



Embrapa and Tropical Agriculture Development

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Director-President





Dr. Norman Borlaug stated: “the development of the Cerrado is one of the great achievements of agricultural science in the 20th century”, which, “has transformed a wasteland into one of the most productive agricultural areas in the world.”

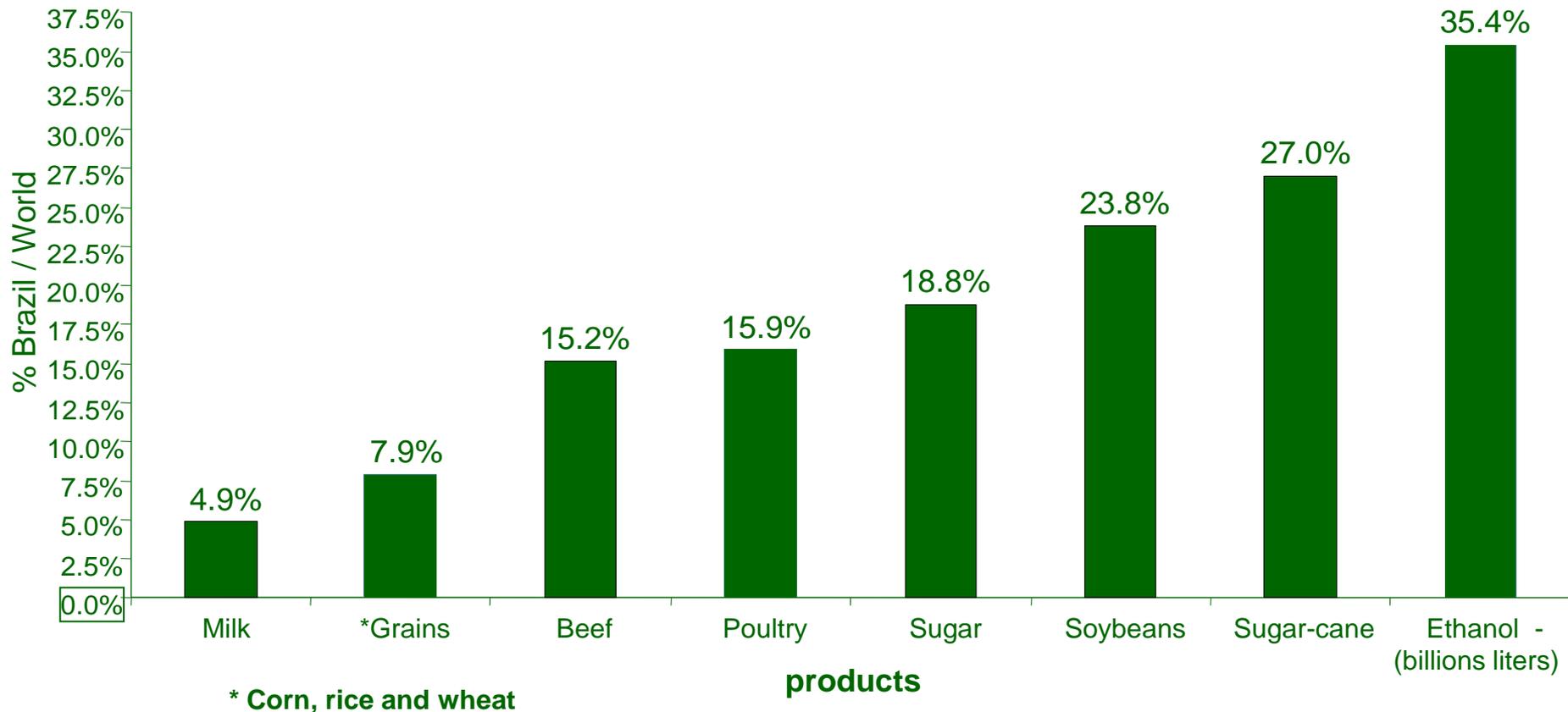


The Building of Tropical Agriculture



Brazilian Tropical Agriculture: Today

Brazilian Major contributions to the World production - 2005



Brazilian Tropical Agriculture: Today



Economic and social impacts:

- **Inward development**

 - increased Human Development Index
 - higher income, education, health, and jobs

- **Stable food supply**

- **Lower basic food prices**

- **Increased agricultural exports**

 - trade surpluses, diminished financial vulnerability



Brazilian Tropical Agriculture: before 1970's



Brazilian Tropical Agriculture: before 1970's

- Low Ag Production (few itens)
- Low Productivity
- Yield Shortages, Food Supply Crisis
- Expensive Food, Inflation, Poverty
- Inadequate Ag Public Policies
- Lack of Specific Knowledge about Tropical Ag
- Institutional void (ag research, education, markets, midia and governmental agencies, etc)

THE TASK: TO MOVE FROM AGRICULTURE APPLIED TO THE TROPICS TO TROPICAL AGRICULTURE



What was done

- The needed public policies
- The needed tropical knowledge
- The needed institutional building



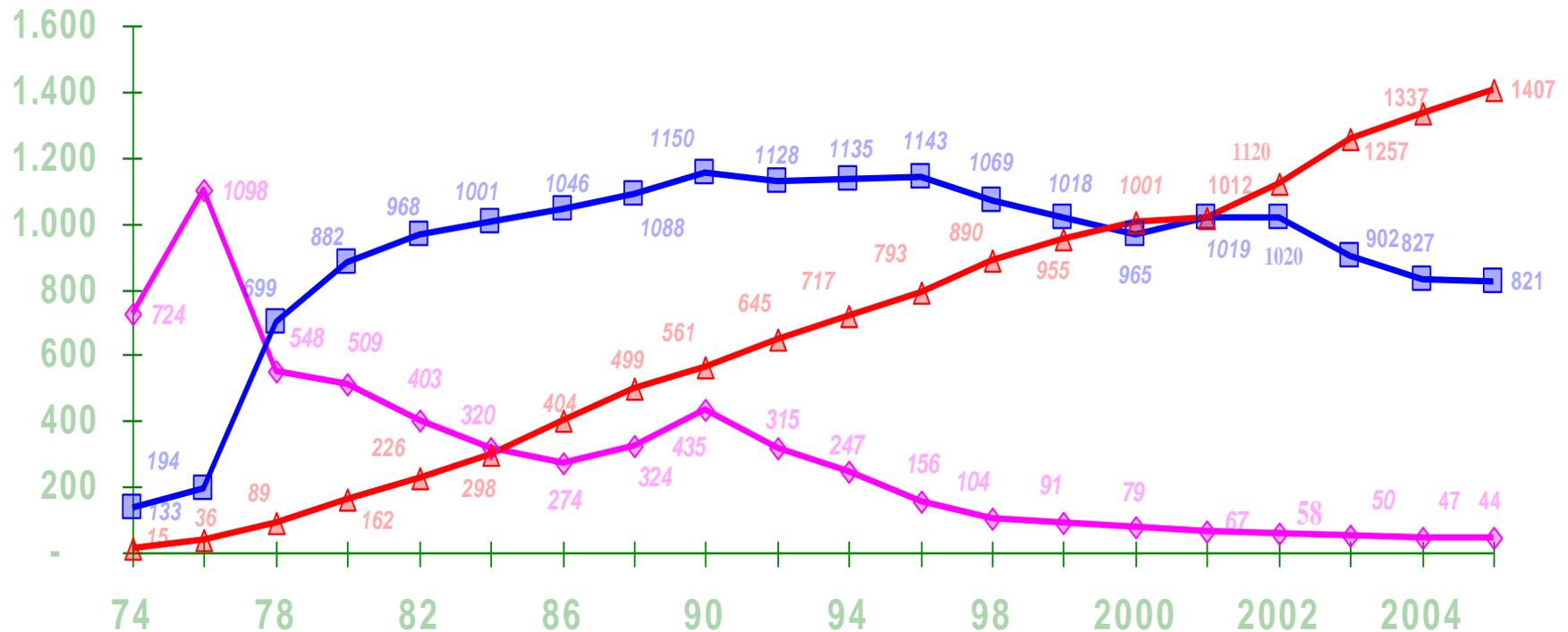
The needed public policies

- **AG CREDIT - LAND, TECHNOLOGY (SEED, FERTILIZERS, AGROCHEMICALS, MACHINERY, EQUIPMENTS, IRRIGATION)**
- **AG MARKET - MINIMUM AG PRICES
FOOD REGULATORY STOCKS**
- **AG RISK INSURANCE**
- **AG RESEARCH & EDUCATION & EXTENSION**
- **INFRA-STRUCTURE ROADS, STORAGE FACILITIES, ETC**



