

The Belize Ag Report

Belize's most complete independent agricultural publication



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Cremello page 15



Pork Gaining Popularity in Belize

The cess (a type of tax) of \$1. per pig paid at slaughter, is collected by Belize Livestock Producers Association (BLPA). Last year slaughter cess was paid on approximately 18,000 pigs, putting over \$6M Bz into the local economy. Over 75% of the pigs originated in the Orange Walk Mennonite Community of Shipyard. Other communities with large swine production are Spanish Lookout and Barton Creek in Cayo District and Little Belize up north. Seven slaughter facilities handle between 90-95% of the hog slaughtering.

All fresh (unprocessed) pork meat sold in Belize is of local origin. Belizeans consume approximately 10 lbs of pork per capita annually. Local producers are not able to meet the demands for processed pork products year around, and are especially unable to meet demand for both cured picnic (shoulders) and hams at Christmas time. Almost 200,000 lbs. of cured hams/shoulders, or nearly 2/3 lb for every Belizean, are imported annually during the holiday season. Due to lower prices of imported hams and shoulders, the imports often meet or even occasionally sell for less than those locally cured. Local hams are injected with approx 10 to 15% water, while many of the imports may contain up to 30% water. Slowly and sensibly the Belizean consumer is learning to appreciate the quality of our local products, shedding outdated preferences for imported food products. On a health level, the Belizean consumer also benefits by an overall healthier swine-rearing environment which is possible at the scale of pig farming here. Farms here have high health standards which are enhanced by modern management including A.I. breeding and regular importation of new breeding lines.

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Corn Smut or Huitlacoche.

Dr Alessandro Mascia, BMBS, CHed

We are back to mushrooms this issue and we will discuss a species which is commonly considered a pest of corn production but happens to be good to eat. In a way, I am trying to appeal to, not only the mycophiles among our readers but also to our Belizean corn growers who might find the diversification of growing a valuable product that could have appeal locally among the Mestizo population and also be exported to Central America and the United States, financially rewarding.



Ustilago maydis (Ustilaginaceae) has the distinction of being the organism that causes a highly prized edible delicacy and a much reviled disease. (Check out the photograph I got, without permission (sorry!), from: *Issues in new crops and new uses*, 2007.) The fungus causes common corn smut, a disease which can result in economic losses wherever maize or corn is grown. Common smut is especially a problem in processing sweet corn, where the galls and spores can foul processing equipment and result in an unappetizing product. On the other hand, the very same galls, which reduce the income of sweet corn producers, are edible and can be a more profitable crop than the corn itself. Huitlacoche (cuitlacoche) is the Hispanicized version of the Nahuatl name for the edible galls, which has been consumed by the people of central Mexico since pre-Columbian times. Huitlacoche was also consumed by the Hidatsa people of the upper Missouri. During the rainy season, huitlacoche occurs naturally in maize fields of central Mexico where it is gathered by maize growers for sale in Mexico City and surrounding areas. The popularity of huitlacoche is increasing rapidly in the US, due both to the increasing size of the Mexican-American community and an interest in new foods and fusion cooking, especially in high-end restaurants. US restaurants pay as much as US\$50-80 per pound (these are 2007 figures) for frozen huitlacoche produced by specialty growers. (Most of this information is not from my own brain but hacked and slashed; get in touch with me if you want references). It would seem that the purposeful introduction and production of huitlacoche for export and/or local consumption might add another product that Belize can benefit from.

Huitlacoche occurs naturally in the right season in most corn fields but in order to be economically viable, it must be purposely raised to produce a profit. Remember, corn smut is a pest and as such, most farmers are trying to eradicate it, not grow it. There has been much research dedicated to its study; initially to help in its control and subsequently, once the economic considerations and growing popularity of this gourmet food were taken into account, to grow it. As a result, the technology and economic cost studies for the production of huitlacoche have been examined and are available to the interested farmer. (Contact me through the AgReport and I will make the material I have available). Personally, I have not attempted it as a profit-making project but the small test trials to see if I could grow it myself (for yum-yum!) were successful. Theoretically at least, the Mestizo population, especially up North, might esteem it and since only 400-500 tons of it (2007 figures) are produced in Mexico, a nearby export market might exist.

It might help to go through the general process of producing corn smut (with little tid-bits from my own experience). Before you can start you have to find some corn smut. This is relatively easy to

accomplish, especially if you grow corn; at your next harvest, walk through your fields and look at the ears for something that looks like the photograph and that's it. Personally, I walked through my "field" of 19 corn plants and found two ears with three or four galls on them. You then have to grow some corn; sweet corn is supposed to be better but the techniques are successful on dent corn too. (Dent corn is naturally more resistant to corn smut, supposedly.) You probably would want to grow a test patch of, say, 400 plants to get a good idea of how much work is involved and how good your yields are. The rest of the process involves growing the corn until six to eight days after the mid-silk growth stage, preparing an inoculation liquid from the collected corn smut, inoculating every ear through the silk channel, de-tassling every plant and harvesting the ears 16 to 17 days after inoculation. Personally, it took me about five hours to do all the labour involved from inoculation to harvesting and I thought it was fun but then I really, really like mushrooms. My yields were consistent with the literature and the biggest ear I found, weighed almost a pound!

The Big Question: was it any good, after all the work? Well, since I really like mushrooms (can't you tell?) I really, really liked the "mushroominess" and texture. You probably want to Google it if you want more varied opinions...it seems like most people either really like it, or they hate it...

Go forth and spread the spores!

<http://rollybrook.com/ar-huitlacoche.htm> link to simple recipes with photos. Note for eating raw in salads, etc, writer suggests eating the white (less mature) huitlacoche. For cooking both the white and more mature gray or black are fine.

Other names for this delicacy are Mexican corn truffle' and 'Mexican caviar'. This product is available canned and frozen in Mexico and North America.

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Cooperatives And Associations: A Possible Driving Force For Rural Economic Development

By: Romaldo Isaac Lewis (MBA & Agronomist)

Unlike other developing countries in Latin America and the Caribbean, Belize's cooperative movements and associations have been instrumental organizations in rural development. In agreement with author, Acosta Pinto, 2009, cooperatives provide the opportunity for poor people to increase their incomes; they are democracies empowering people to own their own solutions; they increase security for their members; and they contribute directly and indirectly to primary education for children, gender equality and reducing child mortality.

In past years few developmental agencies, NGOs, bilateral or multilateral organizations have supported agricultural development. Even fewer agencies defended, promoted or supported agricultural cooperatives. At the same time, very few governments continued to see rural cooperatives as important tools for development and allies in the fight against poverty. Year after year the budget allocated for agriculture and cooperatives has been reduced in spite of the fact that ministers and government officers strongly express interest in small-scale farming or farmers' cooperatives. The World Bank, the bilateral agencies and most of the major NGOs followed the same path.

Types Of Cooperatives In Belize

Analysis done in February 2012 with the cooperatives sector and the Cooperatives Department in Belize indicates that the largest sector where cooperative movements are formed is in the agriculture sector (52%), followed by tourism, transport, fisheries and finance (Credit Union) with values of 17%, 13%, 10% and 6%, respectively, as illustrated in graph below. An average 52% of cooperatives provide beneficial services to a little less than 100 individuals and 31% provide the same services to 101 to 500 individuals in Belize.

Types of Cooperatives per District Expressed in Percentage

Source: Analysis of the Cooperative Sector and Cooperative Department (02/2012)

Global Cooperative Challenges

Acosta Pinto 2009 states that the situation among rural communities continues to be very challenging. 85 % of the world's 460 million farms are small-scale, of less than 2 hectares.

A synthesis of the information states that subsistence is the tendency in production and the emphasis is still on meeting food security needs. Most of the global stallholder farmers earn less than 2 dollars a day and are not organized. The smallholder farm sector in developing countries is largely left without necessary support arrangements in infrastructure, extension services and local processing.

