The Belize Ag Report

Belize's most complete independent agricultural publication

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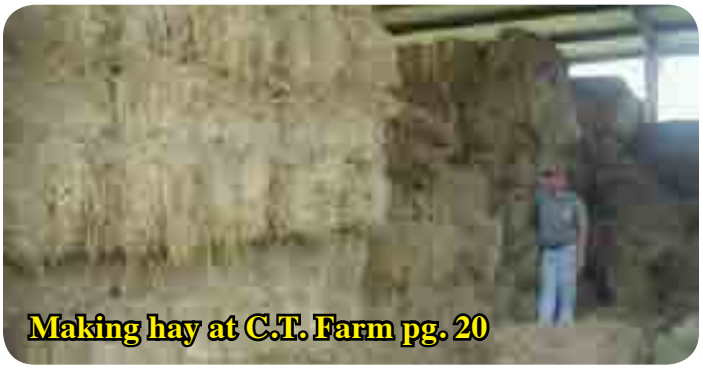

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Turkey (Domesticated) (*Meleagris gallopavo*)

By Orlando Habet

The domesticated turkey is a large poultry bird. The modern domesticated form descends from the wild turkey (*Meleagris gallopavo*). It was domesticated by the indigenous peoples of Mesoamerica at least 2,000 years ago, with the evidence pointing to what are today the central regions of Mexico (Guerrero, Veracruz and Jalisco). Ancient Mesoamericans domesticated this subspecies, using its meat and eggs as major sources of protein and employing its feathers extensively for decorative purposes. The Aztecs associated the turkey with their god of night and sorcery, Tezcatlipoca ("Smoking Mirror"), as well as the patron deity of Aztec kings and of young warriors. Domestic turkeys were taken to Europe by the Spanish. Many distinct breeds were developed in Europe. In the early 20th century, many advances were made in the breeding of turkeys, resulting in the modern breeds which are efficient meat producers and which have also been bred to produce a large breast compared to the remainder of the body.

William Strickland, a 16th-century English navigator, is generally credited with introducing the turkey into England. The domestic turkey was sent from England to Jamestown, Virginia in 1607.

In the early days of introduction of turkey, it was considered food for the well to-do. Intensive farming of turkeys from the late 1940s dramatically cut the price, making it more affordable for the working classes. With the availability of refrigeration, whole turkeys could be shipped frozen to distant markets. Later, advances in disease control increased production even more. Advances in shipping, changing consumer preferences and the proliferation of commercial poultry plants has made fresh turkey inexpensive as well as readily available.

The turkey was initially raised throughout the temperate parts of the world but is now also raised in the warmer climates as housing management has improved with controlled environmental housing. Turkey production is a popular form of poultry, partially because industrialized farming has made it very cheap for the amount of meat it produces. The female domesticated turkey is referred to as a hen and the chick as a *poult* or *turkeyling*. In the United States, the male is referred to as a *tom*, while in Europe, the male is a *stag*.

The great majority of domesticated turkeys are bred to have white feathers because their pin feathers are less visible when the carcass is dressed, although brown or bronze-feathered varieties are also raised. The Broad-breasted White is the commercial turkey of choice for large scale industrial turkey farms, and consequently is the most consumed variety of the bird. They have been selected for size and amount of meat. Mature toms are too large to achieve natural fertilization without injuring the hens, so their semen is collected, and hens are artificially inseminated. Several hens can be inseminated from each collection, so fewer toms are needed. The Broad-breasted Bronze is another commercially developed strain of table bird. The Standard Bronze looks much like the Broad-breasted, except that it is single breasted, and can naturally breed.

Turkeys are traditionally eaten as the main course (as stuffed turkey) at Christmas in the UK and in much of the world, as well as for Thanksgiving in the United States and Canada. Turkeys are usually baked or roasted in an oven for several hours, often while the cook prepares the remainder of the meal. Sometimes, a turkey is *brined* before roasting to enhance flavor and moisture content. This is necessary because the dark meat requires a higher temperature to denature all of the myoglobin pigment than the white meat (very low in myoglobin), so that fully cooking the dark meat tends to dry out the breast. Brining makes it possible to fully cook the dark meat without drying the breast meat. Note that the dark meats also contain higher levels of collagen, now associated with heart health.

Turkey, breast, meat only, raw Nutritional value per 100 g (3.5 oz)	
Energy	465 kJ (111 kcal)
Carbohydrates	0 g
- Sugars	0 g
- Dietary fiber	0 g
Fat	0.7 g
Protein	24.6 g
Thiamine (vit. B_1)	0 mg (0%)
Riboflavin (vit. B_2)	0.1 mg (8%)
Niacin (vit. B_3)	6.6 mg (44%)
Pantothenic acid (B_5)	0.7 mg (14%)
Vitamin B_6	0.6 mg (46%)
Folate (vit. B_9)	8 µg (2%)
Vitamin C	0 mg (0%)
Calcium	10 mg (1%)
Iron	1.2 mg (9%)
Magnesium	28 mg (8%)
Phosphorus	206 mg (29%)
Potassium	293 mg (6%)
Sodium	49 mg (3%)
Zinc	1.2 mg (13%)
Source: USDA Nutrient Database [1]	

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GOOD PESTICIDE MANAGEMENT PRACTICES FARMER RECOGNITION INITIATIVE

By Miriam Ochaeta-Serrut, MA

The Pesticides Control Board (PCB), in collaboration with the Food Safety Department of the Belize Agricultural Health Authority, the Extension Department of the Ministry of Natural Resources & Agriculture (MNRA) and the Taiwan Technical Mission (TTM) in Belize is pleased to announce the commencement of a voluntary initiative designed to assist horticulture farmers in improving their pesticide management practices.

Since its inception in 1988, PCB has focused on the promotion of rational pesticide management for the protection of human health and the environment among pesticide users, primarily those involved in crop production, through its national training programme for the certification of users of restricted-use pesticides.

The decision to use pesticides requires great responsibility on the part of the pesticide user. "Pesticides kill not only pests, but also pests' natural enemies; their overuse can harm farmers, consumers and the environment" (Save and Grow, FAO, 2011). The *rational* management of pesticides entails the judicious decision-making process carried out by the pesticide user including, but not limited to, the proper identification of the type of pest and the extent of pest damage as well as the consideration of pest control options within an integrated pest management (IPM) strategy.

The Good Pesticide Management Practices – Farmer Recognition Initiative (GPMP_FRI) features (1) a farmer assistance programme for capacity building in good agricultural practices as it relates to pest and pesticide management, (2) a monitoring and sample collection programme led by a team of trainers/inspectors comprising PCB technicians and MNRA extension officers, and (3) the rapid bioassay analysis of samples for pesticide residues by the Food Safety Department of BAHA. This work is being made possible through the technical assistance programme of TTM.

Farmer participation in GPMP-FRI was promoted in all districts in Belize by way of farmer meetings, and a total of forty-one farmers involved in full-time, small-to-medium scale horticulture production for the local market have now been selected from among those who volunteered to participate. Farmers are presently undergoing training provided by a trained team of technicians and extension officers of the PCB and MNRA. Trainers will also serve as inspectors to achieve the objective of the initiative which is to promote best pesticide management practices within a system for monitoring and evaluating pesticide use at the farm level.

Aspects of good pesticide management, such as choice of pesticide, use of the recommended dosage, and observance of the pre-harvest intervals, are specific critical areas which need to be addressed in order to ensure that consumers in Belize have access to wholesome, locally-produced food. The early detection of undesired pesticide residues in the crop volunteered for monitoring will allow for corrective action to be taken prior to the granting of approval for harvest from the collaborating farms.

This initiative is expected to improve the competitiveness of participating local farmers through a scheme which will award public recognition to those in compliance with the GPMP-FRI's requirements, while increasing farmers' awareness of rational pesticide use within the larger scope of farm food safety and good agricultural practices. In this way it is also expected that the monitoring and recognition components of this initiative will extend to additional volunteer farmers in the coming years.

The GPMP–FRI will be officially launched in early December 2012 at the Pesticides Control Board Headquarters in Central Farm, Cayo.

To THE EDITOR

Dear Editor,

I am the administrator of a Facebook group called ***Belizeans Against GMO's*** (BAGMO.) I post information almost daily, keeping our membership of over 1,500 people well-informed on GMO developments all across the world. https://www.facebook.com/groups/bagmo/ I invite your readers to join BAGMO so they, too, might stay current in this rapidly-changing field.

On Wednesday, Nov. 7, I attended the Belize Grain Grower's meeting where Dr. Caroline Herron, a UB instructor, gave a presentation about the positive benefits of Biotechnology with emphasis on GMO's. I was sorely disappointed to see that a good amount of her data was outdated... much of it more than ten years old. I was also discouraged that the group did not want to discuss anything that was against GMO's. In fact, when one attendee suggested that grain growers wait a little while longer before seeking to grow GMO corn here in Belize... while more research is completed about the safety of GMO's... a number of farmers actually got up and left the room.

It appears that the members of this new group want to grow GMO crops in Belize. My concern is that they are not getting all the facts or that the facts are skewed. Recent data that I have received indicates that crop yield of GMO corn is NOT greater as 'they' have promised. Pesticide use does NOT decrease, it actually requires more and stronger pesticides as the pests develop resistance. Additionally, these pesticides are now being found to cause great harm both to our environment and to human health.

I call for continued public debate and discussion on GMO issues so that Belize can make decisions based upon FACTS... not upon wishful promises.

Sincerely,

Denise Frank

Administrator of BAGO - https://www.facebook.com/groups/bagmo/

Owner of Ms. D's - ***Kills 'Em Dead*** Cockroach Bait

Belize City

Mission Statement:

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.

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Fair Exchange: Seed Swapping

By Mitylene Bailey

I returned home from my two–year study in Taiwan with a hunger for my local greens. At my first opportunity I went to the market to seek out my favorite, calalloo, also known as vegetable amaranth. (See Issue 17 of Belize Ag Report.) As I walked around the Belize City Queen's Square Market I spotted a few different varieties I had never noticed before. I walked up to the stall that had calalloo with the most luscious leaves and took a couple bunches home. I found myself at the market every other day taking a bunch or two home. I decided that if I started to grow my own, and a few other vegetables that I liked, it would be most convenient for me. I started browsing around the market selecting the choice vegetables and fruit with intent to collect the seeds and sow them in my own burgeoning garden. The fruit and/or vegetable that I could not retain seeds from or were not the best seed fruits I discarded and returned to the vender that sold them to me to ask for seeds. I asked the vendor that sells me the calalloo to share some of his seeds with me. He asked me what I had and I did not know what he meant. He told me that if I wanted seeds from him then I was to share some of whatever I had with him. It was then that I was made aware of the *modus operandi* for seed acquisition in that market: seed swapping.

