



## Harvesting the Ag News from All of Belize

### Belize—Brazil Bilateral Agreement

Happily, Belize is among countries positioned to greatly benefit by Brazil's activism, especially in the realm of agriculture.

Brazil is an agricultural superpower, and her role in our region and in the world has blossomed. Since the election of President Lula in 2003, twenty-three new embassies, mainly in the Caribbean and Africa have been opened. Brazil plays a key role in the G5 (Brazil, India, China, Mexico & S. Africa) and the BRIC Group (Brazil, Russia, India & China). G5 and BRIC have been active in many agricultural issues on the world stage. Brazil is currently the world #1 in exports of coffee, sugar, orange juice, soy and beef. As well, she is a leader in development of the ethanol bio-fuel industry.

Mr. Pedro Etchebarne, the Charge de Affairs of the Brazilian Embassy to Belize and the EMBRAPA team who visited here in July are quick to point out the similarities between our countries. For instance, in ratios of population to landmass, both are fairly sparsely populated. Brazil, over 8.5 million sq. km. in size and population of 198 million has density of 22 people per sq. km.; Belize, with just under 23 thousand sq. km in area with population of 310,000, has a density of

12 people per sq. km. Both also are blessed with much arable land and available water.

Another similarity is in our labour forces, which by occupations in agriculture are 20% for Brazil, and 19.5% for Belize. As well, Brazil has both a developed mechanized sector and a backyard sustainable sector of agriculture. So Brazil is better poised than many to understand Belize's agricultural environment. Brazil realizes that there is a necessity for both sectors, mechanized and backyard, and have developed different strategies for development in each.

How has Brazil accomplished so much? Part of the credit for that success must be attributed to EMBRAPA, the Brazilian Agricultural Research Corp., which was formed by the Brazilian Government in 1973 to improve agricultural production. EMBRAPA has over 8000 employees, who work in 38 Research Centers. 75% of all EMBRAPA employees have Doctoral Degrees. The remaining 25% have at least Masters Degrees. Their vision is to develop new technology while conserving natural resources, and transfer of this knowledge. They are the recognized leader in tropical agriculture research and development. The team who visited Belize in July were specialists in citrus and grain production. They spent 3 days visiting rural Belize and meeting with producers.

Brazil's philosophy of action here is very soft-toned. Very willing to share information on what has worked for them, yet her policy is one of encouragement for other countries to make their own decisions, on whether to utilize shared strategies/technologies or not.

Although paperwork began 2005 to facilitate cooperative actions between our countries, the signing of the bilateral umbrella Memorandum of Understanding in July of this year was a landmark necessary to allow the Technical Cooperation Programmed proposed by Brazil to move to the next level, whereby actual training programs and the like can begin. Belize's Minister of Agriculture Mr. Rene Montero has made two trips to Brazil since 2007.

The focus right now from the M.O.U. is on Agriculture, and the agreement covers other areas of mutual cooperation too. The first member from the Belize Ministry of Agriculture, Mr. Manuel Trujillo will shortly travel to Brazil to commence training in Ag. Sciences and Starches. Mr. Etchebarne implied that agricultural education would be a continued focus of their mission in Belize. Their sharing of knowledge and expertise is appreciated and we are looking forward to increased cooperation between our countries.

The Belize Ag Report wishes to thank Mr. Pedro Etchebarne of the Brazilian Embassy to Belize, for his assistance with this article, and also recognizes Ambassador Coutinho and his staff at the Brazilian Embassy here, for their efforts to promote agriculture in Belize. *By B. Roberson*



October 3 2009

Schutzhund Training



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### Mission Statement;

The Belize Ag Report is a 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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For the Best in Organic Farming

**An Alternative Strategy for the Belize Citrus Industry**

**By Nikki Buxton, Belize Bird Rescue**

The Citrus Industry and the birds that take advantage of its bounty have been at loggerheads for years. Farmers spend thousands of dollars a year and endless man hours trying to keep Belize’s birds away from their crops. But research shows that there could be a way that man and bird may exist harmoniously, and farmers may even get richer as a result.

With 70% of Belize’s citrus groves in the Stann Creek district, the industry extends throughout prime parrot territory, transforming natural bush habitat into agricultural land, effectively opening a rather good restaurant right next to the bird’s nest sites. Parrots are not the only diners - woodpeckers, grackles, and jays also wreak havoc amongst citrus groves, so why is the parrot suffering so much, and why is that a problem for Belize?

Parrots have a short, precise breeding season, they are long-lived and mature and breed later than many other species, producing only one or two offspring per year. The chick rearing season coincides with peak orange production when adult birds need maximum nutrition for minimum effort. Parrots browse in the upper reaches of a tree and will destroy an entire fruit to get at one seed. Whereas woodpeckers and grackles will follow a fallen orange to the ground, parrots will not: if they drop a fruit, they will simply take another one. A flock of parrots is a high-profile, noisy, conglomerate of colour and they make for a very easy target. Whilst the Growers Association diplomatically advise “scare, don’t kill”, when the only thing standing between a farmer and a pristine crop is to aim 2 feet lower.... well, who can blame them.

Estimates of bird damage range from as low as 2.5% to around 11-15% in some tests, but let’s assume that the worst-case scenarios are correct, and in the absence of any form of counter-measure, the total bird damage amounts to 20%. What could be done to recoup this loss?

**Decoy Crops**

Deterring parrots is not easy: they are smart and willful and they visit in large flocks. For any deterrent measure to work, it has to be utilised in a planned and co-ordinated way alongside several different methods, it must be implemented in all the farms in the area or the damage will just be relocated, and above all, there *must* be provision for a more attractive alternative: as far as a parrot is concerned, not eating is not an alternative. This is where decoy crops, or lure crops come in.

A good decoy crop will represent a more attractive alternative to being harassed in a citrus grove and needs to provide greater calorific value and nutrition at reduced effort to the bird. We have observed parrots known to give problems to the citrus industry preferentially visit the more densely seeded bitter orange tree, so we recommend that farmers intersperse their commercial crop with bitter, rootstock orange or mandarin, making sure growth cycles coincide with their cash crop.

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Sir,

I have just read your Ag report on the Belize News site. I think it is excellent. At present we farm organically in the UK and sustainably in Oklahoma USA. I very much liked your article on soils, organic, and sustainable agriculture. The more we farm sustainably the better our soils are responding.

In Oklahoma we grow soybeans, corn and watermelons on deep soils and despite 30 inches in May and only 1 inch in June and 100 degree days our crops are still doing well and should make something. We also run 200 cows on the grass-land.

Anyway I am also a frequent traveller to Belize and believe many of the methods used are applicable to a wide range of conditions and we have incorporated much of what I have observed there, to our operation here.

I would like to subscribe to your magazine (by email) so please send details.

Yours Sincerely,

Jack Harley.

p.s. We are a family farming operation, who have built up since the 70’s, when father moved to England from Scotland, in the UK and the USA (my brother and father have ranches in Texas) and have been farming and running cattle for generations.

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## Back to Office Report

### Trade Mission to Central America

#### Delegation:

Mr. Eugene Waight, Chief Agricultural Officer, Ministry of Agriculture and Fisheries; Mr. Adalbert Tucker, Ambassador for Foreign Trade- Ministry of Foreign Affairs and Foreign Trade; Mr. Roque Mai Belize Marketing Development Corporation; and Mr. Bernard Penner, Director of Belcar representing the private sector.

**Location of visit:** El Salvador and Guatemala

**Date:** 28<sup>th</sup> to 31<sup>st</sup> July, 2009

**Sponsor:** Accompanying Measures for Sugar- EU (AMS)

#### Purpose of Mission:

The trade mission to El Salvador and Guatemala was an exploratory mission to seek markets for the export of grains from Belize. It would be used as a platform to inter-phase grain producers from Belize with grains processors/distributors from the target countries.

#### Background:

For over a decade, Belize has attained self-sufficiency in the supply of basic grains. This has been achieved by producers investing in land development, machinery, storage and value-adding; and government's support in creating the enabling environment. However this sub-sector has become stagnant as with the absence of export outlets, local production is geared mainly at meeting the local demand for livestock feed and food for human consumption.

The Ministry of Agriculture and Fisheries (MAF) cognizant of these limitations for expansion in production has embarked on the initiative to find markets in the region for corn (white and yellow), rice and beans (black and red) in neighbouring countries of Central America.

The decision to start with grains was on the basis that grains are non-perishable and it was felt that Belize has the necessary infrastructure and capacity to export on a competitive basis to the region. Consequently the MAF sought funding from the Accompanying Measures for Sugar (AMS) project of the European Union to carry out a trade mission to the three closest countries in Central America; Honduras was left out due to the on-going political crisis that surfaced afterwards.

