

# Bauers Family Tree Farm News

Miramar Costa Rica

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## *Farm Update December 2017*

The 2017 rainy season proved to be particularly wet and provided for a healthy year of growth for the trees. Atlantic hurricane activity was up, which typically adds to the rain totals for Costa Rica additionally tropical storm Nate parked itself over the country for 5 days adding to an already wet year. The trees saw particularly good growth and the farm as a whole is in very good shape. We are actively looking at taking a small amount of wood out of the farm in the dry months and believe the wood will

have a small amount of commercial value. Yearly maintenance on the farm will decrease significantly over the next ten years and time will be spent maximizing the value of wood coming out of farm as we let the biggest and best trees grow to their full maturity.

The rainy season of 2017 ended up being one of the wettest of the last 20 years. The rains started early in April and continued well through November and were consistently heavy during the

year. Areas around the farm saw rain totals in excess of 150% of yearly averages and some other parts of the country saw up to 2 times the normal rain. The heavy rains in the country lead to Costa Rica generating 100% of their electricity from renewable sources due to the fact that hydroelectric power provides the largest percentage of the country's electric needs. Joe and I were lucky enough to experience this wonderfully wet weather as well, during the time we were on the farm in the later part of October. We got to see

it rain non-stop and steadily for 5 days straight. Ocean currents known as "La Nina" set up a healthy dose of moisture for the country and especially heavy hurricane activity in the Atlantic added even more to the weather. The year had 10 hurricanes go through the Atlantic with 6 of those being considered major storms. In comparison an average hurricane year will have 6 hurricanes with 2 major storms. In addition to the hurricanes 7 tropical storms developed including tropical storm Nate that parked itself over Costa Rica for 5 days in early October and brought a significant amount of water and wind to the country. Nate made its presence known on the farm as well as its wind and water uprooted approximately 20 to 30 trees on the farm and broke the tops off some others. The combination of incredibly

waterlogged ground and very strong winds proved to be too much for a small number of trees. The good news on the uprooted trees is that most of them are of the size that

The farm overall looks very good and healthy with good sized, straight and strong trees. The farm is completely canopied over, with significant and large canopies



on all the trees and with all the trees annually flowering and dropping seeds. The ground cover has significantly changed from what we saw originally on the farm of large grasses, bushes and other large plants that would compete with the teak trees to small shade loving plants such as ferns and other shade loving ground covers. Keeping these ground covers healthy and in place is critical to the health of the

should yield some commercial value. The farm is at the point where some thinning, this time done by nature, is a good and healthy thing for the farm.

The rainy 2017 as compared to the relatively dry 2016 that we had on the farm contributed to healthy growth of the trees.

farm as they reduce erosion of the soil and maintain moisture all the while without competing with water or nutrients for the trees. With a good growth year behind us we are seeing trees that are over 14 inches in diameter and upwards of 60 feet tall.

Also, a much higher percentage of the trees are expanding their girth and we have a good number of trees in the 10 to 12-inch diameter range. We are now at the stage of the farm's growth where we will have seen the fastest growth rate of trees. Over the next 15 years the growth rate will slow. This is particularly true in terms of height, but also holds true for girth and total volume produced over the course of a year. Historical growth patterns of teak have shown an increase of 10 to 20 cubic meters per hectare in the initial years tapering off to 4 to 8 cubic meters per hectare as the plantation ages. An important part of aging teak is the maturity of the wood as it adds oils and increases the valuable heartwood of the tree. As teak trees mature the



sap wood goes from about 37% of the total volume down to 14% leaving behind the mature heart wood that is highly valued by the commercial market. Speaking of long term growth, we are hoping to get to a total of about 200 cubic meters per hectare of total marketable wood by our final harvest. In order to get there, we will need to see average tree sizes with about 12-inch diameters of usable wood on a usable log of some 30 to 50 feet. As trees taper as they grow upward it is typical to see a loss in diameter of 40% to 55% from the base of a log to its narrowest section at the top.