Services Provided By The Cooperatives Sector In Belize

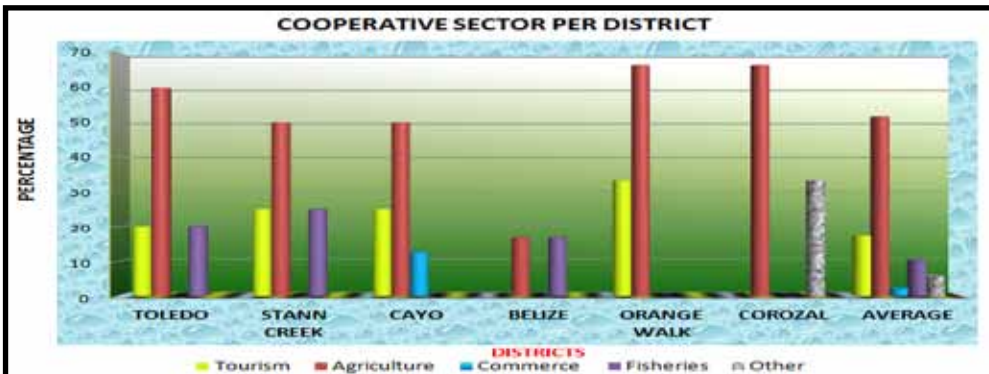
In recent years price increases of food staples and products such as bread, butter, pasta and vegetables led to a hysterical wave in the mass media in our nation and around the world and social unrest in several countries. Those with the highest return on investment were mainly those who are in control of the chain between the farmer and the consumer, i.e., wholesaler or retailer. However, there is no doubt that many farmers around the world also received part of the benefit, although a significant part of the price increase was matched by the price increase in factors of production such as inputs and fuel. The cooperatives sector seeks to assist farmers in these areas. Most of the goods and services provided by the cooperatives sector, 31%, goes to agriculture; support to commerce, tourism, transport and fishing industries are 24, 24, 14 and 7 percent, respectively.

Strategy For Cooperative Success In Belize

The present economic crisis presents new challenges to the cooperatives especially in agriculture whose environmental risk is highly significant. The projections of world population development need to be addressed with efficient initiatives to scale up the production of goods and services. In Belize and around the world, the most important future limitations on agriculture development will be the availability of fresh water, climate change, market access, access to micro-financing, and access to technological and legal support.

During recent years, farmers' cooperatives around the world have been promoting a new agenda for rural development and the development of farmer-owned organizations and enterprises. Developments in recent decades have also shown that, although cooperatives have been affected by many problems, they are still the most relevant organizational form for small and medium-scale farmers' enterprises. Cooperatives have shown resilience in periods of crisis. Cooperatives have resisted the negative impacts of a rapidly changing environment. Cooperatives have been a privileged forum for discussing and finding solutions to common problems. Many new initiatives give hope for a renewed, member-owned, community-committed and independent agricultural cooperatives movement.

In Belize specifically, the cooperatives movement will be successful only if the organizational focus is from a collective business perspective; that is, members should be highly committed to work, produce and market their goods or services collectively. This collective approach also provides opportunity to negotiate inputs (raw materials, training, infrastructure, technology) at less cost, access to micro-financing at less interest rate, concession rights and finally grant opportunities provided by donors with specific interest.



PALLET GARDEN

By Carol August



Love to grow your own vegetables/herbs, but low on space? Challenged by the thought of buying expensive pots for pot gardening? Want containers that will be within your budget, locally available and can look nice? Concerned about water bills associated with gardening and managing pest problems? Why not try a pallet planter! Several web sites provide information on making pallet planters, composting and companion planting.

This planter was made using a damaged pallet with empty horse feed bags stapled to the underside and bottom to keep in the soil. An extension at the top held additional soil. Home composted "soil" filled the planter and provided a good nutrient value medium for higher plant density. On 24 March, marigold, carrots (short root variety), bok choy, and salad greens were seeded and cebollin transplanted. Red romaine lettuce seedlings and additional marigold seedlings were transplanted when the planter was raised on 22 April. On 29 April, green leaf lettuce seedlings were transplanted to fill the empty spots.

Observations: This planter was placed on a south-southeast verandah that receives limited direct sun during the longer days of the year; the sun is directly overhead. The orientation will be excellent for the shorter days of the year when the sun is lower in the sky. The compost was too loose to allow the planter to be placed fully upright, and could be washed out by heavy driving rains. Watering was done by filling the empty seedling cups (with small holes at the bottom) set between the lettuce plants in the top row and supplemented with misting using a sprayer. Water distribution from top down watering seemed to be insufficient for nutrient distribution for the bottom row of plants. Overall, little water is needed since compost holds water well, and the pallet slats and feed sacks help hold the water. Weeding was minimal and easy because the soil was loose and the planter orientation was upright. Harvesting began 5 May.

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Belize National Organic Council (BNOC) Working towards strengthening the organic sector in Belize

By Fay Garnett

The Belize National Organic Council (BNOC) was formed during an elective process conducted at the First National Organic Forum held in Belmopan on November 11th of 2011. The event was organized by the Ministry of Agriculture in collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA). The council is composed of seven members whose representatives are from the private and productive sectors. Their main objective is to serve as the entity that will support farmers in organic production and development and also work along with the ministry to promote research, capacity building, promotion and certification in organics.

In a meeting held by BNOC in Punta Gorda, a decision was taken to endorse the Belize Organic Alliance (BOA) local certification scheme as an alternative for local producers. The BOA is comprised of various farmer groups (mainly from the Cayo and Toledo Districts), consumers and technicians from the Ministry of Agriculture, IICA and other partners in development. Over the last two years, technicians have been working with the alliance in developing skills in organic production, inspection and certification procedures, especially with regards to the concepts of a Participatory Guarantee System (PGS) which is becoming popular among the Latin American countries in the region. The PGS system is intended for local certification only; however international standards are used.

Earlier in May of this year, the BNOC signed an agreement to participate in the *Central American Network for Organic Agriculture*. The other members that signed into the same agreement are Honduras, Panama, Costa Rica, El Salvador, Nicaragua and Guatemala. This network came about after the countries discussed and agreed that strengthening organics cannot only be done through the establishment of normative measures and control standards, but instead, from the very production level. Organic movements throughout the region are suffering from the same growing pains in that the organization of farmers are weak due to lack of motivation and support, there are no clear roles, lack of funding, and usually the lack of guidance as to how to take on organics in a more productive and profitable manner. In many instances, as in Belize, the government and NGO's sometimes execute projects without proper planning, consulting or even without a national strategy for organic development. Belize, in an effort to avoid this same mistake, has developed a draft strategy and the council is working on how to begin to execute it effectively. The Ministry's Chief Agriculture Officer, Mr. Eugene Waight, has played a major role in the initiation of this entire effort. He has so far expressed great interest in this initiative and continues to provide support to push organic development forward.

BNOC at the moment looks forward to continue to build a strong, productive relationship with these countries that are in a similar situation as Belize and it is clear on prioritizing farmer organization, training, production, certification, marketing as well as information and knowledge sharing.

In July of this year, IICA and the Ministry of Agriculture and Natural Resources (MNRA) will be conducting a second training for organic inspectors from the various districts to allow them to become more familiar with organic norms and procedures as well as become part of the BOA certification scheme for local production.

Launching the Slow Food Movement in Belize

By Marla Jernigan

Slow Food International (SFI) was started in 1998 by Italian journalist Carlo Petrini who saw the proliferation of the western diet and the fast food industry as a threat to the environment, health and cultural traditions both in Italy and around the world. Today, the movement has local chapters called *convivia* (to reflect the community spirit of the organization) in over 140 countries with projects such as the Ark of Taste and Presidia, to protect endangered traditional foods and Terra Madre, a biennial gathering of farmers, food producers, indigenous peoples, youth and cooks from around the world in Turin Italy.

SFI is active in Mexico, Guatemala, Nicaragua and Costa Rica, and now, also in Belize. The first event was a simple farm workers' lunch of caldo and tortillas, held in December, 2011. It was a small scale celebration to honor the completion of a Mayan garden at Belcampo Farm. In the garden, the workers planted traditional Maya crops like coco yam, culantro and a field of black corn. With increasing pressure being applied by multinational companies to sell hybrid and even GMO corn to the developing world, planting a lesser-known traditional crop such as black corn is an act of cultural and genetic preservation and self-sufficiency, which is what Slow Food International is trying to encourage. The Punta Gorda Convivium, under the leadership of Elon Ranguy, assistant farm manager and a former teacher, the local convivium has held a couple of events at Belcampo including a lunch featuring Belize's biggest salad in a giant hand made wooden bowl and monthly Green Drinks events uniting southern Belize's NGO and environmentalists on the last Friday of each month.

