

# EMBRAPA SOYBEAN SOLUTIONS FOR SUSTAINABLE PRODUCTION SYSTEMS



**Embrapa**



# RESEARCH AND SUSTAINABLE PRODUCTION SYSTEMS

Current agricultural production systems increasingly demand qualified knowledge and information for appropriate decision making. Embrapa Soybean, a research center of the Brazilian Agricultural Research Corporation (Embrapa) develops technologies and technical information to support the soybean crop in Brazil, helping farmers and technicians to obtain good results. **It is the Brazilian science working towards the sustainability of production systems and the profitability of farmers.**

A broad team of Embrapa Soybean research specialists expands the knowledge on soybean cropping and their interactions with the productive system, associating the assistance with the demands of the supply chain, along with a strategic view for the future of soybean production in Brazil and around the world.

Embrapa Soybean also has the role of stimulating the expansion of sunflower crop, offering new varieties, hybrids and technologies for the production system. Regionally, Embrapa Soybean acts in the development of wheat cultivars for the States of Paraná, São Paulo and Mato Grosso do Sul. The wheat cultivars from Embrapa have great yield potential, excellent phytosanitary and high bread-making quality.

# EXCELLENCE IN RESEARCH

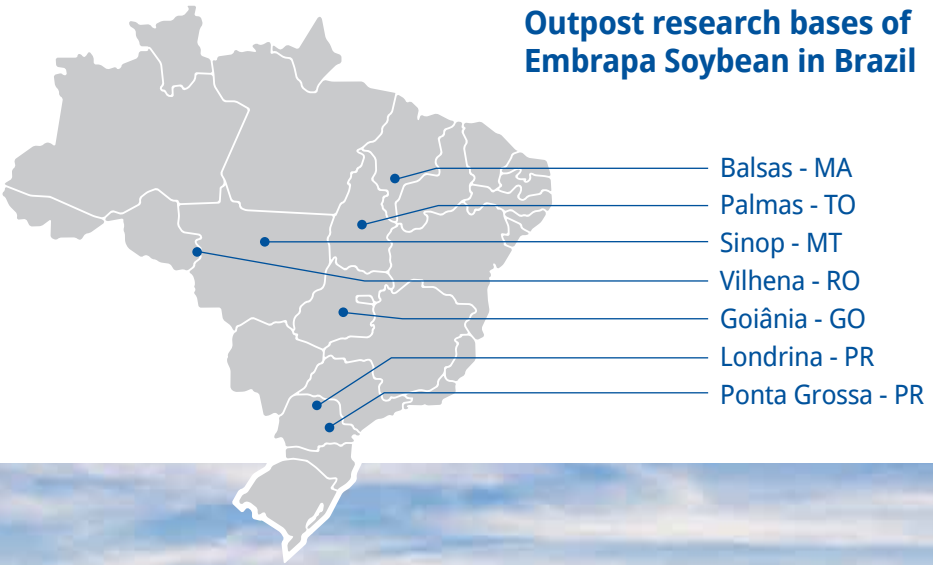
The agricultural production systems in which soybean is inserted have experienced big changes in recent years. In order to face such challenges, Embrapa Soybean maintains a modern research infrastructure in Londrina, PR, consisting of 37.221 m<sup>2</sup> of built facilities, including greenhouses, laboratories, support facilities for experimental fields, auditorium for training and administrative buildings. Outpost research bases in the country's main soybean producing regions carry out regional research, local adaptation trials and technology transfer.

The present research infrastructure allows Embrapa Soybean to respond assertively to the challenges posed by the sustainability of production systems. It was with determination that Embrapa Soybean engaged to the soybean adaptation to the tropics in late 1970s, as well as dealt with the onset of restraining diseases such as stem canker in the 1980s, soybean cyst nematode and



Asian soybean rust (ASR). The same strong response took place recently with the onset of the old world bollworm (*Helicoverpa armigera*) and with weeds resistant to glyphosate. In addition, ASR, white mold and stinkbug research networks, coordinated by Embrapa Soybean, have monitored the evolution of these problems in the soybean producing regions and have tested the efficacy of methods and products available for their control.

