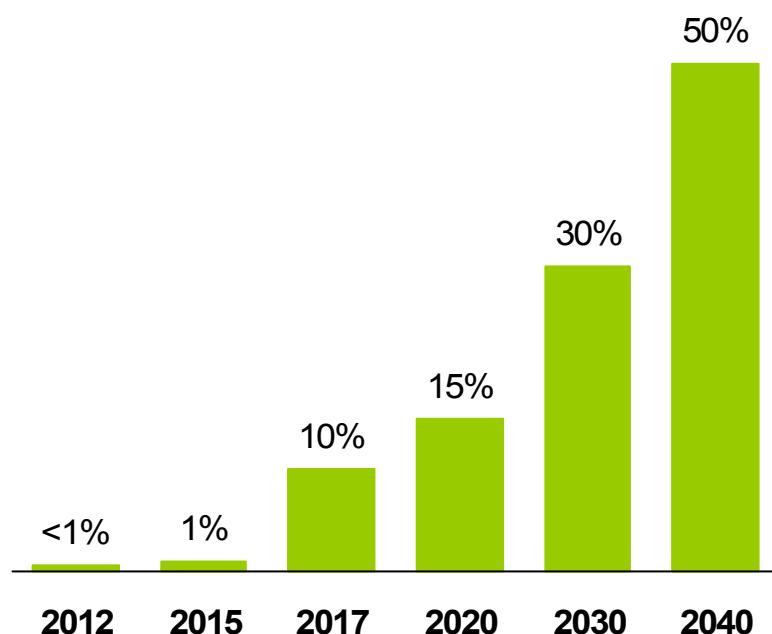


World Biofuel Markets
March 22-24th, 2011
Rotterdam, Holland

Starting point: Biokerosene will become a reality until 2020, but feedstock production is still a major challenge

