

Division of Marketing
Agricultural Development and Diversification (ADD) Program
1998 Grant Final Report

Grant Number 13058

Grant Title Strawberry Breeding - The Development of New Commercial Cultivars
for the Wisconsin Grower (Phase 2)

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Continuation of progress report

This project was unique since the original intent was to improve the profitability of existing and future Wisconsin strawberry growers by developing and providing them with new, adapted, more productive strawberry cultivars. These new cultivars would require less inputs since they would have increased winter hardiness, disease resistance and other stress tolerance. The concept of this project then, departs from the typical business development/sales improvement projects funded through the ADD program.

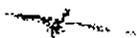
Funds for this project so far have been used to plant larger numbers of seedlings to select superior types from and to evaluate "advanced selections" already on track for cultivar development and release for commercial grower trial plantings. Funds were also used to increase the amount of winter hybridization conducted in the UW-River Falls Campus greenhouses. As a result, this project now encompasses 16 acres and has doubled in size and effort. This greatly shortens the time required between hybridization and release of a final product (a new strawberry cultivar) to our Wisconsin commercial growers. Other facets of this project have included industry characterization surveys and evaluation trials.

The objective of the evaluation trials has been to test new/existing cultivars released from other regions of North America. Based on these results Wisconsin growers receive recommendations on which cultivars to plant commercially until Wisconsin cultivars become available. The economic impact is projected to be substantial. An estimated 75% of state growers are contacted and provided this information. The cultivars they plant in response to our recommendations typically yield far better than the average, thus increasing profitability on a per acre basis a minimum of 30%.

A new survey was distributed to Wisconsin strawberry growers in Spring 1999 at a statewide meeting and approximately 60% of the surveys were completed and returned. The survey was designed to accurately characterize Wisconsin Berry Growers and allow us to fine-tune our support programs at UW-River Falls. This valuable information will also show industry trends from the 1996 survey completed. Data from this survey is currently being analyzed.

A new evaluation trial was established in Summer 1999. Each replication of a new cultivar or selection is a 25 foot row. This is a large 3-replicate trial that includes 58 entries, of which 28 are UW- River Falls strawberry breeding program advanced selections. These 28 most elite UW-selections from 1996 and 1997 characterize the philosophy of the new "Fast Track" program. Strawberry advanced selections were usually evaluated 3-4 years before reaching replicated yield trial testing, but under the new system we can place the most promising in simulated commercial trials within 2 years.

Much more promising progress has been made this past year as compared to 1997. More commitment to careful maintenance and observation of advanced selections has helped streamline our "Fast Track" system.



From the 3,916 seedlings planted in Summer 1998, we selected 49 advanced selections in Summer 1999. Of the 103 advanced selections from Summer 1998, approximately 18 have been placed in the "elite" category. The following table summarizes the status of best selections from both years.

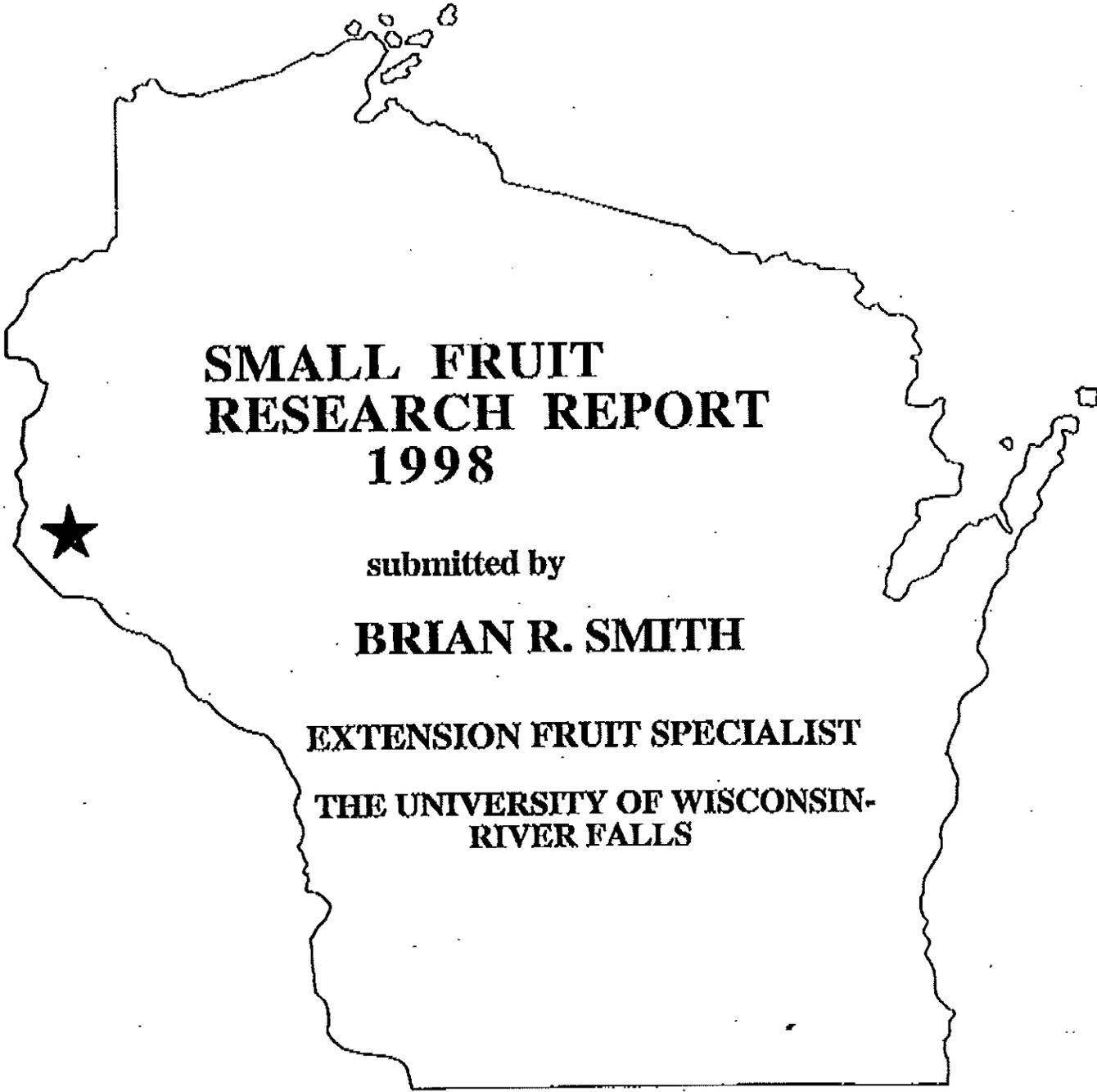
Elite Advanced Selections Summer 1999²

	Advanced Selection ID
1.	98-5-92
2.	98-5-16
3.	98-5-38
4.	98-12-31
5.	98-13-5
6.	98-14-18
7.	98-14-28
8.	98-53-14
9.	98-58-13
10.	98-108-45
11.	89-108-46
12.	98-110-2
13.	98-111-2
14.	98-111-11
15.	98-111-14
16.	98-112-1
17.	98-112-2
18.	98-112-5
19.	99-57-64
20.	99-58-41
21.	99-59-7
22.	99-60-2
23.	99-60-8
24.	99-60-22
25.	99-60-45
26.	99-63-6
27.	99-69-28
28.	99-116-69
29.	99-118-3
30.	99-127-61
31.	99-130B-4

² 1998 and 1999 Advanced Selections evaluated for 2/1 year(s) respectively; and originally selected from 3,995/3,916 total seedlings in 1997 and 1998; and as of Summer 1999 number of original advanced selections selected from totaling 103/49 for 1998 & 1999, respectively.

Strawberry seedlings for selection in Summer 2000 were planted in June 1999. The 3,005 seedlings were derived from 96 different parental combinations.

Attached are additional report specifics and "spin offs" from this ADD project.