Joseph Lawrence, a Jamaican-born vendor at the Belize City Queen's Square Market, decided to let me in on the seed swapping procedures; whenever he receives a new seed he plants it first to observe the plant and its growing habit on his farm. If the plant seems to have a successful life history he allows it to bloom and seed and he now has seeds ready to exchange. Otherwise he abandons those seeds and moves on to another. While the plants are growing he allows potential recipients to come in and view the plant. He also does the same for other friends who are involved in the seed swapping activity. So, once or twice a month they meet at the farm of one of the persons involved in the seed swapping activity to observe plants cultivated solely for the purpose of seed production. If a few of them happen to have the same seeds both are planted and the plants that are most vigorous are the ones chosen for seeds. Most of the persons involved in the seed swapping are friends and members of the Rastafarian community. As more plants succeed in giving viable seeds the exchanges become more intricate. Joseph emphasizes that although seed swapping sounds like a good idea it does involve a lot of proof work. He does encourage the activity and reveals that he would gladly be involved in an organized district-wide and even country-wide seed swapping programme.

After hearing Joseph's story, I thought that instead of buying packets of seeds that have proven to be nothing but inferior from the local grocery store a seed swapping party can be arranged among neighbours and friends next door with seeds that I already have on hand. Who knows? I may even be able to engage persons across the nation. So gather up some seeds from your favorite fruit tree or vegetable plant, even if you think no one might ever want them and initiate a trade with a neighbour or two; use the social media to your advantage! Plant something you never thought you could…or would even care to eat. You may be surprised what this new colourful world will open up for you.

Editors Note: Mitylene Bailey received her masters degree in agronomy in Taiwan through the TAIWAN ICDF Scholarship Program. She plans to be a regular contributor to the Belize Ag Report.

Recent Test Shows Dangers of Genetically Modified Food

By Bill Lindo

Belize City: November 12th 2012: -- The verdict is now in -- Monsanto's genetically modified (GM) NK603 corn causes cancers in rats. September 19th, 2012 the independent team led by Professor Gilles-Eric Seralini at the CRIIGEN lab at the *University of Caen* published in the journal *Food and Chemical Toxicology* the findings of a two-year feeding trial of rats using Monsanto's NK603 Roundup tolerant corn (maize) and Roundup herbicide (the brand name weed-killer containing glyphosate many GM crops are designed to resist).

The research found:

- Death rates in rats fed GM maize was 70% in females and 50% in males compared to the 20% and 30% in control animals.
- Female death rates were 2-3 times higher than the controls.
- Mammary tumors were the most common cause of death in females.
- Treated male rats showed increased liver and kidney problems.

Above are Photos from the study of the massive tumors caused by the GM corn & Roundup

The researchers suggest the observed effects are due to the hormone-disrupting effects of Roundup and the impacts on metabolism of the GM trait that makes the corn tolerant to the chemical Roundup. The study was first made public by France's *Le Nouvel Observateur* in its September 19th 2012 edition. According to the newspaper the study was paid for by the supermarket giants Auchan and Carrefour who, because of European consumers' objection to consuming GM foods, wanted to protect themselves against food scandals.

(***Le Nouvel Observateur*** Google English translation**)** Monsanto has assaulted the French study, claiming it did not use enough rats and that the duration of the study was too short -- an absurd claim, given that Monsanto's own studies on animals are *only 90 days* in duration, while the French study looked at the effects of rats eating GM corn (and drinking trace levels of Roundup herbicide) for two years.

Russia has now officially banned all imports of genetically modified corn, citing concerns from the French study that showed rats grew massive cancer tumors when fed a lifetime of Monsanto's genetically modified corn. Russia's consumer protection group, *Rospotrebnadzor*, said it was halting all imports of GM corn while the country's *Institute of Nutrition* will be evaluating the results of the study. Furthermore, on June 19th 2012 Alex Baranov of The National Association for Genetic Security (NAGS) released a Russian study which showed that animals who are fed GM soybeans meal had developed severe reproductive problems. As a result, the Russian Parliament is now considering a bill to ban cultivation of GM crops, and to ban the use of GM feed in animal farming. (www.gm.org)

On April 13th 2012, the journal, *Effektivt Landbrug*, published a front-page piece which appears to have caused quite a stir in Danish farming circles. The article, written by Anne Wolfenberg and Jacob Lund-Larsen, described the "significant improvements" which farmer, Ib Borup Pedersen, has seen in his herd after changing from GM-soy feed to GM-free soybeans. He was quoted: "Most obvious was the fact that our massive problems with piglet diarrhea disappeared from day one following the change." The farmer noted a number of improvements -- including easier farrowing, sows with higher milk yield, fewer dead piglets, more uniform pigs at weaning, lower medication use, a higher farrowing rate and an increase in weaned pigs per pen, with many litters of 14 piglets. The reporters reported that the many improvements in the health of the herd were – in cash terms -- more than enough to cover the cost of the more expensive GM-free feed. The article reported that Mr. Pedersen was also critical of GM soya because it is grown with a significant use of glyphosate on the fields. On that basis, he said he is convinced that his colleagues would drop GM forage crops if they were better informed about the harmful effects which they have on animals and humans. (*GM-Free Cymru (Wales)*

The above are the latest push against the biotech companies after years of silencing their opponents who had dared to expose the truth about the terrible dangers of genetically modified foods. The first time the world heard from the scientists about the serious health dangers of GM was the

Note: *Roundup is a trademark of Monsanto.*

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WEEDS

By Dr. Morris F. Keller

I have been doing a lot of gardening lately, so weeds have been on my mind as well as in my garden. As a very small child, I remember crawling in the grass of our small back yard and being enthralled with the little yellow flowers that bloomed there in the spring. However, much to my amazement, no one wanted dandelions in their grass; adults spent much time and energy prying them up with a two-pronged tool - until "weed killer" came along. During my infancy and youth, we lived in a suburban neighborhood of modest one and two family homes. The home next to ours was owned by a ninety-six year old lady, Mrs. Ashley, and her middle-aged, unmarried daughter. I distinctly remember, as a small child, that Mrs. Ashley asked everyone whom she knew in the neighborhood to save dandelions for her. With these "weeds", she made soup, tea and even wine. Mrs. Ashley obviously knew something that we did not know.

When I revolted against the medical industry after healing myself of serious illness with natural methods not taught me in medical school, one of my goals was to learn how to grow my own healthy food without man-made chemicals, while preserving and improving the earth around me. I began to read books and the first book I read was called Secrets of the Soil. The first statement that jumped out at me in this book was, "a weed is a plant that you do not know yet". Many years later, when I was an apprentice to a master organic farmer, I was assigned the lowly job of weeding his large vegetable gardens. During my long hours of toiling with a hoe in my hand, my observation showed me that first of all, the "weeds" had many holes in the leaves from being devoured by insects, much more than the leaves of the vegetables we were growing and when the weeds had been removed, the insects began to eat our valuable crop. Perhaps the insects knew something that we did not know? Now we know that many so-called weeds are edible and medicinal plants and at the very least make a good green manure or fertilizer for our gardens if turned under and allowed to rot slowly.

It seems to me that just as we do not want to get to know people that look different we also don't want to get to know new plants, but once we take the time to get to know them, we find out that they have much value. One of the first questions new organic-minded gardeners ask me is "What do you do about bugs?" The answer is to build soil fertility which gives the plants a natural resistance to bugs. Moreover, electro-chemical studies show that plants generate different types of extracellular electrical events in response to environmental stress. Healthy plants give off a different frequency from sick ones, whose frequency can attract insects.

Editor's Note: Dr. Keller is the director of New Life Farm, a research, demonstration and teaching organic farm and community located in Duck Run 2, Cayo.

BEYOND THE BACKYARD

A Passionate Pursuit

By Jenny Wildman

In London back in the sixties my Aussie and New Zealand flat mates introduced me to a dynamic duo: Pavlova and passion fruit, the first being a famed baked meringue created and named for the Russian ballerina, Anna Pavlova, and the second said to be an absolute must as a topping: kiwi, strawberries, passion fruit and cream. Now some 40 years later I am finally growing passion fruit in my garden.

Although there are over 500 species of passiflora and evidence of early cultivation in North America it is claimed to hail from South America, discovered by 15th century Spanish missionaries. As the priests cast their eyes on the glorious blooms on this vigorous vine they were struck by the design of the 10 petals, which they said represented the 10 faithful apostles (scratch 2), the 3 stigmas signifying the nails on the cross, the crown of thorns, the 5 stamens as the 5 major wounds and the tendrils as the whips. This inspired them to christen it passion fruit or so the story goes. I prefer to think it was the musky aroma and abundance of seed conjuring up passion and pleasure.

There are also many cultivars from those species but commonly cultivated are two main types, purple or yellow. Mine is the purple variety that clings to almost anything with its tendrils but does require a strong frame. I would suggest a wire fence with a slight overhang at the top at about 8 feet high maximum as higher may make for treacherous harvesting, as it is capable of great heights. I had romantic visions of sitting under a passion decorated arbor which I find would be totally impractical as for the best flavor it is recommended to let the fruit drop to the ground and collect from there. It makes a grand fence line and perfect for vertical gardening. Plant the seed fresh from the fruit and it will germinate in two weeks, then transplant after it is a foot high. Set in sandy loam, in full sun with good drainage allowing plenty of room for the roots, which are shallow and stretch far. Water regularly especially when the vine is flowering and fruiting, fertilize with chicken manure and add potassium and calcium if it shows signs of deficiency. Prune each year after it is well established. Passion fruit begins fruiting after the first year and the life expectancy of the plant - 7 years. Initially I almost gave up hope of getting a crop and started trying to hand pollinate, then was ecstatic at my first sighting of the fruit and visiting bees. As with most garden projects I learn by trial and error but there is much useful information, particularly on pollination, in *Fruits of Warm Climates* by Julia F. Morton.

Being a subtropical-to-tropical vine, passion fruit is well suited to the climate here. As an exotic fruit it is delicious as juice, cocktails, jams, ice cream, etc. It would be a good commercial crop even for the local market. At home you will not only enjoy its added attraction to your garden but get to savor the luscious fruit which is tastiest just as the skin begins to shrivel. You could use it as still life decor on the counter top until ready. It keeps well in the fridge for a couple of weeks and both juice and fruit can be frozen. Over the years the passiflora has made its mark in the medicinal field as a herbal tranquilizer and remedy for epilepsy, inflammation, insomnia, headaches, shingles, asthma, pain and to lower blood pressure. It contains alkaloids, flavonoids and non-addictive sedatives. Nutritionally it is low in sodium, fat and cholesterol, plus a good source of vitamins A and C, minerals, potassium, antioxidants and rich in fiber. Now using some of its lesser known names and varieties from other regions, the Maracuja, Granadilla, Parcha and Maypop are making their pitch for sport drinks, weight loss, anti-microbial, cancer inhibitors, oil for cosmetics, hair and skin care products. 1.7 fl oz of maracuja oil from Brazil will cost you USA $46. In all these years I thought of this fruit only on top of a Pavlova or a cheesecake but now see the great potential and future of passion and hope to try more from around the globe.

<u>Dipping sauce for shrimp or chicken wings:</u>

Juice of 2 passion fruit, (How? Scoop out flesh into a sieve and press with back of spoon until only the seeds remain.) Then mix with 2 tablespoons of chili sauce and 1 teaspoon of honey (Optional)

<u>Passion fruit juice:</u>

Cut 12 fruit in half and scoop pulp into blender; add 1/3 cup sugar and fill with cold water.

