



# Cooperative Research Centre for Sustainable Rice Production

... of growing importance

## Media Release

16 February, 2005

### TISSUE CULTURE PROMISES FASTER RICE BREEDING

Scientists working at the University of Sydney's Plant Breeding Institute have, "all but perfected" a system of plant breeding that could speed the production of new rice varieties by several years.

Known as the double haploid system of breeding, the process depends on the technique of tissue culture to produce adult plants from the male sex cells of early generation plants derived from crosses between selected parents.

Dr. Norman Darvey explains that the system allows the breeder to produce plants that breed true to type in one generation, something that may take six to eight generations using normal plant breeding techniques.

"It's a generally accepted breeding system for canola and barley and I believe in some parts of the world it is being used for wheat," he says "but rice has always presented problems."

When using the double haploid system breeders make no initial selection for such traits as disease resistance or quality rather, the system produces a vast number of individually different true breeding plants from the first cross.

"You then subject them to your selection criteria, quality, disease control and the like knowing that they will breed true. When you get exceptional double haploid lines you can cross them again to make further improvements. Using the double haploid system you're bound to make more progress in a given time than you would with conventional breeding techniques."

Dr Darvey explains that the usual technique employed is one of anther culture where the entire anther is placed in a culture with a hundred anthers yielding no more than a single adult plant. The Rice CRC's Sydney University's team's technique is to liquefy the anthers, producing thousands of microspores.

While the process holds the promise of yielding thousands of plants for the plant breeder from a single cross Dr. Darvey says that it's usual for around 95 percent of the cells to die within 24 hours of culture. The success of the team rests with the tissue culture expertise of Dr. Xiaochun Zhao who's been able to recover thousands of live calli (a stage in the development of the adult plant) from some fifty to seventy anthers.

"Nobody has succeeded at this or in taking the process further," says Dr. Darvey. "But, we're already recovering slightly more green plants from our microspore technique than from anther culture and believe that within six to twelve months we'll be getting a result fifty to one hundred times better.

"That sort of result would revolutionise the business of rice breeding."

Dr. Darvey says that while the process is, "patent-able" he doesn't believe that either the University or the Rice CRC will choose to patent it but neither will they reveal the detail of the process preferring instead to offer the service to rice breeders around the world.

- ENDS -

**Further information:**

**Norm Darvey, [normd@camden.usyd.edu.au](mailto:normd@camden.usyd.edu.au) or tel: 02 9351 8828**

Xiaochun Zhao, [zhao@camden.usyd.edu.au](mailto:zhao@camden.usyd.edu.au) or tel: 02 9351 8829

Laurie Lewin, [crc.rice@agric.nsw.gov.au](mailto:crc.rice@agric.nsw.gov.au) or tel: 02 69512713

**Electronic copy available by contacting Rice CRC office – attention: Julie Symes**