**SMALL FRUIT
RESEARCH REPORT
1998**

submitted by

BRIAN R. SMITH

EXTENSION FRUIT SPECIALIST

**THE UNIVERSITY OF WISCONSIN-
RIVER FALLS**

1998 STRAWBERRY BREEDING PROGRESS REPORT

PRINCIPAL INVESTIGATOR
 BRIAN R. SMITH
 UNIVERSITY OF WISCONSIN-RIVER FALLS

- OBJECTIVE 1:** (Short & long term) Junebearing cultivar development. Develop Junebearing cultivars incorporating high yield potential, superior flavor, fruit size and firmness and winter hardiness.
- OBJECTIVE 2:** (Short & long term) Day neutral cultivar development. Introduce day neutral cultivars with superior winter hardiness, fruit characteristics and summer heat tolerance.
- OBJECTIVE 3:** (Long term) Continuous Source Population Improvement. Screen *F. virginiana* ssp *virginiana* Staudt (Wild Scarlet or Virginia strawberry) and ssp *glauca* Staudt, *F. ovalis* (Lehn.) (Rocky Mountain strawberry) and *F. chiloensis* (L.) Duch. (Frutillar, Chilean or beach strawberry) for unique characteristics such as winter hardiness, drought tolerance, fruit color and flavor and incorporate superior selections in crosses with *Fragaria x ananassa*.
- OBJECTIVE 4:** (Long term) Develop commercially acceptable cultivars resistant to tarnished plant bug injury.

The strawberry breeding program at the University of Wisconsin-River Falls was initiated in the fall of 1988. The Wisconsin Berry Growers Association (WBGA) has been the primary source of funding for this program since 1990. Other sources of funding include North American Strawberry Growers Association, Smithberry Farms, Mitchell, SD, Dr. Brian R. Smith, University of Wisconsin System Grants, University of Wisconsin-River Falls, Wisconsin Dept. of Agriculture, Nourse Farms, Inc., and Brittingham Plant Farms, Inc.

Since 1988, over 26,179 seedlings have been planted, and 21,005 screened and selected from. Approximately 3,916 seedlings were field planted this past summer to be evaluated July 1999. The total seedling population from 1988-1998 represent over 876 families or cross combinations. This is a distinct departure from traditional breeding programs usually characterized by fewer crosses and larger progenies. The objective has been to screen large numbers of cross combinations for potential performance. Each succeeding year, those parental cross combinations identified as producing a high percentage of superior seedlings are planted in greatly expanded numbers, thus reducing the number of "exploratory" cross seed planted each year. Concurrently, a large number of advanced selections have been identified from 1989 to 1998 (approximately 812 - 4% selection pressure as compared to traditional breeding program .5 - 1% selection pressure). This was decided because of past observations of complications with juvenility effects and short growing seasons. To compensate for the large advanced selection numbers, a high turnover rate has been established.

The cumulative number of advanced selections (812) broken down by year and those remaining that are used in breeding or have cultivar potential as of Fall 1998 are in the following table:

YEAR	NUMBER OF SEEDLINGS PLANTED	ORIGINAL NUMBER OF SELECTIONS MADE	NUMBER OF REMAINING SELECTIONS AVAILABLE TO BE USED IN BREEDING PROGRAM	NUMBER OF REMAINING SELECTIONS UNDER EVALUATION AS CULTIVAR POTENTIAL
1989	2,054	—	0	0
1990	4,023	77 (from 1989 seedlings)	13	0
1991	2,073	171	18	0
1992	1,944	179	17	0
1993	1,710	91	3	3
1994	3,066	77	15	13
1995	2,100	75 (from 1994 seedlings)	30	8
1996	1,298 (Includes 376 TPB seedlings)	27 (from 1995 seedlings)	19	20
1997	3,995 (Includes 1,258 TPB seedlings)	12 (from 1996 seedlings)	12	12
1998	3,916 (Includes 1,243 TPB seedlings)	103 (from 1997 seedlings)	103	82
TOTALS	26,179	812 (Includes 21 TPB sels.)	230	137

In the past nine years, 151 advanced selections have been incorporated into crosses in the breeding program. Currently, 142 advanced selections (from the UW-River Falls Breeding Program), 54 selections from other breeding programs and 159 cultivars originating worldwide are potted and on hand for winter hybridization in 1999.

The 1997-98 winter eased in gradually, allowing sufficient time for the strawberries to harden off properly. Therefore, advanced selections were not mulched until December 8, 1997.

Temperature extremes/snow cover conditions were:

-7°F	December 31	0.5" snow cover
-22°F	January 13	8.5" snow cover
+54°F	February 24	
+72°F	March 26	

First and last snowfall of the season were November 2, 1997 (2.5") and March 23, 1998 (1.5") respectively. The 1998 spring season was characterized as very warm (warmest since 1988) and average precipitation. The most unusual aspect of this spring was the lack of frost - the last frost event was 27° on April 10, 1998. Temperature extremes ranged from 40°F (May 13) to 92°F (May 14) during the 61 day berry development and harvest period.

Descriptions of the most promising recent advanced selections evaluated in Summer 1998 are as follows:

98-12-31 (RF 91-3-5 x Jewel) Very large, glossy, bright red, productive conic. V.good flavor. Vigorous plants.

98-37-8 (Allstar x RF 93-91-4) Large, late-fruited medium red with very high sugars. Productive. Healthy plants, runner freely.

98-66-61 (Glooscap x Kentville, N.S. sel.) Dk. red wide conic of excellent flavor - (best of sels. for flavor). Good runner production.

98-77-12 (Jewel x Kentville, N.S. sel.) Glossy medium red firm, with very high sugars. Plants upright, productive and good health.

98-97-3 (Seneca x Midwestern cultivar) Dark red, conical firm, very large fruit. High productivity. Runners freely.

98-108-15 (Primetime x RF 91-3-25) Excellent-flavored, medium glossy-red, large, firm fruits. Plants very healthy, vigorous, upright.

98-110-2 (Latestar x RF 91-13-2) Large uniform dk. red conic. Red flesh. Plants v.large and vigorous.

98-111-11 (Winona x RF 91-3-25) V.large wide conic; light red fruit with well-balanced aromatic flavor. Maintains size very well. Plants upright, vigorous. Moderate runnering and excellent plant health.

98-97t-2-4-99* (Mic Mac x Eastern Cultivar) Excellent flavor, productivity and size. Plants vigorous and multiple runners.

98-97t-2-17-2* (Cavendish x Eastern Cultivar) Dark red wide conic with good flavor. V.firm - productive; moderate runnering and excellent plant health.

* Denotes seedling from tarnished plant bug breeding segment of program.

Tarnished Plant Bug Resistance Investigations

The possibility of breeding new strawberry cultivars resistant to tarnished plant bug feeding was addressed in a series of journal articles by David Handley (University of Maine). In response to Dr. Handley's initial encouraging results, a new facet of the UW-River Falls breeding program was initiated via a UW-System grant.

At UW-River Falls, the two facets of the project are: (1) To confirm results from Dr. David Handley's initial research identifying possible existing sources of resistance. In Spring 1996, a large replicated planting of 6 cultivars was planted to measure tolerance levels in Wisconsin. These cultivars represented Resistant, Average and Susceptible as indicated by studies by Handley, et al. Each cultivar plot consists of four 25 foot rows. Within each of these four row plots only the two middle ones are harvested. Each four row plot is replicated four times per treatment (insecticide sprayed versus unsprayed). In summer 1998, these plots were harvested. Data is currently being analyzed.

(2) To make initial hybridizations among cultivars of suggested levels of resistance, e.g. Resistant x Resistant, Resistant x Susceptible and Sus. x Sus. In Winter 1995-96, hybridizations were made among cultivars representing the resistance level combinations of resistant x resistant, resistant x susceptible, (and reciprocal) and susceptible x susceptible. A small number of seedlings (376 representing 6 progenies) were grown to transplant size in the greenhouse and field set in 4 x 4 ft. spacings in Summer 1996. Seedlings were equally divided into two replications. Three standard control (check) cultivars were interplanted amongst the seedlings to be used as comparisons of degree of TPB injury. Due to the late planting date and devastating freeze in Spring 1997, no data collection was possible that year.

