



Agri-link



Algenol's sealed bioreactors

Issue 8
Jan-May 2010

Inside this issue:	Page
Fuel Farming Kicks into New Gear in Lee	1
Community Gardens; what they're all about	2
Tropical Edible Fruit Tree— <i>The Breadfruit</i>	2
Understanding Florida's Snakes	3
Environmentally Sound Agricultural Production	3
Check out this issue's 'Farm Joke'	4
Lee County Sustainability Program—	4

Fuel Farming Economy Kicks into New Gear in Lee County

The government of Lee County has signed an *Incentive Award Agreement* with Algenol Biofuels inc. which will see the latter receiving 10 Million of the 25 million dollar budget reserves set aside for economic development within the county. The 10 million dollars will be held in a restricted reserve by Lee County which will see no more than 6 million dollars disbursed to Algenol by February 2011. Additional payments will be made on a quarterly basis and will not exceed 4 million dollars by February 28, 2012.

For the privilege of this funding, Algenol will essentially be required to create a minimum of 120 new local jobs by March 1, 2015 and pay an average project wage of \$85,000 per year as it's algae bio-ethanol production project is implemented. The agreement between the parties outlines very stringent Incentive Awards Repayment requirements which penalizes Algenol for failure to provide the returns agreed upon. For example, if Algenol fails to create 120 jobs and less than

108 by February 28, 2016, it will be required to pay Lee County \$200,000 for the shortfall in each new job it failed to create or maintain. This is no small order, but the technology offered by Algenol promises not only to deliver 120 high paying jobs by the required date, but 6000 gallons of ethanol fuel per acre of algae from its project.

The potential of certain algae species for producing fuels, especially biodiesel has been touted for many years, but Algenol offers a slightly different approach and end product. Essentially the company uses specialized hybrid algae (remember, algae are plants) whose intercellular enzymes will utilize sunlight to turn carbon dioxide into sugars and then ethanol. According to Algenol, each of these tiny algae plant cell is a small ethanol factory itself.

The process of producing ethanol will work this way. The specialized algae will be placed and grown in sealed 'photo-bioreactors' (shown in photo) placed on marginal

land areas. Carbon dioxide gas from industrial sources will be infused into the system together with saltwater from brackish sources or from the ocean. When the algae, in its saltwater medium, photosynthesizes (as all living plants do) using sunlight and carbon dioxide, the waste product from its intercellular processes is bio-ethanol. When this is cleaned up and separated, not only is ethanol produced in large quantities, but fresh water is also another end product.

In theory, the potential for spin-off opportunities are enormous, and the combined effects of the need for industrial carbon dioxide, technical skills required to manage the operation, unskilled labor required for menial tasks, production of freshwater and the establishment of a local ethanol production economy spells enormous social, economic and environmental benefits. The Lee County government, in making this \$10 million investment, might well have invested in a brand new economy.

Community Gardens; What They're All About

A **community garden** is a single piece of land gardened collectively by a group of people and can be classified into at least five types.

1. Donation Gardens
2. School Gardens
3. Therapy Gardens
4. Neighborhood or Allotment Gardens
5. Market Gardens

Donation Gardens

Hunger is a chronic problem in Florida; more than half a million people are estimated to go without food for part of the month. Donation gardens are often located at churches and other places of worship, and the vegetables they grow are

donated to food pantries.

School Gardens

Fort Myers is one of dozens of cities with growing numbers of gardens on school or after-school campuses. Children learn science, math and social responsibility through garden projects, as well as building teamwork, problem solving and decision-making skills.



Pizza garden at STARS Complex in Fort Myers

Therapy Gardens

Gardens at hospitals, clinics, or special needs schools provide therapy to the disabled as well as an inexpensive source of nutrition.

Gardens at elder care centers inspire residents to get exercise and fresh air while working with their neighbors in a community setting.

Neighborhood or Allotment Gardens

Community gardens in neighborhood parks or vacant lots can consist of individual family plots or a group gardening effort.

These gardens provide an opportunity for neighbors to come together and grow nutritious food while creating a beautiful

destination for community members to spend time in.



New community garden at Lakes Park, Lee County

Market Gardens

Community gardens can provide a source of income for low-income residents as well as entrepreneurs. Local growers sell produce to individuals, restaurants and in farmers' markets.

Tropical Edible Fruit Tree—The Breadfruit

The **Breadfruit (*Artocarpus altilis*)** is a tree and fruit native to the Malay Peninsula and western Pacific islands but widely planted in tropical regions elsewhere.

It was collected and distributed to the Caribbean islands by Lieutenant William Bligh as one of the botanical samples collected by the Ship HMS Bounty in the late 18th century, on a quest for a cheap high-energy food source for British slaves in the West Indies.

