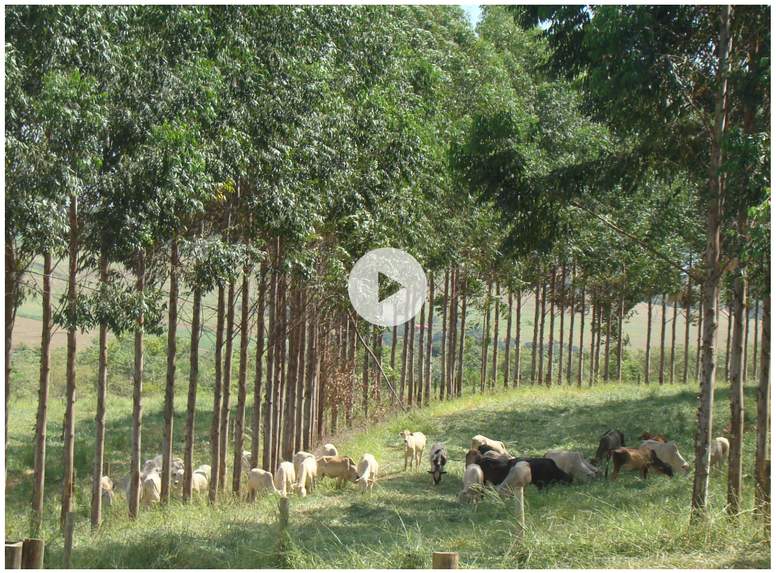
INTEGRATED CROP-LIVESTOCK-FORESTS SYSTEMS: A NEW AGRICULTURAL REVOLUTION UNDER WAY

Integrated crop-livestock-forest (ICLF) is a production strategy that integrates different production systems - agricultural, livestock and forestry - within the same area. It can be implemented using mixed, rotating, or succession crops, so that there is interaction between each component, thus generating mutual benefits.

ICLF can be implemented in different ways, with a wide range of crops and various animal species. It is adaptable to regional characteristics, climatic conditions, local market, and producer´s profile, and can be adopted by small, medium, and large producers.

Photo: Luiz Gustavo Garbelini



WATCH THE WELCOME VIDEO OF THE CITY OF RIO DE JANEIRO

- 11 million ha are being used by the crop-livestock-forest integration system*;
- 83% of this area consists of crop-livestock integration*, where soybean has a predominant role;
- The system contributes to reduce de greenhouse gas emissions;
- Between 2010 and 2015, the increase of 5.96 million ha of ICLF was responsible for the sequestration of 21.8 million tons of carbon dioxide equivalent (CO_2 eq).

**Research commissioned by the ICLFI Development Network/Kleffmann Group*

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Embrapa MINISTRY OF AGRICULTURE, LIVESTOCK AND FOOD SUPPLY BRASIL BRAZILIAN GOVERNMENT

BRAZILIAN AGRICULTURE

ONE OF THE MOST EFFICIENT AND SUSTAINABLE IN TROPICAL ZONES

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BRAZILIAN AGRICULTURE

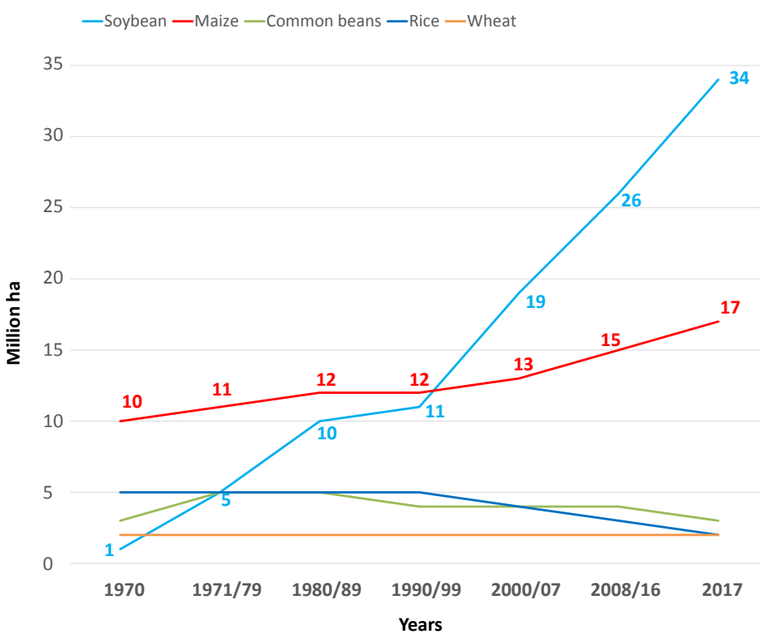
TROPICAL AGRICULTURE

Brazilian agriculture is one of the most competitive in the world. It is an example of productive efficiency in tropical regions. From being a net food importer in the 1970's, Brazil became the second major food exporter. Given its effectiveness in food production in tropical zones, Brazil presents itself as one of the main food suppliers to the world's future food demand, with soybean leading this process.

The Brazilian Agricultural Research Corporation (Embrapa), created in 1973, under the Brazilian Ministry of Agriculture, Livestock, and Food Supply, has taken on the challenge to develop a genuinely Brazilian model of tropical agriculture.