### Outpost research bases of Embrapa Soybean in Brazil





Another important contribution is the maintenance of one of the world's largest soybean active germplasm banks: a rich collection of soybean diversity, with more than 45,000 accesses filed. The collection is open to public and private entities for use in genetic studies and breeding programs.

For the fulfillment of its public role, Embrapa Soybean has been technically subsidizing discussions and participating in the definition of public policies for soybean, such as free-host periods, protection of pollinating insects, phytosanitary control, seed quality control, definition of classification and commercial standards, studies for the regionalization of cultivars, soybean protein content, climatic risk zoning, among other demands.

**Integrated research actions, technology transfer and communication strategies, a broad inter-institutional network of partnerships and effective mechanisms for the prospection of demands, make Embrapa Soybean a world reference research center in the generation of technology for soybean production.**

## Research Structure



**37,221m<sup>2</sup>**  
built area



**350 ha**  
Experimental field  
Santa Terezinha Farm



**38**  
Greenhouses  
12,396m<sup>2</sup>



**121 ha**  
Experimental field  
Maravilha Farm



**31**  
Research  
laboratories



**Experimental  
kitchen**

# RESPONSIBLE MANAGEMENT

Embrapa Soybean promotes and provides guidance on responsible management practices that comprises from the pre-sowing to the post-harvest stages of soybean production. The developed technologies are directed towards the sustainability of production systems, being applicable to all types and sizes of soybean farms. In addition, they contribute to the profitability of the farmer, creating benefits for the entire society. The following are some of the main contributions from the soybean research:

- Soil management recommendations for the main climate and soil regions (the oldest uninterrupted no-tillage experiments in Brazil are located in Londrina, PR, carried out for over 35 years);
- Resistance and tolerance to biotic stresses, such as insects and pests;
- Strategies for coping with abiotic stresses, such as drought, high temperatures and impacts caused by climate changes;
- Integrated management of pests, diseases and weeds;
- Soybean cultivars with high productive potential, phytosanity and production stability;
- Anti-resistance strategies in the control of pests, diseases and weeds;
- Grain storage, pest control and post-harvest technology;
- Biological nitrogen fixation and co-inoculation technique;
- Management of crops adapted to different production systems;
- Soil fertility, fertilization of production systems, and plant nutrition;
- Technology for production of high quality seeds;
- Integrated crop-livestock-forests systems;
- Technology for application of agrichemicals;
- Assessment and prevention of harvest losses;
- Technology for soybean production in agro-ecological farming systems;
- Climatic risk zoning; and
- Soybean for human consumption.







# PARTNERSHIPS AND SYNERGY FOR THE SOYBEAN CROP DEVELOPMENT

Founded on April 16<sup>th</sup>, 1975, Embrapa Soybean has had a history of contributions to Brazilian agriculture based on a broad network of research and partnerships which involve several players of the supply chain. At the national level, research activities include other Embrapa research centers, as well as cooperatives, universities, farmers associations, private companies, state organizations for agriculture and livestock research, research support foundations, rural extension organizations, among others.

Embrapa Soybean has also actively participated in several government programs and initiatives, aiming to promote technological, social and economic regional development. Internationally, it has maintained solid partnerships with American, Japanese, European, African, Latin American and Caribbean institutions.

The base of knowledge built along with the broad network of partners has made possible to expand soybean production into the tropical regions. Efforts are also being made towards new agricultural frontiers, such as MATOPIBA (a region composed by the States of Maranhão, Tocantins, Piauí and Bahia), SEALBA (formed by Sergipe, Alagoas and northeastern Bahia), and the southern half of the State of Rio Grande do Sul.

Although Embrapa Soybean is an institution focused on innovation and headed towards the future, it maintains strong connection with current challenges and needs of the society. Networking, partnerships and personnel development are the bases for continuous innovation and the assurance that Brazilian agriculture will continue to produce, in a sustainable and efficient way, food, bioenergy and wealth for the nation.

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