

The Belize Ag Report

Belize's most complete independent agricultural publication

Nov-Dec

2010

ISSUE 9



Beyond the Backyard, pg. 8



Technical Mission R.O.C. (Taiwan), pg. 10

Belize's State-of -the-Art Cobia Fish Factory Hatchery to Offshore Fish Cages: Delighting Export and Local Markets with a Gourmet Omega-3 Fish.

By Feucht/Roberson

PART 1, The Hatchery

Tucked away in Dangriga, sits one of Belize's modern marvels: a state-of-the-art cobia hatchery. Marine Farms Belize Ltd is a subsidiary of Marine Farms ASA, a Norwegian firm which started operations in Belize in 2006, and since 2007 has been selling its omega-3 rich cobia fish (mainly in 'bullets'-headless, tailless, and gutted) to the U.S., Mexican and Belize markets. (As an EPZ, there is a limit of 5% sold in country.)

Cobia, *Rachycentrol canadum*, is a pelagic fish (indicates does not live mainly on the sea bottom) and is native to Belize. Other Caribbean pelagic fish are mahi mahi, tuna and sharks. The brood fish in the hatchery were caught in the wild waters of Belize, inside the reef.

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Cobia Brood Fish

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Neem, The Miracle Tree

by Karin Westdyk

The Latin name for Neem is *Azadirachta Indica*, which literally means "Free Tree of India" where it has been revered for centuries because of its many agricultural and medicinal properties. Neem is a botanical cousin of mahogany belonging to the Meliaceae family and like mahogany, neem trees thrive in Belize and can live between 150 – 200 years.

From tiny seeds, they grow slowly the first year and then bolt, reaching heights of 70-100 feet within 3-5 years, at which time they begin to bear fruit. Neem timber, like mahogany, is termite resistant but can be harvested after only 5-7 years. Needing little water, but lots of sun, the neem tree grows in almost any soil including clay soils. With a tap root that can be twice the height of the tree, it provides shade and repels insects wherever it grows. Some say that between 2 neem trees is the perfect place to hang your hammock.

Agriculturally, neem produces a very effective and safe natural organic fertilizer, but most importantly, an oil from the seed produces a safe insecticide that affects approximately 200 insect species, many of which are difficult to control with traditional pesticides. At a time when we are beginning to see the negative effects of using chemical fertilizers and pesticides, neem's importance and value are dramatically gaining attention throughout the world.

Neem leaves can protect stored grains from insects for 3 to 6 months. Neem cake fertilizer protects crops against parasite

nematodes while enriching the soil. It slowly releases nitrogen, aerates, nourishes, and promotes plant growth as well as resistance. Neem cake is the residue obtained from neem seed kernels which have been crushed to extract the oil. Rich in N-P-K, it is an excellent organic fertilizer. Earthworm populations have been known to increase wherever neem cake has been applied to soils.

Agricultural chemicals are increasingly expensive, crippling many small farmers and eating into their profits. The need for stronger and more powerful pesticides each year is another factor to consider. Natural predators of the bugs we wish to eliminate are also destroyed with chemicals, and the fittest of the most destructive insects will survive and reproduce a stronger and more resistant generation.

Neem does not work in the same way as chemical pesticides. It is not an instant kill everything pesticide and it only eliminates the chewing and sucking insects that destroy, not the beneficial insects. It works by intervening at various stages of the life of an insect incapacitating it in several different ways. When neem enters the body of an insect larva, it is prevented from feeding and moulting and will die. If concentrations of neem are not sufficient at this stage, the insect may enter the pupal stage, but then die. But, if it should reach the adult stage, it will be completely malformed and incapable of reproduction. Because insects will not feed on a leaf sprayed with neem and will not reproduce, populations are drastically reduced. Some plants will even "take-up" the applied neem systemically and in effect, become inoculated against feeding insects.

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FROM THE EDITOR

Ag Shows, School Garden Projects, Seed Authority

Time to again be thinking about NATS and the Spanish Lookout Expo. We share with you a report on last year's NATS by MAF's CAO Mr. Eugene Waight, in our ONLINE ANNEX. Farmers were looking forward to two ag shows in Cayo District in 2011, NATS and the EXPO, but will be disappointed in the latter, which will not be held in 2011. The Spanish Lookout community, after extensive review and discussion, have decided that there is too much controversy to forge ahead with plans for this February 2011. There was no debate about whether the community's businesses had prospered in the immediate months after last year's fine show. The controversy was over the indirect effects to them as a community, and 'too much interaction' with the outside world. Also, fears about potential negatives, including increased crime exposure led to the conservative decision. So, no show will be held this coming winter over there. We hope that some compromise way can be found – perhaps a large piece of cleared farmland can be found closer to the Western Highway, where they might 'host and manage' a winter agriculture fair in 2012 ?? Farmers and businesses servicing the ag community enjoyed and appreciated the quieter and more pastoral management style of last year's Expo there. We certainly have room for 2 big ag shows a year!!

Toledo was host on October 29, at Union Field in Punta Gorda, of the 2nd National Organic Fair. Slightly less farmers/business persons participated, perhaps because the fair was held on a Friday (thinking to enable more school children to visit). Also, late planning and less advertising may have been factors. We encourage the organizers, Sustainable Harvest International and Plenty Belize, to schedule next year's before the end of this year, and keep this fine tradition going.

Plenty Belize shared with us their news of primary school garden project. They have been instrumental in getting many gardens going, which then are taken over by the schools themselves – 'graduated schools' they are called, once they have the knowledge and tools to continue on their own. Plenty Belize offers plans and the know-how to get schools started. They offer to share this with any and all interested schools/groups countrywide. Those interested in replicating their success just call the Plenty Belize office in P.G. We note that there seems to be an inverse relationship between 'grass roots agriculture' and crime. The benefits are so much more than food... children learning to be and feel useful. The Samuel Haynes Center for Excellence in Belize City has a great garden project too – We are pleased to see agriculture included in the school agenda and invite you to share your success stories in our TREASURE CROP section which will

start in issue 10 and ONLINE.

We understand discussion is under way regarding a National Autonomous Seed Authority for Belize, which would be an independent (non-political) group which would make decisions on seed policy, etc. It is our view that the GMO issue, among other hot topics with incredibly long-term and wide ramifications to the country and culture, should be discussed and decided at this level, not Cabinet. Food is an essential and non-political issue; let's keep it that way.

We wish all affected by Richard the best in clearing up and carrying on. Warm holiday wishes for a healthy and prosperous new year to our readers and advertisers.

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TO THE EDITOR

While We're Starving, Blame GMO? Some Long-Term Considerations about Introducing GMO Seed into Belize

Dear Editor,

If a radio company in the 1920s claimed that it had mastered the new art of electronics, we would in retrospect regard such a claim as ridiculous. After a century, electronics has matured well beyond what it was in the 1920s, and the new field is now bioengineering. It too is no more refined in the manipulation of genomes than electronics companies were in the 1920s. Yet in their effort to spread manipulated crop genomes worldwide, Monsanto and other companies have put everyone who eats food at risk, using what are crude, early methods for tampering with life itself.

Bioengineering uses viruses and bacteria to introduce genes into the nuclei of cells so that for some of them, the DNA – the programming of life itself – is altered. DNA is a long sequence of genes, the components of DNA that determine characteristics of the organism. While much effort is spent trying to avoid gene alteration in humans, as does cancer, similar mechanisms are being applied in bioengineering. The result is the *genetically-modified organism* (GMO). The technology has advanced to the point that what some genes do in an organism such as corn can be identified and replaced with other genes that alter the characteristic. For instance, a gene can be introduced that makes the corn plant capable of surviving with less water. However, this replacement process is not well-controlled and genetic side-effects are unavoidable.

The biotech effort in the long-term holds promise for the future, and will eventually be desirable when more is known about genetics, biochemistry, and life generally – but not now. Here's why:

1. Biochemists who do not share in the profits or the control of crop seeds have pointed out some harmful side-effects of altering plants and the extent of damage is unknown. Some of these mutations, under further testing on laboratory animals, have led to colon cancer. Other ill effects include severe allergic reactions to GMO-based food that are beginning to appear in the American population. Crop yields might be increased, but so might colon cancer. Is more cancer worth higher crop yields? The farmer, seed distributor, and Monsanto reap the increased profits while the population suffers from greater cancer risk and allergic reactions which could develop into chronic diseases.
2. GMO crops, like any other, release pollen into the air where it can pollinate native varieties of corn or other crops and alter them. Once altered, the native variety, which over the centuries has been optimized by natural selection, is threatened with extinction. Once lost, those who eat crop food become dependent upon Monsanto and others to supply their daily bread or tortillas. Is this a dependency we want to find ourselves in? Whoever controls the food supply controls those who depend on it for their very lives.
3. Monsanto is also putting "terminator genes" in its seed so that it cannot reproduce. Consequently, farmers must come to Monsanto every year to buy their seed. They cannot any longer use naturally reproducing varieties optimized for their growing conditions and capable of being grown year after year by them. They lose their independence as farmers as they pay several times the price of ordinary seed.

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Hello,

I had read and posted a reply in the July Belize News about the visit from the U.S. to push GM (genetically modified) foods. I am a U.S. citizen planning to relocate to Belize one day (hopefully soon!). This information from Dr. Mercola's website should be of interest if your organization will take a stand against this insanity. Please, I hope this never, ever gets implemented in Belize. My rheumatoid arthritis, thyroid issues and other matters are proof positive that GMOs are never a good option. Your feedback is most appreciated.

Many thanks,

Laurie Surla

<http://articles.mercola.com/sites/articles/archive/2010/10/04/watch-out-there-are-more-problems-with-genetically-modified-foods-than-youre-allowed-to-know.aspx>

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.

