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Indian River Research and Education Center

A Newsletter for IRREC Advisory Committee Members, Faculty, Staff and Students

From the Director

Photo by Velma Spencer

Mums are in full bloom in Haitian greenhouses designed by Dr. Brian Boman, see pages 2-5.

Work performed by members of IRREC faculty and staff has positive impacts upon agricultural and natural resources industries at the center, statewide and abroad. Dr. Brian Boman is leading efforts to build a new agricultural industry in Haiti; IRREC Academic Coordinator Jackie White is advising UF distance education students; Wayne Hemighaus demonstrates tireless devotion to maintenance at the UF/IFAS Norman Hayslip Biological Control and Containment Facility.

Over the last three years faculty member Dr. Brian Boman has devoted much of his time to directing efforts for the construction of greenhouses in Haiti. His work, carried out under the auspices of USAID, is part of USAID's Watershed Initiative for National Natural Environmental Resources (WINNER) project in Haiti. In America's outreach to assist Haitian agriculturalists as they strive to gain independence from foreign aid, WINNER's mission is to rebuild the country's infrastructure.

Recently IRREC's Academic Coordinator Jackie White, and IRREC's Maintenance Technician, Wayne Hemighaus, were each recognized with double prestigious awards to honor their tireless work to support the center's mission, including its outreach to other departments and its reach to agricultural operations in other parts of the world.

Please congratulate Dr. Boman, Jackie White and Wayne Hemighaus on their superior accomplishments. The three bring recognition to their outstanding career achievements, to the university, and to the center.

Pete Stoffella

Inside this issue

Professor Dr. Brian Boman, "Father of the Greenhouse Revolution" in Haiti

Bringing Protected Agriculture to Undeveloped Regions

Brian Boman, P.E.

Editor's Note: *For the past three years, Brian Boman has been working in Haiti to introduce modern agricultural production practices, specifically drip and sprinkler irrigation and protected agriculture. Along with many challenges, he has had some great successes. "Brian Boman continues to play an outstanding role in the development of rural communities in Haiti. Not only he is the father of the Greenhouse Revolution, which triggered the most impressive technical leap ever achieved by small farmers in the country, but he also helped resolve water problems in a village called Furcy" said Jean Robert Estime, Chief of Party to the USAID/WINNER project in Haiti. "Now children can find water at their school and women can do their laundry when they need. Brian is unique and deserves our deepest respect and most sincere gratitude."*

Before Haiti established its independence from French administration in 1804, it was the world's richest and most productive colony. Today, Haiti has the distinction of being the poorest country in the Western Hemisphere, and one of the poorest countries in the world. Many Americans continue to share their expertise in Haiti in an effort to improve the quality of life for the nation's earthquake-ravaged citizens and to reduce the Caribbean country's decades-long dependence on foreign aid. My job is to help Haiti's agricultural producers reduce the adverse environmental impacts of farming and ranching operations. A large portion of my time is devoted to the USAID Watershed Initiative for National Natural Environmental Resources (WINNER) project in Haiti. Over the last four decades, food imports have replaced most of the country's agricultural operations. WINNER's mission is to rebuild the country's infrastructure and help its citizens become independent from foreign assistance.

Three years ago, one of my goals was to introduce simple greenhouse structures that could be built, maintained, and operated by farmers in the mountainous regions that cover most of the country. The first small greenhouses (hoop houses) were constructed from PVC pipe and wood framing at a demonstration farm that we developed through the WINNER project near the town of Kenscoff. On terraces cut into the steep mountain slopes at elevations of 1800 m (6000 ft) or more, farmers in this area historically produced flowers and vegetables for local markets. In recent decades, these farming practices, along with deforestation, have led to tremendous erosion of topsoil whenever tropical storms or high-intensity thunderstorms occur.

Unlike the hot and often dry conditions at the lower elevations, such as the Cul de Sac plain

east of Port au Prince, the cool temperatures at the higher elevations are ideal for many vegetable and fruit crops. However, low nighttime temperatures, rain, and problems with insects and diseases have resulted in reduced, often low-quality, yields. With assistance from my University of Florida colleagues, we conducted demonstrations of both in-ground and vertical production systems in hoop houses. The hoop houses greatly reduced pest problems and enhanced growing conditions, resulted in higher yields and excellent quality. Our initial studies showed that the structures could generate enough income to pay for themselves in six to nine months. The vegetable and flower buyers in Port au Prince soon became very interested in the hoop houses because the quality of the produce was equal to or better than that of the produce that they were importing from the Dominican Republic and the U.S.