As we have had trees in the ground and growing for more than ten years we are getting to the point where trees coming out of the farm will

have some commercial value. Our management goal currently remains the same of maximizing the volume and values of the trees at our final harvest around the end of the 25<sup>th</sup> growing season as our research continues to point to the highest return from a 25-year cycle. This allows the best and biggest trees to continue to grow. In order for the best trees to continue their growth we will need to do periodic thinning. The thinning will be based first and foremost on what is best for the trees and the farm as a whole. Allowing trees to crowd together too much could lead to decreased volumes of wood. Thinning prematurely could cause less competition among the trees leading to lower growth rates as well as letting too much



light to the forest floor which could lead to larger plants taking root and competing with the trees. A secondary consideration for the thinning of trees will be to maximize the value of those thinnings and minimizing the cost to extract and process the trees into lumber. Based on these considerations as well as to give us a smaller test sample to explore some markets we are looking at doing a fairly small thinning in the upcoming months and are looking to commercialize it. With the exception of some areas that will need some trees to be removed most of the areas have sufficient room to allow the trees to continue to grow for 2 to 3 more years before a more significant thinning will be required. The amount of room needed for the trees is largely based on the amount of light making its way through the canopy. We

can tell how much light is making its way through the canopy by looking at the thickness of the ground covers on the forest floor and by looking at the lowest branches of the trees canopies. If the ground covers thin out too much or turn to dirt or if the lower branches of the trees start to dry up and turn yellow, then thinning in the area will be required. For commercial reasons we also believe a small initial thinning will play out best as it will give us a smaller sample size to use to explore different markets. Wood coming out of the farm over the next 8 to 10 years will be the most difficult to market as younger teak wood is not well known nor utilized nearly as much as mature teak that is common and frequently used in a

number of markets. With this initial thinning we are looking into a number of different markets for the wood. There are saw mills in Costa Rica buying younger teak trees as well as exporters sending shipments of wood to India. In addition to these we are looking to the feasibility of finding a buyer here in the United States. Establishing a good market and contacts now will certainly benefit us down the road. The wood taken out of the farm for this initial thinning will be done manually using teams of ox to pull the logs out to the main road that passes through the farm and then pulling them up the road with a small tractor. In the future as more volume is being taken out we will need to bring in heavy equipment. First a bulldozer



to grade and repair our existing road system and then heavy trucks and lifting equipment to load the logs out.

We look forward to reporting the volume of wood we end up for this year and how the market for that wood looks. Going forward we expect our next thinning will take place 2 to 3 years from now followed by 2 more thinnings spaced 3 to 5 years apart getting us to our final thinning around the 25th year. Based on our projection of 200 cubic meters per hectare we expect something close to the following volumes for the next harvests.



Harvests 1 and 2 (next 3 years) 20 cubic meters per hectare,  
Harvest 3 (6 to 8 years) 35 cubic meters per hectare,  
Harvest 4 (9 to 11 years) 55 cubic meters per hectare, and  
the Final Harvest of 90 cubic meters per hectare. Teak prices remain good with good

prospects for the future with supply and demand characteristics projected to remain favorable. Retail prices of mature good quality lumber can range from \$15 to \$30 per board foot. Wholesale prices for teak are hard to convert as many factors go into the price such as whether you are selling standing timber, roadside logs, logs delivered to a mill or milled lumber. Based on what we see we don't see any need to adjust our projections at this time and we continue believe the farm will produce good results for all involved.

## *Interesting Facts – Costa Rica*

- Costa Rica hosts more than 5% of the world's biodiversity even though its landmass only takes up .03% of the planet's surface.
- Costa Rica's marine area reaches 580,000 km<sup>2</sup>, approximately 10 times larger than its land area of only 52,100 km<sup>2</sup>.
- The government made education both free and mandatory for all Costa Rican citizens in 1869. Costa Rica's education system is rated one of the best in all of Latin America and the country boasts a 96% literacy rate.
- Costa Rica's 1949 constitution guarantees freedom of religion, though the official state religion is Roman Catholicism. More than 75% of the population identifies as Catholic, though only 45%

practice their faith. Evangelical Christians are the second largest religious group in Costa Rica.

