

SUMMARY

In December 2012 Reforestación Grupo Internacional S.A. (Reforestation Group International) a Costa Rican plantation developer, requested DHForest S.A. to do a review of the stand growth monitoring and financial evaluation of their plantations in Costa Rica. The monitoring and the evaluation has been executed by Silvo Consult Srl, and the reports are dated December 2012. DHForest S.A. did similar reviews over the past years.

The productive RGI area included in the study is currently 1.359,5 ha. These productive areas consist of 11 plantations in the Northern zone of Costa Rica. The total effective plantation area consists of 1.316.8 hectares of Teak (*Tectona grandis*) and 42.7 hectares of Acacia (*Acacia mangium*). Compared to last year area distribution, no real changes were observed, with the exception of the incorporation of 39.2 hectares Teak 2008 in Combate farm, that were formerly addressed as Teak 2007.

One can observe this in table 1.

Project (Name)	Location (Name)	Planting (Year)	Area (ha)	plots (n)	Plot (area m2)
Monte Verde 1	Corazon de Jesus	1997	58,7	16	5600
Vasconia	Vasconia	1998	21,9	6	2712
Monte Verde 2	Corazon de Jesus	1999	28,4	6	2100
Monte Verde 3	Amparo	2000	55,7	12	5292
Monte Verde 3	Amparo	2001	32,5	6	2646
Monte Verde 4	Arco Iris	2001	84,5	17	7497
Monte Verde 4	Arco Iris	2002	90,5	18	7938
Mairena	Mairena	2002	25,9	5	2205
Cristo Rey	Christo Rey	2002	199,6	35	15435
El Parque	El Parque	2003	304,6	69	30429
El Parque	El Parque (Acacia)	2006	42,7	4	1764
Monte Verde 4	Arco Iris	2004	11,4	3	1323
Concho	Concho	2005	73,2	14	8400
Carrizal	Carizal	2006	87,0	16	9600
Conchito	Concho	2007	70,4	15	6615
Combate	Combate	2007	133,6	34	14994
Combate	Combate	2008	39,2	8	3528
Total			1359,5	284	128078
			5 ha/plot		0,94%

Table 1/ area included by farmlocation

RGI provided detail maps for the productive areas. These were reviewed, and during field sampling proven trustworthy. Though some minor updates in these maps should be executed.

The Teak was established in the years from 1997 thru 2008. Most farms had initial planting density of 1111 trees/ha (3 m by 3 m), but 1400 and 1540 trees per hectare were used also. The Acacia is planted with a density of 800 trees per hectare.

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In total, 26 sample plots for Teak and two for Acacia were measured and checked in the field by DHForest, and these measurements do neither show significant deviation nor systematic errors from the measuring data of Silvo Consult.

All plots are easy to locate because they are well defined in the field, and come with sufficient and accurate descriptions. The plot distribution over the area is good.

On the average, the teak trees are nine years old, have an average diameter of 16 cm, which accounts for a little under 1.8 cm/yr. Height development reached 15 meters, which is the same as last years.

Thinning reduced the stands to 505 trees per hectare, which corresponds to an absolute removal of 15 trees per hectare, but due to incorporation of measuring data provided by Silvo Consult of new young area in this valuation overall average tree number per hectare calculates 548 (+/- 2 %). The basal area calculates 11 m²/ha, and with the average of 548 trees per hectare this sums a standing volume of 84 m³/ha (+/- 2 m³). The current volume increment since last year is 8 m³/ha and 3 m³/ha were thinned; so total production was 11 m³/ha.

The mean annual increment in volume calculates on the average 9 m³/ha/yr.

Thinning operations have its influence on present value of standing plantations, because its value is withdrawn from the plantation with the harvest of the trees, in order to provide growing space to the remaining trees.

During the field visits, it was observed that infrastructure is weak and not passable the whole year round. The maintenance of the stands is good; however, thinning interventions are still not in concordance with the stand growth scenarios; however efforts can be observed by the new head forester, and the forestry department to comply with this issue.

Overall, performance of the stands is according to monitoring reports. Mean annual increment varies from 7 to 11 m³/ha/yr. Growth models for the Teak areas were presented and adjusted accordingly to the executed thinning regime and growth. Total commercial volume for the five models calculated by SilvoConsult is the same as last year and represents 180, 179, 169, 170 and 126 m³/ha.; respectively 9, 9, 8.5, 8.5 and 6.3 m³/yr/ha, which seems reasonable for the local site conditions.



Illustration 1/ Well identified tree from permanent measuring plot



Illustration 2/ young Teak trees from plantations recently thinned.

