# Minutes of 4th PCGIN Management Meeting at John Innes Centre, Norfolk on 20th July 2007

**Present:**

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| JIC | Noel Ellis |
| JIC | Claire Domoney |
| JIC | Mike Ambrose |
| JIC | Carol Moreau |
| JIC | Catherine Chinoy |
| JIC | Mary Wade |
| Nickerson-Advanta | Keith Fox |
| PGRO | Anthony Biddle |
| PGRO | Barrie Smith |
| NIAB | Jane Thomas |
| NIAB | Haidee Philpott |
| NIAB | Donal O'Sullivan |
| Unilever | Frances Bligh |
| CSL York | Adrian Charlton |

**Chair:**
Noel Ellis (JIC)

**Agenda:**

1. Welcome & Introduction (NE)
2. PCGIN annual report submission (NE)
3. LINK, BBSRC/Dfid grant updates (AB, DO'S, NE)
4. Plot trial data analysis from 2006 (MA)
5. Disease trials (AB, JT)
6. Populations for genotyping: combining marrowfat, vining and bean (NE, CM, HP)
7. Genetic marker web update (NE)
8. Seed quality update: combining & food (CD)
9. Seed quality update: metabolomics (AC)
10. MTAs & confidentiality agreements (CD, NE)
11. AOB

**Lunch break (12:30)**

**Plot visit (13:30)**

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**Chair:**
**Noel Ellis (JIC)**

It was decided to visit the plots first because of the heavy rain forecasted for the afternoon. The meeting therefore commenced at 11:00 a.m.

**1. Welcome & Introduction (NE)**

NE welcomed all who attended the meeting.

**2. PCGIN Annual Report submission**

NE reported that the annual report was submitted on Tuesday 17th July to Defra and was sent to David Cooper who has acknowledged receipt. Once Defra has approved it, it will be put onto the PCGIN and Defra websites.

**3. LINK, BBSRC/DFID grant updates**

NE reported that the BBSRC/ DIFID grant proposal had been rejected. AB reported that the Bruchid LINK project with PGRO, Rothamsted Research and NIAB was going ahead but awaiting a signature from DEFRA. There are many different participants involved (including Nickerson-Advanta, Wherry's, Syngenta, Bayer, Velcourt and Raynham Farming) and with at least 53% of good industrial support. Contacts have been made with staff at ICARDA to obtain sufficient seeds for trials. This project will begin with field work in 2008.

**4. Plot trial data analysis from 2006**

MA reported that his analysis of the 2006 field plot data was still incomplete. He presented data from replicate 1 at JIC relating to the vigour of 16 pea lines and their standing ability, where basal sag, creep and lean had been measured. BS commented on the data presented in the annual report, which showed some remarkable consistency in harvest indices both within plots and between sites. CD noted that JIC was the exception in showing much more variable data when comparing location (outside or inside) the plots. However, some of the exotic material had been comparable in HI to the commercial lines.

MA said that a full report of the data would be available via the web-site prior to the 2007 stakeholders' meeting, and will be presented at this meeting.

**5. Disease trials**

JT reported that the downy mildew (*Peronospora*) disease screening of lines grown in 2006 was complete. Two populations of downy mildew, differing in pathogenicity profile on JIC differential varieties, were used. However, reaction profiles of the lines were similar for both populations. Some lines had complete resistance to each population. Inoculated field tests of the 2006 lines were carried out for *Mycosphaerella pinodes*. During the wet season in 2007, very high levels of disease were observed. None of the test lines showed significant partial resistance, and most showed higher disease levels than the commercial controls, Bilbo and Cooper. Inoculated growth room tests with *Ascochyta pisi* would be completed by the end of the summer. Scores of chocolate spot, downy mildew, and rust were made on the bean lines included in 2007 plots. Bruchid damage would be counted after harvest. Further downy mildew and *Ascochyta* tests will be carried out in 2007, with the pea lines included in the 2007 field tests. (The responses of the JI 15 x JI 1194 RILs will be of particular interest.) Further *Mycosphaerella* tests will be carried out in the field during 2008.

AB reported that the root disease screening was nearly complete on the lines grown in the 2006 trial. Inoculation with *Fusarium solani* f. sp. *pisi*, *Aphanomyces eutieches*, and *Phoma medicaginis* var *pinodella* had been carried out and full results would be available by mid-August.

Whole plot scores for pea and bean weevil damage had been made on the pea and bean lines in 2007 and for *Mycosphaerella pinodes** on the 2007 pea lines and for chocolate spot and rust on the 2007 bean lines. The pea lines would be screened for root diseases as for 2006 and the additional scores for bruchid damage would be made on the bean lines after harvest. (* related to standing ability: very susceptible, once plant leans).