#### El Salvador Leg:

In El Salvador three visits were carried, namely; Chamber of Commerce, GUMURSAL S.A. and Arrocera San Francisco. The latter two entities specialize in the processing and distribution of rice and beans for internal distribution. Both also import most (80%) of the beans from Nicaragua and most (80%) of the rice and white corn from the United States (US). The corn imported from the US is grade US#2. Red beans is bought from Nicaragua at the farm gate for BZ\$0.70 to \$0.90 per pound and black beans is gotten from Guate-

mala. The rice imported from the US is in paddy form and they purchase at  $\leq$  BZ\$0.42 per pound. White corn is purchases at BZ\$0.20 per pound.

In terms of duties, beans pay 20% plus a 13% VAT. In the case of rice it pays 40% duties and 13% VAT.

#### Guatemala leg:

During the one-day visit to Guatemala the mission met with representatives from the Chamber of Commerce, COPEREX and Deloitte International. During the session with the Chamber several companies that either store, process and distribute grains were present. The session focused on sharing of information on production of grains in Belize and f.o.b prices in Guatemala. They purchase yellow corn at BZ\$0.24 per pound. In the case of red beans they purchase at BZ\$1.10 per pound (cif) and BZ\$0.90 to \$1.00 per pound for black beans. Paddy rice pays a low duty of 5%.

COPEREX is a Committee that manages a conference center; similar to that like the National Agriculture and Trade Show grounds. This group requested to meet with the mission to promote their services, which include the hosting of trade and other specialized shows. Their next agriculture trade show will be held the first week of December.

Similar to COPEREX, Deloitte International requested a meeting with the mission to showcase their services. Deloitte has expanded their services to include market studies and providing advise on import/export procedures/requirements.

#### Conclusions:

Although no concrete marketing arrangements were made for the export of grains from Belize, the delegation was satisfied with the outcome of the mission as important contacts were made with potential importers/distributors of grains in Salvador and Guatemala. They expressed interest to pursue further discussions with Belizean distributors/exporters for the supply of any of the grains. These contacts will be shared with local distributors/exporters of grains for them to analyze the feasibility of exporting grains to any/both of the countries visited. The line Ministries involved in this initiative will do all within its reach to assist local companies to penetrate these markets; both countries have a potential captive market of approximately 23.0 M persons.

The high tariff rates will make it very challenging for Belize to export to Salvador or Guatemala.

White corn, beans and probably paddy rice may be the only products that Belize will be able to export competitively.

The contacts established during the mission created the platform for future export initiatives, when the conditions are favourable. There was a willingness and a keen interest in trading with Belize and in also exploring opportunities for investment. In addition opportunities for exhibiting Belizean products in the countries and facilitation for participation in trade shows and other affordable marketing opportunities were highlighted.

*(Continued on page 4)*

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As an immediate follow up, the private sector member of the delegation committed to send back samples to the Chambers of Commerce and other entities in both countries for verification of quality and other specifications and for ongoing negotiations for sale of commodities.

At the public sector level it is recommended that GOB continue to pursue the negotiation of appropriate trade agreements with Central America, whereby the prohibitive tariff rates are no longer an issue for market access. The Ministry of Foreign Affairs and Foreign Trade can be asked to accelerate work on the Caricom/Central America FTA.

Continued work in Belize on streamlining national productive efforts and encouraging innovation and coordination that will impact the cost of production and enhance competitiveness of products.

Strengthening of the trade promotion efforts and institutional framework to spearhead and promote aggressively the trade of Belizean products in Central American and other markets enhancing the roles of Belizean Embassies in the different territories to promote the export of Belizean products.

By Chief Agricultural Officer, Eugene Waight

#### **Acknowledgement:**

Special thanks go out to Ambassador Alfredo Martinez and Carlos Montero from the embassy of Belize in Guatemala and Mrs. Celie Paz Gonzalez, Honorary Consul in El Salvador, for their support in the coordination of the visits to the different companies, institutions and Chambers of Commerce. Their assistance and support was invaluable to the success of the mission. Special thanks also goes out to the PIU of the AMS (EU) for providing the funds for the trade mission/international meeting.

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*Continued from page 2*

Dear Editor,

In the first two issues of The Belize Ag Report there was a lament that Belize has not accepted GMO crops. I would like to speak up in support of leaving GMOs out of Belize. John Carr wrote 'There must be some very significant production advantages to GMO methods or the major producing countries of the world would not be moving in that direction.' The reason that countries are moving in that direction is because large corporations spend millions of dollars to lobby governments and work hard to promote this technology and remove other seeds from the market. Currently 6 companies control 98% of the commercial seed market and they have the money and sway to keep it that way.

One example to learn from is corn farmers in Oaxaca Mexico who for generations have saved seeds in order to protect the world's most diverse corn varieties. The valuable resource is now in danger as genetic tests are showing that these once pure crops are now contaminated with GMO genes. Once we begin growing GMO crops, in a country the size of Belize, we cannot take back the genes that spread to those that choose not to grow or eat GMO products. It should be our right to decide not to eat or grow GMO, but if GMO is allowed into Belize we risk losing that right as the Oaxacan farmers have.

Because GMO seeds are patented property, organic farmers whose lands are unwittingly contaminated with GMO can risk owing money and losing their right to save their seeds. We also risk losing the variety of vegetables and grains available to us and more importantly, the safety that genetic diversity brings. The more diverse a gene pool and the more varieties that exist and are grown, the better the odds that plants will be able to adapt to changes in climate, pest infestations or disease. If only GMO clones are left, we risk susceptibility to regional to worldwide crop loss. This can be particularly devastating when talking about staples such as wheat, corn, rice or potatoes.

In Barbara Kingsolver's 'Animal, Vegetable, Miracle' she writes that 'In internal reports, Monsanto notes "growers who save seed from one year to the next" as significant competitors, and allocates a \$10 million budget for investigating and prosecuting seed savers. Agribusiness can patent plant varieties for the purpose of removing them from production, leaving farmers with fewer options each year...Garden seed inventories show that while about 5,000 nonhybrid vegetable varieties were available from catalogs in 1981, the number in 1998 was down to 600.'

I don't believe that this loss is acceptable and my vote is to keep GMO out of Belize. Informed consumers in the US and many European countries are demanding GMO-free foods. If other countries already have GMO and cannot go back to GMO-free, Belize is in a good position to provide to a vast market that others cannot. Surely, this would be a safer bet than allowing technology that cannot be easily controlled or removed into Belize.

Heather duPlooy  
Curator  
Belize Botanic Gardens

## U.S Corn Exports

August 24, 2009

Information from USDA/FAS/ Export Sales Reporting  
September 1<sup>st</sup>, 2008- August 1<sup>st</sup>, 2009

<u>Country</u>	<u>Metric Tons</u>	<u>100 lb bags</u>
Mexico	6,738,485	148,246,670
Guatemala	584,443	12,857,746
El Salvador	383,765	8,442,830
Honduras	356,224	7,736,928
Jamaica	230,502	5,071,044
Trinidad & Tobago	87,984	1,935,648

## Belize Corn Statistics

Provided by John Carr

2007 GOB Production- 844,670 bags (Bze Abstract of Statistics, 2008)

2009 Belize Production estimate- 1,100,000 - 100 lb bags

2009 Belize Consumption estimated - 650,000 - 100 lb bags

Estimated Surplus for Export- 450,000 - 100 lb bags

(Only 2007 is an official statistic, other #'s are estimates by private sector)

## Organic Production By Greg Clark

### The Organic Arsenal

In speaking with farmers about the transition to Organic Agriculture, the biggest concern that arises is the limited products that aid them with insects, weeds and fungi. Over the years, as more and more farms have adopted organic practices, the research and development of accepted products has increased.

I would like to highlight some of the products that are currently available on the market.

**Insect Control:** In dealing with insects, the current conventional chemicals are mainly derivatives of the allowed organic insecticides. One main listed item is Pyrethrum, which causes instant paralysis of insects. It is extracted from a Chrysanthemum flower that is native to Kenya.

Another listed item is Neem Oil. Neem Oil contains an active ingredient that kills and repels most insects. Secondly, Neem will reduce the incidence of Powdery Mildew, Black Spot and Rust. Neem trees grow very well in the Belize climate and will provide extracts for making your own spray.

Rotenone is effective on aphids, beetles and caterpillars. It is extracted from the roots of derris plants in Asia. Rotenone acts to poison insects after ingestion.

Dishwashing Liquid Soap is effective when used in a 1 to 2% concentration and sprayed on plants. This method will require repeated applications to bring the pests under control, but the cost of application is minimized.

Coconut Oil is effective as a smothering agent when applied by spray on aphids.

**Weed Control:** The most effective methods in dealing with weeds involve proactive combined efforts. Compost or mulch over the area will reduce the occurrence of weed seed germination. As weeds penetrate thru the mulch material, the stems are fragile and easily removed.

