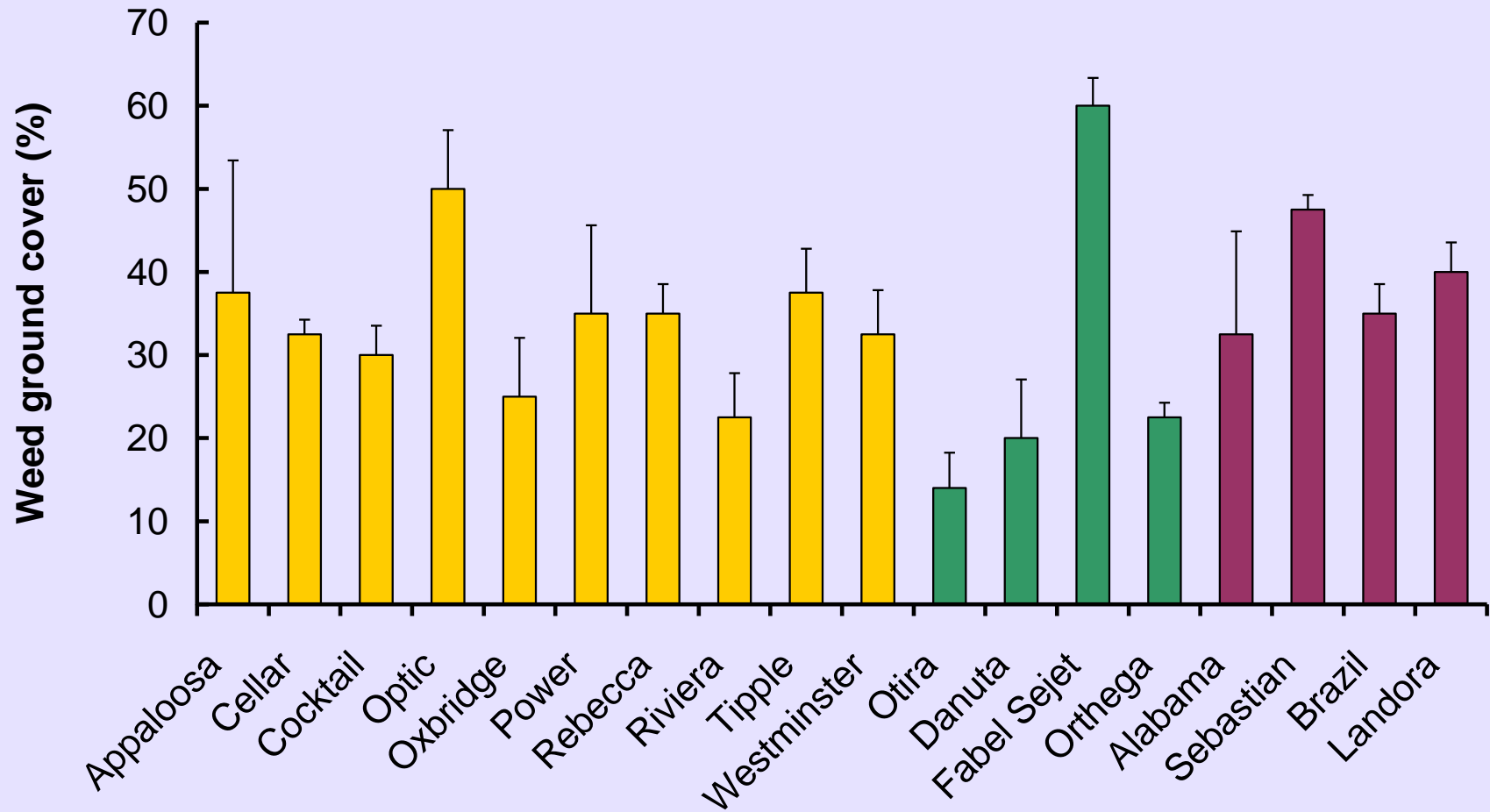
# Competing with, or tolerating, weeds



Significant structural and competitive differences between spring barley varieties

