

Table Grape Growing in Tropical Areas

V. DELAITRE, J.P. LYANNAZ

CIRAD-FLHOR
Station de Neufchâteau
Sainte-Marie
97130 Capesterre-Belle-Eau
Guadeloupe

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Promising results have been obtained in preliminary table grape cropping experiments in Guadeloupe. Variety trials highlighted the interesting qualities of cv Muscat d'Alexandrie.
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introduction

Table grapes are being grown to an increasing extent in tropical regions worldwide (Thailand, Brazil, Venezuela, Colombia, etc.). In the West Indies, this crop could be interesting for diversification and reducing grape imports (about 400 t in 1992).

A table grape research programme was set up in July 1990 at the CIRAD-FLHOR research station in Vieux-Habitants, Guadeloupe. A 1-year vine tying operation was first undertaken, followed by an efficient crop protection programme that began in 1993. The preliminary results are very encouraging.

material and methods

Two 0.3 ha experimental vineyard plots were planted in July 1990 on the same site with two different irrigation systems:

- trickle system: 2 tricklers, 4 l/h/plant,
- sprinkler system: 1 sprinkler, 35 l/h/plant.

Two plant training systems were tested at the same planting rate of 1600 plants/ha (2.5 m between plants within the row and between rows):

- espalier training: vines tied vertically (bilateral cordon),
- arbour training: vines tied to arbours (2 m high).

Seven different table grape varieties were studied on various rootstocks and cuttings:

- Cardinal (on R110, S04, 3309c),
- Dattier de Beyrouth (on S04, cuttings),
- Muscat d'Alexandrie (on R110, S04, cuttings),
- Italia (on R110, S04, cuttings),
- Ruby Seedless (on S04, cuttings),
- Centennial (cuttings),
- Thompson Seedless (on S04, cuttings).

results

Experimental plots were divided into three parts to determine the best production periods: the first was pruned in December and June; the second in February and August; and the third in April and October. This test was conducted from December 1991 to August 1992. The bud burst rate after pruning, flowering rate and grape weights and quantities were determined.

Because of pest damage to the crops, trials focusing on pruning dates were based on flowering rates rather than grape yields.

bud burst rates

To determine optimal pruning lengths, spurs (branches with two buds) were considered separately from long branches (4-6 buds). For practical reasons, measurements were only done on espalier-trained vines.

Higher bud burst was obtained on spurs than on long branches, as noted in Table 1.

This indicates that it would be generally best to prune branches to the two-bud length in order to obtain optimal bud burst. Moreover, the best bud burst seemed to occur after a drought period in February-March.

flowering rates

As shown in Table 2, the highest flowering rate was obtained following February pruning. The same rates were obtained on spurs and long branches. Cultivars Muscat d'Alexandrie, Cardinal and Ruby Seedless bore the most flowers.

Floriferousness seemed to be best favoured on the R110 rootstock.

In Guadeloupe, the best flowering could thus be obtained with cv Muscat d'Alexandrie, pruned to the two-bud length in February and August. Under these conditions, the vines are leafless during the cyclone season and fruitless during the rainy season.

yields

Despite the fact that a large proportion of the April and June grape crops were destroyed by a pyralid moth, almost 6000 kg/ha of cv Muscat d'Alexandrie grapes were harvested. These initial results are very promising (Table 3).

Table 1
Bud burst rates for seven grape varieties grown on espalier at Vieux-Habitants, Guadeloupe (n° burst buds/total n° buds).

	December pruning		February pruning		April pruning		Mean/cv		
	Spur	Long branch	Spur	Long branch	Spur	Long branch	Spur	Long branch	Mean
Ruby/cutting	64	39	87	89	92	85	81	71	76
Cardinal/3309	63	42	81	62	93	77	60	60	60
Centennial/cutting	38	49	85	71	89	71	71	64	67
Thompson/SO4	86	32	92	78	93	84	90	65	77
Italia/110	71	55	67	71	100	73	79	66	72
Italia/SO4	65		88	83	88	67	80	75	77
Dattier/cutting	80	56	87	76	96	72	88	68	78
Dattier/SO4	67		93	67	84	50	81	58	69
Muscat d'Alexandrie/110	58	20	79	67	92	82	76	56	66
Muscat d'Alexandrie/SO4	66	35	81	61	90	25	79	40	59
Mean	66	41	84	72	92	69			
Monthly rate		63%		78%		80%			

Table 2
Flowering rates for seven grape varieties grown on espalier at Vieux-Habitants, Guadeloupe (n° burst buds/total n° buds).