**6. Populations for genotyping: combining/marrowfat, vining and bean**

NE reported that the $F_3$ seeds of the three chosen combining/marrowfat pea populations had been sown. A similar diversity screening exercise had been carried out on commercial vining pea lines, to identify parents. There was discussion of the vining tree data and the optimal parents to choose. It was pointed out that Waverex has different parentage to the others. KF queried the characters to be followed – taste, flavour, appearance, colour? ABsuggested that Avola and Waverex be included for flavour. KF said all vining peas apart from Waverex have similar characteristics and therefore Waverex with two others seem an ideal choice. This led to the cultivars Avola, Cabree and Waverex being chosen as parents for a 3-way cross.

Some discussion centred on the characterization of genetic variation in faba bean. NE said work would continue on collecting information from phenotyping and underpinning characteristics for a mapping programme. DO'S mentioned the resources for the bruchid control project. AB emphasised the other desirable characteristics, including drought tolerance. Commercial variation was still being assessed.

Regarding faba bean genetics, HP reported that Spring Bean varieties, that have been sown at NIAB over the past 20 years, had been analysed using a genotype plus genotype by environment analysis. A GGE Biplot was presented that graphically displays the interrelationship among the genotypes, the interrelationship among the environments and the interactions between the genotypes and environments. This is to be used as an aide to help decide which varieties would be grown as populations for genotyping.

MA reported on this season's regeneration rates for beans**.**

**7. Genetic marker web update**

NE reported that mapping information for pea was available on the open part of the PCGIN web-site, and that this was being routinely updated. There is a database on primers available and this will be put on the website; a set of 300 with known map position has not yet been published. A file of primer data will be made available that is comprehensible and in an easy format. This will be applicable to a range of legumes including pea.

**8. Seed quality update: combining & food**

CD gave an overview of the genes and crosses being studied for seed colour retention. The annual report contains additional and background information. The *i* and *Lox* loci are the candidates being followed, and intron-based markers are being used to follow variation in genes at these loci. Variation within green-seeded lines has been detected for *sgr*, a gene that regulates the breakdown of chlorophyll. The marrowfat lines that are prone to bleaching have been crossed with 'supergreen' genotypes and the progeny lines analysed for colour retention and inheritance of the *sgr* parental alleles. Variants for LOX, an enzyme implicated directly in pigment bleaching, are being studied in a similar manner. There was some discussion regarding methods for the measurement of colour. This has been monitored by the industry, using paint charts, and scores of 1-10. One suggestion had been made to use a Chroma Meter (used by the turf industry) – however these are pricey and clearly needed sporadically. A demo from a company will be followed up. A further suggestion was to contact Niall Green (SASA) to see how seed colour is being monitored there.

**9. Seed quality update: metabolomics**

AC reported on developments within the satellite project on metabolomics. He outlined briefly data obtained for pea leaves, where differences in the amounts of specific compounds relate to

drought status. He then described results from seeds in more detail, where effects of year of growth, as well as drought status, could be measured. Analysis of seeds from the RI lines derived from JI281 x JI 399 showed a clear separation (PC1) into two groups that each included one of the parents.

**10. MTAs & confidentiality agreements**

CD reported that an MTA had been drawn up at JIC to allow materials identified in the course of PCGIN research to be passed to the industry. The MTA was now acceptable to all concerned and the template can be adapted easily. The blank MTA could be publicly available on the web, and is good evidence that we are involving industry. It was stressed that passing material outside the consortium to stakeholders is on the basis that it is not our responsibility once passed.

A confidentiality agreement was proposed as a framework for open but confidential discussions with industry on academic and applied research. The idea is to set up documents which can be exchanged easily for confidentiality. This is being considered further by the JIC contracts office and PBL.

There is a standard MTA for germplasm, that allows for breeding, research and food use. It doesn't cover industrial uses or non-food use. MA will expand on this at the next meeting.

**11. Stakeholders' meeting plans**

CD reminded everyone that it had been agreed to have a more focussed meeting this year, based on a theme, rather than try to cover all objectives in the project. This had been suggested at the previous management meeting as a way to try to increase industry involvement. KF said that a focussed meeting on seed quality, that included the seed colour and metabolomics work, would be welcomed. Birds Eye had previously offered to host a PCGIN meeting, and it was agreed that this would be suitable. Other suggestions for a venue included a vining processing factory, Defra and Unilever facilities in London. (Action: CD to establish if Birds Eye possible for early October).

**12. AOB**

NE informed the group that two of the JIC pea RIL populations (281 x 399; 15 x 399) were being grown by Nickerson-Advanta in the field at Docking this season. MA said he would make a specific visit to Docking to record data from this experiment, where transgressive segregation for some traits of interest was evident (Action: MA).

CD requested that the relevant excel files related to the disease trials be forwarded to JIC, so that the data can be added to the web-site. (Action: NIAB, PGRO).

AB suggested that data for 2007 should include extra diseases such as rust, Bruchids and components of yield for the faba bean trial. BS pointed out that protocols for faba bean scoring were not available. MA suggested that it would be helpful to have a data chart for flowering and seed set per node on faba bean. MA will send out a draft recording form with details of the data to be collected. (Action: MA).

NE suggested that Ian MacKay be invited to a future meeting to talk about population genetics. It was agreed that this should be in a format that can be comprehended easily (Action: NE).