Local farmers were encouraged to visit the demonstration farm and learn about hoop house construction and operation, including how to produce high-density crops in vertically stacked containers mounted on pipes using drip irrigation. Interested farmers were organized into associations that were set up to grow and market produce. To encourage adoption of the hoop houses, a grant was made to a farmer association near the town of Furcy. This grant funded the construction of nine hoop houses. The structures stand on new terraces near the top of the mountain where there is road access. To protect the terraces, vetiver and peach trees have been planted to stabilize the soil. These techniques were severely tested this past summer when tropical storms Isaac and Sandy pummeled the area with torrential rain and high winds. A few of the hoop houses were damaged by tree limbs and wind, but the peach trees and vetiver protected the terraces, and overall the damage was minimal. The association has been so successful that the farmers constructed additional houses at the site and and now produce a year-round supply of flowers and vegetables.

Word of the success of the Furcy hoop houses spread throughout the region. More and more farmers became interested in protected agriculture. The WINNER project and Haiti's Ministry of Agriculture have now teamed up to encourage the adoption of this technology. So far, more than 200 hoop houses have been constructed in the Kenscoff area and are in full operation. A big step will take place this year, as there is a new goal to have 1,000 greenhouses in production by 2014. The farm businesses, and the villagers' livelihoods, are growing along with their produce.

Thomas Jacques of Haiti's Minister of Agriculture is leading a cost-sharing program for the new hoop houses. Through this program, the government will provide 80 percent of a farmer's start-up costs for installing hoop houses. Those who have been farming on the open mountainsides must also agree to cease

that destructive practice. The farmers are eager to sign on to the cost-sharing program because they've seen others, who are already involved in hoop house production, achieve crop yields that can't be equaled by production on open land. The hoop houses also produce higher-quality crops healthful, ripe, and free of wind and insect damage. In addition, each farmer must also agree to assist the government's reforestation efforts and plant 50 new trees. And these trees bear fruit peaches, apples, mangoes, and coffee beans. In the mountainous regions of Haiti, the conditions are perfect to produce these varieties and others.

A continuing challenge for the farmer association in Furcy was water for irrigation. Even with the capture and storage of rainwater, water shortages continued to be a limiting factor for greenhouse production. A natural spring, located at an elevation about 245 m (800 ft) below the hoop houses, had very good flow, but the logistics of pumping water up the steep mountainside made it unattractive. Another spring, located on the property of the local school, the Ecole Nationale de Furcy, was the second best option, but the flow was only about 4.5 L (1.2 gal) per minute. Even though this spring is on school property, there was no running water for the school's 500 children.

This spring serves as a water source for the village. All day long, women carry 19 L (5 gal) buckets down to the spring, fill their buckets while standing in the mud around the outlet, balance the full buckets on their heads, and then carry them back up the mountain to their homes. Often, young children will be sent to the spring to carry smaller 4 L (1 gal) jugs of water back to their homes. The spring also serves as the social center for the village when the women come to wash clothes filling their tubs with water from the spring, soaping and washing by hand, rinsing, and then hanging the clothes on shrubs to dry.

After studying this situation, we realized that the farmer's association, the villagers, and the school all shared one unmet need: access to water. A plan was developed to meet all three needs, and discussions were held with representatives of all the interested parties. Electrical is power is available in the region, but there were no power lines near the spring. And even if there were nearby power lines, the grid is unreliable, and generally the power is on for only a few hours a day. Therefore, solar energy was the best choice for powering a pump.

Fortunately, there was an abandoned cistern below the spring that holds about 11,350 L (3000 gal). This cistern was used to catch the spring water and serve as a reservoir for the pump. Association members cleaned out the cistern, removing years of accumulated rock, rubbish, and mud. A 24 VDC pump capable of producing about 8 L (2 gal) per minute at 60 m (200 ft) of head was selected. To simplify the installation and reduce the cost of the system, no batteries were installed. Two 60 W panels were installed on a south-facing hillside about 30 m (100 ft) from the spring and

connected to the control box. A float switch prevents the pump from running when the water level in the cistern is too low

Two 2300 L (600 gal) tanks were installed at the school, at an elevation about 15 m (50 ft) higher than the spring, and supplied by a PVC line from the pump. Similarly, a water line was run about 1500 m (5000 ft) from the pump to the storage tanks at the association's hoop houses, which are about 30 m (100 ft) higher in elevation. The supplies to the school tanks and association tanks are controlled automatically with float switches. A pressure-relief valve on the pump's discharge line dumps water back into the cistern when the tank valves are shut off.

