

## SCRI visit to IPK to learn new plant transformation skills

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The Functional Genomics Facility was set up to provide a central point for crop transformation experiments at SCRI. Currently, barley and potato are the main crops being utilised. Although potato transformation is routinely established, transforming barley has proved less amenable with only Golden Promise producing sufficient numbers of transformed plants. Our current barley transformation process (Figure 1) involves co-cultivating immature embryos with *Agrobacterium tumefaciens* and then incubating the embryos on different types of medium, first to promote the growth of callus and then to generate shoots and roots.

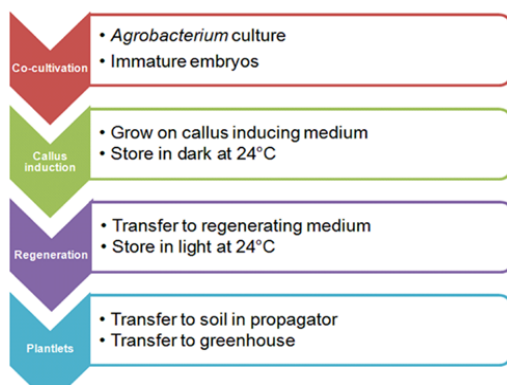
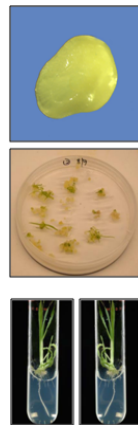


Figure 1. Barley transformation process



A group at IPK, Gatersleben, Germany, led by Dr Jochen Kumlehn has developed a highly efficient method for barley transformation using ovules as donor material. With this improved method they have found significant increases in transformation efficiency when using Golden Promise and other previously recalcitrant cultivars. During the visit of SCRI staff to IPK

these methods were taught first hand by a highly qualified member of the team (Tilo Guse). This involved learning to emasculate and fertilise the donor plants at the optimum stage ready for transformation. The delicate procedure for isolating the ovule was also learnt along with their improved method for *Agrobacterium* co-cultivation. The group also supplied SCRI with their full range of protocols for media preparation. As well as gaining practical experience, SCRI staff were able to inspect the conditions under which donor plants were maintained. The health of donor plants is a critical factor in improving transformation efficiency.

On return to SCRI a number of changes were made to the way the barley transformation process is managed. A new system to maintain donor plants in a controlled environment throughout their lifetime has been implemented. Improvements have been made to the medium used for inducing callus and regenerating transformed plantlets. The new method for ovule transformation is being practised and perfected. Each of these changes is expected to make a significant difference to the efficiency of transforming Golden Promise and other recalcitrant cultivars, as well as improving the service that we provide to other research groups at SCRI.