Last year's production was down slightly with wheat yield averaging 2.30 tonnes per hectare and field peas down to 0.70 tonnes per hectare. Barley suffered wind and some hail damage in 2008 to average a disappointing 1.30 tonnes per hectare.

Two paddocks of Tanami canola averaged 0.85 tonnes per hectare in 2007 but with canola prices hovering around $800 per tonne, their net return was approximately 25 per cent more than field peas.

In 2008 the profitability of canola and field pea crops was on a par as yields dropped to 0.90 and 0.70 tonnes per hectare respectively.

Though follow-on benefits have to be taken into consideration, a lot of thought goes into determining the most profitable pulse component into the rotation in any one year.

FUTURE SYSTEMS

Ron and Kerry are happy with how far the farm has come over the past two decades and see that any changes in the near future will revolve around fine-tuning the present rotation. Canola will start to play a bigger role on the farm and provide extra management options.

Another legume similar in characteristics to faba beans would be ideal. A legume which performs as well as field peas and attracts higher commodity price, would give the business extra options and hopefully increase profits.

Variable Rate Technology (VRT) is likely to be another addition to the management options and applied to sowing, spreading, and spraying operations. VRT would potentially lower production inputs and increase productivity by placing inputs where they are most needed.

Genetically modified crops in the future may provide the opportunity to offset risk from environmental influences such as frost, drought, and salinity.

Ron is enthusiastic about GM use in herbicide resistant crops but warns that very careful management is needed. He believes managing weeds through the system is a more sustainable way to go.

Break crops on Ron and Kerry's farm are here to stay. An increase in the use of break crops as part of the farm's rotation is likely to occur in the near future. Ron constantly sees an increased grain production as a result of his pulse crops. Pulses have greatly increased the productivity and profitability of Cape Lagoon Farms.

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Hybrid lupin world first

A dainty pink flower with a tinge of yellow is one characteristic of a hybrid plant representing a genetic pathway to transfer best plant characteristics between narrow-leafed and yellow lupins.

The hybrid, a world first, is the result of 1600 crosses made during 2008 by researchers based at the Centre for Legumes in Mediterranean Agriculture (CLIMA) at The University of Western Australia (UWA).

Dr Jon Clements, Project Leader for the Grains Research and Development Corporation (GRDC) supported project, said the aim was to transfer desirable characteristics from yellow lupin (*Lupinus luteus*) to narrow-leafed lupin (*Lupinus angustifolius*).

"Narrow-leafed lupin is the most important grain legume in WA due to its adaptation to infertile sandy soils, reasonable tolerance to pests and diseases and its use as a break crop," Jon said.

"Yellow lupin has superior seed quality to narrow-leafed lupin, but is susceptible to anthracnose and aphid damage.

"This breakthrough in producing flowering hybrid plants between these two species creates the opportunity to transfer traits from *L. luteus* to *L. angustifolius* and vice versa," he said.

Confirmation of the hybrids was made by visually intermediate plant characteristics and also through molecular marker analysis.

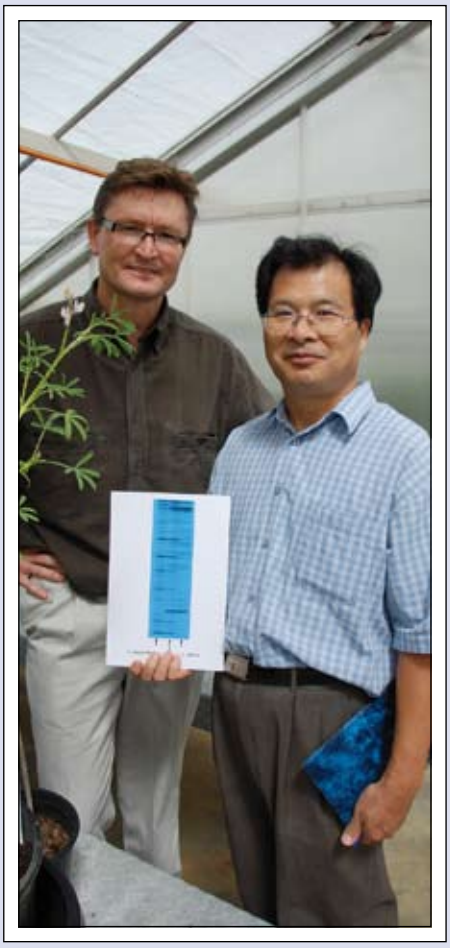
Jon emphasised that achieving the hybrid cross had been a team effort by John Quealy, Leah Chong, Dr Larissa Prilyuk, Dr Hua'an Yang and Gordon Francis – the group who crossed thousands of flowers and tissue-cultured hundreds of embryos to generate a few individuals.

He also acknowledged the valuable input from past team member Dr Julia Wilson and collaborators Dr Heather Clarke, Dr Bevan Buirchell, Professor Craig Atkins, Dr Mark Sweetingham and Professorial Fellow John Kuo.

"One challenge to be overcome is crossing lupin species with differing numbers of chromosomes," Jon said.

The next step will be backcrossing the hybrids to lupin cultivars and incorporating them into the breeding program managed by Bevan Buirchell, Senior Lupin Breeder at the Department of Agriculture and Food WA (DAFWA).

The introgressed genes would then be tracked using molecular marker assisted breeding in molecular geneticist Dr Hua'an Yang's laboratory at DAFWA and further cytogenetic work would be done at UWA, depending on funding.



In UWA's glasshouse working on the GRDC supported hybrid lupin project are Project Leader Dr Jon Clements of UWA and Dr Hua'an Yang of DAFWA.

Brondwen MacLean, GRDC Manager for Pulse and Oilseeds, said growers were keen to see lupins become more valuable.

"While the breeding program is clearly focussed on increasing yield, yield potential must be considered in the context of cultivars requiring traits which ensure grower adoption and market acceptance.

"As lupins are price benchmarked against the dominant market positions of soybean meal and canola meal, increasing protein and sulphur amino acids in narrow-leafed lupin is important to increase the price paid," Brondwen said.

Jon will present on the new hybrid at the 14th Australian Plant Breeding Conference at Cairns in August. ■