Link to article on Brazilian Agriculture:

We received a note from the Embassy of Brazil in Belize, advising us of the link below, for a great article about Brazilian agriculture in the August 26, 2010 issue of *The Economist*. Titled, "The miracle of the cerrado: Brazil has revolutionized its own farms. Can it do the same for others?", we were very keen to share this by posting in our ONLINE ANNEX. The Economist did grant us permission to do so, but at a fee of \$6,900. USD. Regrettably, we were compelled to decline. However, below is the link to the article on their site.

<http://www.economist.com/node/16886442>



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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.

Organic Production

The Other Use of Moringa...

By Greg Clark

Many articles have been written, touting the benefits and nutrients for Moringa as a food source; but we have chosen to utilize the tree for "Other Uses"... The ascension from seed to a twenty foot tall tree in one year caught our attention. We were spending tons of money on building shade cloth covered structures to block the intense heat that bears down on the vegetables in the field, and decided that there could be a greener and more cost effective solution. Thus, entered Moringa, both PKN1 and Oleifera. We brought in seeds from India that we were utilizing in a test program for a high protein source in Belize. The trees are amazing at the rate of growth and the ability to maintain leaves in the dry season. This gave us the clue to the expensive shade cloth dilemma. We planted the trees in rows at 10 foot spacing to allow for 2 four foot beds of vegetables to be between the rows of Moringa. Within 2 months of planting the trees, shade was being provided on the vegetables. Our spacing was also important to ensure that we could still get the tractor between the rows of trees for deep cultivation. At the base of the Moringa trees we planted our climbing vegetables to allow the Moringa to be the stake for support of the vines. Between the trees we tied horizontal pieces of wood to further enhance the surface area for the climbing vegetables. When I am referencing climbing vegetables, I specifically targeted the legume family of vegetables; peas, beans, etc. With this method we are able to increase the square footage utilization, and revenue, from the same space of growing area. This utilization yields in an efficiency increase that is seen in less labor for weed control, less input costs for the capital expenditure of purchasing shade cloth, and creating the benefits of companion planting. The amount of shade the tree exhibits on the vegetables can easily be adjusted with a pair of pruners. One concern of the planting of the trees so close to the grow beds for the vegetables was the issue of the trees absorbing excessive water from the vegetables, but inherently, the Moringa has a deep tap root that is its drinking straw. The tree easily grows in many conditions and has multiple methods of propagation, even after eight months from seed, the tree began blooming and producing seeds (and attracting the honey bees for the pollination of the veggies). Secondly, cutting a limb and pushing it into the ground eighteen inches, allows roots to form and a new tree is formed. When we decide to take out the rows of trees for full field plowing or conversion, we are not concerned since we have the cuttings and seeds to follow behind the conversion and recreate the same shaded area as we had before, without the costly labor and materials of shade cloth and the supports required for the cloth structures.

On another note, I will tout about one of the other benefits of the Moringa, and that is for utilization as biomass in a compost pile. Due to the high level of proteins contained in the plant, it is a wonderful source of nitrogen for the compost process. The woody structure of the tree is very low density and will decompose in a very short period of time in the pile.

If you would like to see the example of the above described method, just send me an email at Organics@belizeagreport.com.

Increasing Crops Natural Soil Fertility and Nutrient Availability

by Dottie Feucht

Belize farmers searching for ways to reduce production costs without sacrificing yields now have a product available to them called Agri-Gro. Agri-Gro is a natural biological growth activator in a liquid concentrate form that contains enzymes, amino acids, plant growth hormones, complex carbohydrates and micronutrients that have been tested extensively for crop yield quality and increase and soil improvement. Plants require 16 essential nutrients including phosphorous, potassium, calcium, magnesium, ammonium, nitrate, boron, manganese, copper, iron, zinc and molybdenum. Many of these nutrients may be in the soil but not available to the crop. Some of them are in applied fertilizers that may not be entirely efficient. The increased enzymatic and microbial activity stimulated by Agri-Gro works to release these unavailable nutrients in the soil and convert them into a soluble form that the plant can use and improves the uptake and availability of applied fertilizers. Stimulating the production of beneficial bacteria in the soil results in more carbon dioxide which expands to break down clods and improve soil structure and combines with soil moisture to produce carbonic acid which stimulates root development. Increasing mycorrhizal fungi in the root zone maximizes nutrient and water uptake, disease resistance, and the potential for the highest quality produce. By stimulating microbial life in the soil, the decomposition

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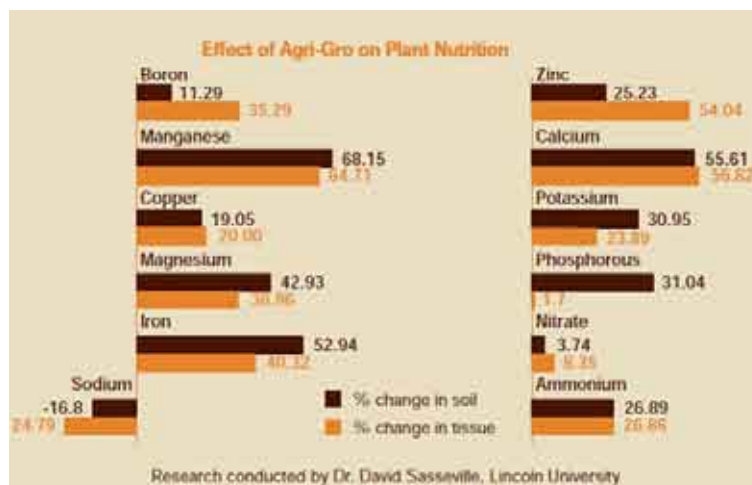
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BEYOND THE BACKYARD SAVE THE PENGUINS

By Jenny Wildman

I was discussing my garden project with a friend who is a phythologist eager to pick his brain on plant behaviour. Now if you (like wikipedia) tell me that this is not a word I will indeed beg to differ. It is a very old word that has been lost from language along with the knowledge of the importance of symbiosis and common sense. A lost "ology". Anyway it will be back. We chatted about garden pests. You may spray everything with chemicals, yes, or you could make a concoction of soapy, garlicky, pepper spray if you need ammunition. Alternatively, if you consider that mostly everything in life has a purpose you could try to pay more attention to what the plants and insects are actually doing and where they live. They could be transporting pollen and seeds and doing a little pruning not intending to destroy your prized produce. Pollen and nectar attract the good guys who make a very effective team of pest controllers. Beetles feed on slugs and maggots, flies on larvae and aphids. Spiders feed on insects and usually the outside varieties are not dangerous. Snakes, frogs, birds, lizards are all part of this harmonious equation. Birds and insects pollinate allowing seed formation and I am told that in pineapples, the seeds affect the quality of the fruit adversely; therefore, in areas where they are cultivated on a grand scale hummingbird importation is prohibited. Oh dear! Bring in the bird feeder. But wild pineapples are often bat-pollinated so they flower at night and close during the day. Going to have to check this out with a headlight.

My friend and I were discussing how to attract the beneficial insects by adding flowering plants and allowing veggies to bloom and seed. These recruits need a safe place to live such as clump-forming grasses so why not make those edible, such as lemon grass? I could also use another clumper "penguin" which harbours many insects and feeds little rodents and makes a fairly decent living fence. He was not familiar with this species. I showed him a picture and he thought it was probably a wild pineapple but had never seen the fruit.

I first came across this plant whilst being a surveyor's assistant once in awhile. Now with all the construction going on, cutters hack them out with no reverence for their charm, beauty and utility, as its fibers can be used as a substitute for jute to make nets etc. Its stiff, strong, fibrous foliage does indeed look like a

pineapple but it grows into an attractive rosette. In the summer months the leaves change to a more reddish orange and its pale pinkish flowers become a central cluster of fruits which rather look like the pineapple flower. If you want to get to the fruit, you must dig into the centre of the plant through the collection of leafy debris and straw-like fuzzy stuff hiding the jewels. Each fruit in the center is the size of a thumb individually "wrapped" in a tough papery skin. Underneath the skin is a white crunchy, acidy fruit, sweet and sour – a bit like unripe pineapple but with seeds. Plucking out the fruit one by one and brushing off the sharp thin hairs at each end of its banana shape, you must be sure not to get hairs on your mouth as they can sting and blister. The fruit can be eaten raw or roasted and makes a very tasty drink full of vitamin C and calcium. Incidentally that fuzzy stuff is a great instant bandage to use for stopping bleeding from bush cuts.

There seems to be a lot of immunochemical studies on pinguinain classified as a sulfhydryl plant protease. Very important sounding. Actually, the pinguin is a source of a proteolytic enzyme, pinguinain whose amino acid composition resembles papain (from unripe papaya) and can be used as a meat tenderizer or to aid digestion. Pineapples contain proteolytic enzyme bromelain - really almost the same uses. Now I would not recommend eating a whole lot at once, because you could expect a cleansing. Pinguinain is an anthelmintic used for expelling parasitic worms, as is garlic, raw cabbage, cloves, moringa, tres puntas tea, honey and vinegar, and the relative of this false pineappleananas comosus, the REAL pineapple.

Everything around us has a purpose. Whilst eaten locally pinuelas are gathered and perhaps cultivated mainly for fiber. They do not contain very much pulp and it takes a lot to make the tasty juice. There may well be several varieties; the pictures I found differ slightly as to the height of the fruit. Those growing around me stay close to the heart of the plant. They are fairly hardy tropical terrestrial bromeliads with a shallow root system which reproduces by runners along the ground as well as by seeding. Often they are found around oaks in dry partially shaded areas. They die about a year after fruit formation but are constantly creating offspring.

