

THE BLUE HOLE

Changing the Way Bahamians Eat

BAMSI set to ramp up production of leafy greens and fish



An estimated \$1.4 million is expected to be derived from the ramp up in production at the Bahamas Agriculture and Marine Science Institute's (BAMSI) shade house facility based on the harvesting of some 700,000 heads of lettuce and 8,000 pounds of organic fish a year.

Dr. Vallierre Deleveaux, director of Marine Resources and Development, said once the infrastructure was put in place the bio-secure aquaponics facility would hold six to twelve tanks ranging in size from 500 to 950 gallons, and could easily produce over a million dollars a year in product sales. BAMSI officials are also considering expansion into other produce, such as okra, tomato and melon.

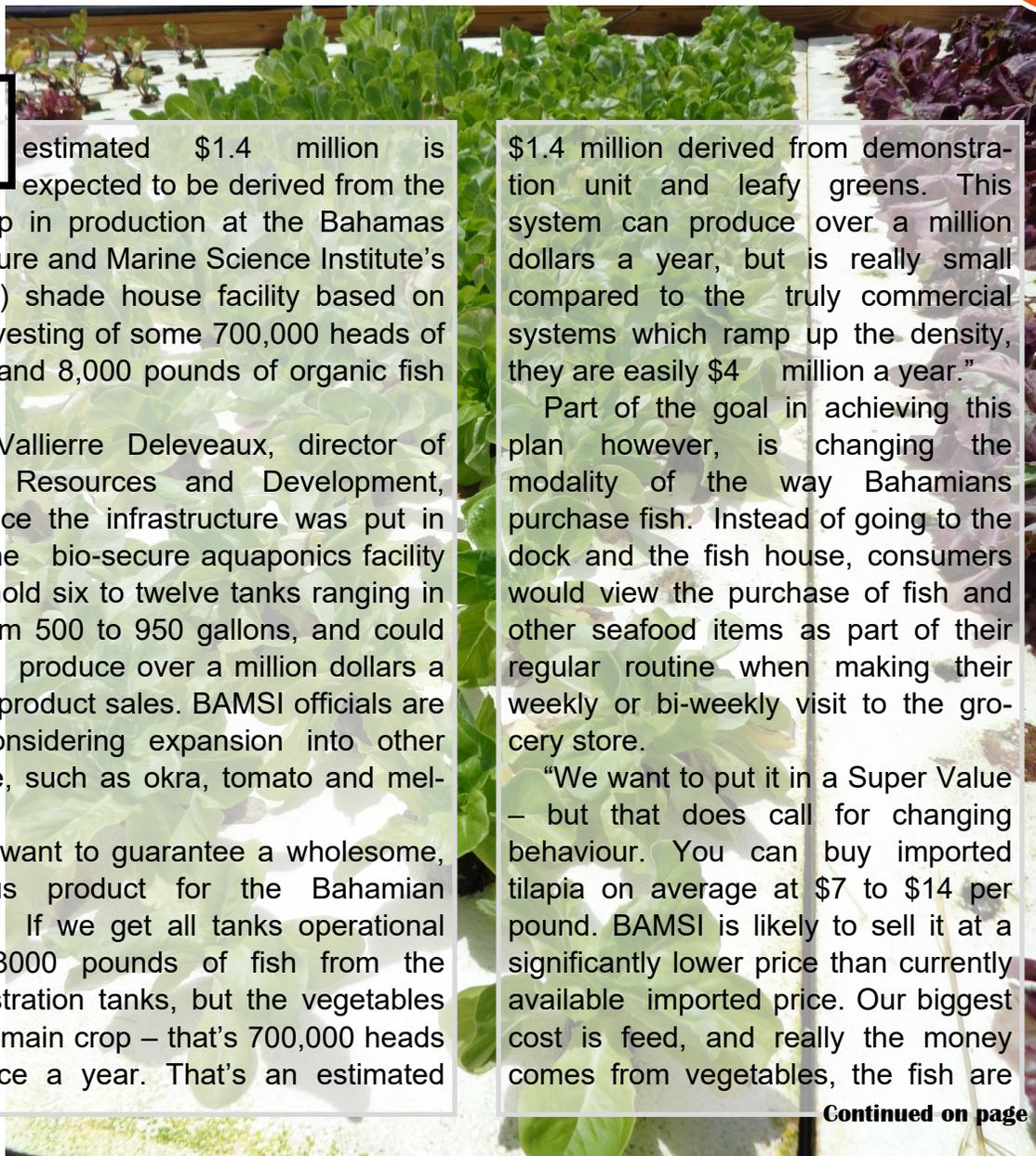
"We want to guarantee a wholesome, nutritious product for the Bahamian people. If we get all tanks operational that's 8000 pounds of fish from the demonstration tanks, but the vegetables are the main crop – that's 700,000 heads of lettuce a year. That's an estimated

\$1.4 million derived from demonstration unit and leafy greens. This system can produce over a million dollars a year, but is really small compared to the truly commercial systems which ramp up the density, they are easily \$4 million a year."

Part of the goal in achieving this plan however, is changing the modality of the way Bahamians purchase fish. Instead of going to the dock and the fish house, consumers would view the purchase of fish and other seafood items as part of their regular routine when making their weekly or bi-weekly visit to the grocery store.

