

**WGIN Management Meeting
6th November 2012 @ University of Nottingham**

Draft Minutes

Attendees:-

Peter Shewry, Kim Hammond-Kosack, Malcolm Hawkesford, Simon Griffiths, John Foulkes, Cathy Mumford, Matt Kerton, Peter Werner, Oorbessy Gaju, Jayalath DeSilva, Pedro Carvalho

Apologies

Simon Berry, Sue Freeman, Jayne Brookman, Stephen Smith, Simon Penson, Mike Grimmer, Sarah Holdgate, Thomas Joliffe, Neil Paveley, David Feuerhelm, Dhan Bhandari, Simon Bright, Peter Jack

Welcome – Peter Shewry

Actions from the last meeting

All actions had been completed prior to the meeting

RESEARCH UPDATES

Objective 2, 3 and 4 – Tools and Resources (Simon Griffiths)

Presentation

Simon provided an update on his objectives with the focus this time round specifically on NILs.

QTL results and summary for the small plot phenotype data for the AxC DH population are now available on the WGIN website.

Due to the weather we are now in a vulnerable situation because we only have 1 rep of the large plot experiment in the ground. **Post meeting note: All three replicates are sown now.**

The core AxC population was developed prior to WGIN and is publically available. Rothamsted have the rights to the extended population which is also publically available. The KASPar marker map has been developed as part of a BBSRC CIRC grant CIRC have agreed that the integrated SSR /KASPar map can be put on the WGIN website.

A map has now been produced for Paragon x Chinese Spring (PxCS). The Paragon x Garcia (PxG) population is at F₄ of single seed descent and will have a map developed for it within the period of WGIN2. PxG was developed for the drought tolerance project (WGIN objective 9). The PxCS map was developed as part of a BBSRC CIRC project called 'Development and validation of a flexible genotyping platform for wheat'. Both populations are available through WGIN. All information is available to view on the WGIN Website with the permission of the CIRC.

Questions

Q. Do the Height QTLs control taller rather than shorter crops?

A. In all cases, other than the RHT21, Cadenza carries the height increasing alleles.

Q. Is each QTL available reciprocally?

A. All NILs except for yield are reciprocal i.e. Cadenza allele into Avalon and Avalon allele into Cadenza.

Q. Are all the height QTLs mapping to the ends of the chromosomes?

A. It depends, 3A appears centromeric. Whilst 2D is distal to Ppd1 on 2D.

Q. With the Malacca x Hereward NIL population at what stage are you up to?

A. Backcross 4 derived homozygotes are multiplied and field drilled.

Looking forward

- Now that we have better maps for Malacca x Hereward it is desirable to reanalyse these QTL to see how much variation the NILs are likely to capture.
- PS suggested further work on non-gluten quality could be a future priority.

Objective 8 – NUE (Malcolm Hawkesford)

Presentation

The Variety Diversity Trial

In total 9 years of data were shown, which includes figures for 2012. There have been 47 different varieties tested for at least 1 year, over a 10 year period. The data gives us a lot of information on the stability of the various traits measured. Grain and straw material from the trials for each year have been stored.

The 2013 trial has been drilled. This is one of the few trials at RRes to be put in the ground so far.

Changes to variety this year are:-

2 x AxC lines have been removed

AC Barrie and Cocoon have been added, due to being tall varieties.

See [WGIN stakeholders Newsletter 2012](#), for the full variety list

Looking forward

- A huge analysis can be undertaken on the 10 year run of data. So far only Peter Barraclough's paper (*Barraclough PB, Howarth JR, Jones J, Lopez-Bellido R, Parmar S, Shepherd CE, Hawkesford MJ (2010) Nitrogen efficiency of wheat: genotypic and environmental variation and prospects for improvement. Eur J Agron 33, 1-11.*) has been published, which covers only the first 4 years of data
- Possibility of spin off project because of the great contrast in growing seasons in recent years. This project could be on breeding for stability.

Avalon x Cadenza Trial

Now have data from six field trials for NUE. Next step is to complete the analysis. For some of these trials, the final yield data and the derived QTL are very variable from year to year. The key objective will be to look in detail at the NUE parameters linked in with yield. Generally yield per se is difficult to analyse.

Q. Yield stability – has the date of sowing been plotted against this data?

A. Sowing dates have not varied sufficiently to affect the comparability of the datasets. The summer rainfall will contribute mostly to effects on yield.

Q. Have you look at Canopy senescence?

A. Yes

Objective 9 – Drought Tolerance (John Foulkes)

Presentation

John provided an update on the Drought Tolerance project. John confirmed that novel data are coming out of the $\Delta 18O$ analysis in combination with $\Delta 13C$ for the panel of 18 cultivars identifying genotypes showing positive departures from the overall negative relationship between water-use efficiency and water use.

There has been limited useful data available from the 2012 Rialto x Savannah population, due to the high rainfall and lack of drought. It was not due to be sown this year however to ensure we have 2 years of data, the Rialto x Savannah population will have to be sown in 2012-13. It was decided not to mill the grain from this year but to store the grain samples. However, these samples will not be submitted for grain $\Delta 13C$ analyses and 2012-13 grain samples will be analysed for $\Delta 13C$ instead.

Questions

Q. In principle can you take any useful material and do $\Delta 13C$. What are costs of doing so and do you need repeats?

