

Division of Marketing  
Agricultural Development and Diversification (ADD) Program  
1997 Grant Final Report

Grant Number 12070

**Grant Title** Strawberry Breeding - The Development of New Commercial Cultivars  
for the Wisconsin Grower

**Amount Awarded** \$9,790.00

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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 15 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 from these recommendation reports alone are estimated 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%.

In preparation for implementing this grant, an industry characterization survey was conducted. The survey was filled out by growers at our 1996 annual statewide convention. A phenomenal 80% return rate on the survey gave us some accurate data we used to determine grower needs and the state of the Wisconsin strawberry industry. Thirty-nine growers representing 357 acres of Wisconsin small fruit production, or about 22% of the total Wisconsin strawberry acreage, served as the basis for the survey. Some interesting facts:

1. The average number of years in business for a WI strawberry grower is 13. 49% had 15 + years of experience.
2. The average size for Wisconsin strawberry farms is 10.75 acres.

3. Of all the commercial small fruit acreage in our Wisconsin survey (excluding cranberries), 93% was strawberries the other 7% consisted of raspberries, blueberries and grapes.
4. 41% of the small fruit farms surveyed grew only 1 crop, 35% 2 crops, 16% 3 crops, 8% 4 or more crops.
5. The strawberry cultivar "Honeoye" originating from New York was grown on 50% of the total strawberry acreage represented in the survey. Sixteen other cultivars made up the other 50%.
6. 90% of strawberry acreage was irrigated.
7. 58% of the growers were commercial part-time, 37% were commercial full-time and 5% considered themselves "hobby growers".
8. 68% of strawberries were harvested/marketed PYO, 21% prepicked-on farm sales, 8% direct marketed off -farm and 3% wholesale.

The project has progressed well in general since its initiation last year. The winter of '96-'97 was somewhat severe, and culminated in a very severe freak freeze in early April 1997. This set us back considerably on already-established plots, killing 60% of our planting. The last year has been spent replanting those plots and expanding to new larger ones as grant funds became available.

Over the past year, 350 hybridizations were made in the greenhouse and yielded 20,000 seed. A much larger amount of seed germinated since the 3/12/98 report and resulted in over 4,000 seedlings transplanted to the field this summer (exact number yet to be determined) instead of the 2,500 reported. 1995-97 advanced selections are being multiplied to accumulate a large enough number of plants to be distributed to our grower-cooperators for small scale testing. A more detailed report is included. Please see "Small Fruit Research Report" attached. Over 50 advanced selections were chosen from seedling strawberry fields this summer as potential cultivar candidates for the future.

The small fruit research report, several "Badger Berry Dispatch" newsletter articles and a list of "Recommended Strawberry Cultivars For Wisconsin" were produced as related to this project. In July '97 a large multi-state Field Day was held to showcase the strawberry breeding project with over 90 growers in attendance from 5 states. An annual grower convention-educational program was held in February '98 in which the results of the strawberry breeding was reported to over 50 growers.

This grant project has met most of our original expectations with only the severe Spring '97 freeze curtailing the timetable progress we had hoped for. Many promising strawberry selections have been made and are being tested. These potential cultivars could make a substantial impact on the profitability of commercial Wisconsin strawberry enterprises. We expect eventually a 50% increase in yield could be realized from these new cultivars over the existing state average. Eventually after the introduction of these new cultivars, this could translate into 1.0 million dollar (25%) increase in profitability short term and \$9.0 million increase over the next 20 years. One good example supporting these contentions comes from the results reported in the "1997 Junebearing Strawberry Cultivar Trials" section of the "Small Fruit Research Report 1997" (attached). Under "Late Midseason" category, one of our breeding selections RF (River Falls) 92-69-16 had a yield of 16,638 lbs and was 1st place out of 27 cultivars tested. It also had a 64% yield advantage over the 2nd highest cultivar.

It is anticipated then, as our new cultivars become available to Wisconsin growers, productivity and profitability will improve significantly.

RECOMMENDED STRAWBERRY CULTIVARS FOR WISCONSIN<sup>2</sup>—1998  
Brian R. Smith  
Extension Fruit Specialist  
UW-River Falls

EARLY SEASON<sup>Y</sup>

\*Annapolis (N & S)<sup>x</sup>  
Top-yielding cultivar in early season. Ranked 6th of 17 for overall yield ('91-'94). Best average berry size through all harvests of any of 30 cultivars ('91-'93). Excellent vigor, runner production and winter hardiness. Red stele resistant. Only acceptable flavor. Berries may be too light-colored in some situations. Good firmness. Somewhat susceptible to fruit rots. Performance severely affected by April 8, 1997 hard freeze.