Pulse gently to mix but not crack up all seeds, then strain through sieve or cheesecloth. Chill.

Enjoy.

For recipes and information you would like to share, email me Jenny Wildman at spectarte@gmail.com

Gimme Dat Good Black Soil

By Harold Vernon (e-mail hmvernon@yahoo.com)

I have heard many an exclamation all over Belize that "black soil da di best!". When people are asked just what is black soil, the answer is usually that my mother, grandpa or some relative in the rural areas always said so and as long as it is black it is good. There is both truth and falsehood in that statement and this article attempts to provide an explanation of the real situation. It is true that soils with fair amounts of sand, silt and clay and lots of organic matter are usually easy to cultivate and are usually rich with available nutrients. On the other hand, soils with lots of clay, little silt and sand with high organic matter are very heavy and difficult to cultivate and are the blackest of soils. These heavy soils are known as *vertisols*.

So just what are good black soils and are they truly the best?

The degree of blackness of soil is caused by the presence of decomposed organic matter or humus that has been converted from green leaves, dead animals and other things that were once alive. People who do composting learn very quickly that the material being composted usually turns a deepening dark brown. The same applies to the dead leaves and trees that fall to earth, decompose and become what we typically call "organic matter". Earth worms, fungi and bacteria aid the breakdown processes and in turn contribute to a building up of organic matter. All living things are composed of carbon and plants are the principal converters of carbon dioxide found in the air around us. Decomposition reduces molecules to carbon dioxide that becomes one of the principal building blocks, is recycled and comes back to carbon dioxide at the end before re-entry into the cycle. Organic carbon is important in soils as it changes the physical, biological and chemical nature of soil.

We define the physical nature of soils as the texture, that is, the amount of sand, silt and clay that gives rise to the structure of the soil such that the plant roots can penetrate, water as a soil solution can percolate and air can circulate. Organic matter, when it decomposes, leaves spaces between the soil particles or *peds* that provide a pathway for water transport, root penetration, worms and other beneficial life forms in the soil. These life forms in turn make the nutrients of organic matter available to the plant. Nutrients are the other chemical elements found in minerals that the plant uses along with water and light to convert carbon dioxide back into complex carbon molecules such as starches, sugars, oils, proteins and other products. Soil can never have too much organic matter; and the moisture content and stage of decomposition determine its usefulness. Carbon dioxide is the oxidized form of carbon and is unstable in the soil because it is a gas and colorless. Carbon, on the other hand, is a solid substance, is black and gives the black color to soil. So - is a soil with lots of carbon, that colors it black, a good soil or the best soil? The answer is no. Black soils probably have too much non-nutrient carbon when organic matter is what is needed to make it most beneficial.

A soil with a good blend of sand, silt and clay, nutrient minerals and organic matter, that allows good drainage and aeration, has good structure and moisture retention is the *best* soil. These soils are usually a deep, dark brown and are known as *mollisols*. These soils typically are found in heavily forested areas and improve with cultivation over many generations provided they are not shallow. These soils started out as reddish clays or clay loams that were deposited by rivers and as they accumulated organic matter, turned darker as the organic matter decomposed.

Thus, dark brown soils are best. Think of coffee: "black" coffee, that is not truly black but only appears black but is really deep dark brown. Add milk and you get a lighter brown rather than grey.

Benefits of soil organic matter

- Provides food for microorganisms and soil animals
- Cycles nutrients
- Stores plant nutrients in soils
- Buffers or reduces harmful changes in soil acidity and alkalinity
- Improves soil structure
- Reduces erosion
- Increases water infiltration
- Improves water holding capacity
- Creates healthy soils and encourages vigorous plant growth
- Encourages life forms to proliferate it

Humates to the Rescue

By Dottie Feucht

The importance of nitrogen (N) in the soil is well understood; what may not be well understood by farmers is the adverse long-term effect of synthetic N fertilizers on the soil. Recent research by University of Illinois scientists shows that its application over time depletes the soil of carbon and undermines the health of the soil. They discovered at the Morrow Plots, the oldest research plots in the USA, that high inputs of N stimulate soil microbes to feed and eventually that accelerated process causes the organic matter to disappear before it can become humified (i.e., humification is interrupted by removal and volatilization of carbon before it reaches the form of humus.) Plant residues that are left behind in crop production, and various tilling and residue management methods make use of that residue as a means of adding organic matter to the soil. But with synthetic N, it was found that soil microbes degrade plant residues and reduce their carbon content and nutritional content into plant available forms and long-term fully degraded carbon, which is the backbone for forming soil humus. The acceleration of microbial oxidation of humin by N stimulation reduces the carbon rich humin to the less carbon-rich humic acids, and finally to fulvic acids, which have very little carbon content. Then as soil carbon levels decline, it is more difficult for soils to store nitrogen. As the ability of the soil to store nitrogen declines, more N inputs are needed, resulting in a vicious cycle. Also included in the downward spiral of physical soil condition in relation to plant growth (tilth) are water holding capacity and nutrient retention, causing compaction and leaching of nutrients. Adding synthetic N also stimulates microbes that feed on nitrogen-fixing bacteria populations like Rhizobium and Azospirillum making N from the atmosphere less accessible to the crop.

Two things can be done to restore soil carbon levels, balance the ratio of carbon to nitrogen and maximize soil fertility: (1) carefully manage the application of synthetic N fertilizers and (2) use humates (humic substances) to restore soil carbon in its most active form, improve water retention, drainage, soil tilth and nutrient retention. Humates are a direct input of soil organic matter. Research has shown that soils with less than 3% organic matter can lose 15% to 40% of N in a growing season. Nitrogen binds readily with carbon-based acids such as humic and fulvic; so the use of humates reduces the need for heavy, expensive inputs of N fertilizers. The stimulation of nitrogen-fixing bacteria by humic substances adds to availability of N from the atmosphere, supplying, in many cases, up to 75% of a crop's needs.

For further information see:

R. L. Mulvaney*, S. A. Khan and T. R. Ellsworth, 2009, "Synthetic Nitrogen Fertilizers Deplete Soil Nitrogen: A Global Dilemma for Sustainable Cereal Production" Published in J Environ Qual 38:2295-2314 (2009).

Tom Philpott, 2010, "New Research: Synthetic Nitrogen Destroys Soil Carbon, Undermines Soil Health"

Attracting Butterflies to your Belizean Backyard

By Marguerite Fly Bevis


Heliconius erato or "Postman" on Kalanchoe

Landscaping your yard to attract butterflies is as simple as providing food, water and shelter for all stages of the butterfly life cycle. Adult butterflies feed on nectar while caterpillars and larvae eat the leaves of specific plants, their "host" plants. You can improve your chances of attracting butterflies to your garden by implementing a few principles into your landscape and planting shrubs and flowers butterflies love.

Butterflies are attracted to masses of colorful flowers in sunny locations and they need shady cool-down areas for protection when it is hot. Plant a variety of flowering annuals and perennials for mass color. Belize has a number of butterfly-friendly native plants that grow very easily. Some are so prevalent that they might be considered weeds. But once you know the beneficial ones, you can keep them in your yard, pruning and taming them to fit your landscape.


Eueides isabellae on *Bidens squarrosa*

One common plant countrywide is "Red Head" or "Firebush", *Hamelia patens*.(See Issue 18, pg.22.) This plant grows everywhere land has been cleared. It can become gangly and unsightly if left to itself, but carefully pruned it is a beautiful landscape specimen providing flowers and fruit simultaneously. It responds well to pruning becoming thicker and lush. Learn to identify young plants growing in your yard and let them grow. Before you know it, you will have constantly flowering shrubs or small trees attracting birds and butterflies.


Dione juno "Silver spotted Flambeau" "Juno Longwing" or "Juno Heliconian" on *Tithonia* commonly known as the Tree Marigold,or Mexican sunflower

Passionflowers should be considered because they attract the Heliconai or Passionflower butterfly for laying eggs. There are at least 23 species of passionflowers in Belize, most of which need a specific habitat to thrive. If you are lucky enough to find them growing as a vine in your yard, let them grow. You can build a simple trellis or structure to give it room to grow. Some species will reward you with gorgeous flowers and delicious fruit, and


Heliconius ismenius on Cissus gossypifolia

you'll be encouraging more butterflies to visit your yard.

Other flowering plants to consider adding to your garden are cosmos, kalanchoes, and pentas. Cosmos grow wild in some areas of Belize. They like extreme heat, poor soil and dry conditions and good drainage. They are annuals but re-seed themselves in the right conditions. Kalanchoes bloom in the late fall and early winter. Flowers are long lasting and can be grown in the garden or in pots. The beautiful, constantly blooming plant called pentas is named for its small, bright, star-shaped groups of flowers. At a distance, the clusters appear to be one larger flower. Pentas come in red and pink and white. Once you have a healthy plant, it spreads easily. Bring in some cuttings to enjoy inside and after a few days, plant them, water and feed them, and before long you'll have more to spread. Butterflies love mass plantings of colorful flowers and this is a great choice.

There are other things you can do in your backyard to encourage butterflies. Choose a spot for a shallow watering area. Butterflies get water and minerals from the moist soil around mud puddles often grouping together in what is called "puddle clubs." Examples of these spectacular displays with large numbers of butterflies seemingly drinking together can be found on muddy trails and back roads.


Heraclides anchisiades on Tithonia, a member of the Aster family.

Use pesticides in your yard cautiously. Pesticides kill butterflies and caterpillars. Try using soap on aphids and other pests or completely removing infected plants.

Attract butterflies to a focal point from your house by placing over-ripe fruit, melons, papaya, mangoes, bananas, etc., on a tray or feeding station. Butterflies are not shy; they land at stations placed close to your windows.

If you are interested in finding out more about butterfly gardening, visit Green Hills Butterfly Ranch and Botanical Gardens. You will see most of these plants and more growing and they have the largest butterfly house in the country. You can find photos and information online at: http://biological-diversity.info/.

Photos courtesy of Green Hills Butterfly Ranch.

THE SWEEP IN BLUE CREEK

By Dr. Miguel DePaz

BACKGROUND Nov. 2012

Belize was an exporter of live cattle to Mexico in the 1980's, but the foot and mouth disease epidemic of 2001 in the United Kingdom led to Mexico closing its borders to Belize to trade in animals and animal products. This effectively destroyed the confidence of the farmers of the Belize Livestock Producers Association (BLPA), as the formal trade of live cattle to Mexico stopped completely. Ever since, Belize has put as one of its priority the resumption of the export of live cattle to Mexico. In 2009 Belize commenced The Belize National Cattle Sanitary Cattle Project, financed by the European Union, Government of Belize, OIRSA/ SENASICA, BLPA and the cattle producers with the objectives of (1) demonstrating the animal health status of the national cattle herd with respect to bovine tuberculosis and bovine brucellosis and (2) implementing an animal traceability system in order to fulfil the requirements for unrestricted trade with Mexico. This project is for a period of 3 years. It is expected that the prevalence of bovine diseases is very low as it has never been found during testing of targeted herds during the past.

