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AVOCADO GROWING IN MOROCCO

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Before 1950 there were in Morocco:

1. Approximately 30 avocado trees in Rabat in the Experimental Garden (Fuerte, Mayapan, Panchoy, Mexicola, Anaheim, two unknown varieties designated as No. 42 and No. 43, and some seedlings);
2. Twenty trees at the Station d'Ain Taoujdat, between Meknes and Fez (a Fuerte and some seedlings);
3. A few scattered varieties on the coast between Kenitra and Casablanca (seedlings not grafted).

In 1950 the Bureau of Horticulture and a specialist in arboriculture, Mr. Chavanier ordered from California several species of avocado: Zutano. Rincon, MacArthur, Hass, Hellen, Nabal, Ryan, Bacon, Emerald, Duke and Edranol.

Later, the Colonial Institute of Deciduous and Citrus Fruits (Institut des Fruits et Agrumes Coloniaux—IFAC), working with Mr. Chavanier, procured numerous graftings, a collection which now includes 92 varieties.

On the coast, between El Jadida and Tangier, the temperature normally has a range of one degree Centigrade above freezing to 1.5 Centigrade, similar to the climate of San Diego, California. In the interior, up to an altitude of 250 meters, between the Atlas Mountains and the coast, the climate is similar to that in Riverside, one degree Centigrade above freezing.

The fruit growers of Morocco were originally nearly all foreigners, mainly French and Spanish. Several were interested in avocado growing, but the prospect of expropriation of their land has since deterred them from a new undertaking. Three years ago, the government of Morocco started an orchard of fourteen hectares in the sandy soil of the Rharb. The orchard is not yet producing.

At present, there are actually only our six hectares of commercial orchard at Skrirat, four kilometers from the coast, between Casablanca and Rabat. The following report, based on the yield of this orchard, will give some idea of the possibilities of avocado growing in Morocco.

CHARACTERISTICS OF THIS ORCHARD	
Average temperature	17.4 C
Lowest minimum (in 25 years)	— 1.5 C
Highest maximum (in 25 years)	45 C

The "chergui," a moderately hot wind, blows five to 10 days a year; it has caused only slight damage to the fruit and has never been strong enough for the fruit to drop from the trees.

The soil is varied, but generally of clay with a rocky base at a depth of from 0.60 meters to 1.50 meters; in 1958 a section of 99 five-year-old Fuertes was destroyed after heavy, prolonged rains. In 1963, in similar circumstances, we lost 20 nine-year-old trees in a section without a rocky base but with a bottom soil of clay.

Phosphate:	6.9
Water:	0.380 grams of salt liter
Soil:	Rich in nitrogen
	Poor in phosphorus
	Rich in potassium

Before the establishment of the orchard, the land was seldom used and was not fertilized.

Fertilizer: Since 1962 only ammonium nitrate. Before 1962, ammonium nitrate and some ammonium phosphate were used. Ten years ago there was heavy fertilizing in all parts of the orchard.

All the trees planted up to 1959 were set out five meters apart, 400 to a hectare. This was too close for the Fuertes, which now need heavy pruning.

The chart at the end of the report gives in kilograms for one tree the annual average of commercially sold avocados on the basis of 1963- 64 and of 1964-65.

The average weight of the fruit of each variety has been figured on the fruit sold during these two years. Indicated at the top of the chart are the dates when the trees were set out. The MacArthurs, Rincons, Lulas, Hasses, and Zutanos marked with a cross are trees from top-grafting, and the year indicated is the top-working.

The last column shows the number of trees of each variety now producing. These figures are the basis of the table.

Our orchard also has about 800 young trees of the varieties shown in the chart, and 300 trees, two to 10 years old, of 79 varieties, which are used for experimentation. Among this latter group we have observed:

> Rapid growth and early production of Taylor, Corona, Benik, Choquette, Topa-Topa, Ettinger.
>
> Poor production: Edranol, Wright, Ryan, Booth 8. Fluctuating production: Duke. This is also the only fruit to be attacked by the Mediterranean fly.
>
> Jalna is a good producer but much of the fruit is poorly formed Moore and Emerald are excellent procedures but have a poor flavor.

The Chavanier 2 of 1949 is a seedling. The same for 1952 is top-grafted. The Rincons all suffer from a lack of iron and need iron chelate every year. One third of the Hass also need iron chelate every year.

All exported fruit is wiped dry with a soft cloth, wrapped in thin paper, and placed individually in crates, which, in turn, are padded with packing material. Each avocado carries a label and there is one layer of fruit per crate. Each crate also contains recipes for the use of the fruit.

The fruit is sent overseas in refrigerated ships to Southampton for sale in London; to Dieppe or Rouen for sale in Paris; and to Hamburg. From June to October, when there is no refrigeration available, the fruit is shipped by air.

Fruit not exported is sold in Rabat and Casablanca.

WEIGHT IN KILOGRAMS — PRODUCTION BY TREE AND YEAR

Year of Planting or Top Grafting

Except for the Three Years 1963-1964 and 1964-1965

Variety and Weight of Fruit	1949	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	No. of Trees
Fuerte 259g		67.6	49.9	57	48	44.7	39.7		28	12	2		404
MacArthur 330g							72		47.8	22.1	32.6		41
Nabal 452g					55.2	52.8	48.4	35.2			10.3		38
Anaheim 480g				40.8	39.8			21.6	11.5	9.6		4.8	25
Jalna 255g				23.4			18.2						14
Chavanier 2 333g	283	208					98		28.6	11			30
Bacon 295g								40.5		15	5		24
Waldin 410g										16			13
Rincon 225g						25.8			33				5
Lula 360g								28	20	23			9
Hass 250g				47		32.7				23.7	6		30
Hellen 330g					37						5.6		8
Zutano 320g		73.6	43.2	39.7	22.4	35.2	19.2						63
													704

DISEASES AND PARASITES

There are no diseases at the present time. In soil where trees have died because of excessive moisture, tests for *Phytophthora cinnamomi* have been negative. Certain varieties have been seriously attacked by thrips and need constant watching and repeated dusting.