"We want to put it in a Super Value – but that does call for changing behaviour. You can buy imported tilapia on average at \$7 to \$14 per pound. BAMSI is likely to sell it at a significantly lower price than currently available imported price. Our biggest cost is feed, and really the money comes from vegetables, the fish are

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2015 SPRING HONOUR ROLL

The BAMSI High Flyers



GIMEL MORLEY



ROMEO JOSEY



ANDREW CLARKE

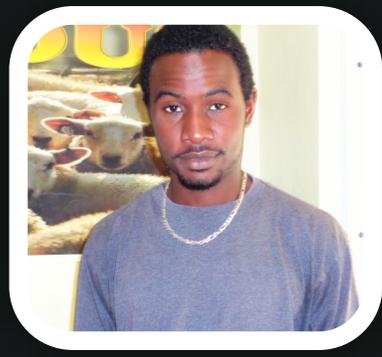


NIGEL SANDS

Meet the BAMSI students who excelled in their academic pursuits. Honour roll status is achieved by attaining a 3.0 grade point average or above during a single semester.



MONTEZ HOPKINS



IAN HEPBURN



STERLING SYMONETTE

AMBASSADOR ENEAS CHALLENGES STUDENTS

This May The Bahamas Agriculture and Marine Science Institute will graduate its first class. This cadre of graduates will represent a new milestone in the history of agriculture in The Bahamas.

It is this grouping of young Bahamians who should commence the implementation of the New Agriculture Agenda during the introduction of the Post – 2015 Sustainable Development Goals which will be made up of the Global Agricultural development agenda until 2030. The central question for this group to consider as they prepare to move into new roles beyond BAMSI is: What role will Agriculture play in The Bahamas?

It is within this framework that this class should assist in the development of this new direction by preparing an Agricultural programme for the islands which are represented in the class.

This should be the class contribution to the Agricultural Agenda they will form as part of the thrust toward the implementation of the Sustainable Development Goals.

By 2050, you will be living in a world with a population of nine billion people. More than 50 per cent of that population will reside in the countries which are called today the emerging economies. A good example are the BRICS – Brazil, Russia, India, China and South Africa and following close behind are Malaysia, Nigeria and South Korea.

The middleclass of the BRIC will be competing with the middleclass of the US, Japan and the European Union for a range of foodstuffs. Small Island Developing States (SIDS) like The Bahamas and the other CARICOM nations may find themselves in a scenario where imported food is unaffordable for socio-economic groups in these states.

In the last decade, food prices went up again as production rose more slowly than before, partly due to greater land and other resource constraints, reduced public investments as well as increased demand for food crops, including crops (corn and sugarcane) for renewable energy like bio-fuels and animal feed.

It is therefore important that you utilize the skills and technologies which you would have acquired at BAMSI effectively and affectively as the capacity of The Bahamas is enhanced through you to feed itself. This is your challenge, the 2016 Class.

B



Ambassador Godfrey Eneas
President of BAMSI

The Blue Hole

Brought to you by BAMSI's Office of Communications

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ANIMAL HUSBANDRY COMES ALIVE FOR BAMSI STUDENTS



Working with students, Veterinarian Dr Keith Cox (far right) helps to hold a goat being dehorned.

WORKING to position the animal farm as a place of knowledge, learning and research, Veterinarian Dr. Keith Cox recently led a dehorning exercise giving students a realistic view of one of the fundamental safety and security processes conducted on commercial animal farms.

The dehorning exercise, which second year agriculture students were allowed to participate in, was completed on some 28 animals - a mix of sheep and goat. The operation involved the removal of the animal's horns, and was done to safeguard the animals from injuring them-

selves and other animals through fighting, pushing their heads through fences or if startled.

To allow all of the students the opportunity to work with the animals the dehorning, which normally would have been completed in a single day based on the size of the herd, occurred over a longer period with some ten animals being treated a day. "The students were the major contributors to removing the horns. I did the first one, used it as a teaching aid and they continued the process," Dr. Cox said.

As part of the lesson, students were divided into groups of four to conduct the

operation. Within each group one student was responsible for subduing the animal by either physically holding it or placing it inside the stakes (a holding pen of sorts). For treatment to take place safely the animal needed to be seated on its hindquarters with all four of its legs off the floor. Once the animal was in the correct position another student secured the head for removal of horns, while the third student used the appropriate apparatus – either a blade or a giggly wire (a bone cutting material) to remove the horn.

Once the horns were removed the fourth student placed a cauterizing gun directly on the horn that had been freshly cut - the gun uses heat to cap off the vein endings. The wound is then 'cured' using an antiseptic solution which reduces the likelihood of possible infection and unsupervised bleeding.

The animals experience no pain during the exercise, Dr Cox said, comparing the process to cutting human nails. He acknowledged however, that the experience may be a nuisance to them.

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Dr. Vallierre Deleveaux, Deputy Executive Director and Director of Marine Resources and Development

“Using an aquatic-based system harvesting can occur in as little as 30 to 40 days.” Dr. Deleveaux

Changing the Way cont'd from pg. 1.

just a secondary product – a necessary secondary product.”

