The Canary Islands, located between 27° and 29° North latitude, are excellently placed to export horticultural commodities throughout Europe. The Spanish mainland and the United Kingdom have been the traditional export markets for many years. Imminent entrance of Spain to the European Common Market should bring the advantages of preferential trade with Europe to these Islands. Now, agricultural exports and tourism constitute the principal income to the Canary Islands archipelago.

Proximity to Europe (Fig. 1) and a subtropical climate in the coastal lands are prime advantages of the Canaries. High labor cost, soaring property values, water scarcity, the need to terrace arable lands, and an excessive number of small holdings are its major drawbacks. These have made very intensive horticulture a must and compelled the change from traditional flood irrigation to localized systems.

A considerable proportion of certain crops is consumed within the Archipelago by a population of about 1,500,000 who live in a total of 8000 km² (70% of this area is at present totally uninhabitable).

**Commercial horticulture**

*Fruit crops.* The Archipelago's main crop is the banana, with more than 13,000 ha devoted to the cultivation of 'Dwarf Cavendish'. From the beginning of this century until the early 1950s the bulk of the banana crop went to Europe, whereas today, as it was during World War II, it is exported entirely to the Spanish mainland.

The outstanding feature of banana growing is the need to terrace the ground (Fig. 2, 3) due to the lack of good natural soils and the steepness of the terrain in the zones where temperatures are suitable for bananas (coastal regions up to about 300 m above sea level). The highest fertilization doses in the world for bananas, very strict desuckering, early flower-end removal, propping and other intensive practices, coupled with the absence of serious banana pests and diseases, have led to the most outstanding yields in the world. These reach as much as 70,000 kg/ha in some locations. These practices also allow plantations to stand for as long as 60 years without replanting. Disease control is not a major problem, because the Islands are free of bunchy top virus, Moko disease, Sikatoga leaf spot, *Radopholus similis* and *Cosmopolites sordidus*. Cucumber mosaic virus is present but does not spread — probably due to lack of vectors. Panama wilt disease also exists, but the 'Dwarf Cavendish' is tolerant.

Research is oriented towards cost-price reduction through proper irrigation and fertilization techniques and to introduction of new cultivars, mainly the medium height Cavendish types and principally the 'William's Hybrid'. Taller Cavendish cultivars are excluded due to the presence of constant trade winds, that make it necessary to build costly windbreak walls around the terraces.

Avocados, grown on about 1000 ha, constitute the second most important fruit crop. Intended initially for higher altitudes (from 300 to 500 m above sea level) than suitable for the banana, the avocado is also an alternative for the banana in the lowlands. The industry in the Islands is based on the California cultivars. Most of the crop is consumed locally, although exports to the Spanish mainland and to the United Kingdom are climbing. Recent plantings of this same crop in southeastern Spain — reaching today about 1000 ha — is a serious competitive menace for the avocados in the Canaries. Research is being directed toward development of new cultivars and toward solving the *Phytophthora* root rot problem, which is as crucial here, as in many other avocado-producing countries.

Several other subtropical fruits are gaining importance in the Canaries. Mangos, with research focused on commercial cultivars resistant to "embryo abortion," and pineapples are being seriously studied, as both have fairly low water requirements. A substantial increase in plantings is expected in the near future.
Passion fruit is also beginning to be cultivated along the walls that are used as windbreaks around banana plantations. Papayas, cherimoyas, litchis and several other tropical fruits are also grown, but none of them are yet commercially important.

Fig. 2. 'Dwarf Cavendish' banana (left); terrace production of banana (right).

Citrus and all kinds of temperate climate fruits are also grown, but mostly for local consumption. The extremely varied climate of the Islands – altitudes ranging from sea level to 3700 m – allows for this diversification. However, the only temperate fruits of promise is the peach, as the prevalent subtropical conditions allow early harvesting, sometimes as early as March, when there is no competition from European countries. Florida cultivars, and a local seedling population with excellent characteristics, though still in need of selection, are the basis of this crop.

Vegetable crops and berries. Almost all of the vegetable industry is oriented towards winter production for export (Fig. 4). Exports of tomatoes, mainly to the United Kingdom, recently reached 150,000 MT/year. In the last few years tomato yields have doubled in the Islands due to the shift to greenhouse cultivation, introduction of new cultivars resistant to tobacco mosaic virus and to the use of localised irrigation. Despite these practices, strong competition with the southeastern regions of the Spanish mainland and the progressive spread of Leveillula taurica (Lev.) Arn. an endemic fungus of the leaves, which is hard to control, have brought about a reduction in tomato cultivation.

