Progress Report 2007: Stone Fruit

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Introduction

Growing stone fruit in a cool maritime climate can be problematical. Some cultivars may not ripen well, and others are unproductive. Diseases such as brown rot, bacterial canker and peach leaf curl are common, as are physiological problems like cracking in sweet cherries or split pit in peaches and nectarines. Evaluation in the local environment is necessary to select cultivars that are well adapted. A test block of cherry cultivars grafted to strongly dwarfing Gisela rootstocks (G 5, G7, G8) was established at WSU Mount Vernon NWREC in 1996 to examine the effect of these rootstocks on selected cherry cultivars, and to evaluate the suitability of cultivars to local climate conditions. An evaluation study of peach, nectarine and plum cultivars was established in 2001.

Over the course of the years, cultivars have been eliminated from these studies based on poor adaptability and performance, and new cultivars have been added. In total, approximately 60 peach, 10 nectarine, 40 plum and 30 cherry cultivars have been evaluated. In 2007, the study consisted of 53 peach cultivars, 7 nectarine cultivars, 35 plum cultivars and 30 cherry cultivars.

Methods

All of the stone fruit plots are drip irrigated 2 times per week for 3-4 hours, beginning in late May, and based on soil moisture irrometer readings. Pest control follows the recommended protocol for stone fruit in western Washington, with a leaf curl spray for peaches and nectarines in January, a dormant spray for bacterial canker, and applications to control brown rot in plums and cherries at popcorn bloom stage, again at petal fall, and if needed as a pre-harvest control. A delayed dormant spray for aphids is also applied in the cherry and plum blocks. Weed control is a soil residual application targeted to problematic weeds. Peach, nectarine and Japanese type plums are pruned to an open center, and European plums and cherries are usually pruned to a central leader.

Peach, nectarine and plum trees are planted in an unreplicated, non-randomized plot with 3 trees per cultivar. Plot spacing is 18' between rows and 10’ between trees. Cherry trees are planted in an unreplicated, non-randomized plot with 3-5 trees per cultivar. Plot spacing is 16' between rows and 10' between trees.

From March to May 2007 ratings were collected weekly for bloom timing and abundance for peach, nectarine, plum and cherry cultivars. Observations of fruit set in peach, nectarine and plum were also made May 25, 2007. Peaches and nectarines were harvested in July and August, the fruits counted and number of externally visible split pits recorded. Ten sample fruit were then randomly selected, held in cold storage for 4-6 days, and observations made of appearance and fruit quality.

Results and Discussion

Peach, nectarine and cherry bloom was abundant on most varieties (Tables 2-4) and the set good on nectarines and most peaches (Tables 6, 7). Most plums had abundant bloom as well (Table 1) but set was variable (Table 5). Unfavorable weather during certain periods of bloom was a factor in reduced fruit set for plums. Also, a new bee study by WSU required removal of our

beehives from the orchards prior to the new hives being placed in an adjacent study area. The result was an interim period when no bees were present in the plots.

Some of the plums that set well in 2007 appear best suited to home orchards, with little or no commercial potential (Kuban Comet, Kuban Delight, Moldavian, Obilnaja.). Fruits of these cultivars are of generally good quality but their appearance and small size lack market appeal. Shiro is a reliable, productive yellow plum of Japanese type well known to home growers that may have some fresh market interest.

Peach and nectarine harvest was good in 2007 for most varieties, and fruit yield and percent of split pits in fruit were recorded, along with observations on fruit appearance and quality (Tables 8-9). Notably productive peach cultivars with few split pits were Summer Prince, Redhaven, Early Loring, Blazingstar, Starfire, Allstar and Contender. The two best performing nectarines were advanced selections from the Harrow, Ontario breeding program, HW 110 and HW111. Both were productive and had low levels of split pits.

