



### NEWSLETTER FROM RGI SA.

Welcome to this April edition of our Newsletter,

RGI SA. has been fairly busy with harvesting and negotiation with the buyers of wood during these last months since the October Newsletter. We have also received a lot of questions from you, our clients which we of course appreciate and do our best to answer within reasonable time. However, I must ask you all to use our website to look for and gather the news and updates you need as we are limited on staff. We do post all information on [www.rgisa.com](http://www.rgisa.com) as they come up and although it might seem to be generalized and not of individual information it does show the core of the situation of the farm and each parcel is a part of the that same whole farm.

Market analyzes shows us now clearly that what we suspected regarding the long term effect of the regression in the worldwide economic situation seems to be reality, the demand for teak is there but the willingness to pay what should be expected is far from the region of that what we could foresee some years ago. That is the hard fact and we have to live by it, but we also have to move on, that involves that we have to make adjustments and changes in order to maximize the outcome and minimize the lost;

Maximize the outcome means for RGI that beside of what we always did, search for the

best prices and terms, we also have to search and accordingly adjust our periods of sale more to according the lowest offer-periods when there are less of the same product for sale. This way we can put a stronger pressure on the buyer regarding the price but it also means that the thinning schedules will become more unpredictable and vary from the original plan with longer or shorter terms, also with a short or none notification to each individual investor.

Minimize the costs is actually the easiest part since we already have been on a cost effective level with strict control during all these years, that's way RGI still is here while many competitors had to throw in the towel. Even though we are cost effective, I still believe that we can do better. Minimizing the costs does not have any direct influence to you as investor but indirectly it certainly does, it secures us being here taking care of the teak and the sales when the income are much lower than predicted.



### **Why there is an overflow of teak.**

Central America, South America and Africa has had a tremendous increase of teak-plantations during the last 10 to 15 years due to the expectation of high demand after the world wide understanding to end the deforestation of primary forests. Unfortunately, the illegal deforestation is still present and the demand for teak are still high for the 60+ teaks and the plantation wood from thinning is of course not at all attractive in this market. However, the plantations need to be thinned and sold, the quantity of teak between 8 and 14 years old teak is enormous. Only from one of the teak plantations in Brazil there are more than 10.000 hectares thinned of that 10 years old teak this year, that is more than 4.000.000 logs of rough square and in addition comes all the other farms and countries.

### **Article: De Telegraaf: March 18th, 2016**

The Weather Phenomenon El Nino  
The UN agency World Meteorological Organization (WMO) reported Thursday that the weather phenomenon El Niño has passed its peak, but the climate remains still influenced worldwide.

El Niño weakens in the coming months and disappears in the spring, April-May of this year.

The temperature in parts of the Pacific last year was 2 degrees higher than the normal average. " *We have just witnessed one of the strongest El Niño and this time the extreme weather phenomenon has caused more than ever such an effect in countries on all the continents, it has even increased the global temperatures to record levels*"; said the Secretary-General of the WMO, Petteri Taalas.

*"Parts of South America and East Africa have yet to recover from torrential rains and floods. The economic and humanitarian burden of drought is increasingly evident in southern Africa and the Horn of Africa, Central America and other areas. "*

This newsletter will also give you an update of the issues from the October Newsletter and a follow up on this above article from De Telegraaf.

Best Regards,

Bjorn Jakobsen,  
CEO RGI SA





**2000:** Miguel and me where trying to look over the trees to see the whole plantation



**2016:** Suddenly it was all gone and the plantation is for us a sad view of emptiness.



## Wood Harvest

As was mentioned in the last newsletter, due to the high risk of losing more trees from natural causes (fungi, pathogens and lightning) it was finally decided with a signed a contract for the sale of the wood from the plantations Monte Verde 1 and 2 and they are in the extraction process at this moment.

The harvest of wood from these farms has already begun and it is being carried out in the best way possible, despite that the weather conditions has not been favorable. This because the amount of rain that was fallen, which led to the erosion on the roads and thus a decrease in performance in the work of extraction.

Vasconia is older than MV2, but the decision to cut MV2 before Vasconia was taken due to the matter of logistics, these farms (MV1 and MV2) are very close together and therefore it reduces the costs when harvesting together. Vasconia will follow after the harvest of MV1 and 2.