IATA's goals of alternative aviation fuel share

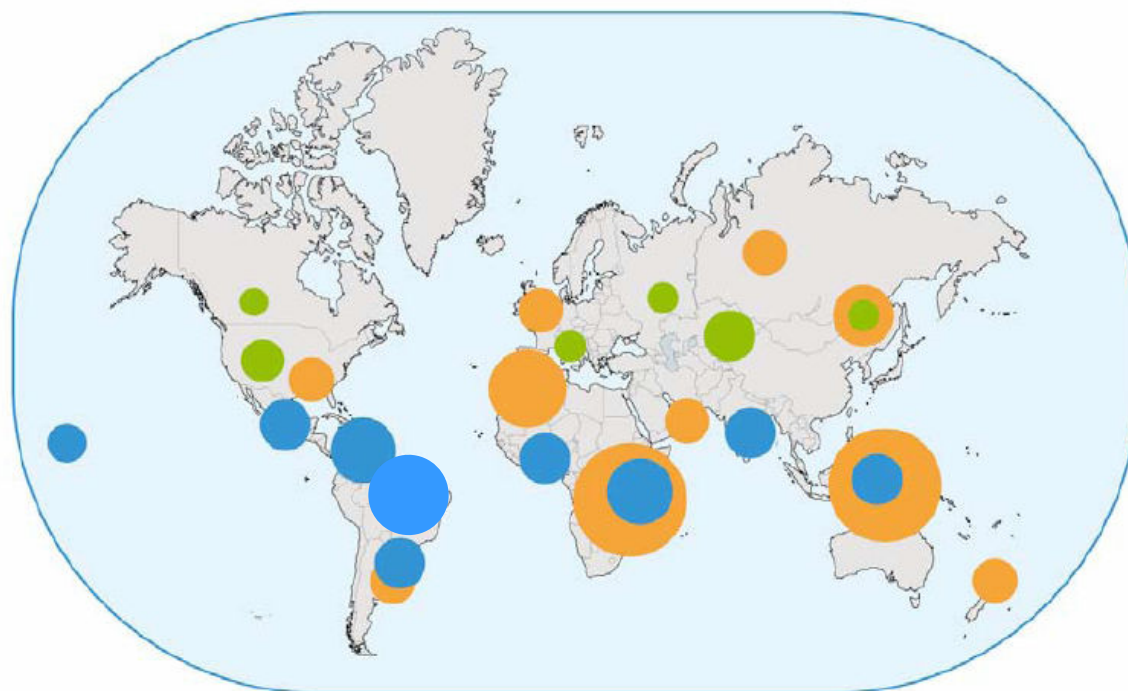


Key messages

- Biofuels will become a reality in aviation fuels over the next ten years (2011-2020)
- International Air Transport Association (IATA) committed goal: 15% biofuels in aviation fuels until 2020
- First steps have been taken – technical feasibility can be considered as given
- **Key challenge:** Produce necessary volumes of sustainable feed stock to supply the aviation industry

Jatropha is one of the key feedstocks for Bio-jetfuel – IATA perspective

Optimal locations to grow sustainable aviation fuel feedstocks



● Jatropha ● Algae ● Carmelina

Comments

- Jatropha one the three most promising aviation fuel feedstock
- Carmelina viable in moderate climates
- Jatropha in the tropics
- Algae only medium term commercially viable option

The Jatropha BioJetFuel project will contribute to solve the feedstock challenge – targets and approach

Targets



- Make viable amounts of biokerosene available in the medium term (> 1 Mio. Tons p.a. until 2020)
- Turn Jatropha into a viable and sustainable feedstock for bio-jetfuel
- Create a showcase for global, large scale and sustainable biofuel production with positive effects on local development

Approach



- Global approach on three continents
- Focused integrated R&D
- Realistic timeframe: two stage approach 2011-2014 and 2015-2020
- **Focus on sustainability:** certification for complete value chain to be compliant to major sustainability guidelines
- Strong network of stakeholders along the value chain
- Coordination by Global Bio-jetfuel Initiative (**Curcas, Inocas, Cosmo, Santiago**)

The Jatropha Bio-jetfuel Project will proceed in two phases – ramp up until 2015, roll-out until 2020

Phase I: Ramp-up

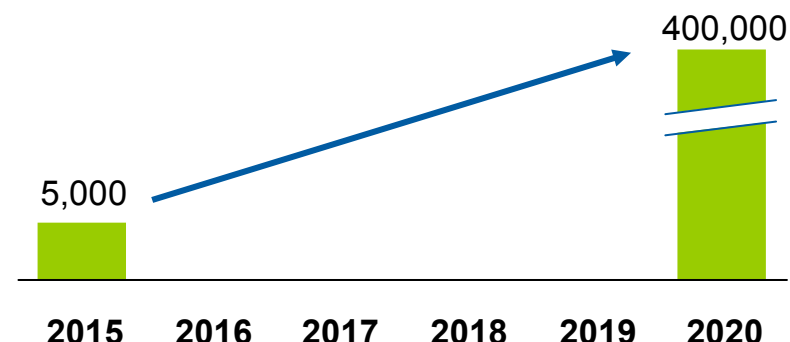
Plantation size (ha) to be developed



Focus in phase I

- R&D: best planting material/ propagation techniques
- Development of best agricultural practices for large scale development and Family Farming
- Global placement trials: Asia, Africa, Americas
- Brazilian Bio-jetfuel Platform – business case on an integrated Jatropha value chain in Brazil
- Sustainable feedstock off-take program

