

ISRAEL'S AVOCADO INDUSTRY — 1969

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Israel's avocado industry during the past three years has been expanding steadily. The increase in acreage is averaging 500 acres per year. The development of the European and Scandinavian markets, taking up to 65 percent of their production, has been phenomenal. The Agricultural Export Company, the Israeli government agency responsible for marketing all agricultural crops in Europe, has increased the number of offices from two, London and Paris, to five, including offices in Frankfurt, Geneva, and Zurich, with a possible office opening in either Stockholm or Copenhagen within the year.

There are now about 4000 acres planted, with two-thirds of these acres not yet in full bearing. Yields continue to increase each year. Production in 1968-69 was approximately 10,000,000 to 12,000,000 pounds. The avocado orchards have been planted on a commercial scale only since 1958. One of the main reasons for the rapid expansion in plantings is that it was found that avocados could be grown satisfactorily as interplants in banana plantations. Approximately one-half of the total acreage is planted in this manner. The climate, soil and watering conditions are similar for the two crops. Because of this the cost of establishing an avocado orchard is materially reduced. Bananas are gradually removed over a two- to three-year period. At this point the avocado trees are established and coming into bearing. The Ministry of Agriculture has encouraged growers to plant avocados because of the increased demand for avocados in European markets. They not only encourage the growers verbally but they offer substantial loans to growers giving a real impetus to expansion of the industry.

Four varieties predominate in the plantings: (1) The Ettinger, a locally developed variety which appears to be a hybrid, is an early and prolific bearer. It accounts for 25% to 30% of the planting. The short picking season, October-November, and a fruit which cannot be stored on the trees are the main drawbacks. (2) Fuerte, a December to March fruit, is increasing in popularity. Thirty-five to 40% of this variety is planted now, but as in California, the main problem is unsatisfactory and inconsistent yields. A search continues for other varieties having similar characteristics as the Fuerte, but with better production and more consistent yields. (3) Hass is relatively new and acreage is increasing. It represents 15% to 20%, mostly in the new plantings. An early and heavy bearer, it has a tendency to produce small fruit. Harvest period is from March through May. In low Fuerte crop years the Hass could be harvested early because they mature as early as January. (4) Nabal has about 15% of the total industry acreage. The season is from February to May. Grown with the Nabal, and used as a cross pollinator, is the Benik.

Rootstocks used are gradually being replaced by two new types that show a high tolerance to salts and high-limestone soils. One is a Mexican type of local origin called

Gvar-Am 13. and the other is a West Indian selection from Florida, called Fuchs 20. Both of these are being used extensively in the vegetative propagation work to find a better commercial method to reproduce clonal rootstocks. Seedlings of these two selections are being used at the present time and show good tolerance to salinity and high-limestone. An extensive rootstock project is in effect throughout the state of Israel, being conducted in cooperation with the Department of Subtropical Horticulture of the Volcani Institute of Agriculture Research, nurserymen and growers. The need for a highly salt tolerant rootstock is great since the water used in most avocado groves will range from 150 to 350 ppm of chlorides.

The climatic conditions where avocados are grown in Israel resemble the climate of the coast and coastal valleys of Southern California. There are, however, generally more heat units with more hours of sunshine in Israel and less incidence of frost. Rains totaling over 20-30 inches annually come in the winter months, November to March. Avocados are grown mostly on medium-heavy textured soils (silty loam) which are well drained. Some plantings are on lighter soils, and others on too high a clay content to be suitable of avocados. Some soils contain a high percentage of lime and as a result, trees are chlorotic. Soil pH is generally between 7.2 (slightly alkaline) to 8.0 (alkaline).

Most avocado plantings are located in two coastal regions: Western Galilee (north of Acre) and in the Sharon and Shomron (south of the Carmel range). There are over 400 acres south of Tel-Aviv. Increased plantings are found in the upper Jordan Valley's thermal belts, and near the shore of the Sea of Galilee. Experiments with new rootstocks and different varieties of commercial value are going on in the Negev Desert near Be'ersheva, with additional experimental plantings in the Sinai and the Ha'arava Deserts. The work is primarily to test the salt tolerant rootstocks in desert regions because of the high saline irrigation water that must be used. In one kibbutz, near the city of Eilat, on the Gulf of Aqaba, a pilot plant for reclaiming salt water has been put into operation. Various fruit and vegetable growing operations are being tested with this desalinized water.

