UF UNIVERSITY of FLORIDA
IFAS Research
Indian River Research and Education Center

Special Edition, Highlighting Professor and Dr. Brian Boman

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

From the Director

Photo by Velma Spencer

Our IRREC research professors perform work that produces results by which others benefit. Because their findings are efficacious, the results are quickly transferred for tactical use by producers who work in local agricultural and natural resource industries.

Further, our professors and lecturers provide instruction---disseminate education to extension professors, students and to producers and land managers. IRREC professors and the extension professors they work with teach them new skills and improve their efforts to produce food and protect the environment. In some situations, end users are learning a new industry for sustenance of themselves and for entire communities.

Two years ago, IRREC Professor Dr. Boman was called to assist in earthquake-ravaged Haiti, which had been prior to the earthquake, the western hemisphere's poorest nation. Thousands of Haitian citizens perished in the earthquakes, much of the country's infrastructure still remains under rubble and clean water for food production and drinking water is a luxury to which few Haitians have access.

Dr. Boman's expertise with agricultural irrigation as it pertains to efficacious production and environmental sustainability was requested by UF/IFAS International Programs for their service to the US Agency for International Development/Watershed Initiative for National Natural Environmental Resources) or USAID, in Haiti. American officials made a commitment to rebuild and improve Haiti's condition.

IRREC Professor Dr. Brian Boman is assisting Haiti's 150-year Premium Rum Manufacturer

As part of this effort, the agency Boman is working for is using his expertise to provide for the sustenance and survival of the Caribbean nation's people so that they are less dependent on foreign aid; and, so that the Haitian community will benefit with independence and a higher quality of life.

Haiti is not the only nation where Dr. Boman's expertise has been sought and is now being applied or used to evaluate and solve new agricultural challenges.

Our nation's example and Dr. Boman's service with his expertise represent our country and the University of Florida admirably. Please read more about Dr. Boman's work in Haiti, and in other parts of the world, and in Florida, within this Special Edition Newsletter devoted to the service UF/IFAS is able to provide.

Pete Stoffella

Inside this issue

Dr. Boman's Work Worldwide

IRREC Professor Dr. Brian Boman instructs Haitian nationals to build simple hoop houses in which high value crops are now being produced. Because flowers are an important part of the country's many religious events, flowers are an important local crop.

An expert in agricultural irrigations systems and sustainability, Dr. Brian Boman's expertise is sought after by growers statewide, nationwide and worldwide. His desk calendar entries include places throughout the globe, each scheduled excursion ranges from five to 10 day-spans. Since 2010, Dr. Boman has visited Haiti more than 20 times; other trips, both transcontinental and domestic, include Tanzania, Egypt, Jordan, New Mexico, Dominican Republic and points throughout Florida's important agricultural regions.

At his office at IRREC in Fort Pierce, Dr. Boman plans, holds meetings, responds to and fills his calendar for this year, and the next. Meanwhile his desk and cell phone ring constantly, e-mails flow into his inbox as he assists growers in the world's most important and up-and-coming regions. A large majority of the communications and plans are from those who are directing construction of hoop house greenhouses and infrastructure for clean irrigation water that will serve those who have never before known the privilege of clean water.

Dr. Boman's plans continue to comprise hoop house and hydroponics system construction projects in Haiti, coupled with major water collection, distribution and storage projects.

This year's new projects are to organize an outlet at which the new hoop house agriculturalists may purchase supplies for their operations. The supply outlets will be designed to ensure the continuance of entirely new agricultural industry in Haiti.

Dr. Boman's many international projects took him to Tanzania earlier this year, and to multiple points throughout Florida. Last month, Dr. Boman last month attended an irrigations conference in New Mexico.

Recently he returned to Haiti for the country's national Farmers' Market Festival. The event was colored with a plethora of fresh mum flowers of bold orange, pink and purple blooms, many of which were produced in the same hoop houses Dr. Boman taught growers to produce in simple, sturdy hoop houses.

During the festival Dr. Boman, along with a crowd of Haitian officials, growers and citizens, listened while Haitian Minister of Agriculture Docteur Hébert announced 200 more hoop houses will be constructed along the country's mountainsides.

USAID FROM THE AMERICAN PEOPLE | WINNER WATERSHED INITIATIVE FOR NATIONAL NATURAL ENVIRONMENTAL RESOURCES

US/AID WINNER in Haiti, Dr. Boman's Role

The U.S. Agency for International Development (USAID) is an independent agency that provides economic, development and humanitarian assistance to victims of disaster around the world—on behalf of all Americans. These actions are in response to our country's foreign policy goals.

