

# Minutes of the Oilseed Rape Genetic Improvement Network Management Meeting

29th June 2021

Zoom meeting

Present:

ADAS: Kate Storer (**KS**)

AHDB Dhan Bandari (**DB**)

DEFRA: Helen Riordan (**HR**)

Elsoms: Mark Nightingale (**MN**)

JIC: Rachel Wells (**RW**)

NIAB: Tom Wood (**TW**)

RRes: Fred Beaudoin (**FB**), Jon West (**JW**)

UoH: Bruce Fitt (**BF**), Yongju Huang (**YH**)

UoN: Rory Hayden (**RH**), Neil Graham (**NG**), Graham Teakle (**GT**)

UoR: John Hammond (**JH**)

UoW Graham Teakle (**GT**)

UoY: Ian Bancroft (**IB**), Zhesi He (**ZH**), Lenka Havlickova (**LH**)

Apologies: Defra Andrew Cuthbertson (**AC**), Pete Berry (**PB**)

Organiser: **IB** (UoY), **LH** (UoY), **ZH** (UoY)

Chair: **IB**

Minutes: **LH**

**IB** opens the meeting, offers the apologies for the missing members. Everyone is happy with previous minutes circulated before the meeting.

## Actions from the previous minutes:

**AP19:** everybody knows about the template (ongoing). **IB** reminding to send any new data to **LH**. - *ongoing*

**AP37:** **IB** reminded everyone to provide **PB** or **KS** two (not too technical) slides about their research and the ways how it could be relevant for the industry. **KS** - *we had two sets of slides (Mark and John) so far so if anybody does have any additional ones please send them over.*

**AP38:** **MN**, **LH**, **RW** decide on the date for the combined meeting Nov-Dec 2021 (UK BRC and OREGIN stakeholder meeting). **RW** - *we can run the meeting at Rothamsted the day after the BRAVO meeting so the networking which we were not able to do for the last few years.*

**AP39:** **IB** and **GM** need to decide in March about next steps for WP.3.5. - **IB:** *I have a report from Georgia, she is redoing the crosses and expecting to be able to trial, either in the field or in the glasshouse this autumn. So the work is being repeated - you might remember that we didn't have the material last time because crossings didn't take well. So they're having another go at that and that is in hand, basically.*

**AP40:** **LH** to discuss the AT results with each group (**YJ** and **TW**). **LH** - *chat with **TW** and **YH** and they will check it in detail. Meeting with **KS** and **PB** tomorrow.*

**AP41:** **JH** to send information about the project with John Deere to **IB**. **JH** - *project finished now, but happy to share public abstract via **LH**.*

**AP42:** All: any publications including old ones related to OREGIN funding should be sent to Jamie. **IB:** *A couple sent there, do remember that we need to get through DEFRA before we publish things so please send it to Helen.*

**YH** would older publications be good to be put on the website? **IB:** *Yes.*

**AP45: RW** - all papers where we used OREGIN resource acknowledged OREGIN, how would you like to capture that? IB: maybe the best way would be if you could just send me a note of it, and I'll try to include it in the annual report for Defra.

## **Project management and administrative matters**

No administrative issues from DEFRA point.

## **Updates on work programme OREGIN 5**

### **GIN Activity 1 – Stakeholder network**

**WP1. Maintain & expand interactions between UK stakeholders and academic researchers**

**WP1.1 Direct interactions between stakeholders and academic project partners.**

**Activity throughout; Milestones 1, 5, 15, 20, 33, 38, 56, 62, 76, 81, 87**

**&**

**WP1.2 Facilitated interactions between stakeholders and the wider academic community. Activity throughout; Milestones 3, 9, 17, 27, 36, 49, 59, 69, 78, 86**

### **GIN Activity 2 – Genetic tools and resources to address challenges**

**WP2. Provide physical resources to underpin rapeseed breeding**

**WP2.1 Maintain and make available for cost-recovered distribution core pathogen sets. Activity throughout; Milestone 13, 31, 54, 74, 91**

**YJ** – (covering WP2.1, 4.1 and 6.1)

All available isolates on the OREGIN website. And we recently went to the OREGIN field trial to collect more isolates now from the different cultivars. And also I have another PhD students working on that and we also collect an isolates from kale. We are testing pathogenicity of the isolates on different cultivars.