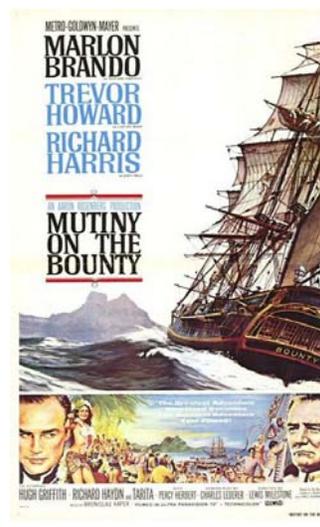
This quest would result in one of the most famous mutinies ever to occur at sea. The mission was to collect seedless breadfruit plants from Tahiti and Timor on The H.M.S. Bounty and deliver them to Jamaica. So tireless was Bligh's pursuit of the plant that he soon earned the nickname "Breadfruit Bligh".

Five months and over 1000

plants later, Bligh decided to set sail for the Caribbean. Two weeks into that 1789 ocean voyage, however, members of his crew, led by the first mate, mutinied. They set Bligh and 18 crewmembers loyal to him adrift in an open boat and threw the breadfruit plants overboard. Some were even used to stone Bligh.

This treasonous act, which was turned into a famous history now terms the most famous mutiny ever, may have been committed because the first mate wanted to return to Tahiti where he had found his true love. Others say the reason for the crew's anger was Bligh's arrogance and his excessive concern about the survival of the precious breadfruit cargo; Bligh is said to have denied crewmembers water in favor of using it to irrigate the plants. The 1962 movie Mutiny on The Bounty star-

ring Marlon Brando depicts the famous account.



1962 Poster for the Movie 'Mutiny on the Bounty'

Breadfruit trees grow to a height of 65 feet. The large and thick leaves are deeply cut into pinnate lobes. All parts of the tree yield latex, a milky juice. This latex is used for boat caulking in many parts of the developing world.

The trees are monoecious, with male and female flowers growing on the same tree. The male flowers emerge first, followed shortly afterwards by the female flowers, growing into a capitulum. These can be pollinated three days later by Old World fruit bats.



The compound, false fruit develops from the swollen perianth and originates from 1,500 to 2,000 flowers. These are visible on the skin of the fruit as hexagon-shaped disks or bumps (Shown in photo above).

For more information on the breadfruit visit the breadfruit Institute at <http://www.ntbg.org/breadfruit/>

Understanding Florida's Snakes—Brahminy Blind Snake



The Brahminy Blind Snake is an exotic species from southeast Asia that has been introduced into Florida. Among other locations, it is found in isolated populations near Fort Myers. The average adult size is 2.5 to

6.5 inches. Adults are thin, and shiny silver gray, charcoal gray, or purple. The head and tail-tip are indistinct, the neck is not narrow and the eyes are only small dot-like remnants under the scales. The tail is tipped with a tiny pointed spur. The head scales are small and similar to body scales. The belly is grayish to brown. The scales are smooth and shiny, and there are 14 dorsal scale rows along the entire body. Juvenile coloration is similar to that of adults.

The Brahminy blind snake

burrows in the soil and leaf litter, and is found under rotting logs, leaves, and trash. Most often it is seen in flower beds while gardening, or on sidewalks after rain.

The Snake was likely introduced into Florida in the soil of imported plants. Being moved around this way in some parts of the world has earned it the name 'flower pot snake'. It feeds on the eggs, larvae, and pupae of ants and termites. It lays eggs or may be live-bearing. All individuals are female and reproduce unisexually, where the eggs

begin cell division without sperm from a male. Up to 8 genetically identical female offspring are produced.

Although frequently mistaken for earthworms, they actually look quite different. Both are shiny, but if you look carefully you will see that earthworms are segmented (they have rings around the body) and the Brahminy blind snake is not segmented. Neither can the Brahminy blind snake stretch itself out or contract like an earthworm.

Environmentally Sound Agricultural Production - *Claudia Piotrowicz, Program Assistant*

Are Agricultural Production and Forest Conservation compatible functions?

The land available for agricultural production is continuously decreasing due to development projects and urbanization. Excessive use of inputs such as fertilizers and pesticides, frequent cultivation, and lack of proper erosion control systems are constant threats to the environment. Scarcity of water during periods of droughts in SW Florida, and irregular rainfall have been responsible for crop losses and misuse of water.

Despite the environmental problems caused by certain agricultural practices, economic development and environmental sustainability can be verified in several initiatives that are being developed in Lee County through techniques which promote conservation of native vegetation cover, soil stabilization and conservation of water. These initiatives are win-win situations which accommodate sus-

tainable farming activities by adopting practices that will maintain ecological functions and conserve biological diversity.

It is recommended that the use of fertilizers and pesticides be reduced and controlled. This will bring environmental and economical benefits—the latter through cost savings—and improve the health of consumers since products intended for human consumption will be free of pesticide residues.

Other recommendations include minimizing the use of irrigation water and avoiding the overuse and misuse of this precious and scarce natural resource.