Proposed Future Studies

In 2008, we propose to add 6 new plum cultivars (Ersinger, Gras Ameliorat, Jubileum, Prune D'Ente, Rosagaca, Ruth Gestetler) and 6 selections (NY 6, 9, 51,81 804, 1466) from the Geneva, NY breeding program. Evaluations of all other stone fruit will continue. Table 10 provides an overview of the data that will be collected for each fruit type. We are looking into the possibility for a new trial of late sweet cherries grown under a high tunnel, to provide rain protection and increased heat levels. A study to test the leaf curl resistance of certain peach seedlings of local origin is also a future prospect, but it would require a separate trial plot that would not receive leaf curl spray.

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Table 1. **Bloom date and bloom density rating of plum cultivars at WSU Mount Vernon NWREC, 2007**
D = bloom density rating (5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light/none)

Cultivar	**D**	**Mar 20**	**Mar 27**	**Apr 2**	**Apr 10**	**Apr 18**
Beauty	5	full	Pet fall			
Earlimagic	5-4	full	Pet fall			
Newbold Golden Marvel	5+	90	Pet fall			
Vanier	4-3	90	Full-pf	Pet fall		
Kuban Comet	4	90	full	Pet fall		
Shiro	5+	80	full	Full-pf	Pet fall	
Kuban Delight	5	60	full	Full-pf	Pet fall	
Obilnaja	5	60	full	Full-pf	Pet fall	
Rubysweet	3	05	Full-pf	Pet fall		
Vanette	4-3			70	Full-pf	
Jubilee	5			70	Full-pf	
Victoria	4			70	Full-pf	
Battema	4			60	Full-pf	Pet fall
Rosy Gage (NY 101)	4		10	60	Full-pf	
Sugar	4-3			50	Full-pf	Pet fall
Longjohn	4			50	full	Pet fall
Vision	4-5			50	full	Pet fall
Vallerie	3-4		10	40	full	Pet fall
VeeBlue	5			40	full	Pet fall
Toka	3			40	full	Pet fall
Moldavian	5			40	full	Pet fall
Voyageur	3-4			30	full	Pet fall
Pipestone	5			30	full	Pet fall
Mount Royal	4			10	Full-pf	Full-pf
Dester	4			10	full	Full-pf
Reine de Mirabelle	5			05	full	Full-pf
Blackruby	NB					

Table 2. Bloom date and bloom density rating of peach cultivars at WSU Mount Vernon NWREC, 2007
B = bloom type (S = showy bloom, NS = non showy bloom)
D = bloom density rating (5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light/none)

Cultivar	**B**	**D**	**Mar 20**	**Mar 27**	**Apr 2**	**Apr 10**	**Apr 18**
K 22-42	S	5-4	90	Full-pf	Pet fall		
H 25-99	NS	5	90	Full-pf	Pet fall		
D 33-1	NS	4	80	Full-pf	Pet fall		
D 51-270	S	5-4	80	Full-pf	Pet fall		
Coralstar	NS	5	80	full	Pet fall		
NJ 318	NS	4-5	70	full	Pet fall		
FA 102	NS	4	70	full	Pet fall		
HW 273	NS	4-5	70	full	Pet fall		
Harken	NS	4-3	60	full	Pet fall		
GaLa (S)	NS	3	60	full	Pet fall		
D 101-62	NS	4	50	full	Pet fall		
Redstar	NS	5	50	full	Pet fall		
Junegold	S	3-2	50	full	Pet fall		
K 22-38	S	5	50	full	Pet fall		
FA 101	S	3	50	full	Pet fall		
D 91-184	NS	4	40	full	Pet fall		
H 28-20	NS	2	30	full	Pet fall		
D 91-134	S	5	40	full	Pet fall		
Starfire	NS	5	40	full	Pet fall		
Springprince	S	1	30	full	Pet fall		
Early Redhaven	NS	4-5	30	full	Pet fall		
H 14-26	S	4	30	full	Full-pf	Pet fall	
Risingstar	NS	4	30	full	Full-pf	Pet fall	
FA 100	NS	3-2	30	full	Full-pf	Pet fall	
Harbelle	NS	4-5	30	full	Full-pf	Pet fall	
Vivid	NS	4-5	30	full	Full-pf	Pet fall	
Juneprince	S	1-2	30	full	Full-pf	Pet fall	
Redhaven	NS	5	30	full	Full-pf	Pet fall	
Allstar	NS	4-3	30	full	Full-pf	Pet fall	
Blazingstar	NS	5-4	30	full	Full-pf	Pet fall	
HW 272	NS	4-5	20	full	Full-pf	Pet fall	
Contender	NS	5	05	full	full	Pet fall	
Township	S	4-3	05	full	full	Pet fall	
H 11-64	NS	3	05	full	full	Pet fall	
L 7-176	NS	5	05	full	full	Pet fall	
H 11-73	NS	5	05	full	full	Pet fall	
Black Alexander	NS	2	05	full	full	Pet fall	
Early Loring	S	4-5	20	90	full	Pet fall	
J 19-28	S	5	10	80	full	Pet fall	
Velvet	S	3	05	80	full	Pet fall	
Vanity	S	5	05	70	full	Pet fall	
D 88-147	NS	5	30	70	full	Pet fall	
Betty	S	5	10	60	full	full-pf	Pet fall
Township	S	4		60	full	Full-pf	Pet fall
Frost	NS	3		50	full	Full-pf	Pet fall
H 13-98	NS	4		50	full	Full-pf	Pet fall
Ernie's Choice	S	4		10	90	full	Pet fall

