

Performance of Several Plums in the Lower St. Lawrence Region of Quebec

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Abstract

Thirty plum (primarily *Prunus domestica* L.) cultivars were assessed over a 13-15 year period for yield, bloom date, harvest date and tree survival. Good yields were obtained with, 'Veeblue,' 'Stanley' and 'Mont-Royal.' Somewhat lower yields were obtained with 'Bluebell,' 'Reine Claude' and 'Victoria.' All other cultivars either gave fair to poor yields or failed to survive. Bloom and harvest dates are given for most of the cultivars.

Introduction

The fresh market demand for plums in Quebec is met by imports, principally from the U.S.A. In 1954, Blair (1) described a number of cultivars suitable to Quebec growing conditions but no significant commercial production ensued. Many new plums released since Blair's report were planted in 3 trials in the lower St. Lawrence area of Quebec. Over 30 cultivars were evaluated for yield, winter survival, bloom date and harvest date. This paper presents the results obtained during the period of 1975-89.

Materials and Methods

The 3 sites were located at La Pocatière (approx. 4 km from the St. Lawrence River), Quebec and were within 90 to 155 m of each other. Brompton (*P. domestica* L.) was used as the rootstock and planting distances were 2.5 x 4.9 m (8' x 16') for site 1 and 3 x 6 m (10' x 20') for sites 2 and 3. Site 1 was a gravelly St-André loam and was

planted in 1975. Site 2 was a Kamouraska clay, site 3 a gravelly St-André loam and both were planted in 1977. European cultivars for site 1 (5 replications) were 'Damas Bleue,' 'Early Italian,' 'Grosse Bleue,' 'Lanark,' 'Mont-Royal,' 'Peach Plum,' 'Reine Claude,' 'Veeblue,' 'Vision' and 'V-33027.' European cultivars for sites 2 and 3 (3 replications per site) were 'Bluebell,' 'California Blue,' 'Early Italian,' 'Greengage,' 'Grenville,' 'Lanark,' 'Late Italian,' 'Mont-Royal,' 'Peach Plum,' 'Reine Claude,' 'Stanley,' 'Valor,' 'Veeblue,' 'Verity,' 'Victoria,' 'Vision,' 'V-370114,' 'V-370120,' 'V-59034' and 'Yakima.' In these two sites the non-European cultivars were 'Compass,' 'Crescent,' 'Early Golden,' 'Pipestone,' 'Purple Hat,' 'Superior' and 'Toka.' First bloom (first blossom open), full bloom, petal fall and harvest date were recorded each year. Fruit was harvested according to its specific skin color characteristic and weighed. A single harvest sufficed for most cultivars but in some years, 2 harvests were needed for some cultivars. Only the most representative harvest date for optimal keeping quality is presented in Tables 1, 2 and 3.

Standard orchard management was followed at all sites. Vegetation control in the tree rows, when needed, was accomplished with herbicides. Alleys were grassed and mowed as required. The plots were not irrigated and no blossom thinning was done.

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On account of winter injury all the trees that produced no fruit during the last 3 years or had a cumulative yield less than 25 kg during the period of the study (1975-89) were eliminated from the trial. No statistical evaluation of the data could be undertaken because of the appreciable tree loss at each site. Yield, therefore, is expressed as kg per tree averaged over the trees producing 25 kg or more fruit during the period of 1975-89 (inclusive).

Results and Discussion

The highest cumulative yields and best tree survival at site 1 were obtained with 'Mont-Royal' and 'Reine Claude' (Table 1). Lower yields were obtained from 'Veeblue,' 'Lanark,' 'Damas Bleue' and 'V-33027' but tree survival was fair to poor with these cultivars. 'Veeblue' was particularly striking in that good yields were obtained on the trees prior to 1987 but most trees succumbed to winter injury after that year. Limb stress and breakage caused by the heavy fruit weight may have made the trees more vulnerable to winter injury. 'Grosse Bleue' and 'Vision' failed to survive at this site. Top performers at site 2 were 'Mont-Royal (V),' 'Veeblue,' 'Stanley,' 'Bluebell' and 'Victoria' (Table 2). Tree survival was fair to good except for