The needed public policies

Building Research Capability 1974 - 2005



◆ BSc

■ MSc

▲ PhD



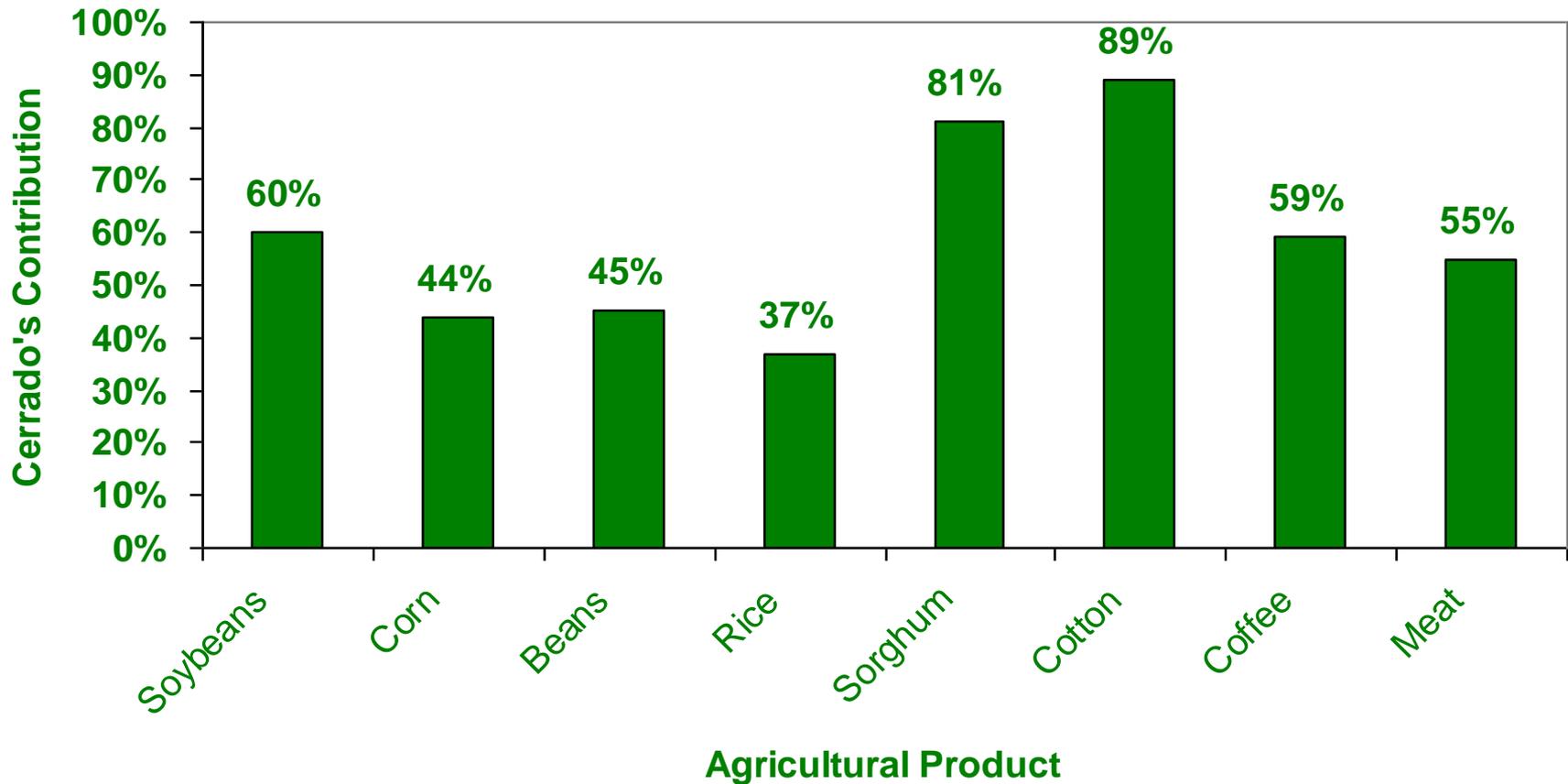
The needed tropical knowledge

- **Tropical plants and animals:**
 - soybeans (photoperiodism)
 - tropical and adapted-temperate fruits
 - zebu* cattle and poultry, etc.
- **Fibers and wood (cotton, *Eucalyptus*)**
- **N fixation**
- **Biological control**
- **No-tillage practices**
- **Sugarcane and ethanol**
- ***Cerrado* Agriculture**



The needed tropical knowledge

Cerrado Agriculture: Contribution to Brazilian Production (2004-2005)



The needed institutional building

- The Ag Graduation Net
- The Ag Research Network
- The organization of Ag Production Chains
- The modern Tropical Agroindustry
- The new ways of marketing