Dr. Deleveaux, who also serves as the Deputy Executive Director for BAMSI, said the whole idea of establishing a centre that utilizes modern agriculture systems such as aquaponics, hydroponics and aquaculture started with the question; how does the government achieve its principal mandate of ensuring food security and increasing food sustainability for the country?

With the marine science component, BAMSI is able to invest in and propagate modern methods of growing, methods that require significantly less water, space and time to achieve maximum yield, to satisfy the government's mandate of establishing an acceptable level of food security and also turning to more sustainable means of food production.

“What we are doing is very

efficient – it uses very little water because it is a recirculating system, which consumes less than a tenth of the water used in regular systems,” Dr Deleveaux said. These new methodologies also support fast rates of growth, especially in leafy vegetable such as lettuces, arugula, kale, and Swiss chard.”

Under conditions where seeds are put in soil, harvesting usually takes place within two to three months. Using an aquatic-based system harvesting can occur in as little as 30 to 40 days. One of the reasons for this faster growth rate is the water allows energy saving nutrients to come to the plant roots as opposed to roots having to search for nutrients in the soil.

Soil-based plants also spend more energy investing in stronger support systems, which means that stems typically need to be stronger

in soil conditions. In hydroponics, for example, not as much energy needs to be diverted into building strong stems.

Using the aquaponics



Aquaponics shade house and tanks

method (where plants and fish exist in the same controlled, recirculating system and form a symbiotic relationship) is a good way to get quick production, Dr Deleveaux pointed out. “You get two crops for the price of one. It's synergistic, the waste from one benefits the other, the plants act as bio filter before water is returned to the fish.”

BAMSI currently has a

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backyard aquaponics demonstration system used for teaching purposes and a small scale



Joining Dr. Deleveaux in the Marine Science Department are Erin Cash (centre) Assistant Farm Manager (Aquaculture and Cameron Lightbourne (Aquaponics).

shade house (similar in concept to a green house, the shade house refers to a cloth or netting type material that covers the area where the plants are, shielding them from direct sunlight and other elements) hydroponics production unit that when at optimal capacity will support a commercial operation.

Overseen by the marine science team, Assistant Farm Manager (Aquaculture) Erin Cash and Assistant Farm Manager (Aquaponics) Cameron Lightbourne, the hydroponics unit is currently growing four different varieties of lettuce: romaine, butter, bib and red, as well as basil and mint. The plants grow on floating rafts placed in raceways, which are rectangular shaped boxes of sort - similar in shape to a long stretch of road – filled with water.

“Right now we have one race-

way operational and we're using it to feed the school. It can meet the needs of the Institute [for] salads, vegetables, that's 60 people, three meals a day, the target was to meet that need and we can easily meet that need. The [raceway] holds 40 rafts and each raft has two hundred plants, but I intend to reduce that number to 120, right now it's too dense.”

According to Dr. Deleveaux, even as the hydroponics unit ramps up its operations and moves into the commercial stage – with the addition of eleven raceways -production will be driven based on demand. Consumers, such as hotels, restaurants, grocery retailers and wholesalers will be able to place orders and within 30 to 40 days BAMSI can provide fresh, quality produce at a competitive cost.

In addition to expanding the hydroponics unit into a thriving commercial entity, BAMSI is also expected to begin large scale operations for both its aquaponics and aquaculture divisions. Along with the commercial enterprise, a tutorial facility will be constructed for the students, providing them with the opportunity to gain practical

knowledge of how to successfully operate a controlled, recirculating system.

“They will be based at the [demonstration shade house] with their own tanks and raceways, which they will construct and manage themselves. There will be four shade houses in total, the three additional ones will be for commercial production.

“The goal is to supply the market to meet the needs of the country. We are also looking to encourage entrepreneurship. We want our students, and even members of the public who can take short courses and get hands on experience here, to go out and reproduce the systems we've shown them. That's why we have the variety of systems – from backyard and community size to commercial aquaponics systems – at BAMSI.”

we are a part of the future.”



BAMSI faculty enjoy the fruits (the leafy green kind) from the facilities first trial run.



Marilyn Nixon-LaFleur

is a second year Agriculture student at BAMSI. Co-Owner of Hearty Mow Farms in Central Eleuthera, her time at BAMSI has been an eye opening experience as she learns what it takes to operate a successful farm.

WHEN the winds of change begin to blow, surrounding you like a flutter of leaves on a windy November day, pushing you in a new direction – let go of what it is that you are grasping, that is holding you back and keeping you mired in the nothingness of mediocrity, and allow the momentum to carry you to a place of destiny fulfilled.

MARILYN Nixon-LaFleur, an agriculture student with the Bahamas Agriculture and Marine Science Institute (BAMSI) has, like many adults, launched into a second career quite unexpectedly. Having worked as a building inspector for many years, her life's journey would make a dramatic shift when she visited Hatchet Bay, Central Eleuthera, on a mission trip in 2006.

It was in that space that she received a new vision for her future and it would be a dynamic change, unfolding before her eyes, recreating the everyday norm she had become accustomed to seeing. This new awareness would transform the landscape into one filled with possibility, one ripe with potential. And in the midst of this evolving scenario along came BAMSI – presenting as a lodestar - guiding her to a place of knowledge, hands-on training, technical exposure and a greater awareness of her role and ability to help shape the industry.

