

*Can LBA science help foster the  
conservation of natural resources  
through the adoption and  
certification of "best" agricultural  
practices?*

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# Many initiatives need scientific information about land management

- Environmental certification system for large-scale cattle ranching and grain production (7 NGOs)
- Campaign to protect and restore riparian zones in the Xingu Headwaters region (Y' Katu Xingu, [www.socioambiental.org.br](http://www.socioambiental.org.br))
- IPAM and Alianca da Terra registry of property holders committed to sound land stewardship
- Companies (Grupo Maggi, Cargill) beginning to impose environmental criteria on their suppliers of grains

Many of the appropriate land management practices are understood.

Others are not.

What is the model soy farm?  
The model cattle ranch?



## **Tanguro Site**

- ***82,000 hectares***
- ***Transitional Forest***
- ***Fire eliminated***
- ***Recuperating streams & riparian zones***
- ***Owner: Grupo AMaggi***



# The model farm/ranch: ponds

- Small number of *deep* ponds, generating energy, regulating water flow, net producer of oxygen, net sink of suspended sediment, with fish ladders.
- Remove trees; deep; limited cattle access?



Not this!

# The model farm/ranch: Fire



- Fire gradually eliminated as a management tool
- Fire breaks along fences and forests
- Formal agreements with neighbors



# The model farm/ranch: riparian zones

- Riparian zones delimited by roads (soy farms) or fences (cattle ranches)
- Tree planting/seeding in *Brachiaria* areas
- Restricted stream access for cattle with sand/gravel in stream bottom



# The model farm/ranch: Soil management



- Anti-erosion bunding
- No-till agriculture; cover crops; crop rotation
- Forest recovery on slopes



# The model farm/ranch: Fauna



- Connectivity of forest reserves; year-round water
- No hunting

# The model farm/ranch: agrotoxins



- 500 meter buffers near streams
- Certified chemicals
- Washing/disposal of receptacles

## What we know:

- MOST of the abandoned lands in the Amazon undergo rapid secondary succession to secondary forest

# What we know:

- MOST of the soils that are cleared have low vulnerability to erosion

## What we know:

- MANY of the processes that degrade Amazon ecosystems could be avoided at low cost:
  - Accidental forest burning from escaped management fire
  - Sloppy timber harvest techniques
  - Fragmentation of private land forest reserves (reserva legal, APP)
  - Cattle access to streams

# What we know:

- Re-establishing tree cover along degraded streams is the single most important step towards its restoration
  - Shades out grasses
  - Shades water
  - Food source for aquatic community



# What many people think they know, but don't (the myths):

- River discharge decreases with deforestation
- Headwater springs supply most of a stream's discharge
- Forest restoration in degraded riparian zones and upland sites requires nursery-grown seedlings.

# What we could know with a MINOR research effort:

- Under what conditions do stream ponds (a) reduce sedimentation? (b) increase water oxygen content downstream?
- What are the most cost-effective ways of encouraging tree establishment in riparian areas dominated by *Brachiaria humidola*? *B. brizantha*?

# What we could know with a MAJOR research effort:

- How do dams and stream ponds affect migratory fish?
- How do agrotoxins move through agroindustrial watersheds?
- Why are there so few algae in streams that traverse pastures?
- Does no till agriculture maintain soil aggregate structure?

# Conclusions:



# Conclusions:

- A scientific basis for environmental management of cattle ranches and soy farms is close at hand
- Some of the most challenging research questions are: the movement of agrotoxins through watersheds and the long-term structural integrity of soil