In Winter '96 - '97 many more crosses were accomplished and a much larger 2-replicate seedling planting was field established in July 1997. This trial consisted of a total of 36 susceptible x susceptible, 309 susceptible x resistant (and reciprocal) and 589 resistant x resistant seedlings (rankings according to reports by Handley et al.) for a total of 1,258 seedlings for resistance evaluations. Twenty plants each of the standard cultivars Honeoye (R), Sparkle (R) and Kent (S) were planted as controls in each of the two replicates.

Seedlings from both 1995-96 and 1996-97 crosses were also in part harvested for analysis. Data was collected June 1998 from 376 of the seedlings established in Summer 1996. Approximately 250 of the remaining 1,100 Summer '97-established seedlings were also harvested. The balance of the 1,100 were not harvested due to juvenility problems associated with the unavoidably late field establishment in Summer '97. Data collected has been divided in to TPB-affected (non-marketable) and marketable yield.

In addition to standard data collection, we selected advanced strawberry genotypes from 1996 and 1997 seedling TPB populations (3 and 15 selections respectively) based on superior horticultural characteristics. These have been replanted into advanced testing blocks to evaluate suitability for cultivar status and breeding potential for TPB-resistance.

A third phase of this project was added to Objective 1 in Summer 1997 when additional resistance crosses were made with a newly-introduced, potentially TPB-resistant cultivar. The seeds of these crosses were stratified in September 1997 and germinated Winter '97-'98. Approximately 1,335 seedlings representing 15 progenies incorporating this new cultivar were planted in Summer 1998 in anticipation of observations in Summer 1999.

1998 JUNE BEARING STRAWBERRY CULTIVAR TRIALS

PRINCIPAL INVESTIGATOR

BRIAN R. SMITH

UNIVERSITY OF WISCONSIN- RIVER FALLS, WI 54022-5001

The Junebearing strawberry cultivar trial contains 45 entries (17 cultivars; 28 advanced selections from New Jersey, USDA and UW-River Falls). The experimental plot design was a randomized complete block with 4 replications. Only 32 of 45 entries are included due to lack of plant stand.

Methods

Location/

Climate: University of Wisconsin-River Falls; USDA Hardiness Zone 3b (-15° F guaranteed, -42° F possible)

Soil Type: Sparta Sandy Loam, 2.1% organic matter, pH of 7.1

Planting: Bare root plants set 6/4/96

Spacing: 1 1/2 x 4 ft within and between rows, respectively; 16 plants per plot. Plant density = 7,260 plants per acre. Plot size was 4 feet x 20 feet.

Mulching: Plots were mulched with 6 inches of rye straw on December 8, 1997. Plots were uncovered April 24, 1998.

Irrigation: Overhead sprinkler irrigation was applied as needed according to Irrrometer[®] tensiometer readings.

Fertilizer:

1. 20-20-20- broadcast at 400 lbs/acre + Boron at 2 lbs/acre before planting on 6/3/96.
2. 45-0-0 broadcast at 80 lbs/acre July 30, September 11, 1997.

Weed

Control: Mechanical cultivation as needed during first growing season. Sinbar (80% WP), 6 oz/acre at renovation on 7/31/97, Devrinol (50% WP), 8 lb/acre on October 15, 1997, prior to mulching.

Pest

Control: Thiodan (50% WP) - 2 lbs/acre on 5/20/98 and 6/3/98, for tarnished plant bug. Clipper weevil present, but below economic threshold levels.

Harvest

Season:

Early Season: 6/11 - 6/18/98 (2 harvests)
Total Season: 6/21 - 7/07/98 (5 harvests)

Results

The 1997-98 winter eased in gradually, allowing sufficient time for the strawberries to harden off properly. Winter mulch was applied December 8, 1997.

Temperature extremes/snow cover conditions were:

- 7° F	December 31	.5" snow cover
-22° F	January 13	8.5" snow cover
+54° F	February 24	
+74° F	March 26	

First and last snowfall of the season were November 2, 1997 (2.5") and March 23, 1998 (1.5") respectively. The 1998 spring season was characterized as very warm (warmest since 1998) and average precipitation. Temperature extremes ranged from 40° F (May 13) to 92° F (May 14) during the 61 day berry development and harvest period.

The most unusual aspect of this spring was the lack of frost. The last frost event of the Spring (27° F) was on April 10, 1998 (this also allowed a full crop of apricots for the first time in 6 years).

The harvest season began on June 11, (8 days early for this area) and extended to July 7. Fruits were of good quality with an average incidence of fruit rots. Yield, yield ranking and fruit size (1st and all harvests), overall fruit size ranking for all cultivars and selections are presented in the table. Total harvest season ranged from June 11 to July 7 and included 7 harvests.

Cultivar	YIELD		FRUIT SIZE		
	Lbs/Acre	Rank ^z	GM/Fruit 1st Harvest	GM/Fruit (Avg. For All Harvests)	Rank ^y
Early Season					
Annapolls	11,639	3	16.5	11.7	12
RF9351-1 ^x	5,570	18	14.2	9.7	23
MNUS 273	4,135	27	11.3	8.4	28
Earliglow	3,153	30	10.3	7.9	30
Early Midseason					
Honeoye	14,320	2	16.2	10.7	16
NJUS 8219-2	6,155	16	12.8	9.1	26
MNUS 255	5,520	19	14.5	10.6	17
MNUS 276	5,280	22	13.6	9.4	25
MNUS 272	4,780	24	10.4	7.8	31
Delmarvel	3,300	29	11.5	13.1	4
Midseason					
Mesabi	8,488	6	16.6	9.9	21
Kent	7,575	8	14.6	10.9	14
Primetime	5,978	17	17.0	11.8	11
WI US 8282	4,915	23	12.2	10.1	19
WI US 8248	4,637	25	19.0	12.4	10
Late Midseason					
Cavendish	15,620	1	18.8	15.6	1
Glooscap	10,520	4	15.8	10.8	15
Mira	8,576	5	19.5	12.5	9
Jewel	8,420	7	20.0	14.4	2
Sparkle	6,980	9	10.7	7.7	32
RF 93-91-4	6,657	13	13.8	10.5	18
RF 92-69-16	6,377	15	11.8	8.6	27
MNUS 225	4,490	26	10.5	9.5	24
RF 93-86-27	5,440	20	17.1	10.0	20
MNUS 246	5,432	21	4.6	11.0	13
RF 93-35-22	2,939	31	20.2	8.3	29
Late Season					
Winona	6,877	10	18.8	12.9	6
MNUS 299	6,680	11	16.6	13.0	5
Marmolada	6,679	12	19.1	13.2	3
Idea	6,415	14	16.0	12.5	8
B27 (USDA)	3,775	28	19.6	12.6	7
Latestar	2,250	32	17.2	9.8	22

^z Yield ranking of all 32 cultivars and advanced selections relative to one another. 1 = Best, 32 = Worst. When two genotypes performed identically, the next higher or lower rank consecutive number was assigned randomly.

^y Fruit size ranking of all 32 cultivars - selections relative to one another for all harvests. 1 = Largest, 32 = Smallest.

^x "RF" designates a selection from UW-River Falls Breeding Program.

RECOMMENDED STRAWBERRY CULTIVARS FOR WISCONSIN² - 1999
Brian R. Smith
Extension Fruit Specialist
UW-River Falls

EARLY SEASON

***Annapolis (N & S)^x**

Top-yielding cultivar in early season. Ranked 6th of 17 for overall yield ('91-'94); 3rd in 1998. Best average berry size through all harvests of any of 30 cultivars ('91-'93). Excellent vigor, runner production and winter hardiness. Red stete resistant. Only acceptable flavor. Berries may be too light-colored in some situations. Good firmness. Somewhat susceptible to fruit rots.

Earlglow (S)

Ranked 7th for yield in early season, 20th-30th overall in past trials. Has poor berry size, but excellent firmness and flavor. Probably has the best flavor of any of the cultivars tested. Excellent overall disease tolerance. Medium vigor. Susceptible to winter injury.

