

## **Olive Oil Production in the Var Region of France, May, 1995**

In the south of France there are approximately 60 oil mills and cooperatives processing and retailing local olive oil today. They have a long history and tell the story of when olives were the dominant agricultural crop of the area. The Var region is at the center of what was once a thriving olive oil empire producing thousands of tons of olive oil each year. A devastating freeze in 1956 killed all of the olive trees down to the ground and most farmers replanted with the more profitable wine grapes for which France is so well known.

Most of the mills in the region today still use the low technology stone mills and decantation processes their ancestors used. Unfortunately they have trouble finding enough olives nearby to sell much more than just to local residents, who bring their own olives for pressing. Mills that have modern equipment supplement their investment by bringing in olives from Spain and selling olive crafts, soaps, and canned table fruit in stores and restaurants adorned with antique processing equipment.

Statistically, France is not a major producer of olive oil, processing an estimated 2,500 to 3,500 tons of olives in 1994. The Var region Chamber of Commerce economic development bulletin lists 11,136 farms in the region with an average size of just under 20 acres each. Vineyards represent 43% of the land and 47% of the earnings, cut flower production occurs on 1% of the land and represents 36% of the earnings. Much of the land is forested or planted to small grains. Olive production and processing are not listed. Most of the olive plantings are very small; ranging from growers with 5-10 trees around homes or bordering the forested areas to part-time farmers with 500-1000 trees. Occasionally, a large group of trees can be seen growing from root sprouts left from the 1956 frost. The trees are quite small in stature because they are infrequently fertilized and almost never irrigated. In many cases, they only have a few inches of new shoot growth. They are generally very intricately pruned to a very open center (vase form) and production is quite low.

Most of the olive trees are not in economic production units but cared for as landscape trees that would provide a family outing to harvest the fruit, visit the mill, and a yearly supply of oil and nostalgia. There are some small new plantings of olive trees designed to take advantage of the worldwide increase in demand for olive oil. The fruit is sold for the highest possible price and made into gourmet condiment oils for export or canned table fruit.

The climate for the Var region is Mediterranean with summer and winter temperatures moderated by the sea. The average temperature is 7°C (45° F) in January and 22° C (72° F) in July. It is a sunny area with only 78 days per year of rainy weather which is concentrated in the autumn and spring months. Killing frosts, like that of 1956, for olive trees are very rare but light evening frosts are not uncommon in winter. The primary olive varieties grown in the region are Aglandaou, Bouteillan, Picholine, Cayon, Cailletier, Salonenque. The primary wine grapes grown in the region are Grenache, Syrah, Mouvidre, Cinsaut, Rolle, Clairette, and Semillon. The region is well known for its production of exquisite rose'-style wines made from a blend of these varietals.

### ***Moulin de Saint-Come***

The first mill we visited was located just west of Toulon near la Cadieue d'Azur. Olive trees were scarce in the agricultural fields surrounding the mill. The mill property itself, however, had a beautiful display of about 20 (Italian variety) trees that were large and pruned to perfection. The trees were part of a display for visitors, along with an interesting mix of antique processing equipment, almost like a museum of the past.

The actual equipment used for processing was very modern Alfa Laval brand machinery from Italy. The olives were worked and milled in a hammermill and malaxator (mixer) about 800 kilos at a time. Hot water (27° C-81° F) was used in the continuous-flow centrifuge-type press. Lastly, a centrifuge was used to separate the oil and water. A total of 250 metric tons were processed in 1994 at a rate of 800 to 1000 kilos per hour. The mill operated for approximately one month per year.

The major variety grown in the area is Aglandau which is somewhat cold hardy and frost-resistant. It is self fertile, produces a high quality oil, and is harvested early (November 1 to 15). It is picked as the olives turn from green to black and has an oil content between 23% and 30%.

Very small plots of trees are harvested by the families that own them. The olives are processed immediately with little or no storage time. The olive producers are charged two "francs" per kilo for processing and they receive all of their oil in bulk metal cans. Some of the oil is purchased by the mill, bottled and sold at the retail store. The store capitalizes on the olive theme and offers every imaginable olive item possible. They sell olive wood bowls and carvings, soap, china, table cloths, and all kinds of craft items, all decorated with olives. Of course, they also sell their own olive oil and canned olives.

