

## **TREE FRUIT RESEARCH 1997**

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## HARVEST REPORT 1997 TREE FRUIT

### Introduction

In 1997 we have continued with the new format, to make it easier to transfer data from field observations to the annual report. Variety information appears as a table, with number ratings to designate important factors such as fruit set, size, flavor, etc. Some ratings such as fruit set are based on the same standard for all fruit kinds. Other ratings, such as fruit size, will be different since they describe the characteristics of different fruit kinds. All the varieties and selections of one kind are listed together, in approximate order of ripening. The key to the numerical rating system appears below. In general, a higher number reflects a preferred rating, but in categories such as skin color of plums, the numbers simply designate a characteristic, with no preferred ranking.

The star rating, found in the farthest left column, reflects our overall assessment of each variety's performance, including cumulative records of past performance. When it refers to selections not yet named and introduced, the star rating reflects possible future potential.

Star Rating - same for all fruit kinds

5 = outstanding, the best, very promising

4 = good established variety, promising

3 = established variety, some faults

2 = serious faults

1 = unsuitable, not recommended, discard

blank = not yet evaluated, new planting

St Fruit Set (in proportion to tree size) - same for all fruit kinds

5 = very heavy, all branches densely fruited

4 = moderately heavy, all branches bearing some fruit

3 = moderate, some areas of tree not bearing

2 = light, most areas of tree not bearing

1 = very light, few fruits only

Fl Flavor - same for all fruit kinds

5 = sweet-tart

4 = sweet

3 = subacid

2 = bland

1 = tart

The ratings below apply specifically to **APPLES AND PEARS**:

Sz Predominant Fruit Size:

5 = very large, 4" diameter and above

4 = large, 3-4" diameter

3 = medium, 2.5-3" diameter

2 = below medium, 2-2.5" diameter

1 = small, 2" diameter and below

C Color, % Red

Total fruit area covered with red blush or stripe (may be 0 for green or yellow).

F Finish:

- 5 = no russet or skin blemish
- 4 = russet only in cavity or basin
- 3 = some light russet streaks on body of fruit
- 2 = light allover russet, or heavy streaks/patches on body of fruit
- 1 = solid allover russet, rough, lumpy, or deformed

For **ASIAN PEARS** color ratings are as follows:

- 4 = yellow, 3 = tan, 2 = brown, 1 = partial russet

Ratings for set, size, and flavor are the same as for apples.

The ratings below apply specifically to **PEACHES AND NECTARINES**.

Cf Flesh Color:

- 7 = white
- 6 = yellow
- 5 = orange
- 4 = green
- 3 = pink
- 2 = red

Sz Fruit Size:

- 3 = large, 3.5" diameter or above
- 2 = medium, 2.5-3.5" diameter
- 1 = small, 2.5" diameter or below

Ratings for set and flavor are the standard ratings; skin color rating is the same as for apples.

The following ratings apply to **PLUMS**.

Cs Skin Color:

- 7 = yellow
- 6 = green
- 5 = orange
- 4 = red
- 3 = blue
- 2 = purple
- 1 = black

Sz Fruit Size:

- 3 = large, 2.5" diameter or above
- 2 = medium, 1.5-2.5" diameter
- 1 = small, 1.5" diameter or below

Ratings for set and flavor are the standard ratings, ratings for flesh color same as for peaches.

The following ratings apply to **CHERRIES**.

Sz Size:

- 3 = large, 1 1/4" diameter and above
- 2 = medium, about 1" diameter
- 1 = small, 3/4" diameter or less

Cr Cracking:

- 4 = none
- 3 = low, less than 20% fruit cracked
- 2 = moderate, 20-50% fruit cracked
- 1 = high, over 50% fruit cracked

R Rot:

- 4 = none
- 3 = low, less than 20%
- 2 = moderate, 20-50%
- 1 = high, over 50%

Ratings for set are the standard ratings.

For **APRICOTS**, the ratings for set and flavor are the standard ratings, size is the same as for plums, and cracking the same as for cherries.

### Cherry

Conditions for pollination were better in spring 1997 than in 1996, and as a result most varieties set enough fruit for evaluation, and some, such as **Angela**, **Viscount**, **Emperor Francis**, **Kristin**, and **Hardy Giant** had a good quantity of fruit. Problems of rot were more serious this year. Three days of heavy rain ( total 1.53" from July 8-10) just before the WWTFRF harvest day produced severe cracking, followed by rot in most varieties. WWTFRF pickers, however, still sampled and gleaned much of the cracked fruit before rot set in. Some of the young trees on Gisela rootstock set fruit this year. **Lapins** and **Sweetheart** were both of good quality in the late season, **Sweetheart** being the later of the two by about a week. We are planning to net the entire block against the birds whenever the money becomes available. This should be much easier than netting big trees on standard rootstocks, and also make harvesting and sampling more convenient. One block of standard size trees was eliminated and several big, old trees discarded as part of the program to phase in to the smaller dwarfing rootstocks.

#### Proposed Discard

**Royalton** - unproductive

**Compact Stella** - fully evaluated, virus problems

### Apricot

Apricots set better in 1997 than last year; although the cool damp weather was not ideal, it was an improvement over 1996. **Puget Gold** reliably set a good amount of fruit, and though **Harglow**, **Alfred**, and **Sunglo** did not have as much fruit, the flavor and quality was good. The stone fruit plot planted in 1994 contained a number of new apricot varieties, and four of them were discarded in the spring of 1997 for excessive disease susceptibility. The others are not yet in production. We are continuing to collect and plant seeds for the apricot seedling project, hoping to find an improved variety for our climate, as even the best of the currently available varieties has many faults.

#### Proposed Discard:

**Earli Cot** - trees diseased, no fruit

**Earli Sun** - trees diseased, no fruit

**Goldbrink** - trees diseased, no fruit

**Jordanne** - trees diseased, no fruit

**Peach x apricot** - unproductive

**Puget Gold/St. Julien A.** - trees disease prone on this rootstock, small, weak

### Peach

In the 1997 season, conditions were better for pollination than in 1996. **Harrow Diamond** and **Sentry** are both good early season peaches, ripe in mid to late July. Mature trees in general did well, with reliable producers like **Harbelle**, **Harken**, and **Redhaven** carrying a moderately heavy set of fruit. After several years on trial, **Newhaven** has proven itself to be reliable and productive with high quality fruit. Also looking good this year was **Harrow Beauty**, having large fruit with very good flavor and attractive golden undercolor. **Proud** leaf curl resistant clone is in process of being introduced, with the name of **Avalon Pride**. The fruit is large, highly colored, attractive, with

little fuzz, and of good quality. Our initial evaluation of this variety has been good.

In the new stone fruit block, many peach varieties set little or no fruit this year. For this reason, those that did produce stood out from the rest. Even on those that set fruit, the overall crop was light. Notable were the white fleshed peaches, many being very attractive with nearly 100% dark red skin color at harvest. **White Lady**, ripe just after **Redhaven**, is very sweet and almost entirely free stone. **Sugar Lady**, in the same season, also set more fruit than most of the white fleshed varieties, though individual fruits were on the small side. **Arctic Supreme**, ripening in the last week of August, looked good in its first year of fruiting. Due to the earlier bad weather, there was also more than the usual amount of damage caused by split pits and rot.

Proposed Discard:

**Mid-Pride** - unproductive, blooms too early most years

### Nectarine

Again this year the nectarines were seriously affected by both cracking and rot, especially the earlier ripening varieties, **Juneglo** and **Nectired**. **Arctic Glo**, a white-fleshed nectarine also in the early season, will get another look to see how it performs next year. Later on in August the warm, dry days contributed to better results with some of the midseason varieties. Among those fruiting for the first time, **Hardired** and **Tasty Gold** were the best of the yellow fleshed varieties. **Crimson Snow**, another white-fleshed variety, stood out for its excellent color, sweet flavor, and productivity, though fruits were rather small and some were cracked.

Proposed Discard:

**Mericrest** - cracking, rot, fully evaluated

### Plum

The 1997 season was outstanding for many plum varieties. Though a few early varieties, such as **Beauty**, **Methley**, and **Shiro**, did not crop as heavily as usual, the overall picture was a productive one. Several of the plums in the new block are doing very well, and would merit inclusion in any plum fancier's gourmet selection. Opening the season in the first weeks of July is **Early Laxton**, a small, sweet, freestone plum that ripens over an extended period and has a spreading tree habit that makes it well suited to home gardens. **Imperial Epineuse**, also a European type, ripens in late July and was loaded with delicious sweet fruit. Both of these look very promising and appear to have potential as consistent producers.

Two purple-leaf plums produced good fruit and also showed ornamental value. **Cochecho** ripened in late July, and has an upright-spreading tree habit; the pinkish orange, round fruit is moderately attractive, with juicy flesh and good flavor. **Hollywood** has a more broadly spreading habit, and the sweet dark red fruit is ripe in mid to late August. This strain of **Hollywood** initially appears more productive in comparison with other strains we have tested.

Despite being transplanted in early 1997, trees of **Seneca** and **Valor** both yielded a full crop of high quality fruit. Either of these varieties is excellent for overall flavor straight off the tree, or for drying and canning. A new one of similar type is **Victory**, and it looks to be equally good. Toward the end of the season, **Midnight Sun** is a large, round plum, blue-black with pale yellow flesh that is firm and sweet. Though the trees are not as heavy bearing as some, fruit quality is good.

Proposed Discard:

**CB 15** - not well adapted here, mediocre, not likely to be named

Pear

European pears generally are well adapted to this area, and this year was no exception. A very early, attractive pear fruiting for the first time was **Bella de Guigno**; we are interested in how it will perform next season. **Harrow Delight**, ripe in early August, produced a heavy crop of good quality fruit. Somewhat later, **Rescue** and **Orcas** continued their record of consistent performance. Both of these summer pears are good for canning and drying as well as eating fresh. The red pears **Starkrimson** and **Sensation Red Bartlett** continue to show good production. New trees of **Cascade** produced fruit in their first year; it will be interesting to see if they also show a tendency to alternate bearing.