For a long time I thought the penguin was called ping wing. It is called false pineapple, pseudananas, pinguin, viru, pinuelas in Mexico or Maya as it is called in Puerto Rico; it is all the same plant. As to the etymology of pinguin it is a bit of a mystery since it is close to pinguino - Spanish for penguin, pingue - pink, pingue - fat and plentiful. Looking up penguin you run into similar

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Beyond the backyard, Continued from pg. 8

unresolved theories including the welsh pen (head) and gwyn (white). Our fruit is pinkish white and inside fat and plentiful, at least this week. Halt that machete!

In case you are wondering, you can find this pretty prickly plant listed in Wikipedia, with a one liner for bromelia penguin, but it is not featured in many Bromelia family albums.

I thank my friend for his time and stimulating conversation and continue the reflective stroll around the yard.

Belizeans will perhaps fondly remember this plant and for posterity I would truly love to hear any stories you would like to share about our beloved penguin.

Thank you.

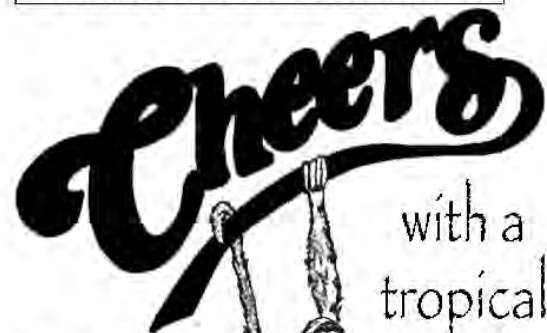
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Orchids are the #1 potted flower in the world, especially in the foreign markets of Taiwan, Japan and the U.S.A. (formerly the pointsetta held this position). The Phalaenopsis, a native to S.E. Asia, also known as the butterfly or moth orchid, is the most popular type of house orchid. (Phaluna is Greek for 'moth'.) Total world production is estimated at 250-300 Million plants/yr, and of this, Taiwan, known as Kingdom of the Phalaenopsis, produces about half.

In 2008 Taiwan produced 135M Phalaenopsis plants. Of these, main export markets were 30M to the U.S., 30M to Europe, and 15M to Japan. Formerly Taiwan composed 50% of the world market, but the U.S. market now purchases 60-70% of Taiwan's potted phalaenopsis production.

The wild species, *phalaenopsis amabilis, var Formosa* was officially recognized in Taiwan in 1897. For approximately 90 years, hobby breeders created many varieties from that original cultivar, which is white in the wild. Now a spectrum of colors from very dark purple down to yellow and white, exist and some have a strong fragrance. There is a popular variety known in Taiwan, as 'notice you at lunch' which emits a strong fragrance at mid-day. Orchids are an easy and three dimensional decoration favored also for their longevity (lasting from 2 to as long as 6 months). December to May is the normal blooming season, but some bloom two times a year.

As cold weather induces flowering in this variety, historically orchids would be moved to 1,000 m elevations in Taiwan, to force flowers. The combination of growing in a hot environment, then inducing to bloom in a cool one, formerly was a difficult combination but is now facilitated by the miracle of air conditioning.

At the Taiwan Technical Mission headquarters at Central Farm, sits a climate controlled greenhouse chock full of Butterfly Orchids. Mr. Frank Lin heads the orchid and rice sections of the mission, although one surmises orchids are his passion. The TTM has identified orchid production for Belize as very promising.

Belize is well situated climatically and geographically to enter and become a main player, if she chooses, on the world stage with orchid production. Not only could phalaenopsis be cultivated here commercially, but Belize's wild species offer, in Mr. Lin's opinion, "more than 5 good local varieties which have great potential to propagate by tissue culture. With the North American market well established and only a reasonable 3 day road trip away, marketing from Belize is quite competitive.

Belize has the lab facilities to propagate by tissue culture, and U.B. students are learning the necessary horticultural skills in U.B.'s own tissue culture labs. Since the 1990's, world expansion in the field has been due to new varieties,

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improved cultivation techniques, and uniform virus-free material available from tissue culture.

Cooperation will be needed between producers here to make coordinated overseas shipments viable. The TTM encourages cooperatives, women's groups, and the private sector to consider this enterprise. The TTM can offer training sessions (recommend 4 weeks duration) and assistance, for both co-ops, NGO's and the private sector. TTM estimates approx 6 groups, (less if larger players enter the market), would be needed to produce sufficient quantity for export to be attractive.

By B. Roberson

Note: The Taiwan Technical Mission's orchid expert in residence is Mr. Frank Lin. With over 20 years experience in the private sector, he built the first glass computer automated greenhouse in Taiwan, and won in 2005 the prestigious Grand Champion International Orchid Award. He has created over 1,000 varieties of orchids. Belize is fortunate to have such a world leader in this field here to share his skills.

"To accomplish great things, we must not only act, but also dream; not only plan, but also believe"

Anatole France

Marketing Strategy For Modern Agriculture

By Romaldo Isaac Lewis, MBA & Agronomist

In these modern times of Agribusiness, which is the application of business principles to the production of agricultural products and services, Agri-Marketing is one of the most important strategies that entrepreneurs invest in to guarantee that their products will get to the consumer at the right time, place and price. It is obvious that our producers in the rural communities need marketing skills in order to survive in this competitive market.

Agri-marketing strategy requires the application of the 4 P's: **Product, Price, Promotion and Physical Distribution.**

Product - vegetables, grains, fruits, etc or services (rentals, sales, materials supplies, etc). Some products are more perishable than others. A marketing strategy must include a consideration of product perishability as well as losses due to inappropriate technology, poor agronomic management and effects of undesirable natural disaster.

Price. The marketing strategy includes determining the minimum price that we can sell the product or offer the service based on product cost, competition and desired return on investment (ROI). Key elements to be considered in the strategy of establishing a price are determining what consumers can afford as well as the quantity they desire.

Promotion. The marketing strategy to promote products and services includes effective communication to reach niche clients or market segments as well as persuading and influencing a consumer's purchase decision. Agencies such as BELTRAIDE collaborate with industries to promote and develop products. However among rural farmers is a need for improvement through product development, segmentation, pricing, packaging, and labeling.

Physical Distribution. The logistics in the distribution of our agricultural products from rural communities to urban towns can be complicated because of poor or inadequate infrastructure or unreliable transport mechanism. Nevertheless there should be a strategy for delivering products to their final destinations. Typically there are four types:

Producer -> Consumer, *the shortest and most simple distribution channel.*

Producer -> Wholesaler->Consumer, *a scenario whereby the wholesaler buys directly from the producer and then sells to the consumer.*

Producer-> Wholesaler->Retailer->Consumer, *the most traditional one whereby the producer sells at wholesale prices and in large quantity. The wholesaler then commercializes to the retailer, who sells the product or service to the consumer.*

Producer-> Agent->Retailer->Consumer, *a medium producer, who commercializes to an agent who earns a commission. The agent then commercializes to the retailer who sells to the consumer.*

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FROM THE MEXICAN SIDE
Restoring the ancient trade routes

Translated by Maruja Vargas
For Spanish Original See ONLINE ANNEX

EXPORTATION
Roxana Lili Campos Miranda
Licensed to practice law in Mexico
roxanacamp@yahoo.com.mx

There exists a false belief that conducting business outside one's country is reserved for those few entrepreneurs who have large amounts of capital and that it is a difficult and complex process. This belief is far from reality. This sequence of steps is for those who wish to export from Belize to Mexico for the first time.

The sequence of the export operation is very important. Attempting a different order can cause problems to the destination country that you must attend to before the commodity leaves the country of origin.

The first thing to do after you have a buyer in Mexico is to draw up a contract to decide the conditions of purchase and international commerce terms (InCoTerms). If you have interest in sending plant or animal commodities to Mexico, you need to establish the requirements of Mexico's official norms for this type of product. Once the requirements are fulfilled for the point of entry it is necessary to solicit a phytosanitary or zoosanitary certificate corresponding to the type of export product.

The procedure with Mexican Customs involves (a) payment to the supplier, (b) clearance with the customs office and (c) a contract for local freight.

Contract with the Provider and Seller

The first thing to consider for exporting a product is whether there is a company in Mexico that can transact for the same product. You may locate a manufacturer or provider of your commodity in Mexico by your own network or consult with a company that can put you in contact with companies, that are certified and of known good reputation. Usually the international contract of buy/sell results in a purchase order, signifying acceptance of the contract and containing an offered quotation of the Mexican provider or manufacturer.

Price Quotations

The price quotations of most international commerce contracts based on the InCoTerms are ExW, FOB, or CIF:

- Ex Works (ExW) means "in the factory" – that is, the commodity is to be delivered in the provider's factory, and the rest of the costs to bring it to the business of the buyer falls to the buyer. In this case, the buyer must acquire help of a company to transport the commodity from the factory to the point of embarkation and contract the freight, whether land, air or sea.
- FOB means "Free On Board" - that is, the price of the commodity includes all of the costs encountered to be loaded on the ship at the point of origin, and the balance of the costs for cargo are the cost of the buyer.

Continues on pg. 20



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Caribbean Agro-meteorological Initiative (CAMI) Project

By Gary Ramirez

The Caribbean Institute for Meteorology and Hydrology (CIMH) in partnership with the Caribbean Agricultural Research and Development Institute (CARDI), World Meteorological Organization (WMO) and National Meteorological and Hydrological Services (NMHS) of ten Caribbean member states including Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St. Vincent, Trinidad and Tobago have received a grant from the European Union through the African Caribbean and Pacific Group of States (ACP) Science and Technology (S&T) Programme for CAMI. The objective of the project is to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved dissemination and application of weather and climate information using an integrated and coordinated approach.