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.

Veestar (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).

\*Earliglow (S)  
Ranked 7th for yield in early season, 20th 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.

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 stele, leaf scorch. Tolerant to Verticillium wilt.

## MIDSEASON

\*Glooscap (N & S) Widely-adapted cultivar. Very high yields. Ranked 1st overall. Large, firm, dark-red berries of good flavor. Good size retention over several harvests. Average disease tolerance. Vigorous and winter hardy.

\*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.

\*Cavendish (S, for trial N) Promising new cultivar. Very high yield potential—ranked 4th-7th overall '93-'96. Very large globose dark red berries with adequate to 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. Good disease tolerance to red stele, mildew, *Verticillium* and fruit rots. No winter hardiness problems observed so far, although was severely injured by April 8th (1997) hard freeze as indicated by significant yield reduction.

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. 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.

\*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.

Lateglow (S, for trial N) Very large fruit of excellent flavor, adequate firmness, but color too light. 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, gray mold, leaf scorch and leaf blight. Winter injury—River Falls '95-'96.

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.

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'.

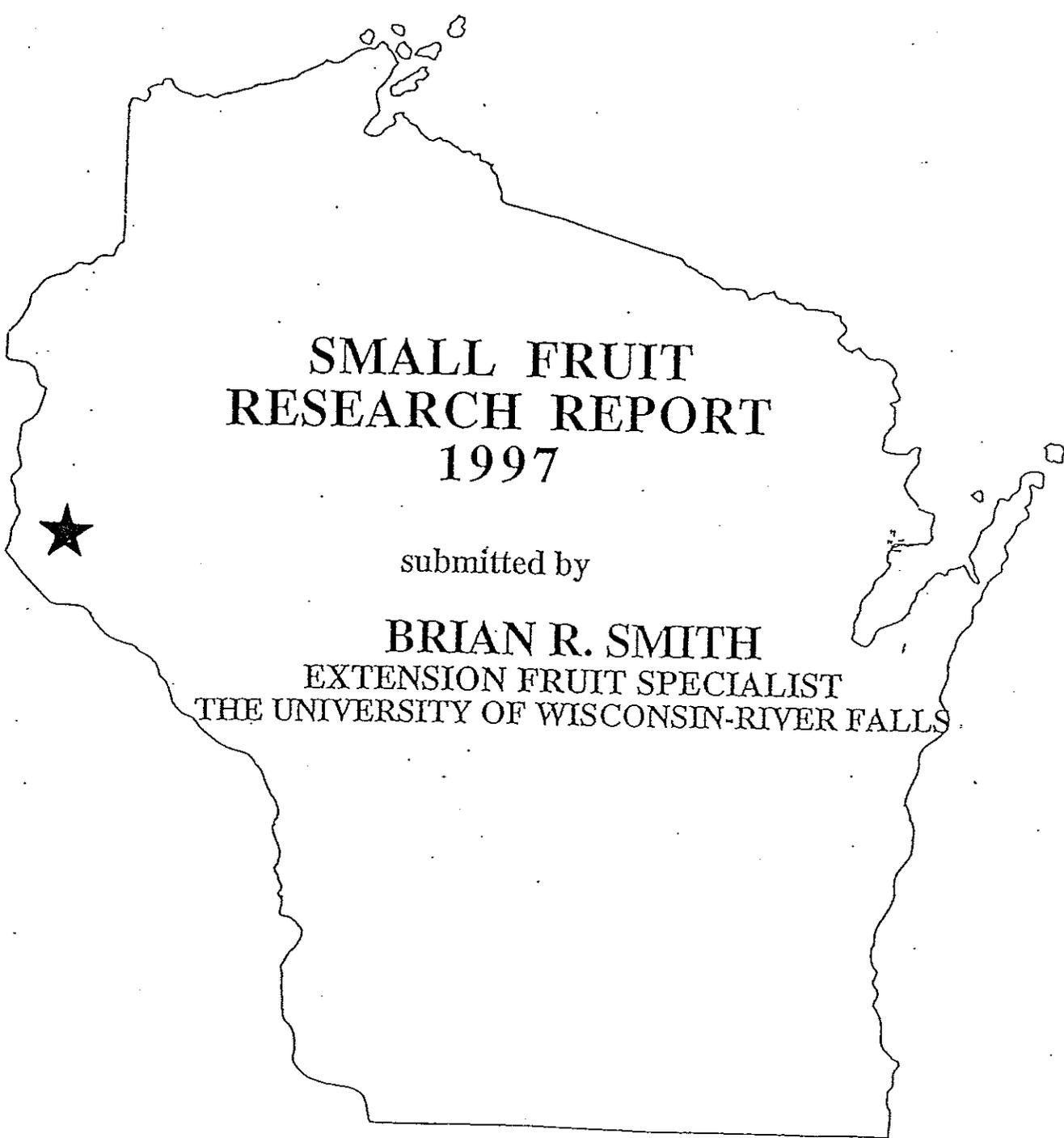
Latestar (for trial N & S) Ranked 2nd both for total yield and fruit size. Very attractive glossy red. Pleasant mild flavor, excellent firmness. Should not be planted in most severe parts of Wisconsin. Resistant to red stele and most leaf diseases. Poor runnering ability. Must be planted at least on 12" x 38" spacings to obtain acceptable production (13,760 plants/A).