### Lost wood on the plantations.

Due to the extraordinary climatic conditions we have in our area, caused by effects of climate change and over forced by El Niño, some plant pathogenic fungi and other problems coming to the plantations and they are causing some death of trees each year. The following table shows the decline in tree densities in each farm. Monitoring done by SilvoConsult SRL (2011-2015).

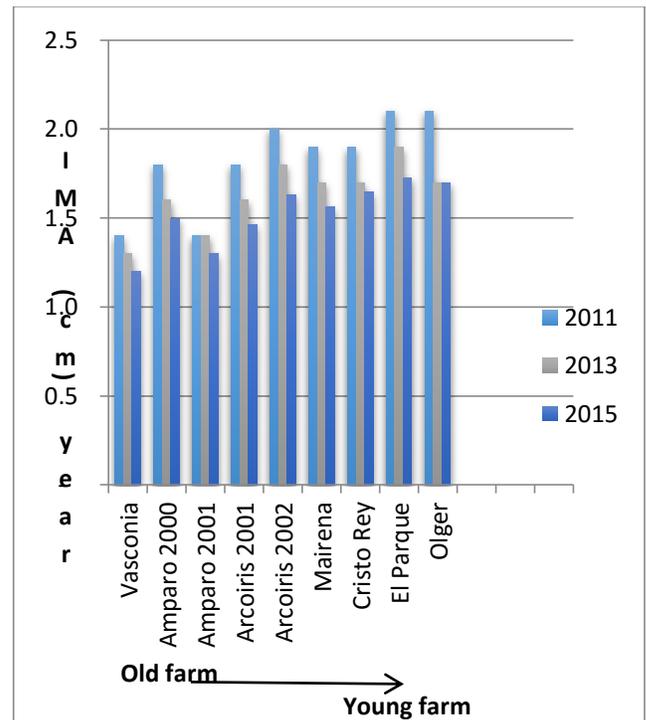
Table 1. Number of trees left per/hectare in the different farms of RGI S.A

Finca	2011	2012	2013	2015
Vasconia	283	260	249	232
Amparo	368	361	359	349
Amparo Arcoiris 2001	533	525	521	510
Arcoiris 2002	492	449	436	429
Mairena	438	433	406	409
Cristo Rey	481	433	433	325*
El Parque	476	471	413	406
Olger	635	612	605	484***
Carrizal	716	692	573**	557
Combate	946	937	928	695****

**Note:** \*commercial thinning of 107 trees, \*\* sanitary thinning of 119 trees, \*\*\*sanitary thinning of 119 trees, \*\*\*\*sanitary thinning of 230 trees

In addition to the affected trees we also found a decrease in the average growth of plantations (IMA) which has been decreasing

year after year, normal situation within any forest plantation. The graph is seen as the older plantations have lower growth.



**Figure 2.** Behavior of IMA in recent years  
The combination of mortality of the trees and the current growth are the cause that made RGI S.A to consider and decide upon changing the final cut of the plantations to be closer to 15 years old in order to optimize the investment.

### FSC.

RGI S.A are working on the new certification process, which is progressing satisfactorily. It is expected that by the end of this year we officially have the new FSC certificate in place.

It is noteworthy that although our certificate was for a period expired, RGI S.A continued to manage our farms according to the FSC regulations as we always did.

### **Climate change studies in Costa Rica.**

Since 1995, the National Meteorological Institute has been studying the possible impact of climate change on agriculture in Costa Rica, first under the framework of the Central American Program on Climate Change (PCCC) and then with the Program Dutch assistance for Climate Change Studies.

Altering weather patterns will undoubtedly affect agricultural production and productivity in different ways, depending on the types of agricultural practices, systems and production period, crops, varieties and areas of impact.

The results indicate that the increase in temperature, combined with variations (maximum and moderate) of rainfall, produced a delay to start dry season.

<https://www.imn.ac.cr/documents/10179/20913/Cambio+clim%C3%A1tico+y+agricultura+en+Costa+Rica>

The drought was severe between May and August 2015, So that the start of the rainy

season was delayed as never before with up to 4 months.

The very intense phenomena of “Niño” like this, added to the global warming it has the potential to increase to extraordinary levels in air temperatures.

These variables are of great interest because the plantations are a farming; and that affects the productive development, and therefore it can negatively affect to the investments income.

