Who profits most from seed royalties?

Research completed by a fourth year agricultural science student at The University of Western Australia (UWA) could play a key role in the development and adoption of grain varieties.

Completing a double degree in agricultural science and commerce, Courtney Rose, whose family farms at Wickepin in Western Australia's Great Southern region, researched the modern funding system for commercial plant breeding because of its important role in sustaining innovation and raising yield performance across the grainbelt.

"With public research funds increasingly focused on environmentally sustainable farming systems, growers rely more than ever on the private sector to deliver new grain varieties," Courtney said.

"For innovative companies to flourish, they must generate enough revenue to repay their investment in research and development, but no-one has compared, for fairness, the two royalty systems used today."

Those two systems are:

- The traditional 'seed royalty', where growers pay an upfront premium on seed for new varieties; and,
- The 'End Point Royalty' (EPR) system, where growers pay a lesser amount for their seed upfront and then pay a set rate per tonne when the grain is sold.

Finding the best balance

Courtney's research, supervised by Professor Ross Kingwell, UWA School of Agricultural and Resource Economics and Department of Agriculture and Food WA and UWA Emeritus Professor Bob Linder, set out to define which system struck the best balance between profitability for the farmer and the plant breeder.

UWA 4th year agricultural science student, Courtney Rose.

She used a computer modelling system to account for more than 5000 different scenarios that could affect the performance of a given wheat variety over 10 years of farming.

"Our model found that irrespective of the intellectual property right employed, being a seed royalty or an EPR, it was optimal for farmers to purchase enough seed to allow them to bulk-up their seed over one year," Courtney said.

As a result of farmers bulking-up their own seed on farm and retaining it for use in future seasons, the potential revenue streams for plant breeders using seed royalties is reduced.

EPRs help overcome the problem of farmer saved seed limiting return on plant breeders' investment. But as an annual payment, EPRs could affect ongoing farm profitability and so Courtney set out to calculate what that effect would be.

"With EPRs usually around $3 per tonne, the EPR variety requires more than a 0.9 per cent yield increase over the variety subject to a seed royalty for a farmer to be indifferent between the two varieties in terms of profit. Once the yield advantage of a new variety surpasses 0.9 per cent, the figures look better for the grower," Courtney said.

Perhaps the greatest advantage of EPRs is how they incentivise commercial innovation.

Despite representing a greater cost to farmers than a traditional seed royalty over a 10 year period, EPRs can create far greater revenue streams for plant breeders, especially if the variety is very successful.

For example, Courtney found that if a wheat variety paying an EPR was grown over 100,000 hectares for 10 years, it would generate as much revenue as if growers were asked to pay $20,457 per tonne for the seed to begin with. ■

RESEARCH WITH IMMEDIATE IMPACT

Courtney's research comes off the back of a fourth year research project scholarship funded by Cooperative Bulk Handling (CBH) and, according to UWA Institute of Agriculture Director, Winthrop Professor Kadambot Siddique, it can make an immediate impact on the grains industry.

"This research reveals that the royalty system used to fund most plant breeding could profoundly affect innovation," he said.

CBH Senior Operations Manager, Value Chain, David Fienberg, said CBH was pleased to support talented agricultural science students at UWA on projects of immense practical significance to the grains industry.

"During the past four years we've proudly supported eight fourth year students at UWA on a variety of grain related topics and we expect their studies will have an important impact," he said.