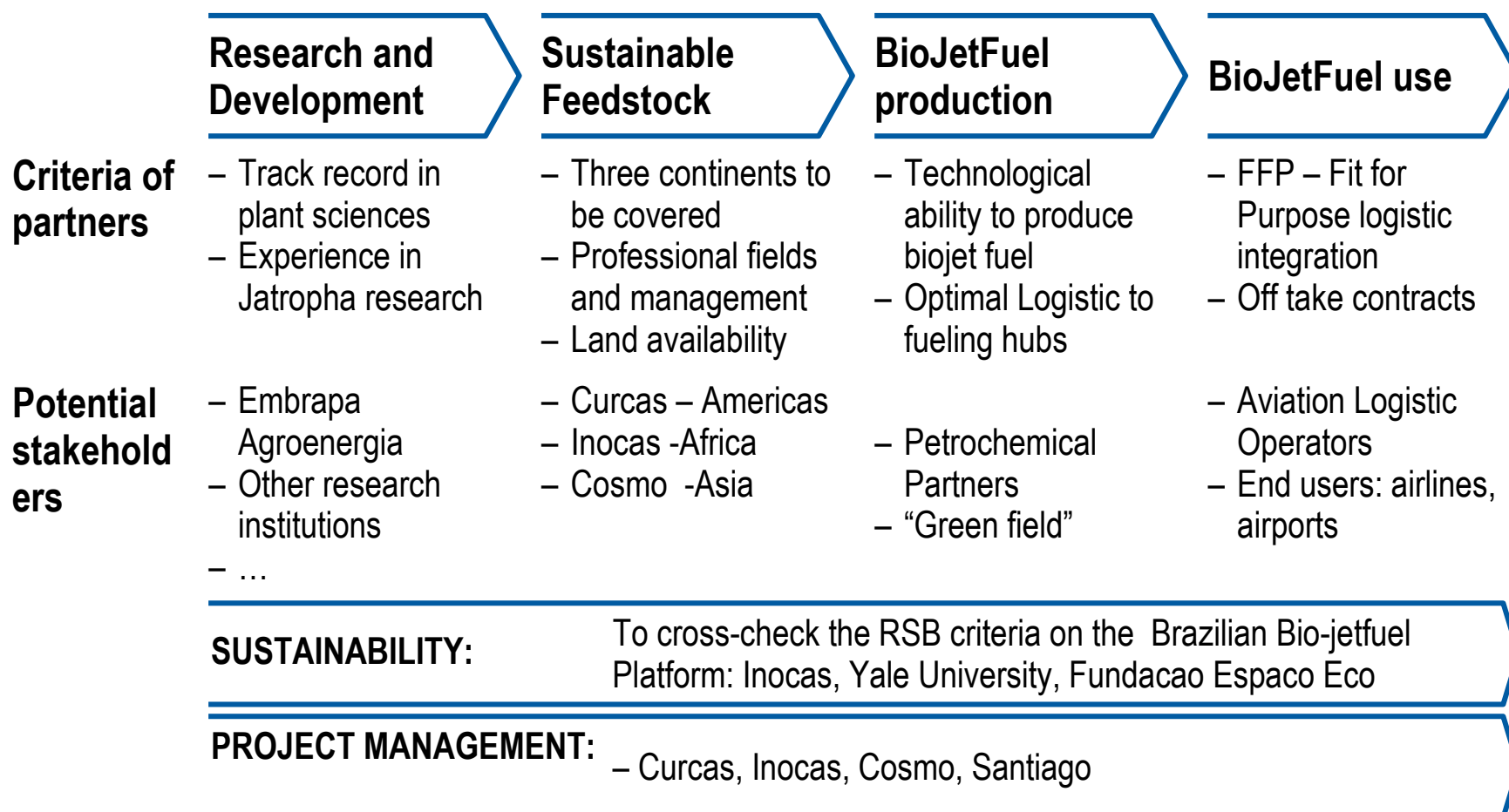
Phase II: Up-scaling/rollout



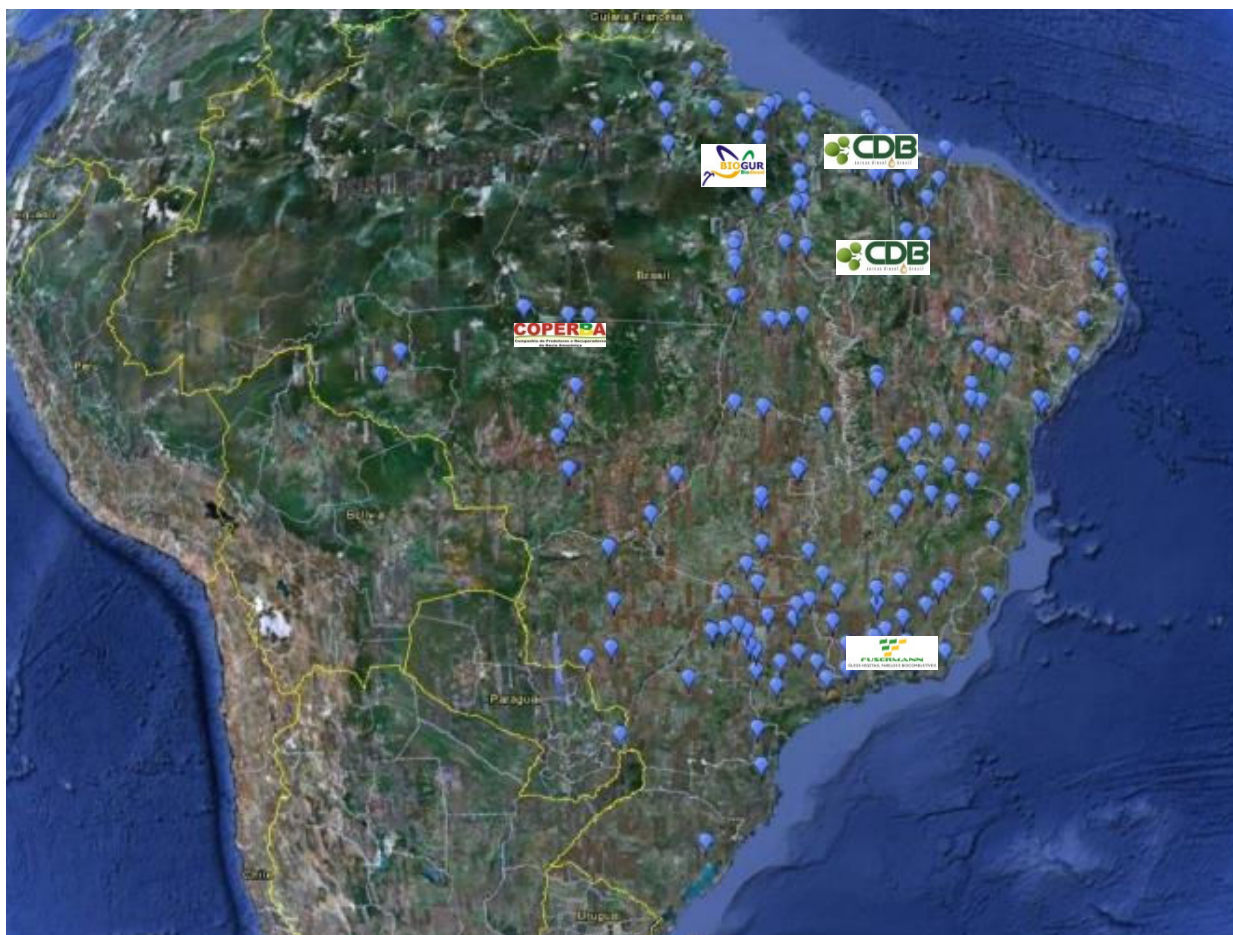
Focus in phase II

- Scale-up of pilots in the three continents
- Integration to refinery infrastructure and final logistics – field to wing
- Implementation of large scale plantations, including mechanization
- Implementation of Food + Energy program for family farming
- Sustainable feedstock trading