	December pruning		February pruning		April pruning		Mean/cv		
	Spur	Long branch	Spur	Long branch	Spur	Long branch	Spur	Long branch	Mean
Ruby/cutting	27	16	32	27	10	11	23	18	20
Cardinal/3309	18	25	45	25	30	33	31	28	30
Centennial/cutting	12	0	4	8	4	8	6	5	5
Thompson/SO4	6	0	19	18	6	11	10	3	6
Italia/110	10	0	13	0	17	13	13	4	8
Italia/SO4	6		14	0	0	0	7	0	3
Dattier/cutting	11	6	15	22	3	5	10	11	10
Dattier/SO4	10		4	0	6	0	7	0	3
Muscat d'Alexandrie/110	17	0	46	45	43	30	35	25	30
Muscat d'Alexandrie/SO4	14	50	44	55	45	25	39	43	41
Mean	14	12	24	20	16	14			
Monthly rate		13%		22%		15%			

Table 3
Grape yields in June 1992 for espalier-trained vines at Vieux-Habitants, Guadeloupe.

	N° grape bunches/plant	Mean bunch weight (g)	Yield (kg/ha)
Ruby/cutting	8	219	3 540
Cardinal/3309	-	-	-
Centennial/cutting	-	-	-
Thompson/SO4	1	222	710
Italia/110	2	200	666
Italia SO4	2	187	533
Dattier/cutting	4	244	1 567
Dattier/SO4	3	219	1 243
Muscat d'Alexandrie/110	13	266	5 762
Muscat d'Alexandrie/SO4	9	247	3 857
Mean	5	225	2 235

length of the production cycle

The mean interval between pruning and harvest was 140 days. The earliest cultivar was Muscat d'Alexandrie (125 days), and the latest were Italia and Dattier de Beyrouth (150 days).

economic data

table grape imports in Guadeloupe

Grape imports increased by more than 100 t in 1991, reaching a total of 400 t in 1992. This could be explained by a marked rise in grape imports from Chili and Spain, whereas imports from metropolitan France dropped drastically (-100 t in 1991).

These imports were very high in the September-December and March-April periods. Wholesale grape prices in Guadeloupe were very high in July (35 F/kg in 1991) and levelled off at 10-15 F/kg throughout the rest of the year.

production costs

Annual vineyard installation and maintenance costs were calculated after a year of grape production at Vieux-Habitants (Guadeloupe):

- installation: 187 000 F/ha for espalier training and 237 000 F/ha for arbour training,
- maintenance: 82 000 F/ha/year for espalier and 128 000 F/ha/year for arbour.

Grape prices are generally below 12 F/kg in Guadeloupe (minimum import price). Considering the technical constraints that necessitate production in June and December, note that:

- in June, grape consumption is quite low (20 t in 1991), whereas prices are high (20-25 F/kg in 1991);
- in December, grape consumption is high (100 t in 1991), whereas prices are the lowest (12 F/kg).

In Guadeloupe, the grape production breakeven point (10 F/kg) is reached when a minimum of 7600 kg/ha/year are produced on espalier-trained vines. Arbour production data are still insufficient to reach a final conclusion.

conclusion

An efficient crop protection programme was set up in 1993 and the interesting qualities of cv Muscat d'Alexandrie were highlighted.

There are still substantial technical choices to be made, especially to determine the best rootstocks, vine training and pruning techniques under local conditions.

Although tropical grape production is labour intensive and requires high initial investments, it could be cost effective in Guadeloupe. Thirty ha of vineyards could produce enough grapes to meet the domestic market demand. ●