The Belize Ag Report

Belize's most complete independent agricultural publication

PASTURE MANAGEMENT IN A NUTSHELL

By Peter Margesson

In Belize tropical grasses grow exceptionally well and can have a very high value to the stockman farmer. Grasses are relatively unaffected by pests and diseases, and respond very well to increased levels of management. In today's world where theft of agricultural products can be a problem, grass is seldom stolen.

Why do we not have more quality "grass farmers" in Belize? It is because, as in growing any agricultural commodity profitably, pasture care is a science that requires knowledge, planning, dedication and money. Returns per acre from properly managed intensive pastures can equally compare with other planted crops. However if a farmer has plenty of land or the inability to harvest large amounts of grass during flush growing periods it may not be preferable to switch to intensive pasture management but to increase management levels within existing extensive pastures.

Good pasture management requires learning the characteristics of grass growth on your farm. Each farm differs due to soil type, hilly or flat land etc. At the learning stage of grass management, effort should be placed on correct fencing, paddock size and animal rotations. Good "grass farmers" walk their paddocks on a regular, if not daily basis, observing their grass, learning the correct time to move animals to fresh grass, when to reduce or increase stocking rates, etc.

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Can The Sugar Cane Industry Survive?

By Jose Alpuche

Examining the way the sugar cane industry in Belize is regulated and administered, one could easily fail to recognize that it is a privately owned industry. Historically, an unhealthy but powerful mix of market protection, political clout due to voting numbers and its contribution to foreign exchange earnings created an attitude of invincibility and entitlement among some in the industry. The world has changed and so has our most important market for sugar, the European Union (EU). Although we were told in 1995 to anticipate and prepare for change, sixteen years later the pressure of a self-inflicted crisis is now rapidly forcing change. Can the sugar cane industry survive?

The legislative and regulatory regimes governing the sugar industry are best described as archaic, interventionist and unconstitutional. The laws were revised in 2001 to eliminate costly practices such as production licenses thereby allowing farmers to directly deliver whatever they produced. This removed over 2000 "paper farmers" that had license but no cane and were earning a quota rent at the expense of farmers **with** cane. Several other important elements of the law met resistance from farmers, in particular the "core sampling" method of testing quality for a "payment by quality" system which would have rewarded farmers for producing better quality cane and made the entire system more equitable.

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Five Acres of Coconuts and Security

Dr Mandy Tsang, MBChB, DRCOG

When we first moved to our farm, we discovered that the previous owner had planted two acres of coconuts, half of which had died from lethal yellowing. At that time, the disease had decimated thousands of coconuts in the Toledo District and Belize. We travelled around the Toledo District selecting coconut seedlings from trees that had survived the blight and set about systematically replacing all the dead palms. We planted an extra acre of coconut palms for three successive years giving us a total of five acres and with subsequent blights our coconuts managed to resist disease. In the last two years they have started fruiting in respectable quantities bearing on average of 75 to 100 fruit a year. (A poorly fertilized tree yields only 30 fruit per year.) Most of the coconuts ended up being the Dwarf variety with a few interspersed Panama Talls.

We were faced with the reality of managing five acres of coconuts and trying to find the best way to use this commodity. Having no previous farming background our discovery into the uses of coconuts in an effective and economic way was completely experimental. We started by processing the coconuts into coconut oil as we had discovered a local niche market for this in Punta Gorda. The coconut oil had to be made to a specific requirement to the local Belizeans, taking into account that clarity and a deep brown colour of home-made coconut oil were essential qualities esteemed by the locals. The making of coconut oil involved a lengthy manual process which included husking, grating, squeezing coconut milk and then the boiling cream. All of this we did by hand with only partial mechanization at the grating stage; boiling the cream took eight hours to get to the stage of a marketable coconut oil. On average, ten coconuts yield one litre of coconut oil which retails in Punta Gorda for $10 Bz.

From a purely economic stand-point it hardly seemed worth going through the trouble of making coconut oil especially when ten husked whole coconuts retail at $10bz! So why did we persist with this venture? We discovered that the benefits of the by-products of producing coconut oil helped us manage our farm in many other ways. For instance, the grated coconut waste was used as supplemental feed for all the animals including ducks, chickens, dogs, cats and guinea pigs. In addition to using the coconut oil in our cooking, we also incorporated the grated coconut into breads, stews and stir fries. We burned the coconut shells and husks to make the fire on which the coconut oil was boiled and subsequent ash from the fire was used to fertilize the coconuts. (There is 45% potassium content in coconut ash making it a very worthwhile source of potash.) Excess coconut husks were used as a starting medium for orchids and vanilla. Our making of soap was borne out of experimenting with the uses of coconuts and very quickly we realized that the making of soap from our own farm-processed coconut oil was more economically effective than selling it as cooking oil.

Through our own practical endeavours we have discovered a way to maintain and manage our farm through the many uses of coconuts. Before writing this article I did a quick internet research for a list of uses of coconuts. I would like to share with you two further examples (which we had not thought of!). One is the Filipino use of polishing floors with coconut shells. (Apparently there is a technique and style to it as you manipulate the coconut shell with your feet.)...hmmm... Maybe, I would consider it on a rainy day! This I find very interesting: coconut water mixes easily with blood, and was used during World War II in emergency transfusions. It can also serve as an emergency short-term intravenous hydration fluid. This is possible because the coconut water has a high level of sugar and other salts that makes it possible to be used in the bloodstream, much like the modern lactated ringer solution or a dextrose/water solution as an IV. Well, I must remember to carry a water coconut and intravenous giving set in my emergency doctor's bag from now on!

FROM THE EDITOR

The GMO debate in recent weeks in Belize has shaken up the agriculture community to some extent. Stress can have some benefit in that it challenges all of us to listen, examine and re-evaluate. Whether it strengthens a position already held or alters thought, educating ourselves is a good thing. It is said that if the lychee tree does not receive a periodic 'hammering to the trunk', it will not bear fruit. We are getting our hammering, and hopefully, 'we will bear fruit'.

The Belize Ag Report ***writers*** have diverse opinions. Our publication itself is inert and opinion-less, operating as a framework within which 'to disperse information useful to the producers large and small' (Mission Statement p. 6). The Belize Ag Report remains an inclusive umbrella group for Belizean agriculture. Diverse opinions are welcomed and appreciated.

At a recent CSME (Caribbean Single Market Economy) meeting* held at Central Farm, the question was raised as to labeling of imported food products which are not in English or Spanish. Increasingly many items on local shelves have labels which are in Arabic and/or Mandarin only. Current rules stipulate that an English translation of labels must accompany the customs application; the items themselves do not require English labels. Is this satisfactory?

As the year ends and the holiday season approaches, we express our appreciation to our readers, our writers, and our advertisers. The participation of each of you is critical to our continuation. Thank you! We like to hear from you; tell us what you like and what you would like improved. Our purpose is to be useful and serve our Belizean agricultural community. **Warm holiday wishes to you all**.

*see page 28 for details on the CSME meetings by district.

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The Belize Ag Report is an independent bi-monthly agriculture newsletter. Our purpose is to collect, edit and disseminate information useful to the Belizean producer, large or small. We invite opinions on issues, which are not necessarily our own. Belize Ag neither solicits nor accepts political ads.

TO THE EDITOR

Editor Sir,

The GM corn seed that was destroyed by burning on Friday October 7th 2011 was imported with the proper paperwork and permissions. It had a BAHA import permit, and a letter from the Biosafety Council. The GM corn that was destroyed had been genetically modified to contain two genes, *cry1Fa2* and *pat,* for insect resistance and herbicide tolerance respectively. Both genes were introduced into the parental maize hybrid line Hi-II by particle acceleration (biolistic) transformation.

The *cry1Fa2* gene, isolated from the common soil bacterium *Bacillus thuringiensis* (*Bt*) var.*aizawai*, produces the insect control protein Cry1F. There is over 30 years of commercial use of B.t. _ preparations in organic farming without any report of allergenicity attributed to the B.t. insecticidal proteins, including occupational allergy associated with the manufacture of *Bacillus thuringiensis* preparations. We have been using BT insecticide in Belize for years. It is derived from a naturally occurring organic product.

It is common knowledge that the specificity of B.t. is directly attributable to the presence of receptors in the midgut of target insects. There are no receptors for the delta endotoxins of *Bacillus thuringiensis* subspecies on the surface of mammalian intestinal cells, therefore humans and other mammals are not susceptible to these insecticidal proteins Hence, Bt has no effect on animals or humans.

Wild public statements have been made in the press and at public meetings about GM corn. Statements such as :

"Given the many dangers that have already been proven to exist with Bt Corn, including environmental dangers". No sound scientific basis was presented for these statements. To the contrary it has been proven many times that Bt Corn does not pose any environmental dangers, but is more environmentally friendly than conventional corn. Less insecticide use and higher yields, requiring less area to produce more is very environmentally friendly. It has never been proven that Bt corn poses a danger to the environment.

"*lower crop production*" Please go to Honduras and talk to farmers who are using Bt seeds. Their yields have increased by 250% over local seed and by 166% over hybrids when using Bt corn seed.

"*loss of our local corn as BT corn cross-pollinates it*," Any corn farmer will tell you that if he wishes to avoid cross pollination between say white and yellow corn, just plant it 200 yds apart or 2 weeks apart. Corn will only pollinate another corn variety which is pollinating at the same time. So, a simple precaution already practiced to keep local varieties separate, will work to avoid any possibility of cross-pollination.

"production of BT resistant pests," Again, no scientific data is provided for this statement. Unlike insecticides to which insects develop a rapid resistance, no resistance has yet been found to the naturally occurring Bt by insects.

"increase levels of toxins in mothers' breast milk". A publication by Aziz Aris and Samuel Leblanc in the journal Reproductive Toxicology *(Maternal and fetal exposure to pesticides associated to Genetically Modified Foods in Eastern Townships of Quebec, Canada)* claimed that they had detected traces of the insecticidal protein Cry1Ab in the blood of Canadian women. The authors failed to consider that the presence of this protein could be from organic food which had been heavily sprayed with BT. In addition, to obtain the levels claimed, the women would have had to consume daily 13 lbs of corn for extended periods to reach the levels claimed. Their findings were disregarded by the professional scientists because of faulty test procedures.

We are facing a dilemma in Belize. Do we believe the malcontents who quote "junk" science and mis-inform, or do we take the responsible approach to the use of this new technology which has been widely tested in the more developed nations?

Frank Redmond
Palms Springs Farm

TO THE EDITOR

Dear Editor,

We have had the honour of meeting Mr. Carr. He came across as an intelligent man, and a visionary. We were surprised to learn that Mr. Carr is promoting GMO in Belize. In Europe (which opposes GMO) the information available about GMO comes from a lot of different sources. We now understand that people in the USA get their information only from companies selling GMO. Here is a big difference and we would like to start an open conversation with Mr. Carr. Let's start with all the solutions genetic engineering could provide. We could accomplish great things, grow cucumbers in the desert, cure diseases that are now lethal etc. Some people oppose this science, stating that it is not right to interfere with the building blocks of life's design, for religious and ethical reasons. Many people with intellect and vision support genetic engineering, because they see its endless possibilities. However, this branch of science is very new, imprecise and in an experimental state.

(1) Genetic engineering has been tragically high jacked by a few agro chemical companies. They have turned a promising new science in a commercial menace. Under pretense of feeding the world while using less chemicals, they have created and patented seeds of the common staples that actually incorporate pesticides in the genetic make-up of the plant.

In spite of the claims, the only GMO seeds that have been commercialized are herbicide resistant for their own brand of herbicide) and with built-in pesticides. in fact, more chemicals are needed in the long run, as weeds and pests develop resistances against those same chemicals used year after year. In the long run, average yields are not higher then those of conventional crops.

(2) Monsanto, the major player in this field, has an ambitious business goal: to control the world's food supply (3). GMO crops are dominant and will cross pollinate, eradicating all natural crops. The company uses a cleverly crafted contract, so it can not be held responsible for the damages done. However, Monsanto an sue a farmer whose farm has been contaminated for stealing its intellectual property. Monsanto and co. have enormous power and spin, and prevent unwanted information from becoming known to the public. Reduced biodiversity and monoculture an lead to new plant diseases that wipe out an entire crop.(4) Mexico opposes GMO but is losing the battle with contamination. Belize, like Mexico, has a variety of heirloom corn seeds to protect. The majority of the Belizean farmers are sustainable farmers.All those farmers will become dependent on the company selling these GMO seeds and the chemicals that go with growing them, and lose the option to replant their own seeds, and to grow organically.