### **REGIONAL WATER RESOURCES COMMITTEE CENTRAL AMERICAN INTEGRATION SYSTEM XLVIII Climate Forum CENTRAL AMERICA**

Santo Domingo, Dominican Republic, 18-19 November 2015

The Forum reviewed and analyzed the most recent oceanic and atmospheric conditions, historical rainfall records, forecasts of global models and their possible implications for rainfall patterns in Central America, as well as historical records and statistical analyzes provided by each of meteorological services in the region.

Given:

I. That the surface temperatures of the equatorial Pacific Ocean, causing an increased to levels equal to or greater than a very intense El Niño and such a scenario the forecast period of this Perspective (DEFM-2016) will remain for most.

II. That from the month of September, temperatures in the tropical Atlantic Ocean have shown positive anomalies (warmer than normal conditions), even reaching very high for the month of October values and that during the period covered by this forecast will continue to increase.

In 2015 the rainy season lasted longer than usual, which meant a delay in the onset of the dry season.

### **Forecast**

ENOS AND RAINY SEASON  
PHENOMENON 2016  
WORLD METEOROLOGICAL DAY, 23  
MARCH 2016

Each March 23, the World Meteorological Organization and its 191 members (including the IMN) celebrate World Meteorological Day.

Therefore, every year a theme for the celebration is chosen. The theme chosen for this 2016 is "Let us face the future: warmer, drier and rainier" referring to the new state of the climate caused by climate variability, global warming and anthropogenic emissions of greenhouse gases.

### **The Rainy Season 2015**

In 2015 the rainy season on Costa Rica was presented as the IMN had predicted earlier this year with a deficit scenario in the Pacific Rim and a surplus in the Caribbean slope, distributed as follows:

a. Pacific Rim in general showed a deficit, especially in the North Pacific with 45% less than the average, the Central Pacific with 30%, the South Pacific with 22%, the Central Valley with 25%, and also the cantons of Guatuso, Los Chiles and Upala with 15%. In the northern part of Guanacaste rainy season was starting until September, which represents a delay of 3 months and also a historical record of later onset.

b. Meanwhile the Caribbean slope was characterized by a surplus distributed as follows, the Central Sector of the North Zone with 17%, the North Caribbean with 31% and South Caribbean with 34%.

Much of the North Zone, the conditions were wetter than normal in percentages ranging from 15% to 85%.

This change in the weather pattern of the last three months was largely due to the change in the thermal conditions of the Atlantic Ocean, which went from a scenario of lower temperatures than normal to one in which temperatures rose to extraordinary levels, in fact the highest since the peak in 2010.

As a result of this; Reforestation Group International, take the decision for make the final cut in some farms; that decision is because the results of that variant produce a several damage and in the end, the death of many trees. This decision is taken in order to return as much as possible of the investments.

Forecasts are clear; and considering the independent variables of some projects, RGI SA decided to perform the final cutting of some of them to return on their investment in the highest yields possible in accordance to the current market situation in Costa Rica

Best Regards,

Forestry Engineer Lic. Jason Rojas  
& Researcher Jonathan Segura, R.G.I. S.A



*“We are here and we will stay here till we have fulfilled our commitments as reforestation company.”*

Bjorn Jakobsen

# Improvement of soils conditions to increase productivity of *Tectona grandis* in Northern Costa Rica:

## Fine root increment

Elemer Briceño, Mario Guevara, Edwin Esquivel, Dagoberto Arias, Sara Molina

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### ABSTRACT

Land traditionally available for teak (*Tectona grandis*), have physical and chemical constraints that require further study and specific solutions. In Costa Rica it is required to maintain the reforested areas under the same use; however no discussion on a second rotation has taken place so far and neither a consideration to continue with the same species or not. Considerations on nutritional status of the site post-harvest or the technology package to which ensure sustainable production is not under discussion either. The priority is that these plantations whether be of moderate to high productivity, must maintain timber production. The current project established several treatments in order to improve soil physical conditions at plantations with apparent deficiency in growth and history of compaction. An experimental design of three complete random blocks was established using five treatments (all with dolomite fertilization except 1 control) that combine the effect three of tillage intensities; the intensities were 1, 3 and 5 chisel plows; with a control plus control fertilization. In addition to effects on normal growth variables (diameter and height and consequently volume) an effect in root development is highly expected, where the intensity of treatments stimulates greater root development, greater area of absorption of nutrients and reasonably growth. The results here presented aim at showing the effect of treatments on root demography for the treated plantations and to recommend the ideal treatment in terms of technical and economic aspects to follow

### OBJECTIVES

#### Main Objective

- To increase the productivity of teak plantations (*Tectona grandis*) through technological improvement of the soil.