\* 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 7 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 (7), ), Earliglow (7), Lester (6), Mohawk (3), Redcoat (3), VeeStar (6); EARLY MIDDLESEASON, Delmarvel (1), Honeoye (7), Redchief (3), Settler (4); MIDDLESEASON - Cavendish (7), Chambly (3), Glooscap (7), Kent (7), Oka (3), Primetime (1), Vantage (3); LATE MIDDLESEASON - Darrow (3), Gov. Simcoe (6), Jewel (7), Mira (1), Mitasome (3), Raritan (3), St. Clair (3), Seneca (6); LATE - Bounty (3), Canoga (3), Idea (1), Lateglow (7), Latestar (1), Marmolada (1), Sparkle (6), Winona (3).

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 La Crosse to Marinette.



**SMALL FRUIT  
RESEARCH REPORT  
1997**

submitted by

**BRIAN R. SMITH**  
EXTENSION FRUIT SPECIALIST  
THE UNIVERSITY OF WISCONSIN-RIVER FALLS

# 1997 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 21,005 seedlings have been planted, and 18,268 screened and selected from. Approximately 2,737 seedlings were field planted this past summer to be evaluated July 1998. The total seedling population from 1988-1997 represent over 739 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 1997 (approximately 709 - 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 (709) broken down by year and those remaining that are used in breeding or have cultivar potential as of Fall 1997 are in the following table:

YEAR	NUMBER OF SEEDLINGS PLANTED	ORIGINAL NUMBER OF SELECTIONS MADE	NUMBER OF REMAINING SELECTIONS 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)	15	0
1991	2,073	171	29	0
1992	1,944	179	22	1
1993	1,710	91	5	5
1994	3,066	77	22	13
1995	2,100	75 (from 1994 seedlings)	41	30
1996	1,298	27 (from 1995 seedlings)	20	20
1997	2,737	12 (from 1996 seedlings)	12	12
TOTALS	21,005	709	166	81

One hundred twenty-five past advanced selections have now been incorporated into crosses in the breeding program.

The 1996-97 winter eased in gradually, allowing sufficient time for the strawberries to harden off properly. However, excessive fall rainfall and early permanent snow cover prevented winter mulching.

Temperature extremes/snow cover conditions were:

-11°F	November 27	10" snow cover
-18°F	December 20	14" snow cover
-27°F	December 26	21" snow cover
-20°F	January 28	10.5" snow cover
4°F	April 8	-30° windchill (upper 60's °F previous 7 days)

First and last snowfall of the season were November 15, 1996 (2") and March 13, 1997 (8") respectively. The 1997 spring season was characterized as very cool and dry (no precipitation between March 14 and May 2). Perhaps the most significant weather event of the season was on April 8 when temperatures dipped to 4° after 2 weeks of mild temperatures in the 50's and 60's. Growers who had already uncovered (and those of us who still needed to mulch) received severe injury on plants in isolated locations. When strawberries succumb to these types of freak circumstances, it should not be construed as an indicator of winter hardiness since cultivars normally considered winterhardy like Annapolis, Honeoye and Cavendish were affected more than cultivars like Jewel and Marmolada, which are considered to be more tender.