The vision of the possibilities of genetic engineering is wonderful, but it is being abused in the most horrible way. GMO is a threat to the whole population of the entire planet.

Yours sincerely,

Naud and Elsbeth Brouwer.

(1), documentary 'A silent forest', David Suzuki foundation /'Genetically modified foods' Amy Dean, D.O. and Jennifer Armstrong, M.D., posted in American Academy of Environmental Medicine.

(2) 'Failure to yield', a report by UCS expert doc Gurian-Sherman

(3) 'Le monde celon Monsanto', (the world according to Monsanto) Marie-Monique Robin

(4) Mad soy disease in Brazil,

http://news.agropages.com/News/NewsDetail---3265.htm
Dear Editor:

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Well - we are certainly making a mess out of our food supply! Our food will kill us way before the terrorists do!

D. Martabano

Dear All,

The decision to import GM seeds into Belize is folly. At the very least, it's extremely premature. The Belize Agricultural Health Authority does not have the resources, time, or capacity to do any meaningful monitoring of this environmental release. I find it incredulous that the product was brought in and no risk analysis was conducted. For goodness sake, BAHA does risk analysis for importation of milk powder into this country. It does point to the fact that doing a risk analysis for GMO is an involved process and BAHA simply does not have that capacity. BAHA has been expecting this push to get GM seeds into Belize for some time and has been pro-active in trying to develop the necessary capacity to deal with the request for importation. For instance, September 26th to the 30th, 2011, BAHA has partnered with the offices of the Convention of Biological Diversity (CBD), to conduct a workshop here in Belize with all the Bio-safety members of the Caribbean and Belize on how to go about doing a risk analysis for living modified organisms (LMOs/GMOs); industry (Monsanto) will be present at this training as well. In addition, we have written a project with the International Atomic Energy Agency and have received PCR testing equipment that can be used for the detection of DNA in LMOs. Furthermore, the CBD is only now developing guidelines for the international community on how to monitor for stacked events in GMO, which this importation is, and a separate set of guidelines for long term monitoring. This is at an INITIAL STAGE. and has not yet been distributed to countries wishing to use these valuable guidelines.

But there are many other reasons why this importation makes no sense. Apart from a policy, Belize does not have a national bio-safety framework, which is composed of a policy, legislation, administrative procedures, and public participation into the decision process. In 2005, 2006, a draft bio-safety law was developed, but this draft law does not reflect the policy, is already outdated given the many new developments in the biosafety arena, and is heavily US centric which will legitimize easy access for GM to come in. I sincerely hope that this is not the same law that is now being presented to the Solicitor General's Office. Any legislation developed for bio-safety must follow the policy of March 2009 as that policy is the result of NATIONAL consultation over a two year period. Belize, like the US, does not have any provision for liability should something go wrong,(and many things have gone awry, even in field trials). It is unfathomable that the Government is pushing for GM in Belize, which will negate the promotion of Belize as a "natural niche" and the markets that we're developing for our quality and organic agro-products. This is a specialized market that Belize is tapping into with higher returns; Belize certainly cannot compete with countries like Canada, Argentina and the US, all non-parties to the Cartegena Protocol, in exporting any GM corn.

The most comprehensive assessment of agriculture and food security to date, that involved over 400 scientists and authors internationally, including the bio-tech industry, was the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), co-sponsored by the World Bank, FAO, UNEP, UNDP, WHO, UNESCO and GEF, which found, among many other things, that in the future, agriculture can only be sustained by small farms without the use of GM. This is where Belize has an advantage and should use it by supporting our small farmers to ensure food security and sustainability.

This is my considered opinion.
Michael DeShield, BVSc, MSc Director of Food Safety 2001-2011
Bio-safety and BCH Focal Point 2004-2011

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Organic Production

Fungus Amongus...

By Greg Clark

In the previous edition, I described the organization of the leaf cutter ants, their association with fungi, and a few methods to deter their habits. This edition, I would like to address another option in dealing with their palette. A scientific study was conducted to test the effects of utilizing the waste pile of the ant nest as a deterrent for their choice of food sources. The study applied fresh waste pile material on the leaves and around seedlings. The ants were deterred from utilizing the leaves of the seedlings due to the intense cleanliness practices of the colony. The waste pile contains products that they remove from the nest and this prevents them from reintroducing the material to the nest. A recommended follow-on study is to utilize the waste pile and create a spray for application onto the leaves of a plant that requires protection. I recommend that liquid dish soap be added to the spray for better adhesion of the liquid to the leaves of the plant. Either method should provide protection to the associated plants for 15 to 30 days, depending on the weather conditions over the period of protection.

Utilizing the methods described in the previous edition and the method mentioned here should provide an organic arsenal to defend against leaf cutter ants. Please write and tell us what methods have worked for you.

At the writing of this article, we are well into the rainy season, and this year the season is holding true to the norm. The soils are being replenished with the moisture to carry into the dry season. Many of the local plants and trees are in large growth spurts with the availability of the moisture. For the local flora of the region the moisture is wonderful, but for the cultivated vegetables, the warm, humid, moist days are a detriment to their survival. The warm humid days allow for the growth of many fungal attacks on the vegetables. To eradicate fungal growth, I recommend a local remedy as the first option: jackass bitter (tres puntas) leaves boiled into a liquid tea concentrate for spray on the plants. The second option is an observed solution. Based on my observation that I have not found a fungal attack on the local pumpkin plant, I would like to recommend the same method as mentioned above substituting local pumpkin leaves for the jackass bitters plant. Since most fungal spores attack from the exterior of the plant, the protective coating of the solution should prevent the attachment of the spores.

My conclusion is that in the garden, a successful gardener is very observant of what is going on in the garden and utilizes that observation for applying the same effect to other plants. Remember to keep adequate levels of potassium in the soils to maintain the internal disease resistance of your plants.

Do you have some knowledge or opinion that you would like to have printed in The Belize Ag Report? We welcome contributed articles, as well as letters to the editor and ideas for articles. Your contributions will improve the paper. Kindly send to <editor@belizeagreport.com> or call Beth at 663-6777. Thank you.

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Belizean Candidates Selected To Attend Training Courses On Agriculture, Food Security And Social Policies Under The Sponsorship Of The Government Of Brazil

The Embassy of Brazil in Belize informs that further to the international event ***"Brazilian Technical Cooperation: Agriculture, Food Security and Social Policies"*** – which was held in Rome, Italy, June 24, 2011, and has been attended by the Hon. Rene Montero, Minister of Agriculture and Fisheries, on behalf of Belize – the Government of Brazil has announced a program of short-term training courses on agriculture and social insertion for the benefit of developing countries of Latin America and the Caribbean, Africa, Asia and the Pacific. More than 50 developing countries are applying for these courses.

This program comprises 24 courses (of a duration from 40 to 80 hours) to be offered by 20 Brazilian institutions of excellence, which have played an important role in the design and implementation in Brazil of public policies on the above-mentioned topics:

It should be particularly noted that the program encompasses several courses that may relate to the mission of other Belizean Ministries or Agencies besides – or shared with – the Ministry of Agriculture and Fisheries, such as those dealing with credit for family agriculture and/or rural development; school feeding programs; prevention of forest fires; management of water resources; school-kitchen gardens; gender equality in agriculture and food security, as well as environment and agriculture. The applicants will be the object of a selection process and only 1 (one) candidate per country will be accepted for each course. The candidates must be public servants or incumbent of offices in the Government of Belize. The candidacy of each applicant must be presented by means of 2 (two) letters of recommendation, one signed by his/her hierarchical superior and another one by a Ministry or government Agency. Transportation costs and per diems will be borne by the program. The Government of Belize has already presented last July the list of Belizean candidates to the complete series of courses offered in the second semester of 2011 and in 2012.

SHI Belize Organic Fair 2011

Mr. Gordon Zuniga

On Saturday October 29th, 2011 Sustainable Harvest International Belize held its Third Annual Organic Fair at the Central Park in Punta Gorda Town. There were a total of twenty eight booths (listed below) comprised of NGO's and farmers working with SHI Belize. It is estimated that eight hundred to a thousand people visited the booths throughout the course of the day. Each of SHI's field officers reported that their farmers made over two hundred dollars each. Two farmers sold twenty bags of corn at forty dollars a bag. Mrs. Caliz from Mafredi congratulated the SHI staff for the fair and said she sold absolutely everything she had on sale. There is no denying that this fair was a huge success. Male Organic Farmer of the Year is Mr. Gordon Zuniga of Punta Gorda and Female Organic Farmer of the Year is Ms. Rita Chiquin of Forest Home Village.

We want to give special thanks to our sponsors. Without them, the fair wouldn't have been possible. We truly appreciate the various contributions they gave to SHI. We thank them for promoting "Living Organic". They are: Scotia Bank Punta Gorda, Toledo Farm Supply, Pro-World Belize, Belize Defense Force, Beth Roberson and The Belize Ag Report, Elizabeth Kearns, Florence Johnson, Arsenio Witz, Alistair King, Robert Jonathan and Beverly Griffiths, Susan Chamberlain, Emily Ramirez, Brian and Anne Holland, Ella and Lorenzo Forbes, Tumul Kin Center of Learning, Roots and Shoots from Consejo Shores.

BEYOND THE BACKYARD

GROWING GREEN

By Jenny Wildman

I used to wonder why there were not more green vegetables in the market until it occurred to me that since leafy vegetables are best picked fresh they were probably growing in home gardens. Sure enough! Chaya, callaloo, dasheen, spinach, pumpkin and various herbs were found plus several I was not familiar with. One bush with large love heart leaves adorned with white candle-like flowers smelled deliciously fragrant of anise and black pepper. The taste test was disturbing though, as it immediately numbed my lips and tongue. Well if the Mayas have been using it for centuries it must be worthy of inclusion in the kitchen so I did some more research to be absolutely sure before experimenting at the stove. There are many different varieties in the piper pepper family and I am told there are more than 20 right around us. The one I had encountered was Hoja Santa (Sacred Leaf) Piper Auritum which is said to relieve stress and anxiety much like kava kava. Another Piperaceae family member is Piper Aducum or Matico found all through the Caribbean and tropics. It was discovered that applying the leaves to wounds would stop the bleeding and was used as an antiseptic on ulcers and wounds. I have the belief that many of the piper family have this capability.

Other names for Hoja Santa are: Mexican pepper plant; false kava; anisillo or root beer plant. Yes it really does taste like sassafrass and sarsparilla both used in the creation of root beer. Although not related they all contain safrole. It is used as a flavouring and condiment for soups and eggs. It can be stuffed with chicken, fish or other meats, rolled like enchiladas or used for tamales. There is a goat cheese, which is wrapped in the leaf giving it a distinctive peppery taste. In Mexico there is a green sauce mole verde and a green liquor made from this plant. It can also be used to flavour cocoa and chocolate or dried and made into a tea but best picked straight from the bush. It apparently likes moist soil where it receives the morning sun and is protected from the afternoon heat and winds. If you want to plant it, give it plenty of room to spread as it can become portly as well as stately.

Another plant found locally is epazote (Dysphania Ambrosioides or Chenopodium); other names are mastruco, paico, Jesuits tea, wormseed and many more. It is an annual, growing to about 3 feet in height with lanceolate leaves and sprays of small greenish yellow flowers which turn to black seeds. To some it is considered an invasive species but its uses and capabilities are endless both in the kitchen and medicine cabinet. It contains ascaridole known to expel worms and can be used against most tropical parasites using both leaves and seed. A decoction is made for worms, as a mild laxative, calming nerves, malaria and asthma. Externally it can be applied to wounds, bruises, fractures, fungal infections, hemorrhoids and arthritis. It seems to have been used by all indigenous people of Central and South America for all manner of disorders. It was even worn as a bracelet as adornment, probably to ward off insects, as fresh leaves are thrown on the fire to drive away mosquitoes. I currently do not have a plant of this so can not try out all of these claims. It is an active ingredient in a well-known pesticide so it must work. Its strong skunky smell alone is probably enough to expel parasites. The pungent anise, fennel type taste makes a very good seasoning for quesadillas, enchiladas, soups, stews and very often in beans as it is also said to prevent flatulence.