**WP2.2 Maintain and make available for cost-recovered distribution B. napus DFFS lines. Activity throughout; Milestones 14, 23, 32, 55, 75, 92**

GT regenerating 57 lines of the diversity set they look pretty good. The set is almost fixed (only two - three lines that are not) so we actually got our sort of, hopefully, a homozygous set of lines for everything.

**AP46 - LH** to check with Zhesi whether we actually have sequenced those lines. We could include them next time we commission RNAseq of the right type.

**WP2.3 Amplify panel of reference B. napus varieties for trialling. Activity in months 9-44; Milestones 21, 40, 63**

**NG** all the lines are in the polytunnel, everything's going fine, no problems, seed set looks good. Just about coming to the end of flowering. So, I can't see any issues with getting that dried and hand over to Mark, as soon as possible.

**MN** is all material coming to us for threshing? **IB** all going to you and some of that material will be used for field trials for next year (current DFFS lines and the mutant lines) Some of the mutant lines were actually down to just one or two plants that we're getting through, because we had a big attrition rate on some of the lines. Some of them will be segregating in erucic acid (EA) so you need to be aware of that. But we're gonna have to put those in because we just will have too few lines otherwise.

**AP47 MN** - if we can have a list from Neil and also a highlighted list from LH which mutation lines have high EA then we can warn people before sending out the seeds.

**IB** - the prediction will be done on our FAE1 analysis but of course if needed can be checked by FAMEs.

### **WP3. Develop novel pre-breeding material for trait assessment**

**WP3.1** Agree target traits and genes 2 (all) completed

**WP3.2** Develop pre-breeding lines from exotic *B. napus* and spring oilseed rape.  
Activity in months 3-44; Milestones 6, 24, 41, 45, 64

**WP3.3** Develop pre-breeding lines from mutagenized populations. Activity in months 3-44; Milestones 7, 25, 42, 46, 65

**LH** - All lines genotyped for FAE1A8, FAE1C3 and target gene. They are in different stages so adjustment in the number of growing plants is needed, based on the expected segregating ratio. Seeds sent to UoN and genotypes of growing plants were validated at UoY (screening ~800 plants by PCR for three genes). Problem with one line (eIF(iso)4E.C4 gene where the segregation ratio doesn't correspond with parental line) so all samples send for low-pass gDNAseq analysis.

Another 182 plants for CER4-like and Cyt P450 were sequenced (low-pas DNAseq). Neil kindly did additional crossing (GTR1.C3bxGTR1.A6; CER4-like.A1xCER4-like.C1 and eIF(iso)4E.C4xeIF(iso)C8) to expand the base of possible mutant lines for field trials.

**WP3.4** Develop pre-breeding lines from alien introgression material. Activity in months 3-44; Milestones 8, 26, 43, 47, 66

**LH** No further progress with restorer lines - seems not very stable, discussing possibility to pass them to MN for purpose of stabilising them.

**IB** giving update on Imola introgression in collaboration with **BF** and **YH**.

One of the cultivars being analysed was expected to have an alien introgression from *Brassica Atlantica* and actually it looks like it really does have some very substantial integrations into that line - pretty much whole chromosomes worth split across the genome. So there's quite a lot more work that YH, BF and we need to do to characterise it in detail, but basically the method worked and that

Imola variety really does look like it's something very interesting. And that of course is a source for light leaf spot resistance in modern material and so that's the top priority for this project in terms of traits, but it will take a bit of time to sort out in great detail.

**IB** the main discussion point I really wanted to discuss today is a number of lines for which we've got very few plants that are going to succeed. And that certainly isn't going to be enough for any kind of field analysis this year. We are kind of preparing for a potential extension for ORIGIN, with additional years, we would be able to analyse those materials that are not yet ready within this current phase. And also we could start to analyse the

double mutants which should have a greater phenotypic impact that we see with the single mutants.

I was wondering what people's views were on the prospect of continuing this type of work into another stage if funding is available, or would you rather draw a line under this and think about something completely different. So, there are options but I'd like people's views, please.

**RW** - can this material be available for testing in glasshouse out of OREGIN? Mainly high GSL in leaves and low in seeds to test in insectary.

**IB** - yes, absolutely we are working towards that. We don't expect to see big phenotypic change in single mutants but we have a new PhD student working on all GTR mutants and we will have much better material in the next few years and we would love to test it within the pests.

