MAIZE HARVESTPLUS CROP UPDATE, MAY 2009

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The maize HarvestPlus Project initiated in 2009 its second phase, which will focus on developing, releasing and promoting - particularly in Zambia - maize cultivars enriched in provitamins A. The future activities build on knowledge, germplasm and experience developed through multi-disciplinary research by partners in Brazil, China, Germany, Ghana, Mexico, Nigeria, USA, Zambia and elsewhere. Nutrition research established target levels for micro-nutrients in biofortified maize grain (15 ug/g for provitamins A and 30 ug/g for zinc; whereas the base-line values for these are 0 ug/g (white maize) and 22 ug/g, respectively) and designed efficacy studies for biofortified maize in target populations. Ex-ante impact assessments calculated the probable extent and economic value of health benefits from biofortified maize, and socio-economists also studied the likely acceptance of orange maize by consumers accustomed to eating white maize. Food technologists have estimated micro-nutrient losses during traditional food preparations and estimated the nutritional value of new foods that would use biofortified maize. Biochemists have improved traditional methods and continue to develop faster and cheaper ways to quantify micro-nutrient content for samples generated by HarvestPlus maize breeders. Finally, molecular biologists have identified allelic diversity, and developed molecular markers to facilitate selection for favorable alleles of genes along the carotenoid biosynthetic pathway in maize. Equipped with this knowledge and practical tools, the HarvestPlus breeders in Brazil, Guatemala, Mexico, Nigeria, USA, Zambia and elsewhere have identified and developed maize with 8-15 ug/g of provitamins A and >30 ug/g of zinc, which are sufficient levels to expect nutritional benefits to vitamin A and/or zinc deficient maize consumers. Provitamins A enriched hybrids have performed well in preliminary yield trials in Zambia; however, the greatest challenge for the coming years will be to develop, validate and promote high-yielding, agronomically excellent cultivars using the nutrient-rich germplasm base that has been established to date.

Keywords: Provitamins A, HarvestPlus, biofortification.