(trading companies, commodities future exchange, etc)



The needed institutional building

Embrapa's Innovation Network

North

- ❖ Embrapa Acre
- ❖ Embrapa Amapa
- ❖ Embrapa Western Amazonia
- ❖ Embrapa Eastern Amazon
- ❖ Embrapa Rondonia
- ❖ Embrapa Roraima

Northeast

- ❖ Embrapa Mid-North
- ❖ Embrapa Tropical Semi-arid
- ❖ Embrapa Coastal Tablelands
- Embrapa Goats
- Embrapa Cassava & Tropical Fruits
- Embrapa Cotton
- Embrapa Tropical Agroindustry

Midwestern

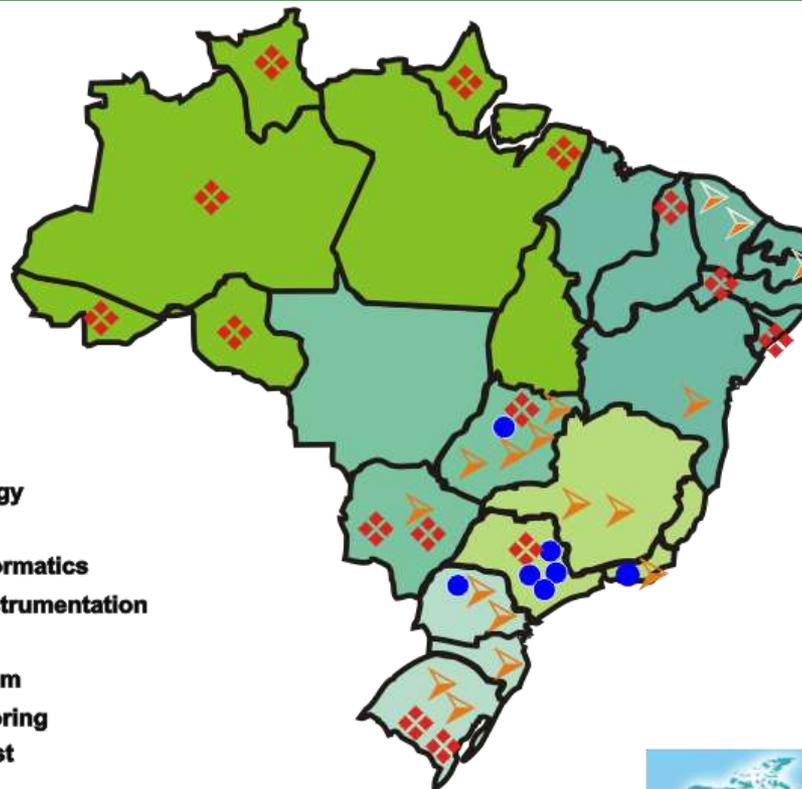
- ❖ Embrapa Western Region Agriculture
- Embrapa Rice & Beans
- Embrapa Coffee
- ❖ Embrapa Cerrados
- Embrapa Beef Cattle
- Embrapa Vegetables
- ❖ Embrapa Pantanal
- Embrapa Genetic Resources & Biotechnology
- Embrapa Technological Information