Flaming the weeds is a secondary method of mechanical removal. The high temperature flame also has the added effect of sterilizing weed seeds on the ground surface and reducing their ability to germinate. For organic chemical herbicides, the following are utilized in weed control.

Vinegar that is greater than 5% concentration will kill vegetative growth on weeds. To increase the effectiveness, add dishwashing liquid soap, as this breaks down the waxy protective layer on weed leaves.

Another vegetative killer is Clove Oil. Clove Oil used in an 8% solution will kill weed growth in a short period of time.

For pre-emergence protection, Corn Gluten is shown to prevent germination of weed seeds. This discovery was recent and is effective to prevent new weeds.

**Fungi Control:** Powdery Mildew, Blight and Black Spot can be controlled organically through the following items.

Sulfur can be used as a spray or powder for controlling Powdery Mildew. The limitation is that it cannot be used on Cucumbers, Melons and Squash.

Neem Oil in 70% concentration will kill Powdery Mildew.

Baking Soda is effective when applied in a spray form.

Corn Meal has also shown good results as a fungicide. It attracts good fungus that feeds off of bad fungus.

If you would like to receive further information about any of the above listed items or more options available in the Arsenal, please email me at [Organic@belizeagreport.com](mailto:Organic@belizeagreport.com).

Greg Clark



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<b>1 Ton Chemical Fertilizer N.P.K</b>	<b>3.16 Ton Organic fertilizer N.P.K</b>	<b>19 Ton N.P.K Chicken Manure</b>

**General recommended application N.P.K**  
**120lbs Nitrogen Chemical**  
**60 Nitrogen organic or Manure**  
**50lbs Phosphorus chemical or organic**  
**120lbs Potassium**

**Thus total then to =**

<b>6.3 bags chemical fertilizer 19-9-19 per acre</b>	<b>19-9 bags organic 6-3-6 Fertilizer per acre</b>	<b>114 bags chicken manure Per acre</b>
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<b>Cost per acre Chemical fertilizers \$510.30</b>	<b>Organic fertilizers \$200.00</b>	<b>Chicken manure \$684</b>
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## North Dakota Beekeepers Spend a Week in Belize

These are a few thoughts from a lady beekeeper who recently spent a week in Belize. My husband, Alan and I have looked at beekeeping various parts of the world and have been blessed with some long term friendships arising from these travels. Earlier this year we decided to take a closer look at Belize and its beekeeping industry and possible potential growth.

I first became interested in beekeeping years ago when my 11 year old son wanted honeybees for a 4-H project. My life has never been the same. I had milked cows, raised and sold dressed chickens and raised pigs. I enjoy all aspects of farming but beekeeping became a true love of mine. I know that many beekeepers can relate to that, as well as other ag producers who are motivated by more than the simple desire to earn a living. I have learned so much throughout the years and gotten many good ideas from older male beekeepers who shared their beekeeping secrets with me. I then thought all beekeepers could benefit from these ideas and used to delight in sharing them when speaking at beekeeper's meetings. I was a sideline beekeeper (as compared to full time commercial) for several years and then 21 years ago my current husband and I were married and we became commercial beekeepers in North Dakota. He had a similar background in hobby/sideline beekeeping and we shared the desire to combine our common interests and earn our living from this unusual occupation.

During the last week of June we visited Belize and found the beekeeping there quite interesting. We met with a couple of beekeepers during our brief stay and spoke with a couple of government officials who all were very friendly and helpful. I was especially interested in the cooperative organizations you have and hope that this approach proves to be increasingly helpful to Belizean beekeepers. It appears that wired beeswax

foundation is used extensively in Belize and it seems potentially worthwhile to consider the importation of plastic foundation which is extremely durable and a big labor saver. It seems that the cooperative structure is ideal for pooling orders for that sort of equipment purchase, as it apparently has been for other beekeeping supplies. It is always interesting to see the practicality of certain types of beekeeping equipment/management techniques in other parts of the world which we are familiar with, but are not practical in our climate/circumstances. Entrance type (Boardman) feeders and ant-barrier hive stands are a couple examples. (The former is a type of bee feeder which is easily inserted in the entrance of the hive, and can be refilled with sugar syrup when necessary with a minimal disturbance of the bees during a dearth of nectar. It is not practical for feeding during cold weather— as during the spring and fall seasons in the Northern U.S.-when the bees won't break their cluster to reach it. The latter is a special stand to set the beehives on which prevents ants from entering the hives.) It is amazing how adaptable beekeeping is to various conditions, and how important those adaptations are to success.

We also appreciated the tall reusable honey bottles that are unique and practical and in common use there. I loved the thought of "jungle honey" and found the flavor of some samples to be delicious. We were impressed with the citrus acreage and wonder how much this potential of citrus honey is being tapped. We were impressed with the way that beekeepers there have dealt with African honeybees and the frequency of honey harvests and the length of the production season.

We have been to Belize twice and we will be back, and I hope that next time we will be able to take in a beekeepers meeting. I would love to meet more Belizean beekeepers.

JoAnne King Kings' Honey Co. Marion, ND USA



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**Banana Bank Agco. Report  
by John Carr**

**Spider Mites**

Identity: 1. Banks Grass Mite and 2. Spotted Spider Mite

BAHA and CARDI have properly identified these in Belize, but the control has not been easily managed.

**History**-Spider Mites seem to have come on the scene within the last five years (at least on a significant damaging basis). They don't come from flying stock and spreading is less than moths and worms. We seem to see more smaller areas but these areas could be a total wipeout. Also in our minds, we see mites on more mature plants with bottom leaves being first infected.

Now we are seeing small corn, 6 inches high that are head from Spider Mite infestation. They multiply rapidly from web building and egg laying. They have become a disaster when they hit. Their size, living location and same single-sex characteristics make them difficult to spray and control. We feel that some chemicals (Lorsban) have damaged friendly enemies of mites.

We recently tried a new Belize product, Talstar 10WP, but it is too early to tell. Biphenthrin has been a good product in other parts of the world, but the jury is still out here. We have less than 5 days since application.

**Treatment**— Talstar WO from Prosser costs approx. \$65.00 per acre for product, plus application—this makes treatment almost prohibitive. It seems that Biphentrim treatment in the U.S.(Colorado) could be one third the price that we are paying in Belize. It has some residual, but the mites live on the underside mostly and good contact to kill is difficult. We are definitely out in Pioneer land when it comes to controlling Spider Mites.

**Costs to Belize of Spider Mites**— The loss of crop is sometimes 100%. It may require replant or partial replant. It will require expensive chemicals, and definitely will reduce yields when it hits. Fortunately, it doesn't spread as easily as worms. Estimating total economic crop loss to the country is difficult, but if you happen to be an unlucky farmer, it may be 20% to a total wipeout

The advertisement features a background image of a worker in a yellow hard hat and safety vest, wearing a respirator mask. The worker is positioned on the right side of the frame. On the left side, there is a green vertical bar with a map of Belize in the background. Overlaid on the map and bar are several words in a yellow, 3D-style font: SPIRIT, ABILITY, DRIVE, VISION, TALENT, POTENTIAL, and OPPORTUNITY. At the bottom of the green bar, the words 'BELIZE NATURAL ENERGY' are written in a large, white, 3D-style font. In the bottom right corner, there is a logo for 'BELIZE NATURAL ENERGY LIMITED' featuring a stylized flame or drop shape.



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By the David Shirk Family**

Dried fruit is delicious and a way of preserving fruit when you have more than you can eat fresh.

We use a wood cook stove to heat the dryer. Make a good fire in the evening and set the dryer on it. Put water inside as shown on diagram. Most fruit is dry by the next morning. Dried fruit is easier to remove while still warm. One important thing is not to let your dryer go dry. It always needs water inside while in use. A dryer can be ruined if heated dry too long, and your fruit will definitely burn.

**Procedure:**

Pineapple: peel pineapples and slice 1/8 to 1/4" thick. Place single layer on dryer

Mango Fruit Leather: Slice mangoes, and place on dryer. When finished drying, roll up in rolls.

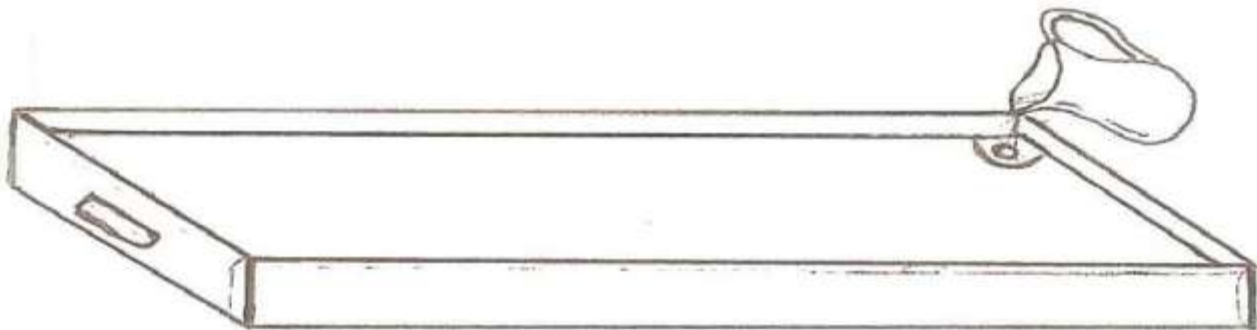
Coconut: Peel and shred coconut and place on dryer. Make sure coconut is completely dry. If not sufficiently dry, coconut can get sale, due to the oil that it contains.