Temperatures and precipitation varied drastically during fruit development and harvest. May and June were dry (4" below normal). Only 6 days in May were  $\geq 70^\circ$  and June was warmer than July (24 days  $\geq 80^\circ$  vs 15 days respectively). Temperatures ranged from 45°F (May 27) to 94°F (June 23 - hottest day of the summer) during berry development and harvest.

Of the 1,298 1997 seedlings, only 500 survived the April injury to fruit. Twelve were selected for further evaluation and transplanted to 8 foot plots. Descriptions of the most promising recent advanced selections evaluated in summer 1997 are as follows:

97-59-14 (MNUS 54 x RF 94-22-13) V. large firm, glossy, crimson wide-conic with slight neck and fancy slightly reflexed calyx. Red flesh and very good flavor. Plants are vigorous and healthy with good runnering.

97-67A-4 (V7210-5 x Minnesota Cultivar) Medium large glossy-crimson; globose to wide conic. Slightly reflexed calyx and firm pale orange flesh. 'Trumpeter' flavor. Large healthy plants and good runnering.

97-67A-11 (same as above) V. large dark red wide conic; medium height neck, reflexed calyx. Firm fruit of v. good but somewhat tart flavor. Primaries somewhat convoluted. Healthy plants - good runnering.

97-75-4 (Chambly x California Cultivar) Medium large firm crimson glossy long conic with reflexed calyx and red flesh. Perfumed flavor. Healthy plants.

Advanced selections that have been expanded in number for extensive evaluation into one or more replications of 25 foot plots in the UW-River Falls yield trials are: 92-69-16, 93-35-22, 93-51-1, 93-86-27, 93-91-4, 94-11-2, 94-11-6, 94-15-5, 94-16-5, 94-22-13, 94-33-15, 94-34-2, 94-34-21, 94-35-1, 94-38-2, 94-43-13, 94-71-2, 94-85-2 and 94-88-8.

To facilitate more accurate strawberry breeding program advanced selection evaluation, more testing locations across the state were added in 1995. Eight commercial grower-cooperators are testing advanced selections in 25-50 foot plots alongside standard cultivars on their farms.

#### Tarnished Plant Bug Resistance Investigations

The possibility of breeding new strawberry cultivars resistant to tarnished plant bug injury 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. Dr. Dan Mahr, UW-Madison entomologist, is a cooperator on the project, investigating the reasons for variability in TPB damage observed in existing commercial cultivars. Part of his project involves conducting preferential feeding screening trials on potted strawberries in the greenhouse.

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)

(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, crosses were made among cultivars representing the above resistance level combinations and a small number (376) seedlings were grown and set in the field Summer 1996.

In Winter '96 - '97 a larger number of crosses were made and a much larger 2-replicate seedling planting was established in the field in Summer 1997. This trial consisted of a total of 360 susceptible x susceptible, 309 susceptible x resistant - resistant x susceptible and 589 resistant x resistant seedlings (according to reports by Handley et. al) for a total of 1,258 for Summer 1998 resistance evaluations. Twenty plants each of the cultivars Honeoye (R), Sparkle (R), Kent (S) were planted in each replicate:

Due to the devastating freeze (4°F April 8<sup>th</sup>) none of the 1996 seedlings were in adequate condition to be evaluated and only partial harvesting was conducted in the TPB cultivar trials for 1997.

# 1997 JUNE BEARING STRAWBERRY CULTIVAR TRIALS

PRINCIPAL INVESTIGATOR  
BRIAN R. SMITH

UNIVERSITY OF WISCONSIN-RIVER FALLS, WI 54022

This Junebearing strawberry cultivar trial contains 45 entries (17 cultivars; 28 advanced selections—1 from New Jersey, 3 from USDA, 7 from Minnesota and 17 from UW-River Falls\*). The experimental plot design was a randomized complete block with 4 replications.