The project was launched in February 2010 and will run for a three-year period. A regional network of meteorological, agricultural and research institutes plan to prepare and distribute a weather and climate information newsletter to include predictors of the rainy season potential and effective pest and disease forecasting. In addition it is planned to organize forums with the farming community and agricultural extension agencies to share information and obtain feedback to provide better products from the meteorological services for use by the farming community.

For more information contact Mr. Dennis Gonguez - Chief Meteorologist, National Meteorological Service at 501-225-2012, dennis_gonguez@yahoo.com or Mr. Gary Ramirez - Ministry of Agriculture and Fisheries counterpart on this initiative at 501-804-2079, garyramrez_bz@hotmail.com. You can also contact Mr Adrian Trotman, Agrometeorologist and Chief of Applied Meteorology and Climatology (Ag.), CIMH, atrotman@cimh.edu.bb or visit their website at www.cimh.edu.bb and view documents and presentations from previous workshops in the CAMI corner.



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A Conversation with Maury Boyd

By Timothy M. Spann

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There's probably not a person in the Florida citrus industry that hasn't at least heard of Maury Boyd, but just in case, here's a bit of background: When greening was first found in Maury's grove in Felda in 2005, he made a conscious decision not to remove infected trees. Bear in mind, this was not a minor decision – the grove is nearly 400 acres. Instead, Maury chose to take steps to maintain the health and productivity of his trees in spite of their greening infection and developed what has become known as the "Maury Boyd cocktail." To date, he has not removed a single tree because of greening.

As a testament to the success of his program, Maury points to a block of young Valencia trees in his grove. The block was heavily infected early on in the epidemic. Many of the world's greening experts visited the block during those early days of 2005 and 2006 and signed its death certificate, saying it would be dead within a year or two. Today, the block is still alive, growing and bearing a good crop. In Maury's words, "It looks better than it has ever looked." This year, Maury says the fruit are good and no drop is occurring. He credits part of his success in this young block to the addition of boron and TurfPro (an organic soil amendment) to the program last year.

In addition to good nutrition, Maury is a staunch proponent of psyllid control. "It has to be 100 percent. I know that's not achievable, but that's the benchmark I use," he says. Trying to achieve that goal with only the use of pesticides causes Maury concern about residues. That is why he has taken up the new challenge of promoting the development of a psyllid-repellent system based on dimethyl disulfide (DMDS), the repellent discovered through research on guava.

Maury has been consulting with engineers and working almost single-handedly to find funding for the development of a repellent-delivery system. The system, as he envisions it, would be a simple network of small diameter tubing with a few nozzles per acre throughout the grove - not unlike an irrigation system – that would release DMDS or other repellents automatically 24/7, 365 days a year. A computer control system would regulate flow based on wind and could completely shut down the system if necessary. Such a system would be particularly beneficial for solid set blocks of new trees. Wind-breaks would enhance the system's efficacy.

Maury knows that he is criticized by some for leaving infected trees in the ground, potentially making it nearly impossible to bring new trees into production without them becoming infected. However, some would be surprised to learn that Maury doesn't disagree with his critics. In fact, he's not sure that a new grove can be planted and kept greening-free for

any considerable amount of time whether trees are removed or not, given our current psyllid control methods. "Look at the Ben Hill Griffin block in Frostproof [at the corner of U.S. 27 and Hwy. 17]. Steve Farr's an excellent production manager, you can't get much better, and still it has 1 or 2 percent infection already."

That's precisely why Maury is pushing for the development of a repellent system. Such a system, he believes, coupled with judicious, well-timed pesticide applications, is the only way to control psyllids well enough to keep new, solid blocks of trees greening-free, and preserve the integrity of the juice and fruit by products. If the system were very effective, it may even allow for the restoration of much of the biological control we have lost over the past few years.

Maury's final thought on how to win the greening battle sums things up pretty well: "We're gonna have to think outside the box."

Note: The Belize Ag Report thanks Dr. Thomas Mathew of Golden Stream Spice Farm/Belize Botanical Gardens, Toledo District, for sharing this article with us.

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Agri-Gro, Continued from pg. 6

of crop residue is increased which releases nutrients and adds organic matter to the soil. Agri-Gro can also be applied directly on to plants, increasing photosynthesis and the plant's continued ability to metabolize carbohydrates, proteins, and other growth compounds contained in the leaves and transfer them to the root system. From the root system these compounds move out into the rhizosphere, feeding bacteria, algae, fungi and protozoa which in turn produce beneficial enzymes, organic acids, antibiotics, growth hormones and other nutrients. These growth stimulants are then re-absorbed by the roots and transported back through the plant system producing higher yielding healthier crops. The crops specific to Belize which were tested by researchers and found to have increased yield and quality using Agri-Gro over those which had no application of Agri-Gro are: bell peppers, broccoli, cantaloupes, carrots, cayenne peppers, celery, corn, jalapeño peppers, lima beans, okra, onions, pineapples, poblano peppers, potatoes, rice, snap beans, soybeans, squash, sugar cane, tomatoes, and watermelon.

Minor-Use Authorizations (Pesticides)



A provision under the Pesticide Regulations of Belize to facilitate the importation of unregistered pesticides by and on behalf of pesticide end-users

Miriam Serrut, MA

Registrar of Pesticides, Pesticides Control Board

The Pesticides Control Board is the regulatory body in Belize mandated with the enforcement of the provisions of the Pesticides Control Act of 1985, and its ensuing Regulations; which include the Pesticide Registration Regulations of 1995, and amendment Registration Regulation of 2003.

The Registration Regulations of 1995 established Belize's formal registration scheme of pesticides by trade name and formulation (as opposed to approval of active ingredients). This system of registration is established by the international standard on pesticide management, the International Code of Conduct on the Distribution and Sale of Pesticides. Only pesticides duly registered by the Pesticides Control Board are allowed importation and use in the country of Belize.

It became evident after 1995, however, that a gap needed to be addressed to facilitate the importation of unregistered pesticides which were needed by end-users but not registered or readily available locally. Belize has a relatively small overall pesticide market size (annual import value of BZ \$15 - \$20 million). As such, the technical and economic investment necessary to pursue and obtain registration of pesticide products of minor use potential is at times not considered feasible by pesticide manufacturing companies.

It is to this end that the amendment Registration Regulations of 2003 addressed this gap with the establishment of a provision for **minor-use authorizations**, to allow for the importation of unregistered pesticides by end-users. Pesticide users may apply for a minor-use authorization, providing minimal information, which includes primarily a justification as to why pesticides registered or locally available in Belize are not suitable to their specific pest control need.

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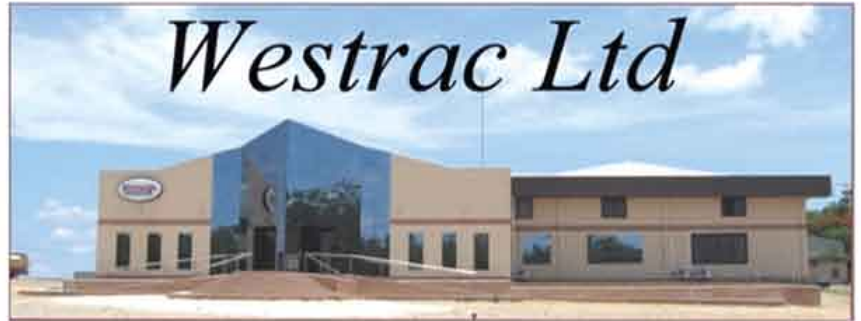
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Minor-use authorizations are issued to end-users only, and an authorization is valid for a single importation consignment of an approved quantity. While there is currently no restriction on the consignment size, the user must also provide information such as acreage, dosage rate and application timing to justify the quantity requested for importation.

For more information, such as the relevant application form and application requirements, contact the Pesticides Control Board at pcbinfo@btl.net, or call 824-2640.

Coming soon
Belize
AGRICULTURE
CENSUS 2010

The Ministry of Agriculture & Fisheries will be conducting an Agriculture Census Starting in November 2010. This census will provide a profile of Belize's agricultural operations, including information on number of farms, crops, land use, land management practices, livestock and poultry, farm machinery, operating expenses, gross farm receipts, ect.



