

Cherimoya Field Report from Southern Spain

By Ben Rockefeller, March 2011

In southern Spain, in the provinces of Malaga and Granada, about three thousand hectares of *Annona cherimolia* are cultivated. “Fino de Jete” is the local variety that has been cultivated by grafting. The climate and the fruit is described as “tropical” to appeal to tourists from northern Europe, but in fact the climate is closer to a semi-desert, with an average of five hundred millimeters of rain per square meter every year. The cherimoya is cultivated between the Sierra Nevada mountains, which protect the fields from the cold wind from the north, and the Mediterranean Sea, which insulates the area from wide daily variations in temperature and relative humidity during the year. The average year-round temperature is eighteen degrees. The temperature can vary from three degrees at night in the winter to thirty-eight degrees in the day in the summer. The average winter temperature is twelve degrees. Unlike the production in Ecuador, Peru, and Chile, the cherimoya production in Spain is at sea level or near sea level. This proximity to the sea prevents the air from becoming dry and damaging the fruit.

At sea level, the climate is warm enough to sustain cherimoya, avocados, and mango, the main products, but not warm enough for coconut. The towns of Almuñécar, Salobreña and Motril have most of the orchards, many of which are badly maintained and in decline today. Many landowners were more interested in the decades-long property price bubble, which has only recently begun to burst. The prices that they get for the fruit have stayed constant for the last fifteen years, while prices of water, fertilizers and pesticides, labor, and transport have all risen. In fact, in orchards in the center of Almuñécar, fruit falls and rots on the ground, because the price that they get in the market exceeds the cost to pick, pack, and ship the fruit. Some landowners are removing cherimoya trees and replacing them with avocados or mangos.



Harvest by small local plot owners in Sandoval fields in town center

A very few local farmers use drip irrigation (*“riego por goteo”*), but most orchards are occasionally blanketed during the main growing season with water that comes from local wells and is distributed via concrete ditches. In some years, water is so scarce that it constrains production. On the other hand, there is a dam and a reservoir within thirty kilometers, in the town of Rules in the mountains, but moving the water from this reservoir has been impeded by bureaucracy and a difficult relationship between the local government and the regional government. Water would be cheap, if it were moved from this dam.

The soil in the plain (*“vega”*) is loamy and mostly slightly alkaline, seven to seven and a half. In the hills, the soil is less porous, and roots do not grow as deeply. To prevent the pipes of irrigation systems from clogging due to too much calcium in the water, they mix the water with nitric acid or phosphoric acid. Ammonium nitrate and phosphoric nitrate are typically used as fertilizers.

Despite the decline in recent years, they still produce between twenty-five thousand and thirty-five thousand metric tons of cherimoya fruit per year here locally. About 88% is consumed domestically, and 12% is exported to markets in Germany, France, Belgium, the Netherlands, and the UK. Some local attempts to produce ice cream, marmalade and other products from the pulp have mostly failed, due to competition from guanábana (*Annona muricata*) pulp imported from Latin America and local mismanagement. The Chamber of Commerce of Granada, local wholesalers, and the local township of Almuñécar are said to be collaborating, planning to make ice cream, marmalade, juice, and other products from the puree of cherimoya pulp. They plan to use the fruit that is too small to sell, called “*marrutes*” by local farmers and “*destrillo*” by the wholesalers. “*Destrillo*” makes up about one quarter of the annual production and is currently scrapped by the wholesalers. They could possibly prune the trees to produce fewer, but larger fruit, but they don’t, probably because of the cost of labor for pruning.

Some techniques and processing may be more advanced in Chile and in the highlands of the Andes. For example, the Bonsai technique to make it easier to harvest the fruit and to grow more trees on less land is only just beginning here, while it has been used for years in Chile and is known as “*espalderas*”.

Fields in the plain further from the mountains receive more sun and yield fruit sooner. Eighty to ninety percent of the cherimoya fruit is harvested between October and December. The first and last fruit harvested gets a higher price. In November and December, the wholesaler can get as little as twenty to thirty Euro cents per kilo of fruit. In March, the wholesale price reaches one Euro and seventy cents per kilo. With this in mind, research is ongoing to stagger the production to yield more fruit in the off-season. This research is based on the idea that a “cherimoya year” begins when the leaves fall. Cherimoya is semi-deciduous. Part of the leaves, or some of the leaves of each tree, fall every year, starting in April. Thirty to thirty-three days after the leaf falls or is picked, the flower appears. Depending on the wind, the insects, and pollination by hand, the year continues with pollination of the flower. More pollen produces bigger flowers. About four to five months after the flowering, the fruit is harvested. Hotter years produce more and bigger fruit, if all else is equal.

The total interval between the leaf falling and the harvest of the fruit is about six months. Within the limits of the climate (coolness of the winter months can prevent this), this makes it possible to stagger some of the production as follows:

1. Prune the tree back to the trunk and the main branches.
2. Let new leaves grow.
3. Pick the leaves six months before a desired harvest date.
4. When the flowers appear, hand-pollinate them.
5. Maintain the orchard as usual and harvest the fruit.

In the province of Granada, there are about a dozen “*recorridos*”, private wholesalers who buy the fruit and ship it to wholesale markets, mostly in Granada, Cordoba, Seville, Madrid, Valencia, and Barcelona, but also abroad. Mostly, the wholesalers do not own the land, but buy and sell the fruit. In Spain, the wholesalers sort and price the fruit, according to the size. The fruit known as “*primera*” weighs three hundred to six hundred grams each and is packed six to a case for shipping to wholesale markets, while “*primera vez*” fruit weighs two hundred and fifty to three hundred grams each, is packed twelve to a case, and makes up most of the market.

Local land is traded in units called “*marjales*”, about five hundred and sixty-two square meters. This unit of land goes back to the times of the North African Moors in Spain from approximately 700 – 1500 AD. The Moors planted sugar cane, among other crops. Until about 1960, cane sugar was the main local crop, and there were various local factories to process the cane to make sugar. Some cherimoya trees were first brought from what is now Peru or Ecuador and planted locally in the eighteenth century. Cherimoya cultivation expanded slightly at the end of the nineteenth century and then expanded greatly to replace sugar cane in the 1960’s. Nowadays, a “*marjal*” contains about ten cherimoya trees.

Here as elsewhere, cherimoya fruit is perishable and has a short period of ripeness before rotting. Some of the retail merchants, particularly in export markets, try to delay the maturity of the fruit by refrigerating it, but this risks undermining the taste and texture of the fruit. Here, there is a low risk from the Mediterranean fruit fly, *Ceratitis capitata*, or medfly for short. They now use a trap with yellow paper and a pheromone to attract the flies and a pesticide tablet known as a “*Tripack*” to kill them. Forty

years ago, they sprayed the fields, using Malathion, an organochloro pesticide that has since been banned in the European common market.

Some of the local farmers complain that Spain is an agricultural nation. As a member of the EU, Spain is subject to strict child labor law, environmental regulation, and controls of pesticides and fertilizers, but Spanish suppliers have to compete with suppliers from outside the EU, who are not subject to the same controls and regulations.

You can preserve the cherimoya seeds, if you keep them moist and refrigerated. We germinated some cherimoya seeds last year. We did not have to plant the seeds promptly after getting them from the fruits, but kept them moist in a plastic container in the refrigerator for at least a month and then planted the seeds and grew the leaves.