Bananas can also be dried on a fruit dryer, but be careful not to heat the dryer too hot. Bananas taste better if dried more slowly. Peel and slice bananas into 3 slices, lengthwise.

All fruit should be stored in an airtight container, and will keep for many months.

Many other fruits can be dried too.

**Note:** David Shirk designed the fruit dryer mentioned in this article. Belize Ag visited Koop Tinsmith in Spanish Lookout, who estimate the price of making a custom Stainless Steel fruit dryer below to be approx \$ 350 Bz.



24" x 36" x 3"

Dryer features at least two supports under the tray top. These must allow the water free access inside the entire base.

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## BEYOND THE BACKYARD

### DASHEEN, NUMBER ONE ROOT

BY JENNY WILDMAN

Recently whilst driving in the car I listened to an arduous radio report describing the inconveniences caused by permits and restrictions for the importation of potatoes. Since I can hardly remember having a tasty potato here ever, I got to wondering what is this obsession with potatoes. They are not native to here, spoil quickly and are expensive.

Obviously all have forgotten about or never discovered DASHEEN which grows fast and furious, large and luscious and just one piece could feed a large family for days. I started asking people and found a few called it sup yam or soup yam (nobody knew the spelling) they remembered it from childhood. Most had never heard of it. There is a Dashine street (alternative spelling) in Dangriga which is where I found many back yard farmers and people familiar with this versatile vegetable.

It is thought to have originated in China. It is related to the Taro, Tanier and Cocoyam but larger and with a far superior flavour closer to that of a potato or Jerusalem artichoke. It is a member of the elephant eared caladium family and all parts are edible when cooked. It was a staple food in the tropics and I found all kinds of recipes mostly dating back to the turn of the century. It can be boiled, mashed, fried, added to soup etc. Try making chicken with coconut milk, okra, onion and dasheen chunks. My friends love it. When boiling to make mash it is best to change the water once. Just use as potatoes and enjoy.

The greens can be used similarly to calaloo but it is the root part which most would eat. So is anyone growing this commercially? No...it would appear that we are now hooked on imported potatoes and French fries. What a pity.

CAUTION: DO NOT EAT RAW—IT MUST BE COOKED. CAN CAUSE A SERIOUS

INFLAMMATION OF MOUTH AND THROAT.

Send any comments or your favourite dasheen recipes to the editor or Jenny Wildman [spectarte@gmail.com](mailto:spectarte@gmail.com)

Here's an interesting note from a reader of Jenny's article on Bissy in the last issue;

Jenny, I live at mile 60 on the Western Highway and River walk estates. I spent several years working at West Africa, What you talking about in you article is a colan nut, when a chief would call on a meeting or the military officers they would always distribute some colan nut to our present. I was there, so I got it too, it is basically a big shot of caffeine, but rather mild. Am sure there is a variety that will grow here in Belize. Our climate and latitude are similar to West Africa, I never had any sides effects and would probably use it again if available.

Oscar Chapleau  
Bush Camp One



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## Light Rein #1 Belize

If you are a horseman/horsewoman, the term "Light Rein" may mean more to you than simply a dreary day with light showers spelled in an odd manner.

I have witnessed many more horse people abusing a rein, than using it in a significant, light but effective manner. More than likely not meant in any abusive manner, but simply "the way they have always done it"- Pull a horse's nose or jaw to the right and they will, for the most part, head in that direction. Kick them in the sides and they might even go a little faster in the direction you were hoping for. What is the big deal? If you were the horse, it could be a very big deal, depending on the bit and who is doing the pulling and yanking. As a rider it is more productive and enjoyable to ride a horse that is willing and giving and understands what is being asked. Not only is it easier and more enjoyable, but much safer as well.

When a horse understands what is being asked, he has much less a tendency to overreact, or act out. There is less of a chance of being thrown, getting smashed into the stable wall, or having a foot crushed, etc. This does not happen by simply riding a horse; it is training, as well as understanding your horse's responses to the training and what is being asked of him. It is not a quick overnight job. Even though there are horses who can be "broke" in a day, training takes time. Teaching a horse and a rider how to convey communication through seat, legs, eyes and hands, makes for a safer, happier, overall situation.

I have been referred to as a "Horse Whisperer", but there are plenty of times I do not whisper at all. I have been likened to a Momma Grizzly with a stranger trying to take her cubs when I need to get the attention of a horse and prove I am the Alpha Mare. When it comes to the horses or dogs that I am working with, I am the Alpha - Number 1. If you watch an Alpha Mare in the herd, very seldom does she lose her cool. She warns and lets others off with a look or a swish of her tail, a snort or a flattening of her ears and a shake of her neck. The witchy mare that is always screaming and running to kick is not the Alpha, just a low level crabby horse. Since I cannot use my tail nor pin my ears, I use my voice and body language to make a point. Most of that communication will be after repeatedly asking the horses to do something the same way with the same cue. There are times where the Alpha Mare response is instant, such as entering a stall, or being in a field. A simple head movement or body move with eye contact can be significant.

There are times when you have that rogue critter who flips you the hoof and says "come on - make my day", and the subtle approach just isn't going to work. The key here is to ask first, maybe even twice, before pushing the issue. I am not one that says one can't get strong with a horse, but my theory is, it is the last resort. If you do not know that horse's history, you really need to figure out if the behavior is an 'I don't wanna' attitude, or perhaps from a bad situation earlier in life. Trust can make or break any training situation.

Reading a horse through the eyes, ears, tails, mannerisms of body and body functions is such an integral part of training to understand what is going on with the horse. Some people have the innate ability to do it without really even realizing it. Others think they have it and do not, and others get it after years of work. It certainly makes training easier when the person and the horse can help each other understand.

Whisperer? Hardly. Light Rein, of course. Enjoy the ride and stay safe.

Marjie Olson Henley  
Light Rein Farm

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

---

**Marjie Olson Henley of**

**Light Rein Farm is pleased to be in Belize!**

**She brings with her 36 yrs of horse training and  
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**Based in Cayo District.**

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Please note phone is only checked twice weekly**

Notice to all

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“Schutzhund” is the specific German training of obedience, tracking and protection. Training can be modified to fit all types of dogs and will help you and your dog work better together in day to day life, not just for competition.

Date: Saturday October 3<sup>rd</sup> 2009 will be our “open public” day and will adjust the schedule and procedures to fit those who plan to attend. Early mornings are best due to the heat. Private times may be scheduled.

Location and time to be set as owners sign up, but Cayo District is planned

Contact: Marjie Olson Henley of Light Rein at [lightrein@cablespeed.com](mailto:lightrein@cablespeed.com) or [Shotzyo8@live.com](mailto:Shotzyo8@live.com) or Smart# 665-5267 but please understand phone is checked only twice a week, email daily.

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## Agricultural Prices at a Glance-\$\$\$\$ - August 25 2009