Yields of trees in the Bosc test plot, which includes **Bosc** on different rootstocks and trees of **Concorde** and **Conference** as pollinizers, were impressive. **Concorde** averaged 40 lbs/tree, and **Conference** 44 lbs/tree, on trees planted in 1994 on Quince C rootstock, which seems to promote early and heavy production. Yields of **Bosc** were not so heavy but still respectable at 20-26 lbs/tree, and the size and quality were excellent. Fruit from standard **Bosc** and from **Bronze Beauty** and **Golden Russet** strains showed that all were fully russeted and quite attractive. In fact, some evaluators might consider **Bronze Beauty** to be too dark and rough skinned for commercial marketing.

Proposed Discard

None

Asian Pear

All of the Asian pears did well this year, and although some fruits were smaller than usual, overall yield and quality were good. **Hamese #1** and **Shinseiki** are the best yellow-skin types that we are currently growing. **Nijisseiki (20<sup>th</sup> Century)** is often considered an "old standby" but in our trials it has not performed as well as the other two, often too small. **Ichiban Nashi** and **Yoinashi** are both high quality, with tan or light brown skin that is thicker than the yellow types. The very large fruit of **Mishirasu** has thick russet brown skin and an unusual turbinate shape. Its excellent flavor, crisp texture, and reliable production make this a good one for the home garden.

Proposed Discard

None

Apple

As usual in most years, the set of fruit in 1997 was good despite lack of optimum conditions. There were some signs of frost scars on fruit in some areas of western Washington, but in most locations much less damage than last year. June was cool and wet, but this was followed by some very warm weather in July and especially August, so that the general trend of harvest dates was about two weeks ahead in the early season, gradually decreasing as the season went on, until the late harvest was only slightly earlier than 1996, or virtually the same. There was, however, a lot of variability in ripening, with some varieties showing signs of undesirable sunburn and water core, while other varieties took longer than usual to mature. Yields in general were very good and fruit

quality was high, with many of the young trees producing enough fruit for evaluation this year.

#### Established Varieties:

Among the early season varieties that did well this year are **Sunrise**, **Homei Tsugaru**, **Aroma**, **Alkmene**, and **Fiesta**. In particular **Aroma**, which set poorly in 1996, came in with a heavy yield of good sized fruit, and the flavor was excellent. However, we will need to check this variety to see if it may be prone to alternate bearing. Both **Sunrise** and **Aroma** tend to ripen over a lengthy period, which makes them well suited to home gardens. **Honeycrisp** was productive but did not seem to color as well as usual, perhaps due to the warm weather at harvest time. **Elstar** and its red strains **Daliest** and **Daliter** set well also, though fruit size tended to be below normal.

The red strains of **Gala** being evaluated all produced good quality fruit this year. **Regal Gala (Fulford)** again stood out for its size, uniformity, good flavor and even color, nearly 100% blush red. **Scarlet Gala** was smaller with variable color; the best **Scarlet Gala** were very attractive but percentage of total fruit that was highly colored was lower than for **Regal Gala**. The young trees of **Royal**, **Ultrared**, and **Galaxy** strains all had very good color, as expected in small trees with high light exposure.

Cox's **Orange Pippin** produced fruit of excellent quality and good color, but wasn't as productive as the **Queen Cox** or **Cherry Cox** strains, both of which had very good fruit. **Karmijn de Sonnaville**, a Cox cross very popular as a gourmet apple, produced well although some of the fruit was subject to sunburn and water core. It was again a favorite at fruit taste tests.

Several strains of **Jonagold** are being evaluated for their potential in both commercial and home orchards. It is not the easiest variety to grow, for a number of reasons, but the high quality that can be attained makes the effort worthwhile. **Jonagored**, **Jomured**, **DeCoster** and **Rubinstar** have the most red color of the strains being tested here, followed by **King (Jored)**. All of these varieties can yield some fruit with 100% red color, the difference being that the first four strains seem to produce a higher amount of all-red fruit per tree.

In the late season, **Braeburn** was productive, and the fruit was of very good size and quality. An early pick of the best-colored fruit in mid October was followed by a second color pick and a final "cleanup" in early November. **Braeburn** is a possible candidate for commercial production. It is being tested on M9 rootstock, which contributes to earlier ripening. The fruit is very firm with excellent keeping potential. Several strains of **Fuji (Standard, Yataka, and Akifu)** were also harvested in early November, benefitting from a spell of warmer weather. Water core and russetting affected a number of **Fuji** specimens, though the color and flavor were good. This variety is not readily adapted to most Puget Sound areas, and needs special care in site selection and cultural methods.

#### New Evaluations

Varieties producing fruit for the first time this year included several interesting additions. From the Delbard nursery in France, **Delblush** is ripe in late August, and is flavorful and attractive, though both size and color were quite variable. In the same season are two red dessert type apple selections from B.C., **11W-12-85** and **11W-19-18**, both crosses of Summerred X Discovery that seem to be doing well here. **Delroval**, another Delbard selection, showed up well in its first season, with very good sweet-tart flavor and attractive orange-red color. **Greensleeves**, an English introduction that fruited last year, continues to look good in the mid-September season, an attractive green-skinned fruit that is very flavorful. **RubINETTE** tends to be on the small side, with russeted

yellow skin, but has potential for the home garden because of its excellent flavor. In early October **Thome Empire** stood out for its good flavor and eye-catching blackish-red color. It could be very promising for the market as well, if the mature tree continues to produce such nicely-colored fruit.

The **McIntosh** variety is very popular in New England and the eastern U.S., and several strains that we are testing seem to do well here. The different strains ripen at various times throughout the season. **Marshall Mac** and **Pioneer Mac**, first evaluated in 1996, continue to look promising. **Marshall Mac** appears to ripen about a week earlier than **Pioneer Mac**. **Compact Mac** is a tree of upright-columnar habit with good quality fruit, well suited for planting where space is limited. **Redmax**, ripe with **Compact Mac**, and **Acey Mac**, about 3 weeks later, are both good quality and it will be interesting to compare them with the newer ones as they come into full production.

One very promising variety that fruited this year was **Beni Shogun**, a Fuji type that is ripe about a month earlier than the other **Fujis**. Both fruit color and flavor were good this year, and we look forward to next season to evaluate its productivity. In the late season, **Chevadel**, another Delbard selection, is an attractive bicolored apple with sprightly, subacid flavor, worth looking at again next year. A new B.C. introduction, **Chinook (8S-27-51)**, a cross of Gala X Splendour, fruited this year. It is an attractive pinkish red, sweet, and very firm, but the fruit size is small.

#### Disease Resistant Cultivars and Selections

These trees did not receive any fungicide treatment, so that their resistance to disease could be evaluated. Though bred for scab immunity, the resistance to other diseases such as powdery mildew can vary from resistant to quite susceptible, as has been shown in ratings taken over the years. In 1997 we noted on a number of trees a serious outbreak of black spots on the fruit, which seems to have been caused by a yeast. We noted that here again not all of the varieties and selections were affected equally. This occurrence emphasized the point that growing scab immune varieties does not guarantee a trouble-free orchard or undamaged fruit.

A nice surprise in the early season was the first fruiting of **Pristine**, an attractive, flavorful yellow apple that could replace **Chehalis**, possibly with better keeping quality. We look forward to seeing this one next season. **Williams' Pride** was productive and the fruit good, but a serious mildew problem damaged many leaves. **Wynooche** also fruited for the first time; its biggest drawback appears to be a tendency for fruit to drop before fully ripe. Just as a fruit seems to be getting good color, it ends up on the ground. **Dayton** is showing improved performance as the trees mature, and should replace **Prima** in its season, with better keeping quality and much better flavor. Fruit of **Liberty** was small this year, though of good color and flavor. **Enterprise** was quite productive, though some fruit was damaged by black spots.

Some promising selections were **CLR-20T-22**, a flavorful and attractive red apple ripe in late September, and **Coop 28**, an eye-catching bright red, crisp, with sweet-tart flavor, ripe in early October. Ripe in late October were **P15R-3T-86**, a very productive tree with attractive fruit, and **PAR-12T-101**, firm and crisp with good flavor. Among the selections from Geneva, **NY 75414-1** continues to be impressive, producing firm, sweet-tart fruit of deep wine red color with attractive pale dots. **NY 65707-19** adds good mildew resistance to its favorable qualities of attractive appearance and good flavor. **NY 75413-30** was very productive, with large, dark red fruit that hangs well on the tree.

#### Proposed Discard

AA 49

Very early 5-minute apple, sweet, bland



<i>M. x zumi 'calocarpa'</i>	white	mid	large spreading	red
<b>Christmas Holly</b>	white	mid-late	small rounded spreading	red
<b>Prairifire</b>	red-pink	late	mid rounded, bronze leaves	dk red
<b>Golden Raindrops</b>	white	late	mid spreading, cut leaf foliage	yellow

The rootstocks used in this trial range from Domestic seedling (full size) to M 27 (extremely dwarf), including M 9, M 26, M 111, and some Budagovski and Cornell Geneva clones.

Several of the new introductions being evaluated for disease resistance and ornamental quality look promising. **Adirondack** is a white-blooming, upright tree with good scab resistance and small, attractive pinkish-orange fruit that hangs late on the tree. **Purple Prince** also appears quite disease resistant, with maroon flowers, dark red fruit, and dark purple-green foliage that could be a good replacement for scab susceptible varieties such as **Liset**. **Prairie Maid** has deep-pink flowers in contrast to green leaves slightly tinged with bronze. It shows good disease resistance, and the small red fruits color up early, but birds like them so the tree has little color after the leaves are gone.