- The staples of the Costa Rican diet are rice and black beans, along with bread, chicken or meat, vegetables, salads, and fruits. Rice and beans mixed together for breakfast is called GALLO PINTO.
- The average wage laborer is about \$10 per day, the highest in Central America.
- Costa Ricans refer to themselves as “Ticos” (males) and “Ticas” (females). Foreigners are often called “Gringos” (males) and “Gringas” (females).
- Less than 1% of Costa Ricans are of indigenous ancestry. 94% are of European or mestizo ethnicity.
- There are 801 miles of coastline in Costa Rica.
- Costa Rica is divided into seven provinces; San Jose, Alajuela, Heredia, Cartago,

Guanacaste, Puntarenas, and Limon.

- Costa Rica is one of the planet’s largest exporters of microchips. Often called the Silicon Valley of Latin America, the country is no longer a cash crop nation. Microchips, software development, and tourism are the chief industries in Costa Rica's economy. Industry giants Intel, IBM, and Microsoft have distribution facilities within the country.
- The country draws international praise for its modern health care system, ranked 36th in the world by the World Health Organization (WHO). Costa Rica has one of the world’s highest life expectancy rates at 77 years. The Nicoya Peninsula is considered one of the world’s seven Blue Zones, where people live longer, happier lives.
- Costa Rica is flush with natural resources and generates 78% of its

own renewable energy by hydroelectric means, and an additional 18% by geothermal or wind power. The government has voted against actions that could damage its lands, such as oil drilling and open-pit mining, though both would reap financial rewards.

- The Environmental Performance Index (EPI) ranked Costa Rica the world’s “5th Greenest Country” in 2012. In an attempt to go entirely carbon neutral by 2021, the country initiated an immense reforestation program to help offset emissions.
- There are more than 121 volcanic formations in Costa Rica, and seven of them are active. Poas Volcano has the second widest crater in the world and Arenal is one of the ten most active volcanoes in the world.
- Though Costa Rica has its own currency (the Colon), many stores list prices in terms of US\$.
- There are about 52 species of

hummingbirds in Costa Rica, making Costa Rica a true hummingbird capital.

- Monkeys are one of the most common mammals in Costa Rica – next to bats. The four-common species are the Howler, Spider, White-Faced and Squirrel.
- Bug-phobist look out! There are about 750,000 species of insects that live in Costa Rica, including about 20,000 different types of spiders! Also, more than 10% of the worlds butterflies live here.
- Costa Rica is one of the most valued

environmental destinations. Approximately 25% of the country has protected forests and reserves. There are more than 100 different protected areas to visit.

- Costa Rica has a population of 4.1 million. The capital is San Jose, with a metro area population of approximately 2 million. The life expectancy is almost 77 years, one of the highest in the world.
- Costa Rica (slightly smaller than Lake Michigan) is in Central America, bordered by Nicaragua on the north and Panama on the

south, the Pacific Ocean on the West, and the Caribbean Sea on the East.

- The Costa Rican government is democratic, with presidential elections every 4 years, and no standing army.
- Since Costa Rica is located so close to the equator, the sun rises and sets at roughly the same time throughout the year. The sunrise occurs at around 5:30 a.m. and the sunset at 5:30 p.m. There is no Daylight Savings Time, and Costa Rica's time zone is the equivalent to either Mountain or Central Standard Time.

### Promising Future

We look forward to the future of the farm and the trees as we start into the next phase, transitioning from growth and maintenance of the trees to commercialization of the

logs and lumber coming out of the farm.

**Thank You,**

Jake, Joe and Jaime