The Jatropha Bio-jetfuel value chain for sustainable feedstock

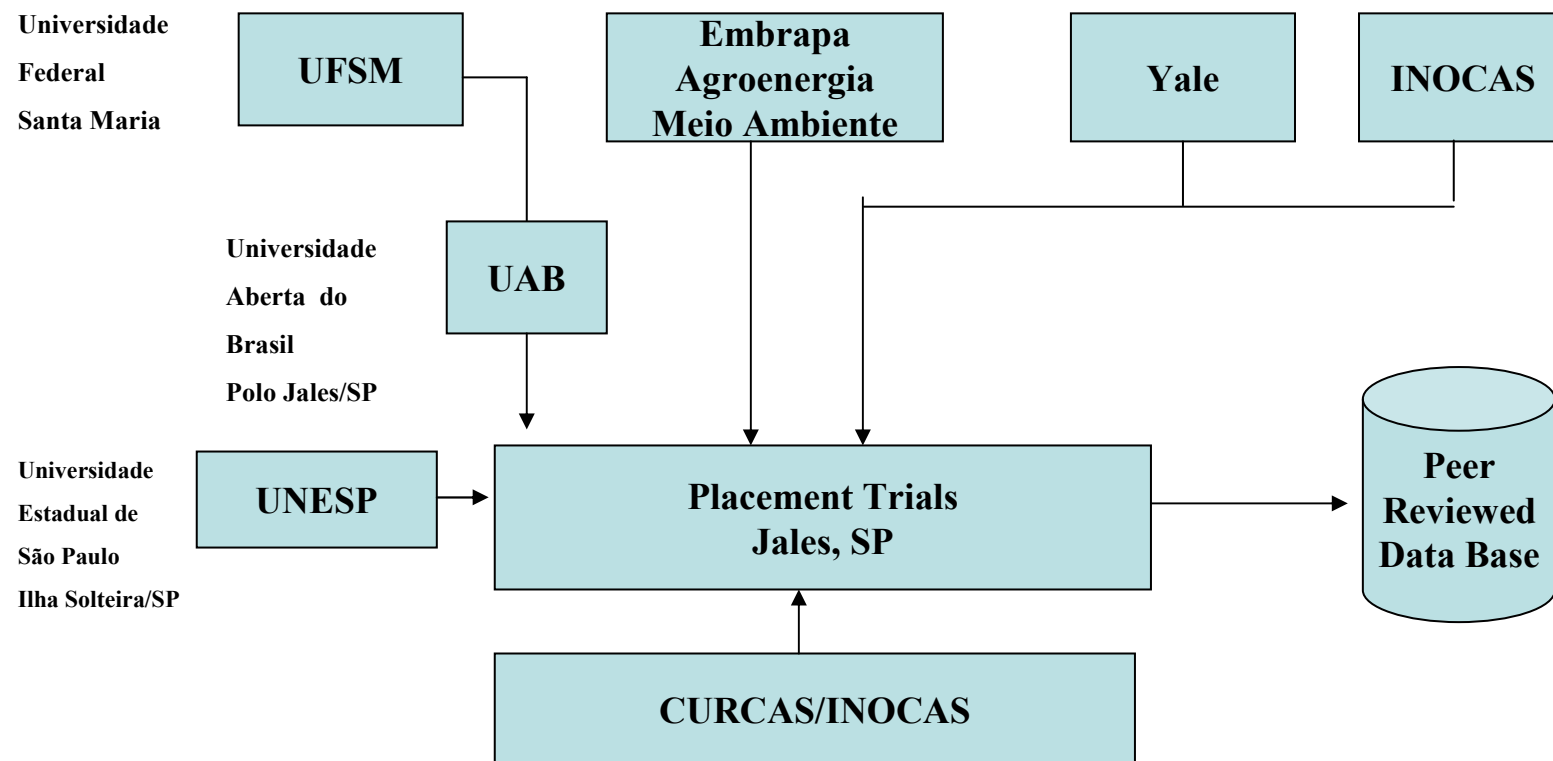


Site location for placement trials and 172 municipalities with Jatropha plantation



ABPPM - BRAZILIAN ASSOCIATION OF JATROPHA GROW

Jatropha Sustainability Cross Check



Jales experiments:

- a) 15 students of family farming and sustainability Jatropha intercropped with sesame
- b) 4 families on a food + energy pilot program
- c) Embrapa placement trial
- d) UFV placement trial

