

WGIN 3 Management Meeting 1st February 2018 @ Rothamsted

This was the tenth Management Meeting of the **DEFRA** funded **WGIN3**.

Minutes

Attendees:

Peter Shewry (PS) (**chair**), Andrew Riche* (AR), Malcolm Hawkesford (MH), Vanessa McMillan* (VM), Gia Aradottir* (GA), Kim Hammond-Kosack*(KHK), Michael Hammond-Kosack* (MHK) (RRes), Simon Griffiths (SG), Clare Lister* (CL) (JIC), Ruth Bryant (RB) (RAGT), Dhan Bhandari (DB) (AHDB), Nick Bird (NB) (KWS), Phil Tailby (PT) (Limagrain), Lucy James (LJ) (ADAS)

[*=gave oral presentation]

Apologies:

Matt Kerton (DSV-UK), Sarah Holdgate (NIAB), Martin Cannell (Defra), David Feuerhelm (Syngenta) and Steve Smith (Elsoms)

A. Welcome – Peter Shewry

B. Presentations:

1. Review of minutes from 6th October 2017 (KHK)

One query resolved and the approved by all.

Action **MHK** To add to website.

2. Tools, resources, genotyping and phenotyping – (CL)

Details in presentation online (**pp1-27**) . Clare gave a comprehensive update of all the activities (8 tasks) that had been ongoing in WGIN 3.

C – There are 354 lines that comprise the full Paragon library. This comprehensive collection now need to be better publicised once a final descriptive list has ben generated.

Action **CL +SG** – create a final line list with descriptions and the place on WGIN website (i.e. the existing handout to be downloadable along with the list), Monogram website, the Cerealsdb website and then advertise via the WGIN newsletter and the new WGIN Twitter handle. **Still ongoing, this is a large task.**

C- In 2017, there was a 20% reduction in grain yield in the non-irrigated plots and therefore yields were 1.5 t/ ha lower than in 2016 .

C- the 35K array analysis is still to be done for the 354 lines in the Paragon library and will include another 30 parental lines.

C- The drought trial under the Phenospec in 2017 did not work as well as in 2016, because the trial was slightly larger and there were edge effects and also because there was a lot of plant removal during the growing season for the RNA time-course exp. This trial will be repeated.

C – Many new mapping populations are available, but the rest have been stopped at the F₂ generation. Need to advertise better their existence.

Action - SG and Simon Orford to draw up the final list to then be advertised on WGIN Monogram and Cerealdb websites and via the new WGIN Twitter handle. **Still ongoing, this is a large task.**

Q MH – In the Paragon x Garcia trial, what is the mean difference for each line between the irrigated and non- irrigated plots

A – this has not yet been calculated.

Action – **CL** to analyse and plot the mean differences per line between irrigated and non-irrigated plots for both field seasons and present at the next MM - **DONE** .

QNB (KWS) - Why was Garcia chosen?

A - The line performed well in the wheat drought LINK project lead by Eric Obers (NIAB) that was done with rain out shelters.

(HGCA 2012) Improving water use efficiency and drought tolerance in UK winter wheats (2007-2010, Defra-SA Link, HGCA, KWS, RAGT, Limagrain)

Q KHK - Are all the seedlings in the seed trays put out for the Avalon x Cadenza CSSL population that are going to be genotyped then going to be kept.

A- No the idea is to only keep a few that are the best to create the final TILING path.

Q PS – Who is using the WGIN lines that has been generated? Also how to researchers know if they request WGIN lines directly from the GRU that these came from the WGIN project.

A - NIAB is the main requester of germplasm as well as some of the breeders.

Action – **SG** to interact with the new head of the GRU at JIC to make sure that all WGIN derived materials currently in the GRU are flagged up and are directed to the WGIN website to ensure the correct text / logos are used when researchers are acknowledge this source in final publications / reports or presentations. **Still ongoing, this is a large task.**

3. Update on WGIN Diversity Trial 2017 (AR)

Details in presentation online (**pp28-41**) Andrew described the results obtained over the last 3 seasons. Andrew also indicated that Caccoon and Gallant had been dropped from the 2017/2018 trial and had been replaced by Barrel and Zyatt.

C- KHK The 2008 year was one of the highest for all types of foliar fungal infections. This is probably why the WGIN diversity trial yielded did so much better than the mean yields from all the AHDB trials in that year.

C- MH The WGIN fungicide regime is very comprehensive and ensures that there is very little / no disease throughout the season.

Q – DB – could specific weights also be measured on the WGIN diversity trial, because this is what the breeders and millers are really interested in.

A- -Yes, these could either be done by measuring the hectolitre weights at the point of harvest which would be fast, or alternatively using the Perton to measure the size and weight of 300 grains from each field plot.

Q- MH – what was the variation in height?