### ***Cooperative La Belgentieroise***

This small facility is located in Belgentier, just north of Toulon. It processes 1,600 to 2,400 kilos per day with a very unique feature. The olives are pitted. They use a revolving screen that presses the olives through slits. The openings are small enough to not allow the pits to pass through. The pitless paste is then malaxated in tubs that have a fine screen on the bottom to allow the olive juice to drip through. The juice is then decanted in a series of ceramic tile tanks and pressure-filtered prior to bottling. The pits are burned to heat the facility and to heat water to warm the olive paste.

Several varieties are processed at the facility including Picholine, Bouteillan, Cayon, Cayon Roux, Aglandau, Brun, Verdalle and Belgentieroise. All of the fruit comes from members of the cooperative who have very small plantings of trees around their homes. Some of the oil is sold all over France but most is kept by the olive producers for home use.

This facility also produces some green table olives by immersing the fruit in soda and ash for 8-12 hours and then rinsing for 8-10 days with salty water. Citric acid is added to the salt brine at the end for storage. This method produces a very firm green olive with a unique flavor.

### ***Cooperative La Tavernaise***

This facility is located just outside Tavernes, a small village north of Brignoles. The cooperative was founded in 1915 and currently has 188 shareholders. Prior to the freeze of 1956, it processed 300 tons per year but now processes approximately 100 tons each year. Mr. Gille Barreme gave us a tour of the facility.

Each shareholder is mandated to bring in a minimum of 5 kilos and a specified maximum each day. The facility runs for 18 days in early December. The primary varieties processed are Gutellion, Aglandau and Salonenque. These varieties yield 16-26 liters of excellent quality oil per 100 kilos of fruit.

Prior to 1974 the cooperative used a stone mill but now uses a hammermill to crush the fruit. The paste is malaxated in temperature-controlled tanks, spread onto mats and pressed. The juice is decanted in a series of tanks to separate the oil from the water of vegetation. The vegetable water is spread onto the agricultural fields in the area by tanker truck.

The bottled oil is sold or used individually by each shareholder. The price is held at a constant 65 francs per liter or 55 francs per liter if sold in bulk. It is sold from Marseilles to Nice, mostly to the same customers year after year. The oils have won several medals

for quality recognition at the French Agricultural Fair in Paris. Their bottles display a sticker indicating that quality recognition. The bottles also have stickers indicating that olive oil is an environmentally-friendly product.

The typical cooperative shareholder has approximately 600 trees planted at 180 trees per hectare (73 trees per acre on 8.2 acres). The average yield is 15-20 kilos of fruit per tree for a yield of 1.2 to 1.6 tons per acre.

There is little or no incentive to plant more olive trees since the oil is mainly used for their families' consumption and the yields are low. Most farmers in the area make their living from wine production.

### ***Cooperative Les Vignerons De Cotignac***

Located northeast of Brignoles in the village of Cotignac, this cooperative started in 1906 and still uses the same stone mill and many of the old methods for processing olives into oil. They hold strongly to tradition and believe that the oil molecule should not be "broken down" by the use of hammermills, centrifuges or filters.

Harvest starts the last week of November for the Cayon variety, which represents the majority of fruit for their cooperative. It is stored in small concrete silos for up to three days. The mill can work 400 kilos at one time. After stone milling, the paste is malaxated for 20 minutes at 22°C then spread onto mats and pressed. Their mats were used for up to 4 years and washed with soap and water at the end of each season.

The paste stays in the press for 45 minutes. The olive juice is decanted 4 times prior to bottling. The vegetation water goes into the local sewer and the dry paste is used as compost or a heat source for greenhouses. The mill operates 18 hours per day, 2-3 shifts, until all of the shareholders' fruit is harvested and processed. They processed 130 tons in 1993 and 85 tons in 1994.