Some seedlings of local origin may have potential for future development. **Pink Cloud**, found by Ed Lewis, has pink double flowers, bronze leaves and large, tart red fruit. A seedling cross was brought to our notice by Marvin Jarmin; it is a semi-double, white flowered tree with narrowly upright habit which would be suitable for street side planting, especially as it seems to have little or no fruit. A seedling cross of Alkmene X Prima made here at the station in 1990 resulted in an upright-spreading crabapple with scab immunity; it has white flowers and large, persistent bright yellow fruit, tart but edible. These seedlings are being evaluated for possible introduction.

Cox, Red	Red sport, less productive than Queen or Cherry Cox
Golden Supreme	Attractive but bland
Lysgolden	Fully evaluated, not best Golden type for flavor
NJ 99	Not likely introduction, mediocre flavor, fully evaluated.
NJ 100	Attractive but flavorless, keep only if NJ is introducing it
NJ 116	Not likely introduction, mediocre flavor, fully evaluated.
Novamac	Mediocre quality, keep only in B block
NY 652	Too similar to Empress in same season
NY 674	Check w/NY for status, otherwise fully evaluated
NY 61343-1	Disease spots, pale color, unattractive
Sunset	Nice small apple but fully evaluated, no commercial potential
Tsugaru, Natsuka	Inferior to Homei in color, flavor
Tydemans Late Orange	Unattractive, blossom end crack/rot, woody flesh, late
CQR-10T-17	Bad spotting and mildew
PAR-14T-238	Unattractive, bland flavor

### Unusual Fruit

With the help of a special donation, we were able to start a planting of unusual fruit for evaluation that we hope to increase in future. The intention is to test a number of uncommon kinds of tree and bush fruit to see if they are well adapted to western Washington conditions, and to look at any specific cultural needs that may apply to growing them in our area. Among the fruit kinds that have been planted are figs, kiwi varieties from England and Switzerland, black, red and white currants, persimmons, paw paws, and some new seedless grape varieties. Some of the uncommon bush fruits include aronia, mulberry, azerole, and sorbus.

We have also been managing trial plots of strawberry, raspberry, and blueberry varieties and selections, which are part of the research program of Dr. Pat Moore at the Puyallup research station. Anyone interested in the results of these projects can obtain specific reports from him.

### Crabapple

The evaluation of ornamental crabapples for disease resistance begun in 1984 continues with new additions as well as the establishment of several proven varieties in a rootstock trial. The established varieties chosen for the rootstock trial included those with high resistance to scab, excellent ornamental quality, and a wide range of tree habits and bloom times (see table, below).

Name	Bloom Color	Bloom Time	Tree Habit	Fruit Color
Sugar Tyme	white	early	large upright	red
Evereste	white	mid	mid spreading, large fruit	red
Molten Lava	white	mid	large weeping	red

# HARVEST LIST - APPLES 1997

● = star rating

St = set, Sz = size, C = skin color % red, F = finish, Fl = flavor

S	Cultivar	Pick 96	97	S t	Sz	C	F	Fl	Comments
2	AA 49	July 6 (95)	July 14	4	3	70	4	4/2	softens quickly
2	Discovery	Aug 9-10	Aug 1	5	2	90	4	3/2	flavor off this year
4	Biringer #101	Sep 3	Aug 4-9	3	3	80	5	5	promising early
4	Williams' Pride	Aug 8	Aug 6	4	4	90	4	3	yellowed leaves
2	NJ 116 52	Aug 18	Aug 6-9	3	3	0	5	3	mediocre
2	Monark (AA 44)	Aug 9	Aug 6-12	4	4	90	4	3	small tree, long ripening
	Pristine	new	Aug 8	4	2	5	5	3/1	attractive, crisp
5	Sunrise 44	Sep 4	Aug 9-15	5	4	50	4	5	productive multi pick
	Fu Shaui	Aug 21	Aug 11-14	4	2/4	5	4	4	some scab & cracks
4	Sansa 71	Sep 5	Aug 14-21	3	4	70	4	5	attractive, firm
	Arkcharm (AA 18)	Aug 19	Aug 14	3	3/4	90	5	5	attractive color
3	Redfree	Aug 26	Aug 14-20	3	3	90	5	3	ex color, firm
3	Red Gravenstein 96	Sep 5	Aug 14-25	4	4	80	4	3	productive
3	NY 652	Aug 26	Aug 18	4	3	90	5	3	too similar to Empress
4	Empress	Aug 27	Aug 21	4	3	100	5	5	good early Mac
	Delblush	new	Aug 21-28	4	4/2	60	3	5	flavorful, color variable
	Beni No Mai	Aug 23	Aug 23-29	4	3	60	3	3	drops, unattractive
4	Aroma 43	Sep 5	Aug 25- Sep 12	4	4	60	5	3	long season, hangs well, ex. flavor
	Wynooche	new	Aug 26-29	3	2	60	5	4	drops early, pink-green bicolor, flattish
4	Tsugaru, Homei 27	Sep 9	Aug 27- Sep 2	4	3	80	4	5	good red color, flavorful

	CMR-4T-18	Aug 28	Aug 28	1	3	90	4	3	poor set this year
	Ellison's Orange	Sep 4	Aug 28- Sep 12	4	3	40/ 70	2	5	long ripening, some drop
4	Ginger Gold 94	Sep 17	Aug 28	5	3	5	5	5	ex flavor, conic
3	BC 11W-12-85	Sep 17	Aug 28	4	4	90	3	5	attractive, some russet
4	BC 11W-19-18	Sep 11	Aug 28	4	4	90	4	5	attractive, some water core
2	PSWR-11T-48	Sep 14	Aug 29- Sep 2	4	2/5	80	4	4	spicy flavor, sunburn
	CMR-2T-13	dnf	Sep 1	3	3	90	4	3	good color, firm, some russet
	Delroval	new	Sep 5-18	4	3	90	5	5	excellent flavor, attractive orange red
4	Honeycrisp	Sep 19- Oct 3	Sep 6-12	4	4	70	4	5	color variable, storage scald early
	Rosemary Russet	Sep 14	Sep 8	3	3	5	2	3	nice golden russet
3	Dayton	Sep 6	Sep 9	4	3	90	4	5	good flavor
2	Prima	Sep 6	Sep 9	4	3/4	80	4	3/2	mediocre, softens
3	Chehalis	Sep 6	Sep 9	2	3	0	4	3	bad mildew
4	Marshall Mac	Sep 11	Sep 10-15	4	4	90	4	5	very attractive, tasty
4	Alkmene 21	Sep 9	Sep 12	5	3	70	3	5	good early Cox type
2	NJ 99 57	Sep 9	Sep 12	4	4/5	10	5	3	mediocre flavor
3	NY 74828-12	Sep 6	Sep 12	4	4	90	4	5	deep red color
3	NY 66305-289	Sep 14	Sep 12	2	3/4	90	5	3	attractive red color
2	NJ 112	Sep 14	Sep 12	4	2	60	5	3	red, crisp, too small
4	Compact Mac	Sep 19	Sep 12	5	3	90	5	3	upright columnar
4	Redmax	Sep 19	Sep 12	4	3	100	4	5	attractive, flavorful
4	Daliest 87	Sep 19	Sep 12	5	3	90	4	5	ex color this year
3	Arlet 22	Sep 19	Sep 12	5	4/3	70	5	3	firm, somewhat tart
4	Cox, Queen 24	Sep 19	Sep 12	3	3	60	3	5	some ripe early

	Deljeni	Sep 19	Sep 12	3	4	10	4	5	nice finish, attractive
3	Tsugaru, Natsuka	Sep 20	Sep 12	5	4/3	80	4	4	inferior to Homei
4	Daliter 88	Sep 20	Sep 12	5	3	100	4	5	ex color, crisp
2	Golden Supreme	Oct 2	Sep 12	4	4	5	5	4	attractive but bland
4	Greensleeves	Oct 2	Sep 12	4	3	0	5	5	promising, attractive green skin, tasty
4	CLR-20T-22	Oct 9	Sep 12-Oct 6	5	3	90	4	5	ex. flavor, attractive, promising
4	Gala, Royal	Sep 24	Sep 15-19	5	2/4	70	4	4	young trees, some russet
5	Fiesta 42	Sep 16	Sep 15-22	4	4	60	3	5	productive, tasty
4	Pioneer Mac	Sep 17	Sep 15-22	3	4	70	4/3	5	excellent flavor
	Coop 40	new	Sep 16	4	2	5	4	3	attractive but small
	Coop 41	Sep 20	Sep 16	2	2/3	80	4	3	pinkish red
	Gala, Ultrared	Sep 20	Sep 16	5	2/4	100	4/3	4	dark red blush
4	NY 75414-1	Sep 30	Sep 16	4	4/3	100	4	5	deep wine red, promising
4	NY 688	Oct 9	Sep 16-Oct 3	4	4	90	5	5	firm, crisp, holds well on tree, promising
2	Novamac	Sep 6	Sep 17	4	3	90	4	3	mediocre
	HWR-19T-18	Sep 6	Sep 17	3	2/3	90	3	3	attractive color
4	Coop 28	Sep 6-30	Sep 17-Oct 6	4	3	90	4	5	bright red, firm, crisp, holds well on tree
3	Sunset	Sep 19	Sep 18	4	2	60	4	3	attractive but small
4	Redcort	Sep 17	Sep 19	4	4	90	4	3	good flavor & color
5	Gala, Regal (Fulford)	Sep 18	Sep 19	5	4/3	90	5	4	sizes well, nice even blush color
4	Freyberg	Sep 23	Sep 19	4	3	0	3	4	ex sweet apple
3	Cox's Orange Pippin	Sep 23	Sep 19	3	2	60	3	5	very good color