	Methods
<u>Location/ Climate:</u>	University of Wisconsin-River Falls; USDA Hardiness Zone 3b (-15°F guaranteed, -42°F possible)
<u>Soil Type:</u>	Sparta Sandy Loam, 2.1% organic matter, pH of 7.1
<u>Planting:</u>	Bare root plants set 6/4/96.
<u>Spacing:</u>	1½ 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.
<u>Mulching:</u>	Plots were mulched with 6 inches of oat straw on April 11, 1997. Fall conditions (12" rain between 10/16 and 11/19 and then 11/20 - 10.5" snow cover) prevented winter mulch protection. Plots were uncovered May 9, 1997.
<u>Irrigation:</u>	Overhead sprinkler irrigation was applied as needed according to Irrometer® tensiometers readings.
<u>Fertilizer:</u>	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 3, August 22, 1996.
<u>Weed Control:</u>	Mechanical cultivation as needed during first growing season. Devrinol (50% WP), 8 lb/acre on April 10, 1997. Sinbar (80% WP), 6 oz/acre at renovation on 7/31/97.
<u>Pest Control:</u>	Thiodan (50% WP) - 2 lb/acre on 5/31/97, and 6/13/97, for tarnished plant bug. Clipper weevil present, but below economic threshold levels.
<u>Harvest Season:</u>	Early Season: 6/24 - 6/30/96 (2 harvests) Total Season: 6/24 - 7/14/96 (5 harvests)

\*The following cultivars and advanced selections were planted late into the cultivar trial in Summer '96 or Spring '97 and were not harvested in 1997 - RF 93-35-22, RF 93-51-1, RF 93-86-27, RF 94-11-2, RF 94-11-6, RF 94-15-5, RF 94-16-5, RF 94-22-13, RF 94-33-15, RF 94-34-21, RF 94-35-1, RF 94-38-2, RF 94-43-13, RF 94-71-2, RF 94-88-8, Mesabi (MNUS 248), MNUS 225, MNUS 299.

## Results

The 1996-97 winter eased in gradually, allowing sufficient time for the strawberries to harden off properly. However, excessive fall rainfall and early permanent snow cover prevented winter mulching.

Temperature extremes/snow cover conditions were:

-11°F	November 27	10" snow cover
-18°F	December 20	14" snow cover
-27°F	December 26	21" snow cover
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4°F	April 8	-30° windchill (upper 60's °F previous 7 days)

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Perhaps the most significant weather event of the season was on April 8 when temperatures dipped to  $4^\circ$  after 2 weeks of mild temperatures in the 50's and 60's. Growers who had already uncovered (and those of us who still needed to mulch) received severe injury on plants in isolated locations. When strawberries succumb to these types of freak circumstances, it should not be construed as an indicator of winter hardiness since cultivars normally considered winterhardy like Annapolis, Honeoye and Cavendish were affected more than cultivars like Jewel and Marmolada, which are considered to be more tender. Temperatures ranged from  $45^\circ\text{F}$  (May 27) to  $94^\circ\text{F}$  (June 23 - hottest day of the summer) during berry development and harvest.

The harvest season began on June 24 (5 days late for this area) and extended to July 14. Fruit were of good quality with an average incidence of fruit rots.

Yield, yield ranking, fruit size (1st and all harvests), overall fruit size ranking and % early season yield for all cultivars and selections are presented in the table.

Cultivar	YIELD		FRUIT SIZE			SEASON
	Lbs/Acre	Rank <sup>z</sup>	Gm/Fruit 1st Harvest	Gm/Fruit (Avg. for All Harvests)	Rank <sup>y</sup>	% Early <sup>x</sup>
<b>EARLY SEASON</b>						
Honeoye	7,830	9	13.4	10.1	14	65
RF 93-51-1 <sup>w</sup>	6,192	13	16.0	9.4	16	60
Annapolis	4,842	18	15.6	11.1	7	66
MNUS 273	3,990	21	14.0	9.2	17	59
Earliglow	1,870	26	10.9	7.6	27	56
<b>EARLY MIDSEASON</b>						
MNUS 276	3,894	22	11.0	8.6	22	44
MNUS 272	3,372	23	13.0	8.2	25	47
Cavendish	2,848	24	15.2	11.4	5	44
Delmarvel	2,124	25	12.4	10.1	15	54
<b>MIDSEASON</b>						
Glooscap	9,954	3	15.7	13.9	1	36
NJUS 8219-2	9,384	6	13.6	8.7	19	35
WIUS 8248	7,842	8	16.5	11.0	8	43
WIUS 8282	6,612	12	12.1	8.3	24	43
Primetime	5,334	17	23.0	12.2	3	39
MNUS 255	4,608	19	14.2	10.6	12	41
<b>LATE MIDSEASON</b>						
RF 92-69-16	16,638	1	13.3	8.3	23	32
Winona	9,642	4	18.6	12.0	4	23
RF 93-91-4	9,564	5	13.5	9.1	18	22
Mira	7,464	10	14.3	10.3	13	28
Jewel	7,380	11	16.0	10.9	9	28
Kent	6,054	14	11.9	8.7	20	23
Sparkle	5,832	15	11.0	8.1	26	30
MNUS 246	4,021	20	13.4	8.6	21	34
<b>LATE SEASON</b>						
Latestar	10,128	2	21.6	13.6	2	14
Marmolada	8,112	7	17.0	11.4	6	15
Idea	5,442	16	18.8	10.7	10	0
EB27 (USDA)	1,484	27	12.1	10.7	11	0