Southeast

- Embrapa Agrobiology
- Embrapa Food Technology
- Embrapa Dairy Cattle
- Embrapa Agriculture Informatics
- Embrapa Agricultural Instrumentation
- Embrapa Environment
- Embrapa Maize & Sorghum
- Embrapa Satellite Monitoring
- ❖ Embrapa Cattle-Southeast
- Embrapa Soils

South

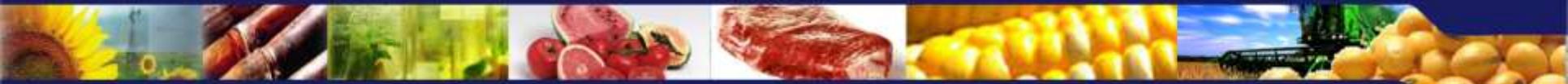
- ❖ Embrapa Temperate Agriculture
- Embrapa Forestry
- ❖ Embrapa South Animal Husbandry & Sheep
- Embrapa Soybean
- Embrapa Swine & Poultry
- Embrapa Wheat
- Embrapa Grape & Wine



Labex - USA

Labex - Europe

Embrapa Africa



Tropical Agriculture: a fine case of international scientific cooperation

THE REVOLUTION AND SOME OF ITS HEROES

Dr. Colin McClung, Dr. Edson Lobato and their ways...
(R&D cooperation, technology transfer and public policies)

Dr. Alysso Paolinelli...

(ag education, public policies, Ag laws,
business leadership and consulting, etc)

AND...

Dr. Norman Borlaug (a supportive action on R&D)