The shareholders pay 185 francs per membership and a price per kilo of oil processed. The per kilo cost is determined at the end of the season after operating expenses are paid and was 1.87 francs per kilo of fruit in 1994. Total processing costs are approximately 12-15 francs per liter of oil. The oil is consumed by most of the shareholder families or sold for 57 francs per liter to non-members.

### ***Cooperative La Cayanne***

This old mill is located in the village of Salernes and was founded in the 1600's, the same time as the village itself. In 1930, the mill was upgraded and a cooperative was formed. This is one of two active mills in the village; there were once seven thriving mills.

In 1994, 50 tons of olives were processed entirely for the 200 cooperative member families and friends. The mill charges shareholders 1.7 francs per kilo of olives for the processing and has the capacity to process 250 kilos per hour. Most members are weekend farmers or viticulturists with a few olive trees for their own use. Some bring in as few as 4-5 kilos of olives while the largest member has 4 tons. The mill operator, Mr. Jean Gros, indicated that most families in the area consume approximately 25 liters of olive oil per year, a figure that he believed to be 60 liters per year prior to 1956. He also felt that consumption of olive oil and demand for the oil was increasing and driving prices upward. He also indicated that the government paid producers 370 francs for producing olives on up to 70 trees but owners of over 70 trees were paid on a production basis per kilo of oil.

### ***Cooperative La Salernoise***

This was the second cooperative in Salernes operated by Mr. Jean-Charles Aicard. This facility uses a stone mill, a traditional press, and a decantation system in stainless steel tanks to separate the oil from the vegetation water. The decantation tank has a floating "hat" that minimizes air contact with the oil. No filtration is used. He is able to process 250 kilos per hour in each batch. The olive oil bottles are handsomely identified with engraved tin labels and sold for 94 francs per liter.

### ***Salernes Orchards***

I had a chance to visit two orchards in the Salernes area with Mr. Aicard and his wife. The first was 1,200 trees on 5 hectares which produced approximately 3,400 kilos of olives per year on 3 bearing acres (97 trees per acre yielding 0.51 tons per acre).

The trees were spaced far apart (approximately 24' X 19') and were about 9-10 feet tall. They were also very open with little shoot growth and poor vigor. The orchard was not irrigated or cultivated and the stress on the trees was evident. I also observed several trees of only slightly larger stature that were re-growth sprouts from large tree trunks. The growth on these trees was 38 years old and started after the freeze of 1956.

The second orchard was owned by Mr. Aicard and his wife. It was more of a hobby orchard near his home and 15 hectare vineyard. This orchard had been cultivated and

irrigated regularly so that the trees were not stressed for water. They were approximately 12 years old and filled a 20' X 20' spacing. The shoot growth was very vigorous and the trees were quite productive.

Mr. Aicard had recently tasted California olive oils at the Brignoles fair. He felt that they were too green and had a bitter taste from the addition of leaves into the paste. He indicated that the French oils are much finer flavored and lighter colored.

### ***Moulin De Saint-Cassien***

This small mill is located in the city of Draguignan in a primarily residential area. The mill operator, Mr. Fabrice Godet, had also recently tasted several California oils at the Brignoles fair. He felt the oils were very good except for oils made from the Mission variety. He stated that the French oils he makes have a very long shelf life (2 years) and are finer, lighter oils.

This mill uses the traditional stone mill, but occasionally, when speed is necessary to accommodate a large supply of fruit, a hammermill is also used. The fruit comes into the mill in 15 kilo boxes and is segregated by variety. The paste is pressed in a traditional press with mats that are used for only one season. The olive juice is decanted by hand with a special large flat ladle. Single varietals are produced and labeled accordingly on the bottle. The two prominent varieties processed are Salonenque and Cailletier.

The olives are harvested by hand at the dark red stage which begins around December 15th and lasts until January 10th. Many of the producers are very small-scale backyard - type growers that do not irrigate their trees. Their yields are approximately 20 kilos per tree or 44 pounds per tree. Mr. Godet purchases some olives outside the local area, where trees are irrigated. The irrigated trees yield up to 80 kilos per tree (176 pounds). Even the larger producers in the area around Draguignan however, are not making a living growing olives. Most have part time jobs. In most years, Mr. Godet also buys olives to process from Spain. Some of his bottles indicate that the origin of the oil is Spanish.