2	Egremont Russet	Oct 2	Sep 19	4	3	5	3	3	unattractive, dense tart flesh, connoisseurs only
5	Gala, Scarlet	Sep 19	Sep 19-25	5	3/2	80	4	4	less color than Regal
4	Beni Shogun	Sep 19	Sep 19-Oct 2	4	4	80	3	4	early Fuji type, looks promising
2	BC 8NE-7-72	Oct 21	Sep 19-Oct 3	3	4/2	80	4/2	4	netted russet, size quite variable, pinkish red
2	NY 674	Sep 19	Sep 22	5	3	90	5	4	good color, softens
5	Elstar 13	Sep 20	Sep 22	4	3/2	60	4	3	smaller than usual
3	Cox, Red (L)	Sep 23	Sep 22	3	2	80	3	5	less productive than Queen or Cherry
3	Cox, Cherry	Sep 23	Sep 22	4	2	80	3	5	good vigor & yield
	Gala, Galaxy	dnf	Sep 22	3	3	80	3	4	young trees, russetting
3	NY 617	Sep 23	Sep 22	5	4	70	4	5	crisp, juicy; check NY for status
4	NY 65707-19	Sep 30	Sep 22	4	3	70	4	5	good mildew resist.
3	Nova EasyGro	Sep 30	Sep 22	5	3	80	4	4	good flavor, some disease spots
3	Russet King	Oct 2	Sep 22	2	4/5	5	2	5	nice overall russet, no cracking
4	Karmijn de Sonnaville 30	Sep 30	Sep 22	4	4	60	3	3	acid at harvest, water core in many
4	Bramley's Seedling	Oct 2	Sep 22	4	4/5	40	4	3	classic culinary
2	PWR-11T-128	dnf	Sep 22	2	3	80	4	3	not promising, check 98
3	NY 75413-30	Sep 25	Sep 22-Oct 3	4	4	90	4/3	3	attractive dark red, hangs well on tree
4	Jimmi (Tuell Sdlg.)	Sep 23	Sep 25	5	4	90	5	4	consider introduction?
4	Hatsuaki 16	Oct 2	Sep 25-Oct 2	5	3	70	4	4	ex. color, crisp, flavorful

4	Ashmead's Kernel	Oct 2	Sep 29-Oct 10	5	3	0-10	2	5	excellent russet type, mellows in storage
4	Liberty	Oct 3	Sep 29	4	3/2	80	4	5	good quality but small
	AA 59	Oct 2	Sep 29	3	4	0	3	4	attractive yellow, crisp
5	Jonagold, DeCoster	Oct 1	Sep 29-Oct 11	5	4/5	90	4	5	great color, some too big
5	Jonagored 68	Oct 1	Sep 29-Oct 11	5	4/5	90	4	5	some too big, color dark red
3	Winterstein	Oct 2	Sep 30	3	4	40	4	3	bitter pit in some
2	Early Dawn	Sep 20(95)	Sep 30	5	4	70	4	3	good flavor, softens
3	NY 73334-35	Oct 10	Sep 30	3	3/4	80	5	3	pale color, short stem
2	CQR-10T-17	Oct 10	Sep 30	4	3	90	5	5	bad spots & mildew
3	Sweet Sixteen	Sep 23	Sep 30-Oct 5	4	3/4	40	3	4	distinct anise flavor
4	NY 75441-67	Oct 10	Sep 30-Oct 6	4	3	100	4	5	allover dark red, attractive, tasty
4	Boskoop, Red 65	Oct 10	Sep 30-Oct 11	4	5/4	80	4	1	productive, classic culinary
3	NY 428	Sep 21	Oct 2	4	4/2	90	3	4	final evaluation 98
3	Sayaka 19	Oct 9	Oct 2	5	4/5	90	4	4	variable color
2	NY 632	dnf	Oct 2	4	4	70	5	3	attractive Mac type
3	Florina 49	Oct 9	Oct 3	5	3/4	80	4	4	good color & flavor
3	Shay	Sep 30	Oct 3	2	2/3	60	4	3	disease spotted fruit
	Borggolden	Oct 2	Oct 3	4	4/3	20	5	5	good flavor
4	Senshu 3	Oct 2	Oct 3	5	3	70	4	4	attractive red over yellow, sim to Gala
	NY 486	Oct 8	Oct 3	4	3/4	5	2	5	russet golden, tasty
4	RubINETTE	Oct 8	Oct 3	4	2/3	20	5	5	occasional russet
2	Delbardestivale	Oct 8	Oct 3	3	2/3	100	4	4/2	pulpy, unappetizing;
2	BC 8S-31-56	dnf	Oct 3	3	3/4	80	4/2	4	russet, pinkish red

4	Empire, Thome	Oct 8	Oct 3	4	2	100	5	5	promising, v. dark red, ex. flavor
	Ultragold	Oct 8	Oct 3	5	2/3	5	5	3	nice finish
	Golden Glory	Oct 21	Oct 3	4	2/3	0	5	5	attractive, tasty, small
2	NJ 100 58	Oct 21	Oct 3-11	5	3/4	0	5	4/2	attractive but flavorless
2	NY 66325-139	Oct 10	Oct 6	4	2/3	60	4	3	disease spots
3	NY 74840-1	Oct 10	Oct 6	4	3	80	3	5	good flavor, rough finish
	NY 460	Oct 9	Oct 6	3	4/2	90	5	3	flavor mediocre
3	Acey Mac	Oct 2	Oct 6	3	2/3	90	5	3	smaller than usual
	OSU 31-19	dnf	Oct 6	4	3/4	90	4	5	some sunburn, young
	X 3191	Oct 2	Oct 6	4	3	60	4	5	red-orange color attractive
	Stellar (AA 62)	Oct 2	Oct 6	2	3/4	0	5	5	conic shape, attractive, flavorful
2	NY 61343-1	Oct 10	Oct 6	4	2/3	40	4	3	disease spots, pale, unattractive
4	BC 8S-27-43	Oct 21	Oct 6	4	4	100	4	4	firm, sweet, dark blush red
3	NY 61345-2	Oct 15	Oct 6	3	2/3	80	5	3	drops, some disease spots, mediocre
4	Jomured	Oct 1	Oct 6-10	4	4	90	4	5	consistent red color
5	Rubinstar	Oct 1	Oct 6-10	4	4	90	4	5	color even, bright, attractive
4	Jonica	Oct 8	Oct 6-10	4	4/3	90	4	5	similar to Rubinstar
4	Jonagold, Hein	Oct 8	Oct 6-10	3	4/5	80	4	5	similar to DeCoster
3	Runkle	Oct 21	Oct 10-17	3	3/4	90	3	5	preharvest drop, slow to color
5	Melrouge	Oct 9	Oct 10-17	4	4/3	80	4	5	v. similar to Melrose
5	Melrose	Oct 9	Oct 10-24	4	3	80	4/3	5	standard late keeper
3	Lysgolden	Oct 10	Oct 11	4	3	10	4	4	not best Golden type



3	Swaar	Oct 10	Oct 11-24	3	3	0	4	3/1	green, dense flesh
	Princess	Oct 9	Oct 15	3	2/3	0	2	3	young trees
3	Shizuka	Oct 9	Oct 15	4	4	5	4	5	firm, good late yellow
3	Macfree	Oct 15	Oct 15-23	5	3	80	4/3	3	late Mac type, flavor good
3	BC 8S-29-18	Oct 21	Oct 17	5	4/3	80	3	4	pinkish red, attractive
	Delkistar	Oct 9	Oct 17	1	4/2	90	4	3	attractive clear red
1	Unknown, not BC 8C-5-62	Oct 8	Oct 17	4	4	90	4	4	not true to name, discard
2	Tydemans Late Orange	Oct 10	Oct 17	4	3/2	70	2	3	poor color, blossom end crack & rot
	Delorina	new	Oct 17	4	3	90	3	3	attractive red-orange
	Delblush	new	Oct 17	2	3/2	10	3	3	Golden type, pinkish orange blush, small
	TNR-10T-11	Oct 10	Oct 17-24	3	3	90	5	3	waxy skin late
5	Enterprise	Oct 25	Oct 17-24	4	3	90	5	5	some disease spotting
4	BC 8S-27-2	Oct 12-21	Oct 23	3	3/2	70-100	4	5	attractive, color may be uneven, v.firm
	Braeburn, Hillwell	new	Oct 23	3	4/3	90	5	3	excellent color, very firm, young
4	Braeburn 35	Oct 16-30	Oct 23-31	4	4	60	5/3	3/1	hard, crisp, tart at harvest, many oblong
	Fuji, Red, TAC 114	Oct 31	Oct 23	4	3/2	80	5/3	4	good color, russeting, young trees
1	PAR-14T-238	Oct 31	Oct 24	3	3	40	5	2	unattractive, bland
2	Coop 29	Oct 10	Oct 24	2	2	0	3	1	poor set this year
3	Jonafree	Oct 10	Oct 24	4	3	90	5	3	disease spots
	Chevadel	new	Oct 24	2	4	60	3	3	attractive bicolor, crisp, sprightly flavor
4	P15R-3T-86	Oct 5	Oct 24	5	3/4	70	4	5	productive, looks good
3	PAR-12T-101	Oct 9	Oct 24	3	5/4	80	4	5	good flavor, firm, crisp

[illegible]

## HARVEST LIST - ASIAN PEARS 1997

S = star rating

St = fruit set, Sz = fruit size, C = color, Fl = flavor

[illegible]

## HARVEST LIST - PEARS 1997

S = star rating

St = fruit set, Sz = fruit size, C = color, % red, F = finish, PP = pressure test at harvest

