

## Grapevine Culture in Brazil

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### Abstract

Grapevine is cultivated in Brazil in almost all the states from Rio Grande do Sul (30° 53' S) to Pernambuco (9° 23' S) over a surface totalling 62,000 hectares. The wide climatic diversity leads to significant differences in the cultivation systems applied in the main growing areas. Rio Grande do Sul is the main wine-producing area (40,000ha), based on the production of the cultivar Isabel. Vinifera cultivars like Moscato, Trebbiano, Riesling, Cabernet Franc, Merlot and others are planted over smaller areas. This is the only region in Brazil with a pronounced winter and the harvest is performed during the rainy summer. São Paulo state is the largest table grape producer (10,000ha), using mainly Red Niagara, Itália and its mutants Rubi and Benitaka. Recently, the region of the São Francisco River Valley, situated in the northeastern part of Brazil has become an important table grape-growing area (3,000ha), based on the cultivars Itália and Piratininga (IAC 842-4 v). Due to the total absence of winter and the semiarid climate, pruning and harvesting in that region can be performed any time of the year, allowing growers to obtain 2.5 harvests/year.

### Introduction

Grapevine is cultivated in almost every state of Brazil, from Rio Grande do Sul (30° 53' S) to Pernambuco (9° 23' S) over a surface totalling 62,000 hectares (Table 1).

The wide climatic diversity leads to significant differences in the cultivation systems applied in the main growing areas.

### Main production regions and climatic conditions

Viticulture in Brazil is centered on the southern and southeastern regions. In the South, including the states of Rio Grande do Sul (30° 53' S), Santa Catarina (26° 50' S), and Paraná (23° 27' S), the cultivation of wine grapes (Copat *et al.*, 1992) is prevalent. In the first two states grapevine is cultivated in temperate areas with altitudes ranging from 600 to 1000 meters, mean rainfall of 1,800 millimeters per year regularly distributed throughout every month of the year and pronounced cold winters, with temperatures below 0 °C, and severe frost from May to September. In these regions grape harvest takes place in the summer (January through March) when rain usually occurs (Martins, 1991).

In northern Paraná table viticulture is based on Itália (Pirovano 65) and Rubi grafted on stocks 420-A, IAC 313 Tropical and IAC 766 Campinas, and grape production occurs in different seasons of the year. Several vineyards are cultivated so as to allow two harvests every year: December/January and June/August. Rainfall is abundant during the normal ripening and harvest period (December/January), which is a highly unfavorable factor for the cultivation of the plant. Cold is pronounced with frequent frost in winter months.

In the southeastern region only the states of São Paulo and Minas Gerais show extensive production,

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**Table 1** Estimated cultivated area of grapevines per state in Brazil  
(Area in hectares)

<b>Rio Grande do Sul</b>	40,000	<b>Santa Catarina</b>	5,000
American or hybrids	31,096	American or hybrids	4,800
Black	28,496	Isabel	2,250
Isabel	19,092	Niagara	750
Herbemont	3,008	Goethe	500
Bordeau	2,956	Others	1,300
Concord	1,396	Vinifera	200
Seibel 2	1,284	<b>São Paulo</b>	10,000
Couderc	632	American or hybrids	7,600
Others	128	Niagara Rosada	6,500
White	2,600	Niagara Branca	700
Niagara	1,884	Others	400
Seyve Villard	380	Vinifera	2,400
Couderc	252	Itália	1,400
Others	84	Rubi	1,000
Vinifera	8,904	<b>Paraná</b>	3,000
Black	2,252	American or hybrids	1,500
Cabernet Franc	680	Isabel	750
Merlot	580	Niagara	600
Cabernet Sauvignon	268	Others	150
Barbera	252	Vinifera	1,500
Zinfandel	140	Itália	900
Others	332	Rubi	450
White	6,652	Benitaka	150
Moscato	1,780	<b>Minas Gerais</b>	1,000
Trebiano	1,704	Itália	700
Riesling (Italy)	1,052	Rubi	200
Semillon	832	Maria (IAC 514-6)	100
Malvasia	356	<b>Pernambuco</b>	1,700
Peverella	188	Itália	1,275
Gewurztraminer	144	Piratinga (IAC 842-4 v)	425
Vernaccia	144	<b>Bahia</b>	1,300
Chardonnay	120	Itália	975
Others	332	Piratinga (IAC 842-4 v)	325

Source: Instituto Agronômico de Campinas, 1994.

adapted by C. V. Pommer and M.M. Terra

and São Paulo is the largest table grape producer in the country, where it is grown in areas at latitudes varying from 20° 15' S to 24° 00' S, altitudes ranging from 430 to 710 meters, annual rainfall of 1,200 to 1,350 millimeters, and annual mean temperature ranging from 18 to 23°C. In southern São Paulo state, with low temperatures reaching almost 0°C and occasional frost in the winter, grapevine presents a definite cycle, that is, it goes through a period of dormancy before restarting the vegetative and productive phase, which occurs from January through March (Terra *et al.*, 1993 b) when the temperature and rainfall are higher.

In northwestern São Paulo state, located at an elevation of 430 meters and 20° 15' S latitude, viticulture is totally different from that in the traditional regions and is characterized by a subtropical fruit plant behavior. Grapevine does not go through a dormancy period and grows all year long due to the climatic conditions, with temperature remaining high almost all the year, and irrigation applied in the dry

season. Only one harvest is performed in this region in slack season months, from July through November, when prices reach their highest values (Terra *et al.*, 1993 b).