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Agriculture Prices at a Glance- \$\$\$\$\$

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 str. & bulls- 750- 1100 lbs	S	.95-1.00	.93 - .95
Cows & Heifers for Butcher	S	.60 - .75	(old).50 - .60
Heifers for breeding 650-900 lbs	S	1.00 - 1.15	.90 - 1.00
Young grass cattle- 350- 650 lbs	S	.85 - .95	.75 - .85
U.S price -corn fed- 1000- 1200 lbs	H	98.82/US=197.65/Bz	
U.S price - feeders 600- 800 lbs	H	1.10/US=2.20/Bz	
U.S price- calves 450- 600 lbs	H	1.40/Us=2.80/Bz	
U.S price- aged butcher cows	H	40-80/US=80-1.60/Bz	
Belize Hogs			
Weiner pigs- 30 -50 lbs- by the head	S	\$85.00 - \$95.00	
Butcher pigs 125 - 200 lbs	S	1.70 - 1.75	1.65 - 1.70
Belize Sheep			
Butcher lambs	L	2.00 - 2.50	1.75- 2.00
Mature ewes	S	1.70 - 1.75	1.60 - 1.70
Belize Chickens			
Broilers- live per lb	L	1.05- 1.10	1.00- 1.05
Old hens	S	.73 - .76	.70 - .73
Belize Milk			
Pd to farmer per lb	S	45 contract	no demand
Special farm items			
Shrimp Retail- Farm Raised	S	6.50 - 8.50	5.50 - 6.50
Pitaya 12-16 oz	S	1.75 - 2.00 each	
Eggs-tray of 30 eggs	S	farm price/4.50-retail/ 7.50-8	

Grains, Beans & Rice	T	A	B
Belize yellow corn	H	.22 - .23	.21 - .22
White Corn	H	.22 - .23	.21 - .22
Corn/ Local retail (Low volume)	H	.25 - .32	.25 - .28
U.S corn price @ 5.82-up from 3.75	H	Bz 20.78 -6¢ -8¢	to get here
Guatemala corn price/Peten	H	.27 - .30	.25 - .27
Belize Milo	H	.19 - .20	.18 - .19
R-K's, little reds & blacks (beans)	H	.80-.85 farm-retail	1.25-1.5¢
Black eyed peas	H	farm-.70- .80 retail	1.25-1.5¢
Paddy rice/ from combine	S	30 - 35 -depends on area	
Milled retail rice per pound	S	whosal 103-108	Ret 115-125
Citrus			
Oranges per 90 lb box-lb.solid basis	H	\$10.50 Est. 2010 price	
Grapefruit- per 90 lb box	H	\$5.50 Est. 2010 price	
Sugar			
Cane per ton- est. 2010 price	L	\$45.28/ est.	
White Sugar- 112 lbs- controlled	S	\$45 per bag	
Brown Sugar- 112 lbs- controlled	S	\$39 per bag	
Bananas			
Export @ 40 lb box	S	June- Aug .price- 12 - 13	
Local Wholesale #2 quality- 40 lb	S	\$ 7.00- \$10.00	
Retail #2 @ 8 per sale	S	\$1.00 - \$1.50	
Fruits & Vegetables			
Tomatoes, Cabbages, cucumbers	H	whosal/75-1.75-ret-	\$1.75-\$3.00

***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: There seem to be confusion in sugar- citrus - no cattle legally to Mexico , crime and home invasion and now we deal with Richard - (the not so little lion). Please note that the US corn price on the Chicago Board of trade has risen from 3.75 US a 56lb bushel to 5.82. This reflects an increase of 8¢ Belize a pound. Life on the farm has been very difficult -hard to sell our products at a profit and everything we buy seems to go up in price. Anyhow we all know as farmers that next year will be better. We always say that, but this year I really believe it. I predict by year end that corn will be selling closer to 30¢ than 25¢ and cattle will be moving legally to Mexico.
 All the best John Carr

Light Rein
By Marjie Olson

**Conditioning the Horse for the
TRIPLE CROWN ENDURANCE RACE**

Before you consider actually competing in any long distance ride, the horse must be up to the task. It can take many weeks, and sometimes months, of consistent, careful, work to condition a horse to do 15-25 miles of serious competition in a day. Conditioning needs to start easy and gradually build until the horse can physically and mentally handle the stress. If you can work your horse on natural terrain, including hill, this is certainly the best scenario.

Your conditioning program needs to get the horse's pulse and respiration levels elevated at least 3 times per week, but you need to be aware of his normal parameters in his day to day routine before you can assume his elevated levels are ok. This can be accomplished with a routine for a few days or over a week or so of checking his heart rate, temperature and respiration. I recommend morning and night as they will often change lightly and then you will be comfortable knowing this before it surprises you on the one day you check in the morning instead of evening and your mare's rate is up, probably due to anticipation of getting fed or turned out.

After you have figured her normal range, now you can start working her. If she is a routinely ridden horse to start then go to a 10 min vigorous workout, working up to a vigorous 20-min workout, or a long, slower, but consistent 4-hr ride. Please use common sense and don't run her into the ground for twenty minutes...use a slow warm up to a vigorous work out and back to a slow cool down with trotting till her breathing is slowed to normal. The horse's pulse and respiration should be monitored as it is being worked to ensure that the workout creates an appropriate amount of physical stress, but not too much. It is all about that happy medium you hear me say all the time: what's too much and what's not enough...

During this vigorous phase of training, the horse's speed and duration of exercise should allow for steady state heart rates below 150 to 170 beats per minute, which is the anaerobic threshold. Your horse's heart rate will remain the same as his speed increases, IF, he is getting more and more fit, if your program is working. Recovery heart rates should occur quicker as the horse becomes more fit. A horse in good aerobic condition will have recovery heart rate around 100 beats per minute at two minutes post exercise when exercising at rates to induce heart rates near the anaerobic threshold. Recovery heart rates at 10 minutes post exercise should be less than 60 beats per minute.

KNOW YOUR HORSE! You should know her resting and working heart rate and respiration and in varying temperatures of weathers if possible. What is her routine body temp? This will allow you to know when your horse is getting stressed or just excited. This is an important part of the conditioning routine. Don't leave it to the guess factor of "you think" her rates are ok. It could kill your horse.

As horses bones, organs and mental health grow well into their young adult years, the U.S. has many rules regarding age limits to



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start endurance racing with 5 yr being the youngest and 7 yrs being the norm. We at the TCER realize we are running a 'conditioning style' race and are offering less distances with a build up to the 25 miler, so we have considered lowering the age to 4 yrs old. The vet/steward will check your horses teeth for age. PLEASE, do not bring a horse whose age will be questionable as there will not be refunds in this instance and use common sense. If you are unsure-have a vet look before you enter.

We look forward to having a great event. And hope you will join us either as a TVER contender or an entry in the OPEN HORSE SHOW, or to come and just watch the excitement.

Please check BelizeAgReport.com, Belizehorses.com and the <http://poozieswicked.blogspot.com> for more info and entry and sponsor forms. Have a safe Oct/Nov.

Thanks for reading and "enjoy the ride".

Marjorie Olson, Light Rein Farm, 5 mile Mtn. Pine Ridge Rd, Cayo Dist. Belize

All comments are the opinion of Marjie Olson and are in no manner expected to be the only way to train a horse but have proven to work for her.

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Mexican Side, continued from pg. 12

- CIF means "Cost, Insurance and Freight" – that is, the price includes all the freight costs encountered from the point of origin to and including the port of destination. All that is the cost of buyer is the handling in the port of destination. These are the costs of unloading the commodity from the ship and loading into the delivery truck, the customs costs such as permits for importation, taxes, custom fees and the freight to the warehouse of the buyer.

Size of Shipment

The most common shipping containers are large metal boxes in either 20 feet or 40 feet lengths for dry cargo. If a shipment is not large enough to fill an entire container you may contact a shipping company to arrange international freight for smaller volumes, sharing the container with other commodities. This is called consolidated cargo. You may also contact other exporters and arrange the consolidation yourself.

Contract a Customs Broker

A customs broker is a professional that can advise you of the regulations that correspond to the type of commodity that you desire to export and help you analyze the viability of the operation. On the Mexican side a customs broker is required by law. A customs broker with patent validity can expedite the exportation process with customs authorities. A Mexican broker reviews the customs documentation corresponding to the importation of commodities into Mexico. Part of this

documentation is elaborated at the moment of arrival of the cargo at the port of destination and is controlled and validated by customs authorities. It is critical to have a shipment in order, listed and clarified to be sure that the commodity can be imported. There are many commodities that require prior permission to import and some that require an exact count before embarking the commodity from port of origin. A customs broker can advise you of these special conditions.

The Belize Ag Report announces a new section starting in issue 10, February-March 2011, and we request your assistance and participation. The column name is

THE TREASURE CROP: Young Belizeans in Agriculture.

We ask teachers, community leaders and anyone who has something to contribute about this to contact us by phone at 663-6777, or email roberson.elizabeth@gmail.com We will also host a TAB on our website, with ample room to post pictures, artwork, compositions, and information on exciting agriculture projects going on countrywide. Thanks for your help.

Corn Yields Falter

By John Carr

The latest 2010 corn harvest is 98% finished. I estimate that the average is 37 bags per acre compared to 42 bags per acre in 2009. This is a 11.9% lower yield compared to 2009 – 2010. I estimated my numbers at 15% at 50 bags per acre or higher – 55% at 40 bags and 30% at 35 bags. To reach an average I did not include 12.5% of the highest yields or 12.5% of the lowest yields. Based on corn exports on raw and processed forms we can expect our 2011 carry over to be 50% less in 2011. Corn went up right here at harvest which is very unusual. Corn has increased from 19 cents to 23 cents which caused a farmer to go from a break even to a small profit of approximately \$120-\$150 an acre. Because it is more or less 11 months to the next harvest, we could expect a continued upswing (Guatemala imports almost 13,000,000 bags of corn from the United States each year.)

Our yields were 12% lower because of heavy rains that cause some flooding and water to stand on the fields. Although the harvest time was the most dry and beautiful ever, the joy stopped there in most cases. The ears were small and in many cases were damaged by earworms, insects, birds and rain went in. Most of this begins with an earworm that damages the top wrap or husk and lets invaders into the ear. When rain enters the ear the damage is significant ranging from 10 to 100%. The harvester combines and grain cleaners find it

almost impossible to separate the damaged kernels from the good kernels and the bad kernels find their way into the food chain (if you looked at those shriveled up – fungusy – black and gray kernels which you would not want to eat). Many of us commercial farmers believe that if we had been able to purchase modern selected “Genetically Modified Organism”, corn seed we would have cut our losses and increased our quality. A group of us went to Honduras a few weeks ago and witnessed GMO corn that had no earworms and right beside it, the same non GMO corn that we have to use here and there were earworms in almost every stock.