Belcampo, the new name for the lodge formerly known as Machaca Hill has historic links to the SFI through the company's CEO, Anya Fernald, and manager, Mara Jernigan, both former directors in the international movement with a strong background in the development of sustainable local food systems and agri-tourism. The lodge is committed to job creation and innovative food workshops for visitors to Belize through the development of vibrant agricultural projects involving the planting of cacao, cane for rum, coffee and vanilla as well as the cultivation of food for the lodge's guests. The farm staff was especially proud of the recent completion of a small scale processing facility so that the lodge could raise and safely, humanely slaughter their own non-medicated pastured poultry.

Those interested in attending a Slow Food event, becoming a member, or just learning more can contact Elon Ranguy at er@belcampobz.com or contact frontdesk@belcampobz.com to find out about the next Green Drinks or Slow Food event.

Mara Jernigan is the General Manager of Belcampo, a lodge located close to Punta Gorda Town, Toledo.

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BEYOND THE BACKYARD

The Power of Peas

By Jenny Wildman



These days it is so hard to know what to eat, what to believe and what to do to make a difference globally. June brought us World Oceans Day designed to educate the public about overfishing and the need for conservation and respect of our marine life as an important food source. Adhering to imposed seasons and restrictions for marine life and wild animals, assessing supply and demand can greatly assist this concern. However the fact remains that eating habits need to change. Obesity, cancers and behavioral problems can be mostly attributed to what we give or do not give to our bodies. If it costs a lot of money it is probably not very healthy and your system really does not need it: too rich; too much fat; too much sugar; too much salt and how about just plain too much.

So what can we suggest....planting!! Add more fresh local vegetables to the family diet. Simple foods eaten in season are best and in many cases once established only cost you the time to pick, do a bit of weeding and watering, which is all great exercise. Some foods are really easy to grow, e.g., callaloo, chaya, plantains, papayas, mangoes, moringa, all hardly need any attention. Worthy of including is the winged pea (*Psophocarpus tetragonolobus*) or Goa bean. It is a very versatile vine, attractive with pretty blue flowers and interesting four angled pods and just about every bit of the plant is edible. The pods taste like asparagus, the pea seeds

like soybeans, the shoots like spinach and the roots like nutty potatoes. Full of vitamins, calcium and iron, which, as with most legumes, draws from the atmosphere and usually does not need fertilizer.

One of my choices is the pigeon pea which is a shrub of multiple uses. In some countries it was used for thatching and basket making. More often people have been introduced to these legumes to enrich the soil as a nitrogen fixer and for shading other plants. What a lovely surprise to discover that this shrub makes an attractive addition to the garden, cascading soft green leaves, orange flowers and bearing delicious edible pods plump with five tasty peas.

Now right here I am only talking about home gardening but there is possibly a market for anyone considering growing this as a crop. I have seen ads for brokers looking for good quality pigeon peas for the Indian market but I would think within our country the local markets maybe a good outlet and sought after by restaurants once people have tried them. The peas can range in colour from white to red, brown to black and speckled. In many Caribbean Islands rice with pigeon peas is a favourite local dish like our rice and beans. In India the peas are one of the most popular pulses either as fresh green pods or cooked in stews, made like dhal or used dried for flour or red gram. The leaves and shoots can also be consumed lightly boiled, peas can be sprouted and eaten, as can the flowers. Medicinally the list of claims to cure are many, from jaundice, blood disorders respiratory infections, mouth ulcers and even baldness.

This food is extremely nutritious and relied on by many vegetarians in India, Africa and Asia to supply high levels of protein to their diets as well as important amino acids. In contrast to green peas they contain five times more vitamins A and C. This tropical green pea (*Cajanus cajan*) is also called congo pea named by slave traders, gungo, tur, arhar, kadios, and finally pigeon peas from being introduced as bird food around 1700. Evidence of it was found in Neolithic sites in India and in ancient Egypt, so it has been around for centuries important as a staple food for people and fodder for animals. It grows from seed, takes awhile to get going then shoots up rapidly. Since it is an easy-to-grow, drought-resistant woody bush that thrives well in poor soil and is such a well-balanced food, let's plant more of this, stay healthy and give the fish a chance to regenerate.

Have fun, stay well and send any comments and recipes to

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Callaloo, the Wonder Green

By Mary Susan Loan of Cristo Rey, Cayo



Callaloo may be growing in your garden. It is a vigorous annual plant that grows like a weed and thrives in tropical environments. At least one variety known as 'pig weed' is considered to be a nuisance by some farmers who have not yet discovered it is edible and keep trying to kill it when they could be enjoying eating it! It is a favorite green leafy vegetable widely consumed throughout the Caribbean region. Callaloo is technically known as *Amaranth Tricolor* (though it is green) or *Amaranth gangeticus*. The genus *Amaranthus* consists of about sixty species so far identified. Some varieties such as *Amaranthus ruentus* and *Amaranth hypochondriacus* are grown for edible seed production. This article focuses on the edible leafy variety of callaloo which is also known as kallaloo, Chinese spinach, Indian spinach, shen choy, green leaf amaranth or just bush greens.

Callaloo is not just delicious, it is also very nutritious. The leaves and stems are edible and have been described in taste to be similar to spinach, bok choy, collards, kale and Swiss chard, with a subtle buttery delicate flavor. Callaloo is good for the immune system, high in iron, high in calcium, vitamin C and K, super rich in antioxidants, protein, Omega 3 and 6.

Cultivation of callaloo is lost in time but dates back more than two thousand years ago. The origin of callaloo is claimed to be in South America. However, in ancient Greece, the plant was believed to have healing properties and callaloo was a symbol of immortality. It was and is still used by the Chinese for its healing elements, said to cure illnesses such as infections, rashes and

headaches. "Eat callaloo and live forever", is the motto of some Belizeans. It has been very popular in Jamaica since at least the 1700's and was used as a food source by slaves.

From seed, callaloo grows quickly reaching maturity in approximately thirty to forty days. It grows easily even in poor soil and generally grows to be about three feet high. Callaloo is best harvested when plants are about twelve inches tall before seed pods ripen. Callaloo likes hot weather and flourishes in the dry season or summer heat, but also does well with humidity and likes to be watered. The only drawback of growing callaloo is that a worm variety loves callaloo as much as people do and can leave callaloo leaves full of holes. There are numerous remedies for preventing worm infestation including: tobacco spray, neem oil and soap, garlic, onion and cayenne pepper. One farmer recommended watering the callaloo plants with a quart of water with about one teaspoon of salt to kill the worms. It grows best direct seeded and easily reseeds itself. The optimum harvest is gained by planting rows about a foot apart.

Callaloo is a store house of nutrition but must be cooked as the raw leaves contain oxalic acid. There are several recipes for callaloo. It is a popular vitamin drink in Jamaica and made into a healing soup. My favorite method of preparing callaloo is as follows: wash about one pound (three to four cups) of fresh callaloo leaves; slice fine, including all but the end stem pieces; set aside while you finely dice 2-3 cloves of garlic and one large or two medium onions; fry the onions and garlic until tender in a large frying pan to which one to two tablespoons of coconut or olive oil have been melted; then add callaloo with about one half cup of water, cover and cook over medium heat for approximately five to ten minutes, stirring occasionally, adding a little more water as needed. Sprinkle with salt and fresh ground pepper and enjoy!

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See Article in Belize Ag Report Issue #15, page 20

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Pigs...Continued from page 1

The smaller, more closely monitored scale of local pork production improves Belize's position in facing the larger health challenges inherently more prevalent in the giant factory farms of North America.

The Belizean swine industry differs from the mainstream Belizean ag community, in that it is not geared toward eventual export possibilities. The necessity of costly imported feed concentrates and other higher costs of production, make local pork uncompetitive with foreign pork producers, notably the USA and Canada who sell to the Caribbean market.



