CHALLENGING GM

The Industrialised Mindset

or

Ecological Literacy?

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INDUSTRIAL VERSUS ECOLOGICAL PARADIGMS

Industrial	*Ecological*
• Focus on individual farm components	• Focus on whole farm system
• Intensive use of external inputs	• Knowledge intensive, on-farm synergies
• Monocultures	• Polycultures, agro-biodiversity
• Simple uniformity	• Location-specific complexity
• Yield maximisation over the short term	• Yield optimisation over the long term

GM VERSUS ECOLOGICAL 'SOLUTIONS'

GM Solutions	Ecological Solutions
Herbicide resistance	Ground cover, mulches, soil fertility management, rotations, mechanical weeding, varietal choice (vigour/habit), transplants, stale seed beds, canopy cover, 'weed' crops as food/predator attractants
Pest and disease resistance	Variety/crop/farm diversity, buffer zones, predator attractants/ antagonists, biological controls, rotations, mechanical covers (fleece/mesh), forecasting/ monitoring - timing, mixed cropping, varietal selection/breeding, grafting, module planting
Improved nutrition	Biodiversity, varietal selection/breeding, soil nutrient management, efficient irrigation (higher dry matter)

EXAMPLES: VITAMIN A DEFICIENCY

'Golden Rice' fortified with beta-carotene

- Increased intake of beta-carotene (RDA 144g rice)

Beta-carotene rich 'weeds' in traditional rice fields

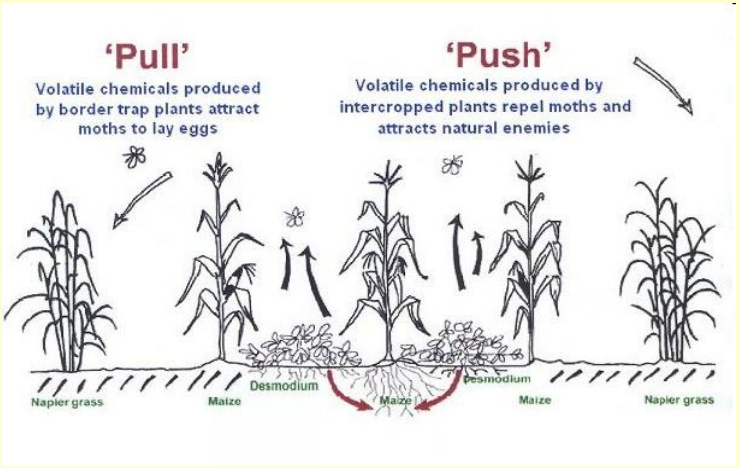
- Increased intake of beta-carotene (RDA 100g green leaves)
- Free
- Increased nutritional & biological diversity

EXAMPLES:
CONTROL OF MAIZE PESTS AND WEEDS

Herbicide resistant maize and Bt maize

- Controls maize stem borer
- Controls certain weeds

"Push-Pull" Strategy



- Controls Striga weed
- Controls maize stem borer
- Improves soil fertility
- Improves water retention
- Produces livestock fodder
- Encourages maize diversity

TACKLING A PROBLEM THE ECOLOGICAL WAY: THE CASE OF DROUGHT RESISTANCE

The Challenge in Cuba

Climate Change	+ Intensive Agriculture	+ Lack of Finances/Fuel	= Successive Harvest Failures
Temp rise 0.5^0 Drought 2002-06	60% soils eroded 40% low water retention 45% low fertility	For irrigation systems	In Holguin Province, 1 year: •3,000 wells dried up •2,000 livestock deaths •400,000 litres milk lost •Maize not sown

The 'Solution': Participatory Development of Rainwater Harvesting and Conservation Strategies

INSTITUTO NACIONAL DE CIENCIAS AGRÍCOLAS
San José de las Lajas, La Habana, Cuba

garden organic
celebrating 50 years of organic growing

Year 1:
1 Province, 2 communities, £15,000

Actions:

- Increase farmer knowledge on water cycles, salinisation and water management
- Experiments with drought-tolerant varieties, rainwater capture, soil improvement and cover crops

Year 1: Results

- Increased farmer capacity to experiment and work together
- Increased crop diversity
- Livestock corralled for manure collection
- Uptake of wormeries and biofertilisers
- Improved soil-water retention capacity
- New local vegetable market
- New local seed market
- Increased family income and nutritional availability

Year 1

“A year ago, drought was a worry to us, but now we don’t list this as so important”

Farmer, Las Caobas, Holguin

Year 2:
Increasing Ecological Literacy

"Greening the desert?"

Geoff Lawton, Permaculture Research Institute, Australia

Year 2: Drought-Proofing Farms

4 provinces, 20 communities, £20,000

WHICH WOULD YOU CHOOSE?

GM Drought-tolerant maize (Budget $47 million)

- Increase in maize yields and/or
- Decrease in water requirements for maize

Drought-proofed farms

- Increase in total farm yields
- Drought no longer a problem
- Soil fertility/biodiversity improved
- Water available for household/ livestock

La biotecnología y la ingeniería genética han abierto las puertas a la modificación de organismos vivos. Ya no se trata de lograr mejores variedades a través del cruzamiento, sino de la alteración deliberada del genoma. En la agricultura, esta tecnología ha sido empleada con el fin de obtener cultivos que sean más resistentes al ataque de plagas y al uso de herbicidas, con superiores concentraciones de vitaminas o cuyos frutos se conserven por más tiempo.

Por consiguiente, han emergido nuevos planteamientos bioéticos que reinterpretan los principios básicos de la existencia y función de los seres vivos en la naturaleza. El empleo de estas tecnologías ha originado no pocas preocupaciones y polémicas en sociedades que deben atender con urgencia y responsabilidad el deterioro del medioambiente, los desastres financieros, las críticas situaciones sociales, así como los problemas alimentarios y energéticos.

Los textos reunidos en este volumen son una contribución al imprescindible debate transdisciplinario sobre tan relevante tema. Desde una perspectiva científico-técnica y bioética, se conjugan para valorar qué se gana y qué se pierde con la introducción de cultivos transgénicos en Cuba.

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Transgénicos ¿Qué se gana? ¿Qué se pierde? Textos para un debate en Cuba

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¿Qué se gana? ¿Qué se pierde?

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COMPILADOS POR

Fernando R. Funes-Monzote y Eduardo F. Freyre Roach

The industrialised mindset: the pathological basis of GM?

Research and interviews with over 400 Cubans in the food and farming sector (Wright, 2009) revealed:

- **No private sector therefore no corporate interests**
- **High level of industrialisation – obsessive focus on increasing yields**
- **Misperceptions and lack of logic around the ability of organic production to perform (in the face of scientific evidence)**
- **Underlying fears around lack of food/starvation and loss of control over nature/farmers and subsequent chaos.**

"The industrialised mindset is the underlying psychological state that drives the development of technologies – including GM - in the absence of evidence on their efficacy !"