During the first Southwest Florida Stewardship Tour in Lee County that took place on February 5, 2010, several agro-forestry sites were visited featuring the practices which are summarized as follows:

- Prescribed burning and salvage harvests have been conducted to make way for reforestation and to improve

the site for gopher tortoises.

- Advanced natural pine regeneration, where the invasive melaleuca and other exotic weed plants are being controlled.

- Meat goat operation depicting ways in which small livestock species such as goats can be used to effectively control invasive weeds and weedy species, and also provide the potential for income on managed lands or in natural areas.



Photo: Mike Weston - Senior Forester for the Florida Division of Forestry demonstrates prescribed burning on one of the sites visited.

Given that conservation is understood to mean "limited impact land use" it is reasonable to introduce agri-

cultural practices with minimum impact on soil, native plant and animals as well as on water resources. Some instances of agricultural practices that are compatible with economic returns from environmentally sustainable initiatives being used by local farmers in Lee County are:

Beekeeping

The introduction of honeybees increases crop and native plants pollination and starts honey production. The role of bees is crucial in maintaining local biological diversity.

Goat farming

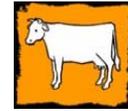
When animals are raised for meat and milk and provide the service of clearing the land from exotic invasive plants through grazing and browsing, a great opportunity to reduce inputs and gain benefits exists.

Organic crop farming

This include all types of agricultural production systems which are environmentally, socially, and economically sound. The demand for organically grown foods is increasing all over the world.

Fitzroy B. Beckford (Roy)
 Agriculture/Natural Resources Agent
 3406 Palm Beach Boulevard
 Fort Myers, Florida 33916
 Phone: 239-533-7512
 Fax: 239-485-2305
 E-mail: fbeckford@leegov.com
 fbeck@ufl.edu

FARM JOKE



Bird Brain



A lady was walking down the street to work and she saw a parrot on a perch in front of a pet store. The parrot said to her, "Hey lady, you are really ugly." The lady was furious! She stormed past the store to her work. On the way home she saw the same parrot and it said to her, "Hey lady, you are really ugly." She was incredibly ticked now.

The next day the same parrot again said to her, "Hey lady, you are really ugly." The lady was so ticked that she went into the store and said that she would sue the store and to get rid of the bird if they didn't do something about it. The store manager apologized profusely and promised he would make sure the parrot didn't say it again.

When the lady walked past the store that day after work the parrot called to her, "Hey lady." She paused and said, "Yes?" And the bird, with a wink in its eye replied, "...You know."

Disclaimer: Please hesitate to call us if you are offended by this silly joke :-)



'Solutions for Your Life'
Click into our Website!
<http://lee.ifas.ufl.edu/>

The Lee County Sustainability Program— Martha C. Avila; Program Coordinator



Report on the Lee County Climate Change and Sustainability Conference 2009

The 2009 work program of Lee County Ag/Natural Resources Sustainability culminated in the first annual Climate and Sustainability Conference on December 4th 2009. The aptly named 'Managing Climate Change with Sustainable Initiatives' conference focused on a two part approach to delivering its educational message.

The morning session was subtitled *The Impact of Climate Change on Local Environment and on the Health and Wellbeing of Residents* and featured presenters from the University of Miami, University of Florida, Florida Fish and Wildlife, Florida Emergency management and Carbon Solutions of America. The presenters focused on the problems associated with climate change and the impacts on humans, the environment, animals and plants and how these issues are affecting ecological relationships.

The afternoon session of the conference, subtitled *Planning and Implementing Sustainable Solutions* then proceeded to focus on solutions for many of the problems presented on earlier. Speakers from the University of Florida, Algenol Biofuels, Florida Atlantic University, Wind Energy Florida Group and Florida Power and Light offered insight into technologies which were already being practiced or researched to provide cutting edge solutions to the climate change challenge.

An important facet of the conference was the outdoor exhibition which showcased products and inventions by more than 30 green businesses and technologies across south Florida. To view the entire list of presentations offered at the 2009 SustainabLEE Climate and Sustainability Conference, visit the agenda page at http://lee.ifas.ufl.edu/AgNatRes/Sustainability/Climate_and_Sustainability_Conference.pdf

For more information contact Sustainability Coordinator Martha Avila at avilamc@leegov.com or Agent: Roy Beckford at fbeck@ufl.edu



Martha C. Avila

The Institute of Food and Agriculture Sciences is an equal opportunity-Affirmative Action Employer Authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, age, handicap or national origin.

COOPERATIVE EXTENSION WORK IN AGRICULTURE, FAMILY AND CONSUMER SCIENCE, STATE OF FLORIDA, IFAS, UNIVERSITY OF FLORIDA, U.S. DEPARTMENT OF AGRICULTURE AND BOARDS OF COUNTY COMMISSIONERS COOPERATING.