Over 5 years ago, BLPA voted to direct 50% of the swine cess to The Pig Council and in January 2012 BLPA's new directors voted to increase that to 75% of (pig) cess revenue to The Pig Council. Currently the council does a survey of all local pig populations 3 times annually. But as soon as the promised funds are made available, The Pig Council will be better able to address their industry's needs. Some of their goals include: improvement of breeding stock for local producers, improvement of survey methods, attending international pork industry seminars, increasing education, and setting up a reserve fund for swine-related emergencies. Lobbying for their industry is directed toward improving pork marketing. Pork producers also comment that they would appreciate increased veterinary support from GOB. Members of The Pig Council are: Mr. Ernie Thiessen of Spanish Lookout, Mr. John Penner of Shipyard, Mr. Henry Peters of Shipyard, Mr. Rudy Plett of Spanish Lookout (Country Meats), and Mr. John Wilharris of Ladyville.

BRIX MEANS QUALITY

High brix plants are healthier; their produce tastes better, is more nutritious, has a longer shelf life and brings the farmer a higher price.

By Beth Roberson

In Belize, the citrus community may be the best acquainted with the brix system, as growers are paid based on pounds solid and the brix measurements of their fruit.



Almost a hundred and fifty years after its inception, a growing number of fruit, vegetable, grain and pasture professionals have learned to pay attention and utilize this rating system to improve their products and their paychecks. Ongoing research continues to underline the importance of brix for growers, processors, vendors and consumers.

What is the BRIX system? Although commonly referred to as a measure of sugars, (sugars comprise about 80%), it is a bit more than that. Rex Harrill, a U.S. farmer, brix advocate and author, explains: "Brix is actually the summation of the pounds of sucrose, fructose, vitamins, minerals, amino acids, proteins, hormones, and other solids in one hundred pounds of any particular plant juice." German chemistry Professor A.F.W. Brix discovered how to measure the density of fruit juice in 1870. The wine industry was thrilled to be able to measure and predict which grapes would produce superior wines. He became a national hero; the system was named in his honor. Since then small handheld and digital refractometers have become available and are widely used by vintners; brix has remained a central relevant technology to vintners who know that high brix grapes produce the best wine.

Continued on page 20

Ernie Thiessen

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Exciting Belize-Guatemala Trade Partnership By John Carr

Agro-productivity growth happens when you can sell your farm crops, have a little left over, raise the living standard and increase development; and agro-productivity in Belize is growing at a rapid pace. Guatemala is a natural outlet for our corn, beans of all types and cattle (to name some products). Of course our traditional crops of citrus, bananas, and especially sugar are also influenced by our western neighbors. We are excited to hear about the Green Tropics sugar development in the Cayo District. We wish them the best. This means jobs, the opportunity to grow cane, increase tax revenue, and foreign exchange earnings, a win- win-win situation.

Guatemala and Belize have been sharing territory for a few thousand years, before there was ever a mention of a border. Our much spoken Maya, Spanish and even English tie all of this together in some very unique ways. **Increased trading is a natural result.** We welcome a new bridge in Melchor and a new road to Jalacte. These projects are moving along and are reality, not a future dream. We trade educational opportunities when Guatemalans attend school in Belize and Belizeans attend University in Guatemala. Many Belizeans go to Guatemala City for major medical care; they have some very fine hospitals and doctors.

Trading always require the door to swing both ways. Success means buying from and selling too; this always involves currency exchange, trading rules, customs and immigration. We worked out a Partial Scope Agreement with Guatemala in 2006, but the trade advantages didn't surface enough to work out the details. However Belize imports shrimp food, fertilizers, ag chemicals, seeds and many other products from Guatemala. In turn we ship plenty of ag products, cattle, corn, beans and whatever-sometime on a back road. This trade amounts to millions of dollars and both sides are having meetings to see how we can facilitate each other. Usually it is bureaucracy and inconsiderate timing that holds up the correct regular border crossing. We don't see these problems as unsolvable and both sides are talking about solutions that will expedite trade solutions.

Guatemala imports cattle from Belize and prices have increased from 20 cents to 30 cents a pound. This amount to \$200 to \$300 a head advantage. My rough estimate of 8000 head in the past year means an approximate \$2,000,000 more in the cattle raisers' pockets. Corn and bean trade is probably larger, especially in the Cayo and Toledo districts.

Guatemala has approximately 13,000,000 people and Belize has 330,000 people. Belize is producing a surplus of corn, beans and cattle and welcomes any business where we can sell our ag products. On the other hand, Guatemala has a large farming sector and a variety of ag supplies and especially production consultants who can teach us a lot. Belize has a great growth potential (a probable multiplier of 4). We share a common border; what an exciting future!



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

A-B denotes the difference between 1st preference & second preference and sometimes between wholesale & retail and bulk or small amounts. Trend (H) means Higher over last 30 to 60 day (L) Lower (S) Steady

Prices intend on being farm gate in Belize dollars - usually price per lb

Belize Cattle		T	A	B	Grains, Beans & Rice		
Young str. & bulls 750- 1100 lbs	H	1.40 - 1.45	1.35 - 1.40		Belize yellow corn	S	.26 - .28
Cows & heifers for butcher	H	1.10 - 1.20	(thin).95 - 1.10				
Heifers for breeding 500-800 lbs	H	1.15 - 1.20	1.05 - 1.15		White Corn	S	.26 - .28
Young grass cattle 350- 650 lbs	H	1.35 - 1.40	1.20 - 1.35		Corn/ local retail (low volume)	S	.32 - .37
U.S. Cattle					U.S corn @ 7.77-per 56 lb bushel	H	\$27.75/ BZ/ 100# + 10¢ frt to BZ
U.S. price: corn fed 1000- 1200 lbs	H	1.19-US=2.38-Bz			U.S soy beans 16.51per 60lb/bush	H	\$55/BZ per 100# + 10¢ frt to BZ
U.S. price: feeders 600- 800 lbs	L	1.37-US=2.74-Bz			Guatemala corn price/Peten	H	.35 - .38
U.S. price: calves 450- 600 lbs	L	1.50-US=3.00-Bz			Belize Milo	S	.22 - .25
U.S. price: aged butcher cows	H	.90-US=1.80-Bz					
Belize Hogs					R-K's, little reds & blacks (beans)	S	.85- 1.00 farm price
Weiner pigs 25 -30 lbs- by the head	S	\$95.00 - \$100.00			Black eyed peas	S	.90- 1.00 farm price
Butcher pigs 160 - 230 lbs	S	1.80 - 1.85	1.75 - 1.80		Milled retail rice per pound	S	.87- .88 farm price
Belize Sheep					Citrus		
Butcher lambs	S	2.00 - 2.25	1.75- 2.00		Oranges per 90 lb box-lb.solid basis	S	\$14.25 Est. 2012 price
Mature ewes	S	1.70 - 1.75	1.60 - 1.70		Grapefruit per 90 lb box	S	\$ 6.50 Est. 2012 price
Belize Chickens					Sugar		
Broilers live per lb	S	1.22 - 1.24	1.21 - 1.22		White sugar 112 lbs- controlled	S	.45 per bag + 3-5 cent mark up
Spent hens	S	.70 - .72	.68 - .70		Brown sugar 112 lbs- controlled	S	.39 per bag + 3-5 cent mark up
Fruits & Vegetables					Special farm items		
Tomatoes, cabbages, cucumbers	S	whosal/75-1.75-ret-\$1.00-\$2.50			Eggs- tray of 30 eggs	S	5.00 farm- retail .25 per egg
Local potatoes	S	.80-.90	.70 - .80		WD milk per lb to farmer	S	contract .50 & non contract .35
Local onions	S	1.00 - 1.10	.80 - 1.00				

