

## UNL partners with Africans on research

Written by Gothenburg Times  
Friday, 01 November 2013 13:53 -

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LINCOLN—University of Nebraska-Lincoln scientists are helping farmers in some of the poorest countries in the world target their use of precious fertilizer to get the highest profits possible.

The research and extension effort can both help raise subsistence farmers' income and help feed a growing global population, said UNL soil scientist Charles Wortmann, who is leading UNL's role in a new \$5.65 million project to enable improved profitability of fertilizer use for 13 sub-Saharan countries.

The three-year project, funded by the Alliance for a Green Revolution in Africa, builds on research done earlier by Wortmann and colleagues in Uganda. They studied how six crops responded to the application of various levels of fertilizer to determine where farmers might best invest those inputs for the highest profits.

The UNL team and Ugandan colleagues developed an Excel-based Uganda Fertilizer Optimization Tool that tracks 15 crop-nutrient response functions across the crops. The tool considers the land area the farmer wants to plan for each crop, expected commodity values at harvest, the cost of fertilizer and finance available to the farmer. From that information, the tool provides recommended fertilizer rates for each crop and the expected effects on yields and returns.

With the new funding from AGRA, \$345,470 of which will go to UNL, scientists will expand this work to Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Niger, Nigeria, Mozambique, Rwanda, Tanzania and Zambia.

Wortmann said UNL is providing its technical expertise; much of the grant's funding will go to national agricultural research institutes in the nations themselves.

Crops to be studied may include maize, sorghum, pearl and finger millet, teff, cassava, rice, beans, groundnuts, soybean, pigeonpea, chickpea and cowpea.

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In sub-Saharan Africa, fertilizer use is very low with only 8-9 pounds per acre applied to such food crops. Crop production is primarily by poor, small-scale farmers with very little financial capacity. Fertilizer use needs to compete with basic needs in allocation of the small amount of money available. Therefore, net returns on investments need to be very high.

In Uganda, for instance, the UNL team's research showed that nitrogen applied to rice or dry beans were especially profitable.

"If farmers have one or both of those crops in their cropping system, that's where they should apply the nitrogen because that's what's going to give them the best return on their investment," Wortmann said.

In addition to research, Wortmann will help train people in the 13 countries to in turn train farmers to use the information.

Other partners in the research, formally known as Optimizing Fertilizer Recommendations in Africa, are the African Soils Information Service; the UNL-led Global Yield Gap Atlas; and the Grameen Foundation, which will help develop the computer-based tool for use on smart phones that are becoming increasingly common in Africa.