In response to the 2010 devastating earthquake in Haiti, the agency developed the USAID/ Watershed Initiative for National Natural Environmental Resources, or WINNER project. In so doing, American officials made a commitment to rebuild and improve Haiti's condition. The program's long term vision is: *to target people living within targeted corridors to sustainably increase their incomes, driven by agricultural development, reduced threat from flooding, and a stronger private sector. The experiences of those who live within the targeted corridors will serve as a model approach to replicate both within and beyond targeted corridors.*

Hoop houses were constructed like steps along a mountainside in Furcy, Haiti.

To carry out and implement the agency's plan, officials hired Chemonics International to develop the project. Chemonics subcontracted UF/IFAS International Programs to enlist research professors, extension agents and graduate students who have expertise in developing infrastructure and agricultural industries to sustain Haitians in the targeted corridors. Dr. Boman was asked to join the effort as a lead research professor.

Dr. Boman's expertise is in agricultural engineering, with an emphasis in water use and irrigations systems. His first task was to assemble demonstration greenhouses, or hoop houses, on mountainsides. But his work in Haiti has expanded to include major irrigations systems that carry water from spring sources at sea-level, for use in multiple hoop houses along the country's steep mountainsides. He installs weather stations, hydroponics vertical systems and smart computers so that he may monitor the hoop houses from his computer at any location in the world.

Several UF/IFAS faculty members are working for WINNER: one professor is an expert with biosensors; a second, provides expertise with harvesting and processing crops; another, with the growers' associations developed to support the industries.

At present, WINNER serves more than 350 growers' associations and has trained more than 800 who are designated "master farmers." The masters will teach innovative growing techniques to fellow community members, thereby, increasing overall productivity and moving Haiti to interdependence and sustainability within itself and by their own people.

Hoop House Construction

Prior to the 2010 earthquake, Haitian agriculture was limited to one successful sugar cane grower and only a few fruit tree, vegetable, and flower operations. Production stood still for a time after the devastating event that took more than 200,000 Haitian lives, but the country is now poised for rebirth. Assistance from US/AID, and UF Professors such as Dr. Brian Boman, nascent agricultural and horticulture industries are at this time beginning to thrive in Haiti.

According to Dr. Boman the country's scarce food production was rooted decades ago. Agricultural production had declined steeply in the 1960s due to foreign aid. Food supplies were shipped to Haiti continuously while local growers failed to compete with the inexpensive food. Imports arrived regularly, creating a cycle of dependency upon long-term aid. Realizing the most recent state of Haiti's food supply, U.S. officials understand the country must become sustainable. UF officials intend to assist with the best technology available to agricultural operations in the world.

Haiti features diverse climates. Some regions are seaside; 70 percent is mountainous topography similar to North Carolina. Only 30 percent is suitable for traditional agriculture. The country's fertile Cul de Sac corridor is situated in the central part of the island immediately south of the capital, Port Au Prince, where it plays an important role to the country's economy. Sugar is still produced in the corridor, but 100,000 acres once occupied by the Haitian American Sugar Co. has now been developed for residential. The low-lying Gonaïves area in north Haiti, and the Cul de Sac flood frequently because they sit at sea level.

The country's economics, opposite climates, lack of fertile soil, flooding, hurricanes and earthquakes, have rendered a nation of people who do not know how to produce food.

"Haitian agriculture is primarily on very small farms of an acre or less and production there is vegetables: potatoes and fruit, which are marketed roadside," said Boman. "Food supply available at groceries is mostly imported, and too expensive for most Haitians to purchase. Also, there are food safety issues with the roadside stands."

According to Dr. Boman, most Haitians have only one meal daily, at a road side street vendor stand. Their meals are purchased and consumed in the street.

As Chief Irrigations Infrastructure and Implementation Advisor, Dr. Boman is responsible for one of US/AID's key objectives: to improve agricultural production. His efforts are focused in more than several projects. His main tasks are: water and irrigation infrastructure, hoop house construction, with hydroponics vertical production systems, and creation of a supply venue.

Dr. Boman began with hoop houses at demonstration sites. Hoop houses are basic greenhouse structures constructed from simple materials transported up mountainsides by hand or by pack animals. Eight original demonstration sites are Rural Centers for Sustainable Development, or CRDDs (French acronym). Hoop houses provide a protected environment for high density crop production. Stacked hydroponics systems allow the placement of crops according to light and water requirements into appropriate compartments. Kenscoff was the first demonstration site, at 5500 feet, in the misty veiled central Haitian mountains. The area is good for agriculture during the cool rainy season in early summer, but dry the rest of the year.