At present, viticulture in the state of Minas Gerais (15° 50' S to 17° 15' S) is concentrated on the northern region, where the climate is hot and dry and harvest is likely to be performed in the slack season months (July through September) or twice a year.

In the northeastern region of Brazil, in the semiarid São Francisco River Valley, especially in the states of Pernambuco (9° 23' S) and Bahia (9° 23' S) extensive irrigated viticulture is being developed focussing mainly on the foreign market. In view of the total absence of winter and the semiarid climate, harvest may be performed any day of the year, leading to even 2.5 harvests per year. In this nearly flat region, annual mean rainfall is 400 millimeters and annual mean temperature is 26.59°C (Copat *et al.*, 1992).

## Varieties and technologies used in subtropical and tropical regions of Brazil

### 1. Subtropical regions

In the Brazilian subtropical regions such as the northwestern state of São Paulo and northern state of Minas Gerais the main varieties of fine table grapes are Itália, Rubi, and, on a lesser scale Benitaka and the seedless grape Maria (IAC 514-6). The stocks used are the IAC 313 Tropical (Golia × *Vitis cinerea*) and IAC 766 Campinas (106-8 Mgt × *Vitis caribaea*), which are vigorous, adapted to different soil types including those with high acidity levels, to the climatic conditions of these regions.

**1) Pruning:** the grape production system applied until now in these regions involved one harvest a year.

However, since this season is equivalent to the southern hemisphere slack season, in addition to the regular production pruning, grape growers carry out an additional pruning called regulating pruning in order to prepare plants for the following productive cycle. The regulating pruning takes place after fruit harvest, usually in the months of October and November. This pruning leaves two to three buds, originating from two to three shoots. Shooting and leaf formation obtained after this pruning are intense since the temperature is high and rainfall abundant (Terra *et al.*, 1993 a).

The branches developed after the regulating pruning are pruned again, with eight to ten buds left. This pruning is designated as "fruit production" and is carried out between March and June.

**2) Vineyard covering:** Covering of the whole vineyard with special nylon screens is encouraged in the northwestern state of São Paulo in order to protect the grapevines against bird and bat attacks, hail, strong winds, and excessive sunlight (Terra *et al.*, 1993 a).

In these regions the reduction of the phenological cycle to a minimum of 30 days for the Itália variety and its mutants Rubi and Benitaka is remarkable compared to the production in the temperate zones of these states.

In the tropical regions of northeastern Brazil, in the São Francisco River Valley, the main varieties of fine table grapes are Itália and Piratininga (IAC 842-4 v) and the only stock is the IAC 313 Tropical.

In these regions grapevine is very peculiarly handled due to the climatic characteristics. Grapevine rest is obtained by stopping irrigation for a suitable period of time between harvest and pruning of the following cycle. Usually, irrigation is interrupted 15 days prior to the onset of fruit harvest so that sugar may be concentrated in the berries (between 20 to 23° Brix). The pruning starting in the following productive cycle may be performed immediately after harvest, when irrigation is reestablished, thus allowing grape growers to direct the crops towards the periods of the year when market prices are higher (Martins, 1991).

A very significant characteristic is the phenological cycle reduction, varying from 100 to 120 days for Piratininga and Itália varieties, thus allowing 5 harvests every two years.

In the subtropical and tropical regions of Brazil grape growers have adopted some very efficient and effective cultural techniques as follows:

**3) Cluster thinning:** This essential practice has been performed for the Itália cultivar and its mutants, using an adapted plastic brush. In this system, thinning must be performed during the separate flower bud-phase, with 50% of flower buds withdrawn from each cluster (Terra *et al.*, 1993 a).

**4) Dormancy break:** Two growth regulators are generally used to stimulate bud bursting in grapevine:

calcium cyanamide and hydrogen cyanamide (Dormex), and one of them must be applied immediately after production pruning. Calcium cyanamide must be applied to the buds at a 20% concentration using a brush while hydrogen cyanamide, more recommended in these regions, must be sprayed on dormant buds, at a 5% concentration, in contrast to colder regions, where hydrogen cyanamide is applied at a 2.5% concentration.

5) **Increase of berry size**: Still in these regions, in an attempt to obtain grape clusters with larger and more uniform berries, gibberellic acid is the most frequently used growth regulator and it is recommended for Itália and its mutants by immersion or cluster spraying, at a 20 to 30 ppm concentration, in the half-berry phase.

### Future perspective

Brazil is characterized by extremely favorable conditions for the expansion of viticulture, especially in the subtropical and tropical regions due to its climatic conditions that are favorable to the production of best quality fine table grapes which may provide both internal and external market, including traditional producer countries of the Northern hemisphere during the between-harvest periods. New varieties, specially seedless ones, are already cultivated on a commercial scale in these regions, aiming at conquering either new national or foreign consumers.

### References

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### Discussion

**Renveni, O. (Israel)**: Is gibberellic acid being used in table grape culture in Brazil to enlarge berries?

**Answer**: To obtain grape clusters with bigger and more uniform berries, we use gibberellic acid. For Itália, the materials are immersed or clusters are sprayed (20 to 30 ppm concentration in half-berry phase).