A headline in the October 9th 2010 issue of the Wall Street Journal reads “Harvest Shocker Rattles Wall Street”. The USDA announced a 3.8% corn harvest reduction from August to September. This caused corn to go up 6% in one day in Chicago. The experts are saying that the supply and demand ratio is very tight. They predict that when the corn harvest starts in the US in the fall of 2011 there will be a 47% shortage as compared to the 2010 carry over. Between worldwide weather phonemes, bio-fuel usage and increased export demand to almost everywhere in the world, this will cause shortages in corn, wheat and soy bean supplies. Some calculations show that corn prices leaving the gulf port area to Belize is at 22 cents a Belize a pound – F.O.B Mississippi. All of this market and production enthusiasm will probably double our grain production potential in Belize over the next 5-8 years.

Continues on pg. 30



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While we starve , continued from pg. 5

4. Monsanto is a litigious company with a long history of lawsuits, including against farmers, and even those who did not use Monsanto seed that drifted into their fields. Monsanto has patents on their products so that if farmers, knowingly or otherwise, end up with Monsanto-variety crops in their fields, they can and have become subject to prosecution by Monsanto. Once the Monsanto genomes start spreading with the wind, any farmer raising crops from natural seed can become legally liable. Are Belize farmers immune from such liability? To put it a different way, do you think the GoB is immune from the deleterious effects of transnational-corporation money?
5. Monsanto sales claims about increased crop yields are a hit or miss proposition, despite the sales hype. Thousands of farmers in India have committed suicide because they bit the hook of increased yields from Monsanto, borrowed to pay for the overpriced seed, and went broke. Because of both the oversell of high-priced GMO seed and the aggressive treatment Monsanto has given the market, India is turning against GMO products, as has the European Union. As the world is finding out about the dark side of GMO and rejecting it, this is hardly the time for Belize to be introducing it.

The best GMO can do is to put some extra profit in the pockets of seed distributors and farmers. It could also give distributors a bad reputation if GMO seed does not deliver in Belize, and because of its high price, it could put some Belize farmers in a similar financial situation to those in India. It could pollute

the native seed genome so that yields with native seed are less than before. It can also potentially sterilize Belize's crop seed base, leaving the country in search of what native seed elsewhere is available. The search for corn would probably be in Mexico, where Mexicans are also turning against GMO seed. It could spread GMO genomes to farmers not wanting it and placing them in danger of a lawsuit from Monsanto. Once GMO and Monsanto, who has been promoting the sale of GMO seed to Belizeans, are in the country, it will be much harder to remove both the effects of GMO on native crop seeds and also the predatory damage of a transnational corporation seeking control of the food supply.

It is well-known to those who study the global social order that the American elitists on Wall Street, in high government positions, think tanks, and policy formation institutes, and the heads of large transnational corporations are attempting to build a New World Order by gaining control of critical infrastructure, such as transportation and communication, energy sources, and the food supply. (See www.globalresearch.ca for more on the geopolitical aspect of GMO companies like Monsanto.)

The GoB, seed importers, distributors, farmers, and anyone who eats in Belize should take heed to this issue, for it can affect everyone significantly in a few years. Now is not the time for Belize to become another transnational corporation market experiment with the primitive level of bioengineering at present. The promised benefits do not outweigh the known risks.

Dennis Feucht



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Fire Safety

By Glenford Baptist



A fire can send

- your job
- your income
- your health
- even your life

up in smoke

Fire kills and injures many people of all ages and economic status. It also causes pain and suffering, destruction of property and financial stability?

Have you taken out time to evaluate what you can do and your preparedness to deal with a fire situation .

Fire can destroy in a matter of minutes what you have taken a lifetime to build. Do not be a victim, be prepared.

Most fires are caused by

- poor judgement
- human error
- ignorance
- failure to follow instructions

The best way to fight a fire is to prevent it from starting.

Start by developing an awareness of your surroundings.

Know how fires start and be aware of the surrounding hazards that can cause fires.

It is very important that one develops an attitude that is all about *safety first* starting at home and the workplace.

Develop a fire safety plan for your home and ask about one at your work place. Teach it at home and study the one at your work place. When in a public area or on public transportation ask about their fire safety plan and pay attention to it for your safety.

Finally be active; take the necessary action to remove fire hazards before a fire starts. Learn how to use a fire extinguisher. Get one for your house, car, boat, truck, business if there isn't one available.

Fire safety starts with you having an awareness of your environment, having a *safety first* attitude and being active to stop any fire from starting or extinguishing it quickly.

More will follow in our next issue.

Note: Glenford Baptist is the Manager of Fabrigas Belize Ltd.

Neem, Continued from pg. 3

An experiment involving 2 jars, each with a leaf and a grasshopper, further demonstrates how neem works. One leaf is sprayed with a chemical insecticide, the other with neem. The grasshopper in the first jar eats the chemically poisoned leaf and dies instantly. The grasshopper on the neem sprayed leaf refuses to eat the leaf and starves to death. Which is better, a half eaten poisoned cabbage, or one that is whole, organic, and safe to eat? Neem is so safe that it is used in many products including toothpaste, mouthwash, soaps, shampoos and many very effective medicines.

In India, it is often referred to as "the village pharmacy" and has been used in treating numerous health conditions for nearly



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5,000 years. All parts of the tree are used in treating a variety of ailments such as skin diseases including acne and psoriasis. It is used as an effective treatment for parasites, rheumatism and arthritis. It has antiviral as well as anti-malarial, antibacterial, and antifungal properties. It is also used in the case of poisonous bites. The bark reduces fever, is a powerful diuretic and contains the anti-inflammatory properties. Neem can lower blood sugar in diabetics by approximately 50%, and is used to lower cholesterol as well as blood pressure preventing heart disease. It is used as a blood purifier and detoxifier. Research is ongoing and promising results have been found in treating as well as preventing AIDS and some cancers. It has been used effectively for hundreds of years as a safe alternative birth control by women and current research promises the first male birth control pill from neem. Neem is also an indispensable remedy for pets and farm animals, preventing tick and flea bites, as well as treating mange in dogs.

The US based National Research Council's Board on Science and Technology for International Development released a report, entitled "Neem: A Tree for Solving Global Problems". This report released in 1992 claims that neem is one of the most promising of all plants and that it may eventually benefit every person on the planet. "Probably no other plant yields as many strange and varied products or has as many exploitable by-products as neem."

Neem oil is available at some agricultural product stores including Prosser's in Belmopan. Neem trees can be purchased at several nurseries in Belize including Central Farms and DuPlooy's. If seeds are planted, they must be planted within a few weeks of harvesting the ripened fruit or they will not germinate.

Karin Westdyk is a former environmental journalist and grants writer, now retired, living in Belize and growing neem trees.

A Bit of History

Reimer Feed Mill, Spanish Lookout, Cayo District

In 1959, one year after the settlement at Spanish Lookout began, Peter and John Reimer, two brothers who had worked at a feed mill in the Mennonite colony at Chijuaquia, Mexico, partnered to create what is now one of the industry giants of Spanish Lookout. With a humble beginning on 3 acres, their first 'equipment', as their long time manager, John Dueck tells us, was 'a shovel'. They began sales with almost all imported feed, slowly augmenting with some locally produced corn. In the first years, the volume was around a ton per day. Next, Reimer's Feed procured a grinder (not a hammer mill), which ground the corn with plates, just like the Maya Indians, only of metal). Still the feed was mixed via shovel, and loaded into the sacks with the same shovels, as there were no bagging machines either.

After a year of growth, the mill purchased a vertical mixer, which they still have but is not in use. Their current mixer is of horizontal type. Their main products were chicken feed, comprising 90% of volume, and then dairy feed, then pig feed. As the Mennonite colony pioneered the broiler industry in Belize, most of their sales were within the colony, with increasing sales to outsiders as time progressed.

So, for 20 years, everything was in bags. Farmers each dried their own corn in cribs, and delivered to the mill in sacks. Only in 1972 were the first 2 silos purchased from Koop

Sheetmetal. The capacity of each was 15 tons. (These have been sold now, but are still in use.) With continued growth, now Reimer's has a capacity to store 13,000 tons of corn. With the advent of silos the days of primarily bagging all feed declined. Larger customers put up storage facilities on their own farms, and Reimer's purchased their first bulk delivery trucks in 1981.

Also in 1981, ownership changed. In keeping with Mennonite tradition of family businesses, of the new 4 partners, all were related to the original partners. The fifth was John Dueck, who was the manager then as well as now. Around that same time, dryers were purchased. The first were batch dryers, with kerosene burners. As these transmitted some of the taste and smell to the corn, Reimer's soon upgraded to butane gas dryers. These dried in a slightly shorter time, but mainly improved product quality. Today's dryer is continuous flow dryer which can dry up to 10,000 bags or 500 tons in one day!

Grain products handled today at Reimer's are approximately 70% corn, 25% soybean meal, and 5% byproducts - millfeed (bran), feathers, etc. Feeds today comprise about 80% of Reimer's sales, with veterinary and pet products at roughly 20%, but growing. An interesting trend is that, of the approximately 10% of feed sales that are 'bagged' (as opposed to bulk), bag sales are expanding, roughly 5% per annum, indicating increases in small scale family farming again.

By B. Roberson

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...we're growing belize

Dear Rubber Boots

We are very happy to know that you have returned. Welcome back!

I have three questions concerning plant toxicity saved up for you:

1. We have been told not to eat green cored carrots as they are toxic. Is it true?
2. Also we were warned long time ago that chaya has toxins so that one should boil them and discard the liquid before eating them. I know many people consume chaya raw in juice, etc. Do you have any information on it?
3. What is the scientific name for the vine locally called "spinach". Are there any information on this plant? Our neighbour got sick every time he ate them, so he no longer eats them.