S	Cv.	Pick 96	97	St	Sz	C	F	Comments
	Bella de Guigno	dnf	July 12-17	4	2	20	5	PP 10.4 smooth finish
4	Harrow Delight	Aug 10	Aug 9	5	3	10	3	PP 18-16
3	Rescue	Aug 21-26	Aug 9	4	4	40	5	PP 15-13
4	Starkrimson	Aug 23-26	Aug 9-12	4	4	100	4	PP 16-14 ex. color
3	Clapp Favorite	Aug 21	Aug 22	4	3	10	4	PP 14-12
3	Sens. Red Bartlett	Sep 3	Aug 29-Sep 3	5	3	100	4	PP 18-16
	Devoe	new	Sep 2	2	3	20	3	large, long, few fruit
4	Orcas	Sep 12-14	Sep 2-5	4	4	20	4	PP 15-13
4	Colette	Sep 9	Sep 5	3	2	10	4	PP 14-12
	Roosevelt	Sep 9	Sep 9	3	4/5	10	3	PP 13-12
3	B. Alexandre Lucas	Sep 6	Sep 9-15	4	3	0	4	PP 14-13
5	Conference	Sep 25	Sep 10-19	5	4	5	2	PP 15-14
4	Concorde	Sep 26	Sep 10-19	5	4	10	2	PP 13-12
4	Highland	Sep 30	Sep 12	4	4	0	3	PP 15-14
5	Comice	Sep 12	Sep 12	3	4	20	3	PP 14-12
2	Comice, Cr. Gem	Sep 12	Sep 12	1	2	100	4	few fruit, ex. color
	Comice, Scarlet	new	Oct 2	1	3	90	3	few fruit, ex. color
2	Comice, Red	Sep 14	Sep 12	3	4	50	4	PP 13-11 dull red stripe
3	Sirrine	Sep 14	Sep 13	3	3	10	3	PP 14-12
4	Bosc, Std.	Sep 14	Sep 17	4	4	0	2	PP 15-14
5	Bosc, G.R.	Sep 26	Sep 18	5	5	0	2	PP 14-13
5	Bosc, Bronze Bty.	Sep 26	Sep 18	3	4	0	2	PP 14-13

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# HARVEST LIST - PLUMS 1997

S = star rating

St = fruit set, Sz = fruit size, Cs = skin color, Cf = flesh color, Fl = flavor

S	Cv.	Pick 96	97	St	Sz	Cs	Cf	Fl	Comments
4	Early Laxton	dnf	July 11-18	5	1	5	6	4	freestone, promising
4	Methley	July 20-29	July 11	2	1	2	2	4	old tree
4	Beauty	July 24-30	July 17-24	2	2	4	6	5	bird damage
	AU-Amber	dnf	July 22	2	2	2	6	4	thick skin, cling
4	Imperial Epineuse	July 29-Aug 5	July 22-25	4	2	2	6	5	promising European type
4	Cocheco	July 29	July 25	4	2	5	6	5	astringent skin, juicy
4	Shiro	Aug 5-10	Aug 4-9	3	3	7	6	4	less productive than usual
	NY 77.602.1	new	Aug 8	3	3	3	6	4	severe cracking
3	Vanier	Aug 26-30	Aug 13-18	4	3	4	2/5	5	drops early
	Castleton	new	Aug 14	1	2	3	6	4	Italian type
	Hollywood	new	Aug 18-Sep 2	4	3	4	2	5	freestone, juicy
3	Fortune	dnf	Aug 18-26	5	3	4	6	5	drops early, long ripening period
2	Dolly	Aug 16-24	Aug 19	1	2	4	6	4	few fruits, very juicy
	AU-Rubrum	dnf	Aug 19-29	4	2	4	2	4	long ripening
5	Seneca	Sep 3-9	Aug 22-28	4	3	3	6	4	transplant 97, top quality
2	CB-15	Aug 20-Sep 5	Aug 25-Sep 12	2	2	4	2	5	juicy, sweet, astringent skin
3	Mirabelle	Aug 27	Aug 25-Sep 3	5	1	7	6	4	good home garden
3	Stanley	dnf	Aug 28-Sep 3	5	2	3	6	4	transplant 97 to Discovery Garden
	Victory	Sep 10-12	Aug 29-Sep 5	4	3	3	6	4	promising

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# HARVEST LIST - CHERRIES 1997

S = star rating

St = fruit set, Sz = fruit size, CR = cracking, R = rot

S	Cv.	Pick 96	97	St	Sz	CR	R	Comments
3	Early Burlat	June 21	dnf					young trees
4	Hardy Giant	July 5	July 7	4	3	3	2	good flavor
	Bergie	July 5	July 7	1	3	3	3	yellow flesh
3	Cavalier	dnf	dnf					
4	Viscount	July 13	July 7	2	2	2	1	dark, sweet
2	Craig's Crimson	July 5	July 7	3	2	2	2	v. firm, cracks
4	Angela	July 13	July 12	4	2	3	2	v. productive
2	Tulare	July 5	July 12	2	2	2	3	firm, good
4	Kristin	July 13	July 12	4	3	3	2	dark, sweet
4	Montmorency	July 13-18	dnf					young trees
4	Sweet Anne	dnf	July 12	3	2	2	3	yellow flesh
	Sunburst	dnf	July 12	1	3	4	4	bird damage
3	Emperor Francis	July 15	July 12-18	5	2	3	3	yellow flesh, productive
	King	dnf	July 15	2	2	2	4	firm, good
4	Lapins	dnf	July 15	4	2	2	2	good flavor
3	Bada	dnf	July 18	2	3	2	2	bird damage
	Sweetheart	new	July 21	2	3	1	2	v. hard, crisp
	Hudson	dnf	July 21	2	2	2	2	young trees
	Bing	new	dnf					young trees
	Rainier	new	dnf					young trees
	NY 518	new	dnf					young trees
	RN02-4-242	new	dnf					young trees
	RN02-7-304	new	dnf					young trees



## HARVEST LIST - PEACHES 1997

S = star rating

St = fruit set, Sz = fruit size, Cs = skin color % red, Cf = flesh color, Fl = flavor

S	Cv.	Pick 96	97	St	Sz	Cs	Cf	Fl	Comments
	Rich May	July 10-16	dnf						
3	Harrow Diamond	July 20-26	July 17-21	3	2	50	6	4	few splits
	Kern Sun	dnf	July 17-21	2	2	90	6	4	some splits
4	Sentry	July 26	July 22	2	3	50	6	4	attractive, few splits
	Proud LCR	July 29	July 22	1	3	80	6	4	splits
3	Harbelle	July 29-Aug 10	July 28-Aug 9	3	3	80	6	4	few splits
	Snowbrite	July 29-Aug 2	Aug 4	1	2	90	7	4	very sweet
	HW 272	new	Aug 4-9	3	2	70	6	4	firm, good
4	Newhaven	Aug 10-12	Aug 5-9	3	3	80	6	4	firm flesh, attr.
4	Harken	Aug 10	Aug 9	3	3	70	6	4	reliable producer
3	Redhaven	Aug 10	Aug 9	3	3	80	6	4	some rot
2	Nerland LCR	Aug 10-15	Aug 9	3	3	60	6	4	flavor mediocre
2	Tuma LCR	Aug 10-15	Aug 9	3	3	70	6	4	flavor mediocre
3	Frost	dnf							
	Double Jewel	dnf	Aug 9-12	1	2	80	6	4	first fruit in 4 yrs
	Strahl LCR	Aug 10-12	Aug 12	3	3	60	6	4	flavor mediocre
	Flamin Fury PF12A	new	Aug 12	2	3	100	6	4	color very dark
	HW 264	new	Aug 12	2	3	90	6	4	some splits
	Sugar Lady	dnf	Aug 12-14	3	2	90	6	4	splits, variable size
	White Lady	Aug 16-21	Aug 12-15	2	2	90	7	4	sweet, free stone
3	Harrow Beauty	Aug 22-26	Aug 14-18	3	3	80	6	4	very attractive golden undercolor
1	Mid-Pride	dnf	Aug 14	2	3	90	6	4	rot, unproductive

[illegible]

Q

$\bar{S}$  = star rating



# HARVEST LIST - APRICOTS 1997

S = star rating

St = fruit set, Sz = fruit size, Cr = cracking, Fl = flavor

S	Cv.	Pick 96	97	St	Sz	Cr	Fl	Comments
4	Puget Gold	July 29	July 30-Aug 9	4	3	3	5	v. productive
3	Alfred	Aug 2-7	Aug 5-9	1	2	3	5	sweet, small
4	Harglow	Aug 5-10	Aug 9	2	2	4	5	ex. flavor
3	Sunglo	Aug 7-10	Aug 9	2	3	3	5	nice color
2	Rouge D'Or	dnf	dnf					
2	Peach x apricot	dnf	dnf					
	EarliOrange	dnf	dnf					
	Hungarian Rose	dnf	dnf					
1	Earli Sun	dnf	dnf					disease-discard
1	Goldbrink	dnf	dnf					disease-discard
1	Earli Cot	dnf	dnf					disease-discard
1	Jordanne	dnf	dnf					disease-discard

# BLOOM DATA APRICOT 1997

Cultivar	March 18	March 24	March 31
Puget Gold	80	pet fall	pet fall
Peach x cot	30	full	pet fall
Alfred	20	full	pet fall
Royal Roza	20	full	pet fall
Harglow	5	40	full
Sunglo	5	50	90
Rouge D'Or (Norton)	5	full	pet fall
HW 462		full	pet fall
Earli Orange		full	pet fall
HW 464		80	full
NY 604		60	full
Hungarian Rose		50	full-p.f.
HW 460		40	full
HW 446		30	full

# BLOOM DATA PLUM 1997

Cultivar	March 18	March 24	March 31	April 8	April 15
Methley	40	full	pet fall		
Beauty	40	full	full-p.f.	pet fall	
AU-Amber	40	full	full-p.f.	pet fall	
Shiro	20	full	full	pet fall	
Fortune	5	full	full	pet fall	
Hollywood		full	full	pet fall	
Mirocais plumcot		full	full-p.f.	pet fall	
Flavor Queen pluot F 1-16		30	full	full-p.f.	pet fall
AU-Roadside		30	full	full-p.f.	pet fall
Coheco		30/20	full	full-p.f.	pet fall
Midnight Sun		5/10	70	pet fall	
CB-15		5	40	full	full-p.f.
Vanier		5	60	full	full-p.f.
Earliqueen			40	full-p.f.	pet fall
315-42			40	70	full-p.f.
NY 58.911.1			10	full-p.f.	pet fall
NY 71.357.1			10	full-p.f.	pet fall
Valor			10	80	full-p.f.
Dolly (small flowers)			10	80	full
Pluot 1-22, 2-22			5	full	pet fall
Early Laxton			5	full	full-p.f.
Imperial Epineuse			5	full	pet fall
NY 77.610.1			5	full	pet fall

