Researchers introducing sustainable agriculture practices to improve food security

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A woman sells her crop at a market in Haiti's Central Plateau. A Virginia Tech-managed program in central Haiti will introduce sustainable agricultural practices that can contribute to greater food security in Haiti. Credit: Keith Moore

Two Virginia Tech professors are leading research teams that will work with scientists and small-scale farmers in South America and the Caribbean to increase food production, improve soil quality, and reduce risks associated with climate change. The projects are part of the Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program (SANREM CRSP), a $15 million, five-year program funded by the U.S. Agency for International

Development (USAID), and managed by the university's Office of International Research, Education, and Development.

Central to both projects and five others managed by the SANREM CRSP through 2014 are conservation agriculture techniques such as controlling soil erosion and increasing soil organic matter with cover crops, minimizing soil disturbance from tillage, and rotating crops to improve soil health and discourage agricultural pests.

Jeffrey Alwang, professor of agricultural and applied economics at Virginia Tech, is directing a project titled "Pathways to conservation agriculture production systems in the Andes." With sites in Bolivia and Ecuador, the project will use research in soil sciences, cropping systems, plant pathology, and economic and social sciences to design, evaluate, and disseminate conservation agricultural technologies aimed at improving food security in the region.

"Farm families in the Andean Region often depend on just one food crop: the potato," Alwang said. "We will study ways to improve potato yields, test new varieties, and introduce alternative crops like beans and Andean fruits to raise farmer incomes. We will also experiment with techniques to improve soil quality and reduce erosion on steep slopes."

James McKenna, professor and interim head of the Department of Crop and Soil Environmental Sciences, is leading a conservation agriculture project in Haiti. "Less than half of Haiti's food is currently produced in Haiti," McKenna said, "and food production has been declining since the mid 1980s. Also, most of Haiti's soils are very severely degraded as result of unsustainable farm practices."

McKenna's project, titled "Conservation agriculture productions systems for the Central Plateau of Haiti," will focus on technologies to make farming more productive and sustainable, and strengthen the agricultural

education, service, and market institutions by training Haitians for key positions.

"Most residents of the Central Plateau are poor subsistence farmers who depend on rain-fed crop systems and livestock grazing for their income and food," McKenna said. "Conservation agriculture techniques involving cover crops, no-till production, and residue management have proven to be successful in other countries with similar soil erosion, fertility, and water holding problems. This project will test these methods of improving food security, profitability and sustainability in the Plateau of Haiti and hopefully transfer these techniques to the existing agricultural system on farmer fields."

McKenna and four other SANREM researchers from Virginia Tech were in Haiti setting up the project when the devastating earthquake struck on January 12. They plan to return in mid-March to continue laying the groundwork for research at farming sites 100 miles north of Port-au-Prince.

Virginia Tech's Office of International Research, Education, and Development has managed the SANREM CRSP since 2004. Collaborating with Virginia Tech in the SANREM program for its next five-year phase are scientists at Kansas State University, with research sites in Ghana and Mali; North Carolina Agricultural and Technical State University, Cambodia and the Philippines; University of Hawaii, India and Nepal; University of Tennessee at Knoxville, Lesotho, Malawi, and Mozambique; and University of Wyoming, Kenya and Uganda.

Theo Dillaha, program director of SANREM CRSP and professor of biological systems engineering at Virginia Tech, said, "The next phase of our research will emphasize increasing food production through the introduction of conservation agriculture principles into existing agricultural systems in food-insecure developing countries. We hope to

develop new conservation agriculture technologies and techniques in collaboration with smallholder farmers that they can use to make the transition to more sustainable, resilient, and productive agricultural systems."

Provided by Virginia Tech