'Joliette' Strawberry

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'Joliette' is a short-day, June-bearing strawberry cultivar (*Fragaria ×ananassa* Duch.) released through the collaboration of Agriculture and Agri-Food Canada and McGill Univ. 'Joliette' has high yields of large, moderately firm fruit and it is resistant to leaf spot (*Mycosphaerella fragariae* Tul.) and to six North American eastern (NAE) races of red stele (*Phytophthora fragariae* Hickman) (Delhomez et al., 1995; Khanizadeh, 1994; Khanizadeh et al., 1995). We recommend 'Joliette' for fresh market and pick your own.

The name "Joliette" refers to a town located on the l'Assomption River in southern Quebec. It is one of the major strawberry-growing areas, renowned for its sandy soils, which are perfectly suited for irrigated production of nursery plants and fruit.

'Joliette' was tested as SJ89288-2, progeny of a cross made in 1989 by S. Khanizadeh between 'Jewel' and SJ85189 (Fig. 1). 'Jewel' is a relatively new commercial cultivar in east-

central Canada and is noted for large, firm, glossy fruit with good flavor and resistance to leaf spot (*M. fragariae*) and postharvest fruit rot (Khanizadeh, 1994; Sanford et al., 1985). SJ85189 was retained in our breeding program

because of its very large fruit; adaptation to heavy soil; and resistance to low winter temperatures (less than -30C), water stress, the herbicide 5-chloro-3-(1,1-dimethyl-ethyl)-6-methyl-2,4(1H,3H)-pyrimidine-dione (terbacil), leaf spot, leaf scorch (*Diplocarpon earlina* Ell. and Ev.), and powdery mildew (*Sphaerotheca macularis* Walls ex Fr.). 'Joliette' has been tested extensively at Agriculture and Agri-Food Canada, L'Acadie, Québec, since 1989. L'Acadie is located 35 km southeast of Montreal Island, Québec (lat. 45°N and 46-m elevation). The climate at L'Acadie is characterized by extreme low temperatures in winter (less than -25C); cool, wet, humid springs (5–15C, 70% relative humidity); and warm, dry, humid summers (25–35C, 70% relative humidity). The area has a clay loam soil with moderate to low drainage and little snow cover. 'Joliette' also has been tested at McGill Univ., Ste Anne de Bellevue (1993–94); at Ministère de l'Agriculture des Pêcheries et de l'Alimentation du Québec (MAPAQ), Sainte Foy, Québec (1992–94); and at Lavaltrie, Québec (1991–93). Ste Anne de Bellevue is located at the far west of Montreal Island, Québec (lat. 45°N and 27-m elevation), close to St. Louis Lake, with a sandy clay soil, moderate drainage, and good snow cover. Lavaltrie is located 35 km north of Montreal Island, Québec (lat. 45°N and 30-m elevation), with sandy soil and a continental cli-

Fig. 1. Pedigree of 'Joliette' strawberry.

Fig. 2. Fruit of 'Joliette' strawberry.

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Table 1. Comparison of yield (per 2 m of row), fruit characteristics, and ripening season of 'Joliette' vs. eight commercially grown strawberry cultivars at Lavaltrie and l'Acadie, Quebec.²

Cultivar	Yield (kg)	Mean fruit wt (g)	Neck size ^y	Calyx form ^y	Skin color ^y	Flesh color ^y	Flavor ^y	Firmness ^y	Ripening season ^x
Bounty	3.3	9.7	3.0	3.9	3.3	3.0	3.8	2.0	L
Chambly	4.5	11.9	4.0	4.7	4.0	4.0	3.6	3.8	EM
Glooscap	3.4	9.3	3.4	4.4	3.0	3.1	3.1	2.6	M
Honeoye	4.0	10.5	3.0	2.0	3.0	3.0	3.0	3.0	EM
Joliette	4.7	12.2	3.2	3.0	2.8	2.3	3.3	3.2	M
Kenr	3.9	11.9	3.5	3.2	2.5	2.5	3.0	3.3	M
Oka	5.0	8.8	2.7	2.5	3.2	2.2	3.3	3.0	M
Redcoat	3.5	6.7	3.8	3.0	3.0	2.8	3.0	2.8	EM
Sparkle	2.6	6.6	2.4	3.4	3.0	2.0	3.4	2.0	LM
lsd	0.8	2.6	0.3	0.2	0.2	0.1	0.2	0.1	

²Averaged over 6 years (1990–95), minimum of four replications per year and two locations.

³Data were transformed to arcsin before analysis of variance (SAS, 1988). Neck size: 1 = none, 5 = long neck; calyx form: 1 = concave (covered the fruit), 5 = reflexed (away from the fruit); skin and flesh color: 1 = very pale, 5 = dark red; flavor: 1 = poor, 5 = excellent; firmness: 1 = very soft, 5 = very firm. For details of ranking, see Khanizadeh (1994).