# Spring barley varieties and weed ground cover at ear emergence

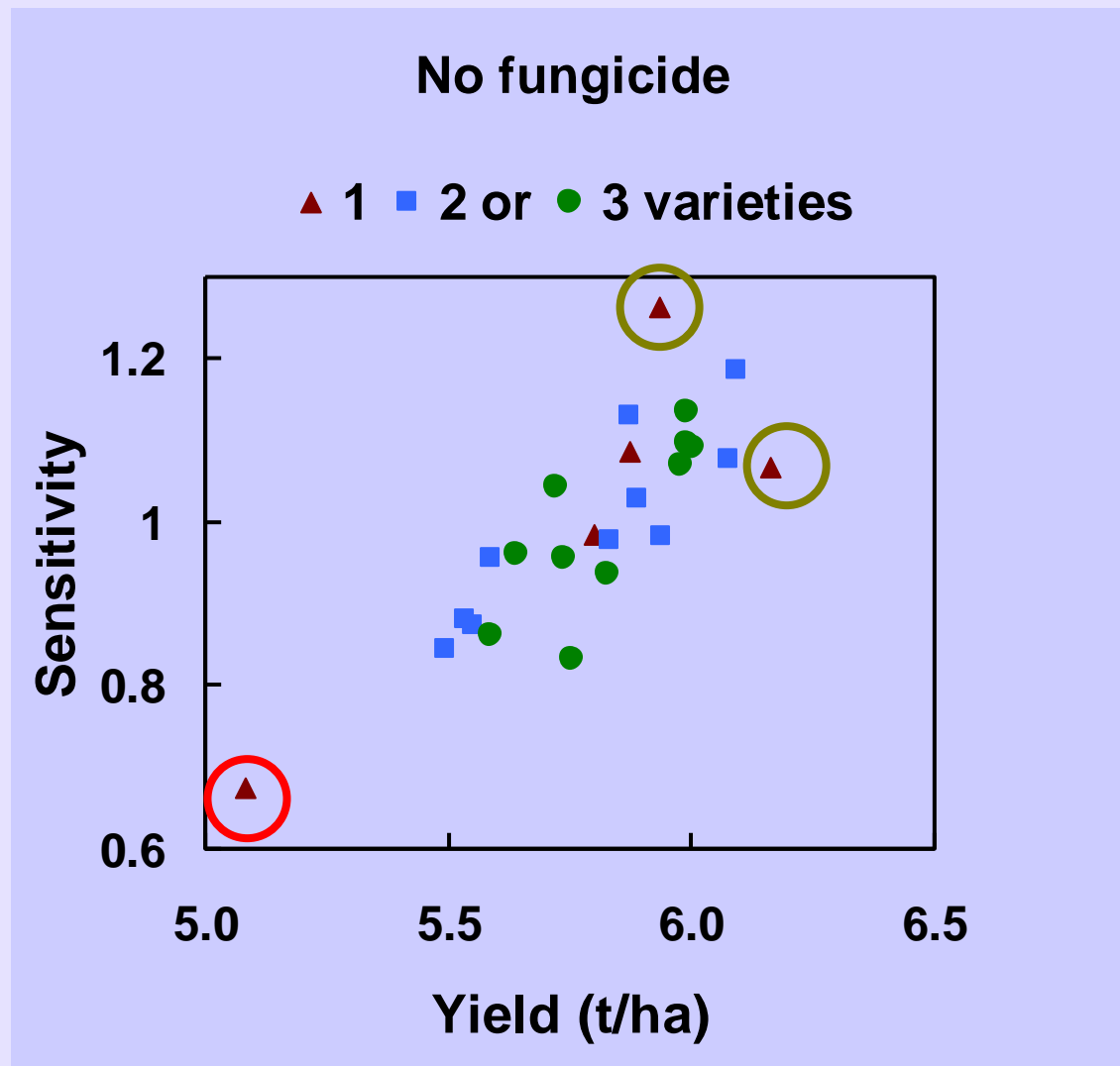
**Weed growth *in* varieties at GS55-59**



# Spring barley mixtures reduce risk

Single varieties  
and their 2 or 3  
component  
mixtures

Data points are means  
of ten trials (2001-2003)



# Spring wheat



	<b>Yield (RL T)</b>	<b>Spec. wt</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Paragon	92	76.4	6	98	0
Tybalt	107	75.5	3	90	0
Ashby	101	77.7	7	91	+1
Chablis	(99)	(76.5)	4	(89)	0

# Spring wheat



	<b>Mildew</b>	<b>Septoria</b>
Paragon	6	5
Tybalt	9	6
Ashby	7	5
Chablis	5	6

# Spring oats



	<b>Yield (RL uT)</b>	<b>Kernel (%)</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Firth	89	75.8	6	109	0
Atego	82	72.8	7	109	[-2]
SW Argyle	90	72.8	7	112	+1
Ascot	91	73.3	6	120	[+2]
Winston	90	76.3	7	109	0