Redcoat (N)

Earliest berry and ranked 2nd for yield in early season ('91-'93), but has poor berry size. Excellent vigor, runnering and winter hardiness. Only fair flavor.

Sable (for trial N & S)

New cultivar from Nova Scotia. Only included in this list because of excellent past performance records of cultivars originating from this breeding program. However, should only be planted initially on a small test plot basis on grower farms until more information is available. Attractive bright red, very good-flavored fruit. Firmer than "Vestar" but probably still not adequate for prepicked sales. Red stete resistant. Good runnering ability.

Vestar (N)

Slightly less yield than Redcoat and smaller, softer berries. Fruit size drops quickly after first harvest. Very good flavor. Excellent winter hardiness. Top-yielding cultivar in early-early midseason ('95, '96 respectively).

EARLY MIDSEASON

***Honeoye (N & S)**

Most widely adapted strawberry cultivar for Midwest. Very high yields—ranked 2nd overall and 1st in early midseason category. Retains berry size well over harvests. Attractive, firm berries with good flavor. Can be off-flavored on heavy soils and may have green tips. Has good fruit rot tolerance but poor resistance to other diseases. Should not be planted where bacterial angular leaf spot is a problem. Excellent vigor and winter hardiness.

Redchief (S)

Medium large, firm, deep red glossy berries. Ranked 3rd in early midseason, 17th of 33 overall in past trials. Good for fresh or processed. Resistant to mildew, red stete, leaf scorch. Tolerant to Verticillium wilt.

MIDSEASON

- *Cavendish (N & S) Very high yield potential—ranked 4th-7th overall '93-'96; 1st in 1998. Very large globose dark red berries with good flavor. Excellent size retention over several harvests. Observations at River Falls and by some growers indicate a tendency to non-uniform coloring in some situations. Adequate irrigation and lower plant populations—narrower rows may help solve coloring problem. Too dark for some situations. Good disease tolerance to red stele, mildew, *Verticillium* and fruit rots. No winter hardiness problems observed thus far.
- *Glooscap (N & S) Widely-adapted cultivar. Very high yields. Ranked 1st overall in 8 years' testing. Large, firm, dark-red berries of good flavor. Good size retention over several harvests. Average disease tolerance. Vigorous and winter hardy. Fruit size declines in 2nd year and beyond if plant population is allowed to increase.
- *Kent (N & S) Widely-adapted cultivar. Very high yields. Ranked 2nd overall for 4 years—23rd of 34 after Winter '96 at UW-River Falls. Very large, firm, attractive berries. Adequate flavor. Some malformed fruit with appendages some years. Long fruiting season. Poor disease tolerance and inconsistent runner production. Questionable winter hardiness in most severe areas of Wisconsin. Injured at UW-River Falls '95-'96.
- Mesabi (for trial N & S) Promising new cultivar. Large, glossy bright red firm fruit with good flavor. Consistently high yields in Minnesota. Ranked 6th of 32 cultivars at UW-River Falls in 1998. Good winter hardiness.
- Primetime (for trial N & S) Ranked 17th of 27 for yield in 1997. Slight winter injury 96-97. Very attractive symmetrical very large fruit (ranked 1st in size for 1st harvests, 3rd for all harvests). Very good flavor, moderate firmness. Resistant to red stele and *Verticillium* wilt. Moderate to good runnering ability.

LATE MIDSEASON

- Seneca (N & S) Very high yield potential, ranked 3rd overall ('91-'93). Dropped to 25th out of 34 in '96. Very large attractive berries with good size retention over several harvests. Fruit may be too firm under certain circumstances. Vigorous grower with no apparent hardiness problems so far. Only acceptable flavor. Tendency to lower yields the further south it is grown. Average disease tolerance.
- *Jewel (S, for trial N) Very attractive large berry. High yield potential, widely adapted; ranked 5th overall, 2nd in this season category ('91-'93) 21st of 33 in '94, 8th overall in '96. Very good flavor. Good tolerance to post-harvest fruit rots. Injured at UW-River Falls winter '93-'94 and '96-'97. Great for pre-picked sales.
- Mira (for trial N & S) Ranked 10th of 27 for yield in 1997; 5th of 32 in 1998. Fruit size holds relatively well over season. Light medium red fruit with mild flavor. Resistant to most foliar diseases and red stele. Moderately vigorous—good runner production.

LATE SEASON***Bounty (N & S)**

Latest cultivar in trials. Older cultivar with accompanying faults such as soft berries. Good yield potential, ranked 8th overall ('91-'93) combined. Berries are large and have good flavor. Winter hardiness adequate in all but most severe areas. Good vigor, average disease tolerance.

Cabot (for trial N & S)

New cultivar from Nova Scotia. Only included in this list because of excellent past record of cultivars from this breeding program. However, should only be planted initially on a small test plot basis on grower farms until more information is available. Has very large, firm, bright red fruit for prepicked markets. Moderate yields at Grand Rapids, MN. Resistant to red stele. Poor runnering ability, suggesting closer within and between row spacings.

Canoga

Very large, convoluted berries that may turn too dark. Poor flavor. Ranked 19th overall in yield. Should only be grown in Bayfield region where growers report good performance.

***Lateglow (S, for trial N)**

Very large fruit of excellent flavor, adequate firmness, but color too light. Somewhat susceptible to fruit rots. Ranked 12th of 17 overall for yield ('91-'94 combined), 31st of 34 after winter '96. In milder regions of the state, probably the best cultivar to grow for this season. Excellent vigor and disease tolerance. Tolerant to red stele, leaf scorch and leaf blight. Winter injury—River Falls '95-'96.

***Sparkle (N)**

Old standby with excellent flavor. Ranked 11th of 17 in overall yield ('91-'94) combined. Fruit are soft and size declines rapidly over harvests. Excellent vigor and winter hardiness.

Winona (for trial N & S)

Very large, very late, medium red and v. good flavor and firmness. Medium to high yield potential. Good overall balance. Tolerant of leaf spot, powdery mildew and red stele. One of the most promising cultivars to be released in past 5 years for Midwest. Will fill in void left by loss of 'Blomidon'. Fruit are held close to ground, making harvest somewhat difficult.

***Top cultivars for region.**

z Recommendations based on yield-evaluation trials in Wisconsin, Minnesota, Michigan, Iowa and Illinois. Cultivar trials at UW-River Falls have continued for 8 consecutive years.

y Rated on fruiting season maturity based on multiple-year trials conducted in the Upper Midwest. Past and currently evaluated cultivars in these categories were/are (number in () indicates number of years cultivar/selection has been evaluated in the replicated yield trials at UW-River Falls): EARLY - Annapolis (8), Earliglow (8), Lester (6), Mohawk (3), Redcoat (3), Veestar (5); EARLY MIDSEASON, Delmarvel (2), Honeoye (8), Redchief (3), Settler (4); MIDSEASON - Cavendish (8), Chambly (3), Glooscap (8), Kent (8), Mesabi (2), Oka (3), Primetime (2) Vantage (3); LATE MIDSEASON - Darrow (3), Gov. Simcoe (6), Jewel (8), Mira (2), Mitasome (3), Rantzen (3), St. Clair (3), Seneca (6); LATE - Bounty (3), Canoga (3), Idea (2), Lateglow (8), Latestar (2), Sparkle (8), Winona (4).

x Suggested for commercial plantings in N (northern) or S (southern) Wisconsin, primarily based on winter severity. Border between northern and southern Wisconsin can be visualized as a straight line drawn from LaCrosse to Marinette.