Many foods traditionally included leaves that helped maintain a healthy body fortifying the blood and preventing parasites. An example of this is cole slaw which uses raw cabbage and garlic. Modern diets have been forgetting the importance of these natural additions to meals and you will mainly find these growing in villages still using the ways of their ancestors. So take a leaf out of my book plant and grow green

CAUTION: Do not use during pregnancy

NEVER OVER USE ANY ONE HERB OR SPICE .

When used correctly the plants of our kingdom are no more dangerous than commercially created products but all leaves must be used with caution as quality and quantity is not regulated.

I would like to thank those who take an active interest in the plants that surround us and for the letters I have received from you with your experiences and questions .

Send any comments or your recipes using these leaves to the editor or Jenny Wildman

Jenny Wildman
spectarte@gmail.com

Belize's Variable Weather

By Dottie Feucht

"Normal" is not a good adjective to use for Belize's weather. Even though small in size its weather, especially rainfall, can vary considerably even within a five mile square area of the same elevation on the same day. According to the Belize National Meteorological Service (BNMS), which collects rainfall data from all six districts every day, rainfall also varies from year to year in the same region. The variableness takes its toll on agriculture as farmers try to plow and plant to take advantage of rainfall.

June to November is generally known as the *rainy* season but it begins in early May in Toledo and early June in Corozal. The rainy season is determined by the first occurrence after the 1st of May in which there is more than an inch of rainfall in seven days with at least four days receiving some rainfall. The southern region has the most rainfall with a mean of 160 inches (4064 mm) per year; July is by far the wettest month there. In the central region are primary and secondary maxima occurring in June and September. Each of these is significantly less than the single maximum for the south. Data for the northern region show that rainfall is usually much less than the other regions; the annual mean there is only 60 inches (152 mm).

The season in August, called *mauger* (pronounced "magah") is a week or two of dry, calm weather (which brings out the biting insects) in all the districts except Toledo.

Ever wonder about the origin of thunderstorms? Belize, at 17 degrees latitude, is in the narrow zone where low-level northeasterlies from the northern hemisphere and the south-easterlies from the southern hemisphere meet, and the air is forced to rise. This is called the *Intertropical Convergence Zone* (ITCZ). The resulting thunderstorms in Belize usually come ashore first in Toledo and as they travel northwest hit the peaks of the Maya Mountains with heavy rainfall.

The "hurricane season" is generally designated as July – October but most have occurred in September when high-level wind flow disturbances combine with hot, humid air at low levels and the huge reservoir of heat energy in tropical waters. Hurricanes usually lose wind force when they come ashore and lose the heat energy from the sea but even as downgraded tropical storms we still receive heavy rainfall.

Rainfall from October through April is dominated by cold fronts moving southward from continental U.S. BNMS reports that a cold front moves across Belize about once every 10 days. The transition from that southerly flow to the ITCZ and the high pressures over the Atlantic occur in March and April, the height of the *dry season*. In 2011, with almost no rainfall in those 2 months, dry season lived up to its name.

The graphs below show the total monthly rainfall data for 2009, 2010, and through August of 2011 for Belize collected by BNMS from stations in

(1) Southern Region - Punta Gorda and TRDP (Toledo), Melinda (Stann Creek)

(2) Central Region – Belmopan and Central Farm (Cayo)

(3) Northern Region - Consejo (Corozal) and Tower Hill (Orange Walk District).

Horticulture management volunteer

Ya'axché Conservation Trust is a community-oriented NGO in Toledo whose mission is to conserve biodiversity and advance sustainable development. Within our sustainable livelihoods program, we assist smallholder farmers to develop organic horticulture and cacao-based agroforestry, which offer potentially lucrative sources of income for local farmers whilst protecting precious rainforest and coral reef ecosystems.

An exciting opportunity has arisen for a volunteer to manage our organic greenhouse and tree nursery, which produce seeds and saplings for distribution to local farmers as well as revenue to support our philanthropic activities. The role will involve the following duties:

- Daily care of crops
- Managing two horticultural technicians
- Developing and implementing planting schedules
- Forging connections with local markets and organizing distribution
- Keeping records of production and sales
- Testing innovative farming methods (i.e. new crops, varieties and techniques)

The successful candidate will possess the following skills and qualities:

- A minimum of one year's experience in horticulture, preferably organic
- Ability to manage two horticultural technicians
- Pro-active (our staff our friendly and able to assist with horticulture and business expertise but you will be the driving force behind the success of the greenhouse)
- Willingness / ability to commit to a minimum of six months

The following would be desirable:

- Experience running a successful business
- Experience in a management role
- Formal qualification in horticulture or a related subject
- Practical skills, such as carpentry or mechanical skills
- A sense of humour

Free accommodation is available at Ya'axché's field station, where the greenhouse and tree nursery are situated. Accommodation is in a bunkhouse with shared cooking and bathroom facilities. There is solar power and Internet access during the day. The field station is near to Golden Stream village on the Southern Highway, approximately 30 miles from Punta Gorda.

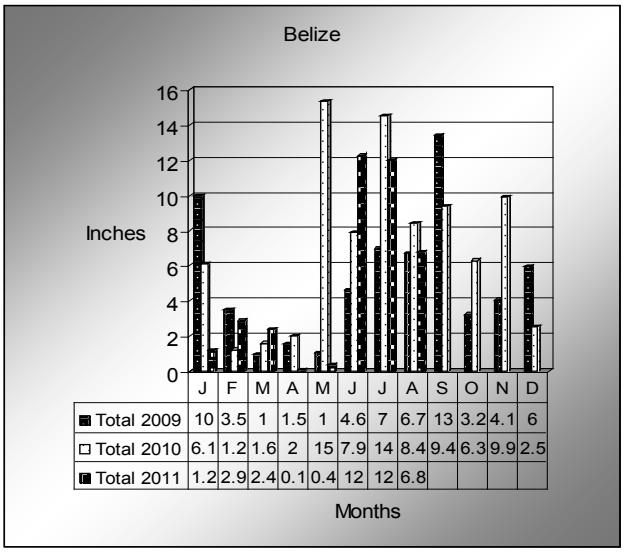
Benefits of volunteering with Ya'axché include:

- A chance to live and work in a peaceful and beautiful rainforest setting
- Being part of a dynamic, multi-cultural team of committed individuals
- A chance to make a positive impact
- Appreciation for your dedication and hard work
- A chance to build your skills and experience

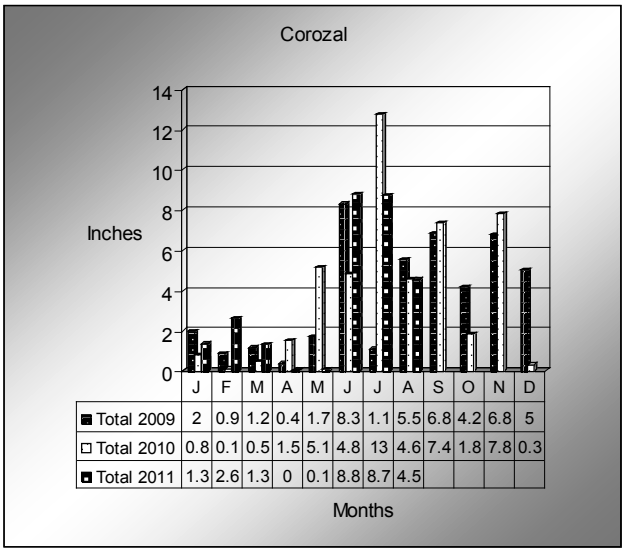
To apply, please send your c.v. and a cover letter to james.lord@yaaxche.org by 1st November.

RAINFALL

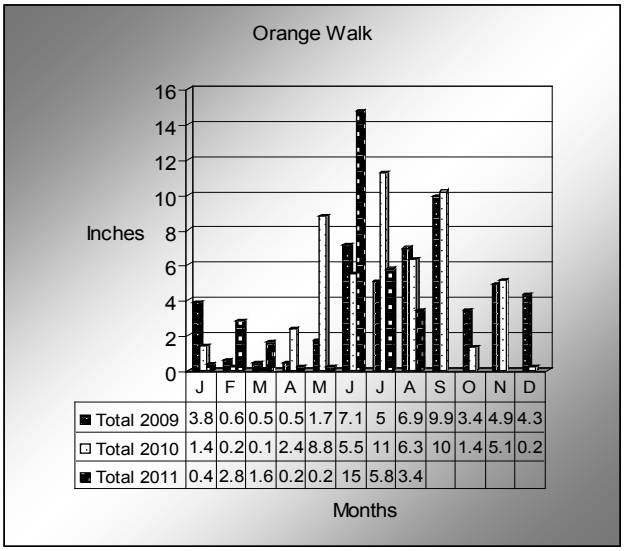
Charts Prepared by Dottie Feucht



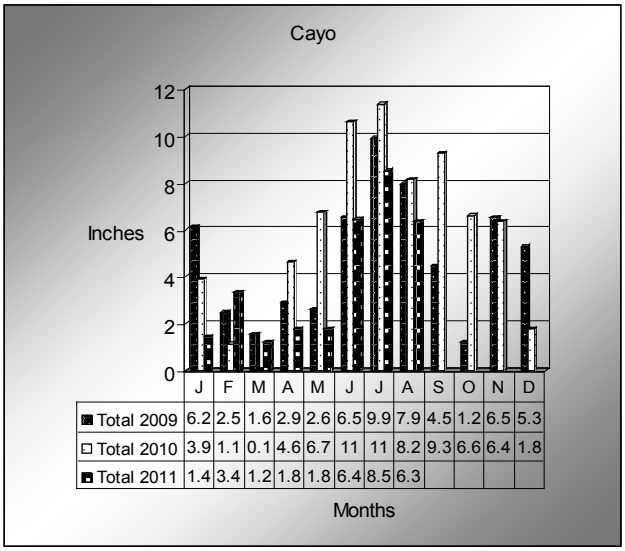
	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	10	3.5	1	1.5	1	4.6	7	6.7	13	3.2	4.1	6
Total 2010	6.1	1.2	1.6	2	15	7.9	14	8.4	9.4	6.3	9.9	2.5
Total 2011	1.2	2.9	2.4	0.1	0.4	12	12	6.8				



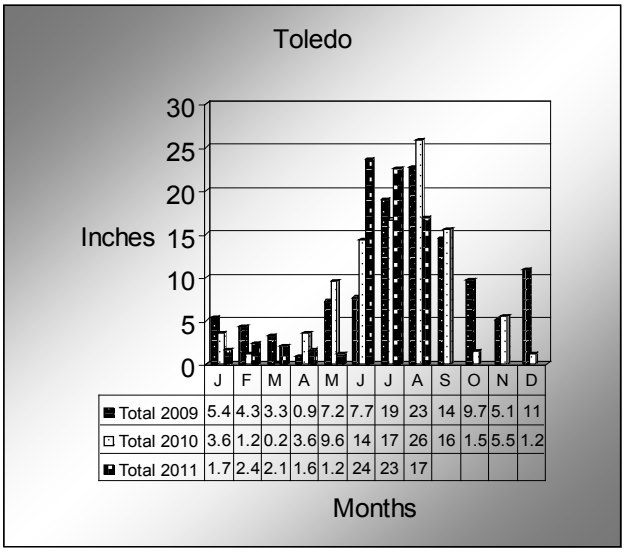
	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	2	0.9	1.2	0.4	1.7	8.3	1.1	5.5	6.8	4.2	6.8	5
Total 2010	0.8	0.1	0.5	1.5	5.1	4.8	13	4.6	7.4	1.8	7.8	0.3
Total 2011	1.3	2.6	1.3	0	0.1	8.8	8.7	4.5				