The southern border of Mexico has a total of 1149 kilometres, of which, 956 kilometres are shared with Guatemala and 193 kilometres, with Belize. It includes the states of Chiapas, Tabasco, Campeche and Quintanna Roo. These are the points of entry and exit to the irregular flow of livestock among the countries of the region. The area provides for numerous accessible points to Mexico due to the lack of official presence and infrastructure to address imports in an adequate manner. Hence, Mexico is concerned, as this poses an eminent risk of introducing and spreading diseases that affect the livestock of the region.

Given such scenarios, The Belize Agricultural Health Authority (BAHA) proposed to SENASICA of Mexico that two designated corrals be identified by BAHA in the area of Blue Creek, Orange Walk and that cattle meet special requirements in compliance with the OIE to accelerate the exportation process at a minimal cost and at the same time ensure minimal risk to the national cattle herd and human population of Mexico in regards to bovine tuberculosis, bovine brucellosis and bovine spongiform encephalopathy.

Bovine tuberculosis and bovine brucellosis are diseases of concern because of the negative impact they have on trade. Not only do they affect the productive and reproductive parameters of cattle but are also considered zoonotic diseases, meaning they can affect humans.

Bovine Tuberculosis

Testing for bovine tuberculosis was carried out at all cattle farms in the area of Blue Creek. All cattle over 6 weeks of age, a total of 18,371 cattle, were tested and all results obtained were negative.

Bovine Brucellosis

All blood samples for bovine brucellosis were collected by the two Mexican accredited veterinarians. Blood samples were collected from all cattle above 6 months of age with the exception of castrated males. A total of 14, 932 cattle were tested for bovine brucellosis obtaining negative results.

Continued on pg 23

Quality Poultry Products

In 1960, just 2 years after Spanish Lookout was founded, a poultry company was also founded. In 1975 that company became a co-op, Quality Poultry Products, now the leading poultry business in Belize, processing about half of the chicken in Belize and employing 130 people in Spanish Lookout. Processed chicken comes in varying sizes, depending on feed and length of time in the barn. (Chickens to be roasted are usually the largest in size.)

1974 Expansion

The original plant was expanded in 1974 with another expansion in 1983. The current plant, completed in 1998 is being expanded again, incorporating HACCP standards. Over 130 poultry farmers under contract, with average lot size of 5,000, but ranging from 3,000 to 17,000 chickens, keep the supply of chickens steady through an 8 week rotation by geographical location all around the Spanish Lookout area. That translates into 6 lots per year per farmer and allows 2 weeks of no poultry in between lots for clean-up and possible disease eradication. Chickens are not processed on Wednesdays but during holiday pre-season turkeys take up that empty slot. Turkeys vary in size from 4 to 25 pounds.

Chicken is so popular in Belize that freshness is guaranteed; from farm to retail sale is only 3 or 4 days. It takes only 24 hours from in-coming live poultry to delivery countrywide, using a fleet of 14 refrigerated trucks and a boat. Quality Poultry sells directly to restaurants, resorts, educational institutions, and retail stores and has 9 wholesale/retail outlets all over Belize to support their operation. Besides whole and cut-up chicken, Quality Poultry produces many poultry products, such as sausage and lunch meat, using the meat of the chicken, and many pre-seasoned products, such as chicken wings.

Poultry farmers in the Spanish Lookout area buy their chicks from Friessen hatchery and feed them mostly grain-based feed, which is custom-blended for broilers. Half of the poultry farmers are also grain farmers who sell their excess grain to the grain co-op.

GRAIN GROWERS IN BELIZE FORM NATIONAL ASSOCIATION

By Hugh O'Brien

Over 50 grain farmers, mostly from the Cayo and Orange Walk districts have come together to form the Belize Grain Growers Association (BGGA). Registration was conducted at regional meetings that were held in October and November this year in the Corozal, Orange Walk and Cayo districts. An initial steering committee, chaired by Mr. Henry Wolfe of Spanish Lookout led the successful registration drive, and grain farmers have pledged their support to the efforts of the steering committee to organize grain growers into a formal and legal entity.

For some time now, grain farmers are complaining that issues such as the high cost of inputs, availability of land, need for research into new varieties, heavy insecticide use to control armyworms, and the lack of concrete marketing arrangements, especially to facilitate exports to Guatemala under the Belize-Guatemala Partial Scope Agreement, have had serious effects on the profitability and long term sustainability of the corn industry. The desire to address these and other problems facing corn farmers as well as represent the interests of grain growers at the national level, drove the formation of the BGGA.

On November 14th, the first general meeting of the BGGA was held in Spanish Lookout and the farmers were briefed on the progress made to date, and various policy issues were discussed. It was agreed that any farmer who farms an acre or more of corn, rice, beans and such grains would be allowed to join the association. Board members, once elected would serve for 2 years, and have no time limit for being on the Board.

Farmers present at the first general meeting agreed to have the election of new officers be done at a subsequent meeting, which will be held in the next few weeks. In the meantime, the Steering Committee was asked to continue to serve until formal elections are conducted. Mr. Henry Wolfe continues to serve as Chairman, Mr. John Carr as Vice-Chairman, Mr. Albert Reimer as Treasurer and Mr. Frank Redmond as Secretary.

At the first general meeting, farmers also requested that one of the first tasks of the Board be to work closely with the government to set up the necessary protocols to facilitate the testing and possible planting of genetically modified (GM) Bt corn in Belize. With this in mind, the services of Mr. Hugh O'Brien, former Chief Agriculture Officer and Chief Executive Officer in the Ministry of Agriculture, and the first Chairman of the National Biosafety Committee that was appointed in November 2002, is being contracted to assist the BGGA.

Editor's Note: *Under the National Biosafety Policy, a scientifically rigorous and sound risk assessment must be carried out before allowing the importation of GMO's.*

Soils

By Cory Schurman

What makes up soil? This is a question I get from time to time. Soil is predominately organic matter and silicon dioxide, although it also contains an assortment of various minerals. More specifically, for plants to live and grow in the soil, a balance of oxygen, hydrogen, and carbon along with 14 other essential elements (nitrogen, phosphorus, potassium, calcium, sulfur, magnesium, zinc, boron, manganese, iron, copper, chloride, nickel, molybdenum) are needed in a high enough quantity to meet the needs of growing plants. For optimum growth and maximum crop production, growers use fertilizers to fill in soil deficiencies, which increase crop yields and quality.

Farmers use soil analysis tests to determine what minerals their soils are both high and low in. From the results of the tests farmers can formulate nutrient blends that provide what the crop needs. Studying soil analysis is important for optimizing the quantity of fertilizer to be applied; that is, the correct rate can be calculated to match what the soil can hold. Furthermore, nutrient applications can be timed to maximize their effectiveness. When farmers look at crop production from this scientific method they can maximize yields and economic returns on their farm, while doing the best job environmentally.

When farmers calculate their nutrient plans they should look at the following factors:

1. Place nutrients where they can be best absorbed into plant tissue.
2. Use the correct rate for their crop and soil.
3. Use high quality nutrients that give the best uptake.
4. Time fertilizer so that the nutrient release corresponds with their crop needs.
5. Look at the soil nutrient levels and develop a fertilizer blend that balances the soil giving optimum nutrient release.

When a grower follows these simple steps fertilizer applications and efficiency can give a grower the optimum response.

Internet Access and Agriculture in Belize
By Shamin Renwick

Until my visit in October, Belize, in an abstract sort of way, was just another "island" in the Caribbean – up north and to one side. This is a view shared by many other Caribbean persons despite knowing that it is a Central American country. However, general background reading for a "small islander", prior to a visit, does not prepare you for Belize. Having to go through Miami is the first indication that something is different. Then flying over the Mesoamerican Barrier Reef (one of the top 5 largest coral reefs worldwide), vast areas of wetlands and great lengths of "white" roads underscore how distinctive it is. My visit was being undertaken in order to conduct research for my doctoral dissertation entitled "Planning for Food Security: Decision Making and Information Use in Trinidad and Tobago, Barbados and Belize." This article deals with another surprising aspect of life in Belize which I discovered in researching information use. It is the cost and quality of internet access and the implications for agriculture.

In Belize, about 25% of persons 5 years and older use the internet while those 15-24 years old had the highest usage at 45%. The vast majority of internet users access the internet with a computer; the use of mobile devices is very limited.[1] To compare, according to a benchmarking survey conducted in 2010, internet usage in Belize was 12%, Trinidad and Tobago, 44%, and Barbados 74%.[2] A recent survey[3] stated that Belize has the slowest internet speeds and is the most expensive in the Caribbean region. Valid reasons for this may be based on the low demand and the large distances between population centers; for example, Belize is about 4½ times the size of Trinidad and has about 1/5 of the population. Skype and other Voice over Internet Protocol (VOIP) programmes are blocked[4] and many persons complain of being unable to afford higher internet speeds. There is an infographic[5] which describes prices, accessibility and usage in Belize. See also Figure 1 which illustrates comparative internet access rates over 8 countries. However, one report indicates that in November, 2012, bandwidth "shall be doubled and prices will be reduced."[6] Belize does have a detailed National Information and Communication Technologies (ICT) Strategy document.[7]

Timely access to critical information and the role of ICT via the internet cannot be overestimated in terms of agriculture and food security. Access to up-to-date research is imperative and "open access" as well as social media enables the latest research information to be freely available to planners and progressive farmers. Extension services can take advantage of ICT,[8] like conference meeting resources such as VOIP programmes, to allow timely sharing of information, networking and provide cost benefits through reduced travel within Belize. (These benefits can be extended to general travel abroad.) E-commerce and sharing of market information/prices are other areas that provide a competitive edge which is critical in successful agriculture. Making internet access affordable for small farmers (most likely via their children) allows greater sharing of information on government incentives and access to credit as well as technical assistance. ICT allows feedback and empowerment by farmers and enables better monitoring of projects as well as the ability to more easily assess the needs of remote communities.

Research in Europe found that "ICT Adoption for Agriculture remains a cardinal problem and that the issues are of public concern to a degree that justifies public funding."[9] This finding in developed countries is amplified when applied to developing countries. Considering that in Belize "35% of GDP and 41% total employment are directly dependent on agriculture, fisheries and forestry,"[10] the Government must play an essential role in terms of making agriculture sustainable and do so by all means necessary. Today, this includes supporting ICT by improving the quality and affordability of internet access for all those involved and for all the notable reasons outlined above.

I take this opportunity to thank officers of the Belize Ministry of Natural Resources and Agriculture for their warm hospitality and extensive support.

