

Progress Report to the Agricultural Research Foundation
For 2001

WTFRC Project #: OSCC-2

Project title: Sweet cherry cultivar collection

PI: Roberto Núñez-Elisea
OSU- Mid-Columbia Agric. Res. & Ext. Center, Hood River, OR

Co-PI: Lynn Long
OSU - Coop. Extension Service, Wasco County

Research

Assistant: Helen Cahn, OSU-Mid-Columbia Agric. Res. & Ext. Center

Objectives:

To evaluate and select outstanding sweet cherry cultivars for the Mid-Columbia area with respect to harvest date, cropping, fruit size and quality, incidence of disease, and susceptibility to rain cracking. There is particular interest in finding high-yielding material that is harvested outside of the peak season of early July, with large, firm fruit. Desirable canopy growth characteristics include open branch angles and a non-clustering fruiting habit.

Significant findings for 2001:

- 13S-21-7: this selection has good fruit quality and is harvested between 'Bing' and 'Lapins', although it has shown some susceptibility to rain cracking. Trees show good branch angles.
- 13S-21-1: fruit is comparable to 'Bing' and has good flavor and firmness; the main attribute of this selection is its extreme lateness (mid- to late August). During 2001, it showed severe susceptibility to powdery mildew while still unripe. Its cultivation would likely require intense powdery mildew management during years of high pressure.
- 8S-3-13: early, with large fruit of good flavor; and good crop load. Trees are relatively vigorous, with good branch angles.

Methods:

Observations are being made on vigor, cropping, maturity, and fruit quality in The Dalles and at the MCAREC in Hood River. Most trees in The Dalles were planted in 1996 (Table 2). Trees are trained to a steep leader and they are grafted onto Mazzard rootstock unless otherwise noted. Trees in The Dalles were treated with 25 ppm GA₃ during 2001. Trees in Hood River were planted in 1994 and trained as a central leader. Selections with poor performance will be

eliminated from the collections and new, promising ones will be added as they become available to the program.

Fruit firmness was determined using a FirmTech2 instrument (BioWorks, Inc., Stillwater, OK), which measures the amount of pressure in grams required to compress individual fruit by 1 mm (g/mm). Fruit with firmness values of 241-290 g/mm are considered average; values higher than 290 g/mm correspond to very firm fruit; values of 191-240 g/mm indicate caution for softness and values of 190 g/mm or lower indicate softness (T. Schmidt, personal communication). Firmness values reported here are the average of a sample consisting of 25 fruit (Table 3).

The Firmtech2 simultaneously measures firmness and the diameter of individual fruit. The row sizes reported here are based on the ranges reported for each row size by the Washington State Fruit Commission.

Results for 2001:

Bloom time

In Hood River, the earliest full bloom was recorded on 'Lapins', 8S-3-13, and 13S-24-21 (April 18), and the latest was recorded on 'Regina', 'Sylvia' and 'Viva' (April 30). In The Dalles, full bloom occurred first on 'Lapins' (March 21) and last on 'Sylvia' (April 25) and 'Regina' (April 26).

Tree vigor (trunk cross sectional area)

The smallest trunk cross sectional area (TCSA) for trees planted in 1996 (the majority of the collection) were measured in 'Bing'/G6 and 'Bing'/G5 (104.0 and 105.1 cm², respectively; Table 2). The largest trunks were recorded for 'Newstar', 8S-3-13 and 'Lapins' (in Marchand system), with values of 249, 256, and 239 cm² TCSA.

Fruit size

'Bing' trees produced fruit averaging 9.4 g (in Marchand system) to 11.4 g (on Mazzard steep leader); fruit diameters were between 28 and 30 mm for 'Bing' (9.5 to 9 row). The largest fruit weights occurred in 13N-7-19 (17.3 g), 8S-3-13 (16 g), 'Sandra Rose', 'Newstar', 'Sonata', and 'Regina' (all with weights of at least 15 g). Fruit from all these extra-large cultivars had average diameters exceeding 33 mm (8-row). More than 95% of the fruit samples from these cultivars consisted of fruit of size 9-row and larger.

Maturity

'Bing' was considered to be ripe on July 3 in The Dalles (Table 3). Cultivars maturing before 'Bing' included 'Cristalina', 'Newstar', 8S-3-13 and 13S-8-33. 'Lapins' was considered ripe on July 26. Cultivars maturing after 'Lapins' included 13S-21-1, 'Staccato' (both ripe on August 9), and 'Symphony'.

Fruit firmness

Firmness varied greatly due possibly to the different maturity stages on the different evaluation dates (Table 3). Across cultivars, firmness did not appear to be directly correlated to maturity stage (for example, under-ripe 'Symphony' and 'Sylvia' fruit had firmness values of only about

240 g/mm, whereas over-ripe fruit of 'Regina' and 13S-21-7 had firmness values above 300 g/mm). This year's preliminary firmness measurements indicate a tendency for soft fruit in 'Sylvia' (239.8 g/mm) and 'Symphony' (247.3 g/mm), since these values were obtained from fruit that was considered unripe, and these values were expected to decrease as fruit maturity advanced. 'Sandra Rose' appeared to be less firm than 'Bing' (Marchand).