Objectives:

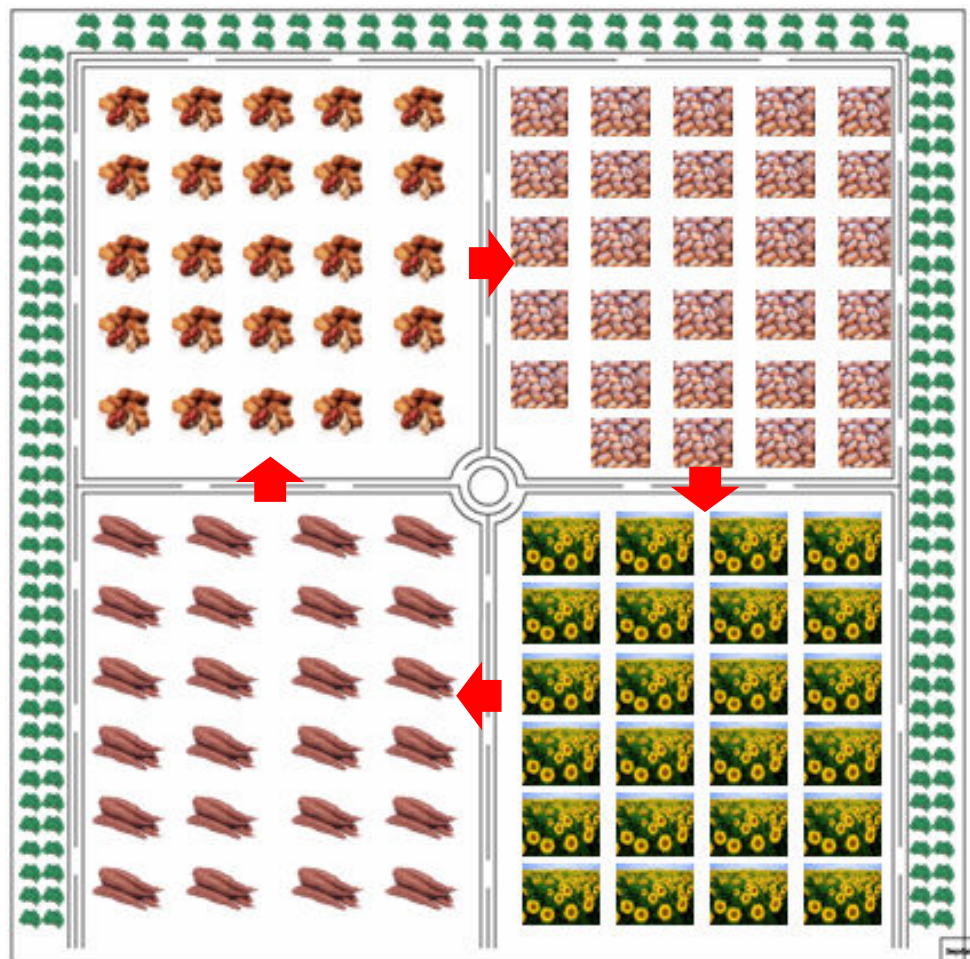
- Jatropha LCA
- Sustainability cross-check RSB criteria
- Peer reviewed data

Global Jatropha Placement Trials Program

- Integrate Global Jatropha R&D initiatives to actual farming projects
- Establish a Jatropha placement trials program with selected elite material and propagation methodology in the three continents (AAA) to support R&D, and train farmers on Jatropha plant cultivation
- Develop sustainability standards with hand-on experience in the field
- Certify sustainability for the feedstock off-take program