Irrigation is necessary for yearlong growing so pipes were installed near mountain base springs to draw water up to the hoop houses.

In Furcy, a second mountainside location, 11 hoop houses are in full production. Irrigation infrastructure is available to producers of high quality flowers and vegetables.

According to Florence Sergile, UF International Programs Faculty Coordinator, Haiti, the program has been successful in increasing Haiti growers' crop yield by up to 75 percent.

Their vision is to cultivate multiple crops throughout Haiti, including plantains, vegetables, melons and fruit trees. Some crops once produced in fields were inferior to imports. The hoop houses will improve crops because they provide shelter from pests, diseases and harsh climate. Many hoop houses, he said, will serve as nurseries for crops to be grown out for field production.

"Quality is part of my work too," he said. "The growers have found it possible to produce the same amount in a hoop house as they used to grow in one hectare (about 2 ½ acres). Also, high density production produces higher quality crops."

Dr. Boman's vision is that Haiti's once-thriving tomato industry will return to its fields and grocery stores. He plans to place more than 1.5 million tomato plant plugs, using both greenhouses and fields, in Florence, where the climate is hot yearlong. Drip irrigation will be installed in the fields to conserve water. Inside hoop houses, a nursery will grow tomato plugs out to small plants. Community farmers will grow the plugs to mature plants and harvest fresh tomatoes on a 150-acre site.

"When harvested, they can sell their tomatoes direct to the supermarket on a weekly basis and reduce the number of tomatoes imported—then the tomatoes will become more affordable," he said.

Dr. Boman expects to construct 150 hoop houses in the Kenscoff area. He makes lists of needed materials and quantities for each: plastic sheeting, aluminum pipes, wood and nails, hydroponics stackers, fittings and sophisticated biosensors and solar-powered LED lights. He also makes lists of possible suppliers abroad.

"I'm trying to get 15,000 vertical stackers for hydroponics operations. Finding the supplies and arranging shipment takes time," said Boman. "We need a supplier in Port au Prince."

Implementing a supplier is a top priority for Dr. Boman. He said it is critical for the sustainability of the hoop house industry. Readily available hoop house parts and replacement parts are essential because all the parts are being imported from the U.S. They must be made available locally.

"In Haiti, there is enough work for an entire lifetime," said Boman with a wide smile.

Hoop House Flower Production

Dr. Boman and a Haitian floriculturalist

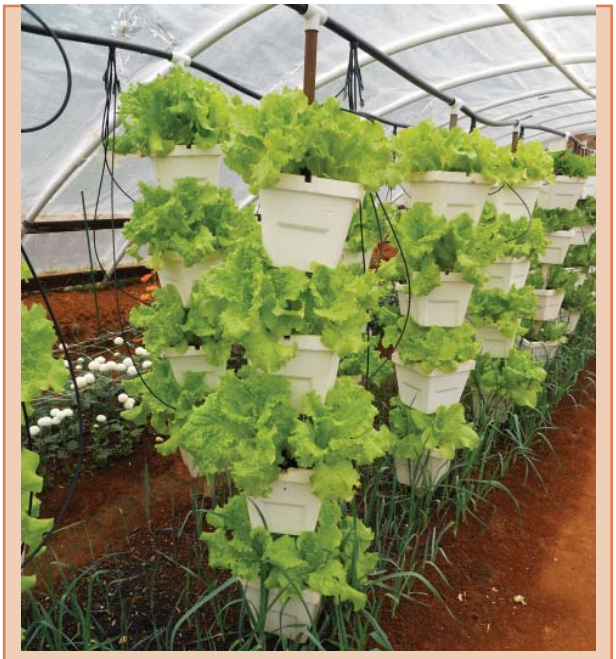
Haiti is perhaps the world's premier nation of holidays. New Year's Day begins each year; the next day is Ancestry Day; the third, Heroes Day. February brings in Carnival, a month long festival. In May, Haitians celebrate historical and cultural traditions. Fresh flowers are a staple of the island nation's many holidays, which in addition to festivals--are religious ceremonies. More than 80 percent of Haiti's citizens practice Roman Catholicism. Along with the holidays are replete displays of flowers in wreathes, arrangements and stands, a familiar and expected part of Haitian culture. And along with the repeated floral pageantry comes a constant demand for fresh flowers.