# Spring oats



	<b>Spec. wt</b>	<b>Crown rust</b>	<b>Mildew</b>
Firth	54.5	5	8
Atego	53.4	[6]	4
SW Argyle	53.9	[8]	6
Ascot	52.9	[5]	6
Winston	54.8	5	8

# Winter wheat – milling



	<b>Yield (RL uT)</b>	<b>Protein (%)</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Malacca	74	12.5	7	86	-1
Solstice	80	12.3	8	95	+1
Hereward	76	13.2	8	89	0
Marksman	87	13.0	7	87	-2
Einstein	84	12.2	7	88	0

# Winter wheat – milling



	<b>Mildew</b>	<b>Yellow rust</b>	<b>Septoria</b>	<b>Eyespot</b>	<b>Fusarium</b>
Malacca	6	8	5	5	5
Solstice	5	9	5	5	6
Hereward	6	5	5	4	5
Marksman	7	7	5	[7]	4
Einstein	6	6	5	6	7

# Winter wheat – soft endosperm



	<b>Yield (RL uT)</b>	<b>Protein (%)</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Alchemy	89	11.8	7	92	+2
Istabraaq	83	11.2	6	95	+2
Robigus	83	11.8	7	90	+1
Claire	78	12.0	6	89	0
Ambrosia	82	11.9	7	86	0

# Winter wheat – soft endosperm



	<b>Mildew</b>	<b>Yellow rust</b>	<b>Septoria</b>	<b>Eyespot</b>	<b>Fusarium</b>
Alchemy	7	9	6	6	[6]
Istabraaq	5	9	5	7	7
Robigus	6	3	7	5	5
Claire	4	9	6	6	7
Ambrosia	6	6	4	5	3

# Winter wheat – other options



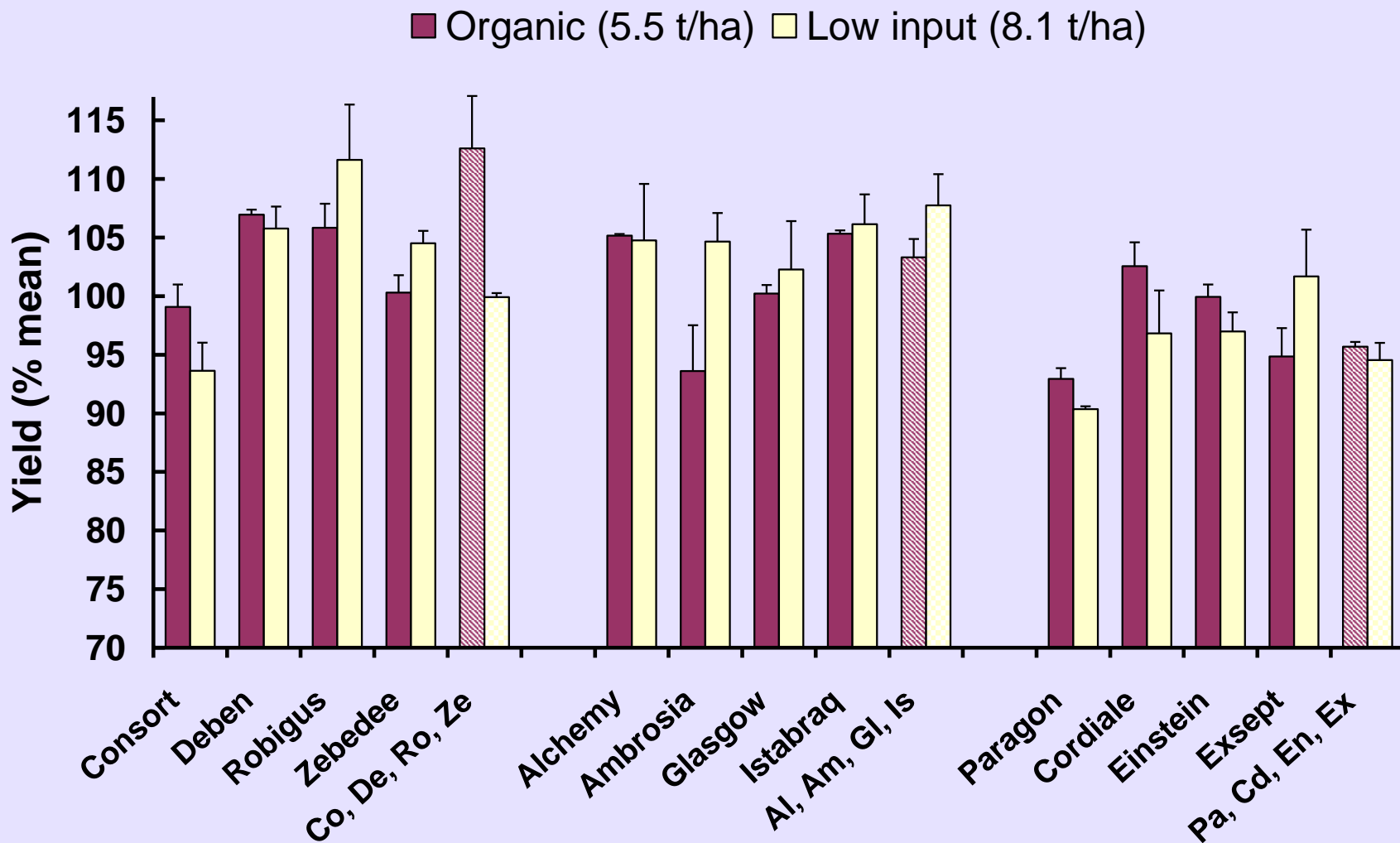
	<b>Yield (RL uT)</b>	<b>Protein (%)</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Exsept	(83+)	(12.5)	(7)	(87)	0
Timber	91	12.6	7	86	0
Oakley	87	10.9	6	87	+1
Option	(83)	12.0	6	90	+1