Rain cracking

Observations on susceptibility to rain cracking were made on June 28, after two rain events occurring on June 25 and 26. Observations were limited mainly to named cultivars. 'Lapins' and 'Sylvia' had slight damage; 'Sandra Rose', 'Newstar', 'Sonata' and 'Cristalina' had slightly less damage than 'Bing'. 'Bing' had close to 30% on lower branches, while 4W-11-8 (still with very unripe fruit) had the most severe damage.

Powdery mildew

Moderate infection levels by powdery mildew were observed in 13S-49-24. Incidence of mildew on 'Sweetheart' varied with rootstock: compact trees grafted onto Gisela 6 rootstock had substantially greater mildew damage than trees grafted onto Mazzard, which had more open canopies and little clustering compared to trees on Gisela 6. Severe mildew damage was observed on 13S-21-1, to a degree that rendered the crop non-harvestable.

Discontinued and new material

Five selections were removed in 2001 from the collection in The Dalles due to poor performance: 13S-8-33, 13N-7-19, 13S-17-40, 13S-49-24, and 13S-24-21. New selections added this year to the collection in The Dalles include NY007, NY304, NY252, NY2131, and NY418033, from Dr. Bob Andersen's program in New York, and Liberty Bell and Early Robin from the Prosser, WA program.

Budget:

Project duration: continuous renewal

Current year: 2002

Original budget request:

Year	Year 1 (2001)	Year 2 (2002)	Year 3 (2003)
Total	\$3,500	\$4,500	\$6,500

Current year breakdown:

Item	Year 1 (2001)	Year 2 (2002)	Year 3 (2003)
Salaries		\$3,160	
OPE (42.4 %)		1,340	
Service and supplies			
Travel			
Total	\$3,500	\$4,500	\$6,500

Table 1. Time of sweet cherry bloom for various cultivars and selections in Hood River and The Dalles, 2001.

Cultivar/Selection*	Research Station, Hood River		Cemetery Block, The Dalles	
	First white (popcorn)	Full bloom	First white (popcorn)	Full bloom
'Santina'	-	4/25	-	-
'Viva'	4/19	4/30	-	-
'Lapins'	4/8	4/18	3/31	4/15
'Sweetheart'	4/12	4/24	4/3	4/18
13N-7-19	-	-	4/4	4/18
'Bing'	-	4/22	4/5	4/19
'Bing'/G5	-	-	4/2	4/19
13S-49-24	4/11	4/21	4/5	4/19
13S-18-15	-	-	4/6	4/19
8S-3-13	4/11	4/18	4/6	4/19
'Van'	-	4/24	4/4	4/20
'Bing'/G6	-	-	4/3	4/20
'Sonata'	-	-	4/6	4/20
'Symphony'	-	-	4/4	4/20
13S-17-40	4/12	4/25	4/8	4/20
13S-8-33	-	-	4/7	4/20
4W-11-8	4/15	4/26	4/7	4/20
'Staccato' (13S-20-9)	-	-	4/4	4/21
'Cristalina'	4/14	4/25	4/8	4/22
13S-21-7	-	-	4/6	4/22
'Newstar'	4/11	4/24	4/5	4/23
'Sonnet'	4/14	4/24	4/10	4/23
13S-24-21	4/10	4/18	4/7	4/23
13S-21-1	-	4/25	4/8	4/23
'Sandra Rose'	-	4/26	4/10	4/24
13S-42-49	4/11	4/26	4/11	4/24
'Sylvia'	4/20	4/30	4/13	4/25
'Regina'	4/20	4/30	4/15	4/26

* All selections and cultivars on Mazzard rootstock unless designated otherwise

Table 2. Sweet cherry cultivars and selections under evaluation in The Dalles, 2001.

