'AC-L'Acadie' Strawberry

Shahrokh Khanizadeh¹, Bertrand Thériault², and Odile Carisse³

Agriculture and Agri-Food Canada, Research Station, 430 Blvd. Gouin, St-Jean-sur-Richelieu, QC, Canada, J3B 3E6

Deborah Buszard⁴

Department of Plant Science, McGill University, Ste-Anne-de-Bellevue, Quebec, Canada, H9X 1C0

Additional index words. *Fragaria ×ananassa*, fruit breeding, storage, shelf-life, red stele

'AC-L'Acadie' is a new June-bearing strawberry cultivar (*Fragaria ×ananassa* Duch.) bred for Quebec and Eastern Central Canada growing conditions. 'AC-L'Acadie' produces large, firm fruit and the plants are moderately resistant to leaf diseases and partially resistant to the principal eastern races of red stele (*Phytophthora fragariae* Hickman). 'AC-L'Acadie' fruit store very well at room temperature for several days, making them ideal for shipping or for growers who need to store fresh fruit. The cultivar is recommended for pick-your-own and/or fresh-market producers.

The Prefix "AC" in the name stands for "Agriculture and Agri-Food Canada." The name 'L'Acadie' was chosen because this cultivar was originally selected at the L'Acadie substation of Agriculture and Agri-Food Canada and it was tested there for several years. This is also the site where much of the strawberry research and breeding is being conducted in the province of Quebec.

Origin

'AC-L'Acadie', tested as SJ8916-50, is a seedling resulting from a cross between 'Glooscap' and 'Guardian' made in 1989 by S. Khanizadeh. 'Glooscap' was used as a parent because of its high yields of high-quality, glossy, dark-red fruit with a reflexed calyx (Craig et al., 1991). 'Guardian' was used as a parent because of its large, firm, pale red fruit and its known resistance to five races of red stele, powdery mildew (*Sphaerotheca macularis* Walls ex Fr.), leaf scorch (*Diplocarpon earlina* Ell. and Ev.), and verticillium wilt (*Verticillium albo-atrum* Reinke & Berth.) (Brooks and Olmo, 1997).

'AC-L'Acadie' has been tested at the Agriculture and Agri-Food Canada substation in L'Acadie, Quebec, since 1990, and at the Macdonald Campus of McGill Univ. in Ste-Anne-de-Bellevue during the 1992–94 fruiting seasons. It was also evaluated from 1996–98 in controlled semi-commercial sites by our private partners Lareault Inc., Les Fraises de l'Île d'Orléans Inc. in Quebec and Réseau d'Essais Petits Fruits—CPVQ Inc. (Quebec Regional small fruit trials, Conseil des productions végétales du Québec).

Description and performance

Plants of 'AC-L'Acadie' are vigorous and have four to seven inflorescences per crown. They can tolerate winter temperatures below –30 °C (with 10-cm straw mulch cover). Peti-

oles are 12–22 cm long, and the leaflets are longer than broad (1.25:1), large, dark green, flat, shiny, and obovate, each with ≈17–24 serrations.

'AC-L'Acadie' produces large, shiny, pale red fruit that ripen in midseason (Fig. 1, Tables 1 and 2). Fruit shape is necked-conic and the semi-reflexed calyces decap as easily as those of 'Chambly' and 'Glooscap'. The flesh is lighter red than the skin and is sweet and firm (Table 2). Fresh fruit store very well for up to 5 d at room temperature and frozen fruit retain their integrity after thawing.

'AC-L'Acadie' produced yields similar to those of 'Joliette', 'Oka', 'Kent', 'Glooscap', and 'Chambly' during 1995–98 (Table 1). The index of crop concentration of 'AC-L'Acadie' was very similar to that of 'Joliette', but more concentrated than that of 'Kent'. No symptoms of powdery mildew were observed on 'AC-L'Acadie' in any of the sites during all the years of testing. 'AC-L'Acadie' had the same level of tolerance to leaf scorch, leaf blight (*Dendrophoma obscurans* Ell. and Ev.), and leaf spot [*Mycosphaerella fragariae* (Tul.) Lindau] as did 'Honeoye'. No signs of gray mold fruit rot (*Botrytis cinerea* Pers. ex Fr.) were observed for any cultivars except 'Glooscap', which showed intermediate susceptibility. 'AC-L'Acadie' plants were ranked partially resistant to the six North American Eastern (NAE) races of red stele (A1 to A6) in a controlled environment (Khanizadeh et al., 1997). The plants are tolerant to the herbicide terbacil [5-chloro-3-(1,1-dimethylethyl)-6-methyl-2,4-(1*H*,3*H*)-pyrimidine-dione].

Fig. 1. Fruit of 'AC-L'Acadie' strawberry.

Received for publication 2 Nov. 1998. Accepted for publication 1 Mar. 1999. Agriculture and Agri-Food Canada, St-Jean-sur-Richelieu, Contribution No. 335/99.04.01R. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.

¹Research Scientist and Adjunct Professor, Breeder, Physiologist, and Statistician.

²Technician.

³Research Scientist, Pathologist.

⁴Associate Professor and Dean, Fruit Specialist.

