

the national research center for rice and beans (cnpaf) in brazil



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BEAN SITUATION IN BRAZIL

BRAZIL IS THE LARGEST consumer and producer of common beans in the world.

Common or dry beans (*Phaseolus vulgaris* L.), together with cowpeas (*Vigna unguiculata* (L.) Walp.) in some states of the Northeast, are the main protein source in the Brazilian diet. The two crops together rank fourth in economic value for the country, but are considered first in social value.

The common bean is very sensitive to environmental conditions and disease and insect pests and is considered a high risk crop. In the last decade, due to many reasons, mainly changes in the cultivation area from the best-suited lands to others of marginal aptitude, bean yields have been slowly and steadily decreasing. Also, in Brazil, as well as in many South American and African countries, common beans and cowpeas are grown mainly in association with other crops like maize, coffee, cassava, etc. Thus, agricultural research developed for these cropping systems and for other problems of the crop is very important to help the Brazilian farmer to produce more and cheaper protein.

THE CENTER AND ITS PHYSICAL CONDITIONS

The "Centro Nacional de Pesquisa de Arroz e Feijão" (CNPAF) — National Research Center for Rice and Beans, is one of the many national centers of EMBRAPA (Brazilian Enterprise for Agricultural Research).

The headquarters are in "Fazenda Capivara," a farm of 1027 ha, from which 350 ha have irrigation facilities. There are also 15400 m² of buildings (offices, laboratories, storehouses, greenhouses, screenhouses, meteorological station, garages, cold chambers, training centers, guest houses). The laboratory facilities are comparable to those existing in the best Brazilian universities.

OBJECTIVES OF THE NATIONAL CENTER

The main objective of the Center is to coordinate the research done in Brazil on rice and beans (dry bean and cowpea). The Center also develops its own research with the same products. The CNPAF staff also works as an advisory group for other Brazilian and some South American institutions.

This Center resulted from the National Centers policy through which EMBRAPA concentrates a trained multidisciplinary group in one location to work on, at most, three different products that are considered very important for social or economical reasons. This group is supposed to have the best available working conditions to perform the multiple functions described above. The idea is to avoid resource dispersion and, through the national coordination, research duplication, although duplication is considered necessary in some cases (yield trials are needed everywhere).

CNPAF also has an agreement (letter for understanding) with the local University (Universidade Federal de Goiás) according to which the Center staff lectures at the University (graduate courses) and also acts in advisory committees for graduate students. There is not such a formal agreement with other Universities, but again, the CNPAF staff acts in advisory committees for graduate students and the Center offers conditions for the development of their thesis research work with rice, beans or cowpeas.

DESCRIPTION OF SOME ACTIVITIES DEVELOPED BY THE CENTER

The Center, through its multidisciplinary group, develops the following main activities:

a) Maintenance of an active germplasm bank.

The active germplasm bank contains 8,000 accessions of common beans that are kept in cold chambers at 12°C (53.6°F) and 25% relative humidity. Around 700g (1.5 pound) of each accession are kept and seed multiplication is undertaken as soon as the amount decreases below one third (0.5 pound) or seed germination reaches below

80%. This germplasm bank maintains an active interaction with CENARGEN (The National Genetic Resource and Biotechnology Center). Bean recollections are also made in all states in the country.

Besides germplasm recollection and maintenance, the germplasm bank also does the preliminary characterization of the material (and the germplasm catalog) as well as furnishing seeds to all the Brazilian institutions that work with these crops and request germplasm.

b) Development of its own research.

There are 33 scientists in CNPAF that work full-time or part-time with common beans.

At the Center, bean research is being developed in the following main subjects: resistance to diseases (anthracnosis, rust, angular leaf spot, bacterial blight, golden mosaic virus), resistance to drought, nitrogen fixation, economy, seed technology, development of machinery (mainly for small farmers), cultural practices for sole crop and for intercrop, soil management, irrigation, yield potential, plant architecture, plant physiology, and genetics.

c) Provision of improved materials to state institutions.

A major emphasis is centered on breeding and development of improved varieties. Since most institutions in Brazil do not develop their own selection programs for beans, they depend on CNPAF to supply them with improved materials. They test the new lines, select the ones most adapted to their conditions, name them, multiply their seeds and release them to farmers. Twenty out of the twenty-three Brazilian states work this way. This collaborative research network was started in 1982 and, so far, only a few releases were made, but the oncoming outstanding results afford the expectation of a significant increase in the number of releases in the near future.

d) Training of researchers and extension people to work on beans.

Periodically, bean courses, either general (bean production) or specialized (multiple disease resistance, evaluations, etc.), are held at the Center for people who work with beans in other Brazilian institutions.

e) Statistical analysis of data.

There is a computer center at the Center that gives statistical assistance to the whole group of the National Center as well as to people who work with those crops in other institutions and request help.

f) Coordination and support of national research.



In South America and most of Africa dry beans and cowpeas are grown primarily in association with other crops. The scenes shown here are examples of this "two" crop system.



The national research coordination is done through annual meetings for research evaluation and programming. The resulting research projects with rice, bean or cowpea, from the institutions involved in the Brazilian program are sent to CNPAF (EMBRAPA) for evaluation. After that, if approved, they are partially supported by EMBRAPA.

The National Bean Research Program (PNP-Feijão) supports 139 projects with *Phaseolus vulgaris* at 28 different institutions. CNPAF develops 33 projects. All projects in the other institutions are also attended by CNPAF staff who periodically visit them all.

g) Seed production — production project.

In order to increase its budget and gather additional funds for research, CNPAF also produces certified seeds. From the 350 irrigable hectares, 100 are used for research and 250 ha are used for commercial seed production in connection with EMBRAPA's Basic Seed Production Service.

This "production project" is also used as a large scale experiment, where the newest technologies are used to obtain the largest possible yields. The project is economically evaluated (costs x benefits). ■

editor's note:

Brazil, the largest bean producing country and largest consumer of beans in the world, is monitored closely by Michigan and U.S. interests. With a consumption of over 200,000 metric tons of beans per month . . . 4.4 million cwt. per month . . . this market bears watching. This article focuses on the major research arm for Brazil's dry bean and rice industries. As we go to press, CFP, the governmental agency that handles agricultural production in Brazil, confirmed a substantial shortfall in Brazil's 1987 dry bean production. Drought in the Northeast has cut production prospects in Brazil materially and rain in the central and South regions hurt production prospects more. They are in the market now looking for substantial quantities of Pink and Pinto beans. The shortfall in production has already driven prices of quality colored beans in the Sao Paulo area up to \$610.00 per metric ton. Brazil's 1986-87 Black bean production of 484,900 metric tons plus 112,900 metric tons of Blacks carried over from last year looks like they will sustain Brazil's annual appetite for Blacks that normally runs from 500-600,000 metric tons. Brazil's 1986-87 colored bean production is now estimated to be 1,605,800 metric tons. They claim beginning colored bean stocks totaled 147,100 metric tons. Consumption of colored bean products in Brazil this year is estimated to total 1,900,000 metric tons. Their 86-87 projection and carry over from a year ago does not stretch that much. Total bean usage in Brazil this year may, in fact, be greater than the 2.4 million metric tons that the government is forecasting. The upswing in the domestic prices of beans in Sao Paulo . . . where colored beans are consumed in volume by the nearly 14 million plus people that live there, suggests that Brazil's government may be forced to free up enough hard currency to buy U.S.-grown Pinto and Pink beans as we forecast earlier in the year following our market survey of the area.

