

## Observations on Horticulture in Brazil

BY

G. W. ADRIANCE (1)

During the spring of 1960 (which was autumn down there!) it was the privilege of the writer to spend ten weeks in Brazil, as horticultural consultant for the International Cooperation Administration. This brief time was spent primarily in Rio de Janeiro, with opportunities for some work in the vicinity of Sao Paulo, Brasilia, and also in the state of Minas Gerais, particularly Belo Horizonte and Vicosá.

Many other areas, more temperate to the south, and more tropical to the north, were not even visited, because of the limited time and nature of this particular assignment. The principal objective of the work was to give some advice and assistance in production problems with horticultural crops, especially vegetables, in the vicinity of Rio de Janeiro and also around the new capital, Brasilia.

Brazil is definitely a "long way from here!" Nevertheless, the beautiful scenery and the friendly people make such a trip worth while; and the sympathetic response of the Brazilians when their friends attempt to communicate with them in Portuguese, is indeed a gesture of international good will. It is the sincere hope of the writer that the success of his mission may be comparable to the extent of the pleasant experiences and contacts that he enjoyed.

With particular references to the horticultural industries, the area in the vicinity of Rio de Janeiro appears to be inadequate to produce the fruits and vegetables required for local use. The peninsula has much rocky, even mountainous land, and also a considerable area of marsh land. The climate is favorable for vegetable production in the cooler seasons, but too warm for best quality in other seasons. While there is much production in the nearby area, a great quantity of the produce comes into the city from other areas, particularly in the vicinity of San Paolo, as well as from a limited area in the nearby mountains, around Teresopolis.

Distribution of produce is being facilitated through the establishment of "Free Markets" (Mercado Livre), where stalls are available for individual dealers, and produce of local origin, or from other areas of production, is displayed in attractive manner for sale. These

1. Department of Horticulture, Texas A. & M. College.

markets contained a wide diversity of products and appeared to be very heavily patronized. Transportation by trucks over good roads assures arrival of the produce in good condition, and facilities in the markets themselves are adequate to handle everything in a satisfactory manner.

There is considerable interest and enthusiasm among the people in the Rio area, through the leadership of the National Society of Agriculture, in improving and expanding the horticultural production in the immediate area. This group sponsors the "Escola Practicale Agricultura "Wenceslao Belo", where younger boys are given practical training in horticulture. The Society recently adopted a program aimed at encouraging improved methods of production, careful variety testing, seed production, storage and distribution, and also marketing practices. Such a program should have a very beneficial effect upon horticultural production within the area.

Just outside of Rio de Janeiro, at "Kilometer 47" is located the National Center of Agricultural Teaching and Research, where the grounds, buildings and equipment provide facilities for excellent programs in both fields of work. The horticultural industries, both fruits and vegetables, receive considerable attention here and much information is being provided for the entire country, and particularly for the immediate area. Supervision of five regional centers of research is also located here.

In the state of Sao Paulo, there is an abundance of good soil and the agricultural industries reach a peak of development. There is a considerable extent of the red soil (terra roja) that makes the area famous for coffee, sugar cane, citrus fruits and other crops. Many smaller tracts of muck soils are found, and in these soils, vegetables are grown to perfection. The production in this area is on such a scale that both fruits and vegetables are placed on the markets of Rio de Janeiro and also the new capital, Brasilia. There is also a considerable export of principal crops that are mentioned above.

Market facilities in Sao Paulo are well developed, with a large cooperative organization that maintains its own market, both on orders and on open auction; and also a city market, held in the immediate area of the one operated by the coop. The period from midnight to four a. m. is a busy time in this part of the city.

Research and education in agriculture are highly developed in this area. At Campinas, the Instituto de Agronomia has a well trained staff working on breeding and cultural problems with fruits and vegetables; and the new virus laboratory is doing outstanding work on the citrus virus diseases. At Limeira the citrus research station, which is under the general administration of the Institute at Campinas, has an area of about 500 acres, with extensive planting on various rootstocks, testing for tristeza tolerance; a large block for fertility and soil management trials, and a newly planted orchard for bud supply. This area was the battle ground for the early work on tristeza, with scientists from the United States and other countries cooperating; and the good

work still continues. The best rootstock in this area at present is sweet lime (limon cravo).

