

WISP Landrace Pillar 2016 Toolkit

JIC WISP NILs Cohort 1 (BC3 equivalent)

The main prebreeding output of the WISP landrace pillar is Near Isogenic Lines in the genetic background of Paragon. They were developed through two marker assisted backcrosses which started off with a RIL from the respective Paragon x Watkins landrace population. So the NILs carrying Watkins alleles will carry ~ 87% Paragon background.

This is the first cohort of landrace derived NILs from WISP. This is why the emphasis is on height and heading as the QTL analysis to inform the choices were based on data from the first season of WISP at JIC. The field trial of the NILs in the last season (15-16) suffered to some extent due to poor establishment. However, there is indication that three of the tested landrace alleles carry agronomic benefit and we encourage you to assess these materials.

Contained in the package are:

- Watkins allele carrying lines and
- Paragon counterparts.

Data from the lines carrying the Paragon allele is useful as it provides the best estimate of the Watkins allele effect. In addition all of these lines carry random Watkins background. If you identify interesting traits that might be useful for breeding purposes, the genotyping group (Bristol) have genotyped these lines to specifically show what non recurrent genetic background is present. The genotype files will soon be available on the WISP landrace pillar website (wisplandrangepillar.jic.ac.uk/toolkit.htm).

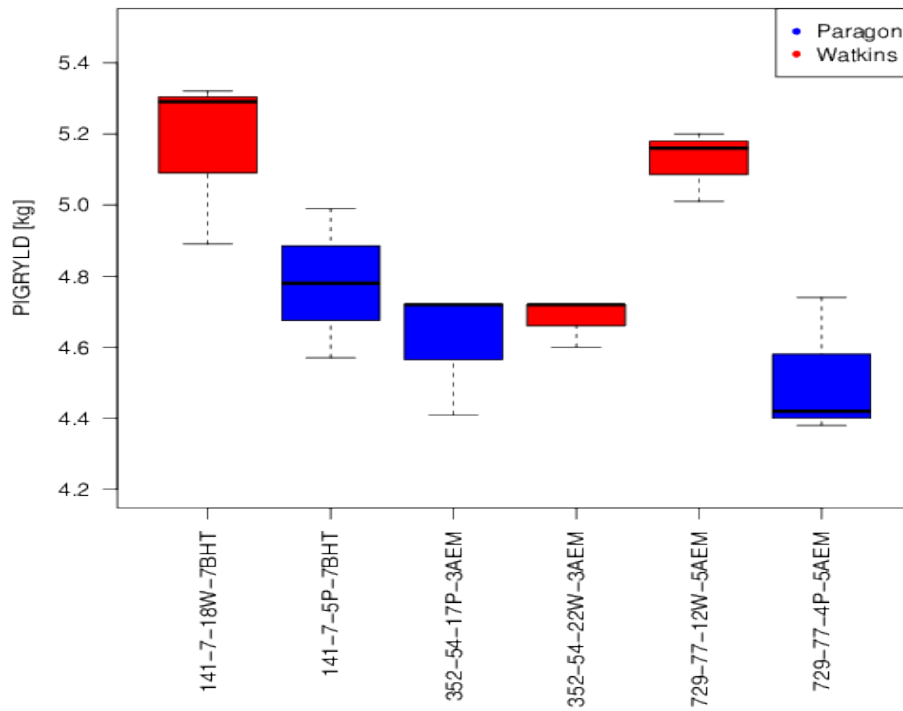
Loci covered were selected as our preliminary data suggests they might confer a yield benefit upon Paragon. They are on chromosomes 3A and 5A originally selected for ear emergence, and 7B originally selected for height:

- PW141-7 QTL-7B-Ht sib 18W (Watkins) and 5P (Paragon)
- PW352-54 QTL-3A-EM sib 22W (Watkins) and 17P (Paragon)
- PW729-77 QTL-5A-EM sib 12W (Watkins) and 4P (Paragon)

Below is a table showing the material and also data for performance in field trials for yield (Statistics on several streams, not just the ones above). The trial was a three replicate 1.5x4m trial with each plot derived from last years multiplication trial.

The seed packages (500g per line) in the box are split each for one carrying Watkins allele material and one carrying Paragon allele material. Please plant three replicates for each allele, as each locus comes with two sibs, that will make 18 plots. Please also plant plenty of Paragon controls (at least three replicates). Please contact Simon Griffiths (simon.griffiths@jic.ac.uk) to discuss any further points on experimental design. The purpose of this pre-breeding experiment is to confirm whether any of these alleles increase yield compared to Paragon under your yield trial (fully treated) conditions.

JIC Field NILs 2016



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QTL	NIL stream	Markers used for selection	Grain Yield (GRYLD in kg)		
			mean Paragon Allele (kg)	mean Watkins Allele (kg)	F-test p-value
3A-DTEM	ParW352-54	BS00088756, BS00010854, BS00011012	4.31	4.69	0.19
5A-DTEM	ParW729-77	BS0001735, BS00029413, BS00034303	4.51	4.98	0.067
7B-PHt	ParW141-7	BS00083352, BS00011065, BS00010355	4.6	5.17	0.21

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4.6	5.17	0.21