# Winter wheat – other options



	<b>Mildew</b>	<b>Yellow rust</b>	<b>Septoria</b>	<b>Eyespot</b>	<b>Fusarium</b>
Exsept	(6)	(7)	(7)	(4)	-
Timber	8	9	7	6	[5]
Oakley	6	6	[5]	5	[4]
Option	4	9	4	7	6

# Wheat varieties and their mixtures (2006 & 2007)





# Winter triticale

	<b>Yield (RL uT)</b>	<b>Spec. wt</b>	<b>Protein</b>
Ego	104	73.5	12.4
Partout	103	71.7	12.3
Trinidad	97	72.6	12.7
Benetto	114	70.4	12.0

# Winter triticale

	<b>Lodging (%)</b>	<b>Height (cm)</b>	<b>Maturity</b>
Ego	7	125	-1
Partout	9	119	0
Trinidad	5	120	-1
Benetto	2	122	-3

# Winter barley – feed options



	<b>Yield (RL uT)</b>	<b>Spec. wt</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Saffron	85	70.3	8	92	0
Retriever	82	66.6	6	88	-2
Camion	81	71.3	7	92	-2
Amarena	88	64.4	7	106	-2
Pelican	91	64.6	7	108	-1
Sequel	84	69.8	7	110	-2

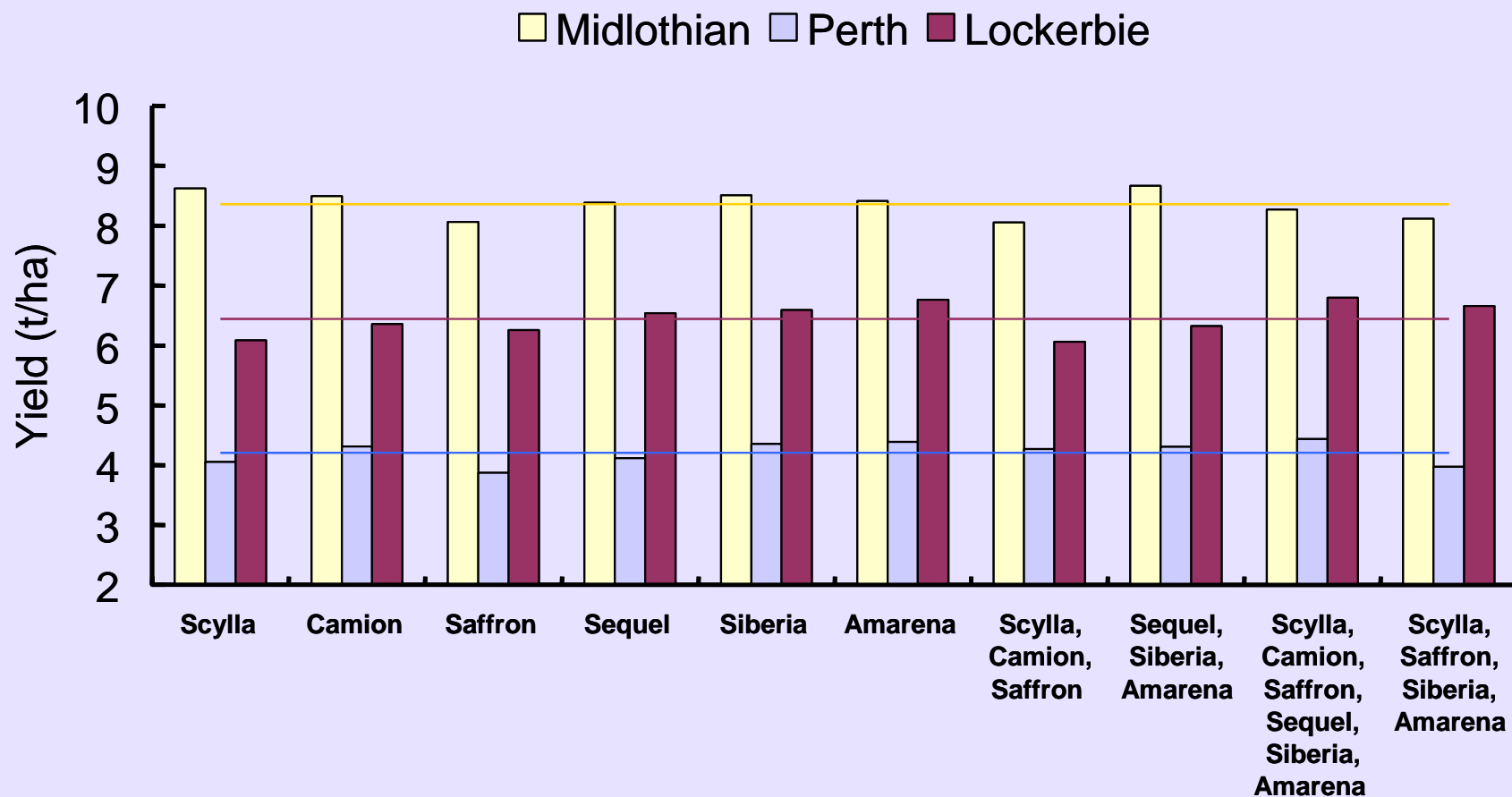
# Winter barley – feed options



	<b>Mildew</b>	<b>Brown rust</b>	<b>Rhyncho</b>	<b>Net blotch</b>	<b>BaYMY</b>
Saffron	3	6	6	8	-
Retriever	5	5	8	7	R
Camion	5	5	6	8	-
Amarena	9	8	8	8	-
Pelican	8	8	8	6	R
Sequel	5	5	8	7	R

# Varieties and mixtures in barley

Low input (no fungicide and 33% of total nitrogen)



