proceedings

Abstract

Rice Biofortification—Progress and Challenges in Improving the Nutritional Value of Rice †

Russell Reinke [1,*], Mallikarjuna Swamy [1], Abdul Kader [2], Reynante Ordonio [3], Untung Susanto [4] and Emily Arocena [3]

[1] International Rice Research Institute (IRRI), Metro Manila 7777, Philippines; m.swamy@irri.org
[2] Plant Breeding Division, Bangladesh Rice Research Institute (BRRI), Gazipur 1701, Bangladesh; abdulkaderbrri@yahoo.com
[3] Philippines Rice Research Institute (PhilRice), Maligaya, Science City of Muñoz 3119, Philippines; rlordonio@philrice.gov.ph (R.O.); ec.arocena@philrice.gov.ph (E.A.)
[4] Indonesian Center for Rice Research (ICRR), Sukamandi 41256, Indonesia; untungsus2011@gmail.com
* Correspondence: r.reinke@irri.org
† Presented at the third International Tropical Agriculture Conference (TROPAG 2019), Brisbane, Australia, 11–13 November 2019.

Published: 19 January 2020

Abstract: Rice is the principal source of calories for more than half of the world's population, and while an excellent source of energy is a relatively poor source of micronutrients. Developing rice varieties with increased levels of bioavailable micronutrients is a sustainable and complementary approach to tackle micronutrient malnutrition, and may be achieved through transgenic or conventional breeding approaches. Using the former approach Golden Rice has been genetically engineered to produce β-carotene in the grain to address the persistent and pervasive problem of vitamin A deficiency, while high levels of iron and zinc have also been achieved via a transgenic approach. The primary focus of conventional breeding is increasing zinc content. This paper reports on the progress and challenges in developing and delivering rice with improved micronutrient content.

Keywords: biofortification; micronutrient malnutrition; hidden hunger; transgenic approach; rice