#### Specific objectives

- Morphologically characterize the physical and chemical soil constraints and their effect on root development, leaf area development, health and productivity of teak plantations in soils of low current productivity.
- To demonstrate the effect of deep tillage (multiple treatments) in root development, and productivity of teak plantations.
- To evaluate the effect of the application of amendments in combination of different treatments of deep tillage.

### METHODOLOGY

Variables measured in the plots prior to the establishment of the experiment and then every 6 months:

- ✓ Texture of each soil horizon.
- ✓ Morphological description of the soil.
- ✓ Monitoring of soil carbon, biological activity, litter dynamics and water balance.
- ✓ Diameter and height, live crown height, and total height of all useful trees of each experimental unit.
- ✓ The dynamics of fine roots will be monitored every two months in each of the treatments.



Figure 1. Application of Treatments on each experimental block.

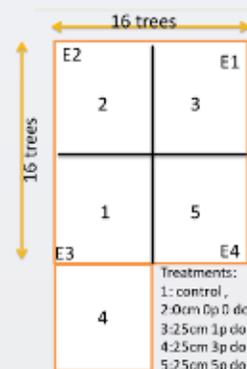


Figure 2. Treatments:  
1) Control,  
2) Control+ fertilization,  
3) 1 Chisel at 25 cm depth,  
4) 3 Chisels at 25 cm depth,  
Treatments 3 to 8 include fertilization with 3 tons/ha of  $\text{CaMg}(\text{CO}_3)_2$



Figure 3. Data collection.



Figure 4. Observable differences in treated area and non treated area; evidence of good application of treatments was found at each experimental unit.

### RESULTS AND DEVELOPMENT

Table 1. Analysis of Variance (SC type III)

F.V.	SC	gl	CM	F	p-value
Modelo.	5359995,33	4	1339998,83	2,47	0,0481
Treatment	5359995,33	4	1339998,83	2,47	0,0481
Error	65598421,01	121	542135,71		
Total	70958416,35	125			

Treatment	Mean Live dry weight (tons /ha) mean
1	273.52(a,b)
2	800,44 (b)
3	312,22(a,b)
4	198,37(a)
5	317,07(a,b)

Table 2. Significant differences of amount of biomass per hectare (Tons/ha) by treatments (Test:Tukey Alfa=0,05)

Table 3. Significant differences of amount of biomass per hectare (Tons/ha) partitioned by depth of live and dead fine roots (Test:Tukey Alfa=0,05)

Treatment	Mean Live dry weight (tons /ha) mean	Mean Dead dry weight (tons /ha) mean	n
<b>0-20 cm</b>			
1	439,02(a)	243,50(a)	9
2	526,85(a)	329,27(a)	9
3	420,69(a)	233,06(a)	9
4	543,55(a)	153,31(a)	9
5	646,34(a)	173,17(a)	9
<b>20-40 cm</b>			
1	236,93(a)	174,22(a)	9
2	390,24(a)	81,30(a)	9
3	500,00(a)	91,46(a)	9
4	185,37(a)	148,78(a)	9
5	243,50(a)	119,51(a)	9

Figure 5. Dry Biomass weight (tons/ha) and error range of measurements per depth and treatment.

### CONCLUSIONS

- At two years after treatment appliance, results show no conclusive treatment to be the best, significant differences in biomass can be detected for accumulated sampling, but show no difference when compared by condition (live/dead root quantity) or by depth.
- The previous suggests that fine root recycling is more climate dependent and not conditioned by only physical properties.
- This stated the treatments seem to have no effect on the higher proliferation of roots so far, this can be attributed to the time of sampling, which makes it necessary to collect during rainy season, to have this additional variable.
- A longer period of growth is necessary to asses treatment effect.
- Additionally no effect on dolomite application can be detected, as to be related to root proliferation.

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