Sustainability Certification of Feedstocks – RSB’s Global Perspective

From macauba in Brazil, jatropha in Mexico, pongomia in Paraguay, carinata in Canada, and camelina and perennial grasses in the US
The New Oilseeds
Looking beyond soy and canola
CAMELINA SATIVA

- Rotational Oil Seed Crop for Fallow Land
- High Oil Content
- High Omega3 Animal Feed
- Low Input Requirements
- Low Moisture
- Less than 100 day crop
  - Full Regulatory Approval: EPA, CARB, FDA, & USDA
- No ILUC (as modeled by EPA and CARB)
- Uses Existing Farm Equip.
• Tolerance for heat, drought, and disease allows for cropping on land which is typically left fallow – i.e.: does not displace food production;

• Carinata oil is suited specifically for the aviation sector, a growing contributor of GHG emissions.
Pongamia

- 8 times more vegetable oil than soy (400 gal. vs 50 gal)
- 2 times more protein animal feed per acre than soy (2 tons vs. 1 ton)
- One-tenth the water and chemicals of soy
- Nitrogen fixing
- One hectare of Pongamia plantation sequesters approximately 2.5 MTs of CO2
- Of which 1.5 MTs are re-emitted by Pongamia biodiesel
- Resulting in a NET CO2 sequestration potential of 1 MT of CO2 per hectare
Jatropha

- Grows on poor, rocky soil
- Drought resistant
- Can be used as a living fence, or in a plantation model
- Opportunities for both manual harvest (rural development) and mechanization
- Native palm tree of South America ("cerrado region") with fruits with 20-30% oil content

- **Rural development**
  Fruit collection provides family farmers and women in rural areas extra income

- **Food security**
  Macauba has natural occurrence in patches of natural vegetation, in degraded areas or can grow naturally in pasturelands or associated to food crops. No land use change is expected.

- **GHG emissions**
  Fruits obtained from extrativism can produce oil with very low GHG emission (no input is required for production in natural areas);

- **Biodiversity Benefits**
  As a native tree, the sustainable management of macauba contributes to ecosystem restoration and conservation of natural vegetation in "cerrado" areas, as an alternative to the conventional oil crops.
SOLARIS “SEED TOBACCO”

- **GMO free energy tobacco patented plant**
  Sunchem is a research & development company developing next generation energy crops

- **No nicotine biofuels (animal feed, biomass for energy)**
  The Solaris variety does not contain nicotine and is characterized by low leaf and high seed production; the separation and pressing of seed generates oil for biofuels, press cake for animal feed and biomass for energy generation

- **Low carbon footprint**
  As a result of multiple annual harvests and high yields per hectare, Solaris Seed Tobacco has a very low carbon footprint
BIOMASS FOR POWER AND CELLULOSIC FEEDSTOCK
GLIRICIDIA SEPIUM

- Used as a **live fence** in the dry zone of Sri Lanka and to **prevent soil erosion** in the tea plantations and wet zone of the country.
- Grown in 3 rows in which the first row is used as firewood, and the 2nd and 3rd can be sold.
- **Provides organic fertilizer, a natural insect repellent, and also feed for animals.**
- Nitrogen fixing
- Can be cut back to crop height year after year with no adverse effects
**Switchgrass**

- Native
- Perennial
- No need for fertilization
- Great for soil erosion, water quality, wildlife and carbon sequestration
- Can be easily converted back to row crops if need be.
- Annual crop
- Geographically suitable to most of the US
- Little to no management required after establishment
- 3-7 tons per acre depending on region of US and variety of Switchgrass used.
Giant Miscanthus

- **High yield**
  - 10-20 tons/acre!

- **Low input**
  - Nutrients sent from the stems to the rhizomes underground in the fall and reused in spring for rapid growth

- **Perennial**
  - Limited soil disturbance allows soil carbon to build
INDUSTRIAL WASTES
• High value protein (gluten) & high grades of ‘A’ starch from Industrial Grade Flour separated for specialty food applications

• Low grades of waste starch converted into high value end product (ethanol)

• Remaining protein, fiber & other non-fermentable products recovered and sold for animal feed products

• Residual solids in waste water stream recovered as Biogas from Waste Water Treatment Plant

• Water re-use at Factory and residual water irrigated on Environmental Farm for pasture growth and beef cattle sales
MANILDRA GROUP OF COMPANIES
Value Added Products - Assisting the Environment

Nowra Plant Process

Flour → Starch Plant

‘A’ Starch → Syrups Plant

Syrups Plant → Starch Sales.

Waste Starch → Ethanol Plant

Ethanol Plant →

- Gluten Sales.
- Starch Sales.
- Brewers Syrup Sales.
- Glucose Sales.
- Gemspray Sales.

Fuel Ethanol Sales & Industrial Ethanol Sales.

Carbon Dioxide Sales.

Mill Feed → Stillage Recovery Plant

Stillage Recovery Plant → DDG Sales

Environmental Farm → Bio gas/Recycled Water.

Beef cattle sales.
No Land Use Change nor Indirect Land Use Change
No interference in the food value chain
Naturally occurring microbe biodegrades industrial waste*
True waste; unavoidable residue of industrial production**
Third party LCA demonstrate GHG reduction >75%***
Carbon reduction through re-usage of carbon
Abundantly available
Roundtable on Sustainable Biomaterials

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