Dear Ag Readers: Today I will write about weather and its effect on producers and consumers. In this part of the world, we are affected by what happens in the US. The US exports thirteen million hundred-pound bags of corn to Guatemala annually. (They have approx. 13 million people or 1 bag per person.) Guatemala is our most logical export destination because of closeness and heavy usage. Cheap corn in the US= cheap corn in Guatemala = cheap corn in Belize ***** On the other hand ---high corn in the US =high corn in Guatemala = high corn in Belize***** (it costs 9¢-12¢ to ship corn from US to Guat and 4¢ -5¢ from Bze. to Guat.) All this is true 80-90% of the time; sometimes other factors have an effect. Probably you are aware of the horrible drought in the US that covers over 26 of the 50 states. In the major corn and soy bean growing areas there will be a reduced harvest and in some cases none at all. Soy beans at 16.50 US per 60 lb bushel is the highest price on record, Corn and other food grains are likely to follow.(Corn has already gone up \$1.00 US a bushel.) In this corn season in Belize we started out with too much rain and planting was difficult and delayed. Then we got some nice rains; insect and worm pressure are minor to average. We are looking forward to a good harvest of increased acreage accompanied by good prices- I project prices at 32¢ and above for the new crop corn - This guess doesn't cost you anything and it may not be worth anything, but the fundamentals look to be in place. We have to stay on our knees and pray to God that high winds and hurricanes miss us this year. All the best, John Carr

Light Rein Horse Bits

By Marjie Olson

Bits... a horse bit to be exact - the piece that goes in a horse's mouth or around the muzzle. It is attached to a headstall and reins are attached to the bit, maybe a curb strap-leather, rubber, rawhide or curb chain, thus becoming the bridle. Bits come in as many shapes and variations as women's shoes...and are almost as much fun to buy, actually for a real horsewoman, more fun!



There are so many misconceptions of bits that I could easily write about them in every issue for the next year, but let's make it a "bit" condensed and hit the main points.

A bit is designed to **control speed, turn and stop** a horse. BUT! Let me emphasize that a bit is the secondary part of all three of those components. Remember my farm name is "Light Rein Farm" for a reason. Your bit should be the second or even third connection following your seat and legs; it is not meant to be the only effort used for communication.

You have the mouth piece which lies just above and occasionally on a horse's "bars"...the area of his jaw that has no teeth, about a two inch spot behind the canines. This area can be severely damaged with improper use of the bit, causing bone spurs, cuts of the gum, even broken bone. The bit should always be on top of the tongue. If a horse gets his tongue over the bit, there will be severe issues both in control and fussing. The bit should be placed high enough to create 1 to 2 wrinkles in a horse's lip corner or it may bang against his canines, causing head tossing and worse.

A "shank" is any piece of a bit extending below a mouth piece to which you attach a rein; it may be 1/2" or 8"...and that bit may have a broken jointed center or even two areas jointed. If there is **no shank** then it is a snaffle, regardless of the mouth piece. Just because it has a broken center, a joint in the middle, DOES NOT MAKE IT A SNAFFLE!!!

A bit that has a rusty looking mouthpiece may be actually a sweet iron that horses enjoy and will slobber over making a "soft" mouth... or could be a cheap piece of crap, creating a sharp edge or splinter; you need to know the difference.

A curb bit is any bit that has a curb chain attached (or should have a curb chain/strap) and has a shank. (I see many improperly used bits such as a Tom Thumb with NO strap.)

Remember: the narrower/thinner the mouth piece, the more severe the bit; the longer the shank, the more severe the bit; the higher the port, the more severe the bit. The "purchase" is the top part of a shank bit and can have an effect on the severity as it places the curb chain higher, into a more sensitive area.

A horse's mouth shape, his roof of mouth and width will often determine a bit's proper fit. Many times a bit is too short in length

across the mouth to fit correctly. Many are 4.5 or 5 inches and horses with wide muzzles may need a 5 1/4 or even a 5 1/2 which are hard to find. A 5" is standard, but one size does not fit all!

How the bit balances in a horse's mouth makes all the difference in how a horse responds and can make training easy and enjoyable or make it become confusing, painful and annoying. Fit, curb strap/chain placement, port, and the rider's hands are all determining factors in the actual available use of the bit. The main thing to remember is that a bit is only as severe as a rider's hands!

I have barely touched my thoughts on bits. At one point in my training career I had over 350 bits...a "bit" of a bit fetish perhaps? Maybe... but it was a wonderful arsenal to have for training. And as always I am learning every day, what bits work for certain horses and not for others. Buying women's shoes is certainly easier, but getting the right bit for a horse to work well in...that's an accomplishment! Keep in mind, you will need several bits to get through all the training mechanics of the first few years...and I have not even mentioned bosals or hackamores. I need more issues!

Have a wonderful summer and come and enjoy NBHA Belize at the BEA.

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Marjorie Olson, Light Rein Farm, 5 Mile Mtn. Pine Ridge Rd. Cayo District, Belize

NBHA BZ RESULTS MAY 26, 2012



OPEN 1D: Marjie Olson 18.902
5 pts

Trey Roberson 19.38
3 pts

Assad Bedran 19.765 3 pts

OPEN 2D: Marjie Olson 20.062 5 pts

OPEN 3D: Santiago Juan 21.289 5pts

Valerie Thiessen 22.117 4 pts

Katherine Roberson 23.525 3 pts

Amir Roriquiez 23.684 2 pts

Kenan August 24.391 1 pt

TEEN 1D: Estuardo Alvarao 19.600 5 pts

Valerie Thiessen 20.108 4 pts

TEEN 2D: Abigail Coverdale 21.960 5 pts

TEEN 3D: Dennis Alvarado 22.465 5 pts

Jessica Leonard 22.699 4 pts

Katherine Roberson 22.782 3 pt

NO YOUTH 1D or 2D

YOUTH 3D: Jacob Wilson 23.954 5 pts

Chase Harsta 26.457 4 pts

Continued on page 15

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NBHA BZ RESULTS... Continued from page 14

SENIOR 1D:	Marjie Olson 20.065	5 pts
	John Carr 20.740	4 pts
SENIOR 2D:	Marjie Olson 21.031	5 pts
NO Senior 3D		
POLES 1D:	Amir Rodriquez 29.494	5 pts
POLES 2D:	Estuario Alvarao 35.014	5 pts
	Jennifer Harsta 40.596	4 pts
	Dennis Alvarado 41.824	3 pts
	Katherine Roberson 43.739	2 pts
	Jessica Leonard 44.533	1 pt

Total points with two shows stands as follows: (Poles not run in March)

NBHA BELIZE

OPEN 1D: Marjie Olson 10, Estuardo Alvarado 4, Trey Roberson 4, Assad Bedran 3

OPEN 2D: Marjie Olson 10, Hugh Milton 5, Stephawn Scott 4

OPEN 3D: Valerie Thiessen 8, Katherine Roberson 5, Santiago Juan 5, Tre Roberson 3, Amir Rodriguez 2, Philip Wilson 1, Kenan August 1

TEEN 1D: Estuardo Alvarado 10, Valerie Thiessen 4

TEEN 2D: Abigail Coverdale 5, Joel Smith 5

TEEN 3D: Valerie Thiessen 5, Dennis Alvarado 5, Jessica Leonard 4, Abigail Coverdale 4, Katherine Roberson 3

YOUTH 1D: None

YOUTH 2D: None

YOUTH 3D: Chase Harsta 8, Logan Harsta 8, Jacob Wilson 5, Amberly Reimer 3, Peyton Gentry 3, Daniel Wilson 3

SENIOR 1D: Marjie Olson 10, John Carr 4

Next runs are Sat-August 25th Sept, Oct, Nov and Dec. dates to be announced

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Cremello is an uncommon equine color, caused by double homozygous cream genes. Crossing a cremello on a chestnut will produce a palomino. The cremellos in the cover photo are offspring from Banana Bank's cremello stallion.

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Wild Edibles of Belize - Part One Purslane (Portulaca oleracea)

By Dr Mandy Tsang, BMChB, DRCOG



This is article is part one of a series of articles on foraging for wild food in Belize. My reason for promoting the use of wild food is that I would like to encourage the eating of greens in Belize and entice people to broaden their culinary palate; recipes have been included with the article to start you off but I would encourage personal inventiveness and innovation in the cooking of the vegetable. Furthermore the foraging of greens in grasslands, shrub areas or even in the back yard will promote physical well-being in terms of mild cardio-vascular activity. Moreover, I would like to banish the excuses that I hear time and time again... "There is no callaloo in the market so I can't eat greens," or "I don't have a place to grow my own vegetables," or "I can't afford the broccoli or the green peppers!". Well, here is the solution: put on a shade hat and walk out of your house with a basket and start foraging!