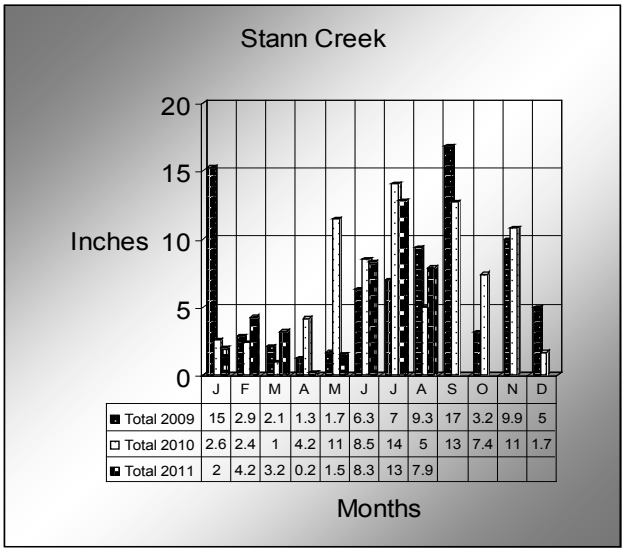
	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	3.8	0.6	0.5	0.5	1.7	7.1	5	6.9	9.9	3.4	4.9	4.3
Total 2010	1.4	0.2	0.1	2.4	8.8	5.5	11	6.3	10	1.4	5.1	0.2
Total 2011	0.4	2.8	1.6	0.2	0.2	15	5.8	3.4				



	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	6.2	2.5	1.6	2.9	2.6	6.5	9.9	7.9	4.5	1.2	6.5	5.3
Total 2010	3.9	1.1	0.1	4.6	6.7	11	11	8.2	9.3	6.6	6.4	1.8
Total 2011	1.4	3.4	1.2	1.8	1.8	6.4	8.5	6.3				



	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	5.4	4.3	3.3	0.9	7.2	7.7	19	23	14	9.7	5.1	11
Total 2010	3.6	1.2	0.2	3.6	9.6	14	17	26	16	1.5	5.5	1.2
Total 2011	1.7	2.4	2.1	1.6	1.2	24	23	17				



	J	F	M	A	M	J	J	A	S	O	N	D
Total 2009	15	2.9	2.1	1.3	1.7	6.3	7	9.3	17	3.2	9.9	5
Total 2010	2.6	2.4	1	4.2	11	8.5	14	5	13	7.4	11	1.7
Total 2011	2	4.2	3.2	0.2	1.5	8.3	13	7.9				

Data from Belize Hydromet

Unusual Edibles

By Beth Roberson

Headhunter's Asparagus

Sauropus androgynus, in the spurge family of Euphorbiaceae, has a native range from India to Malaysia.

Very popular in Asia, where it is known variously as: katuk, mani cai, cekur manis, pucuk manis, sayur manis, star gooseberry, rau ngot, Sabah vegetable or sweet leaf, in this hemisphere the popular name is 'tropical asparagus', although it is not at all related to asparagus. (The stems are often eaten and have the texture of asparagus.) After researching the tasty perennial shrub, we have dubbed it 'Headhunter's Asparagus' – from its infamous culinary history of its leaves being the garnish, historically in Borneo, for 'long pork' (human flesh). Recently having attracted the attention of North American culinary crowd seeking out 'new' exotics, a local seed merchant introduced me to this delight.

The leaves, young and old (younger of course more tender for raw consumption in salads, etc) and stems provide an estimated 6-10% protein, as well as many vitamins and minerals, a higher level being in the more mature leaves. Provitamin A, B, C and K are to be found – in fact, this is one of the few plant sources for vitamin K. Sauropus androgynous received some bad press a few years ago in Taiwan, when it was the 'fad diet' for weight loss. If consumed excessively it can cause lung problems (purportedly from alkaloids – which may break down with cooking). The seeds and stunningly beautiful flowers are also edible, although I cannot claim to have eaten those. My favorite part for nibbling is the small stem. Many cultures favor the leaves in salads (mixed with other greenery). Other popular uses are with eggs – it excels as addition to quiche, using both leave and chopped stems. Chefs appreciate that it does not lose its dark green color after cooking, and we have used it in place of broccoli in recipes. An Asian traditional culinary partnership is eggs with it and anchovies. The flavor is closest to snow peas – very sweet tasting and pleasant smelling. Some websites describe it as also close to 'peanut taste', but for the cultivar we have sampled, we have not encountered this allegedly peanutty aspect. Used worldwide in soups (with crab, minced pork or dried shrimp), or as you like, this is a versatile veggie with giant possibilities.

It is also utilized frequently as medicine in Asia. In both Vietnam and Indonesia, its touted glories include increasing milk supply for nursing mothers. (Boil the leaves, drink the water.) Also it is reputedly antipyretic (lowers fever) and a remedy for mumps.

The low maintenance perennial bush, reaching 6-7 ft high (if you are not eating it down), thrives under varied conditions – semi-shade to full sun, tolerating soils from acid to clay and is easy to cultivate from seeds or perhaps easier from cuttings. It can be planted under or around trees where it may adapt growth to a vine-like fashion. Try it as a hedge – just plant sufficient and plant this one close to the kitchen or where you often stroll (for a handy snack). My internet search shows that it is highly disease and pest resistant – although some insect finds it tasty at my Cayo home. Spraying occasionally with hot pepper spray has been effective to detract them. It Is said to tolerate heavy harvesting and will regenerate easily. Many cooks strip the leaves, then plant the stem; I find the crunchiness of the stems much too tempting to allow much planting like that.

"Let food be your medicine, and medicine be your food..."

Hippocrates

The Paddy Straw Mushroom.

Dr Alessandro Mascia, BMBS, CHEd

In this issue let us discuss one of my favourite mushrooms (yet another one!), the Chinese Paddy Straw Mushroom, also known as *Volvariella volvacea*. Any of you that like Chinese food will be familiar with the appearance and taste of this mushroom and will probably agree that it adds that special something to a meal prepared with it.

The Paddy Straw Mushroom is a pan tropical species that thrives at warm temperatures (75-95°F or 24-35°C) with an extremely rapid life cycle, making it one of the most suitable mushrooms for cultivation in warm climates. In subtropical and tropical Asia, many rice farmers rely on the cultivation of this mushroom as a secondary source of income from cultivation on waste rice straw. (Hint, hint to all you rice farmers.) In fact, it has become an economic mainstay in the agricultural economies of Thailand, Cambodia, Vietnam, Taiwan and China.

As I am talking about it, and I have consistently talked about mushrooms that grow in Belize, especially Toledo District, our esteemed readers can probably guess that yes, this mushroom grows here in the wild state. I will qualify that statement: while I haven't actually found it growing in the bush or in a "natural" setting (haven't looked hard enough, really because…), it crops up with consistent frequency in the piles of chocolate waste that I use for composting; so we generally get to eat it at least every month in the wet season, without doing any work!

This mushroom's most distinctive feature is its volva, or cup at the base. It does not have a ring, or annulus on its stem and carries a cap which is between 5 to 15 centimetres broad. The cap is generally smoky brown to cigar brown to blackish brown, which tends to fade with age or exposure to light. The gills are free and initially white, becoming pinkish with maturity. The stem is 4 to 20 centimetres long and 1 to 1.5 centimetres thick, white to yellowish, solid and smooth. And of course, the base is encased in a thick volva. The spore print is pink to salmon brown. Perhaps a photograph of some of these mushrooms I've found will help this description:

As many of you will know, this mushroom is generally harvested at the stage when it still has the egg shape, that is, before the universal veil breaks. This is when the flavour is best and it is in the form most suitable for market. The nutritional profile is as follows: 26-30% protein, 40-50% carbohydrate, 9-12% fibre and 9-13% ash. The mushroom is also apparently rich in vitamins B and C with an assortment of amino acids. None of the literature I consulted listed any medicinal qualities, unless you consider sitting down to have a tasty meal as medicine!

As mentioned earlier, it is used in a wide array of Asian dishes, being sliced thin and stir-fried or as a condiment for soups. I have also eaten it as a crunchy snack in Singapore, being freeze dried and flavoured with different spices to be eaten much like salted peanuts. Stamets, another of my favourite mycologists, recommends injecting onion-soaked soy or tamari sauce via syringe into each Paddy Straw "egg", covering with foil and baking in an oven at 375°F (190°C) for 30 to 45 minutes. The mushroom is then eaten whole and "explodes in your mouth creating a flavour sensation *par excellence*." Though I haven't tried this myself, it does sound like a good endorsement on the quality of this mushroom.

Go forth and spread the spores!

The Domesticated Commercially Grown Turkey

by Orlando Habet

Manager, Belize Poultry Association

Unlike the wild turkey which is native to the Americas and which can run and fly, the commercial turkey has been specifically bred for its huge breast and tender meat. (Broad Breasted White was bred in the 1950's for commercial use and today constitutes the majority of the turkey line available.) The most prized portion of the turkey is the white meat of the breast. Because Americans like white meat so much, turkeys are bred to produce large breasts. The domesticated turkeys have such large chests that the male, "tom turkey" is not able to fertilize the eggs of the female, "hen turkeys" in the natural mating position. Today, turkey eggs are fertilized by artificial insemination for the hatchery. Although the natural colour of the turkey is black, commercial species are white-feathered. Most birds reach about 22 lbs live weight in 15 weeks due to the constant availability of carefully, formulated feed, and ample water supply, controlled environment housing and superior management conditions. The food is designed to retain water in the body. Consequently roasting loss is significant.

Belize produces most of the turkey meat demanded by our consumers. In 2010, the local industry produced 34,956 turkeys with a dressed weight of 439,879 lbs. Turkey eggs for hatching are imported for production but when there is a short supply of eggs, day-old poults are imported. The young turkey (poult) is very delicate and requires tender care during the first few weeks of life. In Belize smaller turkeys are available because they are grown to satisfy the market demand which requires small, medium and large turkeys. The higher turkey demand is in November, (US Thanksgiving holiday) and December, during the Christmas holidays. In the past 5 years, a notable increase in consumption has been noted in the period May-June which coincides with Belizean college (US high school equivalent) and university graduations.

Turkey meat is naturally dry because the bird does not have a chance to create a fat layer that actually provides taste. For this reason carcasses are injected with vegetable oil solutions, water and salt to render it "self basting". Injecting a turkey with a flavoured liquid is a good technique for producing moist, flavourful meat. Flavouring the surface of the turkey with marinades, rubs, sauces, and seasonings provides additional flavour, but flavouring the surface does not penetrate the meat. A meat injector must be used to allow the flavouring deep into the meat of the turkey. Many variations of spiced or herbed liquids can be used, but other ingredients, such as sherry, wine, beer, flavoured vinegar, and seasoned oil can be used as well

Note: Butterball is a brand of turkey and other poultry products produced by Butterball LLC. The company's headquarters are in Greenfield North off Interstate 40 in Garner, North Carolina.

The BPA encourages all consumers to purchase local turkey. Purchasing local Belizean turkey guarantees you fresh, tender and flavourful meat.

Belize Sugar Industry...Continued from page 1

The revised law was seen as an intermediate stage that would require further reform to complete deregulation of the industry.

However, the failure to fully implement the new law and prepare for further reform was cited by ING Bank as one of the principal reasons they lost confidence in the industry and decided to withdraw their investment in Belize Sugar Industries (BSI). Banco Atlantida also made legislative reform a condition precedent to an investment as they rightly recognize that under the current system the industry is not sustainable. Even within the farming community, a constitutional challenge to the law was successful in the Supreme Court. Instead of change, today we still have political agents sitting at the helm of important regulatory bodies such as the Sugar Industry Control Board, intervening on a daily basis and making decisions for what is a privately owned industry! Without a drastic change to deregulate the sugar cane sector, any serious investor will shy away or require significant government guarantees to accommodate their investment. I would posit that except for phytosanitary, plant health and some agronomic extension work, the government should leave the current and future investors (farmers included) to administer their business as they see fit.

At a time when global sugar prices are at historic highs and expected to stay so for a while, Belize sugar production is on a downward trend. For the last five years we have seen a decline in sugar production from an annual average of 112,000 tons for the period 1996 to 2006 to an average of 90,800 for 2007 to 2011. Average sugar cane production for the 07 -2011 period is 1.01m tons with varying quality and conversion to sugar ratio. This coincides with the coming on stream of BSI's BELCOGEN cogeneration plant which is premised on a throughput of 1.25 million tons of cane per annum. The investment is starved of sufficient cane supply yet the rules prevent them from going beyond existing farmers to acquire cane. This is at the heart of BSI's woes as their financiers saw no improvement on the horizon. Last year government stepped in to provide a BZ $10m bridge financing to alleviate BSI's cash flow and it seemed the days were getting darker. However, from adversity has come a glimmer of hope as last year's memorandum of understanding (MOU) between government, cane farmers and BSI led to implementation of delivery by appointment and payment by "relative cane quality" and this has significantly increased conversion rate from 12.75 to now 8.57 tons of cane to make 1 ton sugar and seen farmers being rewarded (although by group) for supplying better quality cane. This crop will see a record high final average price estimated at $70.91 with quality-based payment spread of $6.97 from $66.86 to $73.83. Government and the banks have once again made this a requirement for a rollover of their funding facilities and we trust the results will be even better. Imagine how farmers could benefit if a system to pay them individually for the quality cane delivered can be instituted.

