



PEB Technology Opportunity – CMS Restorer genes

Opportunity Researchers at the ARC Centre of Excellence in Plant Energy Biology have developed a predictive tool for the identification of plant fertility restorer (*Rf*) genes.

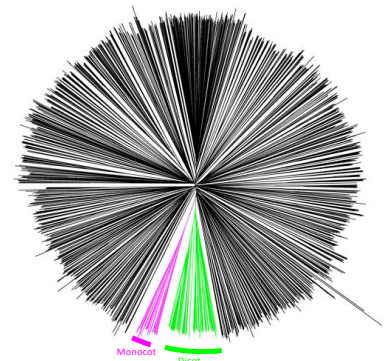
The method relies on the combination of (i) phylogenetic analysis of a family of genes known to be associated with plant fertility, (ii) an assessment of the predicted sequences for the presence of novel positive selection indicators recently identified by our researchers.

The opportunity exists to use this method for the prediction of *Rf* genes in fully-sequenced crops bred with cytoplasmic male sterility (CMS).

Summary The phenomena of CMS and fertility restoration have been exploited by plant breeders to synthesize hybrid lines of a number of crop species. The presence of a nuclear *Rf* gene is essential to confer self-pollination on the hybrid plants, but functional *Rf* genes must be excluded from the female parental line to avoid contamination of the hybrid seed.

Rf genes are currently identified by map-based positional cloning approaches that require several years work. For example, it took six years to limit the *Rf* region of rice to a 300 kb sequence, and another two years to validate the *Rf* gene by plant gene manipulation. If the genome information for a target plant species is available, the method developed by our researchers only requires a short in silico analysis to predict the candidate *Rf* genes.

As proof-of-concept our researchers trialed the method with rice, a species where 2 *Rf* genes have been identified and validated:



30,000 genes → 6 preferred candidates (320kb region)

*The 2 known rice *Rf* genes were found to be included in the 6 preferred candidates.*

This computer based analysis and prediction would have saved many years of traditional analysis and the researchers are keen to apply this method to crops of commercial importance.

Intellectual Property The IP exists as software and “know-how” that can be accessed by potential partners.

Commercialisation The Centre of Excellence in Plant Energy Biology is seeking partners who require access to the method for the prediction of *Rf* genes. Ideally this will be as a collaborative project, although commercial partners can access the method under a fee-for-service arrangement.

For further information on the CMS restorer genes opportunity please contact:

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