Strawberry Cultivar Descriptions

(Introduced since 1988)²

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University of Wisconsin-River Falls

Updated January 1999

JUNE BEARING

1. Cavendish (K83-4) Named after the most popular tourist location of Prince Edward Island.

- Parentage:** 'Glooscap' x 'Annapolis'
Origin: Agriculture Canada, Kentville, Nova Scotia, 1990.
Season: Midseason
Fruit: Very large globose conic to wedge shape. Size retained over several harvests. Color dark red with medium red flesh. Firm flesh and medium firm skin. Flavor slightly superior to Annapolis. May have green shoulders and non-uniform coloring in some situations. Midday evaporative cooling and proper nitrogen level management may curtail the problem.
Disease: Resistant - A-4, A-6 and A-7 races of red stele
Tolerant - *Verticillium* wilt, *Botrytis* fruit rot, leaf scorch, leaf spot
Susceptible - green petal disease, powdery mildew
Plants: Moderately vigorous, reportedly productive, 85-90% of 'Kent' yields.
Yield Performance: Wisconsin-high; Minnesota-very high (Grand Rapids), above average (Morris), low (Excelsior); SW Michigan-very high.

2. Chambly (SJ84187-3) Named after a garrison town between the St. Lawrence and Hudson rivers in SW Quebec.

- Parentage:** 'Sparkle' x 'Honeoye'
Origin: Agriculture Canada and McGill University, Quebec, 1990.
Season: Midseason
Fruit: Medium size conic shape moderately firm fruit with white raised neck; average firmness. Shiny deep red skin with red flesh. Prone to excessive darkening when approaching overripe condition. Easily capped like 'Glooscap'. For fresh market or processing. Good flavor.
Disease: Resistant - leaf scorch, powdery mildew
Tolerant - leaf blight
Susceptible - red stele
Plants: Low vigor, medium size, thinly foliated. Reportedly good winter hardiness.
Yield Performance: Wisconsin - average; has outyielded 'Honeoye', 'Sparkle', 'Redcoat' and 'Bounty' in Quebec trials. High yields in SW Michigan.

3. DelMarvel (MDUS 4923) Named after the peninsula where it first fruited.

- Parentage:** Earliglow x Atlas
Origin: USDA, Maryland, 1994
Season: Early midseason
Fruit: Large, symmetrical with firm flesh and skin. Very attractive, aromatic berries with excellent flavor like 'Earliglow'. Good storage and shipping characteristics.
Disease: Resistant - 5 races of red stele and most leaf diseases, Anthracnose
Tolerant - Fruit rots
Susceptible -
Plants: Very vigorous, prolific runner production. Adapted to sandy or heavier soils. Probably borderline winter hardiness for Midwest.
Yield Performance: Good in MD, NJ and OH. SW Michigan-high. Wisconsin-low (UW-River Falls). Iowa Average.

²Not to be used as a list of recommended cultivars. New cultivars developed in regions other than the upper Midwest and the eastern U.S. and Canada (excluding day-neutrals and those with promising pedigrees) have not been included. Individuals seeking information on excluded cultivars can contact the author.

4. Idea (NF-1584-86-3)

Parentage: [(Gorella x MDUS 3816) x Tioga] x Etna
Origin: Italian Breeding Program, Cesena, Italy, 1991.
Season: Late
Fruit: Maintains good fruit size throughout season. Large berries are very light red, moderately firm; mild, pleasant flavor.
Disease: Resistant - Unknown
 Tolerant - anthracnose
 Susceptible - Leaf spot, (v.sus.) leaf scorch (v.sus.)
Plants: Winter hardiness unknown. Parentage would indicate insufficient hardiness for Midwest-no winter injury UW-River Falls, Winter '96-'97.
Yield Performance: Wisconsin-average (UW-River Falls). Very high yields at Nourse Farms in MA.

5. Latestar (MDUS 5084)

Parentage: Lateglow x Allstar
Origin: USDA, Beltsville MD. 1995
Season: Late Midseason
Fruit: Very large, glossy red. Pleasant mild flavor and aroma; outstanding firmness. Size declines somewhat rapidly over season.
Disease: Resistant - Red stele, leaf diseases
 Tolerant - Unknown
 Susceptible - Unknown
Plants: Vigorous. Some runnering problems, does not renovate well under some conditions. No winter hardiness problems Winter '96-'97-UW-River Falls. Probably insufficient hardiness further north.
Yield Performance: Wisconsin- High-(UW-River Falls). Very high yield potential in East. SW Michigan-high.

6. Marmolada

Parentage: Gorella x Salvi 15 or Sel. no. 8 (possibly Driscoll cv. 'Heidi')
Origin: C.I.V. Program, Comocchio Ferrara, Italy, 1989.
Season: Midseason
Fruit: Very attractive glossy medium red conic; bright red flesh, very large, good firmness and acceptable, sweet flavor. Excellent shelf life.
Disease: Resistant - Unknown
 Tolerant - Rhizoctonia & anthracnose rots, *Botrytis*, bacterial angular leaf spot, *Verticillium* wilt.
 Susceptible - Unknown
Plants: Good vigor, erect inflorescence. Some winter injury winter '96-'97 UW-River Falls. For "Hill System" of culture.
Yield Performance: Wisconsin-above average (UW-River Falls). Very high in New Jersey.

7. Mohawk (MDUS 5122)

Parentage: MDUS 4587 x Earliglow
Origin: USDA, Maryland and Ontario Ministry of Agriculture, 1994.
Season: Very early to early midseason (earlier than 'Veestar' in Canada)
Fruit: Medium size, similar to 'Earliglow'. May have some irregular-shaped berries—wide conic. Excellent color and flavor, medium firm. Not as tough-skinned as 'Earliglow'.
Disease: Resistant - 5 races of red stele
 Tolerant - fruit rots, powdery mildew
 Susceptible - Unknown
Plants: Very vigorous plants and good, runners freely. Probably borderline winter hardiness in Midwest.
Yield Performance: Lower yields than 'Veestar' in Ontario and Maryland; SW Michigan, Wisconsin (UW-River Falls), and Iowa-low

8. Northeaster (MDUS 4787) Named after typical strong northeast winds on the East Coast.

Parentage: MDUS 4380 x Holiday
Origin: USDA, Maryland, 1994.
Season: Very early to early midseason
Fruit: Very large, very firm, dark red skin color, good medium flesh color. King berries may be slightly rough. Intense, aromatic flavor like 'Holiday'.
Disease: Resistant - 5 races of red stele
 Tolerant - Unknown
 Susceptible - powdery mildew
Plants: Large plants, but sparse runnering on sandy soils. Probably borderline winter hardiness in Midwest.
Yield Performance: Average in Ohio, New Jersey and Maryland. SW Michigan, Minnesota, and Iowa-very low.

9. Oka (SJ83184-3) Named after a community at the mouth of the Ottawa River near Montreal.

Parentage: 'K75-13' ['K71-8' ('Salinas' x 'K60-98') x 'MicMac'] x 'Honeoye'
Origin: Agriculture Canada and McGill University, Quebec, 1991.
Season: Midseason
Fruit: Large size, moderate firmness. Medium red with light red flesh. Very good flavor similar to 'Sparkle' or 'Glooscap'. For PYO markets.
Disease: Resistant - Unknown
 Tolerant - Powdery mildew, leaf scorch, leaf spot.
 Susceptible - Unknown
Plants: Medium size and vigor. Survived test winter in River Falls with no injury. Good runner production. Somewhat more tolerant to terbacil than 'Kent' and 'Bounty'.
Yield Performance: Wisconsin - very high (River Falls); has outyielded 'Glooscap' and 'Kent' in Quebec and New Brunswick Canada.

10. Primetime (MDUS 5069)

Parentage: [(Sunrise x MDUS 3082) x Earliglow]
Origin: USDA, Maryland, 1995.
Season: Midseason
Fruit: Very large, moderate firmness, very good flavor, attractive.
Disease: Resistant - red stele, Verticillium wilt
 Tolerant - Unknown
 Susceptible - powdery mildew
Plants: Vigorous. Adaptable to various soil types. No winter injury UW-River Falls '96-'97.
Yield Performance: Wisconsin - average (UW-River Falls); SW Michigan-average.

11. St. Clair (GU62E55)

Parentage: GU18B34 x GU71M59
Origin: University of Guelph, Ontario, 1992.
Season: Late midseason
Fruit: Medium-large size, dark red (possibly too dark) with excellent but somewhat acidic flavor. Only average firmness. Good for freezing.
Disease: Resistant - leaf scorch, powdery mildew, race A-6 of red stele
 Tolerant - Unknown
 Susceptible - Unknown
Plants: Vigorous, runners freely. No winter injury 3 years at UW-River Falls.
Yield Performance: Wisconsin - high (River Falls); average-high in Ontario.