We always hear of potential new investments in sugar cane to produce sugar, ethanol, and electricity among others; however, none have materialized as yet. At the moment, we hear of two with the most prominent being Destill Belize, the new owners of the old Libertad factory. However, if the cane supply is already insufficient to serve BSI, where will the new cane come from if Libertad is to reopen in 2012? This illustrates the dire need for formulation of a comprehensive sugar cane industry policy by government in consultation with all stakeholders. BSI and the current cane farmers should be joined by other processors and farmers as we seek to expand the base of the industry. A properly articulated policy would assure the existing stakeholders of their continued operations but provide enough room for new entrants. This policy would need to promote fair competition and equity among stakeholders and allow for some of the current stakeholders to exit if they wish. Money for all of this is available through the premiums being paid to farmers under the Fair Trade scheme and from the EU Sugar Accompanying Measure which allocated BZ$135m to be used by Belize. These EU funds are on a time bound "use or lose" basis with the potential for an additional allocation of BZ$ 73m already earmarked. It is unfortunate that to date more of this money has been spent on road improvement than to provide for industry reform to become competitive and to diversify within or outside of the industry.

World market prices for sugar usually reflect a dump market except for times like now when serious undersupply is evident. We are too small to impact world prices and therefore must depend on more secure long-term markets such as the EU. The EU has already commenced preliminary work to further open their domestic market and this should take effect by 2015. If we do not undertake urgent systemic reform, our industry may be unable to compete on the future EU market. We have the US and Caribbean market but they are much less reliable and are also under pressure to reform. In short, if we can't improve volume, quality and overall competitiveness in a short time the sugar industry will face certain decline or become dependent on subsidies.

Government has said they expect to be repaid the outstanding money loaned to BSI and that the industry must acquire its own resources. This is a very responsible approach that must now be complemented with the proper deregulated framework that will allow the industry to reorient itself and become attractive to both domestic and foreign investors. Cane farmers must shed their militant approach for a business approach and undertake serious reform if they are to remain in sugar cane production. BSI is actively seeking a strategic investor to strengthen their operation and many other investments could materialize both in farming and processing if the business environment is set right. Our export markets for sugar are rapidly opening to increased competition; we can only survive if we shed the closed system that is currently failing us. The status quo is not an option!

Agriculture Prices at a Glance- $$$$$

November- December 2011

A-B denotes the difference between 1st preference & second preference and sometimes between wholesale & retail and bulk or small amounts. Trend (H) means Higher over last 30 to 60 day (L) Lower (S) Steady
Prices intend on being farm gate in Belize dollars - usually price per lb

Belize Cattle	T	A	B
Young strs. & bulls- 750- 1100 lbs	L	1.05 -1.15	.95 - 1.05
Cows & heifers for butcher	L	.80 - .90	(thin).75 - .80
Heifers for breeding 500-800 lbs	L	1.20 - 1.25	1.10 - 1.20
Young grass cattle- 350- 650 lbs	L	1.10 - 1.20	1.00 - 1.10
U.S. price -corn fed- 1000- 1200 lbs	H	1.22-US=2.44-Bz	
U.S. price - feeders 600- 800 lbs	H	1.40-US=2.80-Bz	
U.S. price- calves 450- 600 lbs	H	1.50-US=3.00-Bz	
U.S. price- aged butcher cows	H	.90-US=1.80-Bz	
Belize Hogs			
Weiner pigs- 25 -30 lbs- by the head	S	$95.00 - $100.00	
Butcher pigs 160 - 230 lbs	S	1.75 - 1.85	1.70 - 1.75
Belize Sheep			
Butcher lambs	S	2.00 - 2.25	1.75- 2.00
Mature ewes	S	1.70 - 1.75	1.60 - 1.70
Belize Chickens			
Broilers- live per lb	S	1.21 - 1.23	1.19 - 1.21
Spent hens	L	.70 - .72	.68 - .70
Fruits & Vegetables			
Tomatoes, cabbages, cucumbers	S	whosal/75-1.75-ret-$1.00-$2.50	

Grains, Beans & Rice	T	A	B
Belize yellow corn	L	.29 - .30	.27 - .29
White Corn	L	.34 - .36	.33 - .34
Corn/ local retail (low volume)	L	.33 - .38	.31 - .33
U.S corn @ 6.53-per 56 lb bushel	L	$23. 50/ BZ 100# +12¢/lb frt. to BZ	
Guatemala corn price/Peten	L	.36 - .38	.34 - .36
Belize milo	L	.26 - .27	.25- .26
R-K's, little reds & blacks (beans)	S	1.40-1.50 farm price	
Black eyed peas	S	.85- .90 farm price	
Milled retail rice per pound	S	.87- .88 farm price	
Citrus			
Oranges per 90 lb box-lb.solid basis	S	$12.00 Est. 2011 price	
Grapefruit- per 90 lb box	S	$ 6.00 Est. 2011 price	
Sugar			
Cane per ton- est. 2011 price	H	$78. 00	
White sugar- 112 lbs- controlled	S	.45 per bag + 3-5 cent mark up	
Brown sugar- 112 lbs- controlled	S	.39 per bag + 3-5 cent mark up	
Special farm items			
Eggs- tray of 30 eggs	H	6.67 farm- retail .27 per egg	
WD Milk per lb to farmer	S	contract .50 & non contract .35	

***These prices are best estimates only from our best sources and simply provide a range to assist buyers and sellers in negotiations. ***

Dear Ag Readers: We are very happy to have missed the brunt of Rina, although we got some rain that didn't help because of Hurricane Harvey in August Corn harvest has brought down the corn prices by about 25%. Cattle prices have softened because of the Guatemala buyer's lack of interest. The ag future is very bright because of our great export potential for livestock, grain and beans. We just need to get our trade agreements so they work in the field as well as in offices. Our Sanitary Livestock program continues, slowly but surely and we are looking at spring to start. Our agriculture depends on exports for everything -One critical grain is rice- another one is pork and our inability to export processed meat. To many hurdles and not enough speed or athletes.
All the best- John Carr

LIGHT REIN

By Marjie Olson

As of 2012 Marjie Olson has the approval to begin an exciting equine association here in Belize. The 3D and 4D divisional formats have made the **National Barrel Horse Association** (NBHA) a truly unique organization. Plans are in the making to be able to run NBHA-approved barrel races all over Belize and have people run for great year end awards. Even beginners have a chance to win money and prizes.

The NBHA, headquartered in Augusta, Georgia U.S.A. is the largest barrel racing organization in the world. In 1992, the NBHA revolutionized the barrel racing industry by pioneering the divisional format, which allows riders of all skill levels a chance to win money and prizes in barrel racing competition.

NBHA has over 24,000 members of all ages across the United States and affiliates in twelve countries: Australia, Brazil, Canada, China, France, Hungary, Italy, Mexico, Panama, Spain, Switzerland and the Netherlands. Find out more about barrel racing's international presence at **NBHA.com/ibhf**.

NBHA official home office events to date have paid out $13,157,330.00. Added money is over $3 million

Q: What is the National Barrel Horse Association?

A: The NBHA is an international equine sport association whose purpose is to: Promote the sport of barrel racing and its growth on local, state, provincial, national and international levels. Increase the number of participants. Improve the quality and safety of shows. Enhance the image of barrel racing. Provide all barrel racers, regardless of age, sex or experience, the opportunity to compete for prize money, awards and points in local events throughout the year so they may qualify to compete in NBHA state/ provincial, national and world championships.

Q: Why should you join the NBHA?

A: You will become part of an international barrel racing organization developed to improve your sport, making it better for you and all other barrel racers. The sanctioning power of the NBHA helps to improve conditions at existing shows and to upgrade arenas to meet NBHA safety standards and show requirements. You can ride in sanctioned shows, close to home, to compete for NBHA points and prize money and qualify for year-end awards, state/provincial, national and world championships. The NBHA is designed primarily for the local weekend competitor. **You will have the opportunity to compete for more prize money and awards plus district, and state/ provincial, national and world titles. The NBHA 4-D format means more entries and larger purses, but more importantly, it gives YOU a fairer chance to win**

If you are a barrel racer or if you want to become a barrel racer the NBHA is **"THE"** association to join!

Watch for fliers and newspaper ads as well as ads here in the Belize Ag Report for barrel races in 2012. Opportunities are endless; besides winning beautiful gist silver buckles and NBHA merchandise...you could compete in the USA at the prestigious **NBHA WORLD CHAMPIONSHIPS!** There will be delegates from Belize attending the 2013 world shows, I am sure of it! Contact Marjie at **Shotzy08@live.com** or 663-4609

Photo by Cheers

2nd Annual TRIPLE CROWN ENDURANCE RACE

WINNERS: HANNAH PERSHING riding Lil Bit! $375 6pts

2nd place Cesar Xi riding for Banana bank $225 5 pts

3rd place Joel Neal riding for Banana bank $200 4 pts

4th place Chrissy Tupper on Fred 1 pt

The event was produced even better than last year: perfect course, excellent footing in arena, 3 Polar digital heart monitors, better staging area and parking, better advertising covering more of the country and great sponsors (again), … Just all around what you expect for an event of this caliber to be for its second year. So…then why do we have a low number of entries for the endurance race???

The TCER had lowered the entry fee, from $200 last year to $150 **and** added $750 more dollars to pay for the laps **and** did not change the guarantee of the $1500 extra payoff at the end even with three champions instead of two. Over all, less money to spend for the entries, much more money and more ways to win for the entries…so…why the low turn out one would ask? We now have only four horses that go for the final $1500 additional dollars and the titles of CHAMPIONS.

As frustrating as it is, the BEA and LRF are proud to produce the most professional equine event in the country. And *can not* thank our sponsors enough. **Belize Natural Energy and Reimers Feed Mill have been so supportive and we could not do this event without them!** So how do we get horseman to be supportive? If anyone has serious suggestions, please let me know. I know the biggest deterrent is the "no way to get the horse there" but unless we can get a bus converted to a giant horse trailer and schedule pick ups… yeah, that's not gonna happen.

Companies like **Yalbac Ranch and Sawmill** and the **Belize Ag Report** have a small stake in the hopes of the TCER doing well as they at least provide a service for horse enthusiasts. And I'm sure the **San Ignacio Hotel** hopes to gain a few rooms. **Cheer's** restaurant, I would hope, would get a few dinners on the way home from folks stopping by and **Mega Foods** is new enough, that having their name seen everywhere on the T's is good. **Running W** is also pretty big into horses, so having the support of them seems natural. **BIO MEDS** is a new sponsor and has great equine stuff, but how do we show people the product if they aren't there to see it? None of these fabulous businesses will want to continue to support even our top notch event, if folks don't come and without sponsors, the TCER has no chance of survival. **Uckele** is a company that LRF has done business with for years and with the economy suffering in U.S. it is a blessing they still support us. **Olde Mill** is always a huge help and supports us no matter what. Thanks, Johnny!

We had a better turn out for the speed classes, even in the rain! Kicking off our "Barrels" event were all of the BEA students doing a demo of how they practice and it was so fun! From 13 to 4 yrs of age, they all did an amazing job and Marjie Olson was a very proud trainer.

John Carr and his sweet palomino gelding was back in a snaffle and he and his daughter, Liesa, had fabulous runs in the cloverleaf with John winning it! Trey and Finishing Touch took the 2nd Division and Chuck Curcio and Denito took the 3d Division. It was our first time paying out the 3 divisions and it was super! Even with a $5 entry John won $30 and Trey won $18 and Chuck $12, each with 5 points in those divisions towards the beautiful breast collar and buckles… The "Poles" event was a blast and Amir on Pinto won the 1D and has 5 pts toward the breast collar and Cesar Xi won the 2D and has 5 pts towards a buckle! Asad Bedran won the flags and he and Davina Bedran won the relay after the Banana Bank team just passed off the baton a few strides too late.