<sup>z</sup> Yield ranking of all 27 cultivars and advanced selections relative to one another. 1 = Best; 27 = Worst. When two genotypes performed identically, the next higher or lower rank consecutive number was assigned randomly.

<sup>y</sup> Fruit size ranking of all 27 cultivars - selections relative to one another for all harvests. 1 = Largest; 27 = Smallest.

<sup>x</sup> Percent of total crop for each cultivar harvested during first two harvests (6/24 & 6/30/97). Total season was 5 harvests (6/24 - 7/14/97).

<sup>w</sup> "RF" designates a selection from UW-River Falls Breeding Program.

## Strawberry Cultivar Descriptions (Introduced since 1985)<sup>2</sup>

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Update February 1996

### JUNEBEARING

- 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 ripening in some situations.  
**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).
- 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 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.
- 3. Governor Simcoe (V7236R3)**

**Parentage:** 'Holiday' x 'Guardian'  
**Origin:** Horticulture Research Institute of Ontario-Simcoe, 1985.  
**Season:** Late midseason  
**Fruit:** Very large, glossy light-medium red with light red interior. Symmetrical, firm and mild, pleasant flavor; good skin strength. Good choice for pre-picked or PYO. Freezes quite well.  
**Disease:** Resistant - Unknown  
Tolerant - Verticillium wilt, leaf scorch and leaf spot, *Botrytis* rot  
Susceptible - powdery mildew and red stele races  
**Plants:** Some winter injury in northern parts of the Midwest. Vigorous and runners well. Somewhat sensitive to Sinbar. May have inconsistent production on heavier soils.  
**Yield Performance:** Wisconsin - low to average; average to high yields in Ontario (1985-1990). Poor yields in Minnesota.

<sup>2</sup>Not 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. Jewel (NY 1324)

**Parentage:** 'NY 1221' ('Senga Sengana' x 'NY E58') x 'Holiday'  
**Origin:** New York Agricultural Experiment Station, Geneva, 1985.  
**Season:** Late midseason  
**Fruit:** Very attractive, bright red, glossy, large, blunt wedge conic shaped firm fruit with red internal color. Very good flavor, reminiscent of 'Holiday' - 'Honeoye' derivatives; may turn somewhat bitter or off-flavor in hot weather. Good freezing quality. For pre-picked or PYO.  
**Disease:** Resistant - Post-harvest fruit rots  
Tolerant - leaf scorch, leaf spot, mildew  
Susceptible - red stele, Verticillium wilt  
**Plants:** Moderate vigor and runner production, suffers winter injury in northern-most regions of Midwest. Performs well on heavy soils.  
**Yield Performance:** Wisconsin-average to very high; Michigan-average to high; Minnesota-average; Iowa-high to very high. Ontario-high to very high (Simcoe, Vineland); very low (Kemptonville).

5. Lateglow (MDUS 4839)

**Parentage:** 'Tamella' x 'MDUS3184' ('NCUS1768' x 'Surecrop')  
**Origin:** USDA-Maryland, 1987.  
**Season:** Very late  
**Fruit:** Very large, uniform, symmetry, glossy medium red, juicy, aromatic and sweet, interior medium red.  
**Disease:** Resistant - red stele, Verticillium wilt, gray mold and leather rot  
Tolerant - powdery mildew, leaf spot, leaf scorch  
Susceptible - Anthracnose, leaf blight  
**Plants:** Vigorous, medium size plants. Good runner production. Questionable hardiness in northern parts of Wisconsin.  
**Yield Performance:** Wisconsin-low to average; Michigan-very low; Illinois-low; Iowa-low; Minnesota-extremely variable (very low to very high); Ontario-low to average.