At Piracicaba, still in the state of Sao Paulo, the Escola Superior de Agricultura "Lunz de Queiros" has a fine staff and a good program of instruction in horticulture; and the Institute of Genetics has also a good program of breeding vegetable crops, and also some fine work in orchids with a most interesting collection.

Turning next to the State of Minas Gerais, the Universidade Rural at Vicosa has a good staff in horticulture, as well as in other fields of agriculture; and extensive planting of tropical and subtropical fruits, that are used in class work. The oldest planting of fruits was established by Dr. Rolfs from Florida, who aided in the establishment and early operation of the Universidade. This institution has an exchange contract, through the International Cooperation Administration, with Purdue University, and there were a number of staff members from that institution in residence at Vicosa at the time of this visit.

Also in the State of Minas Gerais, at Belo Horizonte, is the Institute of Agronomy of this state. A valuable service is being performed here in variety testing and development of foundation seed of many of the vegetable crops. This work is also extended into six substations under the supervision of the staff of the Institute.

The most exciting development in Brazil at the present time is the new capital, Brasilia. Located about five hundred miles north and slightly west of Rio de Janeiro, it is much nearer the center of the country and will serve to open up a vast expanse of the interior to more intensive development. The new Federal District is in the State of Goias, and is on a plateau ranging slightly above 3,000 feet in elevation. The country is rolling and only slightly hilly, and the vegetation is low and sparse—the same general appearance as many of the western states in the United States, but certainly not the same plants.

The city itself has been built almost over night, it would seem—but the very modern type of design, and the steel, concrete, tile and glass construction of the official buildings presents a most striking contrast to the surrounding country. Far from complete as yet, the city has been occupied as the new capital since April 21 of this year; and while only a fraction of the residential construction has been completed, there were still many people already in residence. The city will beyond question be beautiful, with the startling plan, in the shape of an aeroplane; the huge lake in a semicircle around part of the city; and a system of parks that are planned for botanical and zoological collections and for recreation.

The problem of food supply, for a city springing from nothing to 100,000 a present, and an estimated 700,000 within a few years, is tremendous and one of the problems in the assignment of the writer was that of surveying the situation and prospects for production of horticultural crops, especially vegetables in this area, and making suggestions for expanding and speeding up such production.

Most of the upland soils in the area are of the type known as "cerrado" a reddish clay soil that is friable but low in fertility; but there are a large number of springs in the area that produce a considerable volume of water; and in the areas immediately adjacent to these springs and small streams, there are relatively small deposits of muck. These muck soils have been used for vegetable production with excellent results, and if an adequate amount of such land and water is made available for that purpose, vegetable production on a considerable scale can be assured.

There are no research stations nor universities in Brasilia as yet, but there is a very fine Extension Service Farm in the area for agronomic and horticultural crops, as well as one for livestock work. On this station, some very fine work has been done in the production of vegetables and strawberries on muck land. On the upland cerrado soils, work with leguminous cover crops has resulted in marked increases in fertility and crop production in three years. There is also a good fruit tree and ornamental nursery on the farm, and extensive trials of both will be initiated. This project is under the supervision of the joint Brazilian-United States Cooperative Program, known as Eseritorio Tecnica Agricultura (ETA).

Looking back over the situation in the small part of the country visited by the writer, it is apparent that a good supply of the various tropical and sub-tropical fruits will always be available. Some of these, such as citrus, are now being exported; and many others could be produced in quantity for export, provided markets and transportation were available and adequate.

In the regions having some elevation and slightly cooler weather, there is considerable interest in the growing of low chilling types of deciduous fruits, such as peaches, plums, and pears. There is some indication of success in some locations.

With regard to vegetables, the warm season crops, such as tomatoes, are produced as often as four times in a year, with heavy rainfall at certain seasons being the most serious limiting factor. The cool season crops are produced to good advantage in the cooler season of the year; and breeding and selection have resulted in development of varieties of cabbage, cauliflower and lettuce that give excellent results even during the warm season.

In this country, as in the United States, there is still need to give careful attention to all the problems involved in production, beginning with variety selection and proper seed, selection and management of soil, maintenance of fertility, and control of insects and diseases. In the field of marketing, more attention should be given to maturity standards, harvesting methods, grading, preparation and packaging, transportation and finally proper handling and display in the market.

Brazil is indeed a horticultural paradise and production of these crops will undoubtedly show a tremendous increase in future years.