# Winter oats

	<b>Yield (RL uT)</b>	<b>Kernel (%)</b>	<b>Lodging</b>	<b>Height (cm)</b>	<b>Maturity</b>
Gerald	87	72.5	6	120	0
SW Dalguise	86	75.4	5	123	-2
SW Kinross	94	74.9	5	130	0
Mascani	95	78.9	6	120	-1
Tardis	[94]	72.7	6	112	[-2]

# Winter oats



	<b>Spec wt</b>	<b>Crown rust</b>	<b>Mildew</b>
Gerald	53.3	4	4
SW Dalguise	54.6	3	3
SW Kinross	53.0	6	6
Mascani	54.5	8~	6
Tardis	49.9	7	8

- Place in rotation
  - Early vigour and speed of development
  - Effects of previous crop on performance of cereals
- Mixtures and intercropping
  - Increased yield stability with variety mixtures
  - Increasing yield (measured as Land Equivalent Ratio) with mixed species
  - Effects of the intercrop on a following cereal



- Choice of variety is often limited, but try to select the most *robust* or low-risk types
- Good establishment and ground cover with *robustness* in crop responses are essential for the best organically grown varieties
- New varieties are offering improved disease resistance
- More local information is needed as trial results ‘travel’ less well compared to non-organic crops

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