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							
all Belize dollars - usually price per lb							
Belize Cattle	T	A	B	Grains, Beans & Rice	T	A	B
Young str. & bulls- 750- 1100 lbs	S	1.00 -1.05	.95- 1.00	Belize yellow corn	S-L	.22 - .24	.20 - .22
Cows & Heifers	S	.85 - .95	.75 - .85	White Corn	S-L	.25 - .27	.22 - .25
Heifers for breeding 650-900 lbs	S	1.05 - 1.20	.95 - 1.05	Corn/ Local retail	S-L	.30 - .35	.28 - .30
Young grass cattle- 350- 650 lbs	S-H	1.05 - 1.15	1.00 - 1.05	U.S corn price	S	.15 - .18	.13 - .15
U.S price -corn fed- 1000- 1200 lbs	S	160 - 166	154 - 160	Guatemala corn price/Peten	H	.38 - .40	.35 - .38
U.S price - feeders 600- 800 lbs	S	2.00 - 2.10	1.90 - 2.00	Belize Milo	S	.19 - .21	.17 - .19
U.S price- calves 450- 600 lbs	S	2.30 - 2.40	2.20 - 2.30	R-K's, little reds & blacks (beans)	S	1.35 - 1.60	1.15 - 1.35
U.S price- aged butcher cows	S	1.00 - 1.10	.90 - 1.00	Black eyed peas	S	1.00 - 1.25	.75 - Spa Lt
Belize Hogs				Paddy rice/ from combine	S	.32 - .34	.30 - .32
Weiner pigs- 30 -50 lbs- by the head	S	\$75.00 - \$95.00		Milled retail rice (controlled)	S	1.21 per lb	
Butcher pigs 125 - 200 lbs	S	1.70 - 1.75	1.65 - 1.70	Citrus			
Belize Sheep				Oranges per 90 lb box	H	(\$6.50 final est. price)	
Butcher lambs	S	2.25 - 2.50	2.00 - 2.25	Grape fruit- per 90 lb box	S	(\$3.50 final est. price)	
Mature ewes	S	1.70 - 1.75	1.60 - 1.70	Sugar			
Belize Chickens				Cane per ton- after 2nd payment	S	\$45.00 per ton	
Broilers- live per lb	S	1.27 - 1.29	1.24 - 1.27	White Sugar- 112 lbs	S	\$46.00 per bag	
Old hens	S	.63 - .65	.60 - .63	Brown Sugar- 112 lbs	S	\$39.00 per bag	
Belize Milk				Bananas			
Pd to farmer per lb	S-L	.49 - .51	.46 - .49	Export @ 40 lb box	S	\$16.84.	
Special farm items				Local Wholesale #2 quality- 40 lb	S	\$8.00.	
Shrimp Retail- Farm Raised	S	7.00 - 9.00	6.00 - 7.00	Retail #2 @ 8 per sale	S	\$1.00 - \$1.50	
Pitaya fruits	S	2.00 - 3.00	1.00 - 2.00	Fruits & Vegetables			
Organic/Sol Farms Ltd.- Teakettle Village Phone # 628- 9040				Tomatoes, Cabbages, cucumbers	S	1.00 - 1.75	.75 - 1.00
<b>***These prices are best estimates only from our best sources and simply provide a range to assist buyers and sellers in negotiations.</b>							
<p><b>Notes-</b> We have talked before about the Ministry of Agriculture and others to recognize the two farming systems in Belize.(1.) Small farms of 15 - 50 acres that grow what they eat and sell the remainder (most often perishable fruits &amp; vegetables ) at the local market. To many, it's a great way of life &amp; is a wonderful and needed farm system in Belize. They usually blend livestock and fruit trees into this system. (2.) Larger mechanized farms with tractors, planters, aerial and ground spraying and storage and packaging equipment must be included.This includes cane, citrus, bananas, cattle, corn, beans &amp; rice We must team together with the government of Belize to help establish export markets.We are increasing production toward a black hole if we can't export our surplus. I see some very positive efforts and co-operation from these main players. I include the recent trip to Central America to talk about corn &amp; beans. We thank Min. of Agriculture - Min. of Foreign of Foreign Trade and also include Min. of Finance including Hon. Prime Minister Dean Barrow in this most positive effort. <b>GO-TEAM- GO.</b> Material and information gathered by John Carr</p>							

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10:00 a.m.

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**40 horses, all ages, all types from the  
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be individually shown under saddle**



## Ask Rubber Boots

Dear Rubber Boots

We have encountered a strange phenomenon recently and are hoping that you can solve this mystery. When we mixed recently purchased local dark honey with cinnamon powder, it turned into a glob like ball of slime. We put it in to hot tea/coffee thinking it will dissolve, but NO; It stayed a slime ball in the bottom of the cup!. We mixed the same honey with sage powder for an experiment, but it did not turn into a slime ball. We had mixed honey and cinnamon before, but this phenomenon never happened, so we are puzzled. We await your answer.

Dale and Toshi Schwerdtfeger, Cayo

Dear Dale & Toahi

Thanks for your letter, Are local honey authority is a bit bamboozled, but he had this to offer;

I have no idea why Toshi has the problem with mixing honey with cinnamon. Honey is a mixture of sugars and hydroxy-methyl-furfurals . . . usually not chemically active. The dark color in honey is probably carbon and is usually associated with bees collecting honey from sugar cane after farmers burn the leaves to get the cane. Jungle honey is darker then cane honey if the farmers have not burned the cane. Cane honey has a very mild taste.

If any of you readers have something else to offer to explain this please send it in!

-----  
Dear Rubber Boots:

I'm a new reader of the BAR which I find very useful.

I have another method for discouraging leaf-cutter ants from eating plants. This method also works to keep woodlice from climbing along poles, posts, ropes, etc. Simply tie a strip of plastic (from one of the too many wasted plastic bags all around us) around the plant, post, etc. Neither the parasol ants nor the woodlice will cross the plastic. Be sure the critters cannot get under the plastic via a groove in the wrapped material. Also be sure to keep vines and branches from providing another route for the pests.

I look forward to learning more from you and BAR.

Yours in Toledo,

Tanya Russ

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**If you have any questions or tips for Rubber Boots, please send them to;  
rubberboots@belizeagreport.com**

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## Farming out Tourism in Belize

By Heather duPlooy

From time to time my job takes me to the farms or the homes of farming families in Cayo and Toledo. These are my absolute favourite days. There is just something real and true and wonderful about getting to scratch a baby pig, poke around in a vermiculture (worm) bin or walk down rows of ripe vegetables with the person that grew them.

Apparently, I am not alone in considering a day at the farm one that is well spent. At a recent workshop I found out that this experience is called Agro-Eco-Cultural Tourism, to be referred to as agrotourism for the sake of brevity, and it is a rapidly growing tourism trend. The workshop, which took place at the George Price Centre for Peace and Development, was sponsored jointly by IICA, OEA-OAS and the Government of Belize as part of their efforts to begin development of this tourism niche for Belize.

Ms. Ena Harvey, IICA's Hemispheric specialist in agrotourism, gave an extremely dynamic talk on the concept of agro-eco-cultural tourism and the opportunities and challenges it offered to a country like Belize. The object of the IICA agrotourism project is: 'To build resilience in rural communities through the realization of competitive businesses which link agricultural activities to tourism, in ways which foster environmental sustainability, validation of traditional knowledge and the achievement of sustainable livelihoods.' This seems to be an ideal direction for tourism in Belize.

During his opening remarks Ricardo Thompson, the National Coordinator of Extension services for the Ministry of Agriculture, shared his own experience in the Toledo district at an organic cacao and vanilla farm. In San Felipe he met Cyrila Cho and her family who turn their crops into 'Cyrila's Chocolate' and their farm into an Agro-Eco-Cultural Tourism destination. The Cho farm has been written about in Budget Travel, Daily Telegraph and New York Magazine, so even without the push for specifically marketing agrotourism, it is already happening in Belize and getting positive feedback.

Agrotourism can help a destination differentiate itself in the marketplace. This is of growing importance as many destinations in our region tout the same attractions: Maya sites, canoeing, tubing, caving, snorkeling, SCUBA etc. Agrotourism is a way to give your product very personal spin. After all, you can lie on a sandy beach in just about any Caribbean

destination, but you can only spend the day making tamalitos with the Canto family if you go to San Antonio, Cayo, Belize.

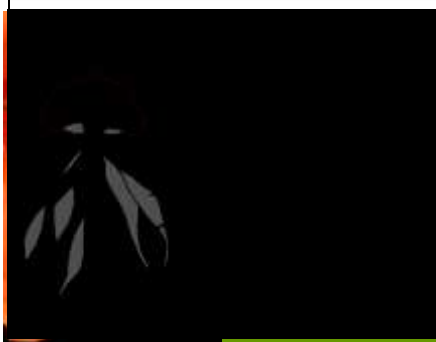
Other main speakers were Mario Sampers, the IICA Regional Specialist in Rural Development in Panama, who spoke of the meaningful potential for positive Rural Development with Agro-tourism and Kim Osborne, of Dominica, who is Belize's Country Representative for OAS and seems to work closely with the tourism board.

Overall the workshop was well presented and lent hope for the continued development of agro-tourism in Belize, but there were two moments that gave me pause. Once when shortly after one of the presenters extolled the importance of 'Authenticity! Authenticity! Authenticity!' she then stressed the need for standards in agro-eco-tourism. I don't know how this would be addressed but my concern would be that the authenticity of cultural experiences risk dilution if we are not careful of the standards imposed on them. Consider, for instance, what it would mean to the Maya home stays that are promoted in Toledo if it is decided that all tourism destinations require a flush toilet, concrete flooring and electric lighting. Another concern was that the recommendations for Belize were basically to copy what other Caribbean countries are successfully doing. I think we can and should draw from other lessons, but we need to be careful that Belize does not wind up with the same 'unique' experience as every other Caribbean destination.

If we promote spending a day not with people hired to memorize a spiel of facts but with real people doing what they do in real life, especially when that life is what puts food on our tables then I think that no one will be able to beat the agro-tourism experiences of Belize. Pursuing this tourism market is also a great way to help out small farmers and other agro-enterprises. Small farmers are surely the 'Salt of the Earth' and yet they are notoriously underpaid and under appreciated. Agro-tourism is a chance for additional income and the chance to showcase the traditional knowledge and local expertise of many Belizeans.