**MN** - We will be happy to grow them for you if we are not talking about big amount

**IB** that will be great, thank you.

**FB** - for the part of phenotyping I am happy to help to move things forward (especially sterols etc.)

**YH** we would like to test the material for three pathogens we are working on.

**IB** asking **HR** for any discussion within Defra about the next phases of GINs? **HR** not yet but will take forward that you are looking for the next phase and you are ready to go forward next year with the material. I will provide any update.

### **WP3.5 Develop pre-breeding F1 hybrids between winter and spring oilseed rape. Activity in months 1-32; Milestones 22, 39**

Already discussed as part of AP39

## **WP4. Conduct pre-breeding assessment of novel winter oilseed rape lines**

### **WP4.1 Establishment, management and phenotyping of field trials Activity in months 21-57; Milestones 29, 44, 51, 67, 71, 82**

**YJ** presents assessments from the field done in April (high and low N). Some of the plants already had stem canker in April and differences in degree of infection (leaf spot, stem canker) between different lines were observed.

**TW** - giving updates on field pathology trials and on AT results from previous assessments. If there are useful traits to anybody else, please get in touch.

**MN** - how did you assess cabbage stem flea beetles? **TW** - visually. **MN** - there is a new agreed protocol from AHDB which we use and I am happy to share it with you.

**RW** if you have CSFB we will be happy to compare it (trends and patterns within the diversity set).

**DB** - are you looking at pod shatter? **TW** no but we can do a quick assessment of this trait.

**RW** - one the study on the original diversity set was done at JIC - didn't show much, but done by using an old pipeline.

**JW** - could also be a problem with different maturation if you really want to look into that.

**KS** - giving OREGIN trials update for ADAS and Elsoms. 2021 ADAS trial drilled 27th August 2020 and compromised plots by waterlogging and pigeon damage were removed. The rooting assessment was delayed.

**MN** - our plots recovered very well and we will get some yield data and other assessments. We will try to get some good data next year (three OREGIN trials and we will choose the best one) including better insurance policy on CSFB.

**JH** giving updates on trials at Reading. We observed variation in grain protein at different N application rates.

Trial design 2020/21 split nitrogen treatment, plant established very well, at the moment monitoring growth stages. Some spring OSR suffered frost and pigeon damage.

#### **WP4.2 Assessment of heterosis in spring x winter hybrid oilseed rape. Activity Q7-Q18; Milestone 35, 58, 61, 79**

Already discussed as part of AP39

#### **WP4.3 Assessment of the impact of modified leaf wax composition in disease and pest interactions. Activity Q15-Q19; Milestone 83 (scheduled for May 2021)**

*Planned for May, but it's more likely it will be October this year CSFB is better in the autumn.*

#### **WP4.4 Interpretation of trial data. Activity Q11 – Q19; Milestones 48, 68, 84**

**LH** - UoY received data from TW, YJ and KS. AT performed and results shared back with providers. Data interpretation managed via individual Zoom meetings.

#### **GIN Activity 3 – Develop and exploit opportunities for further research**

##### **WP5. Promote spin-off projects (all)**

**KS** - there is some potential waterlogging effect at Elsoms, we are looking at the moment.

**RW** - Introducing new project which come out of work done with AHDB on CSFB controlled feeding and larval trials using OREGIN material.

**IB** – could you please send me all information so I can report it to Defra?

**RW** – yes as soon as we will be allowed.

**AP48** – **RW** send **IB** info about new project on CSFB.

#### **GIN Activity 4 – Dissemination and knowledge exchange**

##### **WP6. Provide information resources to underpin rapeseed breeding**

#### **WP6.1 Provision of molecular data from current phase of OREGIN. Activity throughout the project; Milestones 10, 12, 18, 30, 53, 73, 89**

**YJ** - OREGIN website with information about crop cultivars, linkage map, genotype data, field trial data, pathogen collection, links to different places etc. Some isolates were distributed across UK but also internationally (Australia, Netherland etc.). Jamie uploaded all trait data on the website.

#### **WP6.2 Provision of trait data from current phase of OREGIN. Activity Q9-Q20; Milestones 49, 68, 86**

**YJ** – Trait data uploaded to OREGIN website managed by UH

### **Reporting to the authority**

**IB** – asking Helen what is the next thing we have to do.

**HR** will check with **AC** but basically put all information in the right scheme, summarise all data within the project. Next RAG meeting is scheduled for December

### **Date for next meeting**

The next OREGIN meeting - physical meeting 15th December 2021 at Elsoms