I will begin this series with purslane because it is everywhere and it grows even in the worst conditions in dry clay soils. During our dry season this year, I was deprived of many of my garden greens since I do not use an irrigation system, and I managed to find purslane in abundance. For completeness sake this is the description of it from Penelope Honychurch's "Caribbean Wild Plants and Their Uses": *A prostrate herb with spreading habit. The fleshy leaves are ovate and rounded at the tip. The flowers are small and yellow, and open only in the morning. The stems are a reddish colour.*

It is rich in vitamin A and C and has a high percentage of omega 3 which is usually only found in fish oils and flax seed. It is a versatile vegetable which can be eaten raw in salads or cooked in a variety of ways. It has a mildly acidic taste and the soft texture of a succulent. Leaves, flowers and stem can be eaten.

Coconut Purslane Salad(serves two people)

Ingredients:

two cups of chopped purslane
one small chopped onion
half cup of shredded coconut

one jalapeño pepper minced
one tablespoon of coconut oil
two tablespoons of lime juice
salt and pepper to taste

Combine all ingredients in salad bowl.

Can be enjoyed with nachos or corn tortillas.

Purslane Chicken Chow Mein(serves two people)

Ingredients:

two cups chopped purslane
one chopped onion
one breast of chicken sliced into ¼ inch slices marinated in one tsp of soya sauce and two tsp of coconut oil for 30 mins in fridge
small bunch of salad onions chopped finely
200g of chow mein noodles boiled for 4-5 minutes until soft and washed in colander with cold water and left to drain
one tablespoon of soya sauce
salt and pepper to taste

In a wok or skillet, heat 2 tbsp of coconut oil to high temperature. Fry chopped onions until brown and then add chicken. Cook chicken until well-done (5-6minutes). Next add purslane, stir fry for 30 secs. Then add chow mein and lower heat to medium. Add soya sauce, salt and pepper whilst frying the chow mein. Stir noodles well to stop it from sticking (takes about 5 minutes). Serve with chopped salad onions sprinkled on top.

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Update on the Competitive Regional Policy & Strategy for the Cultivation, Education, Marketing and Promotion of Fruit Cultivars - PROMEFrut

By Maruja Vargas

The *Belize Ag Report* carried two previous articles on the Central American Initiative, PromeFruit: the first in 2010 and the second in 2011. This regional policy and strategy is now known as Por-Fruta.

The PromeFruit preinvestment initiative was scheduled to complete on June 30, 2012, following a two-year period of planning for the expansion of the fruit sector in Central America and the Dominican Republic. Public and private sector participants from the eight countries contributed in numerous workshops and conferences which resulted in the final matrix consisting of eight projects with estimated budgets for implementation.

Por-Fruta is now entering the implementation phase in each of the eight participant countries. From the outset, the ministers of agriculture of each participating country had pledged their support to engage personnel and vehicles to implement this strategy during the life cycle and propose future projects to ensure the sustainability of the fruit tree industry in the region upon the completion of the preinvestment initiative.

The eight projects of the Por-Fruta initiative are to be implemented and assisted in each country by the Central Technical Committee of the organization, of which each country has two representatives, one each from the public and private sectors. Within the next several weeks, the Minister of Agriculture in Belize is to announce the Belize Task Force on Expansion and Implementation of the regional initiative formulated and adopted by the Regional Organization for Fruticultura – Por Fruta.

A brief summary of the eight project areas follows. The summary includes the projected time frame for implementation and an estimated budget request in US dollars.

1. Formation and maintenance of the Por-Fruta Central Committee to assure the execution of the strategic plan. \$195,000 June 2012 to January 2014.
2. Program of Fruit Culture and Climate Change, the aspects of which are mitigation measures, adaptation strategies, and reduction of vulnerability. \$7,600,000 over 5-year period 2012- 2017.
3. “Escuela del campo” for the training of workers in the expanded spectrum of fruit cultivars. \$ 2,000,000 over 3-year period 2012-2014.
4. Certification and sanitation requirements for fruit subsectors across the region. \$1,000,000 over 2-year period 2012-2014.
5. Role of fruit culture in food security for the region. \$528,000, over 3-year period 2012-2014.
6. Regional data base for marketing of fruits. \$400,000 over 5-year period 2012-2016.
7. Consolidation of the marketing data bases of participating countries into one regional system. \$245,000 over 2-year period 2012-2014.
8. Online fruit educational course consisting of 130 hours over 13 weeks resulting in a diploma on fruit cultivation targeting 25 participants. \$150,000 by year end 2012.

Of the current total agricultural production for Belize, fruit contributes 65% of the total revenue. Of the eight countries, Belize is the most heavily invested in the fruit sector. Therefore, Belize has a demonstrated ability to compete in the fruit market sector.

As a spring board into future expansion, Belize has a tremendous number of different fruit trees some of which are native and indigenous and others that have been coming in for as long as people have traveled. Thousands of trees currently exist in villages and farms, presenting a magnificent resource at hand, as the plants are mature and already in production. These trees have proven genetic adaptability to our locale and the great diversity in soil type present in Belize. This might be the first stepping stone to the fulfillment of the initiative for Belize.

For example, we have one of the most diverse collections of mangoes throughout this country already in full production. It would take a small processing operation for people to be able to have an outlet for their fruit. Mangoes are just one example. We have guavas, kinep, plums, craboo, black berries, custard apples, cow sap, monkey cap, bread fruit, bread nut, almonds, pitaya, and the list can go on.

As another significant point of note, the strategic initiative recognizes that food security will be strongly tied to deep-rooted trees which not only produce food in the form of fruits but also starch foods which can be stored. As noted in issue 15 of *The Belize Ag Report*, the central focus of vertical production is the productive tree. Tree farming promotes wise land use. Instead of spreading out over more land, the farmer concentrates on less land and becomes an *intensive* rather than an *extensive* agriculturist.

As a positive resource, Belize has many, many small farmers. Tree cropping is a perfect match for the extended family farming unit. Fruit production does not require huge plantations, but can be economically managed on a simplistic format using manual labor. Belize is blessed with a bounty of ready and willing workers. Por-Fruta offers a promising opportunity for Belize to expand its scope and production in the fruit sector as well as providing more economic prospects for our people on the land.

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Central Farm Services By Maynor Hernandez

What is known locally as Central Farm (CF) is the research and development station of the Ministry of Natural Resources and Agriculture (MNRA) dedicated to helping Belizean farmers. With the dependence and expansion of agriculture in Belize, CF plays an important role in the both livestock and crop production. Under the direction of Mr. Melanio Pech, a staff of 47 provides the following services:

The Organic Program focuses on:

- Innovative organic technology, training and demonstration for farmers
- Production of organic amendments (humus, compost, bokashi and liquid fertilizers)
- Promotion of eco-friendly and sustainable alternatives for farming systems

The Root Crop Program was developed to address:

- Seed multiplication and germ plasm collection of local and new varieties
- Dissemination of information to farmers to improve root crop production in Belize

The Vegetable Program includes:

- The use of on-farm materials to produce healthy vegetables
- Demonstration of new farming technologies
- Promotion of the consumption of local and oriental vegetables
- Training in crop management

The Protective Structure program was established to:

- Demonstrate different models of protective structures to producers
- Promote the use of protective structures to produce high quality and healthy crops all year round
- Provide information on protected cultivation and post-harvesting techniques to farmers, farmers' groups and extension agents
- Assist farmers in adapting new cropping technologies

Mexico Declares Highly Pathogenic Avian Influenza (H7N3) outbreak

BPA, 20 July 2012

In June 2012, the animal health authority of Mexico (SENASICA/SAGARPA) reported a major outbreak of highly pathogenic avian influenza (HPAI) H7N3 in the western state of Jalisco, an important table egg producing state. Mexican officials acted quickly to control the outbreak declaring a national animal health emergency and implementing movement controls, slaughter and destruction of poultry in affected farms, cleaning and disinfection and testing of poultry farms around the initial three infected farms. Other states in Mexico banned the movement of poultry and poultry products from Jalisco into their states. Countries in Central America, especially Guatemala and Belize, which border Mexico also went on alert stepping up emergency preparedness plans.