6. Lester (MDUS4359)

**Parentage:** 'Raritan' x 'MDUS 3413' [(['Tennessee Shipper' x 'Maytime') x 'Stelemaster']) x 'Earlidawn']  
**Origin:** USDA, Maryland, 1985.  
**Season:** Early midseason  
**Fruit:** Large attractive, symmetrical wedge to blunt conic, very glossy deep red. Interior medium red to pink. Flavor is mild, sweet and pleasant. Acceptable frozen product. High percentage of marketable fruit.  
**Disease:** Resistant - races A-1, A-2, A-3, A-4 and A-6 of red stele, leather rot.  
Tolerant - leaf scorch, powdery mildew, leaf blight, highly to gray mold  
Susceptible - Anthracnose, Verticillium wilt  
**Plants:** Medium size, high vigor, good runner production. Winter injury a problem in northern Wisconsin. Considered a red stele-resistant replacement for 'Raritan'.  
**Yield Performance:** Wisconsin-low to above average; Minnesota-low to average; Michigan-low to average; Iowa-low; Illinois-average.

*Strawberry Cultivar Descriptions (Introduced since 1985)*

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7. 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, medium 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.
8. 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.
9. 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
10. Secord (V7236-3)  
Parentage: 'Holiday' x 'Guardian'  
Origin: Horticulture Research Institute, Simcoe, Ontario, 1986.  
Season: Midseason  
Fruit: Uniform, large, very firm with acceptable flavor. Medium bright red skin color and good red interior. Excellent frozen pack. Pre-picked shelf life superior.  
Disease: Resistant -  
Tolerant - leaf spot and gray mold  
Susceptible - powdery mildew, leaf scorch, Verticillium wilt  
Plants: Poor winter hardiness-may be for trial in extreme southern Wisconsin  
Yield Performance: Minnesota-low; yields in Ontario average to high.

11. 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).

12. 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, high yields.  
Yield Performance: Wisconsin-high to very high (River Falls); below average in Illinois.

13. 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.

14. Veegem (V6737-1)

Parentage: 'Valentine' x 'Fulton'  
Origin: Horticulture Research Institute of Ontario, 1986.  
Season: Early midseason  
Fruit: Medium to large, firm, short conic shape, bright medium red skin and flesh. Good flavor. Tends to lose size rapidly in successive harvests. Good frozen product.  
Disease: Resistant - Unknown  
Tolerant - *Verticillium* wilt, leaf scorch, leaf spot and powdery mildew.  
Susceptible - Unknown  
Plants: Moderate vigor and runnering  
Yield Performance: Average yields in Minnesota; average to high in Ontario; Michigan-low.

## Junebearers: Recent Releases and Advanced Selections Under Test

### 1. 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 good flavor. Good storage and shipping characteristics.  
Disease: Resistant - 5 races of red stele and most leaf diseases  
Tolerant - Fruit rots  
Susceptible - Anthracnose  
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. No reports for Midwest.

### 2. 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, leaf scorch  
Plants: Winter hardiness unknown. Parentage would indicate insufficient hardiness for Midwest.  
Yield Performance: No reports for Midwest. Very high yields at Nourse Farms in MA.

### 3. Latestar (MDUS 5084)

Parentage: Lateglow x Allstar  
Origin: USDA, Beltsville MD. 1995  
Season: Late midseason  
Fruit: Glossy red; pleasant mild flavor  
Disease: Resistant - Red stele  
Tolerant - Unknown  
Susceptible - Unknown  
Plants: Vigorous. Unknown winter hardiness.  
Yield Performance: Very high yield potential in east. No reports for Midwest.

### 4. Marmolada

Parentage: Unknown. Thought to be derived at least in part from California cultivar(s).  
Origin: C.I.V. Program, Italy  
Season: Midseason  
Fruit: Very attractive glossy medium red conic; very large, good firmness and acceptable flavor.  
Disease: Resistant - Unknown  
Tolerant - Unknown  
Susceptible - Unknown  
Plants: Good vigor. Winter hardiness unknown and questionable due just to suggested lineage.  
Yield Performance: Very high in New Jersey; no reports for Midwest.

5. Mira (K84-5)

Parentage: Scott x Honeoye  
Origin: Agriculture Canada, Kentville, Nova Scotia, 1996;  
Season: Late midseason  
Fruit: Large, blocky conic, bright medium red. Good flavor.  
Disease: Resistant - Most foliar pathogens, most races of red stele.  
Tolerant - Unknown  
Susceptible - Unknown  
Plants: Moderately vigorous. Winter hardiness unknown.  
Yield Performance: Very high potential in Nova Scotia and other Atlantic provinces. No known reports in U.S. In the past Kentville cultivars have performed admirably in Wisconsin.