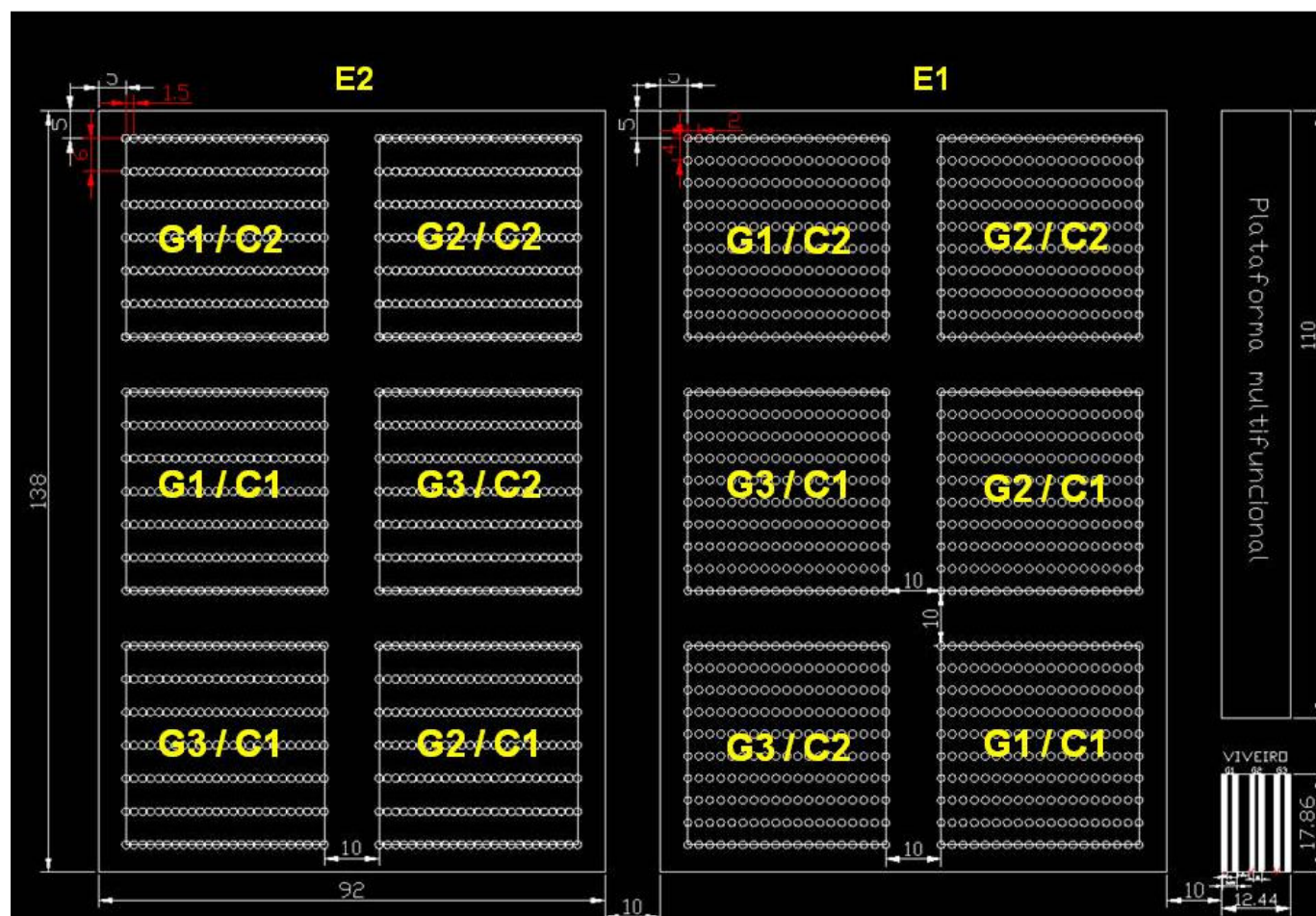
Boundary crop – SCC

- Cartesian System
- Intercropping energy with food, providing mutual benefits to the crops
- Crop rotation for soil improvement
- Cross breeding



