

Underlined = parent of public DH mapping population

---

1. <b>AR</b> che	<b>E</b> instein	<b>Maris Widgeon</b> *	<u><b>RiB</b>and</u>
2. <u><b>AV</b>alon</u>	Enorm ( <b>V1</b> )	<b>ME</b> rcia	<b>SC</b> orpion
3. <b>BA</b> tis	<b>F</b> landers*	Monopol ( <b>V4</b> )	Sokrates ( <b>V3</b> )
4. <u><b>BE</b>aver</u>	<b>HE</b> reward	<b>OP</b> us	<u><b>SoiS</b>sons</u>
5. <u><b>Ca</b>denZa</u>	Hurley ( <b>ELS</b> )	<b>PA</b> ragon	<b>SoL</b> stice
6. <b>CaP</b> horn	<b>IS</b> engrain	<b>PB</b> IS	<u><b>SP</b>ark</u>
7. <b>C</b> appelle- <b>D</b> *	<u><b>LY</b>nx</u>	Petrus ( <b>V2</b> )	<b>XI</b> 19
8. <b>Ch</b> ablis ( <b>RE</b> )	<b>MA</b> lacca	<u><b>RiaL</b>to</u>	Zyta ( <b>AP</b> )

---

**Blue** = public molecular data available  
**Purple** = spring wheat

**Green** = Broadbalk expt @ RRes  
**\*Tall** variety

**4 x Fertiliser-N rates\***

**Split N application**

<b>Code</b>	<b>kg N/ha</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>
<b>N0</b>	<b>0</b>			
<b>N1</b>	<b>50</b>	<b>50</b>	<b>50</b>	
<b>N2</b>	<b>200</b>	<b>50</b>	<b>100</b>	<b>50</b>
<b>N3</b>	<b>350</b>	<b>50</b>	<b>250</b>	<b>50</b>

**GS 24**      **GS 31/32**      **GS 37**

\* Soil N<sub>min</sub> (90 cm) 57-96 kg/ha

**PGR applied to prevent lodging and a full pesticide programme to prevent pests and diseases**

# 'Nitrogen Use Efficiency'

**Fertiliser Use Efficiency (FUE)**  
% of applied fertiliser recovered by crop

**Nitrogen Uptake Efficiency (NupE)**  
 $N\text{-uptake}/N\text{-available}$  ( $Nup/Nav$ )

**Nitrogen Utilisation Efficiency (NutE)**  
Grain yield/ $N\text{-uptake}$  ( $Y/Nup$ )

**Nitrogen Use Efficiency (NUE)**  
Uptake efficiency  $\times$  Utilisation efficiency  
 $NUE = Nup/Nav \times Y/Nup = Y/Nav$

# WGIN-05 Varieties

Varieties	Nabim	Rationale
1.Avalon	1	WGIN DH parent; DESK <sup>1</sup> - low NupE & NutE; WGIN-04 <sup>2</sup> - low NupE & NutE
2. Batis	German	Recommended by industry; WGIN-04 - high yield, NutE & NupE
Beaver Not Available	3	WGIN DH parent; High Canopy N requirement <sup>3</sup> ; WGIN-04 - best yield & NutE
3. Cadenza	2	WGIN DH parent; WGIN-04 - best NupE
4. Claire New for WGIN-05	3	Biggest area on RL; WGIN DH parent
5. Hereward	1	Best protein on RL; In previous studies on N and grain quality.
6. Hurley NEW		WGIN-04 – low yield, NupE & NutE
7. Istabraq NEW	4	Best yield on RL; Distilling cultivar; In LINK ‘Green grain’
8. Lynx	Danish	WGIN-04 - low NupE
9. Malacca	1	Best Group 1 area; DH choice; WGIN-04 - low NupE, high NutE
10.Maris Widgeon	1	Tall (rht), old cultivar;
Mercia Not Available	1	DESK - low NupE & NutE; Low Canopy N requirement; In IGF micro-array
11. Monopol	German	Recommended by industry; WGIN-04 – high NupE, worst NutE
12. Paragon	1	Spring variety; WGIN mutagenesis population; WGIN-04 - high yield & NupE
13. Riband	3	WGIN DH parent; Distilling cultivar; In LINK ‘Green grain’; WGIN-04 -high yield & NutE
14. Robigus NEW	3	Best Group 3 yield; DESK - best NUE, high NupE & NutE
15Savannah NEW	4	DESK - best NutE
16Shamrock NEW	1	High root length density at depth
17. Soissons	2	WGIN DH parent; Early maturing; WGIN-04 - high NupE, low NutE
18. Sokrates	German	Recommended by industry;
19. Solstice	2	Best Group 2 area; DH choice; WGIN-04 - worst NupE
20. Xi19	1	Best Group 1 yield; DESK - high NUE, NupE, NutE; WGIN-04 - low yield & NupE

<sup>1</sup>DESK – Defra study  
<sup>2</sup>WGIN-04 – Early results (N0 only)