Irrigation is generally done with the use of overhead sprinklers. Approximately 3 acre feet (325,000 gallons or 1,500,000 liters per one acre foot) per acre are given annually in about 20 to 24 shallow applications every 7 to 14 days, depending on the soil type and climatic conditions. In some orchards a heavier amount of water is applied every 6 weeks in order to leach out the salts that have accumulated in the root zone. Introduction of a new type of irrigation, called "drip irrigation," developed by an engineer named Mr. Blass, is being tested on many of the tree crops, including avocados.

Most bearing orchards are non-tilled. Weed control is accomplished with the use of oil or paraquat (Gramoxone). Simazine is also used. Nitrogenous fertilizers only are used at the rate of approximately 600 lbs. per acre and are in the form of ammonium sulfate or ammonium nitrate, applied twice a year. If iron deficiency is present, the soil is treated with Chel 138. Use of leaf analysis to determine the nitrogen level in trees is increasing. This provides a good guide for the application of nitrogen.

Planting distances for most varieties are generally 20 feet by 20 feet. The rapid growth of some varieties sometimes makes this distance too short. Growers have a real problem in keeping the trees low enough to harvest. Many are attempting various

pruning methods to train trees in the early formative years. Some are pinching back new growth; others are bending branches down with the use of string to encourage low-growing branches. Harvesting becomes a problem in the tall trees. Because of this, a new type of machine has been used in the avocado orchards. It is self-propelled and has a movable tower that goes to a height of 16 feet. Controls are in the basket at the end of the movable arm and can be controlled by the operator in the basket. The machine is manufactured in Israel and is proving to be a good labor-saving machine for harvesting and pruning. It is well adapted to the groves of Israel because most orchards are planted on flat ground.

Avocado diseases are still not a serious problem. Sun blotch virus disease is more prevalent than in California, but the government, in working with the nurserymen, are gradually eliminating all sun blotch known trees and the program seems to be paying off. Avocado root rot, the serious fungus disease in California, has not been identified to date in Israel. Verticillium wilt disease shows up from time to time. Fruit rots which become noticeable some time after picking are caused by colletotrichum, diplodia and other fungi.

Marketing is handled by the Fruit Production and Marketing Board. The Board is responsible for packing fruit, for harvesting, for developing the export and domestic markets, and distribution of fruit. A small percentage of the fruit is packed, shipped and marketed by a private packer-shipper, but about 85% is under government control. Fruit is divided into three qualities: (1) Grade A fruit for export. (2) Grade B for local markets. (3) Other fruit to the army for softening and to Kibbutzim.

Export shipments constitute up to 65% of the total crop, or about 6,000,000 to 8,000,000 pounds. A large percent of the avocados are shipped to France, United Kingdom, and Germany. Within three years Israel has been able to develop the European market to a very-high degree. Consignment is predominantly by ship, though air freight is used when the market demands quick delivery of fruit. Israel has now five chartered Norwegian ships to handle produce going to Scandinavia and Europe. Three packing houses, one in the north, one in the central district, and one in the south handle the fruit from the industry's 4000 acres. In 1967-68 a pilot avocado packing house was built, utilizing the latest equipment for the handling, grading, and packing of avocados. The other packing houses which were used for avocados also packed bananas, apples, oranges, flowers, etc.

The Fruit Production and Marketing Board also has the responsibility for advertising and promoting the sale of avocados. This involves preparation of advertising material, such as posters, recipe booklets, store display banners, ads for magazines and newspapers and radio. Promotion abroad is financed up to 50% by the government. The recipes and other promotional material have been printed in numerous languages, including English, French, German, Spanish, Italian, Hebrew, and Arabic.

The future of the avocado industry in Israel still appears bright. The world picture concerning avocados is just beginning to develop. Many markets for avocados are so far untouched. Israel has developed the European and Scandinavian markets to a high degree. Other Mediterranean countries such as Spain, Greece, Cyprus, Turkey, and Lebanon are becoming interested in planting and commercially growing avocados.

Israel has the land available, the suitable soils, and an excellent climate in which to grow avocados. Above all, Israel has the men and women who believe in this industry and they alone will make it succeed. The Israeli avocado industry will provide many more tons of fruit for the market in the years ahead and avocados will make a substantial contribution to the agricultural economy of that country.