A month after the start of this event, Mexico reports that 305 poultry farms have been sampled with 33 farms testing positive, 106 testing negative and diagnosis is on-going in the other 166. Around 3.8 million birds have been slaughtered and destroyed of an affected population of 9.3 million birds. There are about 17 million birds at risk with 60% of these being layers, 24.6 % broilers, 6.9% breeders and 8.5% being backyard poultry. Currently, the disease causes death in 10.58% of birds in an affected flock and 39% of birds that get sick die. As soon as the first reports were received about the major outbreak in Mexico, the BPA and poultry producers, especially those in the Northern Districts of Belize, went on alert calling community meetings to inform producers and stepping up biosecurity measures. The harmonised Biosecurity Assessment Tool, recently adopted by the BPA, is being used to strengthen farm biosecurity measures. The BPA is also working closely with BAHA and OIRSA to coordinate strategies and activities under the national alert status to prevent the introduction of HPAI. While not a cause for complacency, it is reassuring to note that Jalisco is many states away from Belize's border and these buffer states are on alert to also prevent the introduction of this disease.

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No Hormones No Preservatives

Rice Field Day

By Dottie Feucht

The rice seed production project, restarted in 2009 (after a few years of no progress) by the Taiwan Technical Mission (TTM) at Central Farm, celebrated its success story with a *Rice Field Day* on May 25, 2012. In addition to a detailed description of the multi-step process to produce high quality seed, Mr. Wayne Chen, TTM Rice Specialist, and Ms. Ina Sanchez, Ministry of Natural Resources and Agriculture (MNRA) officer, conducted attendees on a tour of the rice seed growing plots on the 5 acre site at Central Farm. The attendees learned that the annual 1652 pounds of **basic** seed (pure, in terms of variety, and uniform) that are produced there are further refined to produce 20,000 pounds of **stock** seed that are then sent to the 25 acre Poppy Show Farm in Toledo for producing 220,000 pounds of the final seed, called **commercial** seed which are sold to the rice farmers. Three varieties are produced: Cypress - for mechanized irrigated farms, CARDI-70 - for mechanized irrigated, upland, and milpa farms, and Tai Chung Sen 10 (sticky rice) - for mechanized irrigated farms.



The success of the project can be assessed in a number of ways: (1) For a number of years Belize has not had to import rice because the quality of the seed maximizes production, and even exceeds the annual consumption of 18 M pounds of rice. (2) The rice field plots have a well-designed irrigation and drainage system, ensuring that the crucial water level of the plots remains at the optimal level even during heavy rains. (3) The Belizean staff who work at the site are proficient in soil preparation, seedling transplant, monitoring and caring for the plants, and harvesting and preparing the seeds, having been taught by the TTM staff. (4) There are now 650 rice farmers who have access to TTM's expertise and information and high quality production seed to maximize their harvest and supply the local market. (5) The registration system established in 2011 provides monitoring information for quality assurance. (6) The goals of the project have been met and culminated in the signing of a letter of intent (LOI) to turn over the production seed activity in 2013 to the MNRA. The signing of the LOI by representatives of both governments took place at the end of the Rice Field Day program.

Plans for future assistance to the rice industry by TTM include grading, packaging and marketing.



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ASK RUBBER BOOTS

Dear Rubber Boots,
I have a question regarding local honey. We use honey a whole lot, but recently we have noticed some oddity. Some are so thin that they almost run like water. Our recent purchase is really dark and tastes a bit like molasses. It foamed up and fermented! We did not think that pure honey did that. Is it a normal thing? Please alleviate our ignorance.



Thanks a bunch.
Cheers
Toshi Schwerdtfeger

Dear Toshi,

Thanks for sending us such an interesting question. Yes, there seems to be some issues with the local honey crop this year. Here is what we were able to learn. Regarding the color, that is often related to the bee's food source. Yes, you may be seeing fermentation, as in a poor crop year it is not uncommon to have quality issues (including color and moisture) in addition to poor production quantity.

When bees forage nectar it is usually around 80% moisture (give or take a few percent). As the bees "ripen" the honey they remove excess moisture to yield a moisture content much lower. They do this by spreading the honey out in the combs to increase its surface area and moving air through the hive by fanning with their wings to draw in outside air and, at the same time, exhaust more moisture-laden air to the outside. In this process they reduce the moisture level in the honey to below 20%. The acceptable moisture content is usually <18.5%. At that level the honey should be stable for storage. Anything that hampers the ability of the bees to remove moisture can make it difficult or impossible to evaporate sufficient moisture to attain this stability. Excessive long term humidity in the ambient air is problematic. Even honey that is properly evaporated can pick up moisture again under extremely humid conditions because of its hygroscopic (moisture absorbing) property although once the honey is sufficiently evaporated the bees normally "seal" the honeycombs with beeswax cappings which provide some level of protection from subsequent exposure to high humidity. Problems with high moisture honey are exacerbated when sugar-tolerant yeasts are present, which they commonly are, and fermentation can begin. Once that begins there is no good remedy. If high moisture honey is extracted from the combs and a beekeeper or honey packer has drier honey available, the two can be blended to lower the moisture level to 18.5% or lower, alleviating the problem. For the smaller producer this is frequently not an available option—especially if the problem is occurring among a majority of honey producers in the area. For consumers looking for lower moisture honey with a normal long shelf life, it may be well to point out that there may be pockets within a broader area that had better evaporating conditions, and therefore, normal, drier honey. These moisture levels are tested with a refractometer, the better of which are generally too expensive for small scale honey producer to own. Once there is significant fermentation in bottled honey it becomes quickly degraded and not palatable for consumption. High moisture honey can result from a too-rapid harvest, but if the problem is widespread, that more suggests an environmental cause as discussed above.

Rubber Boots

Brix... Continued from page 10

Curiously, almost a century elapsed before brix was adapted for widespread use with other crops. Dr. Carey Reams, a 20th century Florida agricultural consultant, was one of the first to grasp the importance of the brix index and to promote and expand its use, starting with citrus. He realized that brix was more than just a 'sweetness' index; it is the simplest single test which also indicates a fruit's nutrition and flavor. Dr. Reams created several charts, and a few are now combined as The Reams Composite Chart* (printed on page 21), which is still widely used as a reference today. The crux of his message was: 'Brix is quality.' He classified fruits into 4 quality divisions using a system known as "PAGE" (P = Poor, A = Average, G = Good, and E = Excellent), each with a corresponding brix number. Following Florida's orange producers' adoption of the brix system of measurement, eventually other industries began to realize the potential benefits of high brix. Having produce with more natural sugars requires less added sweeteners, saving the processor money plus contributing to a higher quality product. In addition to the brix-pioneering grape and orange industries, now the ketchup industry widely uses it to buy tomatoes; the cranberry industry has also converted to purchase by brix. Even the USDA sets minimum brix levels for salad bar items. Savvy wholesalers measure brix before purchase to have the best tasting products on their shelves, and even home gardeners can now measure their produce's brix using handheld affordable refractometers.



More and more farmers are becoming aware of the importance of brix levels in both the leaves and fruits of their crops, and with good reason. Brix infers both good quality and good health for the plants as well as resistance to many kinds of plant pests: insects, bacteria, viruses and fungi. This good health also follows the plant after harvest, as high brix produce dehydrate rather than spoil and have an extended shelf life. (Tomatoes are said to be the exception to this rule.)