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Overall calculated weighted production is 155 m³/ha according to Silvo Consult, which calculates 8 m³/ha less than last year. Silvo Consult has included the youngest stands now in this overall production level, so some variation was expected. DHF calculates overall weighted production level of 143 m³/ha. This implies, respectively, a 7.7 and 7.2 m³/ha/yr production level for Silvo Consult and DHF.

Total standing volume reported by Silvo Consult was calculated by DHF to have a statistical deviation of + or - 3% (well within the recommended 10% deviation), however within the various strata the deviation is higher which indicates that higher sampling intensity could be necessary.

Analyses of the monitoring data over the years 2005 - 2012 show consistency and no indications were found to doubt the methods or the measurements. This year's figures show a continuous slight tendency of stagnation in growth, and adequate attention should be paid to determine and react to this tendency. Silvo Consult calculates approximate - 2% overall decline in production.

Farm (name)	Area (ha)	Strata (year)	Silvo Consult		DHF	
			Accu. (m3)	Weighted (m3)	Accu. (m3)	Weighted (m3)
C. de Jesus	58,7	1997	158	5,2	152	6,8
Vasconia	21,9	1998	171	2,9	153	2,5
C. de Jesus	28,4	1999	171	3,7	159	3,4
Amparo	55,7	2000	170	7,3	159	6,7
Amparo	32,5	2001	126	3,1	146	3,6
Arco Iris	84,5	2001	159	10,4	155	9,9
Arco Iris	90,5	2002	169	11,8	159	10,9
Mairena	25,9	2002	152	3,0	136	2,7
Cristo Rey	199,6	2002	164	25,2	164	24,9
Parque	304,8	2003	165	40,2	146	33,7
Arco Iris	11,4	2004	155	1,4	146	1,3
Concho	73,2	2005	143	6,7	126	7,0
Carrizal	87,0	2006	146	9,7	128	8,5
Combate	133,6	2007	126	16,7	117	10,7
Combate	39,2	2008	n.a.	n.a.	115	4,6
Conchito	70,4	2007	135	7,3	115	6,2
Total.	1317,1			155 m³/ha 7,7 m ³ /ha/yr	143 m³/ha 7,2 m ³ /ha/yr	
			year 2011	163,0 5%	136,0 -5%	

Table 2/ Monitoring data from Silvo Consult comparing to DHForest.

In order to evaluate the growth projections presented by Silvo Consult, the distribution of current height development was projected on the curves of Vallejos, (this is graphically illustrated in Figure 1). This distribution was then used to determine the growth level distribution over existing production scenarios for Costa Rica.

Year	I	II	III	IV	V	Total
2011	0,0 Ha 0,0%	16,5 Ha 1,3%	581,4 Ha 44,2%	643,3 Ha 48,9%	75,6 Ha 5,7%	1316,8 Ha 100,0%
2012	0,0 Ha 0,0%	0,0 Ha 0,0%	591,9 Ha 45,0%	663,2 Ha 50,4%	61,7 Ha 4,7%	1316,8 Ha 100,0%
Changes	0,0 Ha	-16,5 Ha	10,5 Ha	19,9 Ha	-13,9 Ha	

Table 3/ Growth class distribution 2011 - 2012

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The distribution over the different growth classes' shows that compared to last year, the extremes are diminishing. Growth class II has disappeared and Growth class V has diminished by 4.7 %. This can be explained mostly by thinning activities; provide growing space to the future trees.