Notes

[1]http://www.statisticsbelize.org.bz/dms20uc/dynamicdata/docs/20110505004542_2.pdf
[2]http://www.belize.gov.bz/public/Data/18311212771.pdf
[3]http://www.7newsbelize.com/sstory.php?nid=23096&frmsrch=1
[4]http://www.7newsbelize.com/sstory.php?nid=18062&frmsrch=1
[5]http://ibelmopan2.blogspot.com/2011/12/story-of-internet-in-belize-infographic.html
[6]http://www.7newsbelize.com/sstory.php?nid=23814&frmsrch=1
[7]http://www.belize.gov.bz/public/Data/1102716565571.pdf
[8]http://uwispace.sta.uwi.edu/dspace/bitstream/handle/2139/12632/icts%20and%20extension%20final%20paper.pdf?sequence=1
[9]http://departments.agri.huji.ac.il/economics/voet-gelb.pdf
[10]http://www.agriculture.gov.bz/PDF/Policy_Document.pdf

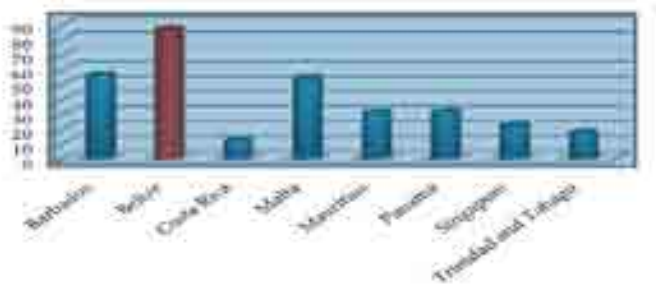

Figure 1. Fixed Broadband Tariffs Residential Monthly Fee
Source: 2011 ICT Benchmarking Report. http://www.belize.gov.bz/public/Data/18311212771.pdf

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Agriculture Prices at a Glance- $$$$$

December 2012

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 days (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	1.45 - 1.55	1.40 - 1.45
Cows & heifers for butcher	L	1.10 - 1.15	(thin)1.00 - 1.10
Heifers for breeding 500-800 lbs	L	1.10 - 1.20	1.00 - 1.10
Young grass cattle- 350- 650 lbs	H	strs.1.40 - 1.50	hfrs1.15-1.25
U.S. Cattle			
U.S price -corn fed- 1000- 1200 lbs	L	1.25-US=2.50-Bz	
U.S price - feeders 600- 800 lbs	H	1.51-US=3.02-Bz	
U.S price- calves 450- 600 lbs	H	1.75-US=3.50-Bz	
U.S price- aged butcher cows	H	1.10-US=2.20-Bz	
Belize Hogs			
Weiner pigs- 25 -30 lbs- by the head	S	$90.00 - $100.00	
Butcher pigs 160 - 230 lbs	L	1.60 - 1.70	1.5 - 1.60
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	1.22 - 1.24	1.21 - 1.22
Spent hens	S	.70 - .72	.68 - .70
Fruits & Vegetables			
Tomatoes, cabbages, cucumbers	S	whsl: .75-1.75; ret: 1.00-2.50	
Local potatoes	S	.80 - .90	.70 - .80
Local onions	S	1.00 - 1.10	.80 - 1.00

Grains, Beans & Rice	T	A	B
Belize yellow corn	L	.26 - .29	.25 - .26
White Corn	L	.28 - .30	.27 - .28
Corn/ local retail (low volume)	H	.35 - .40	.32 - .35
U.S corn @ 7.21-per 56 lb bushel	L	$25.75/ Bz 100#+10¢ frt. to Bz	
U.S soy beans-14.75per 60lb/bush	L	49.16/Bz/per100+10¢ frt. to Bz	
Guatemala corn price/Peten	L	.30 - .32	.29 - .30
Belize Soy Beans/cwt	H	.58-.60	.57-.58
Belize milo	S	.24- .25	.23-.24
R-K's, little reds & blacks (beans)	H	1.00- 1.10 farm price	
Black eyed peas	S	.90- 1.00 farm price	
Milled retail rice per pound	H	.93- .95 farm price	
Citrus			
Oranges per 90 lb box-lb.solid basis	L	$7.00 Est. 2012 price	
Grapefruit- per 90 lb box	H	$ 8.50 Est. 2012 price	
Sugar			
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	S	5.00 farm- retail .25 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: 90% of all the corn is harvested and new crop coming; soy beans and milo are going in. The crops were on a high average of 47-50 bags of corn per acre outstanding of 65-70 bags. The cattle sweep has a new start date of December 10th and will begin in the Ship Yard area. After a very long wait we can see daylight. The citrus people seem to be in some kind of " can -get-a-long -wreck" and world prices are down. I am told of a projected $7 a box of oranges this year; comparing to $14.25 a box last year: " ouch". We need God to help us with our three legged stool: one leg *church,* one leg *business,* and one leg *Government* all working together to achieve wellness in our nation. All the best, John Carr

Light Rein

Therapeutic Horseback Riding

By Marjie Olson

"The outside of a horse is good for the inside of a man." I've seen it quoted by Winston Churchill, John Wayne, Roy Rogers, John Roberson Sr., John Carr and definitely me. It is true. As with a dog or cat, it has been proven that animals are a healing mechanism for many. Whether it is for an emotional healing or a helpful physical strengthening, animals of all forms have virtually performed miracles. Everyone is familiar with the leader dogs and the helper dogs, but few realize that therapeutic riding programs are a wonderful gift to people of all disabilities.

I, myself, have used horses to bring about a young man's self worth, and to create a physical strength he didn't know could exist…Danny was born with Pervasive Developmental Disorder N.O.S. and his parents had been told, "Oh NO; don't ever let him near horses; it will be just a disappointment for him or he could be killed." Among his other issues, Danny had hypermobile joints and low muscle tone, but with a special little mare, who had that innate ability to understand, and his mother's belief, one year later he was qualified to run that little barrel horse at the NBHA Youth World Championships. He not only rides 13 yrs later, he also played football through his high school career which allowed him to "fit in" and be one of the team - so important for a teenager, who is "different".

I was lucky enough to work with an adult man from Jamaica while he and his family were on vacation here in Belize for 6 weeks. This man had been blind since birth, had studied and had a career and a wonderful family, so he knew his self worth. When he asked if he could ride with his wife and daughter, I did not hesitate. Of course he could! I had to be sure to be on my toes and realize I needed my every sense to be able to instruct him to a level he would enjoy. More of a challenge for me then he, I believe. We both enjoyed the weeks and I gained so much from the experience.

Another example is Brooke. She was in a car accident with her family; a drunk driver from a graduation party hit them at high speed. All were injured but she suffered a severed spinal cord; Brooke was 5 yrs old. Horses had always been a huge part of her life. Her family raised and showed Pinto horses. After several years in a wheel chair she was brave enough to get back on a horse and started riding again. Then, a situation happened that terrified her and she was once again unable to ride on her own, this time emotionally more than physically. A couple of years later, Brooke and I had a chance to work together; I was running a day camp at my Light Rein Farm and I convinced her to come and hang out with the other girls. She did not have to ride, but Mom brought her horse and equipment anyway. Day one: we had her walking on a lunge line; day two: she rode off the line and trotted; by day three she was free, cantering and enjoying all she had missed before. From that day on she went back to showing her horses throughout the country, has advanced into an excellent horsewoman with an exceptional eye for a good horse, and has numerous degrees in the industry.

These are three examples that I have been blessed to be a part of, but there are thousands of examples of children and adults developing an amazing relationship with an animal, building physical strength, developing emotional stability and the feeling of belonging.

A current, hopeful, project we are focused on, is getting the Cayo Deaf Institute children involved with the riding program. I was fortunate to spend some time with about 13 of them in the barn during one of the NBA Belize shows. What a joy, what an amazing 30 minutes. They all agreed, they want to learn to "speak horse" and I cannot think of any reason they should not.

Help us do this; help us create a special place where the deaf children can develop a skill they never knew they were capable of doing; give them more belief in themselves, more physical activity, more smiles. With a generous donation from Belgium we have started on the project and are able to purchase additional equipment that will make the project even more enjoyable and safer, but additional funding is needed to make the project a real possibility.

The fund site for the project is:
indiegogo.com/horsesforthedeaf

I believe, no, I **know**, horses can change these children's lives…

"Never sell your saddle, cause life's a long, long ride"

Marjie J. Olson, Light Rein Farm, Cayo, Belize

BLPA –AGM – 2012

By John Carr

A fairly well attended Annual General Meeting (AGM) of the Belize Livestock Producers Association (BLPA) was held at HQ on October 27th, 2012. Most of the presenters focused on the upcoming cattle sweep dealing with TB and brucellosis testing and identification and registration (traceability) of every cow critter in Belize. Through ear tags, every birth, death, sale and cattle movement will be recorded. The chairman's address echoed of major concerns for our country as it relates to economic stress, crime, corruption and other major problems. His message took a spiritual direction that recommended that if we don't take God and biblical principles into our partnership **"How and who will make Belize into that very special country we all dream about?".**

Jose Alpuche, CEO of the Ministry of Agriculture, gave an inspiring address about government and livestock raisers partnering to grow our industry. He stressed that we must seek ways to export live cattle and eventually processed meat. An election was held and the board is as follows: John Carr, Chairman; Abdala Bedran, Vice-Chairman; John Plett, Secretary; Fred Hunter, Treasurer; Directors: Abe Reimer, Abe Froese, Alvin Stephenson, Ramon Galvez and Peter Dueck.

A big thanks to Harry Parham, Roger Cal and all who helped with this successful AGM.

Current Investment in Cattle, Land, Cattle Equipment

All Belize Dollars – October 2012 – BLPA –AGM

100,000 head	**200,000 acre**	**Corrals, Equipment, and Fencing**
Average value $700 head	$2,000 per acre	100,000 head @$150
$70,000,000	$400,000,000	$15,000,000

Total Investment $485,000,000- we expect these numbers to double

Price increase between 2011 and 2012

	Steers 1,000 lbs/head	**Cows** 1,000 lbs/head	**Calves** 500 lbs/head
2011	$1.00/lb = $1,000	$ .75/lb = $750	$1.00/lb = $500
2012	$1.50/lb = $1,500	$1.00/lb = $1,000	$1.50/lb = $750
$'s Gained/head	**$500**	**$250**	**$250**

Cattle inventory by district see page 28

Producing Quality Hay

By Maruja Vargas

Clarence Thiessen of C.T. Farm in Spanish Lookout is the year round source for quality hay for cattle, horses and sheep. Clarence has evolved a sophisticated and well-managed full time haying operation, which depends upon his knowledge of grasses, soils and equipment utilization. The table on page 21 lists the types of hay available, their nutrient content, average pricing, and suitability for use in cattle, horses and sheep. C.T. Farms has also tested its grasses (where marked with *) for crude protein content. Weight of square bales is between 42 and 50 pounds. Weight of round bales is approximately 900 pounds.

Clarence describes bismoto as a grass midway between star grass which stands up to 24" and Bermuda average height around 10". It is highly palatable and very appealing to horses due to its soft texture, which is similar to the texture of blue stem. C.T. Farm bales milo and RK straw in the dry season for cattle. Clarence describes these products as 'survival' for the dry season. He noted that cattle will generally leave the RK stems and eat only the leaves. He rarely bales straw of black eyed beans, black and kidney beans.