Table 3. **Bloom date and bloom density rating of nectarine cultivars at WSU Mount Vernon NWREC, 2007**
B = bloom type (S = showy bloom, NS = non showy bloom)
D = bloom density rating (5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light/none)

Cultivar	B	D	Mar 20	Mar 27	Apr 2
K 54-25	NS	4	60	full	Pet fall
HW 111	S	4-5	40	full	Pet fall
HW 110	NS	4	40	full	Pet fall
Hardired [new trees]	S	2	40	full	Pet fall
K 56-4	S	4-5	30	full	Pet fall
Roseprincess	S	5-4	30	full	Pet fall
SunGlo	NS	4	30	full	Pet fall

Table 4. **Bloom date and bloom density rating of cherry cultivars at WSU Mount Vernon NWREC, 2007**
D = bloom density rating (5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light/none)

Cultivar	D	Apr 10	Apr 18	Apr 30	May 7
Lapins	5	90	Full	Pet fall	
NY 518	4	90	Full	Pet fall	
Vandalay	5+	80	Full	Pet fall	
NY 205 [414205]	3	80	Full	Pet fall	
NY 5288 [45288]	5	70	Full	Pet fall	
Hardy Giant	4	70	Full	Pet fall	
Almaden Duke	5	60	90	Full-pf	Pet fall
Rainier	5	50	Full	Pet fall	
Emperor Frances	4	40	Full	Pet fall	
Bing	5	40	Full	Pet fall	
BC 13N-7-39	5	20-40	Full	Pet fall	
Kristin	5	30	90	Full-pf	Pet fall
Sweetheart	5+	20	Full	Pet fall	
NY 252	4	10	Full	Full-pf	Pet fall
Early Burlat	5	20	Full	Full-pf	Pet fall
Hartland	5	20	Full	Full-pf	Pet fall
White Gold	5	10	90	Full-pf	Pet fall
Governor Wood	5	05	60	full	Full-pf
Angela	5	10	Full	Full-pf	Pet fall
Danube Erdi B	5		20	full	Full-pf
RN 02-4-242	4		Full	Full-pf	Pet fall
NY 242	4	05	Full	Full-pf	Pet fall
Tehranivee	5		Full	full	Full-pf
NY 9295	4		05	full	Full-pf
Schneider	5		10	full	Full-pf
NY 7855	4	01	20	full	Full-pf
Black Gold	5		20	full	Full-pf
Hudson	4	01	20	Full	Full-pf
Skeena	4	10	20	full	Full-pf
Surefire	4-5		20	full	Full-pf

Table 5. **Observed fruit set of plum cultivars at WSU Mount Vernon NWREC, May 2007**
Set: 5=abundant set , 4=moderate set, 3=acceptable set, 2=light set, 1=few or no fruit