A. £12-£15 per sample – every 10th sample needs to be repeated. $\Delta 18O$ is £18

Q. Could you go back through stored samples and would it give a good $\Delta 13C$ indicator?

A. Need to estimate the soil moisture deficit to define stress in the experiments for which stored grain samples are available to identify the most useful experiments where $\Delta 13C$ analysis could be carried out on stored samples.

Q. In your mapping population, is Garcia awned?

A. Garcia is not awned; results from DH lines of a Beaver x Soissons population segregating for awns show a minimal effect of awns on grain $\Delta 13C$.

Looking forward

- Early drilling could this improve drought tolerance through deeper rooting
- Explore mechanisms determining interactions between root traits affecting water uptake and other above ground traits (stomatal conductance, stay green)

- Develop isogenic lines for grain Δ 13C QTL for fine mapping/detailed physiological studies

Objective 10 – Take-All Disease (Kim Hammond-Kosack)

Presentation

Kim confirmed that Vanessa McMillan has now started as Richard Gutteridge's replacement at RRes.

Currently up to 4th year on the wheat variety rotational trial.

Looking forward

- There is a TSB project in place using the A x C population to fine map the QTLs controlling low Take-all inoculum build up
- Any NUE trials done by Malcolm could be oversown with either Oakley or Conqueror to explore the effect of a 1st wheat on 2nd wheat yields
- To explore the mechanism(s) controlling the take-all inoculum build up trait. For example, does Cadenza release a chemistry from roots that influences the take-all fungus or are there major differences in root architecture between cultivars?
- We need to narrow down time of year the take-all inoculum build up takes place.
- Could the degree of tillering influence the trait. Cadenza is the lowest tillering variety in the diversity trial. But other varieties that possess the trait, like Solstice, have a far higher number of tillers.
- Pedigree analysis of this trait would be highly informative.

WGIN 3

From recent discussions with defra we understand they consider WGIN to be a fundamental network platform and it is clear that it could be refunded. However as with most projects it needs to evolve. The Management Team would like to request that the breeders stay on board for the next year and follow up on the letters of support that were forward to defra in March 2012. Both Farhana Amin and David Cooper at Defra plan to attend the WGIN stakeholders meeting on 27th November 2012. **Post meeting note: Both attended**

It was agreed that the Breeders should review their target list of key traits and call a separate meeting to discuss targets going forward for WGIN, including what is coming out of WGIN that needs to be taken forward and what has done its job and perhaps doesn't need to be taken any further. **Post meeting note: Breeders Priority Traits List meeting now organised for 9th January at Ely.**

It was agreed that the revised breeder's traits list would be reviewed as an Action for the next Management meeting.

**Action 01/06.11.12 – BREEDERS to arrange meeting
Action 02/06.11.12 – ST to add to agenda**

The following are various comments that were made at the meeting regarding WGIN going forward:-

- 5 year project that needs to ensure there is flexibility built in.
- A large portion of WGIN should include pivotal projects.
- Grain quality research is largely unfunded
- Resources that are generated are IP free
- All data from the WGIN project is in the public domain.
- Target traits need to be focused on current funding gaps (need to be aware of what TSB etc are funding)
- WGIN to continue to fund Networking activities
- defra are pushing on water quality and WUE, because of the likely long term needs for the wheat growing belt in the UK
- Unlikely to involve durable yellow rust resistance – NIAB already doing WAGTAIL – West European. There is also now a new 5 year £16M global consortium to tackle yellow rust (PI – C. Uauy, JIC)

GENERAL UPDATES

Stakeholder Meeting 2012 – 27th November 2012

Kim went over the Stakeholder Agenda for the meeting due to take place on 27th November 2012.

It was agreed that Peter Werner would give the talk on the IBTI Club in place of Peter Shewry.

Action 03/06.11.12 – ST to change agenda

Avalon x Cadenza DH mapping Workshop

Following a discussion it was agreed that due to key people not being able to attend the A x C Workshop on 27th February 2013 a new date would be found.

Simon and Malcolm to talk to Keith Edwards and confirm new date to Suzanne, who will then distribute wider.

Post meeting note: The date of the new meeting is now 27th March 2013, location JIC – local organisers Simon Griffiths and Caroline Munnings.

Action 04/06.11.12 – SG/MH

It was agreed that the format for the day would be 20 minute talks from attendees who are using this resource.

Action 05/06.11.12 – SG/ST

John to liaise with Simon to see if it is worth adding Rialto x Savannah to the agenda.

Action 06/06.11.12 – JF

WGIN Newsletter

We have now pulled together all the information we can in relation to the latest WGIN Newsletter on resources. Suzanne to send out a final draft to all contributors any further additions/alterations should be sent back to Suzanne by Friday 16th November, in order that the final version can be published to all Stakeholders ahead of the Stakeholder Meeting.

Post meeting note: The WGIN Newsletter on resources was distributed to all and available on the website ahead of the stakeholders meeting

Action 07/06.11.12 - ST

Planned Outreach Activities

JIC - Field Walks

Nottingham – Will look to have plants plus technical piece at Cereals 12th/13th June

Rothamsted - to discuss joining forces with Velcourt to provide something at Cereals 2013.

Action 08/06.11.12 - KHK

SID4

We would like to submit the SID4 report for the WGIN project before Christmas. Suzanne will send out the template for individuals to complete with their technical piece on their relevant objectives together with any outreach activities they have done.

Next WGIN Newsletter – due out April 2013

As you write your SID4 parts, can you convert the research details into a section of text + pictures for the next Newsletter which will revert of the regular research focus

AOB

None

Date of Next Meeting

25th March 2013 location KWS

Action 10/06.11.12 - ST