“Within [BAMSI] walls I am now finding the solutions to all of my unanswered farm

questions – particularly those that deal with soil issues, pest management and the business aspect of my enterprise.”

LaFleur's story or at least the part that focuses on her embrace of the agriculture industry and her experience as a student at BAMSI, begins with a regular drive along Queen's Highway in Hatchet Bay. On the island for a few weeks she would regularly pass an uncultivated plot of land and one day it just came to her, “I'm going to farm this land!” Recalling the moment as if it were yesterday, she remembers her husband coming into agreement with her immediately and shortly thereafter they obtained permission from the Bahamas Agriculture and Industrial Co-operation (BAIC) to begin farming the land.

A happy ending to a short story would be the report that they soon harvested a bountiful crop and went on to live happily ever after as they fed themselves and their community directly from the land...but for the novice farmer there are tremendous variables that impact the outcome of their produce, and like most good novels her story would take a number of twists and turns.

“My experience initially in the industry was met with a whole lot of negatives - from disgruntled farmers and then some disappointments – I cultivated three seasons of watermelons and it was

'Her Say'

BAMSI's Student Perspective

Marilyn LaFleur story

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not profitable. We planted the watermelon and we lost the crops to a disease called Bottom Rot.”

Desperate for a way to stem the tide of loss, Mrs. LaFleur began to research the problem in an attempt to uncover a solution. “Farming for me was not a skill past down from one generation to the next, neither did I have any type of apprenticeship or internship coming into farming. So as I got into farming I found I was faced with a lot of issues that I didn’t have any answers to.

“After doing my research I made the amendments and applied the necessary organic matter to the soil, we planted the seeds and propagation took place. In a short period of time we began to enjoy seeing a healthy crop of fruits, they were flawless! That season we sold watermelon for 13 weeks and it was to the point where we became known as the watermelon man and woman.”



LaFleur is unafraid of the hard work it takes to be successful.

An additional bonus was that as winter residents and other tourists came to purchase fruit they began asking if HeartyMow Farmlands would provide them with fresh vegetables, “some were so serious they even brought packages of seeds”.

“We cultivated our garden and when the season for harvest arrived persons came into the garden with scissors and began to shop for produce. We became a live produce market and customers were able to collect fresh veggies on a daily basis. Shortly after I began baking bread and cakes to sell and added tomato sauce, jams and jellies and dry seasoning to our menu.”

As fate would have it however, this mountain top experience was followed by a period of poor harvests. Faced with yet another unprofitable crop Mrs. LaFleur admits that she was on the brink of throwing in the towel when...she was invited to a meeting in her role as vice president of the Central Eleuthera’s Farmers Association. It was there that she met officials from BAMS I who encouraged her to apply to the Institute...and the rest, as they say, is history (in the making).

Transitioning successfully from one career path to another is never an easy task, but strong determination, passion for the work and a willingness to continue the climb despite the rugged terrain and overcast skies, goes

a long way toward an expected end. For Mrs. LaFleur, the excitement she experienced when she planted those first seeds in the ground has not diminished despite the



Marilyn prepares to put seedlings in the ground on her farm, HeartyMow.

passage of time and the effort involved.

“I’m excited about putting seeds in the ground, seeing it germinate and mature to a crop plant, and I’m thrilled about participating in [the government’s] food security initiative as a part of BAMS I. The winter residents in our community are depending on me to have a fresh crop of sustainable, flavourful vegetables – in fact new persons are coming in. I like the idea also that tourists are coming in and learning of the farm and then coming direct to the farm to do their food shopping – that keeps me interested in farming. Definitely looking at ways that I can get the local Bahamian excited about eating fresh, locally grown produce.”

Dehorning story

Cont'd from pg. 4.

Before the process began Dr. Cox clarified the purpose of the exercise to help students reach a level of comfort and be able to appropriately complete the procedure. He explained an animal that

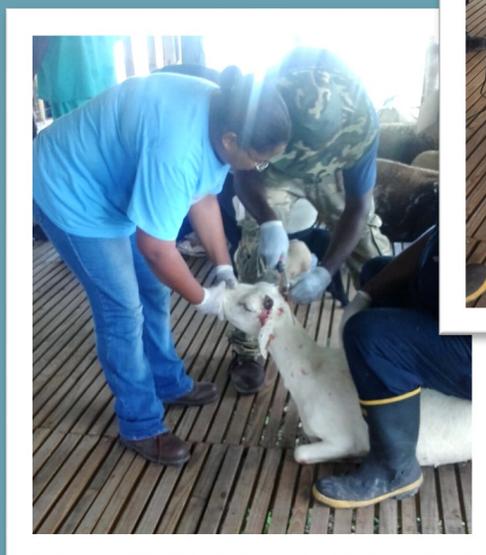
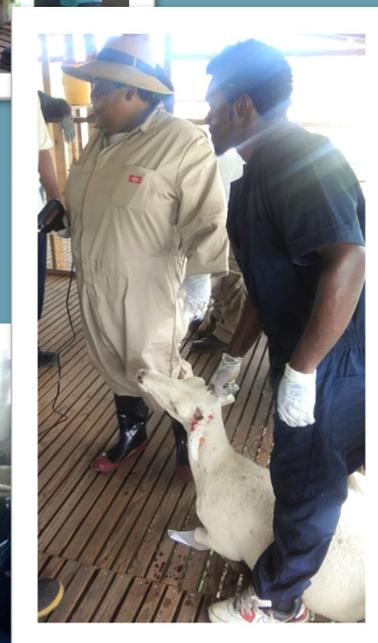


Agriculture students OKendo Armbrister and Marina Newton with a newly dehorned animal.

