

Scientists Adapt Mining Technology to Breed Nutritious Food Crops

Written by NewBusinessEthiopia.com
Tuesday, 06 March 2012 09:32 -

BY NEW BUSINESS ETHIOPIA REPORTER

Agricultural scientists have adapted a technology used in the mining industry to more rapidly develop nutritious food crops that could reduce hidden hunger.



Hidden hunger is the lack of vitamins and minerals, such as zinc and iron, in the diet. It afflicts more than 2 billion people worldwide and has negative health consequences. Iron deficiency, for example, can inhibit physical and mental development in children and increase the risk for women of dying in childbirth.

In response, scientists are developing new varieties of staple food crops that can provide more of these essential nutrients. This process can be time consuming as scientists must identify those few seeds with higher levels of the desired nutrient out of hundreds of thousands of seeds.

Scientists recently turned to X-ray fluorescence analysis (XRF), a technology used in mining to determine the mineral content of soil samples to see if it could be used to analyze minerals in crops such as rice and pearl millet. This technology has several advantages over current technologies (such as inductively coupled plasma (ICP)-based methods).

First, it is cheaper. XRF costs as little as \$US 0.15 per sample to run on an inexpensive machine that is roughly the size of a desktop printer, which is a fraction of the \$20 per sample that ICP-based methods cost. Second, with a little training, scientists can analyze more samples per day using XRF without the lengthy and complex sample preparation currently required. Third, XRF does not destroy the seed samples which can be planted immediately, thus accelerating the breeding process.

While analysis with XRF can be done more cheaply and quickly, scientists had to ensure that they would still get accurate results. A study recently published in the journal *Plant and Soil* provides the evidence needed—the study found few differences in the iron and zinc values in pearl millet and rice when the two technologies are compared.

HarvestPlus, who funded the study, leads a global research effort to breed and deliver nutritious staple food crops to reduce hidden hunger in malnourished populations. HarvestPlus has set up XRF machines at partner institutions in Bangladesh, India, Mexico, and Rwanda. More than 20 scientists have been trained to use the new technology, and scientists are already beginning to see results as they identify the best varieties with more iron and zinc in less time.

“The XRF machines not only provide accurate results more quickly and cheaply, but they have also allowed us to build capacity of partner institutions that are working to breed mineral-rich crops,” says James Stangoulis, co-author on the paper and long-time HarvestPlus collaborator. “We really see this as just the beginning for the role XRF technology can play in improving nutrition through the development of crops richer in nutrients.”