Trees are pruned in this area from March until July and pruners are paid 40 francs per tree. Each tree is intricately pruned for its ornamental as well as productive value.

### ***Moulin De La Brague***

This mill is located just outside the Var region near the village of Opio. The mill operator, Mr. Roger Michel, described in detail his milling operations and table fruit processing. This mill processed 1,500 tons in 1992, 700 tons in 1993, and only 250 tons in 1994. The majority of the production is local and mostly the Cailletier variety. There are several other varieties produced but the quantity of olives makes up less than 10%. In poor production years, the mill purchases Arbequina olives from northern Spain to supplement their market.

The mill begins receiving fruit in mid-November and accepts any amount for processing, even as little as one kilo. Producers bringing in over 180 kilos can get their own oil back. Smaller producers get only a share of the oil being processed at that time. The mill buys olives for 8-10 francs per kilo for oil olives and 20 francs per kilo for table fruit (or charges a fee to do the processing).

The trees in this area are larger due to the warmer climate and good deep soils. The fruit is knocked off the trees with poles on to nets spread on the ground. Many growers have only 20 trees and make olive harvest a family outing.

The mill is divided into two sections. The old stone mill, accompanied by traditional mat presses, and a new, very large, 3 stone mill with a continuous-flow horizontal centrifuge press. All of the olive juice is separated into oil and vegetable water by centrifuge. The olives are milled in the stones for 30 minutes and malaxated for 1 hour prior to centrifuge decantation. The water of vegetation is discharged onto orchards or sometimes directly into the river.

At one time, the old stone mill was powered by a water wheel and a complex of wooden gears. The original mill house has been made into a tourist attraction, complete with olive crafts from throughout France as well as their own local table olives and olive oil. The Moulin de la Brague has become quite a tourist attraction.

### ***Jean Rey Nursery***

This large ornamental container nursery located along the coast east of Toulon at La Londe-les-Maures also produces several French olive trees for sale. Jean-Paul Charvin was our host in the morning as we visited the production grounds for the olive trees. (See Jean Rey Catalogue, Page # 67, "OLEA" and ordering information.) The trees were propagated from cuttings in mist beds and the liners (small plants) transplanted into 3 liter containers for growth and development outside. They are sold at their vigorous growing stage so that they don't become stunted in the confinement of the pots. Jean-Paul emphasized that vigorously growing plants that are transplanted into the field will develop into a much larger plant in a shorter period of time.

### ***Orchards Domaine du Jasson and Thierry Olivier***

The first orchard was a newly planted site (trees in 5th year), previously pine forest, ripped 1 meter in depth and planted at a spacing of 6 X 5 meters ( $\approx 16' \times 20'$ , 135 trees per acre). The soil was not fumigated. The variety mix planted was 30% each of Aglandau, Bouteillan, and Picholine and 10% Cayon. All these varieties are dual purpose and could be marketed as table olives or for oil. The Cayon is used mainly as an extra good pollinizer tree.

This orchard produced 5 tons per 3 hectares in the 4th year (0.49 tons per acre) and 8.1 tons per 3 hectares in the 5th year (1.1 tons per acre). The projected yield at maturity is 5 tons per hectare (4.5 tons per acre). Most of the olives are being sold for table olive production because the price paid for the table olives is double the price paid for oil olives. Table olives are harvested in August, when green, and don't make a good oil at that time.

Pruning of the olive trees in the first year is done only to remove all branching below 50 cm (23 inches) to allow for mechanical harvesting if necessary. In the 2nd and 3rd years, the trees are left unpruned. The 4th year, some shaping and scaffold limb selection is done.

The trees receive 90 to 120 units of nitrogen, 50-70 units of phosphorus, and 140 units of potassium each year, divided between two applications. The first half is applied at flowering and the remaining half after harvest. The trees are drip irrigated to meet a seasonal demand of 900 to 1100 mm of water (35 to 43 inches). Annual rainfall in the growing area is about one half of the total requirement (400-500 mm), falling mostly in the spring and fall months.