We expect a really fun year coming in 2012 with the NBHA coming to Belize and the 3D format paying 3 winners instead of one! And our new Farm Tek timers that go to the .000, that's 1000th of a second, will keep it all honest and fast!

We have already heard we will have more horses for the November 5th and Dec 10th TCER and I hope more spectators as well. It makes for a fun family day and the Barn and Grill has such great food, you can't help but enjoy yourself! Come and join us and see the most professionally run horse event in Belize!

Photo by Chrissie Tupper

Dead Ringer of Barrel Race

By Leisa Carr-Casares

John Carr, TCER October 2011

Age won a feather in its cap as 70 year old John Carr won the barrel racing event over 8 other contestants, all much younger than the true blue cowboy, with a cool 19.9 seconds on the clock. The younger contestants, ranging from ages 12 – 50 years old, were unable to match the expertise and horsemanship shown by Cowboy Carr. We also must give recognition to his trusty steed, Lucas, whom John has ridden on several occasions, and who has repeatedly given an outstanding performance. The event was part of the fun at the Belize Equestrian Academy on October 1st for the first portion of the Triple Crown Endurance Race.

Carr learned to ride a horse before he learned to write his name. He has been a cowboy for as long as he can remember and his hat and boots have been his traditional attire practically since birth. As a young boy in central Montana horses were a part of daily life whether it was riding them to get to school, herd cattle or simply to have fun; his life circled around horses. As a teenager in the 1950's John was already winning rodeo titles across the mid-west USA and Canada. He entered in all events from bronc riding to calf roping to steer wrestling and even rode a bull now and then which won him the title as *All-Around Cowboy* many times over. Upon arriving in Belize in 1977 he whole-heartedly got involved in the rodeo featured by the National Agricultural Show and shared his experiences with many young aspiring cowboys. At Banana Bank he often held small fun events including roping and wrestling calves. Today, at 70 years of age, he is still as natural and agile on horseback as ever. So – a piece of advice to all you young'ins from Cowboy John: "Never squat with your spurs on; never kick a cow pie on a hot day; always drink upstream from the herd; and good judgment comes from experience **but most experience comes from bad judgment**!!!"

John Carr 1959
Wilsall, Montana

Converting a Gasoline Engine to Butane

By Scott Ophof

There are cars that run on various mixes of propane and butane in quite a few countries around the world. Here we're talking about a 50-50 mix of propane and butane, but I'll just call it 'butane'. Estimates from 2008 are that over 13 million vehicles are fueled by butane gas worldwide, with a large percentage in India. The main point in favor of butane is that it enters the engine already as a gas, not as fine droplets of fluid gasoline or diesel oil. So the mixing of butane with air is faster, and completed before the mix enters the cylinders. And unlike gasoline and diesel oil, no heat is lost in converting from fluid to the gas state. Let's start with the bad points. If they turn you off, then read no further.

Why PASS on the idea of conversion?

1. You lose storage space and tote around a tank of at least 60 extra pounds—empty.
2. Your engine runs hotter, so there's more wear & tear on the cooling system, exhaust, etc. if you don't maintain the engine properly.
3. There aren't many butane filling stations and they have shorter opening hours.
4. Butane systems use your cooling system, so a bad cooling system **will** cost you—at least in economy, maybe even the engine itself.
5. Different maintenance practices and scheduling as well as a slightly different driving style are required with butane converted vehicles. Running too lean a mixture makes the engine run too hot, which can cause valves to burn or seize.

   If you ignore the required maintenance, your engine will die sooner. Don't blame whoever did the conversion if you didn't listen and follow recommendations.
6. You feel $2,000.BzD or more is too steep a price for your guzzling V8.

Why is conversion a GOOD idea?

1. Because butane is roughly half the price, or less, than gasoline in miles per gallon, taking into consideration all relevant factors.
2. With proper attention to maintenance, your engine **will** run cleaner and last longer.
3. You can reduce refueling stops by getting the largest tank that will fit. Losing some storage space is acceptable, since you're environmentally minded.
4. At 10 mpg you've paid for the conversion in about 5000 miles; 10,000 miles at 20 mpg and 15,000 miles at 30 mpg.
5. You can actually use the same mix for cooking, for the same price.

What kinds of engines should I <u>not</u> convert?

Forget about 2-stroke engines. Otherwise it's a wide open field, even diesels! The cheapest cars to convert have single-carburetor engines. The more complicated the air-intake and fuel delivery systems are, the more the conversion will cost. A multi-carb system is more complex and also more difficult to keep tuned correctly. Computers won't make much difference in cost.

Continued on page 23

U.S Yellow Corn Exports

Statistics From : www.fas.usda.gov/esrquery/esrq.aspx

1 year- Sept 1st , 2010 to Sept 1st, 2011

U.S farmers plant approx. 93 million acres of Corn ***95% is GMO

U.S farmers plant approx 78.9 million acres of Soybean ***98% is GMO

Importers	Population (millions)	Corn 100 lb bags	Soybeans
Mexico & Central America			
México	112.3	154, 689,173	168,936
Guatemala	14.3	14, 557,420	7,665
El Salvador	5.7	10, 562,141	N/A
Honduras	8.2	9, 504,375	6,391
Nicaragua	5.7	2, 601,337	N/A
Costa Rica	4.5	14, 755,339	5, 475,749
Panama	3.7	5, 796,321	61,403
	154.40	212, 466,106	5, 720,144
Caribbean			
Barbados	2.7	786,762	859,560
Dominican Republic	9.3	15, 100,992	N/A
Guyana	.78	854,469	N/A
Jamaica	2.7	5, 330,594	N/A
Surinam	.52	179,648	N/A
Trinidad & Tobago	1.3	2, 029,707	N/A
	17.30	24, 282,172	859,560
South America			
Venezuela	29.4	19, 697,787	893,729
Columbia	46.1	11, 821,925	536,385
Ecuador	14.3	4, 720,064	214,159
Peru	29.4	1, 460,105	66,248
	119.20	37, 699,881	1,710,521
European Union			
Germany	81.7	1, 383,142	62,756
Spain	46.1	7, 791,713	N/A
Italy	60.6	622,674	28,252
	88.40	9, 797,529	91,008
Other Countries			
Taiwan	23.1	52, 741,169	2,392,975
Japan	127.9	314, 706,802	14,278,893
Canada	34.6	11, 166,544	506,649
	185.60	378, 614.515	17,178,517
Total	**664.90**	**662, 860,203**	**25,559,750**

Note: Belize (333,000 pop.) is the only country in Central America or the Caribbean that is a net exporter of corn. Belize farmers raise approx. 1.2 million bags of corn per year and they believe they can double or triple that amount within the next five years. Belize exports nearly 50% of its production- mostly to Guatemala and Jamaica. Belize consumers utilize processed corn and soy products from the U.S. Nearly all mechanical/ export corn and soy bean farmers agree with U.S farmers that GMO will increase yield and quality. At the same time it will decrease the use of herbicides and pesticides. Belize was moving toward a GMO usage policy, but some special interest resistance caused the test seeds to be burned up. When it comes to the exportation of corn, the U.S is our main competitor and we need to have the same growing and genetic advantages that they have if we are going to expand and stay in the game. Food shortages and famine seem to be headline news in many world publications, and Belize needs to do our part to alleviate this critical situation.

John Carr – October 14th, 2011

WORLD FOOD DAY
Central Farm October 14, 2011

Pasture Management, Continued from page 1

Management During Rapid Grass Growth

Grass growth is cyclical. At certain times during the year it grows really fast and at other times growth almost stops. Factors affecting the rate of growth are: temperature, soil fertility, soil moisture content and day light length, i.e. time of year. Effective methods of managing pastures during rapid grass growth are to fluctuate stocking rates, mechanically harvest hay or grass silage, or leave the pasture alone and not utilize the grass at all and burn it or mow it down when time permits.

In Belize grass usually starts growing faster in May and continues through or to October. This coincides with increased daylight hours, hot temperatures and the start of the rainy season. Grass is most nutritious when it is harvested young and palatable. Mature grass that has set seed is relatively worthless as a feed. Its nutrition is poor. Harvesting grass at the correct age during this period of rapid growth is very difficult to control. It takes careful monitoring. During the period of rapid growth we need to graze or harvest the grass quickly, let the grass rest, and return to the same paddock when the grass has again reached the desired maturity. Usually this requires increasing stock numbers, reducing the size of the area grazed, or mechanically harvesting the area. It is important that the animals not graze for too long in any given area, because their eating the newly emerging grass (re-growth) too soon can damage the plant, ultimately causing death or poor growth.

During rapid growth stage animals should not stay in a paddock longer than 2 to 3 days before being moved out. Grass recovery can be as quick as 7 to 8 days but generally it is 14 to 21 days. Optimizing grass recovery requires correct stocking density, made possible by increasing animal numbers or decreasing paddock size. If increasing stocking density is not an option, it is important to move the animals before the re-growth appears.

On extensively managed pastures (range) re-growth is not as quick and therefore easier to manage. However pastures may still appear straggly and uneven, resulting in productivity loss. A bush hog or mower is a useful tool to clean up pastures if they get out of control. Most pasture farmers mow at least once a year to clean up a paddock.

Management During Slow Grass Growth

As day length decreases so do temperatures. In Belize shorter days and cooler temperatures occur from November through March, often coinciding with cold light rain for several days. Management strategy changes. Re-growth of the grass is slowing; movement of animals from paddock to paddock is no longer necessary. However because the overall production of grass per acre is now reduced, pastures are not able to carry as many animals per acre as when growth was rapid.

During the dry season, usually March/April, temperatures rise, days lengthen, and moisture levels in the soil are reduced due a lack of rain. Pasture re-growth is very slow; however damage caused to the grass by keeping animals in a pasture for too long is reduced because new shoots are slowly emerging. If animal numbers have not been already reduced, supplementary feeding is usually needed.

The cycle starts again with the beginning of the rainy season in May.

Fencing

Keeping animals confined in a pasture/paddock/camp is critical. This means adequate fencing is essential. Correct pasture management is not possible without good fencing.

Planting Grass

Intensive pasture management usually entails replacing our native grasses with improved varieties to be planted either by seed or vegetatively. However improved varieties do not achieve their maximum potential without careful pasture management. When choosing a type of grass to plant for intensive production purposes consider these factors: Is the soil wet, poor quality, fertile, sandy, hilly? All grasses have different characteristics and improved varieties can be obtained to suit most requirements. In Belize we have many improved varieties of grasses available.

It is seldom economical to change grass varieties when managing under an extensive system. Under an extensive pasture or range system subtle changes in grass varieties occur naturally with correct grass management. As more nutritious, less hardy grasses begin to increase grass cover increases as does the general health level of the soil beneath.

Harvesting

It is possible in Belize to grow exceptionally good pastures. However the difficulty is in learning how to harvest grass correctly. Grass is converted by animals into food for humans. Having adequate markets for increased production of beef, milk, lamb etc. is a problem in Belize, so step slowly, learn well and develop your markets.

To the Editor, Continued from page 5

Editor: Belize Ag Report

Little is ever reported about the legal exposure and liabilities by allowing GM seeds to be utilized by the farming community.

Legal liability for the spread of Monsanto's GM seeds is a serious threat to all farmers, whether they intentionally plant GM seeds or not.

To protect its patent rights, Monsanto enforces a "limited use license" called a Technology Agreement. Since the approval of GMO alfalfa in the United States recently, Monsanto has changed the terms of this agreement. These changes now shield Monsanto from liability associated with contamination of innocent, unsuspecting neighboring farmers and passes the responsibility to the GM farmer for keeping GM crops out of markets, elevators or other farmers' fields that do not want GM crops.

In a case of cross contamination, the victim farmer must sue the GM farmer to recover income loss from crop damages and loss of market, as the GM farmer has indemnified Monsanto against such contamination by the simple act of just opening a bag of Monsanto's GM seed. In turn, Monsanto sues victim farmer for patent infringement. Quite a clever scheme.