To complete the installation, a water line was run back down the slope from the school to provide water to the village for domestic and clothes washing. A wash table was constructed so that the women no longer have to squat in the mud while washing clothes, and benches were added so that several women can wash clothes at the same time. While we were working on the pump installation, it became apparent that the spring also served as a community bath. Buckets were used to collect water, and the local people undressed and washed themselves and their children.

Seeing this need and wanting to maximize the use of the spring water, we ran an overflow pipe from the cistern to a tank located farther downslope. When the cistern fills up, water fills this lower tank. This tank is located above a drop of about 2 m (6 ft) on the side of the mountain. This provided a nice place to put in a shower, fed by the tank above.

One day in February this year, a group of women and children from Furcy gathered around the spring, talking nervously when they realized that their lives were changing. They no longer had to stand in the mud to get water and bathe. Instead, they now have access to clean water at convenient locations near the spring for washing, and below the spring for bathing. The cooks at the school now have convenient access to water to prepare hot meals for the children. Our initial intent to provide water to the hoop house growers so that they could maintain adequate irrigation when their rainwater reserve was used up has been accomplished to the benefit of the entire community.

In addition to the hoop house projects, we have also introduced drip and center-pivot irrigation systems in Haiti. Our efforts over the last several years are starting to pay off, as the first major drip irrigation project for 80 ha (200 acres) of process tomatoes is under construction in the Cul de Sac area. Nearby, the first center-pivot irrigation system has already been installed and has generated a lot of interest from landowners. Thomas Jacques, Haiti's Minister of Agriculture, announced at a recent meeting that he anticipates Haiti will increase its agricultural production in the coming years through the introduction of technology, such as greenhouses and irrigation systems. In particular, Jacques said, "We will increase greenhouse acreage from 7,000 square meters to 2 million square meters in the next three years." With time, Haiti can become productive again, just as it was long ago.

Wayne Hemighaus Honored with Double Awards

Wayne Hemighaus serves UF/IRREC Norman C. Hayslip Biological Control and Research Laboratory as a maintenance technician. In March UF/IFAS officials honored Wayne with a Superior Accomplishment Award for the outstanding work he has conducted at the facility for the last fiscal year. In April, Wayne was recognized a second time with a university-wide FBMC Benefits-Human Superior Accomplishment Award by UF officials.

Unique and complicated, the facility is one of only three of its kind in Florida. The laboratory's purpose is to carefully study non-native insects that may contribute to the reduction of invasive species that cost the state more than millions annually.

Hemighaus is responsible for the laboratory's maintenance, which is essential. The screening of foreign insects to determine their safety for release often requires as much as ten years of research. Within the laboratory quarantine section, insects must be contained at all times: all wastewater leaving the facility is sterilized; all solid waste is incinerated before removal.

During 2012, Hemighaus led efforts to convert polycarbonate sheeting on the lab's six quarantine regulated greenhouses to double-paned glass. One thing that university officials found so outstanding with Hemighaus's work for the last year is his ability to with others in a team approach to problem solving.

Director of UF/IFAS Facilities Planning, Kevin Heinicka said, "Wayne's hands-on approach of keeping things simple, eliminating the politics as much as possible and working closely with the on-site contractors and quarantine officers completed the project in a quality manner that will serve the IRREC for many years to come."

Because the greenhouse conversion required the coordination of seven agencies and interests, the job was complex. Working together on the project were the following: a building contractor, federal inspectors with the U.S. Department of Agriculture Animal Plant Health Inspection Service, state inspectors from the Florida Department of Agriculture and Consumer Services, UF/IFAS Facilities leads and university administrators, faculty and researchers.

Mr. Hemighaus oversaw the installation of a new 2,000 gallon fuel tank, a project completed without delays. He maintained the lab's water sterilization and plumbing. He is credited for extending the life of the laboratory's infrastructure and its highly complex machinery with his ability to maintain them for optimum performance. Hemighaus's work hours routinely exceed 40 hours; when not present he monitors the laboratory electronically from remote locations and willingly works during weekends if necessary.

Mr. Hemighaus's attitude about his work and the respectful way in which he works with others is his most outstanding characteristic. His supervisors and co-workers agree his interpersonal skills are distinguished.

Hemighaus's immediate supervisor, Dr. William Overholt said, "Wayne is an absolute joy to be around."