The Archipelago is considered to be
free of the Colorado potato beetle, *Leptinotarsa decemlineata* (Say). This situation gives the Islands a considerable advantage over the mainland, because the latter cannot compete in the European potato market for this very reason. The Canary Islands export more than 40,000 MT of potatoes/year to Europe. Again, entrance into the European Common Market should give to the Islands the edge on other countries that also export potatoes to Europe, such as Egypt. The outstanding feature of potato cultivation is the use of a top layer of 25 to 30 cm deep “jable”, i.e. white volcanic ash. This practice makes planting a much easier job and favors tuber development. The ash also helps avoid weed growth and thus obviates tillage and the use of herbicides. The necessity of using localised irrigation and the possibility of harvesting with small mechanical equipment are also advantages of this method of cultivation.

The cucumber, the third most important vegetable crop in the Canaries, poses basically the same problems as the tomato, although competition is much stiffer. All in all, the prospects for export are not good even though the use of 100% gynoe- cious cultivars has eliminated the labor cost involved in the removal of the staminate flowers.

The production of sweet peppers is satisfactory and exports have increased steadily over the last 6 years, reaching close to 8000 MT in 1979. This crop can be grown cheaper here than on the mainland since the higher temperatures in the Islands allow cultivation in unheated polyethylene greenhouses where yields reach up to 12 MT/ha.

Onions are grown mainly in the province of Las Palmas, on the Island of Lanzarote. Although the quality is usually excellent, yields vary from one harvest to the next due to the island’s scant and irregular rainfall (about 140 mm annually, on average). A unique feature is the use of a top layer (12-20 cm) of “picon”, black volcanic ash that has excellent water retention.

Strawberries, eggplants, and green beans are secondary vegetable crops, mainly for consumption by the local residents. Asparagus has potential for the winter export market. It is a suitable crop for the Canaries because of its low water requirements and good wind resistance. It is a new crop for the Islands, but some research is being conducted towards introduction and testing of cultivars.

**Ornamental crops.** The ornamentals industry, probably the most promising horticultural activity in the Archipelago, with sales of over $25 million in 1979, has still not reached full potential.

The most important crop is the rose for winter export as cut flowers. At present, there are some 30 cultivars in use, but only 7 to 10 are of real importance. Roses were first introduced by Dutch and German farmers who established themselves in the Islands and who used heated glasshouses in the medium altitude lands (400 – 500 m above sea level). Local farmers now grow them successfully at lower altitudes in simple plastic greenhouses with permanent ventilation. This system, with low initial investments and no heating cost, has been proven to give optimum returns when roses are shipped to distant markets. During the late spring and summer months, flower production is stopped by letting the flowers open completely; then they are pruned and pinched in order to start harvesting in mid-September. The commercial cultivars such as ‘Visa’, ‘Mercedes’ and ‘Red Success’ have proved to be very well adapted to this procedure.

Carnations, which were the main flower crop until recently, are now produced less, due mainly to competition with Israel, Colombia and Kenya.

Strelitzia, the Bird-of-Paradise flower, is wonderfully adapted to the northern zones (at to 200 – 400 m above sea level) of the western Islands. Nevertheless, plantings have remained at 30 ha basically due to the length (4 to 5 years) of the period between planting and the first commercially important harvest. Perhaps even more important is the fact that the Strelitzia, stalk included, is a heavy flower. While air freight costs continue to increase, market prices for this flower have hardly risen for several years.

Small plantings of Anthurium under shaded polyethylene sheeting also exist in the Canaries near sea level. Plants have usually been propagated by seeds; despite producing flowers of excellent quality, these are not suitable for export, because of variability in size, colour and other flower characteristics. Research is needed to obtain well-adapted clones which will give uniform flowers for export.

Succulents, chrysanthemums, lilies, gladioli, and gypsophila are also grown on small holdings. Large mother-stock plantings of carnations, chrysanthemums, pelargonium, and poinsettias, that belong to European enterprises, have been established in Tenerife and Gran Canaria. The cuttings are exported to 19 countries throughout Europe.

There is also an important and well-established foliage plant industry, both for the local market and for export. *Ficus elastica* ‘Decora’ and *Sansevieria trifasciata* ‘Laurentii’ are well-adapted and are traditional foliage exports from the Archipelago. Tropical foliage production is undergoing constant expansion: over 1 million units per year of plants or cuttings of kentia palm (*Howea forsteriana*), dracaena, cordyline, philodendron, diphfentbactia, and codiaeum are produced and exported.

An interesting technique, specifically for foliage production, is the preparation of a substrate of volcanic lapilli, European peat, and pine needles (from *Pinus canariensis*, a native of the Islands), all which are mixed in various proportions according to the type of plant to be grown.

**Research and extension**

Although there is some research being done by private firms, mainly on flowers and ornamental plants, the Institute Nacional de Investigaciones Agrarias, Centro Regional de Canarias, which comes under the Ministry of Agriculture, is responsible for the principal research projects. Its central station is located in Valle Guerra, on the Island of Tenerife. Research is conducted on fruits, vegetables, ornamentals, and in plant protection, soil science, irrigation, applied botany and agricultural economics.

Extension is also the responsibility of the Ministry of Agriculture; Extension Service offices are located on all the islands of the Archipelago.