*Heather duPlooy is the Curator of Belize Botanic Gardens of Cayo District. The contain 45-acres of tropical plants from Belize and around the world. Visitors can enjoy displays of traditional medicinals, native orchids, rare palms, tropical fruits and many other features. The mission of the garden focuses on the conservation of Belize's flora through education and conservation projects.*

To learn more visit [www.belizebotanic.org](http://www.belizebotanic.org) or call 824-3101



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## **Who is Responsible? What about Water?**

Water....I get thirsty just talking about it.  
As we travel the rivers of Belize...

## **How Important are Steep Slope & Riparian Forests?**

The deforestation rate in Belize is about 2.3% per year overall. However, estimates of deforestation rates for riparian forests are as high as 13% per year.

How important are steep-slope forests, those forests growing on the sides of mountains and hills? What is the real worth of riparian forests, those forests growing on the banks of streams and rivers? What services do they really provide? These are serious questions that must be asked. We must seek and understand the answers if we hope to avoid the heavy cost of ignoring these questions. Indeed, we are already paying the high price of disregarding these important forests and allowing their demise.

The country of Belize has been physically divided by the loss of the Kendal Bridge crossing the Sittee River. The steel and concrete structure was swept away during the June flood of this year. Estimates for replacing the bridge are as high as \$10 million and the economic loss due to the restriction of travel and movement of goods is also within the millions. It is now believed that the bridge, having survived many floods, was finally brought down by upstream deforestation of the river bank by bulldozers to plant citrus. The likely story is that large piles of uprooted trees were left on the cleared river bank and few large trees were left standing. As unimpeded floodwaters rose, trees and debris were picked up and piled against the bridge. As the rain waters gathered within the mountains and hills collected and rushed down the river, the flow was restricted by the riparian forest. But once the floodwaters reached the cleared areas, the flow could increase in speed, unobstructed by riparian forests. These floodwaters also picked up great loads of eroded soil, sand and gravel from the exposed river banks no longer protected by riparian forests. This fast, heavy water, loaded with sediment, applied enough force against the dead trees piled against the bridge to cause the structure to fail, to divide the country.

Considering the total economic loss of the Kendal Bridge, the upstream riparian forests were worth at least \$20 million. By that same logic, the riparian forests upstream of every bridge in this country carries such worth. Can we ever hope to harvest enough oranges, bananas or corn from our river banks to equal the worth of the forests?

For many days central and northern Belize was inundated by floodwaters in OCTOBER? of this year, some of the highest in recent memory. Our rivers are running dark brown with sediments and flood waters are laden with diseases from our outhouses and poorly designed septic systems. Garbage of all kinds, from plastic bottles to old box freezers float downstream or get hung up in the trees. Deforestation of not just the riparian forests around the country, but steep slopes as well, has contributed to the increasing amount of soils eroded into the rivers. As our rivers fill with sediments, they can no longer hold the volume of floodwaters and excess waters fill the wetlands and spill higher into the flood plains, inundating pastures and fields, reaching into homes and businesses.

The hard lesson here is that lack of enforcement of the '66 foot rule' establishing the riverside or 'riparian' forests as protected areas, and lack of respect for our streams and rivers in general, bares a very high cost. The National Lands Act and the Land Utilization act contain provisions for maintaining a strip of forest at least 66 feet wide, measuring from the high water mark, along streams and rivers. Originally this land was set aside to accommodate travelers back in the days when rivers were the main transportation routes inland, providing people with a place to camp and find firewood. Today, this rule acts to protect these vital forest areas, preserving the ecological services they render. But what are the services provided by steep slope and riparian forests?

Steep slope and riparian forests are special kinds of forests with particular ecological characteristics. Several types of steep-slope forests occur, ranging from forests composed of trees adapted to often drier and relatively nutrient poor soils, to the very fragile cloud forests that depend on high levels of moisture. Riparian forests include those trees, shrubs, vines and associated plants, inhabiting stream and river banks, which are adapted to the fast flow of floods and can survive being periodically inundated by water.

Some of the most intense human changes exerted on watersheds of Belize, Guatemala, and other countries in the world are caused by destruction of steep slope and riparian forests. Lack of awareness among the public and lack of enforcement on behalf of the Government places our crops, villages, towns and coastal marine resources in jeopardy. In order to effectively restore or rehabilitate a watershed severely impacted by such deforestation, managers, administrators, politicians and, most importantly, communities must understand and appreciate the importance of riparian forests.

## **What is so Special About Slope & Riparian Forests?**

The forest structure of a watershed is a complex component of the system, performing important functions necessary for maintaining effective integrity of the landscape, quality of the surface and subsurface waters and consequently floodplain and coastal zone systems receiving watershed discharge. Watershed forests help control the volume of water reaching streams and rivers help maintain the shape of streams and rivers, and affect the amount sediment transported downstream. They also contribute to the habitat complexity and food-web ecology of land areas, streams and rivers.

Upland forests are important mediators of local climate patterns and stream discharge through processes of evapo-transpiration. Much of the rainwater falling on leaves heated by the sun is evaporated. Water dripping through forest canopies and reaching the soil is absorbed by tree roots and pulled up the trunk and to the leaves where it transpires through tiny holes in the underside of the leaves. Watershed forests pump 20% or more of a catchment's rainwater from the soil and release it back into the atmosphere as water vapor, water that would have otherwise added to the flow of streams and rivers. Upland forests also contribute species, detritus (leaf and wood), dissolved organic matter and nutrients to riparian forests, helping make this one of the richest forest areas.

Steep slope forests help to hold soils in place and reduce the potential for erosion and mud slides. Roots of

erosion. Soils of steep slopes are often thin and nutrient-poor in comparison to soils of the river valleys. Services provided by the trees cannot be replaced by corn and other shallow rooted crops that quickly deplete its nutrients and contribute to erosion. As root systems of felled trees rot, exposed soils become susceptible to slumping and excessive rainfall can create mud slides.

Who can forget the thousands of people who died in Honduras, villages buried beneath mudslides from the deforested hills above, during Hurricane Mitch in 1998. Actually all of us can forget, if we even pause to learn the lessons of such disasters.

When large amounts of sediment are washed into streams and rivers, flow patterns are changed, aquatic habitats are broken up and damaged and food webs are impacted. Cattle and corn agricultural practices associated with upland and riparian deforestation add nutrient and toxic chemical stresses to the streams and rivers. Villages, towns and cities along streams and rivers contribute not just sediment, but sewage, pesticides, oils and solid waste to the aquatic systems. Such stresses in combination can disrupt ecological functions of streams, rivers and entire watersheds, depending on the geography and extent of the deforested areas and the magnitude of other impacts.

Once riparian trees are cut down, root systems decay and the riverbank becomes susceptible to sloughing and erosion by high flow waters. Reduction of riverside vegetation exposes more of the river habitats to direct sunlight, causing waters to become hotter than normal and creating stress conditions for many of the aquatic organisms. If the stream or river is already polluted with nutrients from sewage or fertilizers, increased sunlight may also promote excess growth of algae and aquatic plants.

Crops, such as citrus and bananas, typically do not survive well in the high energy, frequently inundated stream and river banks. The economic return on those crops planted on active river banks is often minimal as a result of loss to floods and stress to surviving trees. Tree crops, let alone corn, cannot replace the functions provided by natural riparian forests. Farmed river banks typically have high soil erosion, with direct nutrient and pesticide contamination of rivers and streams from fields. Removal of riparian forest for crop production can also promote invasion by exotic plant species. If left intact, a healthy riparian forest actually serves as a filter for water flowing off of a field. The riparian forest slows down the movement of stormwater flowing over the surface of soil and the groundwater beneath. Soil particles are captured, fungi and bacteria absorb nutrients and bacteria degrade much of the pesticides, keeping these materials from polluting the water.

Extensive cattle grazing on riverbanks and tributaries increases soil erosion. Browsing of vegetation by cattle can also reduce the ability of riparian areas to filter out nutrients. At the same time, cattle add considerable amounts of nitrogen rich fecal material to riparian areas and adjacent pasture areas that leach into rivers and streams. Livestock hooves can compact and pock the soil, breaking up the soil structure within riparian zones. Gazing by livestock can affect the density of trees, damaging and destroying seedlings and saplings. Riparian forests improve within a few years when cat-

tle are excluded, but the recovery may require decades. Often farmers completely clear river banks for cattle pasture, requiring replanting to revive bank areas. Livestock contamination of rivers is also of public health significance to people who use river as a source for household water.

