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The Oil Palm Industry in Costa Rica: Country Report

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Abstract

The oil palm industry in Costa Rica is relatively small but one of the oldest in tropical America. The first commercial plantation was established in 1944, and today, the industry comprises about 47,807 ha; mostly established on the central and southern parts of the Pacific zone (96%). The country has four extraction mills, with an overall processing capacity of nearly 160 metric tons per hour.

Most of the industry is in hands of the private sector (46%), whilst cooperatives hold 28% and smallholders 26% of the planted land. Approximately 3,968 families benefit directly from the industry, for a total of 19,840 persons with an average family size of five members.

The average country's crude palm oil (CPO) production during the last five years (2001-2005) was 147,643 metric tons (t) per year, and for 2006 the CPO production was estimated to be 188,994 tons. In 2005, the production was 181,416 t, which represents a productivity of 4.4 t of CPO per ha from 40,982 ha in production. Costa Rica exports most of its CPO production (72% in 2005), mainly to Mexico. Internally, the food industry uses the oil to produce mainly shortening and olein (margarines).

Introduction

The early history of the oil palm in Central America is largely the history of the crop with the United Fruit Company. Even though the major interest of the United Fruit Company since the last years of the 19th century had been the production and exportation of bananas, an interest in crop diversification has been long standing. The commercial exploitation of oil palm plantations started in Costa Rica in 1944, with the first plantings in the Parrita zone, near Quepos, Costa Rica, as an alternative for the land abandoned by the banana industry in the Central Pacific Zone of the country (Villavicencio, 1999).

Since the initial interest in establishing oil palm plantations in 1943, annual plantings continued regularly through 1952, at which time about 4,000 and 1,800 hectares had been planted in Quepos, Costa Rica and San Alejo, Honduras, respectively. The planting of new areas was essentially discontinued until 1962, except for some 665 ha planted in Quepos, Costa Rica, during 1958-59. Barring a few seed imports, open-pollinated Deli *dura* seed continued to be the main source of planting material through 1966 (Richardson, 1995).

The oil palm in Costa Rica has become a traditional crop and sufficient expertise in plantation management and supply of planting materials has been developed over the years. Since most of the production of crude palm oil (CPO) is exported, oil palm cultivation is becoming an

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important economic export activity in frank expansion. This paper summarizes the principal characteristics of the oil palm industry, and a comparison with other industries of the agricultural sector is also included.

Planted areas and industry structure

The largest oil palm industry in Central America and Mexico was established in Honduras with 84,463 ha, followed by Costa Rica (47,807 ha) and Guatemala (45,576 ha); in Panama the industry is still incipient with only 6,786 ha planted. Most of the oil palm plantations in Central America are in the early producing cycle (3-7 years old), comprising 34% of the total planted area, which is around 227,997 ha (Table 1).

Table 1. Age stratification of oil palm plantations in Mexico, Dominic Republic and Central America (000's of hectares)

Country	Year after planting/000's of hectares					Total
	0-2	**3-7**	**8-15**	**16-22**	**23+**	
Costa Rica	6,824	9,383	17,581	9,961	4,057	47,807
Guatemala	8,655	21,559	10,928	4,353	81	45,576
Honduras	10,904	25,838	24,179	10,304	13,238	84,463
Mexico	4,380	12,000	4,768	2,696	260	24,104
Nicaragua	3,725	4,990	568	1,650	-	10.933
Panama	538	1,952	1,266	409	2,621	6,786
Dominican Rep.	163	1,600	918	4,818	830	8,329
Total	*35,189 15%*	*77,322 34%*	*60,208 26%*	*34,191 15%*	*21,087 9%*	*227,997*

The private sector in Costa Rica holds 46% of the oil palm industry with 21,887 ha planted, followed by cooperatives and independent producers with 13,497 ha (28%) and 12,423 ha (26%) respectively. Smallholders at the cooperatives manage 4 to 40 ha plot sizes, while independent producers can own up to 300 ha of oil palm plantings. Approximately 3,968 families benefit directly from the industry, for a total of 19,840 persons with an average family size of 5 members (Table 2).

Soil and climate characteristics of the oil palm areas

The oil palm in Costa Rica is cultivated mainly in alluvial plains along the coast of the Pacific Ocean. In geologic and physiographic terms two major areas can be defined: Central Pacific Region (Quepos) and South Pacific Region. The latter can be further divided into two major units; an alluvial calcareous unit (Palmar-Coto) and an alluvial volcanic unit (Canoas).

Table 2. Structure of the oil palm industry in Costa Rica, 2006

Sector	Hectares		Families
Private	21,887	46%	2,405
Cooperatives	13,497	28%	979
Independent	12,423	26%	583
Total	*47,807*		*3,968*

Most oil palm plantations in Quepos are located over recent alluvial terraces of the Parrita, Paquita, Naranjo and Savegre rivers. The soils here (Inceptisols), are mostly deep, poorly to moderately well drained, and medium to coarse-textured. The soil reaction is slightly acid, the percent of base saturation is high and the cation exchange capacity is high. The main limiting factors for high oil palm yields in these soils are poor drainage and soil fertility imbalances.