Jatropha Placement Trials Program

Public-Private Partnership → ABPPM and EMBRAPA



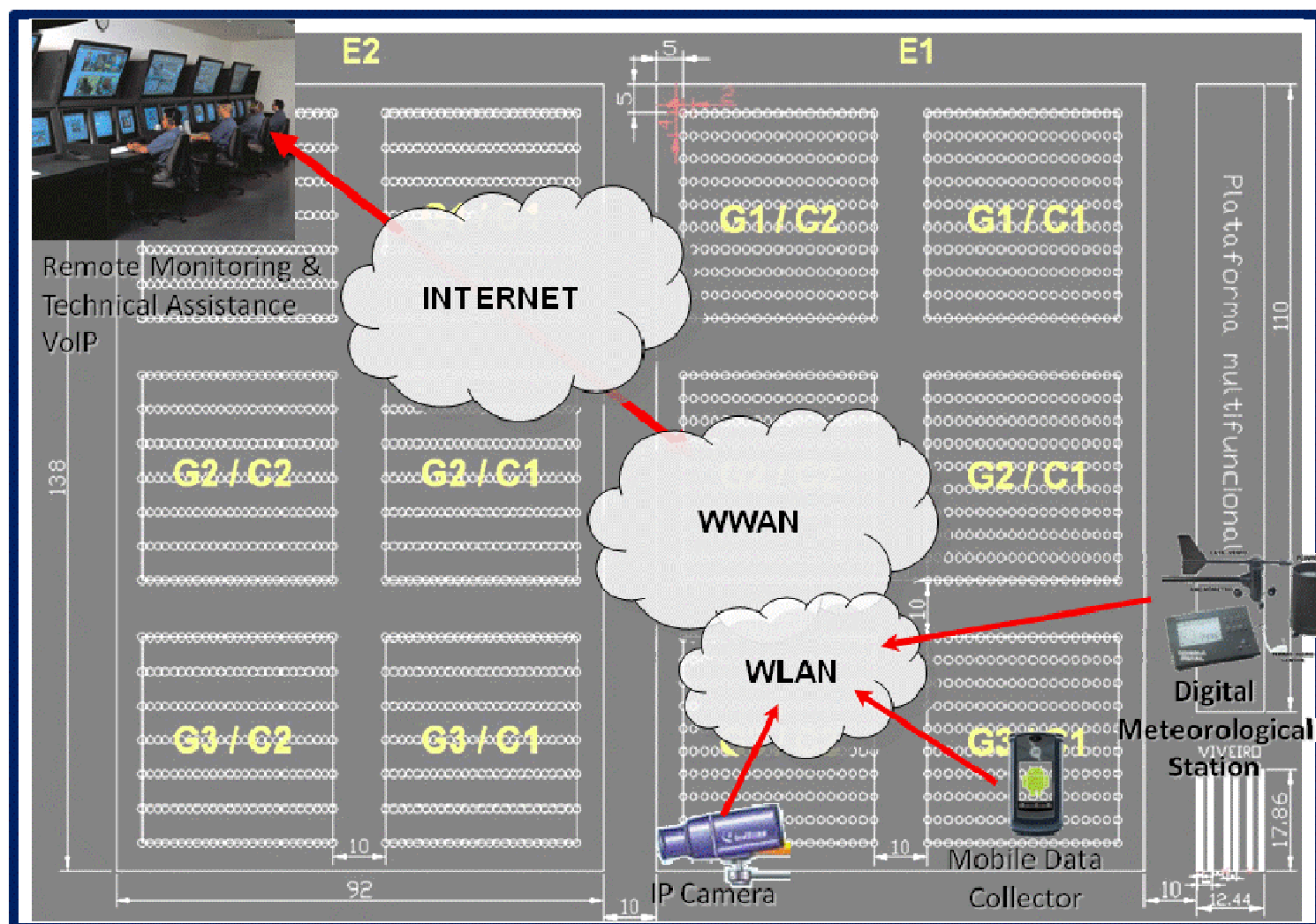
Prunning

C1 – without apical pruning
C2 – with apical pruning

Genotypes

G1, G2 – Embrapa
G3 – Biojan, Paraguaçu

Jatropha Placement Trials Program IT Monitoring and Data Collection



**THANK
YOU!**

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