Flowers are in exceeding high demand in Haiti. The country's floriculturalists cannot meet the country's needs for fresh flower products. In recent years Haitian flowers have not been able to compete with fresh flower product imports from neighboring Dominican Republic.

"The imports from Dominican Republic are higher quality because they are produced inside greenhouses," said Dr. Boman. "Haitian flowers were grown on hillsides where they were vulnerable to high temperatures and belting rain. We introduced flower production inside hoop houses built on mountainside terraces this year and are awaiting the first crop results."

Now Haitian growers will produce high quality flowers inside Furcy's new greenhouses. Drip irrigation was installed to use water efficiently. Hillside flower production sites used about 50 gallons of water; comparatively, greenhouses are using only three gallons of water daily. Dr. Boman recently added solar power panels to the greenhouses and light fixtures. He is constructing sophisticated weather stations to monitor the climate so that the greenhouse's humidity and temperature may be adjusted for optimal growing conditions. The weather

Mums, just beginning to bloom



Verticle stackers

necessitates the weather stations because it is so variable, he said. And, weather data has not been collected in Haiti since the 1960s. Dr. Boman expects weather patterns to emerge from long-term data collection so that the growers can adjust the greenhouse conditions for climate expectations.

Boman said Haitian floriculturalists will likely develop an edge over Dominican Republic imports because taxes are added to products when they cross national borders. Flowers produced locally will not have this disadvantage. The Furcy producers are expected to offer readily available products at a much better price.

Richard Fethiere, UF Coordinator of Research/International Consultant, supports Boman's work by leading the growers in a newly appointed Association of Flower Growers, a part of the US/AID WINNER project. Fethiere helped Association members determine growers who used traditional methods made about $170 annually on 1,000 square meters of land; however greenhouse production using stacked hydroponics offers them an

High quality gladiolus in hoop house greenhouses

opportunity to produce $1,800 annually on only 70 square meters of land. Greenhouse production is intensive and protected so that less maintenance and loss are anticipated.

As the flower greenhouses produce blooming fresh flowers, Dr. Boman and US/AID WINNER officials expect to repeat the sustainable models at additional locations throughout Haiti. The innovative industry is expected to improve the quality of life for many Haitians and the country's economy for the future of all Haitians.

"I have rarely seen, in more than 30 years of experience in international development, this level of competence, dedication and effectiveness," said Jean Robert Estime, Chief of Party to USAID/WINNER project in Haiti. "On behalf of the WINNER team and Haitian farmers, I would like to thank him for all the remarkable transfer of knowledge he has achieved, which will benefit thousands of small farmers for many years."

Development of Haiti's New Agriculture Region

Dr. Boman visits Rhum Barbancourt in Haiti.

Dr. Boman is assisting Haiti's most prominent manufacturer with the company's plans for increased production. Founded in 1862, Rhum Barbancourt is celebrated as the world's highest quality rum manufacturer. Produced and bottled in Haiti, by Société du Rhum Barbancourt, T. Gardère & Cie, Barbancourt, five Barbancourt label rum products are distributed to markets in the Caribbean, the U.S., France and Italy.

For 150 years the rum producer has cultivated sugar cane in the country's fertile cul de sac region, located near Port Au Prince. The sugar cane is then processed and distilled in the manufacturing facility, and aged in oak casks. Some of the finest reserve rums are aged up to 15 years. Unlike other rum manufacturers who produce rum from molasses, Barbancourt uses a technique to ferment and distill fresh sugar cane liquor.

At this time, Dr. Brian Boman is working on an innovation to build an irrigations system that will bring irrigation to the country's barren Gonaives region, to the northeast of the traditional agricultural region, the cul de sac area. Additionally, he is putting in sugar cane for experiments using drip irrigation and three types of sugar cane. The trials are for a local sugar cane, another from northern Haiti, and a third from the Dominican Republic. Weather stations have been introduced to the rum manufacturer's traditional growing sites.

To bring irrigation to the Gonaives region, will bring agriculture for the first time in the country's history. Along with Dr. Boman's plan to assist the rum manufacturer with irrigation in this region, he will also assist with the introduction of hoop houses for the production of protected crops. Sugar cane will be produced utilizing stacked hydroponics systems for space conservation, and to achieve the highest level of production efficiency in the company's 150-year history. The intensive innovations are expected to dramatically increase production per hectare.

The Indian River Research and Education Center News is published quarterly. To submit material or story ideas, please forward information to newsletter editor, Robin Koestoyo, (772) 468-3922, Ext. 103, koestoyo@ufl.edu