

**Central America: Increasing loss of fertile soil**

The traditional food produce system is shifting cultivation on steep hills: clear-cutting of high diverse natural forests, loss of CO<sub>2</sub>-sink, soil erosion, decreasing productivity.

**But:** Today's climate change, need to preserve the forest!

**The solution?**

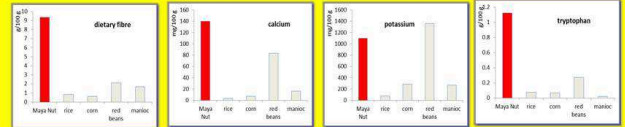
Return to ancient Mayan Food. The tree seeds of *Brosimum alicastrum*, known as Ojoche, Ramon, Masica or Maya Nut are collected in natural neo-tropical forests by local women and provide a high nutritional food for humans.

**This study** quantifies the potential production of *B. alicastrum* in a high diverse humid rainforest compared to annual crops and the importance for the ecosystem to neo-tropical wildlife.



**Nutrition composition of *Brosimum alicastrum***

- ✓ delicious in beverages and pastries
- ✓ nearly **fat free**
- ✓ 345 kcal/100 g
- ✓ good source of sugars (maltose), protein, potassium and calcium
- ✓ very high in the essential amino-acid **tryptophan**, which is poor in the tropical diet, and needed to produce melatonin and serotonin in the human organism.



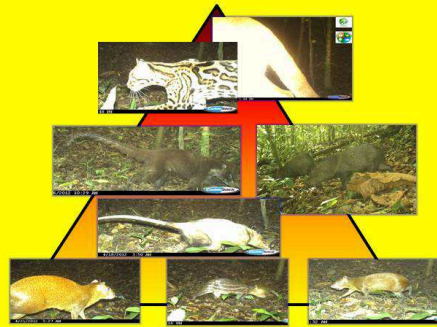
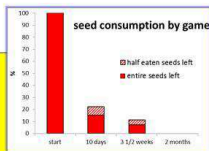
Source: Maya Nut: Silliker Laboratory, Dinok, USA, 2007. Others: USDA Nutrient Database, www.nal.usda.gov/nutrientdata

**Methods**

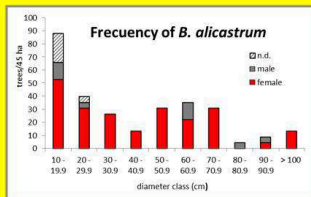
- Study area: high diverse rain forest in UNESCO-Biosphere Reserve Rio Plátano, northeastern Honduras
- Participative: realized by Women´s Cooperative COMGABIL
- Forest inventory of 45 ha: 20 m wide transects covering 10 ha (23 %)
- Estimation of complete harvest volume of seven trees
- 13 plots to measure the amount of nuts eaten by wild life
- 3 camera traps to identify wild life depending on *B. alicastrum* (107 days).

**A key species for neo-tropical forest wildlife**

- At the sample plots, all 390 seeds of *B. alicastrum* were completely eaten up by wildlife within 2 month;
- The pictures taken by camera traps identify the whole pyramid of bigger terrestrial jungle wildlife depending on Maya Nut alimentation or ecosystem;
- Local people confirmed the consumption of Maya Nut as well in tree crowns by monkeys and birds;
- Not just the seeds, but also the leaves are eaten by wildlife (e.g. sloth bear)

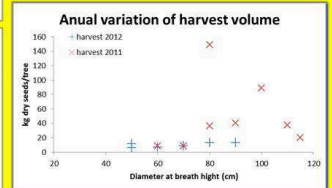


**Carnivore:** *Puma concolor*, *Leopardus pardalis*, **Omnivore:** *Nasua narica*, *Tayassu tajacu*, *Didelphis marsupialis*, **Herbivore:** *Caniculus paca*, *Dasyprocta punctata*. 03 to 06/2012.



**Maya Nut versus red beans**

- Productive: female trees > 30 cm DBH
- Mast species: low harvest: 10 kg/tree, high harvest: 49 kg/tree
- high diverse humid rain forest: 3.1 productive trees/ha  
31-152 kg Maya Nut versus 520 kg red beans/ha/year  
but during 10 years:  
**92 kg Maya Nut versus 104 kg red beans/ha/year**



	Nuez Maya in natural high diverse humid rain forest	Red Beans in shifting cultivation*
yearly production over 10 years	92 kg	104 kg
Calories/year	318,228	360,880
Actual price	3.52 Euro/kg	0.62 Euro/kg
Yearly producers income	323 Euro/ha	65 Euro/ha
Investment level	low	high
CO <sub>2</sub> sink	conserved	destroyed
Biodiversity	conserved	destroyed
Food source for wild animals	conserved	destroyed
Soil fertility	permanent	degradant
Resilience to climate changes	high	low
Impact to clima	positive	negative

\*two productive years within ten years



**Conclusions**

- Mankind´s history is based on forest food (f.e. *Quercus* in Northern America and Europe)
- Since "agriculture revolution" in the Neolithic Age, forest food is more and more forgotten
- 10,000 years later mankind is learning about the importance of "ecosystem services" to conserve climate and biodiversity
- Today is time for a second "agriculture revolution": to end up with the old dilemma of food production, deforestation and climate change
- Especially in the tropics on hill land, agriculture can not compete with the forest services to food production for human and wildlife (direct and indirect)
- This study shows that even in high diverse, low frequency *B. alicastrum* natural human rain forest the production of Maya Nut is a real alternative to traditional shifting cultivation, in terms of economical, social (women activity!) and ecological sustainability.