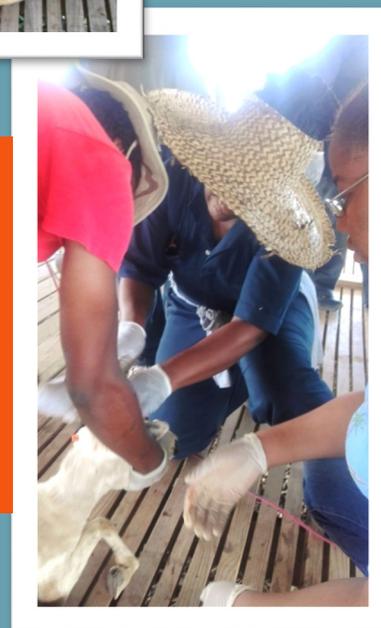
has protruding horns can injure itself, its handlers, and other animals so therefore the horn removal was a necessary precaution. All of the students were able to participate once they understood no harm came to the animals and it was a necessary procedure to keeping them and the farm safe.

According to Dr Cox, the dehorning process typically happens at birth and the horns usually do not grow back. He said the exercise is likely a permanent measure, but if some of the animals do begin to grow their horns back then they will perform the procedure again.

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**BAMSI
Students
participate in
dehorning
activity.**



A Passage Through Time

By Delsanea Thompson

BAMSI students were recently gifted the opportunity to learn more about the rich history of Andros Island with the first installment of the 'Student Enrichment Seminar'. Students were paid a visit by special guest, Social Scientist and former Senior Deputy Administrator for North Andros and the Berry Islands Dr. Huntley Christie, who gave a presentation on the Islands revived agriculture and marine industries, as well as an historical perspective of the development of Andros – from the Lucayans to the Black Seminoles to present day.



DR. CHRISTIE visits BAMSI: Pictured from left are Dr. Vallierre Deleveaux, Deputy Executive Director; Dr. Raveenia Roberts-Hanna, Executive Director; Dr. Huntley Christie, Social Scientist and guest presenter, and Ms. Jarenda Rahming, Student Affairs Officer.

The 'Student Enrichment Seminar' is a monthly initiative that was realized by the Student Affairs Department and approved by Executive Director Dr. Raveenia Roberts-Hanna, in an effort to produce well rounded individuals and build a partnership with the North Andros Community.

The Institute will invite local figures to present one hour lectures on a variety of informative and exciting topics. Student Affairs Officer Ms. Jarenda Rahming spearheaded the first session, by organizing Dr. Christie's visit. "We thought about notable persons in the community who could share their knowledge and experiences with the students, we heard about Dr. Christie's track record and felt he was the best choice".



Following the seminar, students expressed appreciation for the initiative, which allowed them to get a first-hand perspective on the history of Andros.

To kick start this series the theme, 'The History of Andros', was chosen to

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As part of its mission to provide the most vulnerable in society with greater access to higher quality healthy food items, the Bahamas Agriculture and Marine Science Institute (BAMSI) joined with the Food and Agriculture Organization (FAO) of the United Nations in celebration of World Food Day 2015: ‘Social Protection and Agriculture: Breaking the Cycle of Rural Poverty’ by donating some 2,500 pounds of ripe bananas to the North Andros Children’s Home and every school across North Andros yesterday.

Pictured are Dr. Raveenia Roberts-Hanna, BAMSIs Executive Director, receiving two boxes of bananas from Mr. Everton Parkes, BAMSIs Farm Manager. The fruit will be distributed among staff and students.

UNITED NATIONS WORLD FOOD DAY: BAMSI MAKES A DIFFERENCE IN THE NORTH ANDROS COMMUNITY



Two of the country’s top track and field athletes, Shaunae Miller, World Champion silver medallist in the 400m (second from left) and Jeffrey Gibson, bronze medallist in the 400m hurdles (third from left), received a gift of bananas from BAMSIs while visiting local schools in Andros. BAMSIs donated some 3,000 pounds of bananas to every school in North Andros. Pictured along with the athletes are BAMSIs’s Executive Director Dr. Raveenia Roberts-Hanna (far right) and Dr. Deleveaux (left).

“While our purpose remains the same – to position ourselves as a front runner in the push towards national food security – this also necessitates that we play a role in widening access to high quality nutritional foods for the most vulnerable in our midst,” BAMSIs’s Executive Director Dr. Raveenia Roberts-Hanna said.

Part of the Institute’s thrust must be to find more ways to get the food that it produces into the hands of those who need it the most, she added. Viewed as a day of action against hunger, the FAO’s World Food Day was begun as a way to bring attention to worldwide hunger. Agencies, communities and nations use this day to declare their commitment to eradicating hunger in their lifetime.