The unique design and suitability to the tropics of the macerator, a machine manufactured in Canada and the only one in Belize, is at the heart of the success of the C.T. Farm haying operation. The tropics, being very humid

AgLand Macerator

and with unpredictable rainfall, creates not only a difficult climatic environment to cut and bale grasses but also a financial risk. Once the grass is cut, it must dry before baling, and should there be rain during the days of drying, the entire cut is lost and cannot be baled. In the rainy season, one day extra for drying is required due to moisture in the soil. The macerator reduces the hay loss in the field during the rainy season by eliminating one day from the drying cycle. Traditional baling cycle in the dry season is four days. Grass is cut the first day, sun dried for 2 days, sometimes turned with a rake or swatter, and then baled

Continued on page 21

Producing Quality Hay...Continued from page 20

on the fourth day. When operating with the macerator, within 6 hours of cutting, the operator can make a separate pass, which eliminates the need to rake or turn the drying grass. Another benefit of the macerator is the increased palatability of the product which is especially important in the feeding of horses. After passing through the macerator the grass has softer points, and even though baled greener, it has proper moisture content required for baling. There is a marked difference in the color and texture of the grass harvested with use of macerator compared to a bale harvested conventionally. The reduced drying time and the softer texture of the hay are accomplished by the ingenious design of the macerator. The grass is passed through two opposing aluminum rollers, the tension of which can be adjusted for the type of plant matter, that turn at different rpm. The rollers crack the stem of the grass and lay it open, allowing the stem to dry at the same rate as the leaves. This is how the drying period is reduced by one day, which, in turn, results in preserving a higher level of nutrients in the grass.

Another piece of equipment that allows for a one-man operation, thereby increasing C.T. Farm's profitability, is the accumulator, which trails the baler and automatically stakes up to 15 bales in the field for later pickup by tractor and wagon. C.T. Farm estimates that they are baling approximately 60 acres each of star and blue stem, 50 acres of milo and 50 acres of humidicola currently. Their annual production is running approximately 3000 bales of blue stem, 6000 bales of star and an additional 3000 bales of bismoto. Mombasa is sold primarily in round bales, and the production is highly dependent on weather conditions which drive the demand by the local cattle and dairy farmers for supplemental hay.

Generally 4 cuts a year are taken from a given pasture. Cutting is done every 2 months in the wet season and every 4 months in dry season. Wet season yields twice the number of bales as the dry season. Bales in the dry season tend to be of lesser quality as they are less homogeneous

with some weeds and native grasses mixed in. Clarence states that if buyers understood the grass cycle from wet to dry season, they might better accept the seasonal change in quality. Demand is frequently higher in the dry season but supply is greatest in wet season; so C.T. Farm stores hay to adequately supply customers. Management is a key component to quality. Too many cuts leave the grass too low, encouraging undesirable weeds. However, recovery under 6 weeks produces the better quality grass. These two considerations need to be balanced in deciding when to cut.

Clarence stated that he does not apply chemical fertilizers, pesticides or herbicides. With proper management of cutting cycles, herbicides are not needed. Occasionally he has applied manure to a field for soil enhancement.

While C.T. Farm bales for resale, another farmer, Eddie Friesen, does custom baling. He provides equipment and services to cut, rake and bale your grass. He has an hourly rate for cutting and a per bale rate to bale. Eddie bales all grasses, stocks and straws. Once completed, you can transport the bales to your barn, or Eddie may sell them for you to retail customers.

Contact information: Clarence Thiessen at C.T. Farm 672-1441 Eddie Friesen 605-1167

Grass/ Stock	Season	Square bale price	Round Bale price	Crude Protein %	Use	Notes
Blue Stem	All year	5.00		7.0 % *	C, H	Soft stems
Humidicola	All year	4.50		5.0 %	C, H	
Star	All year	5.00	75.00	8.0 %	C, H	
Mombasa 3 wk growth	All year	5.00	75.00	14.1 % *	C	
Mombasa 6 wk growth	All year	5.00		12.8 % *	C	
Bismoto	All year	5.00		8.0 %	C, H, S	Soft stems
Milo Stock	Dry only	3.50	50.00	6.9 % *	C	
Sorghum Stock	Dry only	3.50		4.0 %	C	
Red Kidney Straw	Dry only	3.00 to 4.00		1.9 %	C	

*Tested sample from C.T. Farm pasture USE: C = Cattle H = Horse S = Sheep

Opportunistic Foraging

By Dr Mandy Tsang, BMChB, DRCOG

Shiny Bush (Peperomia pellucida)

This time we are taking a break from the edible plant monographs; I would like to talk more about how people can incorporate foraging into their everyday life, without making it into a chore.

Take every opportunity to incorporate daily life with foraging; in this way you are more likely to do it as a daily or weekly routine in your life. One simple example is to take advantage of every walk, such as going to the market or shops, to observe plant life all around you; look up at the tall trees and most importantly, look down at the ground. Abandoned plots are a absolute gem for foraging. In one plot in Punta Gorda, I spotted five different forageable foods in a tiny abandoned yard.

Walk around your back-yard or land; look at the weeds that you usually pull out and refer to local people or the internet to check if any are edible. Purslane and wild callaloo are good examples of prolific ground cover which occur naturally and can be left to grow. You do not even need a back-yard to take advantage of foraging; having plant pots with your favourite ornamentals may give you a chance to spot the many possible edible plants which sprout out of the soil. Shiny bush (Peperomia pellucida) occurs commonly in cultivated plant pots. Pick these plants young so that they do not interfere with the growth of the plant.

Car travel can also afford you the opportunity to observe trees with edible fruits; you may be lucky and spot decaying logs of oyster or ear mushrooms.

Benign neglect is our own concept that we have developed over time as we observed the plant life on our farm. The concept of "benign neglect" refers to the favoured growth of voluntary wild edible plants in certain areas of backyards or farmland. We have consciously allowed a certain degree of neglect on our farmland in order to support the conditions in which wild plants come up. If the plant is identified as edible or useful it is allowed to grow and self-seed in the selected area. This allows foraging of naturally occurring edible plants in our own farm all year round. The advantages of this method are that the wild edibles will grow vigourously in their chosen area and as a result of this, tend to out-grow other competing weeds. In our case, we mow these areas down every four months to allow fresh re-seeding of the selected plant. Many people would view this concept with slight derision because of the untidiness of the wild plants but I feel this concept of eating fresh wild edibles is more important than having a pristine inedible lawn to look at.

The Sweep....Continued from pg 12

An *animal movement control* check point has been placed at a strategic point on the main road entrance that leads to Blue Creek Village so as to regulate cattle movement as per regulations. This main road is the only road that provides access to Blue Creek Village. Three officers have been employed under the project and posted at the check point, which is being manned 24 hours daily, 7 days per week.

Traceability System

The BAHA through the BLPA has implemented an animal identification system in accordance with Chapter 4.1 and 4.2 of the OIE Terrestrial Code which makes reference to the general principles of identification and traceability of live animals and the creation and application of identification systems that permit the traceability of animals. The animal identification system is supported by the Animal Identification Regulations #77 of 2011 of the Substantive Laws of Belize.

The identification system entails registering all cattle establishments, the individual identification of cattle, movement control and the capturing of all relevant information into a central information bank (CIB). The individual identification of cattle is being done through the use of Belize's official ear tag, which is in compliance with international standards.

It is mandatory that all cattle be identified and that all movements and other events are recorded through an established system of reporting. The movement of all cattle out of an epidemiological unit requires a movement permit prior to movement. Movement of cattle within an epidemiological unit will be allowed without a movement permit but must be reported within fifteen days. Other events such as deaths, lost or stolen, births and slaughter are mandatory to report.

A total of 18,920 cattle in Blue Creek have been identified.

CONCLUSION

All the results obtained from the testing for Bovine Tuberculosis and Bovine Brucellosis were negative hence paves the way for the export of cattle to Mexico and for declaring the area as free of the diseases.

Cultivating a Culinary Delight: How to Grow Pitayas

By Richard Rasp


A jumbo at 1-1/2 pounds

Growing pitaya cactus in your backyard or field can be rewarding when your vines produce a bountiful crop. Once your plants have matured, they can provide a nearly continuous supply of the gourmet fruit from May through November. Not only is the magenta-coloured flesh a treat for your eyes and taste buds, it is also a nutritional source of betalain, known for its anti-oxidant and antiradical activity. To ensure enough pitayas for your family and friends you need to follow a few guidelines for successful cultivation.

Planting Preparations


Concrete post support

Choose a planting location that has full sun (over 10 hours per day). Shade inhibits flowering. Pitayas grow best in soil that is well-drained with high organic matter and a pH range of 5.3 to 6.7. Pitayas do not grow well in soils that have high levels of caliche. However, since pitaya is shallow-rooted with most roots concentrated in the top 12" of soil, you can replace poor soil with rich soil in an area that extends about two feet from the stem. Mounding is recommended for flat terrain that can flood. Once you have chosen an area for planting, next consider the layout.

When planning the spacing of plants and support posts, consider how you will control weeds. If a tractor will be used, spacing should be from 12 to 15 feet. If a weed-eater or other method is used, spacing of 10 feet is optimum. Keep in mind that as the plants mature they will fill the gaps between rows. You will need space to walk through the orchard for pruning, fertilizing, applying wood shavings around the base of stems, harvesting fruits, and training the stems on posts.


Mature pitaya, 4 yrs.

Although not obvious with young vines, mature plants require sturdy support posts to hold the weight of pitaya stems, which can reach over 200 pounds per plant. Normally, two stems are planted per post. Since pitayas can live for 25 years or more, you certainly would not want a post to topple with 400 pounds of cactus growing on it. Typically, posts are made of termite- and decay-resistant wood, 7'6" long, 5" in diameter, and buried 18" deep with a cement anchor. Two four-foot 2x4s are fastened to the top, forming a cross to support the stems.

However, the most durable and long- lasting post is made of concrete. It is 4-1/4" square x 7' 6" long and reinforced with two 3/8" steel rods. Two threaded rods emerge from the top to secure a 4' long 3" x 4" concrete support, reinforced with two 3/8" steel rebar. Two other threaded rods lengths come out the side just under the top of the post. These hold another 4' long 2" x 4" cement post that extends in the other direction. Although more expensive than wooden posts, they are made to last.

Once the posts and their supports are secure it is time to prepare the holes for planting. Loosen soil in an area of about one square foot on each side of post, about 4" away from post and about 10" deep. Remove weeds and roots. If planting on a hill, build up the downhill side to make the ground level around the post. Add a quart or so of chicken manure or compost and mix well into soil. Place several inches of wood chips on the loosened soil.

Planting

Select hardened stems that have been pruned from mature source plants in good condition. For best results use cuttings that are 18" or longer. Stems should be cut at a slant and stored in a dry, shady place for a few days before planting to allow the cut ends to seal. A rooting hormone can be applied before placing cuttings into the soil. Plant two cuttings, one on each side of post and angle stems so they rest against the post. If the stems do not yet have roots or new growth to indicate which end goes up, be sure to plant them so that the areoles with spines face upward. Plant at about 1 – 4 inches deep in the wood chips that surround the post.

Tie the stems against the post and water to allow proper settling of the soil and encourage growth of roots. Don't use too much water, as that may encourage stem rot. Roots will grow down through the wood chips into the soil. Aerial roots will grow from the stem and anchor it to the post.

Continued to page 30

"Apples of Belize" Featuring the Bell Fruit and Sugar Apple

By Mary Susan Loan of Cristo Rey Village

Most of the apples in this series are not botanically classified as apples; however, they are commonly considered to be apples in Belize and other tropical countries.