Tropical Agriculture: Challenges for the future



Tropical Agriculture: Challenges for the future

Ten major challenges for mankind in the coming 50 years

2003: 6.3 billion people
2050: 10 billion people

Energy

Water

Food

Environment

Poverty

Education

Democracy

Population

Diseases

Terrorism & War

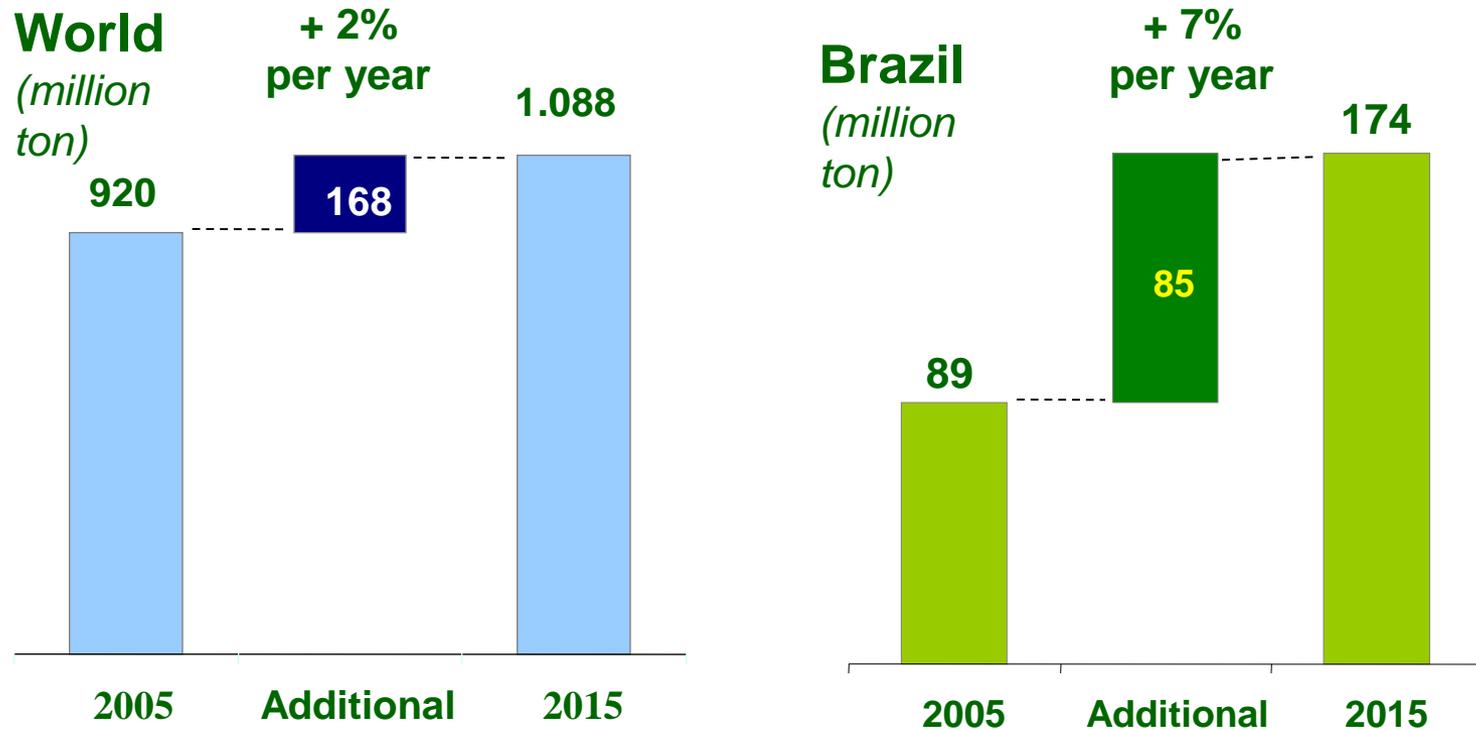
*(Nobel Prize winner Alan
MacDiarmid. at Embrapa. São
Carlos. SP. on April 2005)*



Tropical Agriculture: Challenges for the future

Brazil: Responsibility to feed the world

World projections for soybeans and corn



Source: Bunge.



Tropical Agriculture: Challenges for the future

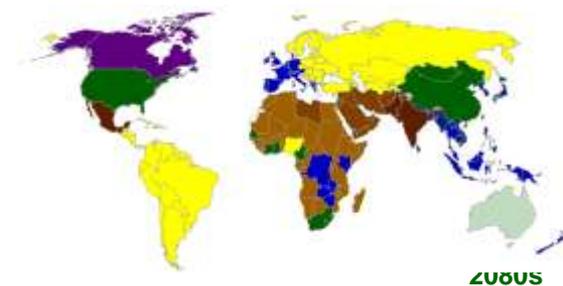
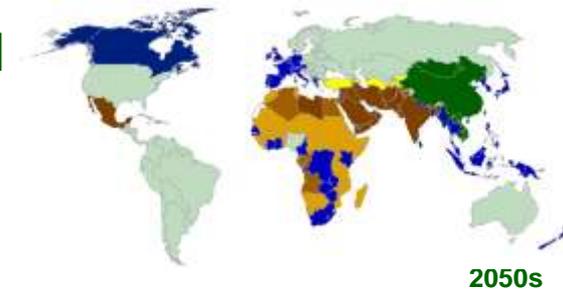
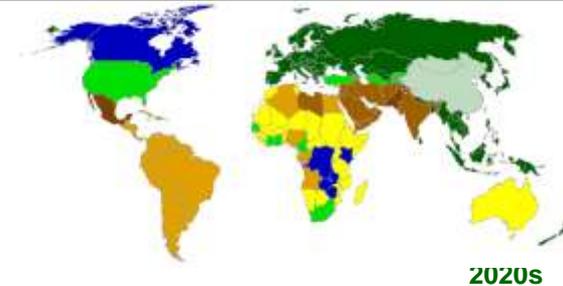
Environmental Degradation

