

IRRIGATED OIL PALM PRODUCTION IN BRAZIL FOR BIOENERGY USES: Opportunities and challenges

Edson BARCELOS, Oil Palm Researcher at EMBRAPA / Manaus / AM. Member of ABID to look at irrigated oil palm

The Oil Palm is a palm species originated from Occidental Africa, broadly dispersed on tropical rainy areas, but also found on marginal climate areas, with low rain and accentuated hydric deficit (Nigeria, Benin, etc.).

The agroindustry of Palm Oil is important economic activity in several tropical countries, such Malaysia and Indonesia, at Asiatic South-East; Nigeria and Ivory Coast at Africa; Colombia and Ecuador at South America. The Brazilian Palm Oil agroindustry faced a slow growth until the end of last century, when, in the first decade of this century, experienced a good expansion, reaching 140,000 hectares by 2012. Pará State, at Brazilian Amazonian region hold 90% of this area. By moment, the activity presents a stagnation, without any new project or considerable expansion, mainly due to the conjuncture aspects of the Brazilian politic and market.

The Oil Palm starts its commercial production at 3 years after its planting at the field, and presently, oil palm is the cultivated oil crop with highest productivity per area unit (4 to 5 tons of oil per hectare per year). Being a perennial crop, with its production distributed round year and with an economic life span lasting more than 25 years, the activity promotes a continuous labor utilization, with a dignifying remuneration for them, offering excellent opportunity for small farmers' settlements, on integrated projects models, resulting in a sensible life patten improvement to all that are involved on this activity.

OPPORTUNITIES AND RISKS

PALM OIL USES

At the world level, the 56.2 M tons of palm oil production at 2012 ([FAOSTAT, http://faostat.fao.org/](http://faostat.fao.org/)) almost 80% were driven to food industries. It is important to register the recently increase destination for a nonfood uses, as renewable bioenergy. Today, with others traditional uses, like soaps, cosmetics, inks, etc., around 24% of the global oils and fats consummation refers to a nonfood uses, against around 10%, for the same destination at 2000.

PALM OIL MARKET

The World oil and fats production grew from 68.7 M tons at 1985, reaching more than 180.0 M of tons by 2012, showing an increase of 3,7%/year. Referring to vegetables oil only, the palm oil that produced 7.5 M tons at 1985, representing 11% of the world oil production, by 2012 represented 35.7%, producing 56.2 M tons of oil. At the same year, soybean oil represented 23.6% of the world oil production, only.

Statistics point that for the next twenty years, the palm oil production will not be able to supply the consume, requirements from population growth and *per capita* consummation increase, all due to the land shortage for new planting by actual big producers (Malaysia and Indonesia). This fact represents huge market perspectives for tropical countries like Brazil, with a large adapted area, to attend this future unsatisfied demand.

Strategically, beside the global food security and markets demand aspects, the oil palm can play expressive roles to the Brazilian society and economy:

- Firstly, as potential diesel substitute due to its chemical characteristics, high productivity per area and lower production costs.
- Secondly, being an environmental and economic sustainable activity, it presents characteristics able to fix the man at rural zone, changing the history of the familiar agriculture in the Brazilian Amazonia region.
- Thirdly, considering the oil palm production under irrigation possibilities, Brazil has savanas and some irrigated perimeters at northeast region, where the oil palm can arrive as a good solution to crop diversification needs, with close market for its production and also, for fertilizers suppliers.
- The oil palm (5.0 tons of oil/ha/year), being 10 times more productive than soybean (0.5 tons of oil/ha/year), much less area will be required to satisfy the huge oil demand in the future for food, fuel or chemical uses.
- Irrigated oil palm by reusing industrial waste water, like sugar cane distillery wastewater, generally known as vinasse, or cities served water can, besides solve environmental problems, allow this water to turn back to hydrological cycle, completely depolluted, after a great social service.

IRRIGATED OIL PALM

In the spite of no commercial exploitation or few researches experience with irrigation of oil palm in Brazil, around world experiences can support and justify the proposition to have irrigated oil palm cultivation at Brazilian conditions, like savanas and at northeast-irrigated perimeters.

A large experimental area (838 hectares) with oil palm under drip irrigation at Benin/Ouidah North/Africa was started at 1972 by IRHO (French Oil Palm Research Institute). At climate conditions presenting 800 mm/year of hydric deficit and air moisture as low as 10 to 30%, this plantation receiving a 5 mm/day irrigation, produced 20.6 tons of fresh fruit bunches/ha/year, equivalent to 4.5 tons of crude palm oil/ha/year. At this same site, a non-irrigated plot produced only 4 tons of fresh fruit bunches/ha/year, or 1.0 ton of crude palm oil/ha/year.

At Guatemala, a 5,000 ha oil palm plantation, in a climate conditions presenting 1,000 mm of annual precipitation and a 7 months of dry season, are producing around 8 tons of oil/ha/year, under a regular irrigation conditions.

Considering the physiological similitudes between coconut and oil palm and based on irrigated coconut results at Brazilian northeast region, equivalent results can be foreseen for irrigated oil palm cultivation at this climate conditions. Preliminary experimental results conducted by Embrapa's researchers are confirming this expectative.

Them, for irrigated oil palm plantation, at savanas/cerrados or northeast Brazilian's regions, adopting best agronomical practices and over a well selected soils conditions, productivities higher than 6 tons of oil per/hectare/year can be achieved. **Precise figures and costs for this production are presently the challenge for researchers.** (edson.barcelos@embrapa.br).