Cultivar	March 18	March 24	March 31	April 8	April 15
Fritz sdlg.			5	80	full-p.f.
Victory			5	70	full-p.f.
Seneca				80	full-p.f.
Stanley				80	full-p.f.
Longjohn				60	full
Kirke's Blue				40	full
Mirabelle				30	full
NY 58.900.12				10	full
8327-65				10	full-p.f.
AU-Rubrum	no bloom	no bloom	no bloom	no bloom	
7404-1	no bloom	no bloom	no bloom	no bloom	
69-339	no bloom	no bloom	no bloom	no bloom	
8155079	no bloom	no bloom	no bloom	no bloom	

# BLOOM DATA PEACHES 1997

Cultivar	Bloom <sup>1</sup>	Density <sup>2</sup>	March 24	March 31	April 8	April 15
Mid-Pride	S	5	70	full	pet fall	
July Sun	NS	5	60	full	full	pet fall
Cole LCR	NS	5	60	full	full-p.f.	pet fall
HW 271	NS	3	50	full	pet fall	
Frost	NS	5	50	full	full-p.f.	pet fall
Harrow Diamond	S	5	40	full	full-p.f.	pet fall
Harken	NS	4	40	full	full-p.f.	pet fall
Snow King	S	2	40	full	full	pet fall
Flamin Fury PF12 A	NS	4	40	full	full	pet fall
HW 252	NS	3	30	90	full	full-p.f.
Strahl LCR	S	3	30	80	full-p.f.	pet fall
Sentry	NS	4	20	full	full	pet fall
Redhaven	NS	5	20	full	full-p.f.	pet fall
Stk Sensation (dwf)	S	4	20	90	full	full-p.f.
Rich May	S	2	20	80	full	full-p.f.
Proud LCR	NS	4	10	90	full	full-p.f.
Kern Sun	NS	4	10	80	full	full-p.f.
Rich Lady	S	1	10	80	full	pet fall.
E. White Giant	NS	3	10	full	full	pet fall
Arctic Supreme	NS	3/2	10	full	full	pet fall
Sugar May	S	2	10	80	full	pet fall
May Sun	NS	2	10	full	full	pet fall
Snowbrite	S	3	10	full	full-p.f.	pet fall
Pix Zee (dwf)	S	5	5	80	full-p.f.	pet fall
Vanity	S	3/5	5	60	full	full-p.f.



Cultivar	Bloom <sup>1</sup>	Density <sup>2</sup>	March 24	March 31	April 8	April 15
Harrow Fair	NS	4	5	60	full	full-p.f.
Zee Lady	NS	2	5	50	full	pet fall
HW 272	NS	5	5	full	full	pet fall
HW 264	NS	3	5	90	full	pet fall
Flamin Fury PF1	NS	3	5	80	full	full-p.f.
Sugar Lady	S	2/4	5	full	full	pet fall
White Lady	S	3	5	60	full	pet fall
Harcrest	S	4		90	full	pet fall
Har Beauty	NS	5		full	full	full-p.f.
Nerland LCR	S	3		80	full-p.f.	pet fall
Tuma LCR	S	5		60	full	full-p.f.
Delp Hale	NS	3		50	full	full-p.f.
Harbelle	NS	5		50	full	full-p.f.
Newhaven	NS	5		20	full	full-p.f.
Double Jewel	S-D	5		10	60	full
Summer Sweet	S	1	no bloom	60	full	pet fall
June Pride	NS	1	no bloom	no bloom	no bloom	no bloom

<sup>1</sup>Bloom (Type): S = showy, NS = non-showy, S-D = showy, double

<sup>2</sup>Bloom Density: 5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light to no bloom

# BLOOM DATA NECTARINE 1997

Cultivar	Bloom <sup>1</sup>	Density <sup>2</sup>	March 24	March 31	April 8	April 15
Arctic Rose	S	4	80	full	pet fall	
HW 108	NS	4	50	full	full-p.f.	
Zee Grand	S	5/4	40	full	full-p.f.	
HW 109	NS	5	20	full	full-p.f.	
Arctic Glo	S	5	20/5	full	full-p.f.	
Juneglo	S	5	5	full	full	pet fall
Nectired	S	4	5	80	full	pet fall
Tasty Gold	S	4	5	60	full	pet fall
Hardired	S	5	5	90	full	pet fall
Crimson Snow	S	4	5	50	90	full-p.f.
Arctic Queen	S	3	5	90	full	pet fall
Necta Zee (dwf.)	S	5	5	80	full	pet fall
Stk. Honeyglo (dwf)	S	5	5	80	full	pet fall
Mericrest	S	4	5	90	full	full-p.f.
Summer Beaut	NS	3/4	5	90	full	pet fall
May Kist	NS	2		60	full	full-p.f.
Royal Glo	NS	1	no bloom	full	pet fall	
Earliglo	S	1	no bloom	full	pet fall	

<sup>1</sup>Bloom (Type): S = showy, NS = non-showy, S-D = showy, double flower

<sup>2</sup>Bloom Density: 5 = very heavy, 4 = heavy, 3 = moderate, 2 = light, 1 = very light to no bloom

# BLOOM DATA CHERRY 1997

Cultivar	April 8	April 15	April 21	April 29
Lapins /G ??	80	full	pet fall	
Moreau	40	full	pet fall	
Sweetheart/G	30	full	full-p.f.	pet fall
Tulare ?(1-7)	20	full	full-p.f.	pet fall
(2-6)	20	full	pet fall	
Early Burlat/G	20	70	full	pet fall
Bergie	10	full	full-p.f.	pet fall
Emperor Francis	10	90	full	pet fall
Merpet	10	80	full	pet fall
Viscount	10	80	full	pet fall
Lapins/G	5	full	full	pet fall
Lapins	5	90	full	pet fall
Hardy Giant	5	90	full	pet fall
Sweet Anne	5	80	full	pet fall
Early Burlat	5	60	full	pet fall
Tulare	5	50	full	pet fall
Bing		60	full	pet fall
Kristin		60	full	pet fall
Craig's Crimson		40	full	pet fall
Merla		30	full	full-p.f.
Angela		30	full	full-p.f.
King		20	full	full-p.f.
Bada		20	full	pet fall
Rainier		20	full	pet fall
Hudson		20	full	full-p.f.

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Cultivar	April 8	April 15	April 21	April 29
E2 R3T4 (Bergie?)			10	full
NY 13242			10	40
NY 11375			5	40

# BLOOM DATA ASIAN PEAR 1997

Cultivar	March 24	March 31	April 8	April 15	April 21
Yoinashi	10	60	full	pet fall	all fallen
UC 17-63		30	full	pet fall	all fallen
UC 8-46		10	90	pet fall	all fallen
Hamese #1		5	80	full	pet fall
Shinseiki		5	80	full	full-p.f.
Chojuro		5	60	full	full-p.f.
Mishirasu			40	full	full-p.f.
Shinsui			30	full	full-p.f.
Yongi			20	full	full-p.f.
Ichiban Nashi			10	full	full
Kosui			10	full	full

# BLOOM DATA PEAR 1997

Cultivar	March 31	April 8	April 15	April 21	April 29
Spalding	30	90	full-p.f.	pet fall	
Harrow Delight	5	80	full-p.f.	pet fall	
Forelle		50	full	pet fall	
Belle de Guigno		30	full	pet fall	
Blancia		30	full	pet fall	
Beurre Alexander Lucas		20	full	pet fall	
Passe Crasanne		20/10	full	full-p.f.	pet fall
Sirrine		20	80	full-p.f.	pet fall
Honeysweet		5	full	full	pet fall
Conference		5	full	full	full-p.f.
Abbate Fetel		5	full	pet fall	
Sensation Red Bartlett		5	90	full-p.f.	pet fall
Rescue		5	90	full	pet fall
Passe Crasanne Rouge		5	90	full	pet fall
Colette		5	90	full	pet fall
Roosevelt		5	70	full-p.f.	pet fall
Highland		5	60	full	pet fall
Mericourt		5	60	full	pet fall
Devoe			90	full	pet fall
Clapp Favorite			90	full	pet fall
Clapp Favorite (Bennett strain)			70	full	pet fall
Concorde			70	full	full-p.f.
Starcrimson			70	full	pet fall
Ubileen			40	full	pet fall

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Cultivar	March 31	April 8	April 15	April 21	April 29
Orcas			30	full	pet fall
Comice			5	full	full-p.f.
Comice, Red			5	full	pet fall
Comice, Scarlet			5	full	pet fall
Bosc			5	full	full-p.f.
Cascade (few blooms)			5	full	pet fall

# BLOOM DATA CRABAPPLE 1997

Cultivar	April 15	April 21	April 29	incomplete
Manchurian/27	70	full	full-p.f.	
Rosedale/27	50	full	pet fall	
<i>M. Baccata</i> v. <i>jackii</i>	40	full	pet fall	
Tea ( <i>M. hupehensis</i> )	20	80	full-p.f.	
Silverdrift	10	90	full-p.f.	
Centennial/27	10	80	full-p.f.	
Simpson/27	5	70	full	
Sentinel	5	70	full	
Bob White	5	70	full-p.f.	
'Pink Cloud' sdlg	5	60	full	
Sugar Tyme		80	full	
Lancelot		70	full	
WSU crab (Alkmene x Prima)		70	full	
Morning Sun		60	full	
<i>M. zumi</i> x ' <i>calocarpa</i> '		60	full	
Purple Prince		50	full	
Maypole		50	full	
Evereste		40	full	
Donald Wyman		40	full	
Louisa		40	90	
Molten Lava		40	80	
Snowdrift		30	full	
Ormiston Roy		30	full	
Professor Sprenger		30	full	