Thousands of farmers have been sued and spied upon for alleged "seed piracy" – at least 2,391 farmers in 19 states in the United States through 2006, according to Monsanto website documents obtained by the Washington, DC-based Center for Food Safety (CFS).

All the while, the unsuspecting farmer in Belize has had his land, field and crop "trespassed" by the natural action of the wind, as the wind has done for eons. But this time, the breeze is accompanied by 'patented' pollen owned by Monsanto that is floating about contaminating all of its local cousins with its new genetic traits that Monsanto owns.

Has anyone in position of power considered who will step up and pay the legal bills for defending Belize farmers, large and small, from Monsanto on the alleged grounds of 'seed piracy' and infringement of patents? To say that Belize will not register the patent will not alleviate the legal liability potential.

Per the Technical Agreement, all legal disputes must be settled in St. Louis, Missouri, USA. Does this imply that US law governs over the patent issues or will Monsanto be litigating based on contract law? Further the terms of this Agreement are not negotiable, and are binding upon the parties even after the farmer ceases to plant Monsanto's GM seed.

Gentlemen, we are playing with fire so they say.

M. Vargas, Cayo

WE LOVE HEARING FROM YOU!

EFFECTIVE FOR OUR NEXT ISSUE:

- Letters to the Editor should not exceed 300 words.
- Kindly identify yourself. Should you prefer your name withheld from print, tell us.
- Letters submitted to us for publication should not be submitted to other publications.

belizeagreport@gmail.com

Converting Gasoline ... Continued from page 20

Can I convert my motor-cycle? Yep, but don't mount the tank with bungee cords on the buddy seat!

How about my generator or other small engines? Yes, especially stationary engines. With those, it's easier to switch the tanks, as you do with the stove.

Some firms that do these conversions:

- Grayson at Belmont Butane, Corozal
- Hassan in Orange Walk
- LP Gas in Spanish Lookout

Some places to fill up with butane:

- Any BNE butane filling station; theirs in the KonTiki area of San Ignacio charges about $4/gallon.
- LP Gas in Spanish Lookout sells both imported for about $5.20/gallon and local butane for _____/gallon.
- Butane prices decrease after 12 gallons.

These factors are included in the cost per mile mentioned previously:

Your mileage may vary—literally. All figures given here are on the pessimistic side.

- Power loss? Yes, at the top end, pedal to the metal; the way I drive I didn't notice, even though my style was pedal through the floor. That's just good tuning!
- Reduced mileage? Yes, about 10-20%.
- Longer engine life? Yes, if you maintain the engine properly, which should be obvious.
- Easier to start on butane? Definitely! My own experience was that even in freezing European winters my car started faster than the gasoline cars around me.
- Emissions are less? Yes, at least 20% overall.
- Insurance goes up? No, butane and propane are **safer** than gasoline.

Good ideas, bad ideas, tips:

- **DIY manual: "**A Guide to LPG Conversion" at **http://www.lpgconversion.htm**
- **Good:** Use ISO 9001-certified parts, such as those from **Stargas, Italy.**
- **Good:** Use spark plugs that are 1 grade cooler.
- G**ood:** Run a few gallons of gasoline every 1000 miles or so to keep valve lubrication up to specs, or risk seized or burned valves.
- G**ood:** Maintain your cooling system.
- **Good:** Fine-tune the engine for best efficiency after it has run 500-1000 miles on butane.
- **Good:** If the butane tank is in your closed trunk, really do drill vent holes in the trunk!
- **Good:** Put 2 smaller tanks side-by-side in your pickup bed and build a raised floor (for toolbox storage).
- **Bad:** Running too lean a mixture.
- **Bad:** Removing the gasoline system altogether**.**

Bus companies can save a **ton** of money! Look at the Mexican metro buses.

Who has a converted engine?

- Dreamer Farm Belize (near Bullet Tree Village). See their blog at: **http://dreamerfarmbelize.blogspot.com/2011/09/butane-vs-gasoline.html**
- I did one myself back in Europe

If you have feedback or other suggestions please contact me:

Scott Ophof <FSOphof@IntouchMI.com>

National Tree of Belize is an Endangered Species

By Maruja Vargas

The Big-Leaf Mahogany (Swietenia macrophylla), a national symbol of Belize, is now listed by the World Wildlife Federation (WWF) as No. 8 in the top 10 most endangered species in the world. If we are to save our national symbol, we have to focus on its sustainability. To sustain is 'to keep in existence'. This definition also implies its opposite; that is, to fail to sustain brings the absence of existence, or nonexistence. Sustainable logging is meeting the needs of the present without compromising the ability of future generations to meet their own needs.

The majestic mahogany takes 100 years to mature and stands up to 150 feet tall and towers above the forest canopy. As its name suggests, it bears large leaves, up to 45 centimeters long and produces small white flowers. The bark has a sweet odor. The fruits of the big-leaf mahogany are large, light grey to brown capsules that measure almost 40 centimeters in length. Each fruit contains up to 71 winged seeds, 7 to 12 centimeters long.

A major problem for the Big Leaf Mahogany tree is that even the legally obtained trees are frequently the best in the forest, being the mature ones which contain the seeds necessary for the continuation of the species. No seeds are left for re-growth, and the younger, and now more exposed trees, do not have the proper light and protection.

Far more damage is done by illegal harvesting, because it is done unsustainably and without the protective restrictions being observed. The illegal loggers cream the forest, taking the best and tallest trees.

Because Caribbean mahogany and Honduran mahogany have been over-harvested to the point of commercial exhaustion, the vast majority of mahogany on the world market is Big Leaf Mahogany. Currently, mahogany populations are in decline in every range state.

The Big Leaf Mahogany is listed on Appendix II of CITES convention which strictly regulates its trade. Consumers can play a powerful role in protecting the species from over-harvesting, by purchasing certified timber that has been harvested in a sustainable and legal manner, with minimal destruction to surrounding forests. The Forest Stewardship Council trademark is a good indication that what we are buying has not been harvested illegally.

National forests are public assets. Belize's national regulations administered by the Forest Department under Ministry of Natural Resources strictly govern the felling of any trees in Belize. Permits are required prior to cutting. The harvester

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National Tree . . . Continued on page 25

must pay royalties to the GOB based on $0.64 per cubic foot on private land or $1.24 per cubic foot on public land for cedar, mahogany and teak. Any exportation of mahogany requires CITES certification as well. Collection permits are required for any seeds taken from public lands. But there are many illegal loggers in Belize; in the Chiquibul area they have taken close to 2.3 million board-feet of timber, mostly virgin mahogany, at a national economic loss of $15 million.

In addition to national conservation efforts, private plantation timber may be a good investment as well as a smart conservation move. Belize has several mahogany farms under development. Mahogany is a long-term, cross-generational family endeavor. It is found that very close planting of seedlings encourages straighter and more rapid growth. Close planting also provides material for periodic thinning, developing an interim revenue stream along the long-term economic course of a mahogany farm. Commercial mahogany farming has the potential to reduce the commercial pressure on the protected reserves worldwide and also can qualify for credits for sequestered carbon. There are companies who invest in rare tree populations grown on plantations. One may buy shares in these companies for return on investment through annual dividends.

Let's contribute to the protection of Big Leaf Mahogany by supporting conservation in our reserves and through alternative methods of commercial cultivation for the international market.

CEDA GRANTS

The Caribbean Export Development Agency (Caribbean Export), a regional export development, trade, and investment promotion organization of the Forum of Caribbean States (CARIFORUM), is excited to announce the rolling out of its new Direct Assistance Grant Scheme (DAGS). Projects to be funded must be aimed at one or more of the following objectives:

- Opening new markets; increasing exports to the Caribbean region and/or other international markets
- Lowering production costs
- Identifying new sources of supply for raw material or other inputs
- Enhancing productivity through training and personnel development
- Facilitating trade mark, intellectual property and copyright protection
- Reducing environmental impact
- Capitalizing on the benefits of the EPA, CSME or any other bilateral or multilateral arrangements signed by the region within the region or with ACP or EU partners
- Fostering intra-regional cooperation to enhance productivity and capitalize on economies of scale
- Promoting programmes which improve underdeveloped areas or disadvantaged sectors within the region

Amounts to be Awarded

Any funds awarded under the direct assistance programme regular procedure must fall within the following amounts:

Min: €5,000

Max: €30,000

How to Apply

Applications must be submitted using the Regular Procedures application form. The application form can be downloaded from Caribbean Export's website at www.carib-export.com

The deadline for submitting application is **November 28, 2011 @ 2:30 p.m.**

Further information on the Direct Assistance Scheme can be obtained by contacting:

Ms. Andrea Prince
Directorate for Trade
Sir Edney Cain Building
2nd Floor
Phone: 822-2832/2833
Fax: 822-2837
andrea.prince@mft.gov.bz

Nilda Sosa
Beltraide
14 Orchid Garden Street
Belmopan
Phone: 822-3737
Fax: 822-0595
beltraide@belizeinvest.org

CITRUS LEPROSIS – Its Presence Now Confirmed In Belize

By Citrus Growers Association

Citrus leprosis is a disease that produces symptoms on leaves, twigs, and fruits. It is caused by a virus and affects some citrus varieties such a Valencia sweet orange, Belize's main commercial citrus variety used to produce concentrate. When the disease is severe, extensive crop loss occurs mainly because the affected fruits fall and citrus twig dieback also occurs, causing biological death of the tree. The disease is spread by a mite vector. Suspicions of the presence of the disease began in August 2011, during a visit to a grove in the Maya Center Village by staff of the Citrus Research and Education Institute (CREI), the research arm of the Citrus Growers Association (CGA). Officials of the Belize Agricultural Health Authority (BAHA) were called in and subsequently samples were sent for official laboratory confirmation. The laboratory results revealed the presence of citrus leprosis virus in Belize and were made official by a press release from BAHA.

Immediately after the first leprosis suspicions, CREI, BAHA and International and Regional Organization of Plant and Animal Health (OIRSA) joined forces to conduct a survey in Maya Center. Precautionary measures were taken when moving in and out of the farm to reduce or prevent the spread of infected mite from one farm to the other. The survey revealed that the disease was present in a few farms close to the initial foci of infection and the infestation level in these farms was very low. The chairman and the chief executive officer of CGA and the research director of CREI met with the Minister of Agriculture and other officials in the Ministry of Agriculture (MOA) to discuss steps to be taken in controlling leprosis. Also discussed was a request by growers in Maya Center to meet with BAHA, MOA and CGA jointly on the issue. It is expected that the BAHA, MOA and the CGA will join forces to implement a containment plan within the area to prevent further spread of the diseases. A more extended survey will be carried out shortly to find out if the disease has spread to other areas.

Historical Perspective of Leprosis

Citrus leprosis was first reported in Pinellus County, Florida, in the late 1800's. Between 1900 and 1925 the disease nearly destroyed the citrus industry in that state. It has been suggested that the widespread use of wetable sulfur was responsible for the control the mite population in Florida. Reports are that by 1948, citrus leprosis symptoms had disappeared in sulfur-treated citrus sites in Florida. The freeze of December 1962 probably eliminated the last remnants of the disease in the state. Leprosis-like symptoms on citrus leaves in Florida have been rarely observed since then. The disease has been restricted to South America since its disappearance from Florida prior to 1962.

A regional survey conducted by OIRSA in 2001 revealed that leprosis was present in all Central American countries and Panama, but was not detected in Belize. Since 2001, after the regional survey, CREI, BAHA and OIRSA joined forces to conduct annual national surveys to confirm the absence or presence of exotic citrus diseases of economic importance in Belize. (Other diseases that were targeted in those surveys were citrus canker and citrus variegated chlorosis (CVC). Later in 2005, the psyllid vector (*D citri*) of Huanglongbing (HLB) was discovered in Belize, so this disease was included as one of the targets of the survey since that time. HLB was recently detected in Belize in 2009.)

Economic Impact of Leprosis

The eradication of the disease would be the best approach to control the disease if it is detected very early. However, if detected when it has already been established, eradication can then be a very costly operation. In Panama, such was the scenario. The disease was detected in 1999 but efforts to control the disease were not made until two years later. Today, Panama has opted to try and eradicate the disease. Such a program has cost around US $4 million and has probably decimated a large portion of their industry.