⁴Ripening season: L = late, LM = late midseason, M = midseason, EM = early midseason, E = early.

mate. Sainte Foy is located in the west of Quebec City (lat. 46°N and 90-m elevation), with sandy clay loam soil and extremely low winter temperatures.

Description

'Joliette' plants are vigorous, medium in size, with five to seven inflorescences per plant and can tolerate winter temperatures below –25°C (with 10 cm of straw mulch cover). Petioles are long with three leaflets that are flat, medium in size, dark green, obovate with ≈21 sharp serrations. Plants do not have a dense appearance. Inflorescences are held erect during flowering, becoming semi-erect as the fruit mature, and generally have 10 to 15 flowers.

About 2 kg of fruit of each cultivar was collected at each harvest, compared, and used to evaluate appearance, texture, and flavor attributes as described previously (Khanizadeh, 1994; Khanizadeh et al., 1994). Specific measuring systems were used for each attribute. Neck size and calyx form were evaluated using the ranking method. Skin and flesh color, flavor, and firmness were evaluated by us using the line scale technique (Khanizadeh et al., 1994). Fruit shape was evaluated using a classification method (Khanizadeh, 1994; Meilgaard et al., 1990). Data collected for all harvests were combined for analysis of variance (ANOVA). Rank and line-scaled data were transformed using an arcsin square root percent transformation to make the means and variances independent before ANOVA. The ANOVAs were done using the General Linear Model Procedure (GLM) of SAS (SAS, 1988). Least significant difference was used for mean separation between the cultivars.

Fruit shape (Fig. 2) changed from globose-conic, similar to 'Kent', to short wedge, similar to 'Bounty', as harvest approached. The calyces are moderately reflexed (Table 1). Fruit are large with a very small white, raised neck. Skin is very glossy red at maturity, and the flesh is light red throughout. Fruit flavor is similar to that of 'Glooscap', 'Oka', and 'Sparkle'. Fruit are moderately firm, similar to 'Kent', and can be decapped easily, like 'Chambly'. The fruit keep their integrity after thawing, and percent juice lost is similar to

that of the other cultivars tested. Plants of 'Joliette' tolerate the herbicide terbacil.

Performance

Yield and fruit weight were similar in all tested areas. However, the data are averaged over 6 years (1990–95) for l'Acadie and Lavaltrie (Table 1). 'Joliette' produced similar yield as 'Honeoye', 'Chambly', 'Oka', and 'Kent' and has outyielded 'Bounty', 'Glooscap', 'Redcoat', and 'Sparkle' since 1989 (Table 1). The ripening season of 'Joliette' is similar to that of 'Glooscap', 'Kent', 'Bounty' and 'Oka' (midseason). The individual fruit weight of 'Joliette' was similar to the weight of 'Kent', 'Honeoye', 'Bounty', and 'Chambly'.

Disease resistance

No symptoms of powdery mildew, leaf scorch, leaf blight (*Dendrophoma obscurans* Ell. and Ev.), or leaf spot have been observed since 1989 during comparisons with other standard cultivars, such as 'Annapolis', 'Bounty', 'Glooscap', 'Honeoye', 'Jewel', 'Kent', 'MicMac', 'Midway', 'Redcoat', 'Sparkle', and 'Veestar' (Khanizadeh, 1994). A greenhouse test was also conducted, as described by Delhomez et al. (1995), to test the reaction of 'Joliette' toward leaf spot, a common foliar leaf disease in eastern Canada (Craig, 1979; Fall, 1951). No symptoms of leaf spot were noticed, beginning 8 days after inoculation until the termination of the experiment at 23 days.

In 1994–95, the susceptibility of 'Joliette' to the six NAE races (A-1, A-2, A-3, A-4, A-5, A-6, mixture of A1–A6) of (*P. fragariae*) was evaluated as described by Khanizadeh et al. (1992), in comparison with 'Annapolis' (resistant), 'Honeoye' (susceptible), 'Sparkle' (semiresistant), and six advanced selections. After 60 days, 10 primary root systems per plant were randomly selected to evaluate the presence of red stele and oospores in the root system. 'Annapolis' and 'Joliette' were the most resistant genotypes compared to the others and had the least frequency of presence of red-stele and oospores in their root segments.

Adaptation and uses

'Joliette' is recommended for areas that have climates and soil types similar to l'Acadie and Lavaltrie. It performs well in compacted or heavy soils or under water stress. 'Joliette' is under evaluation in other Canadian provinces, in Germany, Switzerland, Belgium, and Russia.

Availability

A U.S. plant patent (ref. 1770-141 "US") and a Plant Breeders' Rights application for Canada (ref. 1770-141) has been applied for. 'Joliette' plants will be available from licensed nurseries in Québec or the United States.

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