Toshi Schwerdtfeger, Cayo

Dear Toshi,

1. Carrot greens are categorized as 'mildly toxic', by Judith Sumner in American Household Botany, due to certain alkaloids. The carrot's exposure to the sun, can cause these same alkaloids to be present in the top of the carrot itself too. This also happens to potatoes that are inadvertently exposed to the sun, and they also are mildly toxic. We make no recommendations as to eating or not, but note that we also found many recipes online for using carrot greens in moderation in salads, etc. Ms. Sumner notes that some of the effects from consumption of (vegetable) alkaloids include "slightly elevated blood pressure, slightly elevated alertness, and slightly elevated heartbeat".

2. Chaya is incredibly nutritious, but yes, must be cooked before eaten. Raw chaya contains glucosides that can release toxic cyanide, similar to raw cassava. 20 minutes cooking renders the chaya safe as the poison is released as a vapor, so the liquid may be safely eaten too. Recommendations are not to cook chaya in aluminum pans, as a reaction may occur which can cause stomach problems (Wikipedia). Organic columnist Greg and our chaya writer, Maruja, both advise against drinking the juice raw!!

3. Both callalou and chaya are called 'spinach' locally (chaya called 'tree' spinach). Did your neighbor eat this spinach raw or cooked?

We ask our readers, help us with scientific name for the vine spinach, and will print in issue 10.

Dear Rubber Boots and A. Schiemann,

This is how I controlled the drunken bayman on my pitaya. Take empty 1/2 gallon milk carton, just under the lid on the shoulder of the bottle cut a round circle about the belize dollar, Only cut out about 90% of the circle, leaving it attached at the top near the lid. this keeps the rain out of the bottle. Put in the bottle 1 Tablespoon of Belize 'brown' or unrefined sugar, and 1 teaspoon of this insecticide powder: Sulban 5 DP. It comes in Kg package and costs less than \$5. Available at Mid West Steel in Spanish Lookout. You may have to renew the contents every 3 to 4 weeks. Depending on the size of the tree, you may need more than one bottle. the insect seems to be attached to the sugar, and then takes in the poison.

Maruja Vargas



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Cobia, Continued from pg. 1

MFB's hatchery, situated on 119 acres north of the Dangriga Airport, is dependent on a sea water intake system which pumps fresh seawater into the facility from a depth of 7 m, at a distance of 1000 m offshore. Four thousand gal/minute is the combined capacity of 4 submersible pumps. Each pipe is anchored to the seafloor every 12 feet, with 250 kg concrete saddle weights. Three types of filters insure water purity, starting at 100 micron filters, then sand filters down to 10 microns and the final filters - UV filters - for bacteria, etc. The water is likewise treated on its exit from the facility to minimize pollution.

The brood-stock fish, which begin to produce eggs at 3 yrs of age, can begin spawning at approx. 20 lbs, and can attain a weight of over 100 lbs. Each fish has an imbedded microchip, which can be read from a hand held scanner. Detailed records are kept on each fish, including a spawning log indicating the quantity of eggs per spawning (which can be between 1 to 4 million). An 80% fertility rate is considered good. Lower rate spawns (eggs) are discarded. Each brood fish can spawn approx. every 3 weeks. MFB is finding that Belize's favorable climate can increase the limited spawning season of the wild to year around. The 27 brood fish currently at the hatchery are fed once daily, with rotation of shrimp, squid and sardines, and custom vitamin supplements (imported, except the shrimp which is purchased from a local producer).

Note, these are all natural spawns, occurring at sundown, and male fish are kept in the tanks for egg fertilization. There is only a one minute window for fertilization to occur! The healthiest of the lipid-laden golden colored eggs (similar to caviar), float to the top of the tank and are harvested approx. 12 hrs after spawning. At 30° C (86° F) these hatch in 24 hrs. Within 40 minutes of fertilization, there is cell division, and by 12 hours later, there is an embryo, and in another 12 hrs., (24 hrs. age), larvae.

For the first 3 days the larvae feed on a yolk sac. From day 3-10, these infant fish are fed 50-200 micron sized rotifer, which is an organism similar to plankton, which itself filter feeds microalgae in the water. Quite easy to cultivate, MFB maintains a rotifer department in the hatchery for this production: 1 B of them can increase to 1.6 B within 24 hrs. Next on the menu (from day 8-24) these young fish eat artemia – aka 'sea monkeys' or 'brine shrimp'. These are between 160-400 microns, hatched from dehydrated cysts that are imported in cans. When cysts are placed into sea water, they immediately hatch. MFB enriches them for one day, before feeding them to the hungry cobia larvae.

The larvae grow from being pre-metamorphosized larvae (1-10 days post hatch) to post-metamorphosized larvae (10-25 days post hatch), to fingerlings (once on pelleted diets approx. 30 -40 days post hatch) to juveniles. Cobia have a survival trait that allows them to ONLY strike (and eat) a moving target. This is true from the moment they are born; so live rotifer and artemia are critical. The process of transition from live feed (rotifer/artemia), to pelleted diets is called "weaning", and can be considered training the fish to recognize the pellets as food and learn to strike them and put them into their mouths.

Continues to pg. 27

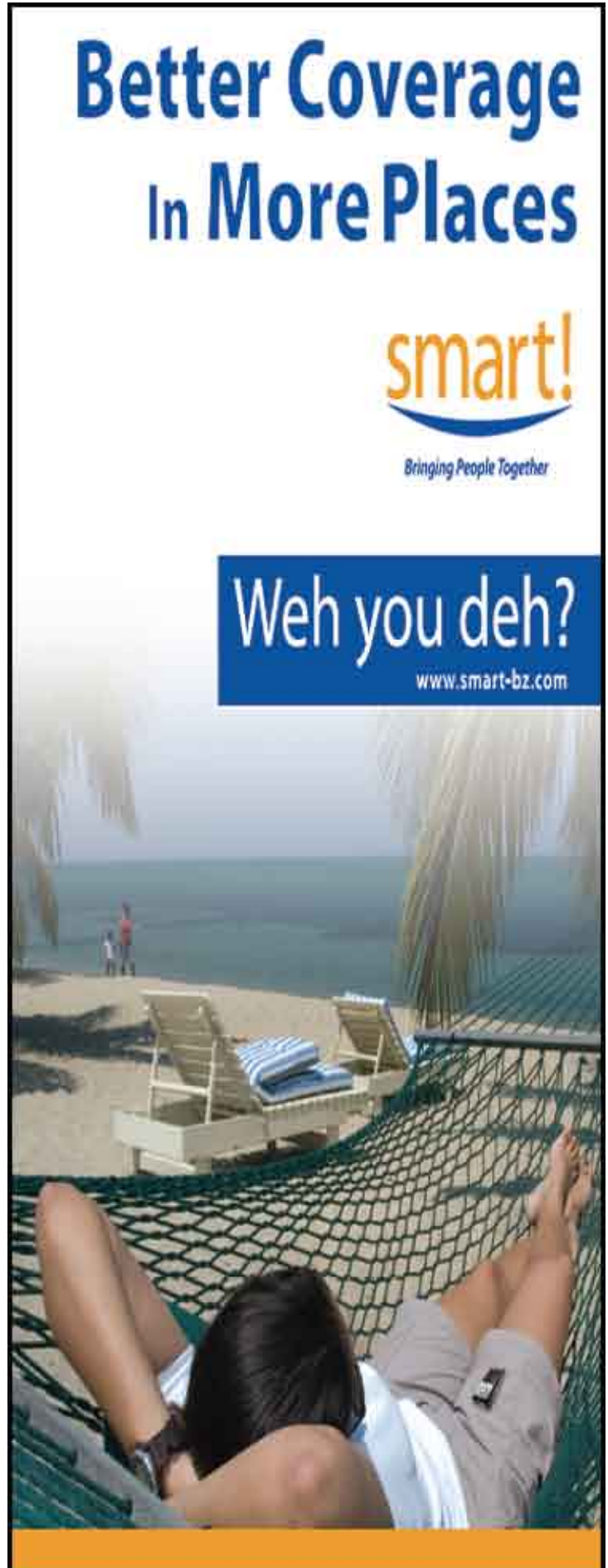
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Cobia, Continued from pg. 26

At day 15 or 16, the fish are introduced to pelleted feed, and on day 18 they undergo the first size grading which is done manually to reduce cannibalism. By day 30 they are up to 1 gm body weight, and at approx. 40-50 days have grown to 3-4 grams, and are sent to the nursery cages. If larvae are sold to another fish farm, the sale is made as one day old larvae. The hatchery presently is producing approx. 200,000 fingerlings per year, and could easily expand to over 1 million with minor modifications.

Cobia are among the fastest growing marine species with a growth rate up to three times that of Atlantic Salmon.

Part 2 will cover Marine Farm Belize's cage farming operation in our next 'regular' issue, Feb-Mar 2011. (January will be FRUIT-only issue.)

Note: Belize Ag Report greatly appreciates the tours given to our staff, at both the hatchery and offshore (inside the reef) operation. Madrid native, Mr. Jorge Alarcon, the general manager, on both occasions reorganized to enable us to see as much as possible – even holding back a batch of fingerlings from their trip to the sea, so we could view them in their tanks. As a youngster growing up in Spain, Mr. Alarcon was a fan of Jacques Cousteau, and he developed a great respect for the sea. He has a bachelors degree in Marine Biology and a Masters on Marine Affairs and Policy / Aquaculture Management from U. of Miami.

We were impressed with MFB's concern not only for financial interests, but also for our marine environment. The staff of 12 at the hatchery, under the management of Mr. Samuel Choc of Toledo, are Belizeans who are highly trained and committed to run the day-to-day operations.