Cultivar	Set	Cultivar	Set
Battema	1.0	NJPC-2 plumcot*	1.0
Beauty	1.5	NJPC-5 plumcot*	1.0
Blackruby	1.0	Obilnaja	4.0
BPJ – 1 beachplum	1.0	Pipestone	1.0
Cambridge Gage*	1.0	Premier beachplum*	1.0
Coe's Golden Drop*	1.0	Rosy Gage	1.0
Dester	3.0	Rubysweet	1.0
EarliMagic	1.7	Shiro	2.5
Flavorelle	1.0	Sugar	1.0
Golden Marvel	1.8	Toka	1.0
Gras Romanesc*	1.0	Vallerie	2.5
Jubliee	3.0	Vanette	2.4
Kuban Comet	3.3	Vanier	1.0
Kuban Delight	4.0	Vee Blue	1.0
Mirabelle, Geneva*	1.0	Victoria	2.0
Mirabelle, Reine de	2.0	Vision	1.0
Moldavian	3.0	Voyageur	1.0
Mount Royal	2.0		

*trees less than 3 years old, not yet fully fruiting

Table 6. **Observed fruit set of peach cultivars at WSU Mount Vernon NWREC, May 2007**
Set: 5=abundant set , 4=moderate set, 3=acceptable set, 2=light set, 1=few or no fruit

Cultivar	Set	Cultivar	Set
Allstar	3.7	H 4-44	3.7
"Betty"	5.0	Harbelle	4.0
Blazingstar	2.7	Harken	3.3
Contender	4.5	HW 272*	2.5
Coralstar	2.0	HW 273	4.0
D 101-162	2.0	J 19-28	5.0
D 33-1	2.0	Junegold	2.3
D 51-270	3.0	Juneprince	1.0
D 88-147	4.0	K 22-38	3.0
D 91-134	3.0	K 22-42	2.3
D 91-184	5.0	K 40-34	1.0
Early Loring	3.8	L 7-176	2.7
Early Redhaven	4.3	NJ 318	2.7
Ernie's Choice	3.0	Redhaven	4.0
FA 100	1.3	Redstar*	1.3
FA 101	1.0	Risingstar	2.7
FA 102	2.0	Roseprincess	3.7
Frost	5.0	Springprince	1.0
Gala (Biringer)	1.5	Starfire*	2.8
Gala (Stark)	1.5	Sunland	1.0
H 11-64	1.0	Sunprince	1.0
H 11-73	1.0	Township	4.0
H 13-98	3.0	TriLite*	1.5
H 13-114*	1.0	Vanity	2.7
H 14-126	3.0	Velvet	2.3
H 25-99	2.0	Vivid	4.0
H 28-20	2.0		

*trees less than 3 years old, not yet fully fruiting

Table 7. **Observed fruit set of nectarine cultivars at WSU Mount Vernon NWREC, May 2007**
Set: 5=abundant set , 4=moderate set, 3=acceptable set, 2=light set, 1=few or no fruit

Cultivar	Set	Cultivar	Set
Hardired*	1.0	K 54-25	4.0
HW 110	2.6	K 56-4	5.0
HW 111	2.6	Sunglo	2.7
K 54-17	2.0		

*trees less than 3 years old, not yet fully fruiting

Table 8. **Observed Percentage of split pits in nectarine cultivars at WSU Mount Vernon NWREC, 2007**.
W = white flesh cultivar

Cultivar	Harvest Date	Total No. fruit	Avg. Fruit/tree	% split pits	Comments
K 56-4 [W]	July 26	144	72.0	1.7	Discard, bad cracking; sweet flavor
HW 110	Aug 9	105	105*	4.8	Semi cling, ex color, flavor fair
K 54-35 [W]	Aug 9	46	46	0.0	Discard, unproductive, small fruit; semi free, ex color & flavor
Sunglo	Aug 23	64	21.3	11.9	Discard, bad cracking & rot
HW 111	Aug 23	535	178.3	0.6	Freestone, productive, good color and flavor

*NOTE: only one tree in 3-tree replications was counted

Table 9. **Observed Percentage of split pits in peach cultivars at WSU Mount Vernon NWREC, 2007**.