Selection/ Cultivar	Year planted	TCSA (cm²)	Crop load Estimation	Distinguishing qualities
'Cristalina'	1996	229.55	Good	early, firm, good flavor
'Newstar'	1996	248.90	Good	large, early
8S-3-13	1996	255.56	small-medium	large, early, firmer than Newstar
(13S-8-33)*	1996	135.74	small-medium	-
'Sylvia'	1996	178.44	medium-good with some clustering	large, later than Bing
(13N-7-19)*	1996	205.35	-	-
Bing/Marchand	1996	244.89	medium-good	standard for comparison
'Bing'/G5	1996	105.13	Good	standard for comparison
'Bing'/G6	1996	103.96	Good	standard for comparison
'Sonata'	1996	201.56	small-medium	firm, large, later than Bing
'Sandra Rose'	1996	227.56	Small	large, later than Bing
'Sonnet'	1997	130.73	very small	late
13S-21-7	1996	181.91	medium with some clustering	firm, good flavor, mid season
(13S-17-40)*	1996	138.10	good with strong clustering	-
13S-18-15	1996	165.22	small	light flesh, later than Bing
13S-49-24*	1996	172.43	-	-
13S-42-49	1996	228.22	small-medium	-
'Symphony'	1996	244.05	small-medium	very late
4W-11-8	1996	135.78	medium-good	blush type, light flesh, late
'Lapins'/ Marchand	1996	238.89	medium-good	standard for comparison
'Regina'	1997	169.31	small	late, rain crack resistant
'Sweetheart'	1996		good to over-set	late, large, firm
'Staccato'	1997	176.68	small	late, good tree angles, good flavor
13S-21-1	1996	172.57	good	good flavor, very late
'Skeena'	1998	50.95	none	good tree angles, late, large
(13S-24-21)*	1996	191.83	Very small	-
'Santina'	1998	57.28	none	early
13S-16-29	1997	106.62	none	no info yet
'Attika'	1996	195.08	-	late, consistently big fruit

(*)* selections eliminated in 2001 due to poor performance.

Table 3. Fruit maturity and size of selections and cultivars under evaluation at The Dalles, 2001.

Selection/ Cultivar	Date	Ripeness status	Fruit wt. (g)	Fruit diam. (mm)*	% of fruit number*		Firmness (g/mm)*
					9-row and larger	8-row and larger	
'Cristalina'	28-Jun	under-ripe	11.5	-	-	-	-
'Cristalina'	03-Jul	over-ripe	11.6	30.4	64	4.0	285.5
'Newstar'	28-Jun	under-ripe	14.6	-	-	-	-
'Newstar'	03-Jul	over-ripe	15.4	33.3	100	48.0	216.0
8S-3-13	28-Jun	under-ripe	16.0	-	-	-	-
8S-3-13	03-Jul	over-ripe	16.5	34.7	100	76.0	250.4
13S-3-13	28-Jun	under-ripe	11.6	-	-	-	-
13S-3-13	03-Jul	over-ripe	12.1	29.7	48	4.0	218.7
'Sylvia'	03-Jul	under-ripe	12.3	30.5	76	8.0	239.8
'Sylvia'	06-Jul	over-ripe	13.4	31.5	92	4.0	265.0
13N-7-19	03-Jul	ripe	17.3	35.3	100	88.0	258.7
'Bing'/Marchand	03-Jul	ripe	9.4	27.9	4	0.0	330.3
'Bing'/G-5	03-Jul	ripe	11.3	29.5	52	0.0	251.2
'Bing'/G-6	03-Jul	ripe	10.8	28.7	20	0.0	235.3
'Bing'/ steep leader	03-Jul	ripe	11.4	30.0	60	0.0	272.8
'Sonata'	06-Jul	under-ripe	13.6	32.3	96	32.0	300.8
'Sonata'	13-Jul	over-ripe	15.0	33.6	96	60.0	263.7
'Sandra Rose'	06-Jul	ripe	15.3	33.7	100	57.7	257.6
'Sonnet'	06-Jul	ripe	13.4	30.0	80	0.0	293.2
13S-21-7	06-Jul	under-ripe	12.6	32.3	100	32.0	408.7
13S-21-7	13-Jul	over-ripe	12.5	30.9	76	0.0	310.5
13S-17-40	06-Jul	ripe	12.5	31.1	80	8.0	302.2
13S-18-15	06-Jul	ripe	10.9	31.8	100	28.0	314.5
13S-49-24	13-Jul	under-ripe	13.2	31.8	96	16.0	252.2
13S-49-24	19-Jul	over-ripe	13.8	32.1	96	16.0	241.8
13S-42-49	19-Jul	ripe	13.6	31.7	96	40.0	344.1
'Symphony'	26-Jul	under-ripe	11.1	27.8	44	0.0	247.3
'Symphony'	03-Aug	over-ripe	11.1	30.2	56	0.0	257.8
4W-11-8	26-Jul	ripe?	11.7	29.9	48	8.0	290.3
'Lapins'	26-Jul	ripe	11.5	29.6	40	0.0	240.6
'Sweetheart'	26-Jul	4 days before harvest	13.1	31.8	80	28.0	322.1
'Regina'	26-Jul	under-ripe	14.0	31.5	84	16.0	279.1
Regina	03-Aug	over-ripe	15.2	34.0	95	75.0	304.8
'Sweetheart'/ G-6	26-Jul	4 days before harvest	12.4	30.9	76	4.0	321.1
'Staccato'	09-Aug	ripe	10.7	30.2	60	4.0	335.9
13S-21-1	09-Aug	under-ripe	10.5	29.8	32	0.0	300.9

* from a sample of 25 fruit