Schools across North Andros from Red Bays’ B.A. Newton Primary School to Mastic Point Primary and

BAMSI attends GMO Workshop

A small delegation from The Bahamas Agriculture and Marine Science Institute recently attended the Biosafety Clearing House (BCH) and Genetically Modified Organism (GMOs) Detection workshop hosted by the Bahamas Environment, Science and Technology (BEST) Commission. The workshop was held September 14 – 18th at the British Colonial Hilton Hotel. Alassis Braynen and Ayrett Lightbourne, both agriculture specialist, attended the workshop.

The workshop examined the current status of GMOs in the Caribbean, and reviewed the ability of individual nations to identify GMO products that were being imported. It also looked at the standards that were in place to protect and inform local populations about what they were consuming.

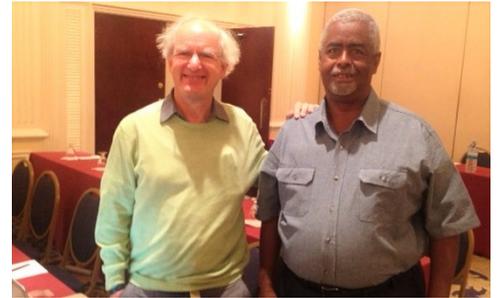
According to Mr. Braynen, the workshop offered a methodology to identify, assess, document and communicate GMO risk factors using Problem Formulation (PF).

“These are real concerns in the world as it grapples to re-shape the balance of the advancement of science and the socio-economic realities of population growth and climate change. The workshop was therefore important for the Bahamas”.



Alassis Braynen

He cautioned that in the Bahamas, like many nations in the Caribbean, the major import trade partner is the US which accounts for the majority of food consumed. Presently there is a push by the grocery lobbyist to pass a US Federal Law not to label GMO products. “This will in fact legislate the status quo. The Bahamas will therefore continue to import massive amounts of GMO products unknowingly. It is doubtful this economic partnership will change due to the importance of financial services and tourism industries. It is hoped however, with this heightened GMO awareness there will be a catalyst for change.”



Pictured from left are Mark Telfer, one of the three scientists based in France who presented and Ayrett Lightbourne an agricultural specialist with BAMSI at the workshop.

World Food Day cont'd from pg 11

B

Nicholl's Town Primary School, all received boxes of ripe yellow bananas. BAMSI Farm Manager Everton Parkes headed the initiative.

“These donations mark BAMSI's good will to the community. We operate out of North Andros, but most of our production is sent to Nassau so with this they get a taste of what BAMSI represents and also it's in honour of the UN's World Food Day.”

According to the United Nations' website World Food Day is marked around the world by grassroots events and public awareness campaigns such as hunger walks, world food day dinners, meal packaging events and food drives.

This emphasis on feeding the hungry is critical as UN statistics show that one in nine persons around the world live with chronic hunger and that the costs of hunger and malnutrition fall heavily on the most vulnerable – women and children. Sixty per cent of the hungry in the world are women and almost five million children under the age of five die of malnutrition-related causes every year.

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A Passage Through Andros cont'd from pg 10

address relevant topics that are pertinent to the growth and development of BAMS I students. When asked if she felt the session was a success Ms. Rahming was certain of that fact, pointing to feedback she received from both her Androsian and Non-Androsian students alike, who felt they walked away from the experience even more informed than they were going into it.

Dr. Christie a local Androsian and pillar of the community studied Social Sciences at the University of Miami and described the subject matter as a passion of his. He expressed a sense of honor to be chosen the first presenter for the 'Student Enrichment Seminar' and the theme being an added bonus. As he recited the historical moments of Andros Island he also shared anecdotes of his experiences as a youth.

What was perhaps quite interesting to learn was his process of preparing for such a session given the lack of written literature about Andros Island. He admitted some of the history was generational in the form of stories and experiences passed down from elders. However he explained that a quick internet search or trip to a local library would prove beneficial to anyone seeking to learn more.

"I want to perfect things, I research information where ever I can find it. The literature is in bits and pieces so I combine my research with written work and results from internet research. I then rehearse by going over my points to ensure nothing is left out."

At the end of his presentation Dr. Christie was enthused by the idea of him returning for another session in the future, sharing that he already choose the topic of Law and feels it would be of great interest to students.

Following the session Ms. Rahming conducted a student evaluation survey and the idea of Dr. Christie returning in the future is mutual. The survey was conducted anonymously, but the majority of students expressed similar sentiments such as appreciating the initiative of an enrichment seminar which allowed them to get a first-hand perspective on the history of Andros. Most students when asked how they would apply what they learned said because they now have a better understanding of their history, they can better prepare for where they are headed.

The launch of the 'Student Enrichment Seminar' was an all-around success and discussions are being had in preparation for the next session. The Bahamas Agriculture and Marine Science Institute considers itself a part of the North Andros community and wants to ensure that the young minds that graduate from this institution are reflections of this. BAMS I would once again formally like to thank Dr. Christie for his time and extend an invitation to return in the future.



Following his presentation, Dr. Christie received a tour of BAMS I's facilities, including its backyard aquaponics system. Pictured are Dr. Deleveaux, who also serves as Director of Marine Resources and Development as he explains how the recirculating system works; Dr. Christie and Dr. Roberts-Hanna.