Cultivar [W = white flesh]	**Harvest Date**	**Total No. fruit**	**Avg. Fruit/tree**	**% split pits**	**Comments**
Gala (source Biringer)	July 26	8	4.0	50.0	Discard, too many splits
Junegold	July 26	46	15.3	14.9	Discard, unproductive, bland
Early Redhaven	July 26	432	144.0	16.8	Freestone, good flavor, v. attractive
D 88-147 [W]	July 26	215	107.5	11.3	Semi free, crunchy firm, good color
Harbelle/Citation	July 26	70	35.0	15.4	Semi free, reliable producer
Harbelle/Lovell	July 26	94	94.0	9.6	Semi free, reliable producer
Risingstar	July 26	344	114.7	17.4	Semi free, firm texture, good color & flavor
Summer Prince	July 28	296	296.0	6.6	Semi free, productive, good flavor
Gala (source Stark)	Aug 2	70	17.5	11.4	Discard, unproductive, split pits, soft texture, bland
Roseprincess [W]	Aug 2	290	96.7	8.1	Cling stone, smallish fruit, crunchy firm, sweet floral flavor, some cracking
D 91-184	Aug 2	217	108.5	41.2	Discard, unproductive; semi free, large, uniform, ex. color
Harken/Citation	Aug 2	23	11.5	10.7	Semi free, good color, good flavor
Harken/Lovell	Aug 2	26	26.0	18.2	Semi free, good color, good flavor
Redhaven/Citation	Aug 2	74	37.0	25.2	Freestone, good color, good flavor
Redhaven/Lovell	Aug 2	197	197.0	11.9	Freestone, good color, good flavor
H 4-44 [W]	Aug 2	179	59.7	3.8	Freestone, crunchy firm, good flavor, v. attractive color
Vivid	Aug 9	88*	88*	8.0	Fully evaluated, freestone, good flavor
Early Loring	Aug 9	209*	209*	3.8	Freestone, productive, ex. color
J 19-28 [W]	Aug 9	105*	105*	2.9	Freestone, crunchy firm, v. sweet
L 7-176 [W]	Aug 9	49*	49*	2.9	Freestone, crunchy firm, sweet
Coralstar	Aug 9	58*	58*	1.7	Discard, not reliably productive; semi free, good size
Blazingstar	Aug 9	219*	219*	1.8	Free stone, good flavor, productive
Redstar	Aug 9	74*	74*	8.1	Semi free, good flavor, sweet
Starfire	Aug 9	199	199.0	7.5	Free stone, productive, reliable, attractive, good flavor, uniform size
D 91-134	Aug 9	6*	6*	50.0	Discard, unproductive, rot; flat peentao type, yellow-green skin, crunchy firm
Township	Aug 16	199	66.3	5.8	Young trees, good size, good flavor
Frost	Aug 16	97	97.0	2.1	Semi free, not highly colored, leaf curl resistant, reliable
H 11-73 [W]	Aug 16	14	14.0	7.1	Free stone, crunchy firm, sweet
H 14-126	Aug 16	63	63.0	3.2	Free stone, ex color & flavor
Allstar	Aug 16	426	142.0	7.5	Free stone, good flavor, attractive
Contender	Aug 23	574	191.3	1.5	Semi free, productive, good flavor
H 13-98	Aug 23	36	36.0	16.7	Free stone, crunchy firm, flavor only fair
NJ 318 [W]	Aug 23	219	73.0	8.2	Semi cling, v. sweet good flavor, large fruit, some internal splits
D 101-162	Aug 23	49	24.5	9.3	Discard, good quality but unproductive; semi cling, ex color, good flavor
FA 100	Aug 23	39	13.0	5.1	Discard, unproductive; freestone, ex color, good flavor
Betty	Aug 23	242	121.0	0.8	Young trees, semi free, productive, leaf curl resistant
Ernie's Choice	Aug 23	48	48.0	0	Discard, good quality but unproductive; freestone, firm, good flavor, attractive
HW 273	Aug 29	247	82.3	2.8	Semi free, color a bit pale, good size

*NOTE: only one tree in 3-tree replications was counted