A – The spring wheat tend to be taller. We do measure biomass at anthesis, but this data has not yet been analysed

C- MH – A new PhD student at RRes will be measuring tillers per plant

4. Resistance to Aphids (GA)

Details in presentation online (**pp42-71**)

All the aphid data was presented on phenotyping the F₃ generation and using 7 day old seedlings.

C- With the new BYDV analyses it has been found that a different strain of the virus resides in the two different aphid species.

Q – Could you do the phenotyping for BYDV and the plant yellowing it causes using a drone?

A – AR – We do not have this type of camera for the drone yet. It is very expensive.

C - A Turkish visiting fellow will be working on the aphid / BYDV project in 2018

5. Resistance to Foliar Diseases (VM)

Details in presentation online (**pp42-71**) Vanessa reported on the phenotypic and genetic data from the multiple years of the Watkins yellow rust experiments.

C- SG – the massive necrosis phenotype caused by yellow rust on Paragon is a scoreable trait and the underlying genetics could be mapped in a suitable population.

C- SG – NIAB has shown that Yr36 works under UK conditions

Action – **VM** to find out what data NIAB has on the UK field performance of Yr36 containing genotypes. **Done:** NIAB does not have any data.

Q- SG - What is the history of the various Yr introgressions you have been exploring ? For example, you could explore with Bristol and their 35K array genotyping data if specific introgressions could be identified. For example Yr37 from *ventricosa*.

Action – **VM** to follow this up with Bristol for the eight Watkins lines that have all been phenotyped in the YR trials as well as the 50 Watkins lines in the new Septoria trials. **Still ongoing**

6. Update on Wheat Promotome Capture (MHK)

Details in presentation online (**pp72-116**). Michael gave an update on the data sets and also gave a live demo.

Q – SG – How do you know when there really is a small deletion compared to just a dip in the sequence read numbers

A- There is usually a very sharp boarder in multiple genotypes and not just a dip indicating low read numbers.

Q- What is Sear's synthetic

A – This was a synthetic wheat line generated in the 1950s by the eminent wheat geneticist Sears when he was based at the University of Missouri.

C- PS – Grain composition (Trait 2) is not controlled predominantly by transcription factors

C- MHK – for the Trait 2 and Trait 4 inter-comparisons we have 152 genes for trait 2 and 162 genes for trait 4 (biotic stress).

C- CL – Arabidopsis shown a very high degree of sequence variability in promoters and introns

C- SG - RFLP never worked in wheat because there was no cutting between the genes. The fragments were all the same size.

As a group we then discussed the plan for immediate access to all the data for the WGIN trait co-ordinators and the breeding companies. Individuals will have access to the data once they had signed a suitable consortium prepublication agreement.

Action -DONE MHK / KHK to revise the IWGSC pre-publication agreement available at <http://www.wheatgenome.org/General-Data-Access-Agreement> and then circulate this revised agreement to the MM group for comment. Then contact those who had been involved in the promotome experiment to sign the new agreement and have access to the data.

The MM group also agreed that the 1st promote workshop should be pushed back from Feb to April 2018 and a suitable date identified via Doodle Poll.

7. Breeders' priority traits (KHK). Kim presented a couple of slides giving the top traits that breeding companies has selected from the 107 sub-traits that they were asked to rank over 10 main traits.

8. Stakeholders' Meeting

The event was well advertised and the overall number of attendees was higher than in several previous years > 100. A lot more came from the Norwich Research Park than usual.

Some farmers were present at this year's event, but would like to see more in future. But at least 2 groups of farmers will make follow up visits to RRes in 2018 as a direct consequence of the SH event. One group from the East Midlands is interested in insect control and nutrient use efficiency, the other group from the St Albans area in improving wheat yields sustainably.

Companies numbers were low, although 203 independent agronomists did attend.

Action – MHK to quantify the different types of 2018 attendees and circulate the results to the MM group ahead of the next meeting. **Action item - To complete ahead of the 2018 SH meeting.**

Next time, the agenda should have more short talks. The AHDB presentation could go either at the start or immediately after one of the breaks.

Think about including an Agronomy focussed talk next time to give the current on farm situation for the wheat crop – Suggested speaker David Brightman (Warwickshire and AHDB committee member).

Many of the presenters in DFW need to make their talks less technical so that these could be well understood by agronomists, farm managers and farmers.

9. New publications, awarded grants and studentships using WGIN data and resources

New users of WGIN field trials or resources

MH (RRes) – newly starting PhD student

SG (JIC) – two new PhD students

GA – Murat Nadi Tas, Bahri Dagdas International Agricultural Research Institute, Eregli yolu uzeri 2. Km Karatay/ Konya / Turkey: Six month fellowship in Gia Aradottir's lab working on aphid resistance in wheat and effect of temperature on aphid development on different wheat varieties

Date of next WGIN Management meeting

28th June 2018 at the John Innes Centre