More photos in our ONLINE ANNEX.



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Belize Ag Report's

AG NEWS BRIEFS



Belize Livestock Producers Association

– **AGM**; On October 30th some 100 cattlemen gathered for their AGM and discussed cattle marketing problems. The members unanimously approved that the Tuberculosis/ Brucellosis sweep be initiated in the Corozal/Orange Walk Districts followed by the entire country. The details will be worked out by MAF – BAHBA – Mexico and BLPA soon so we can ship cattle from these two districts. A ‘designated corral’ system may be used to speed things up. The Minister of Agriculture, Hon. Rene Montero gave an inspiring message of support to the ranchers of Belize. He also recognized 6 deserving cattlemen with plaques and carvings as a show of appreciation for long time service to the industry. Those receiving awards were: Joe Freisen Sr., Edmund Longsworth, John Roberson, Rudy Crawford, Fred Hunter Sr. and John Carr. An election was held and the following persons now comprise the board of directors: Fred Hunter, Frank Rempel, Abdula Bedran, John Dyck, Dr. E. Vanzies, Abe Reimer, Rudy Crawford and John Carr. Officers will be chosen at their first meeting.

Farmland sales, increase 10-fold worldwide: The World Bank reported that during the years 1998 to 2008, worldwide annual ‘large farmland’ sales were approx. 4.5 M ha. Then for 2009, it jumped to 45 M ha.! Media have called farmland, ‘the original asset’, and players from around the world, are entering into this land-buying frenzy. Brazil, recognizing this before the study was released, already put some restrictions on foreign land ownership. Foreign land buyers and lookers are active in Belize as well. In North America, new investment groups are forming to both purchase farmland and administer farms.

While we were sleeping, someone took out the milk fat OUT of most brands of **condensed milk**, and ‘filled’ it with vegetable and palm oils... Not that these are not also healthy fats, but what happened to the days of milk fat in milk? Read your labels!

Holland is assisting Panama to develop **ethanol from cassava**. As a country which imports all of its fuel, Panama hopes to both

alleviate the foreign fuel dependence and create more uses for its local cassava. They hope to have over 1000 ha in production within 3 years. The first plant will be in Veraguas, Panama.

Who are the **two net exporters of food in CARICOM**? IF you said Belize and Guyana, you are right. Both countries share a bounty of arable land and water, and low population densities.

Excerpt from USDA ARS(Agricultural Research Service) bulletin: “ Scientists at Ft. Pierce have evidence that **suggests that guava, interplanted with citrus, prevents the spread of greening[HLB]**. Scientists in Japan and Viet Nam discovered that HLB did not occur in citrus groves when intercropped with guava, while control plots had over 30 percent infection. The mechanism may be volatile compounds produced by guava which disrupt the ability of the psyllid vector of HLB to locate its citrus host. Studies are underway in field plots to validate these preliminary findings and to identify the potential volatiles.” More info, see article pg 14, reprinted courtesy of *Citrus Industry* magazine.

Although North America may experience **turkey** shortage this holiday season, we should be ok in Belize. The heat wave in the U.S. made it more difficult for suppliers to find turkey eggs for importation. Local producers expect that those importers who traditionally import finished turkeys may not be as successful this year. In other poultry news, Quality Poultry Products is expanding their processing area, and will soon add processed turkey items to their product line.

RETURN of PRESS RELEASE/NOTICES and EVENTS CALENDAR TABS to our website: A change to JOOMLA will enable us for more timely uploads. Check out the our new look at www.BelizeAgReport.com

UPDATE TO THE RAIN CHART

We thank the family of Mr. David J. Thiessen

of Friesen Hatcheries, Spanish Lookout, for sharing these figures with us. They have kept rainfall records continuously for 41 years.

The figures shown are for rains in Spanish Lookout, Cayo District. For the chart showing May 1968 to April of this year, go to page 14 of issue # 7, June-July 2010. Available online.

2010

	Aug.	Sept.	Oct.
Per Mo.	6.60"	7.76"	5.29"
Avg.	6.71"	6.85"	6.10"
Variation	+0.11"	-0.91"	+0.91"



Local and Regional Fuel Prices



	Belmopan, Belize	Quintana Roo, Mexico	Peten, Guatemala
REGULAR	↓ \$9.41 Bz/Gal	↑ 8.29 pesos/Lt \$5.16 Bz/Gal	↓ Q 29.98 /Gal \$7.63 Bz/Gal
PREMIUM	↓ \$9.80 Bz/Gal	↑ 9.63 pesos/Lt \$6.00 Bz/Gal	↓ Q 30.48/Gal \$8.02 Bz/Gal
DIESEL	↑ \$8.72 Bz/Gal	↑ 8.69 pesos/Lt \$5.42 Bz/Gal	↓ Q 24.98/Gal \$6.57 Bz/Gal

Red Ring Disease: You may be encouraging the spread of this disease, affecting coconuts, oil palms, and most palm species, by pruning your palms, which creates an entry site for the vector. This nematode has been identified in Belize primarily at resorts which tend to manicure their grounds – thereby, in a way, ‘killing the palms with kindness’. Palm leaves should be left on the plant until they are dry enough to be removed by pulling. (That also allows the palm to re-absorb moisture from the frond, which is recycled in the plant.) Red Ring Disease is a serious economic problem in areas with heavy commercial coconut or oil palm production. Read more in next issue of the Belize Ag Report.

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Classified prices:

2-3 lines= \$24; 4-5 lines=\$32; 6-7 lines=\$40



FOR SALE: ROYAL PALM TREES: \$10. Per tree. At Glenn Schrock in Upper Barton Creek tel 650-0636, or email grschrock@live.com

FOR SALE: Teak of Mahogany Seedlings: Large quantities of young Teak or Mahogany seedlings are now available to purchase and ready to plant. To order call 666-9020.

FOR SALE: 2005 Harley Davidson, 1340 cc, 662-5263

CANOE WANTED: lifejackets & paddles (2 ea) email: k.ray@mac.com

90 Ac Great Bottomland for sale or lease, Banana Bank area, North side on Belize River. Former Caricom Farms land. 663-6777, holdfastbelize@gmail.com

FARM FOR SALE, BARTON CREEK: 74 ac on creek, approx 700 ft creek frontage, at \$249k USD, or 380 ac (includes above with creek), for \$510k USD. Productive farm, estate or resort potential. 664-7272, holdfastbelize@gmail.com

RENTAL PROPERTY: luxury rural, Cristo Rey Rd, 10 mins from San Ignacio, 1 bdrm, 2 bath, includes yard work, wkly maid, security. Very fine, on working farm. Call 664-7272 or holdfastbelize@gmail.com

450 Ac RIVERFRONT, approx 3300 ft on Belize River, Banana Bank area, Bmp, \$2,500 USD/ac. Priced for investment or development, prime location! 663-6777, 664-7272, holdfastbelize@gmail.com

SUNDAY FUN: Great market on the first Sunday of each month at Spectarte Art and Garden Gallery, Maya Beach, Placencia. Something old, something new; Buyers and sellers very welcome. 533-8019

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

Volunteer Vacations: "Pause" suites and cabaña - where animal lovers stay. Come stay with us for a good cause. www.pawanimalsanctuarybelize.com pawanimalsanctuarybelize@yahoo.com Telephone: 624-7076

Property for Sale: 76 acres of luscious fertile land, 15 minutes to Belmopan, 3000' beautiful riverfront, good road and utilities. \$4,500.00 per acre. Call now 664-7272, 663-6777 or visit our website www.holdfastbelize.com or email roberson.elizabeth@gmail.com

Residential Lots for Sale: Beautiful residential lots for sale in Cayo's Iguana Creek area. Lots starting at \$35k USD and up. Acreages range from 1.07 acres to 3.06 acres, 5 lots available. For more information visit our website www.holdfastbelize.com, email roberson.elizabeth@gmail.com or call 664-7272 / 663-6777.

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.

Banana Bank Report, Continued from pg. 21

According to a September 25th article in the Wall Street Journal - page A8 there is an article entitled "High -Tech Harvest—Genetically Modified Crops are Growing Up". It lists the following countries as planting over one million acres of GM Food planted in 2009. United States --158.1 million acres in corn ,soybeans, canola, squash ,papaya ,alfalfa ,and sugar beets - Brazil-- 52.9million acres in corn , soybeans and cotton - Argentina - 52.6 million acres corn, soybean and cotton - India --20.8 million in cotton - Canada - 20.3 million acres in corn , soybeans, canola , sugar beets - China --9.1 million acres cotton, tomatoes, papaya, sweet pepper and poplar - South Africa - - 5.2 million acres in corn, soybean , cotton - Paraguay-- 5.4 million acres in soybean - Uruguay -- 2.0 million acres in corn and soybeans- Bolivia--2.0 million acres soybeans - Philippines -- 1.2 million acres in corn . This total acreage adds up to 329.6 million acres and does not include lots of countries that are planting GMO crops.

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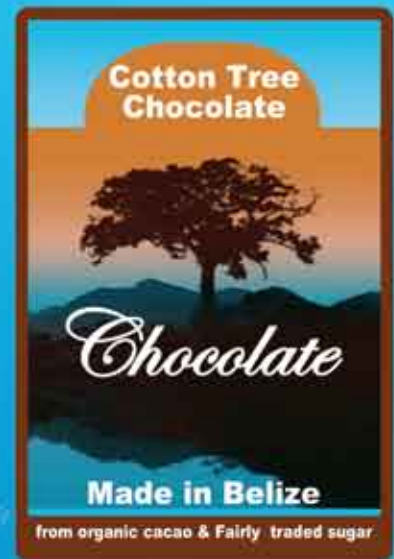
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