12. St. Williams (V7261-3)

Parentage: 'Guardsmen' x 'V6744R-6' ('Veestar' x 'NY844')
 Origin: Horticultural Research Institute of Ontario, 1992.
 Season: Late midseason
 Fruit: Average size, high quality, rated "outstanding" for freezing.
 Disease: Resistant- leaf spot, leaf scorch, powdery mildew
 Tolerant- *Botrytis* rot, *Verticillium* wilt
 Susceptible- Unknown
 Plants: Small, extremely vigorous with wide adaptation, runners well
 Yield Performance: Wisconsin - high (River Falls); high yields in Ontario.

13. Scotland (V 7251-1)

Parentage: 'Guardian' x ('Veestar' x 'NY844')
 Origin: Horticultural Research Institute of Ontario, 1991.
 Season: Very late
 Fruit: Very large fruit and extremely firm with tough skin - may be too firm for PYO. Decaps easily. Medium red skin and flesh throughout. Makes a good frozen product.
 Disease: Resistant - leaf scorch
 Tolerant - *Verticillium* wilt, *Botrytis* rot, powdery mildew.
 Susceptible - Unknown
 Plants: May be too tender except in extreme southern Wisconsin (no injury River Falls 1990-1992). Vigorous plants runner well.
 Yield Performance: Wisconsin-average to poor yields; excellent yields in Ontario; average to poor yields in Minnesota; SW Michigan-poor.

14. Selkirk (V7210-5)

Parentage: 'Earlibelle' x 'Holiday'
 Origin: Horticultural Research Institute of Ontario, 1992.
 Season: Early midseason
 Fruit: Size halfway between 'Veestar' and 'Gov. Simcoe'. Very firm, attractive, red throughout. For PYO, prepicked or processing. Good fresh storage qualities.
 Disease: Resistant - Unknown
 Tolerant - leaf spot, *Botrytis* rot
 Susceptible - leaf scorch, extremely to powdery mildew, *Verticillium* wilt
 Plants: Good vigor, lacks winter hardiness at Grand Rapids, MN; no injury River Falls, WI 1990-1993.
 Yield Performance: Wisconsin-average to low (River Falls); Minnesota-very low (Grand Rapids) to average (Excelsior).

15. Seneca (NY 1529)

Parentage: 'NY 1261' ('Redcoat' x 'NY844') x 'Holiday'
 Origin: New York Agricultural Experiment Station, 1993.
 Season: Midseason
 Fruit: Large, very attractive exceptionally firm fruit (probably too firm) with tough skin. Good for fresh market or as frozen product. Only average flavor.
 Disease: Resistant - Unknown
 Tolerant - leaf spot
 Susceptible - leaf scorch
 Plants: Vigorous plants
 Yield Performance: Wisconsin-high to very high (River Falls); below average in Illinois; SW Michigan-high.

16. Settler

Parentage: 'Guardian' x 'Holiday'
Origin: Horticulture Research Institute, Simcoe, Ontario, 1989.
Season: Early-midseason
Fruit: Very large and attractive, medium firmness, superior to 'Veestar', medium red skin and flesh; average skin strength. Very good flavor, better than 'Annapolis'.
Disease: Resistant - none
Tolerant - leaf spot, gray mold and *Verticillium* wilt
Susceptible - leaf scorch and powdery mildew, red stele
Plants: Poor winter hardiness. May be for trial in extreme southern Wisconsin. Very susceptible to Sinbar herbicide on sandy soils.
Yield Performance: Wisconsin-above average (River Falls); average yields in Minnesota; very high yields in Ontario; SW Michigan-low.

17. Startyme (225C1)

Parentage: B7705-3 (Selkirk x V9294-2) x GU66Q50
Origin: Horticultural Research Institute of Ontario, Simcoe, 1994.
Season: Late midseason
Fruit: Medium size, firm, conical, somewhat pale orange-red with average skin strength. Good flavor—has hollow cores and decaps easily.
Disease: Resistant - leaf spot
Tolerant - leaf scorch
Susceptible - powdery mildew
Plants: Above average vigor.
Yield Performance: Wisconsin (River Falls)-lowest yield of 33 cultivars tested in 1994; SW Michigan-average. Minnesota-low (Grand Rapids) to poor (Excelsior).

18. Winona (MNUS210) Named after town in SE Minnesota.

Parentage: Earliglow x MNUS 52 (Lateglow x MDUS4616)
Origin: University of Minnesota and USDA-Maryland, 1995.
Season: Late
Fruit: Attractive, very large glossy, medium red, firm, good texture and quality. Maintains size well. Skin breakdown in wet years with heavy canopy or too much nitrogen.
Disease: Resistant - red stele (5 races); black root rot complex, leaf scorch, leaf blight
Tolerant - leaf spot, powdery mildew
Susceptible - Unknown
Plants: Vigorous, winter hardy. Fruit are held close to the soil, making harvest more difficult than many other cultivars.
Yield Performance: Wisconsin (River Falls)-high. Minnesota - most reports high.

JUNEBEARERS: RECENT RELEASES and ADVANCED SELECTIONS Under Test

1. AC-L'Acadie (SJ8916-50)

Parentage: 'Glooscap' x 'Guardian'
Origin: Agriculture and Agri-Food Canada, and McGill University, 1999.
Season: Midseason
Fruit: Uniform, firm, sweet, large, shiny pale-red, necked-conic. Decap easily. Good fresh storage characteristics and also freeze well. Good for pre-picked (and shipping) or PYO.
Disease: Resistant - Unknown
Tolerant - Powdery mildew, leaf scorch, leaf blight, leaf spot, gray mold, 6 red stele races.
Susceptible - Unknown
Plants: Tolerant to Sinbar. Perform well on both sand and heavy soils. Semi-vigorous and appear thus far, to have adequate winter hardiness.
Yield Performance: Similar to 'Kent', 'Glooscap' and 'Chambly' in Quebec.

2. Brunswick (K90-12)

Parentage: 'Cavendish' x 'Honeoye'
Origin: Agriculture Canada, Kentville, Nova Scotia, 1999.
Season: Early Midseason
Fruit: Large (but slightly smaller than Cavendish) attractive and uniform color and shape. Flavor is similar to 'Honeoye' and not as sweet as 'Cavendish'.
Disease: Resistant - Several races of red stele
Tolerant - Unknown
Susceptible - Unknown
Plants: No data available. Unknown winter hardiness for Midwest, but expectations are positive based on parentage.
Yield Performance: High in Morden, Manitoba and Fredericton, NB; average at other sites in Canada

3. Cabot (K92-17)

Parentage: K87-5 x K86-19 ('ArKing' x K79-5)
Origin: Agriculture Canada, Kentville, Nova Scotia, 1998.
Season: Mid - late season
Fruit: Bright red, juicy, very large! Primaries irregular, later fruit uniform. Firm flesh, average skin strength. Good for prepicked markets.
Disease: Resistant - Several races of red stele.
Tolerant - Unknown
Susceptible - gray mold (Botrytis)
Plants: With proper nutrition and water management, will be large with sufficient runners. Unknown winter hardiness for Midwest.
Yield Performance: Moderate and low, respectively for Grand Rapids and Excelsior, MN

4. Evangeline (K93-1)

Parentage: [('Honeoye' x 'Veestar') x NYUS 119]
Origin: Agriculture Canada, Kentville, Nova Scotia, 1999.
Season: Early
Fruit: Very firm, medium-sized, dark red conic with sunken achenes.
Disease: Resistant - Unknown
Tolerant - Unknown
Susceptible - probably tolerant or susceptible to red stele, according to breeder.
Plants: Flower slightly before 'Annapolis'. Fruit are held on upright, stiff peduncles. Unknown winter hardiness for Midwest, but expectations are positive based on parentage.
Yield Performance: Moderate in Canada, but breeder indicates reports may be low due to possible floret frost injury at various sites.