The UF Superior Accomplishment Award program seeks to recognize staff members who contribute outstanding and meritorious service, efficiency and/or economy, or to the quality of life provided to students and employees. According to UF Human Resources officials, "recognition by one's peers is the highest point of achievement."

IRREC Academic Coordinator Honored

IRREC Academic Coordinator Jackie White has been recognized with two prestigious awards for her work as a student advisor. Jackie serves IRREC as a student recruiter and advisor, and supports IFAS's distance education program which serves students statewide, nationally, and some international students.

The awards by which Jackie has been recognized are the UF College of Agricultural and Life Sciences Teaching and Advising Award—Professional Advisor; and a second award, a UF/IFAS Superior Accomplishment Award.

Each of the two awards celebrates Jackie's effectiveness in recruiting, enrolling and retaining UF students. The students she works with pursue single courses, certificates, bachelor's and master's degrees--and Ph.D.'s. The students are mainly those who pursue their education by online instruction, the fastest growing trend in higher education.

"Jackie has assisted in the recruitment efforts for the undergraduate and graduate degree programs," said IRREC Director Dr. Peter Stoffella. "Her skills and persistence has not only 'paid' benefits in attracting new students, but she has persevered in a high retention rate for enrolled students."

Dr. Stoffella said Jackie is the students' first point of contact. She responds to inquiries made about the center's degree programs, and assists prospective students with meeting prerequisites and enrollment. She continues to advise students with course selection and tracks their progress to graduation. Jackie places students in internships and assists them to find employment. Last year she matched students to internships at the UF site's neighboring U.S. Department of Agriculture U.S. Horticultural Research Laboratory, and the UF/IFAS Florida Medical Entomology Laboratory in Vero Beach. According to Jackie, of the 33 students who graduated in the last three years, 32 found employment related to their degrees. One elected to remain in a position held prior to enrollment.

Dr. Stoffella said Jackie's strongest contributions are in her keen observations for distance education students' needs. She understands the special issues of students who pursue education online and then matches the issues with solutions.

"In an ongoing effort to build our distance education programs, Jackie has been very creative in developing several interactive online tutorials," said Dr. Sandra Wilson, UF Professor of Environmental Horticulture. "Jackie produced an online orientation activity now available to all of the department students. She is always thinking of new ways to facilitate the entire process of online learning."

Jackie authored the online orientation for distance education students to address their unique needs as online students. Her invention received departmental-wide adoption. At this time, all new UF College of Agricultural and Life Sciences have the option to use the online orientation created by Jackie White. A second initiative Jackie designed is a comprehensive list of distance education courses offered by the College of Agriculture and Life Sciences. The courses had previously been listed separately in seven different departments. The list has been formatted by the college and placed on the CALS website for use by all students of distance education and advisors so that they will more easily identify courses for fulfillment of degree programs.

White also developed service learning opportunities and internships for students enrolled at Indian River State College at the UF campus and at the U.S. Department of Agriculture and the UF/IFAS Florida Medical Entomology Laboratory.

In addition to the advisement duties, and the initiatives, White managed three special events to highlight current and graduating students, and a special celebration to highlight the university's role as a land-grant college.

"Jackie is a tremendous asset to the University of Florida, the UF Indian River Research and Education Center—and more important—to the students statewide," said Stoffella. "Ms. White's 'beyond the call' contributions, dedication and innovations are exceedingly remarkable."

IRREC News

Summer Semester 2013

Undergraduate Course Offerings:

Environmental Monitoring Techniques
Tropical Entomology
Tropical Entomology Field Laboratory
Selling Strategically

For Course Offerings check the UF/CALS website:

www.cals.ufl.edu/distance/online_courses.shtml

For full listing of UF courses visit: http://www.register.ufl.edu/soc/

Important Dates:

Summer A Classes.....May 13 through June 21
Summer B Classes.....July 2 through August 9
Summer C Classes.....May 13 through August 9
Memorial Day observed.....May 27
Summer Break.....June 24-28
Independence Day observed .....July 4

UF/IRREC Degree and Certificate Program Offerings:

Bachelor Degrees:
- Environmental Management
- Microbiology and Cell Science

Master Degrees:
- Ecological Restoration
- Environmental Sciences
- Environmental Horticulture
- Entomology and Nematology
- Agricultural Education and Communication

Certificates:

Undergraduate
- Geomatics
- Urban Pest Management
- Landscape Pest Management
- Pest Control Management

Graduate
- Ecological Restoration
- Non Profit Management
- Sustainable Land Resource and Nutrient Management
- Soil Ecology Services
- Wetland and Water Resource Management

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