

## **Minutes of Meeting of Oilseeds Breeders – held 28<sup>th</sup> November 2005 at CPB Twyford**

In attendance:

Peter Werner (CPB-Twyford), Richard Jennaway (Raps GB), Matthew Clarke (Monsanto), Mark Nightingale (Elsoms), Jo Bowman (Nickerson), Tina Barsby (Biogemma).

Apologies were received from Craig Padley (Serasem/NPZ)

Background to the meeting

- Current developments in the academic community, particularly with regard to the BBSRC Crop Strategy Initiative, have led to a series of academic led projects being initiated within a short period of time. The introduction of the ‘delivery pipeline’ is welcomed by the breeding industry and has alerted us to our role in the R&D process.
- Prior to the meeting Peter Werner had requested information from UK researchers about their current proposals. We were very grateful to the large number of researchers who responded to our request in a very positive manner. One of the main objectives is to continue to improve communications between the academic and industrial communities.

Purposes of the meeting

- All agreed that little would be gained by constituting an independent organisation. It was felt that this grouping of Oilseeds breeders could represent its position with regard to R&D issues through the existing OREGIN structure and by direct representation.
- All present agreed that this meeting should:
  - Restate the priority areas for UK Oilseed rape genetic research needed to support breeding/on-farm production
  - The above views should be circulated through OREGIN to the research community and to BBSRC (Sustainable Agriculture Strategy panel)
  - Use this priority framework to consider the outlines of research proposals forwarded to the meeting and feedback comments (confidentially) to the researchers involved.
  - In no way did the meeting want to be seen as a ‘pre-pre-proposal’ gateway for researchers, but we did wish to take the opportunity to clarify our position on priorities and provide feedback to the research community.

### **Restatement of the Research Priorities of UK Oilseeds Breeders**

Over the past three years a series of meetings and discussion held through the auspices of OREGIN have crystallized a series of targets for research to support and underpin UK oilseeds production (<http://www.oregin.info/index.php?area=Stakeholders&page=shf3>). These were re-stated in the meeting and are presented below in priority order:

1. **Insect resistance** – this is a growing and increasingly pressing issue. Pesticide use is under pressure through environmental, efficacy (pest resistance), health and safety and cost factors. Sustainable solutions are needed to protect against:
  - a. Seedling pests – flea beetles and root flies
  - b. Pod midge
  - c. Pollen beetle
  - d. Aphids both as *per se* pest and as a vector for virus
 Glucosinolates while providing good general protection against grazing herbivores are not considered a likely solution.
  
2. **Seedling establishment** – the stability of production in the UK is most influenced by early crop establishment. Several factors impact upon this but the most important are:
  - a. Dry seed beds in the autumn – a problem that has become more frequent and more widespread in recent years. The genetic aspects to consider are:
    - i. Seed vigour
    - ii. Seedling rooting
  - b. Insect pests
    - i. Cotyledon damage by adults
    - ii. Root/stem damage by larvae
  
3. **Nitrogen Use** – OSR has a high demand for nitrogen which is becoming a very significant factor in the input/output calculations owing to the energy costs of fixing nitrogen. Whilst the plans for a Link project cover understanding and exploiting genetic variation available in elite material it was felt that a more basic understanding of the nitrogen use in oilseed rape would be valuable and could lead to more substantial re-structuring of the nitrogen economy for seed production. The role of the balance of oil:protein in the seed may be an important variable in improving oil yield per unit of applied N.
  
4. **Disease resistance** – for the UK crop disease resistance is very high priority but much research work has been and is continuing in this area particularly with regard to stem canker and light leaf spot, while not complacent we feel that other areas deserve a greater focus for new work. Milder autumns are expected to increase the disease pressure from:
  - a. Club root – already a significant problem in several parts of Scotland and Kent. Genetic resistance does exist but may be prone to break down.
  - b. Verticillium – currently not a problem in the UK but climate change could lead to increasing occurrence and severity.
  
5. **Water utilization** - particularly in mature plants during bolting and seed fill. Little is known of the potential for genetic variation in OSR to deliver improved performance in water stress conditions, aspects to consider are:
  - a. The factors leading to stress and the extent to which water stress is yield limiting
  - b. Root architecture - little is understood and the extent of genetic variation in water stress response is not known
  - c. The role of water stress in other physiological processes, particularly nitrogen use, is not well understood.

6. **Crop architecture** – several aspects of crop architecture are currently being studied in the Novorb Link programme. There is considerable genetic variation available in elite cultivars that breeders currently use to deliver different types of product. Most interest lies in the introduction of variation beyond the existing range, in particular for:
  - a. Internode spacing – shortening the internode in the absence of other pleiotropic effects would lead to dwarf types with no reduction of vigour and yield. This should significantly increase the harvest index.
7. **Seed quality** – Existing variation within the elite population has led to a steady increase in oil content, this seems to have been driven more by improved analytical equipment than through genetic understanding. The aspects of quality to consider are:
  - a. Oil content – but mainly in the context of gross oil output as set against nitrogen use, so we would consider this now as an aspect of NUE.
  - b. Glucosinolate content – biodiesel cropping may substantially increase leading to a glut in meal availability but current signs suggest that the bulk of this excess will be burned for electricity production.
  - c. Oil profiles - the genetic pathways involved in the oil profile are fairly well understood and several companies have developed a range of different fatty acid types (eg high erucic and HOLLI). New research in this area is not a priority.
8. **Non-food uses** – all agree that these could be very important for UK agriculture but also recognise that the development of new markets is likely to be a 2 stage process initially involving the utilisation of the commodity crop and only later leading to refinement through breeding specialist varieties.