6. 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. 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.

7. 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.

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, average 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.

9. Primetime (MDUS 5069)

Parentage: [(Sunrise x MDUS 3082) x Earliglow]  
Origin: USDA Maryland, 1995  
Season: Midseason  
Fruit: Large, moderate firmness, very good flavor, attractive.  
Disease: Resistant - red stele, Verticillium wilt  
Tolerant - Unknown  
Susceptible - Unknown  
Plants: Vigorous. Adaptable to various soil types. Unknown winter hardiness  
Yield Performance: No reports for Midwest.

10. 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. Winter hardiness unknown.  
Yield Performance: Wisconsin - high (River Falls); average-high in Ontario.

11. SJ89288-2

Parentage: Jewel x SJ85189  
Origin: Agriculture Canada; St. Jean-Sur-Richelieu, Quebec, 1996  
Season: Midseason  
Fruit: Large, moderately firm globose conic to short wedge, light red.  
Disease: Resistant - 6 races of red stele, leaf spot  
Tolerant - Unknown  
Susceptible - Unknown  
Plants: Vigorous, medium size. Winter hardiness appears quite good, but no tests for Midwest.  
Yield Performance: High in Quebec. No reports for Midwest.

12. 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). Worst yield of 33 cultivars tested in 1994.

13. Winona (MN210)

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 quality. Maintains size well.  
Disease: Resistant - red stele  
Tolerant - leaf spot, powdery mildew  
Susceptible - Unknown  
Plants: Vigorous, winter hardy.  
Yield Performance: Wisconsin (River Falls)-high. Minnesota - most reports high.

**Day-Neutrals  
(Introduced since 1985)**

1. Capitola (CN93) Named after a town by that name near where the UC Watsonville Strawberry Research Facility is located.

Parentage: 'CN25' (CA75.121-101)x 'Parker'  
Origin: University of California, 1990.  
Season: Day-neutral  
Fruit: Softer than 'Douglas', but 25% more acid. Good flavor. Medium large.  
Disease: Resistant - Unknown  
Tolerant - (Highly) of virus diseases common in CA  
Susceptible - leaf spot  
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' x  
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. Mrak (Named for a former University of California-Davis Chancellor)

Parentage: 'Hecker' x 'Aiko'  
Origin: University of California, Davis, 1987.  
Season: Day-neutral  
Fruit: Similar to 'Fern' in quality, medium large  
Disease: Unknown  
Plants: Erect, semi-vigorous  
Yield Performance: Average to high yields in Minnesota, 1990.

4. **Muir** (named for the naturalist John Muir)
- Parentage: Sister to 'Selva'. 'CA 70.3-117' ('Tufts' x 'CA 65.65.601') x 'CA 71.98-605' ('Tufts' x 'CA 63.7-101')
- Origin: University of California, Davis, 1987.
- Season: Day-neutral (weak)
- Fruit: Very large - larger than 'Selva', somewhat difficult to pick; firm skin and flesh. Good flavor, good frozen product.
- Disease: Resistant - leaf spot, leaf scorch
- Plants: More mite tolerant than 'Selva'
- Yield Performance: Higher yields than 'Selva' in California. Poor to average yield in Minnesota, 1990.
5. **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, medium firm, dark red skin and flesh. Very good flavor. Medium long; conic. Similar firmness to Selva.
- Disease: Resistant - Verticillium wilt, leaf scorch  
Tolerant - Unknown  
Susceptible - leaf spot
- Yield Performance: Low to average - Grand Rapids, MN, 1992-1993.
6. **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 less than 'Fern'.
- Fruit: Flat conic, sometimes heart-shaped; medium-red interior-exterior, glossy; larger than 'Selva' or 'Seascape'. Firmness similar to 'Seascape'. Very 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.
7. **Yolo** (named for county in which University of California-Davis is located)
- Parentage: 'Hecker' x 'CA 71.98-605' ('Tufts' x 'CA 63.7-101')
- Origin: University of California, Davis, 1987.
- Season: Day-neutral (strong)
- Fruit: Glossy red, large, firm flesh and skin. Good flavor. Very attractive.
- Disease: Resistant - Verticillium wilt, leaf scorch  
Tolerant - Unknown  
Susceptible - leaf spot
- Plants: Compact growth, runners well
- Yield Performance: Poor to average yields in Minnesota, 1990-1992.

**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 fruit.  
**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.