Table 1. Yield distribution (g·m⁻¹ of row), indices of crop concentration and earliness, ripening season, and total yield of 'AC-L' Acadie' compared with those of other genotypes.

Genotype	Harvest ^z							Total yield (g·m ⁻¹) ^y	Wt/fruit (g) ^y	Ripening season ^x	Index of crop concn ^w	Index of earliness ^w
	1	2	3	4	5	6	7					
AC-L' Acadie	108	102	427	1004	501	504	197	2841	14.5	M	1.5	2.1
Joliette	209	542	711	749	338	205	---	2752	15.3	M	1.4	2.5
Oka	516	467	607	520	291	254	---	2653	13.6	M	1.0	3.0
Kent	409	443	443	385	255	263	154	2350	14.0	M	0.6	2.5
Glooscap	385	563	651	342	221	161	---	2322	11.8	M	1.3	2.5
Chambly	591	466	486	325	262	157	---	2286	13.9	EM	1.2	2.9
Honeoye	695	344	297	218	296	156	222	2226	11.8	E	1.1	3.0
Jewel	135	378	451	393	234	248	---	1837	13.9	M	1.1	1.6
LSD _{0.05}								600	2.3		0.6	1.1

^zNumber of times fruit were harvested during the season; the number in brackets is the cumulative day after the first harvest during 1995–98.^yAveraged over 4 years (1995–98), minimum of four replications per year, data from the L' Acadie site, genotypes are ranked by total yield.^xL = late, M = midseason, EM = early-midseason, E = early.^wCalculated as described previously (Galletta et al., 1996; Khanizadeh and Fanous, 1992) using the Pedigree software (Khanizadeh and Prasher, 1997).Table 2. Firmness, flavor, skin color, and shelf life of 'AC-L' Acadie' compared with those of other genotypes.^z

Genotypes	Firmness ^y	Flavor ^y	Skin color ^y	Shelf life ^x
AC-L' Acadie	4.1	3.3	2.0	5
Joliette	4.2	3.3	2.8	4
Oka	2.0	3.7	4.0	1
Kent	3.0	3.0	2.2	2
Glooscap	2.7	3.1	3.6	1
Chambly	4.0	3.7	3.8	3
Honeoye	3.0	3.0	3.0	1
Jewel	4.0	3.0	2.6	3
LSD _{0.05}	0.1	0.2	0.2	1.3

^zAveraged over 4 years (1995–98), minimum of four replications per year, data from the L' Acadie site.^yData were transformed to arcsin prior to analysis of variance (SAS Institute, 1988). Firmness: 1 = very soft, 5 = very firm; flavor: 1 = poor, 5 = excellent; skin color: 1 = very pale, 5 = dark red. See Khanizadeh et al. (1994) for details on score evaluation.^xNumber of days at room temperature for which the fruit were >95% marketable.

Area of adaptation and uses

'AC-L' Acadie' is recommended for Eastern Central Canada, especially in areas where the climate is similar to that in Quebec. It is ideal for shipping because of its good postharvest fruit quality and integrity. It performs very well in sandy soils and in compact or heavy soils similar to those in L' Acadie where this genotype was first selected. 'AC-L' Acadie' is presently being evaluated in other provinces of Canada, in the United States, and in Europe.

Availability

A patent is pending for 'AC-L' Acadie'. Plants can be purchased from licensed nurseries in Quebec and licenses for multiplication can be obtained from Agriculture and Agri-Food Canada. European nurseries can obtain a multiplication license from Meiosis Ltd. (Bradbourne House, Stable Block, East Malling, Kent ME19 6DZ). A limited number of plants are available from the author (SK) for research purposes.

Literature Cited

- Brooks, R.M. and H.P. Olmo. 1997. Register of fruit & nut varieties. 3rd ed. ASHS Press, Alexandria, Va.
- Craig, D.L., A.R. Jamieson, and K.A. Sanford. 1991. Glooscap and Blomidon strawberries. Can. J. Plant Sci. 71:937–941.
- Galletta, G.J., J.L. Maas, J.M. Enns, J.C. Scheerens, R. Rouse, and R.F. Heflebower, Jr. 1996. 'Primetime' strawberry. HortScience 31:1038–1042.
- Khanizadeh, S. and M.A. Fanous. 1992. Mathematical indices for comparing small fruit crops and trait similarity. HortScience 27:346–348.
- Khanizadeh, S., J. Fortin, M.J. Lareau, and D. Buszard. 1994. Sensory evaluation of six strawberry cultivars after machine harvest, p. 249–254. In: H. Schmidt and M. Kellerhals (eds.). Prog. in temperate fruit breeding. Kluwer Academic, The Netherlands.
- Khanizadeh, S., A. Gruber, O. Carisse, D. Buszard, and P.O. Thibodeau. 1997. Red-stele susceptibility of advanced strawberry selections from Quebec. Acta Hort. 439:189–193.
- Khanizadeh, S. and S.O. Prasher. 1997. Pedigree®: A database program to draw pedigrees, trace traits, and view images of strawberry genotypes. Adv. in Strawberry Res. 16:67.
- SAS Institute. 1988. Statistical analysis system. SAS/STAT, SAS/BASIC guide for personal computers, version 6.04 ed. SAS Inst., Cary, N.C.