Bell Fruit

Bell fruit (*Syzgium Samarangense*), commonly known, among other names, as wax apple, love apple, java apple, Jamaican apple, wax jambu, champoo, ohi'a, royal apple, water apple, mountain apple, cloud apple, rose apple, lembu, macepa, and jamrul fruit, is a member of the *myrtaceae* family. Bell fruit is a 'cousin' to the Mallay apple which shares many of the characteristics of the Bell fruit.

The Bell fruit tree is becoming more popular in Belize, thanks in part to the introduction of the Bell fruit varieties popularly grown in Taiwan, by the Taiwan Technical Mission (TTM) in Central Farm, Cayo. Michael Zheng, head of horticulture, reports; "Wax apple is the most famous fruit is Taiwan; through off-season cropping the production is from November to April (normal season is from May to August)."

This minor tropical fruit was originally grown in India, Indonesia, Malaysia and later, the Philippines. Bell fruit has been grown in Jamaica since the turn of the century and are believed to be introduced to the Americas on a voyage by Captain Bligh. Bell fruit trees are now widely cultivated in most tropical countries and prefer lower altitudes and a long dry season. The sun-loving trees tend to require a minimum of attention and flourish in the wild. For commercial harvest, attention must be given to pruning the trees to achieve optimum harvest. In Taiwan the blossoms are often bagged until harvest to protect the growing fruit from birds. Additionally the trunk is girdled or scored to induce fruit growth.

Bell fruit trees produce a unique pear-like bell-shaped fruit. Fruits range in size from two inches to five inches. Each fruit has one, sometimes two seeds which is approximately the size of a marble. The edible glossy thin skin is generally a soft red color. The fruits also come in all shades of pink to dark-reddish purple to black. Considered the most delicious are the two highly-prized, sought-after varieties from Taiwan, known as 'black diamond' or 'black pearls' which are purplish-red and another very rare pale green variety known a 'green pearls'. The darker or lighter the skin in these two varieties, the sweeter and more delicious the fruit. The taste of a bell fruit is difficult to describe. The flesh is sweet to slightly sweet to bland with astringent undertones. Fruits generally provide a slightly crunchy, but spongy, juicy bite. The flavor is mild and sometimes watery and is more the texture of an Asian pear than an apple. Most often bell fruit is enjoyed by eating out of hand. It is also served in fruit salads and stewed with cloves, cinnamon and sugar

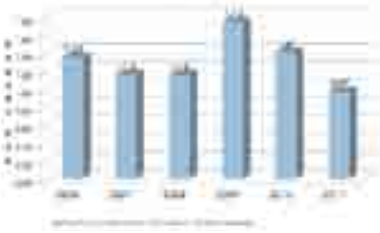
Bell fruit trees generally grow spontaneously from seeds. They are spread by birds, fond of the fruit as a food source. Birds disperse the seeds which easily sprout where they are dropped, leaving trees to grow in the wild and often providing a refreshing treat for hikers and those who work in the forests and jungles. Trees are also reproduced by layering or budding the branches and roots. Due to their size and productivity, Bell fruit trees are not recommended for the casual back yard gardener; they are more appropriate for the serious gardener with a passion for bell fruit. The trees grow vigorously to at least sixteen feet and can reach sixty feet in height. Between twenty-six to thirty-two feet is the recommended distance to plant the trees from one another in the orchard. The trees are heavy producers. At maturity, considered to be approximately five to ten years, each tree is capable of producing seven-hundred fruits. During fruiting season the trees can appear to be almost completely red in appearance as a unique feature of the bell fruit tree is its capacity for fruits to grow straight from the bark on the trunk, limbs and even branches! Bell fruit trees are known for flowering and fruiting two times per year. The showy white blossoms grow in clusters and produce fruit approximately three months later. Fruits are best hand-picked when ripe. They bruise easily and have a short shelf life.

The leaves of the bell fruit are broad, dark green and shiny with a light whitish-green velvety underside. They grow to be approximately three to four inches long and are pleasantly aromatic when crushed. Bell fruit trees are considered to be excellent shade trees. They grow to be so full of leaves that the trees provide an umbrella-like effect. Even in a heavy rain people and animals can remain completely dry under its branches. The leaves of the tree can be lightly chewed and applied to the skin to relieve insect bites. Most insects tend to avoid the fruit, leaves and bark due to their astringent taste and the trees' thick tough bark.

The trunk of the tree is short and thick; the bark is rough and ridged. The wood of the bell fruit tree is prized by custom wood workers and has been used for the construction of huts as it is resistant to termites. The wood of the trunk is slightly oily and light at the surface and becomes dark-brown to black near the core. To treat infections and wounds, the bark is ground to a fine powder and applied dry, then bandaged. Bell fruit has a high water and electrolyte content and contains oleanolic acid; its tannic acid compounds are healing agents used to treat diabetes, dysentery, and liver discomfort.

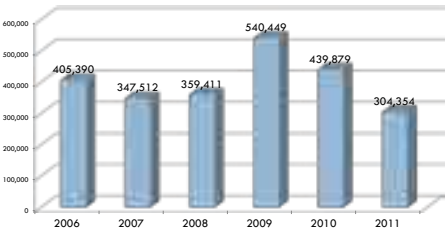
Turkey ...continued from page 3

Turkey Consumption per Capita



In Belize, turkeys are also mostly consumed at Christmas and in November for those who celebrate Thanksgiving. However, during the past 5 years, there has been an increase in demand, supply and consumption of turkey meat during May and June, coinciding with high school and tertiary institution graduation parties. Most of the whole turkey consumed is produced in Belize. There is some importation of whole turkeys for the Christmas season. Additionally, Belize City consumers seem to have developed a liking for turkey necks which are imported to supply that particular demand. For some years, processed turkey franks and turkey ham slices are also imported. The charts show local production and consumption. Import figures for 2011 indicate that some 103, 207 lbs of turkey was imported at a value of $286, 484.00. Locally produced turkey had a wholesale value of $ 1,065,329 BZD. There are two local turkey producers viz. Caribbean Chicken and Quality Poultry Products.

Dressed Turkey



Belize Poultry Association- 16th Annual General Meeting

Source:

(1.) Belize Poultry Association (BPA) Annual General meeting 2011 report (2.) Wikipedia, the free encyclopaedia (3.)USDA Nutrition database (4.) Cacklehatchery (5.) The feathersite

Making Artisan Cheese at Caves Branch

When Ian Anderson purchased sheep for a petting zoo at his Caves Branch Resort, cheese making was not on his mind. The petting zoo blossomed to showcase sheep, goats and chickens in an environment where children from across the country could touch and hold small animals. After collecting the eggs, egg sandwiches were served to the children and they were given glasses of sheep or goat milk to enjoy.

Given Ian's natural exploring instincts, it wasn't long before he yearned to produce something with his milk. Internet searches yielded many recipes for cheese which he tried. Ian's wife, Ella, and son Gabe, who was the chief taster, were supportive of the culinary venture, but encouraged him to find proper cheesemaking classes. After more prowling on the internet Ian found an article on cheesemaking by a Vermont family of professional cheese makers, the Faillace family of Three Shepherds Farm, in Warren, Vermont. In September of 2011, Ian flew to New England and took a two week course with Dr. Larry and Linda Faillace on their farm. On his return, Ian again tackled cheesemaking, beginning with one gallon batches, working up to the current 30 gallons per day production. Caves Branch now has a 500 sq. ft. working cheese kitchen, with a 250 sq. ft. wine and cheese tasting room attached. There is a glass half wall enabling tasters to watch what is going on in the kitchen. A 12 x 14 walk-in aging room kept at 55° F completes the set up. A relationship with the Vermont Faillaces has resulted in their visiting Caves Branch on various occasions as Ian continues improvements in the facility and expands his product line.

Currently all cheeses are made with cow's milk, purchased from a neighbor's dairy. This winter, Caves Branch will be importing both milk goats and more sheep from the U.S.A.

Semi-hard cheeses such as Old Brabander, Spressa, Trappist, Parmesan and soft cheeses, such as Ricotta, whipped Quark Feta, Roquefort and triple crème Camembert are offered for sale. The soft cheeses are often blended with herbs, peppers or garlic. Marketing began at the local market and over facebook to friends. Two resorts are already serving Caves Branch cheeses to their guests and the growing trend to 'serve local' is increasing demand.

Guests at Caves Branch who wish to spend a relaxing day learning to make cheese can do so at the facility. Those who wish to learn more are invited to attend one of the International Cheese Making Workshops (see ad on facing page) scheduled for January of 2013. Visitors are welcome to contact the resort to schedule a wine and cheese tasting session.

All the ingredients to produce the cheeses are donated by the Andersons and all of the proceeds from the cheese sales are donated to fund the 'youth at risk' programs of the Belize National Youth Chess Foundation, which Mrs. Ella Anderson founded and chairs.

Contact Caves Branch to purchase their artisan cheeses, learn more about wine and cheese tastings or their International Cheese Making Workshops at 610-3451 or e-mail: cheese@cavesbranch.com

Belize Wildlife Conservation Network

Working for Wildlife

0800 822 8888

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Use the freephone 0800 number to:
- Receive expert advice on human-wildlife conflict issues
- Report injured or orphaned wildlife
- Report illegal activities involving wildlife

Become a BWCN member for as little as $20 per year
- Membership fees support the phone line and Response Team
- Members are a vital part of the communication network
- Members help to provide communication between the public, wildlife organisations, rehabilitation centres and the Belize Forest Department

Become a BWCN volunteer
- 24 hr wildlife advice phone-line
- Belize Wildlife Emergency Response Team
- Country-wide rescue network

BWCN is growing network of individuals and organisations dedicated to solving human-wildlife conflict issues and assisting wildlife in trouble. Our communication network and on-the-ground rescue network of individuals and organisations are prepared to respond to wildlife emergency calls at a moment's notice.

Working with the Belize Forest Department for the Wildlife of Belize

Join us!

Call 610 0400 for more information on membership & volunteering

Belize Bird Rescue

PO Box 219 Belmopan
610 0400 / 822 1145
www.belizebirdrescue.com
belizebirdrescue@gmail.com

Love is in the air

Mid November to January you should see large flocks of parrots as they travel morning and evening, between their feeding and roosting grounds.

In days gone by this daily mass migration of noisy parrots was used as a signal to start and end the working day: people would say they worked 'parlé-to-parlé'. Sadly, numbers of wild parrots have fallen dramatically and we rarely see such wonderful displays.

Parrots in Belize nest from February/March through to July or August. Toward the end of October, the breeding season is long over, all chicks are fledged and the birds resume their flocking behaviour. Parrots mate for life so there isn't the large-scale battle for mates that we see in many other bird species; however juveniles coming into their 4th or 5th year are reaching sexual maturity and will begin the serious job of finding a life-partner.

The lifespan of an Amazon parrot is between 45 and 100 years, depending on the species. In their lifetime, one pair of parrots may have up to 80 offspring.

If one nest is poached, the removal of just those two chicks from the wild can potentially prevent the birth of more than 5500 chicks over the next 40 years. It's not hard to see how increased poaching over the last 2 or 3 decades has impacted our wild populations.

Remember: it is illegal to capture or keep a parrot, or any other species of wildlife.