5. G19

Parentage: 'Chandler' x 'Holiday'
 Origin: University of Guelph, HRIO, Simcoe, Ontario 1998.
 Season: Midseason
 Fruit: Large, same size as 'Kent', but fruit more pale shade. Very firm. Flavor similar to 'Kent'. Good for shipping, IQF or PYO.
 Disease: Resistant - Unknown
 Tolerant - leaf scorch, leaf spot, mildew
 Susceptible - Unknown
 Plants: Tolerant to Sinbar herbicide. Unknown winter hardiness, but parentage would suggest insufficient for Midwest. Vigorous, with pale leaves. Good runnering
 Yield Performance: Unknown.

6. Joliette (SJ89288-2) Named after town located on l'Assumption River in southern Quebec

Parentage: Jewel x SJ85189
 Origin: Agriculture Canada and St. Jean-Sur-Richelieu, Quebec, 1996
 Season: Midseason
 Fruit: Large, moderately firm globose conic to short wedge, light red with small white neck, decap easily.
 Disease: Resistant - 6 races of red stele, leaf spot, leaf scorch, powdery mildew
 Tolerant - Unknown
 Susceptible - Unknown
 Plants: Vigorous, medium size. Winter hardiness appears quite good, but no tests for Midwest. Adapted to heavy soils. Tolerant to terbacil herbicide
 Yield Performance: High in Quebec. No reports for Midwest.

7. Mesabi (MNUS 248)

Parentage: Glooscap x MNUS 99 (WIUS 8002 x WIUS 8008)
 Origin: University of Minnesota and USDA-Maryland. 1999.
 Season: Late midseason
 Fruit: Large, glossy, bright red with very good firmness and flavor
 Disease: Resistant - Common races of red stele.
 Tolerant - Unknown
 Susceptible - Unknown
 Plants: Good winter hardiness. Poor runnering UW-River Falls.
 Yield Performance: Minnesota-very high (Grand Rapids & Excelsior)

8. Mira (K84-5)

Parentage: Scott x Honeoye
 Origin: Agriculture Canada, Kentville, Nova Scotia, 1996.
 Season: Late midseason
 Fruit: Large, blocky conic, bright medium-light red. Mild flavor.
 Disease: Resistant - Most foliar pathogens, most races of red stele.
 Tolerant - Unknown
 Susceptible - Unknown
 Plants: Vigorous. No winter injury Winter '96-'97 UW-River Falls.
 Yield Performance: Wisconsin- Above average (UW-River Falls); Minnesota-average (Grand Rapids) to high (Excelsior). Very high potential in Nova Scotia and other Atlantic provinces. In the past, Kentville cultivars have performed admirably in Wisconsin.

9. NJUS 8826-11

Parentage: NJ8219-2 x 5130 (Earliglow)
Origin: Rutgers University Research Center at Cream Ridge NJ, 1996.
Season: Early
Fruit: Large, excellent appearance and good flavor.
Disease: Resistant - Overall good resistance.
 Tolerant - Unknown
 Susceptible - Unknown
Plants: Vigorous, very adaptable. Good overall balance. Winter hardiness unknown. Adapted to most planting systems.
Yield Performance: High productivity in east. No reports for Midwest.

10. Sable (K90-1)

Parentage: 'Veestar' x 'Cavendish'
Origin: Agriculture Canada, Kentville, Nova Scotia, 1998.
Season: Early
Fruit: Attractive bright red. Larger and more firm than 'Veestar' but less firm than 'Annapolis'. Very good flavor. Niche for PYO but not prepacked.
Disease: Resistant - several races of red stele
 Tolerant - Unknown
 Susceptible - Unknown
Plants: Vigorous; unknown winter hardiness for Midwest. Good runnering ability
Yield Performance: More productive than 'Veestar' in Nova Scotia. Kentville cultivars have performed quite well overall in the Midwest in the past. High - Grand Rapids, MN and low at Excelsior, MN.

11. AC-Yamaska (SJ89700-1) Named after town located near the shore of Lake Saint-Peter, a widening of the St. Lawrence River in Quebec

Parentage: 'Pandora' x 'Bogota'
Origin: AC (Agriculture and Agri-Food Canada) and St. Jean-Sur-Richelieu, Quebec, 1999.
Season: V. late (5-7 days past 'Bounty')
Fruit: V. large dk. red glossy fruit. Good fresh storage characteristics.
Disease: Resistant - Unknown
 Tolerant - Leaf scorch, leaf blight, leaf spot, gray mold, powdery mildew.
 Susceptible - 6 red stele races.
Plants: Perform well on sand or heavier soils. Appear so far to have sufficient winter hardiness based on Canadian reports.
Yield Performance: Quite concentrated. Similar total production to 'Kent', 'Glooscap' and 'Chambly' in Quebec.

**Day-Neutrals
(Introduced since 1988)**

1. **Capitola (CN93)** Named after a town by that name near location of UC Watsonville Strawberry Research Facility.
 - Parentage:** 'CN25' (CA75.121-101)x 'Parker'
 - Origin:** University of California, 1990.
 - Season:** Stronger day-neutral than 'Seascape'
 - Fruit:** Attractive, softer than 'Douglas', but 25% more acid. Good flavor. Medium large and firm. Less size variation than 'Seascape'.
 - Disease:** Resistant - Unknown
Tolerant - (Highly) of virus diseases common in CA
Susceptible - leaf spot
 - Plants:** Higher temperature tolerance than other day-neutrals; should be grown with runners removed.
 - Yield Performance:** Very high yield potential. High-1992; low-fall 1993 at Grand Rapids, MN.

2. **Irvine (CN14) CA82.14-603**
 - Parentage:** 'Douglas' x 'Muir'
 - Origin:** University of California, 1988.
 - Season:** Day-neutral (very strong)
 - Fruit:** Large size; medium conic, very firm, bright, attractive medium red exterior
 - Disease:** Resistant -
Susceptible -Anthracnose, Verticillium wilt, leaf spot
Tolerant - virus diseases in CA
 - Plants:** Erect, semi-vigorous
 - Yield Performance:** Poor yields in Grand Rapids, Minnesota in 1990-1992.

3. **Seascape (CN49)** Town near University of California Watsonville Strawberry Research Facility
 - Parentage:** 'Selva' x 'Douglas'
 - Origin:** University of California, Davis, 1989.
 - Season:** Day-neutral (not as strong as 'Selva')
 - Fruit:** Large, 70+ gm berries, medium firm, dark red skin and flesh. Very good flavor. Medium long; conic. Similar firmness to Selva. More fruit size variation than 'Capitola'. Prone to some cracking around calyx.
 - Disease:** Resistant - Verticillium wilt, leaf scorch, powdery mildew
Tolerant - Unknown
Susceptible - leaf spot
 - Plants:** More runners than 'Capitola'.
 - Yield Performance:** Low to average - Grand Rapids, MN, 1992-1993.