Cultivar	April 15	April 21	April 29	incomplete
Pink Satin		30	full	
Winter Gem		20	full	
Indian Magic		20	90	
Jewelberry		20	90	
Sinai Fire		10	full	
Mary Potter		5	full	
David		5	full	
Christmas Holly		5	90	
D 3-45 (Geneva)		5	80	
White Angel		5	80	
Prairifire		5	60	
Adirondack		5	30	
WSU-MJ			70	
Camelot			70	
Prairie Maid			40	
Candymint			30	
Silver Moon			5	
Golden Raindrops			5	
Doubloons			5	

BLOOM DATA APPLE 1997

Cultivar	April 15	April 21	April 29	incomplete
AA 49	70	full-p.f.	pet fall	
Red Gravenstein/27	40	full	pet fall	
Williams' Pride	30	full	pet fall	
NJ 116	30	80	full	
Red Gravenstein	20	90	full-p.f.	
Biringer #101	10	full	full-p.f.	
PAR-14T-238	10	90	full	
Sunrise	10	80	full-p.f.	
NY 74840-1	10	70	full-p.f.	
Coop 27	10	50	full	
Nova EasyGro	10	50	full	
AA 44	5	90	full	
NATCO 21	5	90	full-p.f.	
Egremont Russet	5	90	full-p.f.	
BC 11W-19-18	5	80	full	
NY 75414-1	5	80	full	
NY 75441-67	5	70	full-p.f.	
Arlet	5	70	full-p.f.	
Orin	5	70	full	
Mutsu/27	5	70	full	
TNR-10T-11	5	70	full	
CLR-20T-30	5	60	full	
BC 11W-12-85	5	60	full-p.f.	
Alkmene	5	50	full	
AA 18 (L)	5	40	full	

Cultivar	April 15	April 21	April 29	incomplete
NY 74828-12	5	60	full	
Jonagold/27	5	50	full	
Prima		90	pet fall	
Vagnon Flocher		80	full-p.f.	
Emerald Spire		70	full-p.f.	
Pioneer Mac		70	full	
Pomme Gris		70	full	
Liberty		70	full	
CMR-4T-15		70	full	
OSU 31-19		60	90	
Early Dawn		60	full	
Empire		50	full	
PSWR-11T-48		50	full	
NY 66305-139		50	full	
Ashmead's Kernel		50	full	
Marshall Mac		50	full	
Braeburn		40	full-p.f.	
Red Boskoop		40	full	
NY 652		40	full	
Swaar		40	full	
Discovery		40	full	
Jonagored (L)		40	full	
CQR-10T-11		40	full	
Liberty (B)		40	full	
Pristine		40	full	
Ginger Gold		40	70	

	April 15	April 21	April 29	incomplete
Cultivar				
Empress		30	full-p.f.	
Dayton		30	full	
HWR-19T-18		30	full	
NY 73334-35		30	full	
Redmax		30	full	
Jonagold, New		30	full	
Compact Mac		30	full	
Greensleeves		30	full	
Wynooche		30	full	
Redcort		30	full	
Winterstein		20	full	
Russet King		20	full	
Anere de Berthcourt		20	full	
Geeveston Fanny		20	full	
Empire, Thome		20	full	
NY 428		20	full	
Delroval		20	full	
AA 59		20	full	
Macfree		20	full	
X3191		20	full	
CMR-4T-16		20	full	
Enterprise		20	full	
Foxwhelp		20	full	
NY 65707-19		20	full	
CMR-2T-13		20	90	
Jonagold, Jonica		20	90	

Cultivar	April 15	April 21	April 29	incomplete
Jonagold, Jomured		20	80	
Pink Pearl		20	80	
PAR-12T-101		20	80	
Jonagored 369		20	70	
BC 8NE-7-72		20	60	
Bramley's Seedling		20	60	
NY 428		10	full	
AA 18 ? (F)		10	full	
Freyberg		10	full	
NY 75413-30		10	full	
NY 66305-289		10	full	
Acey Mac		10	full	
Shizuka		10	full	
Delblush		10	90	
PSWR-11T-48 (F)		10	90	
Fuji, Yataka		10	90	
Rosemary Russet		10	90	
NY 61343-1		10	90	
NY 617		10	90	
Jonagold, Nicobel		10	90	
Jonagored 9613		10	90	
NY 688		10	80	
BC 8C-28-27		10	80	
CLR-20T-22		10	80	
Elstar		10	80	
Fuji, Red, BC #2		10	80	

Cultivar	April 15	April 21	April 29	incomplete
NY 688		10	80	
BC 8C-28-27		10	80	
CLR-20T-22		10	80	
Elstar		10	80	
Fuji, Red, BC #2		10	80	
Sansa		10	80	
Tydemann's Late Orange		10	80	
PAR-4T-215		10	80	
BC 8C-5-62		10	80	
NJ 112		10	80	
BC 8S-27-51		10	80	
Jonagold, DeCoster		10	80	
Jonagold, King		10	70	
Marachel		10	70	
Jonagold, Rubinstar		10	70	
Jonagored, Std.		10	70	
Braeburn, Hillwell		10	60	
Karmijn de Sonnaville		10	50	
Coop 41		10	50	
NY 61345-2		5	full	
Sunset		5	full	
Melrouge		5	full	
Chehalis		5	full	
Jimmi (Tuell sdlg.)		5	full	
NY 75413-30		5	full	
PAR-12T-101			full	

Cultivar	April 15	April 21	April 29	incomplete
HWR-11T-18			full	
CMR-4T-18			full	
Shay			full	
NY 75441-67			full	
NY 66325-139		5	90	
Cox, Red		5	90	
Lysgolden		5	90	
NY 632		5	90	
NY 460		5	90	
Honeycrisp		5	90	
Tsugaru, Homei		5	90	
Coop 28		5	90	
Gold Rush		5	90	
NY 674		5	90	
Delkistar		5	90	
Deljeni		5	90	
Senshu		5	90	
Jonagold, Hein		5	90	
Bellflower		5	90	
BC 8S-29-18		5	90	
NY 486		5	90	
BC 8S-27-43			90	
HWR-18T-18			90	
CQR-10T-17			90	
Stellar (AA 62)			90	
Ultragold			90	

Cultivar	April 15	April 21	April 29	incomplete
BC 8NE-7-72			90	
Spartan			90	
BC 8S-31-56		5	80	
RubINETte		5	80	
NJ 99		5	80	
Fuji, Std.		5	80	
Fuji, Akifu		5	80	
Beni Osho			80	
Redfree			80	
Aroma			80	
Sayaka			80	
Chevadel			80	
P15R-3T-86		5	70	
Florina		5	70	
Muscat de Berney		5	70	
Gala, Royal		5	70	
Jonagored 9631		5	70	
Golden Glory			70	
Cox, Cherry			70	
BC 8S-27-43			70	
Daliest		5	60	
Novamac		5	60	
Daliter		5	60	
Tsugaru, Natsuka		5	60	
Suncrisp			60	
Sweet Sixteen			60	



Cultivar	April 15	April 21	April 29	incomplete
Beni Tsugaru			60	
BC 8S-27-2			60	
Princess			60	
Fiesta			60	
BC 8S-27-2		5	50	
Gala, Scarlet		5	50	
X4892		5	50	
Canadian Grise		5	50	
Jonafree		5	50	
Borggolden		5	50	
Cox's Orange Pippin			50	
Fushau			50	
Fuji, TAC 114			50	
Reine des Pommes			50	
Muscat de Lense			50	
Runkle			50	
Cox, Queen			50	
Ellison's Orange			50	
PWR-11T-128			50	
NATCO 73		5	40	
Tremlett's Bitter		5	40	
Coop 39		5	30	
Gala, Fulford (Regal)			40	
Goldensheen			30	
Gala, Imperial			30	
Baujade			30	

Cultivar	April 15	April 21	April 29	incomplete
Gala, Ultrared			30	
Golden Supreme			30	
HER-3T-139			30	
Coop 40			20	
Coop 42			20	
Bulmer's Norman			20	
Hatsuaki			20	
Crimson Spire			20	
NJ 100			20	
Beni No Mai			20	
Delbardestivale			20	
Jonamac			10	
Kingston Black			5	
Pixie			5	
Chisel Jersey			5	
Brown's Apple			5	
Michelin			5	
Dabinett			5	
Cow Jersey			5	
PWR-11T-128			5	
Sweet Coppin			5	

## BC SELECTIONS ON TRIAL AT MOUNT VERNON

1996-1997

### Discards 1996-97

None

### Proposed Discards 1997-98

None

### Currently on Trial (1997 harvest date)

The star rating, in the lefthand column, refers to our overall assessment of each selection's performance, including cumulative records of past performance, and our subjective rating of possible future potential.

5 = outstanding, the best, very promising

4 = good variety, promising

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2 = serious faults

1 = unsuitable, not recommended, discard

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We are now using a somewhat different system for field harvest evaluations, to include a numerical rating for set, size, percent of fruit color, skin finish, and flavor. This allows us to save time in taking field observations, and to quantify observations when preparing post-harvest reports. See endnotes<sup>1</sup> for detailed explanation of ratings.