The mean annual rainfall in the Quepos region is around 3,700 mm, with lower records in El Niño years. In normal years, there are three months with rainfall below 100 mm, but there can be up to five dry months during El Niño years. The annual water deficit is estimated at 200 mm, but it can be quite severe in El Niño years, particularly in areas with shallow soils. Temperature is within the suitable range for oil palm (minimum 21-23°C and maximum 30-34°C) and sunlight levels are adequate for high yields (> 13 Mj/m² for most months).

Most oil palm plantations in the South Pacific Region are on the alluvial fans of the Térraba, Sierpe and Coto-Colorado rivers. These soils (Inceptisols) are mostly deep, poorly to moderately well drained, and medium to coarse-textured. The cation exchange capacity is high throughout the profile and the soil reaction (pH) varies from slightly acid at the surface, reaching neutrality with depth. The percent of base saturation is very high and dominated by calcium inherited from the parent material. The main limiting factors for high oil palm yields in these soils are poor drainage and soil fertility deficiencies and imbalances.

An important plantation sector in the South Pacific Region is on shallow volcanic ash soils over riolithic volcanic tuff. These soils are moderately to well drained and have very low extractable bases due to their coarse texture under high leaching conditions. They also have high phosphorus retention capacity. Under natural conditions, all kinds of nutrient deficiencies may be observed in the plantations; however, yields of over 20 tons of FFB per hectare per year are common when the plantations are properly managed.

The mean annual rainfall in the South Pacific region is around 4,000 mm, with higher records in La Niña years. In this region, there are two to three months with rainfall below 100 mm and hence the water deficit is normally mild or nil. Mean monthly temperatures are within a suitable range for oil palm (minimum 20-22°C and maximum 31-34°C), but sunlight is rather low for 4 to 5 months (<13 Mj/m²).

Oil palm is also grown on a smaller scale near Batan, in the Atlantic zone of Costa Rica. These plantations, which started in 2000, are located mainly on the recent alluvial terraces of the Matina River (Inceptisols) and on old alluvial terraces and foothills in the neighborhood

(Inceptisols and Ultisols). The main problems in this area are poor drainage (lowlands) or low soil fertility (old terraces and hills).

The annual rainfall in the Batan area is adequate for oil palm, over 3,000 mm, well distributed throughout the year. Temperature is within a suitable range for oil palm (minimum 19-21°C and maximum 29-32°C) and sunlight levels are adequate for high yields (>13 Mj/m² for most months).

Economic importance

The country has four extraction mills, with an overall processing capacity of nearly 160 metric tons per hour; three mills are managed by the private sector and one by a cooperative of smallholders.

The country's average crude palm oil (CPO) production during the last five years (2001-2005) was 147,643 metric tons (t) per year, and for 2006 the CPO production is estimated to be 188,994 tons. In 2005, the CPO production was 181,416 tons, which represents a productivity of 4.4 t of CPO per ha from 40,982 ha in production. The 1982-1996 average planting of oil palms in Costa Rica was 1,421 ha per year, including renovation of old-aged plots and new areas. However, the aggressive renovation of 16,538 ha during the period 1997-2000 at an average pace of 4,134 ha per year -- almost 4 times the historic average - meant that an important portion of the oil palm industry in Costa Rica was young-aged (<5 years old) in the period during 2001-2003, making the productivity per hectare lower than 4 MT of CPO per ha (Table 3).

Table 3. Yearly production and exports of crude palm oil (CPO) in Costa Rica

	2001	2002	2003	2004	2005	2006*
Production (MT CPO)	107,331	120,100	156,409	172,959	181,416	188,994
Exports (MT CPO)	61,819 58%	76,304 64%	110,375 71%	124,412 72%	130,492 72%	
Total hectares	40,225	40,295	40,982	42,900	45,615	47,806
Hectares in production	36,223	39,267	40,225	40,295	40,982	42,900
Productivityt (MT CPO/ha)	3.0	3.1	3.9	4.3	4.4	4,4
Hextares <5 year old	48%	36%	23%	17%	15%	18%

*Estimated production, with data up to September

Costa Rica exports most of its CPO production (72% in 2005), mainly to Mexico. Internally, the food industry uses the oil to produce mainly shortening and olein (margarines). Compared with other plantation crops in terms of export values, the oil palm's economic importance is lower than bananas, pineapples, coffee and oranges but higher than the sugar industry. However, its economic importance has gradually increased since 2001, reaching 69.1 million US$ in export value in 2005 (Table 4). The relatively greater economic importance of crops like bananas and

pineapple over the oil palm is due to its product added-value, even though it occupies less land; however, those crops are highly sensitive to price variations compared with the oil palm.

Potential expansion of the oil palm industry in Costa Rica is estimated in 89,400 ha of new areas, 56,200 ha in the Pacific and 33,200 ha in the Caribbean, by using grassland and low-profit crop substitution.

Table 4. Exports of major plantation crops in Costa Rica (000's of US$)

Crop	Hectares	2001	2002	2003	2004	2005
Bananas	41,147	502.1	469.1	548.3	532.9	475.4
Pineapple	26,821	142.3	159.0	207.6	256.3	325.3
Coffee	113,387	162.5	165.3	190.7	199.6	230.6
Oranges	26,000	46.5	57.0	55.7	69.9	73.6
Oil Palm	47,807	22.9	34.6	54.8	63.4	69.1
Sugar	49,210	30.0	27.0	21.9	37.9	29.7

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