- Agribusiness accounts for approximately 25% of the GDP;
- Supplies 35% of the country's jobs and 45% of the exports;
- Maintains 61% of Brazilian lands with native vegetation.

EVOLUTION AREA OF MAIN CROPS IN BRAZIL



Sources: Conab, IBGE and author's calculation

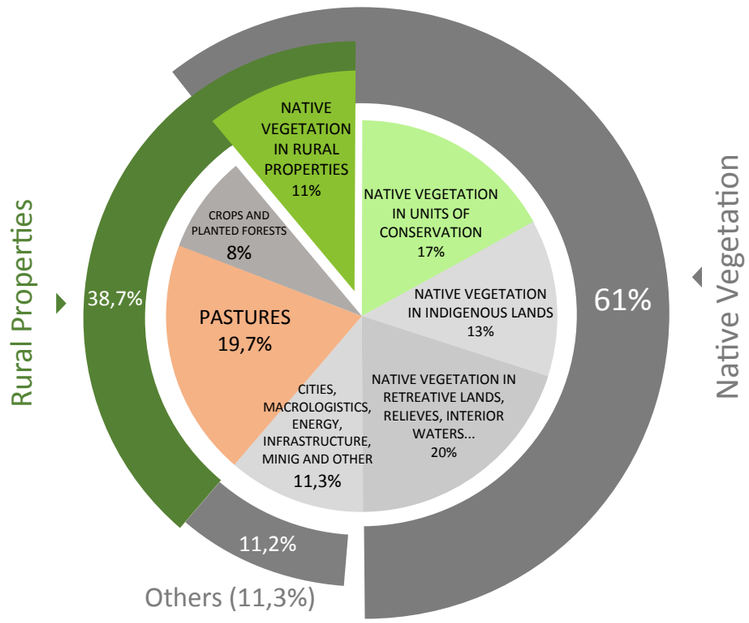
A GREAT REVOLUTION

From 1970 onwards, Brazil incorporated a wide area of infertile savannah lands (Cerrado) into an important granary of the world. Such revolution was considered one of the greatest achievements of the twentieth century, according to Dr. Norman Bourlaug, the father of the green revolution and Nobel Peace Prize.

The efficiency of the Brazilian productive systems allowed reconciling agricultural development with preservation of the environment. Currently, Brazil maintains approximately 60% of its territory covered by native vegetation. In other regions of the world, such as the United States and Europe, these rates are 23% and 1%, respectively.

In addition to the government protected areas, the Brazilian producer maintains in its properties areas of native vegetation reserves, established in Law, which depending on the location, vary from 20%, 35% or 80% of the property area.

LANDS USE IN BRAZIL



Source: GITE / Miranda, 2017. Embrapa, IBGE, CNA, MMA, FUNAI, DNIT, ANA, MPOG

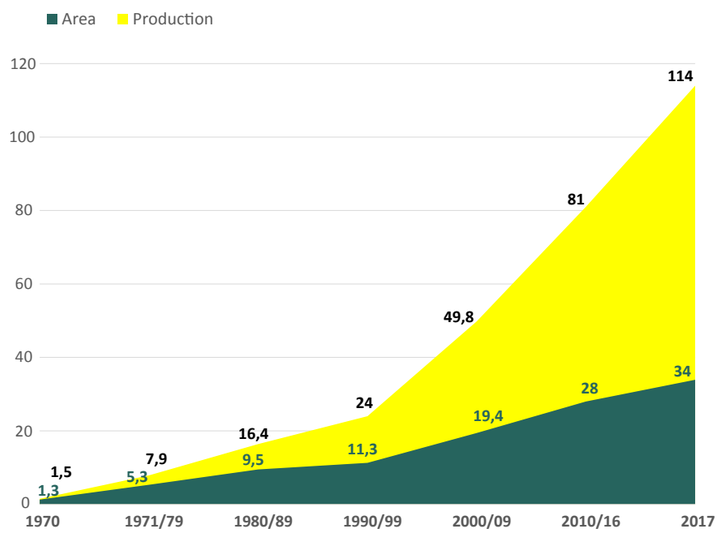
LOW-CARBON EMISSION AGRICULTURE

With a low-carbon emission agricultural model, Brazil has stood out for a more sustainable agriculture based on technologies such as No-Till System, Biological Nitrogen Fixation, Integrated Pest Management and Integrated Crop-Livestock-Forests systems.

SOYBEAN IN BRAZIL

Soybean is the crop that has grown the most in the last 40 years in Brazil. The impact of soybean on the Brazilian agribusiness has been so significant that it can be divided in two periods: before and after soybean. Much investment in science and technology was needed to adapt the crop to the Brazilian soil and climate.

SOYBEAN AREA AND PRODUCTION IN BRAZIL



Source: IBGE

- Soybean is the driving force of Brazilian Agribusiness;
- The crop is cultivated from 30°S to 5°N;
- No-Till System is applied to over 80% of soybean cultivated area, the largest area in the world;
- Biological Nitrogen Fixation with rhizobia: Exempts nitrogen fertilization, preserves water, soil quality and is applied over almost 100% of cultivated area;
- Integrated Pest Management: reduce up to 50% of insecticide used in tropical conditions.