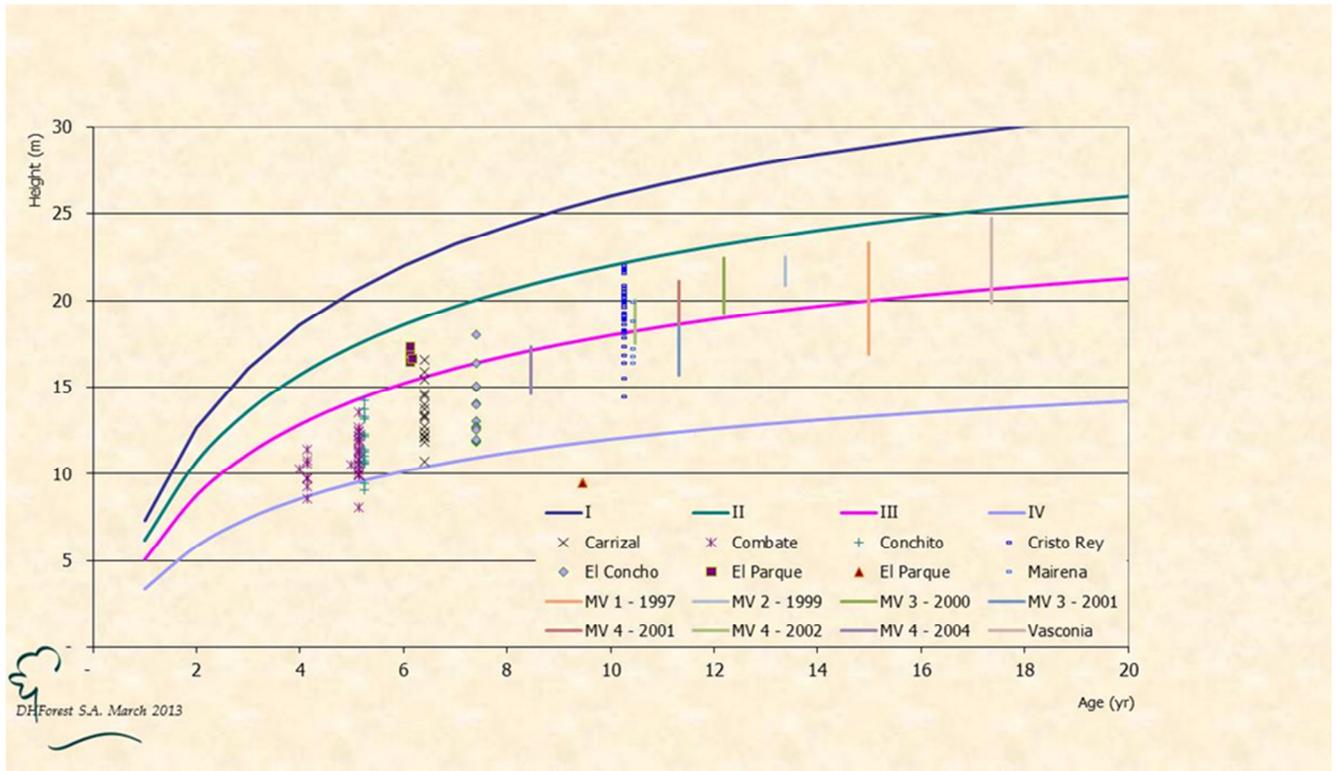


Figure 1/ Height distribution compared to Vallejos

The method of determination of the present value of the objects is, compared to last year, not changed. However, the used prices were changed by RGI. The prices for standing tree value have been adjusted. The use of new prices have an impact on total future and present value presented by Silvo Consult. DHForest uses for this exercise the current market prices for roundwood.

To calculate the future value, a conservative 2.3% increment in wood prices was used.

Overall average increment in Teakwood prices since 1994 calculates 3.8% annual increment.

After the decline in prices for Teak and other wood products in 2009, prices are continuing going up. A discount rate of 6.3% is used.

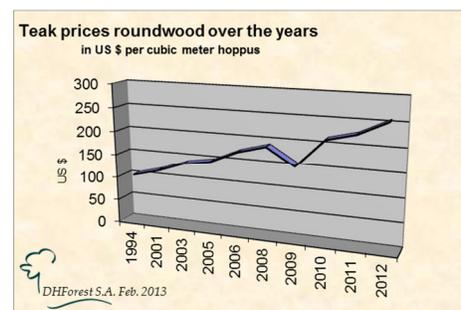


Figure 2/ Price development wood prices Costa Rica.

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The Present Value calculated for the different Teak strata vary from \$ 28.021,- per hectare (Strata Teak 1999) to \$ 10.789,- per hectare (Strata Teak 2008). On the average it calculates \$21.143,⁸¹ per hectare.

The Acacia is present with 391 trees per hectare. The diameter has reached 18 cm, and height is 15.5 meters. Standing volume calculates 83 m³/ha, hence with its six years age mean annual increment is 13.5 m³/ha/yr.

Due to the little bit disappointing growth the total expected volume was adjusted to 183 m³/ha.

For the Acacia the value is \$ 6.438,⁴⁰ per hectare.



Illustration 3/ Acacia stand

Total overall Present Value¹ calculated for the plantations of R.G.I. S.A. is \$ 28.116.876,- or \$ 20.681.⁹³ per productive hectare.

Considering all the before mentioned assumptions on the input data and variables, this Present Value reflects fairly well the actual plantation situation.

¹ The Present Value is partly based on revenue information currently available and provided by RGI S.A., the tree measurements and assumptions for growth and prognostics. No rights can be derived from these values.