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MEDIA RELEASE

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BIOTECHNOLOGY DELIVERS IRON-RICH CEREALS TO FIGHT HIDDEN HUNGER

Iron deficiency affects more than two billion people globally, and this number is set to rise with the impact of climate change. Biotechnology is providing one solution by delivering iron biofortified rice and wheat where conventional breeding has failed. Iron-biofortification of crops can increase the iron intake of populations, at no additional cost to growers, in some of the world's poorest countries.

This will be a key focus of Associate Professor Alexander Johnson, School of BioSciences, The University of Melbourne, in his address to ''*Reshaping Agriculture for Better Nutrition: The Agriculture, Food, Nutrition, Health Nexus",* the 2018 Crawford Fund annual conference in Canberra on 13-14 August. Associate Professor Johnson will be joining other international and Australian specialists to consider how to reshape agriculture to address the increasingly urgent and competing needs of the hungry and the over-nourished, and the finite resources of our environment.

"Micronutrient deficiencies are among the most serious health issues for people in developing countries of Africa, Asia and Latin America with symptoms ranging from poor mental development in children, depressed immune function to iron deficiency anaemia," said Associate Professor Johnson, whose research focuses on how plants absorb nutrients and the factors affecting nutrient bioavailability in edible parts of plants.

"Rice and wheat provide a significant proportion of dietary energy in these countries yet people who consume large quantities of cereals often suffer from "hidden hunger" due to low concentrations of iron, zinc and provitamin A in the grain," he said. "And with climate change, this problem will grow as elevated atmospheric carbon dioxide decreases iron concentrations in grains such as rice and wheat."

"The development of iron enriched crops – a process referred to as iron biofortification – has emerged as a highly economical and sustainable approach towards increasing iron intakes in developing countries," he said.

"We have used genetic engineering to produce rice and wheat plants that are more effective at mining soil for iron and transporting iron to grain. These iron biofortified plants contain significantly increased iron concentrations in edible grain tissues, yield normally in multi-location field trials, and show high iron bioavailability in laboratory tests," said Associate Professor Johnson.

The first release of iron biofortified rice will likely occur in Bangladesh, but subsequent adoption in West and Central Africa could contribute to major reductions in human iron deficiency, and iron biofortified wheat is likely to have similar impact if adopted in wheat growing regions of North Africa according to Associate Professor Johnson.

The most high profile biofortified crop, so-called Golden Rice, was developed to address vitamin A deficiency, and is undergoing regulatory approval processes for release in Bangladesh and the Philippines.

"The benefits of iron biofortified rice and wheat can be realised in countries that embrace agricultural biotechnology," he concluded.