'Mont-Royal (V)'. No tree survival was recorded with 'Compass,' 'Toka,' 'Pipestone,' 'Valor,' 'Vision,' 'V-370114,' 'Grenville,' 'Superior,' 'Crescent,' 'Purple Hat,' 'Verity' and 'V-59034.' 'Stanley' was top performer at site 3 followed by 'Mont-Royal (V),' 'Veeblue,' 'Mont-Royal' and 'Bluebell' (Table 3). Overall tree survival was 56% at site 2 and 33% at site 3. Site 3 was surrounded by windbreaks and significant sunburn was noted on many of the trees. Snow covers and bright sunny days were factors in the sunburn. Site 2 was more open and little sunburn was noticed in the block. Another factor in the higher tree loss at site 3 may have been water stress. The soil is a coarse loam and some summers were quite dry. With no irrigation in place, trees in the coarse loam would be under greater stress than those in clay at site 2. We do not know why 'Mont-Royal (V),' trees from Vermont, yielded better than 'Mont-Royal,' trees from Quebec, at site 2 (Table 2).

Keulemans (3) noted good yields with 'Stanley' as well as good returns to the grower. 'Stanley' performed well for Christensen (2) under Danish growing conditions. 'Stanley' was a good performer in Quebec (Table 1). There were no other plums in the latter 2 studies that were common to

Table 1. Mean cumulative yield, bloom date and harvest date for several European plums grown in the lower St. Lawrence region of Quebec, 1975-89 (Site 1).

Cultivar	No. of trees ¹	Yield (kg/tree)	First bloom (days) ²	Full bloom (days) ²	Petal fall (days) ²	Harvest date (days) ²
Mont-Royal	5	291	147	149	155	260
Reine Claude	5	166	145	150	155	258
Veeblue	1	140	148	149	153	262
Lanark	1	109	143	146	151	272
Damas Bleue	3	92	148	152	158	255
V-33027	1	92	153	157	164	269
Early Italian	2	62	150	150	155	256
Peach Plum	1	31	147	152	157	240

¹Number of trees with a cumulative yield of 25 kg or more.

²Expressed in Julian days.

Table 2. Mean cumulative yield, bloom date and harvest date for several plums grown in the lower St. Lawrence region of Quebec, 1977-89 (Site 2).

Cultivar	No. of trees ¹	Yield (kg/tree)	First bloom (days) ²	Full bloom (days) ²	Petal fall (days) ²	Harvest date (days) ²
Mont-Royal (V) ³	1	138	146	151	158	262(-4) ⁴
Veeblue	3	134	146	151	158	262(-4)
Stanley	3	121	148	153	159	266
Bluebell	2	119	149	153	161	264(-2)
Victoria	3	109	145	150	156	257(-9)
V-370120	3	76	147	152	158	256(-10)
Reine Claude	2	68	145	149	156	257(-9)
Greengage	3	62	148	154	164	258(-8)
Mont-Royal	3	62	147	151	158	261(-9)
Yakima	2	54	145	150	156	253(-13)
Late Italian	3	49	150	154	160	265(-1)
Early Italian	2	46	150	154	160	255(-11)
Lanark	1	38	147	151	157	268(+2)
Peach Plum	2	44	147	152	157	239(-27)
Early Golden	1	46	145	150	157	226(-40)
California Blue	1	45	151	155	160	241(-25)

¹Number of trees with a cumulative yield of 25 kg or more.²Expressed in Julian days.³Scion wood from Vermont, otherwise from Canadian sources.⁴Number of days before (-) or after (+) Stanley's harvest date.

our trials. Tehrani (4) found better production with 'Veeblue' than with 'Early Italian' under Ontario conditions. 'Early Italian' tended to be fair in production on our studies but was susceptible to winter injury.