Globally

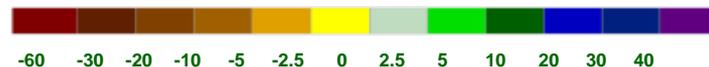
40% cultivation areas already degraded
20 to 30% forests already cut down
40% of fish reserves already explored
70% of the water is used on irrigation

Climate Changes

Temperature increases
will affect tropical
agriculture.



Yield Change (%)



Tropical Agriculture: Challenges for the future

Sustainable Utilization of Altered Areas

Humid Forests Sustainable Use

Biotic and Abiotic stresses

Crop-Pasture-Forest Integration

Public Private Partnerships

Bioenergy (ethanol, biodiesel): Embrapa Agrienergy

North-South-South Dialogue: Embrapa Africa





Crop-Livestock-Forest Integration

Dr. Norman Bourlaug's Challenge

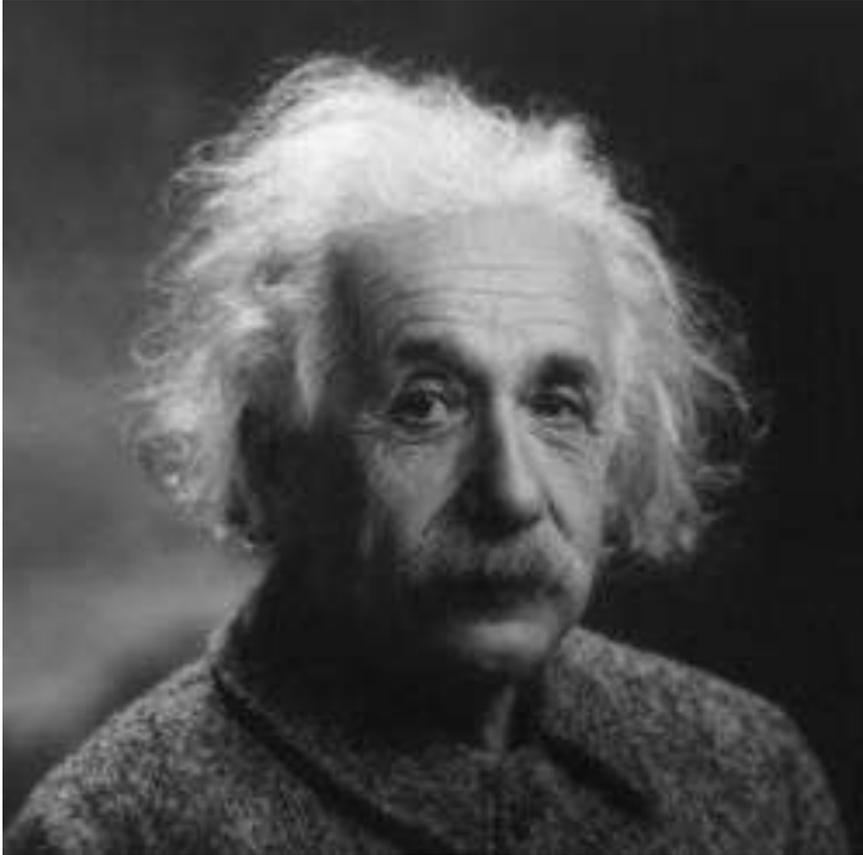
“Eventually, the Cerrado technology or one similar to it, will move into the llanos in Colombia and Venezuela and hopefully, into central and southern Africa where similar soil problems are found”.



“This will bring tens of millions of previously marginal acres into high-yield agriculture. Hundred of millions of people will benefit from their work.”