The citrus industry in Brazil spends about 75 million dollars (US) annually on miticides to control Brevipalpus mites, the vector of the disease. However, relatively speaking, Brazil's citrus industry is much larger than Belize and thus the cost to control the disease is much more significant. Recent reports (2011), suggest that in Brazil the cost of inputs to control leprosis is about 25%-35% and that this accounts for 10%-15% of the total cost of production. Major losses caused by the disease in Brazil are due to the overall reduction of orchard yield and marketability of the fruit. The abscission (drop) of the diseased leaves and dieback of infected twigs reduce the productive area of the tree canopy. In addition, cultural practices such as the localized pruning or total rehabilitation of the tree also reduce the productive area of the tree canopy. The diseased fruit also falls off the trees.

All these factors contribute to a major reduction in the orchard yield. Factors affecting the marketability of the fruit due to leprosis are the blemishing of the fruit which causes the loss of the aesthetic value for fresh fruit consumption and the reduction or total loss of the fruit's internal quality that makes the fruit unsuitable for processing.

Host Range and Symptoms

Leprosis is observed primarily on sweet orange; however, sour orange and mandarins may also react to the presence of the virus. Other citrus cultivars do not normally show conspicuous symptoms; one example is grapefruit. The disease has not been observed on non-citrus hosts or transmitted experimentally to them. Lesions or wounds on fruits caused by leprosis are chlorotic (yellowing or whitening of plant tissue) at first and then a necrotic (darkened tissue) depressed center (Figure 1). On the fruit, the lesions may contain concentric patterns and sometimes have a sticky gum. The necrotic areas on leaves and twigs (Figures 2 & 3) are either flat or raised. The leaves and fruit fall when the lesions caused by the disease are severe. The development of extensive lesions on twigs causes dieback and this decreases the productivity of the tree. On larger limbs the bark lesions may coalesce and resemble psorosis-induced bark scaling. (Psorosis is one of the graft transmissible diseases that affect citrus.)

Figure 1: Chlorotic lesions on leaves caused by citrus leprosis virus (photo: CREI)

Figure 2: Necrotic areas on twigs affected by citrus leprosis virus (Photos: J. Astua)

Figure 3: Damage on sweet orange (Valencia) caused by citrus leprosis virus (Photo: CREI)

Casual Agent and Epidemiology

Leprosis is caused by a virus and spread by a mite. The virus is non-systemic; therefore, it is not distributed throughout the plant's internal system. Thus the disease is said to be localized. Leprosis has been graft-transmitted through the tip grafting of infected shoots. However, the major form of spread is attributed to the mite of the genus Brevipalpus from the family Tenuipalpidae (Figure 4). In Brazil, leprosis has been rapidly transmitted by larvae of *B. phoenicis*. Leprosis has been associated with *B. californicus* in Florida, and with *B. obovatus* in Argentina and Venezuela. Disease spread apparently occurs only when infected citrus trees and mites are present. The incidence is greatest when environmental conditions, like those occurring in the dry season, favor a buildup of abundant mite populations. The mites are easily spread by farming equipment, by workers on their clothing, harvest boxes or bags, movement of fruit, plants, plant parts after pruning, and wind.

Control of Leprosis

Figure 4: The mite that vectors the citrus leprosis virus.

Control can be very costly if immediate best practices are not implemented to detect, remove and prevent further spread of the disease. The following are methods used in countries have opted to live with the disease.

1. **Education Programme:** An education programme to further acquaint growers about Citrus Leprosis and its management.
2. **Regulatory procedures:** The existence of a citrus certification program to ensure that only Leprosis free nursery plant are planted within the industry.
3. **Chemical control:** It is very important to have a monitoring system to detect early population buildup of the mite. This will be used as a baseline for the application of acaricides/ miticides which are pesticides used to control the mite vector.
4. **Cultural practices:** As a complement to the mite control using pesticides, pruning of infected branches is recommended. First the infected tree should be sprayed with a miticide and after re-entry period has passed (this is determined by pesticide label) then the infected fruits are removed and buried. The level of pruning will depend on the level of infestation. For instance, in heavily infected groves, the canopy is totally rehabilitated. All remnants of the pruning process are burned. The disinfection of equipment and vehicles, harvest boxes and bags and clothing of workers should be carried out. There should also be a controlled movement of farm equipment, vehicles and personnel from an infected orchard to a non infected orchard. Also, wind barriers are established to reduce wind speeds which in turn reduce the spread of the mite. **It must be noted that in pruning the citrus trees to control leprosis, there will be increasing regrowth of the young flushes which will be subjected to higher pressures of attack by the Asian citrus psyllid, the vector of Huanglongbing. Growers are advised that a rigid psyllid control programme must be implemented to prevent infection of HLB in the grove and the chances of getting such an infection increases with the presence of citrus leprosis since the regrowth of flushes due to pruning increases the change of acquiring HLB.**

Growers suspecting the presence of Citrus Leprosis Virus in their groves are advised not to remove the suspected samples from the area. This is because of the high risk of spreading the infected mite when precautionary sample collection procedures are not taken. Growers as asked to contact the staff of the CGA for sample collection from their groves.

For further information on the management and control of Citrus Leprosis or Huanglongbing please contact us at the Citrus Research and Education Institute (CREI) of the Citrus Growers Association (CGA) at 522-3535.

Belize Ag Report's AG BRIEFS

Seizing Export Opportunities in the CSME (Caribbean Single Market Economy) is the theme of a series of meetings being held around the country. On October 13th, the first debuted at the University of Belize campus, Central Farm, Cayo District. Speakers ranged from MFA's opening addess by Minister Elrington, Foreign Trade Directorate's Mr. Richard Reid and Ms. Denise Swan, MAF's Mr. Eugene Waight, Mr. Jason Wagner of BELTRAIDE, multiple presentations by both BAHA and Customs, and diversified talks by various private sector CEOs and managers, including BEL-CAR's Mr. Otto Friesen, the Port of Belize's CEO Mr. Reineldo Guerrero, Mr. Salazar of Caribbean Premier Products, and Mr.Nikita Usher of CPBL.

The 2nd meeting was held for the Southern region, on Tuesday October 25, at Pelican Beach Hotel in Dangriga. Belize City will host a meeting November 8th, at a still undisclosed venue. Another will follow before year's end in Corozal, and final one returning to San Ignacio. Contact the Foreign Trade Directorate at 822-2832/33 or email okc26@hotmail.com for further details.

The Banana Industry took a licking from storms on both September 5th and 6th, resulting in approximately 40% loss of their crops (approximately $15-20 M USD) on estimated 6,700 acres in Stann Creek District. The GOB and MAF made a rapid response to this vital crop, being one of Belize's 3 main export commodities , with assistance to farmers of $4M BZD, at terms of 9% interest (DFC). Recuperation is anticipated to occur within 6 to 9 months.

Dr. Louis A. Malkus, better known to us in Belize as Dr. Lonnie Malkus, passed away on September 21 of this year, at the age of 74 years, in his home state of Montana, USA. Dr. Malkus served as a consultant to the Ministry of Natural Resources in Belize, and as advisor to the Belize School of Agriculture. He was Ass't Professor of Animal Science at the University of Connecticut, and during that tenure he visited Belize many times. He was a true friend to agriculture in Belize, and extended a helping hand to many of us. He assisted and enjoyed our early NATS shows and also influenced 4-H programs here and the Veterinary Department of MAF.

Local and Regional Fuel Prices

	Belmopan, Belize	Quintana Roo, Mexico	Peten, Guatemala
REGULAR	↑ $11.10 Bz/Gal	↑ $6.42 Bz/Gal	*$9.86 Bz/Gal
PREMIUM	↑ $11.42 Bz/Gal	↓ $6.45 Bz/Gal	*$10.14 Bz/Gal
DIESEL	↑ $10.49 Bz/Gal	↓ $5.89 Bz/Gal	↑ $9.04 Bz/Gal

**no change*

The Indian Government is suing Monsanto for Biopiracy, for taking advantage of its ownership of native cultivars of eggplant, or brinjal, as it is known in India.

An estimated 2500 varieties of brinjal (eggplant) exist in India, and they grow more than 25% of the world's production. India claims that the company is 'stealing India's indigenous plants in order to re-engineer them into patented varieties." India's Biological Diversity Act (BDA) prohibits such actions. According to K.S. Sugara, Member Secretary of the Karnataka Biodiverity Board about the lawsuit, "It is not acceptable... that the farmers in our communities are robbed of the advantage they should get from the indigenous varieties."

34th Annual General Meeting of the Belize Livestock Producers' Association

November 26, 2011

Date of the meeting: November 26, 2011.
Venue: BLPA Headquarters, 47½ miles Western Highway, Belmopan, Cayo District

At this annual event, members come together to hear of the achievements of the association, to examine its financial position and to plan for the future development of the livestock industry. The chairman will present his report and the treasurer will present the financial position of the association after which plans for future development will be discussed; finally, the membership will elect six new officers to serve on the Board of Management for the period November 2011 to October 2013.

At this year's meeting, the main issue for discussion will be regional and international trade in livestock and livestock products.

Our first effort is to formally establish trade in live cattle with Mexico. Much effort and activities are currently being implemented towards this end. A project is being funded jointly by the EU (EU contributing for three years), the MAF, OIRSA-Mexico and the Livestock Producers through the BLPA. The first activities to recruit the personnel and procure the supplies and equipments are well underway. And we expect field work to test all cattle for bovine tuberculosis and brucellosis early in 2012. This project is very important to cattleman because it is addressing a major constraint for many years.

The Minister of Agriculture, Honourable René Montero, was invited to give the main address and we have invited special guest speakers to talk on international and regional trade in livestock and livestock products.

We expect that all producers will attend since access to markets is one of the major constraint that the cattle producer is faced with and we now see serious efforts being made to open markets.

"Failure is success if we learn from it."

Malcolm Forbes

Classifieds

Classified prices:
2-3 lines= $24; 4-5 lines=$32; 6-7 lines=$40

BELIZE BIRD RESCUE is dedicated to the care, rescue and rehabilitation of all bird species in Belize, especially parrots. 822-1145/ 610-0400/ 602-4291 info@belizebirdrescue.com www.belizebirdrescue.com

STAINED GLASS WINDOWS - Custom design, any size, all imported materials. For churches, hotels, businesses or private residence. Email: leisa@bananabank.com for more info.

BED and BREAKFAST and short term rentals, second floor of the concrete Spectarte building above gallery and De Lite Cafe, MAYA BEACH, PLACENCIA 1 Queen size bed, shower and facilities, kitchenette, Air conditioning, TV, INTERNET,laundry facilities, private breezy veranda with a hammock. excellent rates. Call 533 8019 or 604 8910 for availability. spectarte@gmail.com

FOR SALE: GENERATOR: 75 KVA 3 phase. See page 7

FOR SALE:HORSE VACCINES: your horses need TRIPLE E FLUVAC INNOCULATOR TRIPLE E-FT (single dose syringe) $30. BZD/dose. I have 8 doses left to sell. Contact: Omitade 607-2289 or 663-4276

Art Show December 4th at 12 noon. Place: Macaw Bank Jungle Lodge, Cayo District, email macalbank@yahoo.com, web address www.macawbankjunglelodge.com phone# 603-4825. Buffet $25.bzd beer, and rum drinks $3.50

FOR SALE: TREE FERNS: 5-10 ft in pots; also large Bromeliads, put the rainforest on your shaded patio. Valley Farm, Elridgeville, Toledo District, 623 5146

350 acres just outside of Spanish Lookout and with over 4000 feet of frontage on Cadena Creek. Perfect for cattle or agriculture. Asking $299,000 USD

Call 610-4458 or email ceibarealty@btl.net. www.ceibarealty.com

http://www.ceibarealestatebelize.com/Listings/CustomFilter?id=4JN506

134 acre private island in the New River just upstream from Orange Walk town. Suitable for investment or agriculture. Electric nearby and priced to sell fast! Asking $99,000 USD firm.

Call 610-4458 or email ceibarealty@btl.net. www.ceibarealty.com

http://www.ceibarealestatebelize.com/Listings/CustomFilter?id=NR287

104 acre parcel of prime investment property just South of Punta Gorda town along the Caribbean Sea. Priced to sell fast! Asking $2000 USD per acre.

Call 610-4458 or email ceibarealty@btl.net. www.ceibarealty.com

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