How do high brix plants discourage insects? The fact quoted on several websites is that for many crops, a **leaf** with 12 or higher brix will not be bothered by insects. (Note: The Reams brix chart on page 21, 5th column of values is labeled "Disease Free". Sweet corn and tomatoes require the highest brix to be 'disease free'.) Insects convert plant sugars into alcohol; so a high brix plant can be toxic to them. Mammals have evolved to prevent excess sugar from being converted into a toxic level of alcohol, but bugs do not share this ability. One theory holds that the 'tipsy' bugs are easily eaten by other predators; another theory is that the alcohol dissolves the waxy exo-skeleton and leads to death by dehydration. Note that the high brix level needs to be in the leaves as well as the fruit/vegetable. Certain varieties, such as sweet corn, have been developed for 'sugar translocation qualities', meaning the brix is increased in the ear, but diminished in the stalk and leaf. This increases the plant's vulnerability to disease by compromising the plant's natural system to fight off pests.

How can you increase your brix? Today's soil scientists and fertilizer experts understand that in order to have high brix, plants need to have more than NPK available; minerals and micronutrients must be balanced and available for uptake. Both foliar feeding and application of organic matter to soil have been shown to increase brix. Visit your fertilizer specialist, get your soil tested, discuss your needs and go from there.

Continued on page 22

THE REAMS COMPOSITE CHART (*BRIX*)

	Poor	Average	Good	Excellent	Disease Free		Poor	Average	Good	Excellent	Disease Free
Apple	6	10	14	18	(16)	Mangoes	4	6	10	14	()
Asparagus	2	4	6	12	()	Onion	4	6	8	13	(13)
Avocado	4	6	8	12	()	Orange	6	10	16	20	()
Banana	8	10	12	16	()	Papaya	6	10	18	22	()
Beet	6	8	10	12	()	Parsley	4	6	8	12	()
Blueberry	6	8	12	14	()	Pea, Black-eye	4	6	10	12	()
Broccoli	6	8	10	12	()	Pea, English	8	10	12	14	(14)
Cabbage	6	8	10	12	()	Peach	4	6	8	12	()
Cantaloupe	8	12	14	16	()	Peanut	4	6	8	12	()
Carrots	4	6	12	18	()	Pear	6	10	12	14	()
Casaba	8	10	12	14	(16)	Pepper, Hot	4	6	8	12	(12)
Cauliflower	4	6	8	12	()	Pineapple	12	14	2	22	()
Celery	4	6	10	12	(15)	Potato, Irish	3			13	(13)
Cherry, sour					(14)	Potato, Sweet	6	8	10	14	()
Cherry, Sweet	6	8	14	16	(16)	Pumpkin					(15)
Coconut	8	10	12	14	()	Raisins	60	70	75	90	()
Corn, Sweet	6	10	18	24	(24)	Raspberry	6	8	12	14	(15)
Cucumber					(13)	Romaine	4	6	8	12	()
Cumquat	4	6	8	12	()	Rutabaga	4	6	10	12	()
Eggplant					(12)	Squash	6	8	12	14	(15)
Endive	4	6	8	12	()	Strawberry	6	10	14	16	(16)
Escarole	4	6	8	12	()	Tomato	4	6	8	12	(18)
Garlic					()	Turnip	4	6	8	12	()
Grapefruit	6	10	14	18	()	Water- melon	8	12	14	16	()
Grapes	8	12	16	20	()						
Green Beans	4	6	8	14	(14)	Alfalfa	4	8	16	22	(14)
Honeydew	8	10	12	14	(16)	Corn, Stalks	4	8	14	20	()
Kohlrabi	6	8	10	12	()	Corn, young	6	10	18	24	()
Lemon	4	6	8	12	()	Grains	6	10	14	18	()
Lettuce	4	6	8	12	(12)	Roses					(15)
Lime	4	6	10	12	()	Sorghum	6	10	22	30	()

AG BRIEFS



See John Carr's notes on p. 13 for the impact of the **North American drought** on Belizean ag prices. The drought which at print time is affecting 61% of the contiguous USA, is expected to continue into September. The USA is the world leader in both corn and soybean production and 88% of their corn crop and 87% of their soybean crop are in drought-affected areas. Although rising crop prices will be a boon to other exporting nations, worries arise that rising food prices may contribute to more unrest in the Middle East. Some opine that seed corn supplies for next year may be affected.



The UK had its wettest June since 1910. Many apple, cherry, plum and pear farms have had their harvests almost wiped out.



Belizean realtors noted that buyers for international drinking water bottling companies were in country **hunting for lands with sources of plentiful unpolluted water**, such as isolated springs.

BLPA is anxious for the cattle sweep to begin so we can export to many countries while the price of cattle is up. Better classes of steer and bulls weighing 750 – 1100 pounds are bringing \$1.45 - \$1.50 per lb. for the very best males, cows at 90¢ to 1.20 for the best. Yet these prices are only about ½ of US prices. Maybe cattle raisers will now spend more money for improved pastures, better fencing with cross fencing and better bulls, AI and even embryo transplants. Most of these cattle are currently being exported to Guatemala.

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Local and Regional Fuel Prices



	Cayo, Belize	Quintana Roo, Mexico	Peten, Guatemala
REGULAR	↓ \$10.83 Bz/Gal	↑ \$6.15 Bz/Gal	↓ \$9.59 Bz/Gal
PREMIUM	↓ \$11.70 Bz/Gal	↑ \$6.63 Bz/Gal	↓ \$9.86 Bz/Gal
DIESEL	↓ \$10.07 Bz/Gal	↑ \$6.37 Bz/Gal	↓ \$9.32 Bz/Gal

Chief Agricultural Officer Eugene Waight formally inaugurated **The National Pitahaya Production Task Force.**

Manuel Trujillo, National Crop Coordinator at Central Farm will chair the group. Members of the task force come from Ministry of Agriculture and Natural Resources, IICA, USDA, BAHA, ROC Taiwan Mission and private stakeholders. Central America was recently



approved by USDA for the importation of fresh pitaya into the USA. The task force reconvenes on August 1st to assess current pitaya production information in Belize, market prospects and further USDA requirements and costs.

Keeping Produce Fresh: Some produce emits ethylene gas as it ripens and other produce is ethylene-sensitive, accelerating its ripening process and causing it to spoil quickly. Separating the two helps keep the latter produce fresh longer but Everfresh Partners of New Zealand have invented a gadget which allows them to be stored together in the refrigerator. The gadget traps ethylene gases emitted by high ethylene produce such as apples, avocados, mangoes, papayas, plantains and tomatoes, so that they will not accelerate the ripening and contribute to the spoiling of ethylene-sensitive produce such as unripe bananas, broccoli, cabbage, cukes, okra and sweet potatoes. Everfresh's permeable sachet packet of potassium permanganate or sodium permanganate attaches with a suction cup inside a refrigerator's vegetable drawer and absorbs the ethylene.

Bad Year for Mangoes in Belize: Although mango production regularly has normal and boom years, 2012 has not been a very good mango producing year for Belize. Many Cayo farmers report that either their trees lost their first blooms without fruiting, or lost the first bloom but then later bloomed a 2nd time and fruited in June and July with some still fruiting. The traditional harvest time for some mangoes begins in April-May during the dry season. Mangoes account for over 50% of tropical fruits worldwide. One source claims that some mango trees over 300 years old are still producing fruit. Mangoes are native to India, who remains the top world producer, accounting for over 50% of world production. Mexico's mango production ranges between 3rd - 5th place. The top 10 producing countries grow 80% of the fruit. Mangoes are becoming very popular in the US; imports into the USA market have expanded from 226M US\$ in 2007 to over 343M US\$ in 2011.



Brix... Continued from page 20

Small handheld refractometers are available in the USA for about \$50 USD; Citrus Growers Assn. has marketed them to their members for around \$300 Bz\$. There are several different types. Fruits, vegetables, crops and grasses need models calibrated for range of 0-32 brix. Honey (and molasses) refractometers require calibration for a higher scale. To use the refractometer, simply place a few drops of the juice on the glass prism and read the results.



*For brix values of fruits not on this chart, search online. Two other popular charts are The Neilson Chart and The Pelly Chart. Values have been revised for some items since Ream's time, but most of his values have remained valid.

Note: Milk can also be checked for its brix level. Harrill reports that commercial milk averages 10-11 and excellent milk may be as high as 20.

Do you have any brix information to share with our readers? Please let us hear from you, at <belizeagreport@gmail.com>

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