

BBSRC CIRC Project : Yield Improvement of Oilseed Rape Through Genetic Manipulation of Rhizosphere Exudation

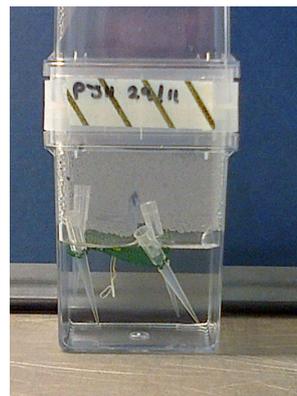
Newsletter N^o.1 – Jan 2013

Hello. The idea of this newsletter is to update you all on the progress being made on the project “Yield improvement of oilseed rape through genetic manipulation of rhizosphere exudation”. We intend to produce these newsletters approximately quarterly and make them available via the CIRC web-portal and the project web-page that we have set up (see below). Whilst the project was outlined at the CIRC dissemination event in October 2012 and on the web-page, these newsletters are intended to provide an ongoing general overview of progress, results and plans for future aspects of the work. They will not include detailed methodologies, in-depth analysis or discussions – these will be provided through regular CIRC dissemination events, academic publications and other appropriate forums. Of course, if people wish to get in touch, we’re more than happy to go into more detail (please see the contacts below).

Project Progress. Since beginning in October, we have identified and prioritized *Brassica napus* lines for the initial screening process, in collaboration with another CIRC project which has a naturally overlapping area of interest; root architecture (“Delivering low-cost, high-throughput root phenotyping screens for arable crops” run by Dr. Martin Broadley at the University of Nottingham). The levels and composition of root exudates in these lines, which include spring oilseed rapes, fodder rapes and more diverse members of the *B. napus* family such as swedes and kales in addition to winter rape lines, will be examined.

We have developed a seed decontamination protocol for producing sterile plant material. This is important, since microbes on the roots will not only use the plant exudates but may directly influence the types of exudates that plants produce as well. Standard surface sterilization methods were found not to be effective at removing microbial contamination carried internally within seeds. A more stringent procedure was developed which effectively decontaminated the seed without unduly reducing rates of subsequent germination.

A growth system capable of maintaining plants until they reach at least the four true-leaf physiological stage when grown in liquid nutrient, has been devised and used to investigate the most appropriate methods for root metabolite collection.



System for the sterile growth of plants.

Initial analyses conducted by the MeT-RO Centre at Rothamsted Research found that exudates could not be measured directly from the nutrient solution because of competing signals from some nutrient components. A system based on growth in nutrient solution (with monitoring for microbial contamination) followed by isolation of the root exudates in sterile water has subsequently been adopted. Initial exudate profiling to estimate levels of variation within lines is currently underway at MeT-RO with the first full screens to follow shortly.

Staffing News. Dr. Sally Hilton has joined the project and will start as a technician from the 1st of February 2013.



Dr. Sally Hilton

Interviews have been held for the PhD post associated with this project and are hoping to make an appointment in the near future

Looking Forward. We have begun investigating potential methods for collection of exudates from plants grown in sand or soil (without disturbing the root system). This method should allow non-destructive sampling of exudates from plants grown in more natural conditions.

Looking further ahead we have also approached Harper-Adams University as a potential site for some of the field trials to take place in the final year of the project.

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Project web-page:

<http://www2.warwick.ac.uk/fac/sci/lifesci/research/rhizodeposition/>

CIRC portal:

<http://www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/crop/crop-index.aspx>