Report injured or captive wildlife to Belize Forest Dept on 802 1524/2079 or contact us if you would like us to enter a bird into our rehabilitation programme.

CAVES BRANCH
ARTISAN CHEESES

All Caves Branch Artisan Cheeses are handmade European styled artisan cheeses made from the freshest milk of grass fed cows. The cheese process starts within minutes of the milk leaving the udder. All cheeses are aged between 4 and 16 months at 55 F/80 H in our aging cellar at Caves Branch Jungle Lodge.

We offer a variety of semi hard cheeses, Old Brabander, Spressa, Trappist and Parmesan; Soft ripened cheeses blended with herbs peppers or garlic; Ricotta, whipped Quark, Feta, Roquefort and a special "Ian's Own". Our triple crème' Camembert has been featured as a "**World Class Cheese**".

Cheese Making Workshops: Cave Branch is hosting two International Cheese Making Workshops in January: 17-22 and 24-29. Limited space available as only 8 students per class.

For more information on our cheeses or our Cheese Making Workshops, please call: **610 3451** or email: **cheese@cavesbranch.com**

* All proceeds are donated in full to the 'youth at risk' programs. of the Belize National Youth Chess Foundation.

Cheese orders of $80.00 or more will be delivered to you at no charge. Wholesale pricing in place for commercial purchases.

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AG BRIEFS

U.S. slipping as corn export leader – Although the drought of 2012 is partly to blame for the slide this year, the U.S. will export less than half the corn (1.1 billion bushels) it did four years ago (2.4 billion bushels). Corn production is expected to be about 13% lower than last year, the lowest output in six years. An acreage base that's relatively static compared to other parts of the world, corn earmarked for use in ethanol, alternative feed stocks, and overall acreage expansion in other nations are all adding up to a smaller share of exports for the U.S., says Philip Abbott, Purdue University ag economist. "Roughly 40% of the corn that's produced in U.S. is used in ethanol, although some of it is later used as distillers' grains for livestock feed," Abbott said. "That's up from about 10% to 12% five years ago. The amount of corn that makes up the increase is more than we export." Contrasting the meager expansion of acreage in the U.S., South America's corn acreage has increased 53% and Eastern Europe has boosted production by 24% in the last two decades.

"The U.S. has historically been a very important part of the international corn market. Prior to the 2007-08 food crisis and spike in commodity prices, the U.S. exported well over half the amount of corn that entered international markets," Abbott says in a university report. "Since then, the high prices have caused the rest of the world to expand its production and become more self-sufficient. Even if we get bigger corn crops in the future, it's likely that the demand in foreign markets will not soon recover to the level that it once reached."

U.K. farm incomes are expected to plateau in 2013 - Supply of agricultural commodities generally increases in response to current high prices, HSBC Holdings PLC recently reported, which means farmers must place extra emphasis on controlling their costs of production and margins. "After recent high levels of farm incomes, this has to be the year to concentrate on the basics in order to preserve margins," said Allan Wilkinson, head of agriculture at HSBC. "Recent weather events have highlighted the need for planning," he added, as many businesses find themselves short of tonnage, cash and profit from 2012, when they might have expected to be in a strong position.

Cattle Population by District
Chart estimates prepared by BLPA, October 2012

Population on Farms

District	100 + head	1-99 head	Total
Corozal	1,000	2,000	3,000
O. Walk	45,000	5,000	50,000
Belize	4,500	2,000	6,500
Cayo	25,000	5,000	30,000
S. Creek	3,000	500	3,500
Toledo	2,000	5,000	7,000
TOTAL	**80,500**	**19,500**	**100,000**

Local and Regional Fuel Prices

	Cayo, Belize	Quintana Roo, Mexico	Peten, Guatemala
REGULAR	↓$10.89 Bz/Gal	↑ $6.71 Bz/Gal	↓$10.14 Bz/Gal
PREMIUM	↓$11.28 Bz/Gal	↑ $7.06 Bz/Gal	↓$10.27 Bz/Gal
DIESEL	↓$10.90 Bz/Gal	↑ $6.93 Bz/Gal	↓ $9.59 Bz/Gal

Test Shows Dangers ....Continued from page 6

case of Dr. Arpad Pusztai. His background is this: he is the world's leading scientist in the field of lectin research. He has worked at Europe's leading research laboratory, where he was part of the team charged with determining the protocol for testing GM that would be adopted by the British government. He inadvertently discovered that the rats which were fed a GM potato had developed damaged immune systems, smaller brains, livers and testicles, atrophy of the liver, and potentially pre-cancerous cell growth in the small and large intestines — they were a mess. It wasn't the result of the lectin; it wasn't the result or the product of the transferred gene. It was in the process of genetic engineering. He went on British TV on August 10th 1998 to relate what his team had discovered. (Note that in 1999 the staff cafeteria of Monsanto's UK headquarters took all GM foods off its menu.) Within a few days of the showing of the TV show a political fire-storm developed in the United Kingdom. It was said that Monsanto in the United States called then US President Bill Clinton who called then PM Tony Blair who then called the Rowett Institute. Within two days Dr. Pusztai was fired, his data, papers and emails were all impounded and he was threatened with jail and libel suits if he spoke out again. But the doctor refused and later the British medical journal, *Lancet,* published his full detailed study and vindicated him. (Acres USA Feb 2004) A few years later, biologist Ignacio Chapela, who had discovered that the GM corn genes were destroying the native Mexican corn genes by contamination, got the Monsanto treatment. At this time in the year 2001 Mexico had banned GM corn so as to protect its vital gene pool of native corn, as Mexico was the world's biological center and originator of corn. Professor Chapela was kidnapped in Mexico City and warned not to publish his study. He still went ahead, but in 2004 the University of California, Berkley denied him tenure. (www.earthopensource.org & Acres USA Feb 2004)

As to the claims of feeding a hungry world, increased yields, etc. – these have not been borne out in the "real" world. The world produces enough food for every human on planet Earth. It's the distribution and money constraints that cause apparent shortages. Study after study by the U.S. land-grant universities have showed that after 2 to 3 years, yields of GM crops have fallen below non-GM crops; and that the weeds had developed massive glyphosate resistance.

Continued on page 30

Pitayas... Continued from page 24

Care of Pitayas

As stems grow, control outward-growing branches by tying them with plastic ties or cord to the support posts as necessary. Start pruning when the plant is young. Allow each plant to grow about three main stems up the post and cut off the rest with pruning shears. Remove old stubby stems that fail to produce shoots. After the main branches have reached the top of the post, remove all branches growing up the main stems. On mature plants, keep at the most 50 main branches and leave only one or two sub-branches per main branch.

Proper pruning is important to control the plant architecture, produce thick stems, and optimise fruit production and maintenance operations. The goal of pruning is to obtain an open, manageable, and productive canopy that is shaped like an umbrella. Since pitayas grow quickly, pruning is essential to keep them from getting too congested and top heavy. This promotes good air circulation, which helps prevent disease. There should be a major thinning out of stems after the last harvest of the season.

Every two months apply chicken manure, compost, or other fertilizer to the surface around each stem. If manure is fresh, keep it away from direct contact with the stems to avoid burning them. Cover area within 18" of post with wood shavings to keep rain from washing away the manure and to hold moisture around the roots during the dry season. Water pitayas when rainfall is inadequate. If shoots are not growing, plants need water.

To control "drunken baymen" (stingless bees) and chinch bugs, you can use a mixture of one teaspoon of isopropyl alcohol and three teaspoons of dish soap to one gallon of water. Use a spray bottle to apply this effective organic pesticide. To protect the fruit from birds and insects, cover with black plastic bags (growing bags with drainage holes work well). However, right before harvest you will need to remove the bag to inspect the fruits for maturity and evidence of splitting.

Harvest

The first fruits can be expected during fruiting season (May to November) from 4-6 month old cuttings, but full production takes about three to four years. In the experience of some growers, one acre yields 8,000 – 10,000 lbs. per year at maturity. In 2010, my orchards produced 13,250 pounds per acre.

Pitaya vines bloom about 10-12 times during the six-month harvest season, or about once every other week. The individual flowers last only one night, and are pollinated by insects such as beetles, sphinx moths, bees (in early morning) and nectar-feeding bats. The huge flowers are produced for several successive nights during a cycle.

Fruits should be ready for harvest about 28 days after blooming. Pick the fruit at its peak ripeness four to five days after the skin turns a full red, when the ends of the bracts are greenish. Splitting may occur if the fruit is left too long before picking. Use pruning shears to remove the fruit. If the fruit is attached along the stem, cut a small triangle of the stem above the fruit. If attached at the end of a stem, cut about ½ inch above the fruit. Pitaya fruits bruise easily, so handle with care.

Growing pitayas takes an investment of time and money, but hopefully it will be worth the expense. It certainly is exciting to follow the progress of April's first flower buds as they develop into blossoms that burst open in a dazzling display of white, become fertilized, and grow into fruits that you can harvest a month later. As you taste your first home-grown pitaya of the year you'll know that it indeed was worth the effort.

Pitaya blooms open at night

Belize Pitaya Growers Association
P.O. Box 365
Belmopan

Have a spare acre or two? Why not grow pitayas? In just four years pitaya, a climbing cactus, can produce 8,000-10,000 lbs./acre/year. Consultation is available.

Email: rasp.pitaya@gmail.com

Test Shows Dangers ....Continued from page 29

The current problem for a GM plant that has Bt toxin inside it is that the natural Bt toxin easily dies in sunlight, but the GM Bt toxin is different. The plant is engineered to express the Bt toxin protein in active form in every cell of that plant to kill insects. Therefore, the GM plant then becomes a pesticide; and every animal or human who eats that GM plant or its seeds, then eats a pesticide. (www.earthopensource.org – GMO myths)

But the elites, such as, Bill Clinton and his family; George Bush and his family; President Obama and his family; and Mitt Romney and his family have all refused to eat any GM products. According to *MSN Today*, Romney's airplane had a private galley up-front where only "organic" and nutrient-dense foods are cooked and served to Mr. Romney. And we all know what Walter Scheib, White House chef under both Clinton and Bush told *Mother Jones Magazine*... that only "organic" and **no GM** foods could be served in the White House. And the current First Lady, Michelle Obama told the *New Yorker*, *"Everything that's in a bottle or package is like poison in a way that most people don't even know..."* Why do you think the roof of the White House has its own organic garden for many years?

If farmers of Belize would plant GM crops in Belize they would derive no benefits; instead they would become beholden life-long slaves to the giant chemical companies, destroy their precious farm soil, and produce poisons for the people of Belize instead of whole nutrient-dense foods.

Let us keep Belize non-GM!

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Editor's Note: William "Bill" *Lindo is a physical-economist, a writer on political economy for over 20 years for the Amandala Newspaper, and a panalist for over 15 years on the Kremandala Radio/TV Show. He published a book on politicial economy in 1995, the only Belizean to have done so. He is a manufacturer who has made printing presses and the largest hydraulic cutterhead dredge in Belize. Mr. Lindo is also an experimenter in agriculture (corn, rice, coconuts, & vegetables) in Belize in energetic, eco, or biological agriculture in order to produce nutrinent-dense foods commercially without rescue chemicals.*