Unnecessary deforestation for agriculture, homes, tourist facilities, businesses, industries and roads greatly increases the amount of soil being eroded into streams and rivers. As more sediment enters the river than can be transported downstream, deep areas in the riverbed become filled. This reduces the volume of water the river can hold during floods. This results in floodwaters spreading out wider within the floodplains, inundating more farms, houses and roads. Besides sediments, riverside villages, towns, hotels and other dwellings also introduce sewage, human pathogens and solid waste to rivers and streams.

### **Can Deforested Riparian and Steep Slope Areas be Reforested?**

Damaged riparian forests can be restored, re-establishing natural biodiversity and ecological functions. Impacted riparian areas may repair themselves once the cause of the stressor is identified and eliminated, with seeds being carried in by the water from healthy forests upstream. Sometimes riparian restoration efforts pose much greater challenges, depending on the characteristic of the river bank and the impact. As a rule, shallow, deposition banks are typically easier to rehabilitate than steep cut banks, each requiring different strategies. Passive restoration may involve fencing out the grazing livestock from the riparian area and letting the forest return on its own. In more severe impact situations, active restoration efforts may be required, including re-planting riparian trees that were started in nurseries and removing unnatural structures.

Restoring the ecological functions and biological diversity of riparian forests helps to stabilize the landscape. Riparian forests, together with wetlands (low lands that hold water during floods) help to reduce the magnitude and buffer us from the impact of floods.

Success of a riparian restoration or rehabilitation program at a watershed scale requires a knowledge of the geography, hydrology and ecology of the system. It also requires knowledge of the extent of healthy and deforested riparian zones identified through field evaluation and mapping efforts and implementing effective measures to preserve those remaining forested areas. Riparian re-colonization processes depend on availability of seed stock from existing riparian forest areas, suitable available habitat, sufficient development time between natural disturbances and the resilience of riparian species. Most importantly, the restoration effort requires the acceptance, support and participation of community members throughout the watershed system. Ecological recovery requires time and commitment to the process over a number of years, with wildlife populations recovering slower than habitat restoration.

Steep slope and riparian forests provide vital services that affect the function of watersheds and affect the movement of water and sediments through those systems.

*Continued on page 25*

## **ARTIFICIAL INSEMINATION -Local Business Serves Belize from Spanish Lookout**

Nearly 2 decades after becoming a certified Artificial Insemination Technician, Frank Friesen has come full circle, having been very recently authorized to administer Accelerated Genetics' Introductory A.I. Technician's Course -from the same leading American company which certified him. (For more information, go to notice on page 23.) Frank is the undisputed leader in A.I. Services for the private sector, handling both the dairy and beef industries' needs. He has stayed the course, and what he started as a hobby to improve his own herd, has become a viable business. Utilizing Frank's philosophy, that 'Nothing happens without a dream', and believing and sharing A.I.'s many advantages – better genetic potentials, less health risks, and cost effectiveness, has yielded bonuses for him, and the cattle industry at large.

The last 5 years have seen a surge in local A.I.; most notable is the very recent increase in A.I. for beef cattle. Even as short as two years ago, nearly 80% of the cattle bred artificially were dairy breeds, but this year he estimates that of the approximate 700 head of cattle countrywide who are being bred artificially, at least 50% and maybe up to 70% will be beef cattle.

The Dairy industry, by its very nature, has always been more conducive to A.I. programs. Frequent contact makes it much easier to detect heats and breed on the more fertile natural heats. (Natural heats generally see a conception rate of 65% or higher.) Although the decline in milk prices have affected the dairy industry, another factor influencing this shift in the local A.I. business, is the emergence of better synchronization implants, used to coordinate bovine estrus cycles (heat). New and reasonably priced products have increased the financial feasibility for beef cattle in Belize to join the A.I. generation. Prospective breeding stock receive implants in the ear, and an injection. After 10 days the implants are removed, which trigger the cows to come into heat approximately 56 hours later. Ranchers using this technology can schedule a herd of cattle to be all serviced together, at one visit of the technician, greatly reducing time and costs. Former synchronization products only yielded approx. 35% calf rate, but the new products are yielding approx. 50%. Cattle who do not catch (become pregnant) on this first synchronized breeding, will come into a 2<sup>nd</sup> heat 20 days from the 1<sup>st</sup> breeding. Other factors in this equation are of course, management, mineral supplementation, and the skill of the technician.

Who are some of the leaders countrywide in the A. I. scene? Besides the main dairy operations in Spanish Lookout, John Carr's Banana Bank Ranch is heading this way, using Simmental semen on his Brahman base cows, working toward a Simbrah product.

Blue Creek's John Dyck has a substantial A.I. program featuring Nelore bloodlines, and Gallon Jug Farm, with its own technicians, is utilizing both A.I. and embryo transplants to produce Hereford and Angus. But even the farmers and ranchers who have not directly implemented A.I. into their management, have felt the effects of this industry. In Spanish Lookout, approx 10% of farmers utilize A.I. for their herds, but virtually every dairy bull in the community is a 3<sup>rd</sup> generation A.I. animal. We can expect this industry to grow too, as potential for beef for export develops with the Mexican market, which will demand an increasingly better product.

A quick costing summary: average price of semen used locally is \$35. per straw. Add \$35 if you are using implants, then travel mileage at \$75 and labor of the technician at \$100. (Per trip for any destination countrywide.) A technician can handle up to 30 animals per day. The per animal costs with 20 animals on a program, might then be approx. \$95. per head.

Pricing for local dairy cattle, using natural heat, are slightly different. Farmers purchase their semen, avg. \$35, plus \$35 for first breeding, \$15 for 2<sup>nd</sup> if necessary, and 3<sup>rd</sup> servicing, if needed at no cost except the semen. Cattle conceiving on the 1<sup>st</sup> breeding then, are at an average cost of \$70.per head.

Now, put all that together, and compare with the costs of purchasing and maintaining a bull, and you will decide if it's time for you too to consider adding A.I. to your program. A.I. does require more planning, record keeping, and coordination than traditional breeding. Only you can decide which system is best for your operation.

Frank is the country distributor for Accelerated Genetics, (formerly Tri-State), the U.S. Artificial Insemination giant which is headquartered in Baraboo, Wisconsin. He imports regularly from Accelerated Genetics, keeping a varied semen inventory of Holstein, Brown Swiss, Jersey, Simmental, Nelore and Brahman Bulls, which range in price from \$25. to \$70. on hand. Of course, custom imports to suit clients' needs are also offered.

*By B.Roberson*





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*Continued from page 23*

massive amounts of sediments. These events are making it obvious that there is a strong need to intervene, protect remaining riparian and steep slope forests and rehabilitate those areas that have been denuded. To be successful in these efforts, we need to understand how these forest components contribute to watershed functions. We need to spread that awareness among community members and all stakeholders.

Re-planted riparian forests can be productive forests. A select few kinds of trees can tolerate the very edge of the river, trees such as bri-bri, river fig, provision tree, and grasses like spiny bamboo. Higher up the river bank other kinds of trees can be included that produce fruit, fodder and wood. Efforts to restore riparian and steep slope forests will not only help protect our present day resources, but these forests shall be sequestering atmospheric carbon and contribute to the economy of the future, the well-being of our children within a climate-changing world.

By Dr Ed Boles  
Aquatic Ecologist, Galen University

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Continued from page 2

Planting 5 trees per acre represents a loss of less than 3% of crop stock based on 145 trees per acre: a good gamble against estimates of 10-20% damage to the commercial crop. Watermelons layered between rows divert the insectivores' attention away from hanging fruit and leaving a few citrus windfalls on the ground may save some of the harvestable crop. Wherever possible we advise leaving rotting trees for peckers and by scattering past-date bread (free from bakeries) the peckers are encouraged to stuff bread pieces into tree crevices to harvest insects much as they do with oranges. This again, we have observed as preferential behaviour.

Year-round non-citrus lure crops could include sunflowers, papaya (wild and cultivated), bird-peppers and banana. Trees in fruit during the April/May harvest include sugar apple, coco plum and cashew. Favourite parrot trees (although not coincidental with crop maturity) include governor plum, ackee, kinnepe, figs, canary palm, gumbo-limbo, wax apple. These should be planted adjacent to, or surrounding the groves but, in areas where land is a premium, some could be grown within the commercial citrus. If space is available, corn can be a valuable decoy crop – young green corn has good protein requirements for chick feeding, and coincides with the citrus harvest and first nesting. As cultivated lure crops are only strictly necessary during peak harvest season and to stave off blossom damage, the families of workers could benefit from these crops during the rest of the year. Whilst it's true that more food encourages more birds, many avian species are excellent natural pest managers and may possibly save on insecticides in the long run.

### Deterrents

Estimates of bird damage range from as low as 2.5% to around 11-15% in some tests, but let's assume that the worst-case scenarios are correct, and in the absence of any form of counter-measure, the total bird damage amounts to 20%. What could be done to recoup this loss?