Mr. Francois-Louis Lori, the President of Olive Culture for the region, accompanied the group for the orchard tours. He was very informative but controversial regarding the effects of climate, particularly heat, on olive oil quality. He felt that heat had no detrimental effects on olive oil quality and that very high temperatures during the growing season were positive for shoot growth and fruit development. He also felt that cool temperatures at harvest and in traditional olive growing regions produced a superior quality oil.

The second orchard is owned by Thierry Olivier, a young farmer who is interested in selling the highest quality olives for oil production. His 5 acre orchard is planted on a beautiful hillside overlooking St. Maxime near St. Tropez. His trees were planted in 1988, so were just starting their 7th growing season. The orchard was planted to 33% Aglandau, Bouteillan, and Grosanne. The trees were planted 5 X 6 meters apart ( $16' \times 20'$  or 135 trees per acre). The local agriculture department was conducting experiments on pollination, yield, tree growth, and oil quality since Grosanne and Aglandau were new varieties to the area. Yields in 1994, the 6th year, were 7 kilos per tree for the Aglandau (1.04 tons per acre) and 25 kilos per tree for the Bouteillan (3.7 tons per acre).



The fruit is harvested by placing a plastic cloth net underneath the trees and using a “comb” to rake the olives from the branches. The cost to harvest is 2 francs per kilo and each worker picks 200 kilos per day. Labor is paid by the hour.

## FRENCH OLIVE VARIETIES

VARIETIES	UTILIZATION	TRADITIONAL ZONE OF HARVEST	COLD RESISTANCE	TREE SIZE	OIL CONTENT	COMPATIBLE POLLINIZER
AGLANDAU VERDALE DE CARPENTRAS	OIL	Vaucluse Bouches du Rhône	very good	medium	23 to 30%	self fertile
AMYGDALOLIA		Greece	medium	small		
BOUTEILLAN	OIL	Var	very good	medium	20 to 25%	Mélanger Verdale de Carpentras
CAILLETIER	BLACK OLIVE	Maritime Alps	medium	very large	18 to 22%	self fertile - Picholine
CAYET ROUX	OIL	Plantières Figanières	good	medium	20 to 25%	
CAYON	OIL	Var	medium	large	18 to 22%	self fertile
CIPRESSINO	POLLINIZER		good	large		
CORNI CABRA	OIL	Tolède, Ciudad Real	good	medium	21 to 27%	
FRANTOIO	OIL	Central Italy	very good	medium	26 to 29%	self fertile - Pendolino
GROSSANNE	BLACK OLIVE	Bouches du Rhône- Est Var	good	large	15 to 17%	self fertile
LUCQUES	GREEN OLIVE	Languedoc	good	medium	18 to 20%	Cornicabra - Amellau Amygdalolia
MANZANILLE	TABLE GREEN OR BLACK	Andalouise	medium	medium	20%	
NEGRETTE	OIL	Gard	medium			
PICHOLINE	GREEN TABLE OLIVE	Languedoc Roussillon Provence-Corse	medium	medium	15 to 18%	Verdale de l'Herault
ROUGETTE DE L'ARDECHE	OIL	Ardèche	good			
ROUGETTE DE L'HERAULT	OIL	Hérault	good			
SALONENQUE	CRUSHED OLIVES	Bouches du Rhône- Est Var	good	medium	20 to 22%	self fertile
TANCHE	BLACK OLIVE	Sud Drôme Nord Vaucluse	very good	large	25 to 30%	Cayon

# FRENCH OLIVE OIL

Technical Information On Olive Oil  
Production And Processing  
Compiled From A Tour  
Of The Var Region,  
France, May, 1995

by: Paul Vossen  
Farm Advisor  
University of California  
Cooperative Extension  
Sonoma County

This tour was sponsored by the Northern California Olive Oil Council and hosted by Jean-Jacques and Roswita Vitrac, consultants for Echovar, a promotional organization for the Var region of France.

It was attended by 30 Californians interested in the production, processing, marketing and consumption of olive oil. This report is a snapshot of the olive industry as it was presented to us over a 5 day period. It is not intended to be a comprehensive study of the French olive oil industry.