In order to avoid spring frosts, late blooming cultivars are of interest to

Quebec. For this reason, ample details on the blooming period are given in Tables 1, 2 and 3. Bloom dates were within 10 days of each other, the range being 143-153 Julian days (Tables 1, 2 and 3). Harvest dates, however, had a range of 226-270 days but most plums were ready at 260 days.

Table 3. Mean cumulative yield, bloom date and harvest date for several plums grown in the lower St. Lawrence region of Quebec, 1977-89 (Site 3).

Cultivar	No. of trees ¹	Yield (kg/tree)	First bloom (days) ²	Full bloom (days) ²	Petal fall (days) ²	Harvest date (days) ²
Stanley	1	221	144	150	157	266
Mont-Royal (V) ³	3	162	147	152	158	262(-4) ⁴
Veeblue	2	153	148	154	159	262(-4)
Mont-Royal	2	143	147	152	159	262(-4)
Bluebell	3	124	150	155	164	266(0)
Reine Claude	1	89	145	150	157	259(-7)
Greengage	1	71	150	155	164	261(-5)
Late Italian	2	65	151	155	160	267(+1)
Victoria	1	59	144	147	155	258(-8)
Peach Plum	1	54	148	152	158	240(-26)
California Blue	2	45	150	155	161	242(-24)
Superior	2	38	147	152	161	262(-4)

¹Number of trees with a cumulative yield of 25 kg or more.²Expressed in Julian days.³Scion wood from Vermont, otherwise from Canadian sources.⁴Number of days before (-) or after (+) Stanley's harvest date.

In summary, it would appear that 'Bluebell,' 'Veeblue,' 'Mont-Royal' and 'Stanley' are suited to Quebec growing conditions. 'Reine Claude' and 'Victoria' are two other choices. Growers should make certain that the trees are planted in good soil and that sufficient water is available.

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Research on Flower Thinning of Early-Ripening Peach and Nectarine with Urea

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Abstract

With the purpose of regulating the crop load, several low biuret urea concentrations (4, 8, 12% and 12, 16 and 20%) in two following years were sprayed during full bloom on 'Armking' and 'Springred' nectarines and 'Springcrest' peach. One month after the treatment a complementary hand thinning was carried out in order to adjust the fruit load. The degree of thinning was floral-stage-dependent and the best results were obtained at 12% dosage. Trees sprayed with concentrations higher than 12% showed toxic symptoms whereas those treated with solutions containing less than 12% of urea did not differ in crop load from the control plants.

It is well known that the most effective orchard cultural practice for increasing fruit size is to adjust the crop load to the leaf area by thinning out the reproductive organs of the tree. In peach, especially in the early ripening cultivars, with a short fruit development period, bloom thinning is more effective than fruitlet thinning (1, 4, 5). Several compounds work quite well in reducing bloom; ammonium thiosulphate (2, 3) and urea (7) have recently been successfully employed as thinning agents in peach. However, application time for ammonium thiosulphate is quite short (from close pink bud to flower stage). When applied at the right dosage, urea can

be effective until fruit set without seriously burning new leaves (7). To verify the possible use of urea in regulating fruit load in an early ripening peach and two nectarines the following trials were carried out.

Materials and Methods

Research was carried out in Sicily (37°41' Lat. N) in a commercial orchard established with dormant budded rootstocks of GF 677 in January 1984. The trees were spaced 4 x 2 m and trained in a "fusetto" (free spindle) shape. Low biuret (less than 0.1%) urea at different concentrations (4, 8, and 12% in 1989; 12, 16 and 20% in 1990) in water solution, with 0.5% "Scam" surfactant added, was sprayed. For all three cultivars, each urea concentration was applied to whole five-tree replicates in a randomized three-block design. In 1989 'Armking' and 'Springcrest' were treated on 10 March and 'Springred' on 17 March. In the following year 'Armking' was sprayed on 12 March, 'Springcrest' on 16 March and 'Springred' on 30 March.

To establish the stage of bloom, the stage reached by each reproductive organ of five shoots per tree was

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