For Practical Purposes: Theory comes to life for BAMSI's Agriculture Students

IN law school they have mock trials, in medical school they work on cadavers and at BAMSI, the students farm – literally. Every student at the Bahamas Agriculture and Marine Science Institute assists in soil preparation, the planting of seedlings, the cultivation of crops and harvesting. Particularly for the agriculture students, the tutorial farm is a unique and intense training ground that becomes their world. It is an outdoor, on the ground, hands in the dirt experience that provides them a realistic view of operations on

Sophomore Agriculture Student Samantha Mitchell transports seedlings at the greenhouse



a commercial farm. It is here that the theoretical transforms into the practical.

Called Farm Skills, every student completes six hours of training a week during the course of a single semester. Marine Science students

are also exposed to activities on the farm, but particularly in their final year concentrate primarily on tutorials geared towards their chosen field of study.

“[Farm Skills] is an additional component in

Freshman Agriculture student Dalexia Barr shows of her strength and wheelbarrow skill.



the holistic development of the BAMSI student,” Zakita Bethel, BAMSI's Agriculture Development Officer and Farm Skills Lecturer, explained. “It provides them with experiential learning, serves as curriculum space within the week and [affords] time for experience

Freshman Agriculture student Brianne Bain (r) and Sophomore Marine Science student Gregory Thompson prepare the soil for planting.



Continued on pg 16.

BAMSI Brings In Bio-Engineered Banana Tissue Culture



Some of the more than 30,000 disease-resistant banana seedlings.

THE Bahamas Agriculture and Marine Science Institute (BAMSI) has brought in 30,000 bio-engineered banana tissue culture as part of a strategy to eliminate one of the most damaging spot diseases targeting the fruit. The tis-

sue culture will also introduce two new varieties into the Bahamian market, the Jarvis and gale, a BAMSI farm official said recently.

Constentina Hamilton, BAMSI's Assistant Farm Manager – Agriculture, said one of the criteria in

bringing in the tissue culture was new varieties had to be resistant to the black sigatoka disease, a leaf spot disease that commonly attacks banana and plantain crops and has been known to reduce harvests by 50 per cent or more and cause premature ripening. Multinational plant propagation and biotechnology firm Meristem Colombia provided the disease-resistant seedlings that are expected to “support increased production, have a longer shelf life and be palatable to the Bahamian consumer”.

The stage two seedlings, which were brought in from Meristem's Israel lab facility, were less than a foot tall when they arrived and were initially placed in beds within the protected environment of the greenhouse, Ms. Hamilton explained. The specimen require eight to ten weeks before being ready to be planted in the ground and will take a year before harvesting.

Bananas are one of the most important commercial crops in the Bahamas and across the globe, so the devastation brought on by the increasingly resistant fungus caused wide spread concern within the agriculture sector. One of the issues in fighting the black

Tissue Culture cont'd from pg 15



Constentina Hamilton, BAMSI's Assistant Farm Manager (Agriculture) and Yanai Nir, a manager with Meristem Colombia, discuss the best way to get the tissue culture into the ground. In the background are planting beds ready to receive the seedlings.

sigatoka disease however is the limited number of banana varieties that are grown for export. Bioengineering firms like Meristem Colombia, which has a number of lab facilities in South America, including Colombia and Ecuador, are now focused on strengthening new varieties through the use of plant tissue culture technology to support the commercial cultivation of bananas.

Yanai Nir, a manager with Meristem, was brought in to assist and offer guidance as the bananas were placed in the greenhouse beds. He explained with the technique Meristem uses, the company can assure growers they are getting a high quality product that is adapted to a specific environment. Meristem produces some seven million plants a year and such "a large variety of clones means we can recommend the best varieties", he said.

The company is able to help growers select varieties based on the intended distribution of the fruit, whether it is for local consumption or export. Mr. Nir said the tissue culture BAMSI is using is more productive for the local market, but not recommended for export because of the short ripening period.

"One of the benefits of utilizing the tissue culture is that the grower is now better

assured a uniform crop," Mr Nir said. "The grower is able to select a culture that can tolerate certain conditions better – cold, humidity, heat. We offer a wide range of products based on the criteria provided by the buyers."

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Farm Skills cont'd from pg 14.

building, relating theoretical concepts to the field setting." Among the activities the students have been involved in are livestock maintenance, banana sucker tissue culture planting, working at the greenhouse, and planting tomatoes, watermelon and also sweet pepper on the tutorial farm.

The students have also had the opportunity to assist on BAMSI's commercial farm which supplies the local market. They were able to participate in the planting of avocados, mangoes and guava trees recently brought in. Constentina Hamilton, BAMSI's Assistant Farm Manager – Agriculture, said the fruit trees would likely take two to three years before they are able to be harvested.

The students are broken down into three groups with each group interacting with a particular section of the farm - livestock, orchard development, greenhouse and protected agriculture, traditional and non-traditional crops, bananas, and procedures in the packing house. "There's no such thing as a typical farms skills session. What we are aiming for is groups of students (on the experimental tutorial farm) who will have their own spaces where they will initiate, maintain and harvest produce from their plot of land."

