

QUESTION ON NOTICE
No. 89
Asked on Thursday, 8 February 2007

MR PEARCE asked the Minister for Primary Industries and Fisheries (MR MULHERIN)-

QUESTION:

How has the discovery of drought resistant genes in crops by Department of Primary Industries and Fisheries scientists helped to increase grain profitability?

ANSWER:

Producing more food with less water is a challenge of global significance.

The Department of Primary Industries and Fisheries (DPI&F) has a long history of developing tough, adapted crop varieties that can help maintain profitability for our farmers who continue to face the challenges of our variable climate. In particular, DPI&F scientists are leading the world in the breeding of water-efficient sorghum varieties that produce more grain than conventional crops under terminal drought conditions.

Research on maize, wheat, barley and pulses, including peanuts, has also identified genetic resistances to drought stresses. This resistance is in the process of being incorporated into commercial varieties.

Sorghum evolved in Africa where mechanisms for drought resistance are essential to plant survival. The 'stay-green' trait is one such mechanism for drought resistance. This trait enables sorghum to save water early in the season, then utilise the saved water later during grain filling. By using water 'smarter', the stay-green trait allows more grain to be produced from the same limited quantities of water. Stay-green also provides the basis for improved production systems that enable grain growers to more reliably produce grain in specific environments.

DPI&F scientists have successfully transferred the stay-green trait to sorghum lines adapted to Australian conditions. This has increased grain yields, reduced crop losses, and improved grain quality. DPI&F sorghum lines have been used by private industry to produce commercial hybrids with at least moderate levels of stay-green. These hybrids now supply half of Queensland's sorghum crop. The stay-green trait alone adds tens of millions of dollars per year to the State's economy and produces greater profits for Queensland's farmers.

DPI&F scientists are now building on this 'stay-green' phenomenon by further researching the genetic and physiological basis of drought resistance. Dr Andrew Borrell and Dr David Jordan at Hermitage Research Station, in collaboration with scientists at Texas A&M University in the United States of America, plan to take stay-green a step further by striving to discover the genes in the sorghum plant responsible for this trait.

Due to the genetic similarity among the world's major cereals, it is likely that genes for stay-green identified in sorghum may help improve the drought resistance of wheat, barley, maize and rice crops. This would have major benefits for all humanity.