Deterrents come in many forms. Netting is expensive and impractical for large acreage / low value crops such as citrus. Industry researchers have observed parrot damage to be less in groves where the aisles are not kept clean, but high ground cover has not been proven as an effective method of control and this strategy has associated fire risk issues.

There are two types of chemical repellents currently available: primary repellents are foul-tasting and secondary repellents cause an uncomfortable and distressing sickness, resulting in an eventual aversion to the fruit. Both are sprayed directly onto the fruit, so are of limited effect on crops where the outer layers are not actually consumed. Taste-aversion only works with transient populations as the 'locals' learn to avoid sprayed fruit and they acquire tolerance or avoidance tactics for the foul taste. Consequential illness is only effective after a repeat experience, so some damage will be sustained during the learning period. Both chemicals are expensive and degrade rapidly under UV light. Neither have received blanket approval for all fruits and could yet cause illness in humans after consumption.

Visual deterrents currently in use include hawk-kites and eye-spot balloons, where youngsters are employed to fly kites printed with the image of a raptor predator around the fields and giant helium-filled balloons are dotted around the groves, mimicking predators. They have been shown to be effective in the short-term, but yet again birds become habituated.

True predators could be encouraged by leaving areas of open field adjacent to the crop and erecting telegraph poles or fence-post roosts in the area. We have witnessed our captive birds become uncomfortable with the presence of vultures in the sky, even though they are not a predator of adults birds. Encouraging vultures by leaving carrion in the area could prove to be an effective deterrent.

There has been some experimentation (with mixed results) where rubber snakes are scattered throughout upper branches. Iguanas are also known to predate on parrot chicks and could be a deterrent if encouraged to remain in the orchard, although damage to the crop by the reptiles may be equally severe as that of the parrots.

Noisemakers such as gas cannons and sirens are expensive, and firecrackers of any volume are hard to come by, if not illegal in Belize. Noise-makers need to be moved frequently and used erratically, and recommendations are to implement these measures only during periods of peak damage occurrence: shortly before harvest in this instance.

Which brings us back to guns. Citrus farmers can only repeat the adage that 'dead birds don't eat fruit' and the temptation will always be to shoot to kill. This temptation could of course be alleviated by using slugs, not birdshot. But whatever the case, making noise to harass has been categorically proven only to work for short periods of 1- 2 weeks, after which birds rapidly become habituated and unless the flock sustains substantial losses, random kill shots are no better than noisemakers at reducing crop damage long-term.

Research on invasive species such as monk parakeets in the US suggests that with greater diversification of crops, birds will become even more of a problem to farmers in future years. In Belize, newly introduced soft fruits such as lychee, pear, peach and raspberry may prove to be popular dining for the indigenous psittacines and an effective strategy needs to be devised and implemented now in order to avoid full-scale war

 <p><b>Belize Bird Rescue</b> Bird Sanctuary and Rehabilitation Centre</p> <p>Belize Bird Rescue is dedicated to the care, rescue and rehabilitation of all bird species in Belize</p> <p>610 0400 / 602 4291 <a href="mailto:info@belizebirdrescue.com">info@belizebirdrescue.com</a> <a href="http://www.belizebirdrescue.com">www.belizebirdrescue.com</a></p>	<p>"Not Just a Pretty Polly!"</p> <ul style="list-style-type: none"><li>• Captive wild birds <u>must</u> be licensed</li><li>• To report an injured or abused bird or to licence your pet, contact Forestry Department 822 1524</li><li>• When you have your licence, call us for information on caring properly for your captive bird.</li><li>• With the right care Polly should live for 50 years or more</li></ul> 
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## Banana Bank Agco. Report

### Worms

#### Identity

Corn ear worm, Cut worms, Army worms or all of the above.

Sometimes we think one type and then we think another.

It's hard to match up with the picture and description.

Weather and ground/crop condition could cause 1 type to be more prevalent at different times. Parents of worms fly and spread all over, even in grass off of the corn field.

#### History-

These worms have plagued Belize for years, but it seems that this year is one of the highest incidences ever. We see 4 to 5 worms on a corn plant 6" tall. If we leave this alone, yield reduction or total loss is imminent. It's easy to imagine a loss of 25 – 30%. I'm assuming we spray as quickly as possible to alleviate the problem. Non – treatment at this point could mean nearly 100% failure.

Assume we spray and the plant progresses, we usually will see a re-infestation of same type worms even going so far as seeing them in the tops of tassels and damage thru-out.

We have been using Match- Rimon- Lubexron (sp)- all growth inhibitors that fatten the worms, but not his outer shell and he explodes- this may take 4 to 7 days- damage continues until burst.

#### Cost of Application:

Product costs between 8 to \$12.00/ Acre plus applications \$5.00 and then crop oil and labor 2 to \$4.00 more – Total 20 to \$24.00/ Acre sometimes 2 or 3 times. Worms often hide in swirls and folds and make kill difficult.

#### Results-

Some years are worse than others- Dry weather makes worm breeding and corn plant palatability a major issue s. Some feel that the problem is increasing overall. Worms like this year at Banana Bank/Kitty Bank inflict tremendous financial losses. Ex. (Total 3000 Acres – cuts into profits by reducing yields by 10 to 30%. If 20% of 5,000 lbs is 1000 pounds of loss at 22 cents a lb, that is \$220./Acre@3000 Acres= \$660,000. (loss)

By John Carr

Banana Bank Ranch

Some of us at Belize Ag wanted more information on cornmeal as a fungicide as mentioned in Greg Clark's article on page 6.

He kindly supplied the following;

#### Who would have thought that something as seemingly innocuous as cornmeal would have such potent fungicidal properties?

Researchers at Texas A&M Research Station in Stephenville, TX, noticed that a peanut crop planted following a crop of corn didn't suffer the usual fungus diseases. Further research showed that cornmeal contained beneficial organisms that were at least as effective as common chemical fungicides. Somehow cornmeal is able to attract a member of the Trichoderma fungus family, which is a good fungus that kills off disease causing fungi in a matter of weeks.

Howard Garrett, the Dirt Doctor, has continued the study and finds cornmeal effective on most everything from turf grass to black spot on roses. Furthermore, since it is entirely organic, it can be used on edible crops.

#### How to Apply

**Dry:** Work 2 pounds of cornmeal into the soil for every 100 square feet. Water well, to activate the fungus killing properties. One application per season is usually sufficient, but repeat applications won't hurt anything.

**Spray:** What's called 'cornmeal juice' can be made by soaking 1 cup of cornmeal in 1 gallon of water overnight. Strain the liquid and use as a spray on susceptible plants.

#### Cornmeal vs. Horticultural Cornmeal vs. Corn Gluten

Any type of cornmeal can be used as a fungicide.

- **Food grade cornmeal**, found in grocery stores, will work just fine, but it is more expensive and comes in smaller quantities than horticultural cornmeal.
- **Horticultural cornmeal** has not been stored under the stricter guidelines required for food grade cornmeal. Hort cornmeal is general used for livestock feed. It too will work just fine as a fungicide and it comes in bulk.

\*\*\***Corn Gluten** should not be used as a fungicide. Corn Gluten is cornmeal that has been processed to have higher protein content. Iowa State researchers discovered that cornmeal gluten can inhibit seed germination. It is now used as a pre-emergent weed killer. That's a great tip, but don't confuse corn gluten with the fungicidal properties of corn meal. A final bonus, cornmeal also appears to be a source of nutrients for the soil.

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## AG CALENDAR

**Sept. 5, 2009** - Belize Landowners Association Ltd (BLAL), Annual General Meeting, 9:30 A.M. at the Belmopan Hotel & Convention Center, Bmp. An informative meeting with varied agenda including:

\*Speaker(s) from Min. of Nat. Resources \* Presentations/ Discussion of Land Leases \* New/Different Policies on Petroleum\* Teak Raising \* Land Use \* Environmental Impact \*Eco-Oriented Issues as Related to Land Owners

**October 3, 2009**— John Carr Livestock Auction, call 820 2020

**October 10, 2009**—Belize Pitaya Growers Assn. to hold Pitaya Orchard Tour, Teakettle. RSVP 822-0369

**October 24, 2009**—AGM for Belize Livestock Producers Assn. [blpa@btl.net](mailto:blpa@btl.net) , tel 822-3883

**November 6 -29, 2009**—Feria X'matkuil, (Yucatan State Fair), close to Merida, Yucatan, Mexico

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And finally.....

**"You cannot legislate the poor into freedom by legislating the wealthy out of freedom. What one person receives without working for, another person must work for without receiving. The government cannot give to anybody anything that the government does not first take from somebody else. When half of the people get the idea that they do not have to work because the other half is going to take care of them, and when the other half gets the idea that it does no good to work because somebody else is going to get what they work for, that my dear friend, is about the end of any nation. You cannot multiply wealth by dividing it."**

*~~~~ Dr. Adrian Rogers, 1931*

Courtesy of a Belize Ag reader in the USA



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