According to Ms. Bethel, the course is designed so students of any skill level can be a part of the farms skills experience.

B

Her Say: Beyond Ordinary – Women In Agriculture



Erin Cash, BAMSIs Assistant Farm Manager, Marine Science - specializing in Aquaculture.

THE United Nations' Food and Agriculture Organization (FAO) recently released a statement that said to improve the social and economic status of women countries need to recognize the vital role they play in the [rural] economy. While this points primarily to work being done at the subsistence level, women proficient in the field of agriculture or marine science, like Erin Cash, the Bahamas Agriculture and Marine Science Institute's (BAMSI) Assistant Farm Manager (Marine Science), who advance a superior level of technical skill and expertise - serve a crucial function in this nation's ability

to establish new streams of revenue for future economic growth and development. The work they are able to accomplish is a critical ingredient in efforts being made by the Government to build initiatives that support food sustainability and reinforce food security measures. Ms. Cash, like many of the talented young women emerging in science-related fields in the country, is positioned as an agent of change and also serves as a measure of progress that an educated mind, coupled with a track record of accomplishments and a fearless drive towards excellence, is

sufficient to open doors to the top. She brings to the table a Master's Degree in Aquaculture and Fisheries Management from Auburn University and a depth of professional experience that belies her youth. She stands as an essential component of the Institute's Marine Science Department that is charged with developing critical and cost effective measures for growing food sources in an aquatic environment.

Hired in 2014 to develop BAMSI's Aquaculture programme, which is the growing of fish or aquatic plants in a controlled, water-based environment such as

ponds, tanks, raceways, cages or pens, Ms Cash explained that the programme, which is still in its infancy, will consist of the production of cobia and shrimp in a caged environment both on and offshore.

Tied in with her role as Farm Manager, Ms Cash also lecturers for the Institute. "Seeing our facilities come to their full potential and imparting knowledge I learned while I was away to students who don't have that opportunity to go abroad is what's important to me," she acknowledged. Under her guidance students will play a role in the maintenance, feeding and fish husbandry of the cobia and are expected to have a similar experience with the shrimp culture which would be developed inland in a bio secure facility. Forward looking BAMSI proposes to

expand its research portfolio to include growing salt water favourites grouper and snapper. The aim of the programme is to "train future entrepreneurs how to recreate our systems for their own companies," she noted, adding that "its primary purpose is for demonstration, though some of the products will be available for national consumption."

Asked how she initially got involved in the field of aquaculture, Ms Cash said it was the result of a 10th grade biology project at her high school, St Augustine's College. The students were required to present on a species and Ms Cash selected the queen conch. "In researching for the class I decided I needed to learn how to grow conch because we were going to run out of it." As it turns out Ms. Cash was the only person in a class of 150 to enter the field of agriculture.

Not just a small field however, agriculture and the sub-section of aquaculture are male dominated fields also, but in the safety of the university culture at Auburn where youth is expected, celebrated even and real attempts are made at neutralizing the issue of gender – Ms Cash could focus on the business of learning and developing her skills free of question.

Now compare that climate with her experience at a small scale aquaponics facility on one of



While at Auburn University, part of Ms. Cash's studies focused on the wild populations of queen conch, as well as evaluating middens.

this nation's Family Islands. Here the questions would come: Can she wield the nail gun, lift the wood, and carry the materials used to construct the wooden frame that surround the aquaponics fish tank? Is it possible that those female arms could lift that 40 pound bag of ornamental rocks that would sit at the bottom of said tank? Does she really understand how to connect the pipes to the water pump to ensure the fish in said tank remain in a water-based environment? As former vice president and president of Auburn's American Fisheries Society Chapter, Ms Cash says yes, yes she can and yes she does understand.

This would be her first experience with gender bias. Here, none of the men wanted her to do anything in terms of construction "to the point where they told me to just go sit in the shade, because that's what women were supposed to do. Even though I went to school in the Southern United States I didn't really feel the strength of the 'old boys club' until I came back home. This was the first time my gender had ever hindered me from doing anything".

Once people get to know her



Ms. Cash, at left, has participated in a number of international research programmes.

however, see her work ethic, witness her strength in the field and understand that she has mastered both the theoretical and practical aspects of production, they back away from any preconceived notions they may have of what women can do.

In spite of existing in an environment where her ability to perform is calculated using an



Surrounded by students, Ms. Cash shares knowledge she gained in the classroom and in the field.

equation that factors in her gender and age, Ms Cash is passionate about her work and chosen field because it provides the opportunity to change lives in a manner that is both worthwhile and tangible.

"Other than winning the lottery, my goal is to help other people establish aquaculture facilities. I like being able to teach someone and then they take that knowledge and build on it. My school did a lot of [charitable work] in Uganda and I've always thought that was valiant – they took their technology and helped people help themselves with things they already had. My goal is to do the same, and not just here [in Andros].

"I want to continue to learn more myself in this field and either extend a hand where it's needed or just be available for opportunities. BAMSIS wants the Bahamas to be self-sustaining so expanding this knowledge to our archipelago will help with our food dependence issues as well as sustaining our environment. There is less pressure on natural fish stocks [when people] learn how to grow them or [we can] teach people how to grow them."

The Blue Hole

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