Einstein's advice



Life or Science is about:

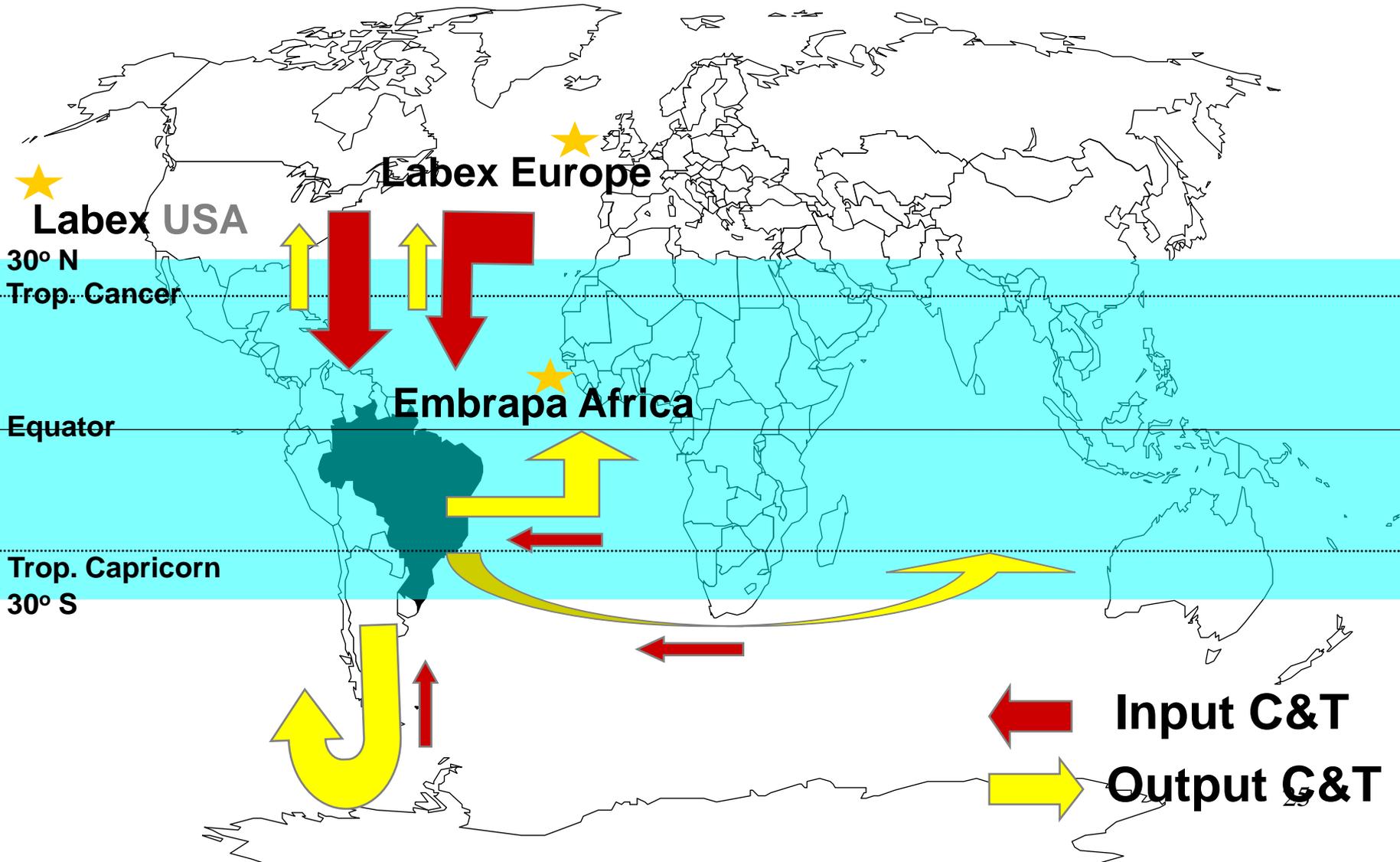
5% inspiration

95% transpiration

So, it's time to translate rethoric into action!



Tropical Agriculture: a fine case of international cooperation





**It's time to build a more equitable world
society based on sustainable
Development, Democracy and Peace!**

Thank you!

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