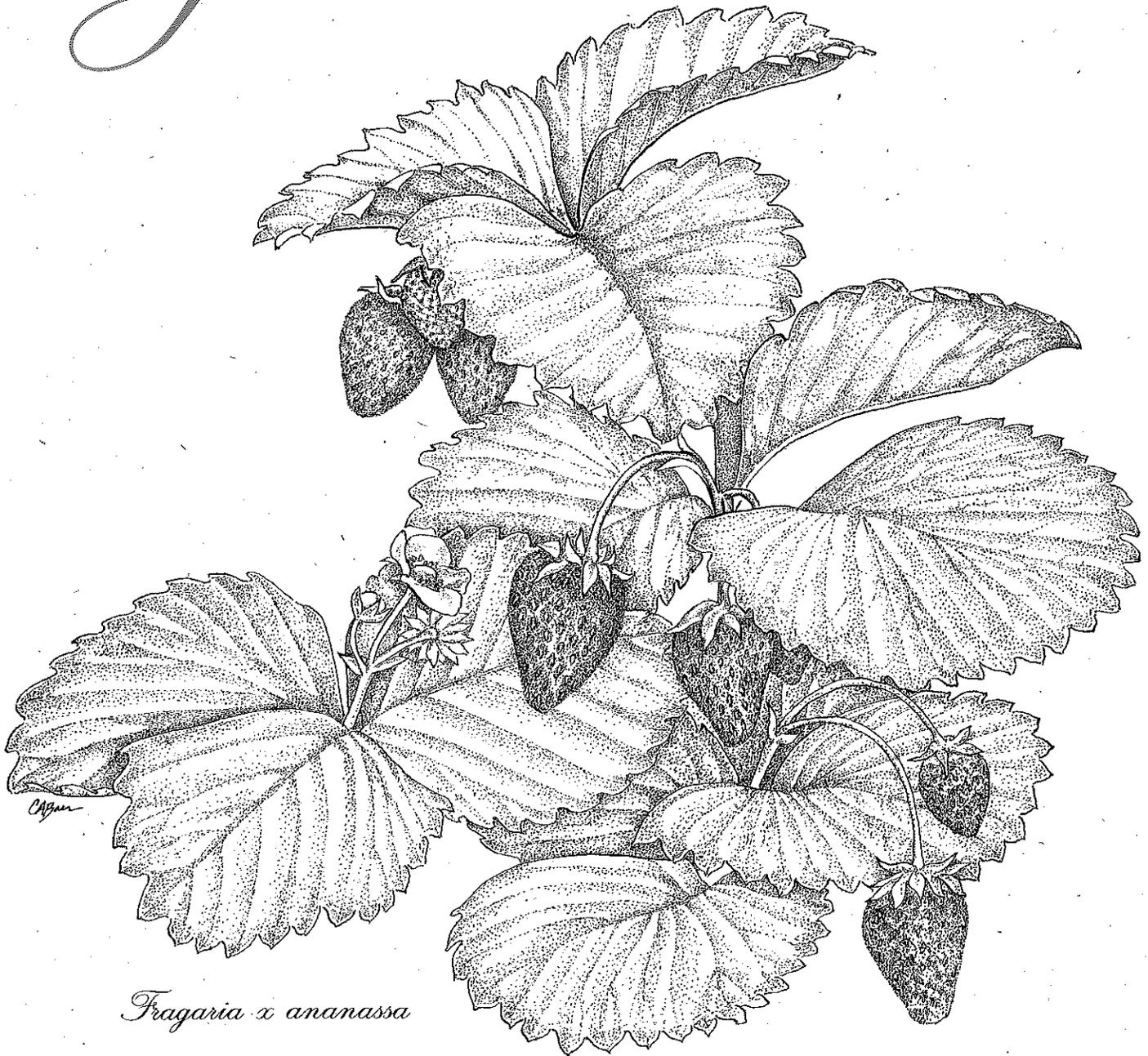
4. **Sunset (CN201)**
 - Parentage:** CA75.121-101 (day-neutral parent of 'Capitola') x CA81.16-604 ((CA71.98-605 x Selva) x Chandler)
 - Origin:** University of California-Davis, 1993.
 - Season:** Day-neutral - moderate expression, more so than 'Selva' and 'Seascape' but less so than 'Fern'.
 - Fruit:** Flat conic, sometimes heart-shaped; medium-red interior-exterior, glossy; larger than 'Selva' or 'Seascape'. Firmness similar to 'Seascape'. Good flavor but not equal to 'Seascape'. Acceptable for fresh eating or processing.
 - Disease:** Resistant - Unknown
Tolerant - viruses found in CA
Susceptible - leaf spot, powdery mildew
 - Plants:** More vigorous than 'Selva' or 'Seascape'.
 - Yield Performance:** Higher yields than 'Selva' or 'Seascape' at Watsonville, CA.

**Day-Neutrals
(New Releases)**

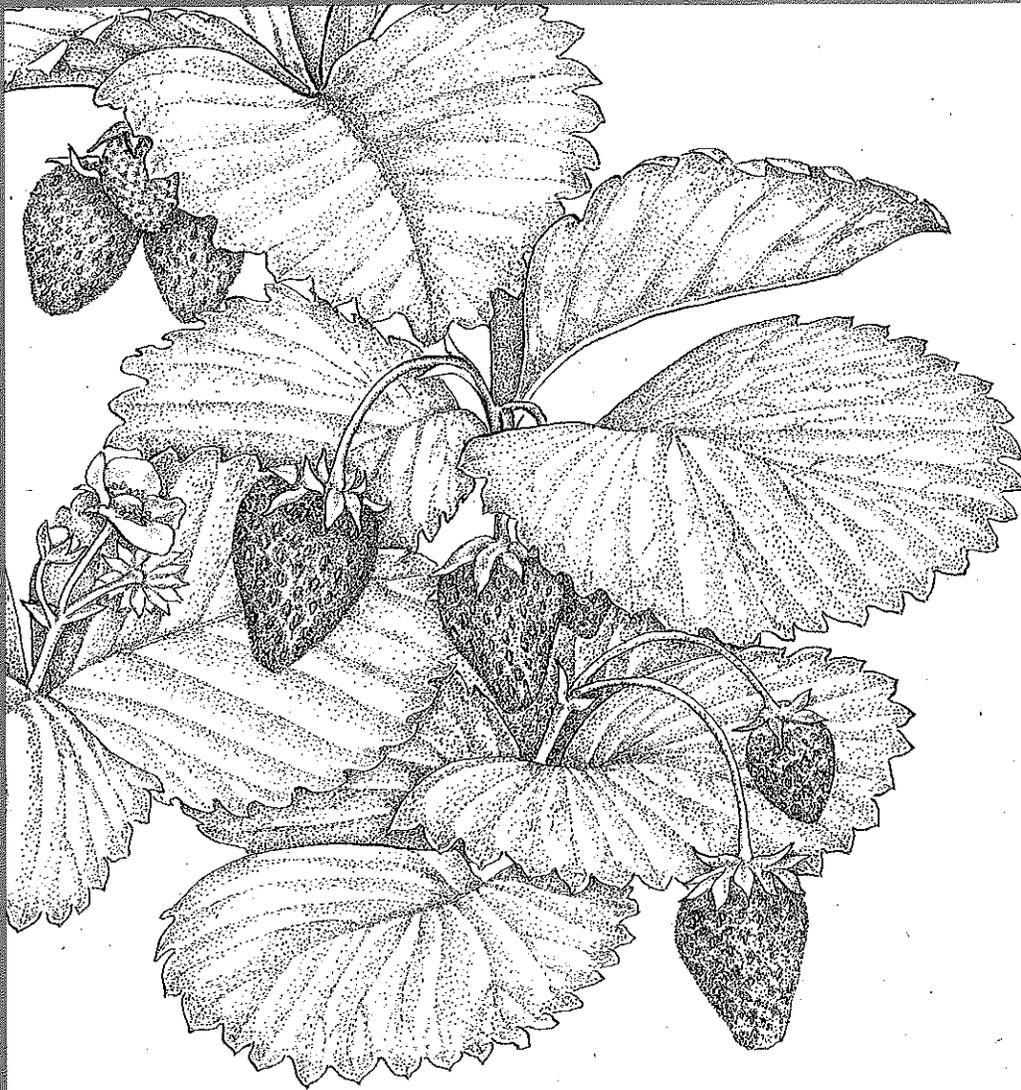
1. Evita

Parentage: 'Chandler' x B144 (Gorella x Brighton)
Origin: United Kingdom - Private breeding program (Peter Vinson), 1991.
Season: Day-neutral
Fruit: High quality medium large, high proportion #1 firm fruit. Light fruit color and good shelf life.
Disease: Resistant - Unknown
Tolerant - Mildew
Susceptible - Red stele
Plants: Prefers light soils, vigorous.
Yield Performance: No reports for Midwest. Productive at Nourse Farms, (MA) and favorable reports from England, Belgium and France.

GROWING STRAWBERRIES IN WISCONSIN



Fragaria x ananassa



UW Extension

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