### **Varieties/selections listed in harvest order:**

*	Cultivar/ Selection	Pick date	St	Sz	C	Fn	Fl	Comments
5	Sunrise	8/09- 15	5	4	50	4	5	productive multi pick, firm, crisp, a favorite
4	BC 11W-19-18	8/28	4	4	90	4	5	attractive, refreshing flavor
3	BC 11W-12-85	8/28	4	4	90	3	5	paler color than 19-18, some russet
2	BC 8NE-7-72	9/19- 10/03	3	4/2	80	4/2	4	netted russet on many, size variable, irregular shape
2	BC 8S-31-56	10/03	3	3/4	80	4/2	4	conic shape, russet, pinkish red
4	BC 8S-27-43	10/06	4	4	100	4	4	firm, crisp, sweet, attractive dark blush red
3	BC 8S-29-18	10/17	5	4/3	80	3	4	attractive pinkish red, firm, russet

*	Cultivar/ Selection	Pick date	St	Sz	C	Fn	Fl	Comments
4	BC 8S-27-2	10/23	3	3/2	70- 100	4	5	attractive color, may be uneven, good flavor, v.firm
4	Chinook (BC 8S-27-51)	10/31	5	3/2	90	4	4	attractive pinkish red, v. firm, crisp, sweet, tends to be small
3	BC 8C-28-27	10/31- 11/05	3	3/2	90	4	5	dark red, many lipped stems, v. firm, too late

On January 6, 1998 samples of the various selections that had been kept at 33°F in common storage since harvest were taken out for evaluation. Comments are summarized as follows:

**BC 11W-19-18** Past storage limit, soft but holds flavor acceptably; large conspicuous lenticels may be a detriment but nice bright color.

**BC 11W-12-85** Past storage limit, very soft but no rot, nice conic shape, color acceptable, not super attractive compared to 19-18.

**BC 8NE-7-72** Firm, good flavor, lot of russet, irregular shape, possible future discard due to poor appearance.

**BC 8S-31-56** Flavor and firmness acceptable, lot of russet, color pale, general appearance poor, consider for future discard.

**BC 8S-27-43** Good texture and flavor, firm, crisp; good general appearance.

**BC 8S-29-18** Good flavor, fairly firm, juicy, pinkish blush color attractive but serious russetting on many, not commercially acceptable.

**BC 8S-27-2** Excellent keeper, good sweet-tart flavor, v. firm; color attractive, not as much russet as most others, good potential.

**Chinook** Very firm, crisp, good flavor, stores well; potential problem of small fruit size, try harder thinning in 98.

**BC 8C-28-27** Very good flavor, fairly firm but softer than Chinook, good color on most, some irregularly shaped fruit, russetting.

1. Fruit set (St): 5=very heavy, all branches densely fruited; 4=moderately heavy, all branches bear some fruit; 3=moderate, some areas of tree not bearing; 2=light, most areas of tree not bearing; 1=very light, few fruits only.

Fruit size (Sz): 5=very large, 4" diameter and above; 4=large, 3-4"; 3=medium, 2.5-3"; 2=below medium, 2-2.5"; 1=small, 2" and below.

Fruit color (C): Total fruit area covered with red blush or stripe (may be 0 for green or yellow varieties).

Fruit finish(Fn): 5=no russet or skin blemish; 4=russet only in cavity or basin; 3=some light russet streaks on body of fruit; 2=light allover russet, or heavy streaks/patches on body of fruit; 1=solid allover russet, rough, lumpy, or deformed.

Flavor (Fl): 5=sweet-tart; 4=sweet; 3=subacid; 2=bland; 1=tart.

**NJ SELECTIONS ON TRIAL AT MOUNT VERNON**  
1996-97

**Discards to 1997**

NJ 107 Fully evaluated, mediocre quality, poor storage, other Golden types are better

NJ 90 Fully evaluated, attractive wine red, firm, good flavor, but not to be named by NJ

**Proposed Discards - 1997/8**

NJ 99 Fully evaluated, consistently productive, sizes well, attractive, but poor flavor, scab susceptibility - keep only if it is to be named

NJ 116 Fully evaluated, not highly productive, good finish but mediocre flavor and quality, very early, no storage

**Currently on Trial (1997 harvest date)**

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- 5 = outstanding, the best, very promising
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We are now using a somewhat different system for field harvest evaluations, to include a numerical rating for set, size, percent of fruit color, skin finish, and flavor. This allows us to save time in taking field observations, and to quantify observations when preparing post-harvest reports. See endnotes<sup>1</sup> for detailed explanation of ratings.

**Varieties and selections are listed in harvest order:**

*	Cultivar/ Selection	Pick date	St	Sz	C	Fn	Fl	Comments
1	NJ 116	8/06-09	3	3	0	5	3	attractive but mediocre quality, early, poor storage
2	NJ 99	9/12	4	4/5	10	5	3	productive, good finish, mediocre flavor
2	NJ 112	9/12-18	4	2	60	5	3	red, crisp, tart, productive but too small unless for home orchards
2	NJ 100	10/03-11	5	3/4	0	5	4/2	attractive, productive but poor flavor

*	Cultivar/ Selection	Pick date	St	Sz	C	Fn	Fl	Comments
3	SunCrisp (NJ 55)	10/24	5	4	20	4	5	good flavor this year, good size, productive, nice coppery blush

1. Fruit set (St): 5=very heavy, all branches densely fruited; 4=moderately heavy, all branches bear some fruit; 3=moderate, some areas of tree not bearing; 2=light, most areas of tree not bearing; 1=very light, few fruits only.

Fruit size (Sz): 5=very large, 4" diameter and above; 4=large, 3-4"; 3=medium, 2.5-3"; 2=below medium, 2-2.5"; 1=small, 2" and below.

Fruit color (C): Total fruit area covered with red blush or stripe (may be 0 for green or yellow varieties).

Fruit finish(Fn): 5=no russet or skin blemish; 4=russet only in cavity or basin; 3=some light russet streaks on body of fruit; 2=light allover russet, or heavy streaks/patches on body of fruit; 1=solid allover russet, rough, lumpy, or deformed.

Flavor (Fl): 5=sweet-tart; 4=sweet; 3=subacid; 2=bland; 1=tart.

**NY SELECTIONS ON TRIAL AT MOUNT VERNON**  
**1996-1997**

**Discards 1996-1997**

NY 315                      Yellow, too late, unattractive  
NY 632                      Early Mac type, good fresh from tree, poor storage (NY is discarding)

**Proposed discards - 1997/98**

NY 674                      Good color, softens, flavor not outstanding  
NY 66325-139              Small, flavor & color mediocre, disease spots  
NY 61343-1                Pale color, unattractive, disease spots

**New - not yet fruiting**

NY 489                      NY 81204-42  
NY 79507-72                NY 81209-69  
NY 79529-70

**Currently on Trial (1997 harvest data)**

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blank = not yet evaluated, new planting

We are now using a somewhat different system for field harvest evaluations, to include a numerical rating for set, size, percent of fruit color, skin finish, and flavor. This allows us to save time in taking field observations, and to quantify observations when preparing post-harvest reports. See endnotes<sup>1</sup> for detailed explanation of ratings. Varieties and selections are listed in harvest order:

*	Cultivar	Pick Date	St	Sz	C	Fn	Fl	Comments
3	652	8/18	4	3	90	5	3	too similar to Empress
4	Empress	8/21	4	3	100	5	5	good early Mac type
3	74828-12	9/06	4	4	90	4	5	deep red color
3	66305-289	9/12	2	3/4	90	5	3	attractive clear red
4	75414-1	9/16	4	4/3	100	4	5	deep wine red, pale lenticels, very attractive, promising

*	Cultivar	Pick Date	St	Sz	C	Fn	Fl	Comments
4	688	9/16-10/3	4	4	90	5	5	firm, crisp, holds well on tree, good color, promising
2	674	9/22	5	3	90	5	4	good color, softens
3	617	9/22	5	4	70	4	3	attractive, crisp, juicy, productive, only fair flavor
4	65707-19	9/22	4	3	70	4	5	attractive, good mildew resistance
3	75413-30	9/22-10/3	4	4	90	4/3	3	attractive dark red, holds well on tree
4	Liberty	9/29	4	3/2	80	4	5	good quality, smaller than usual
3	73334-35	9/30	3	3/4	80	5	3	pale color, short stem hard to pick
4	75441-67	9/30-10/06	4	3	100	4	5	dark overall blush red, attractive, tasty
3	428	10/02	4	4/2	90	3	4	final evaluation 98; not outstanding in color or taste
	486	10/03	4	3/4	5	2	5	russet golden, tasty, firm
2	66325-139	10/06	4	2/3	60	4	3	small, flavor & color mediocre, disease spots
3	74840-1	10/06	4	3	80	3	5	good flavor, rough finish
	460	10/06	3	4/2	90	5	3	flavor mediocre
2	61343-1	10/06	4	2/3	40	4	3	pale color, unattractive, disease spots
3	61345-2	10/06	3	2/3	80	5	3	drops, flavor not outstanding, disease spots

Ratings of powdery mildew have been taken on the cultivars and selections in the disease resistant block from 1995 to 1997. The data are currently being analyzed, and a discussion of the results prepared for publication. It appears from observation that the NY selections as a group have better resistance to mildew than the PRI selections as a group, though certain specific selections from both groups show good resistance.

Note: The "disease spots" mentioned in some comments were depressed black lesions on the skin surface of a number of fruits. Samples sent to pathology for analysis were diagnosed as having



been caused by a yeast. Different levels of fruit damage ranged from very mild (one or two spots per fruit, less than 2 mm in area) to severe (20 or more spots, up to 15 mm in area, over large areas of the fruit). Level of susceptibility appeared to vary with the different selection or variety. We have not seen this problem before, and it did not appear this season in the apple plots where a standard fungicide spray was applied, but only in the disease resistant block which is unsprayed. We will be on the lookout for any future occurrences.

1. Fruit set (St): 5=very heavy, all branches densely fruited; 4=moderately heavy, all branches bear some fruit; 3=moderate, some areas of tree not bearing; 2=light, most areas of tree not bearing; 1= very light, few fruits only.

Fruit size (Sz): 5=very large, 4" diameter and above; 4=large, 3-4"; 3=medium, 2.5-3"; 2=below medium, 2-2.5"; 1=small, 2" and below

Fruit color (C): Total fruit area covered with red blush or stripe (may be 0 for green or yellow varieties)

Fruit finish (Fn): 5=no russet or skin blemish; 4=russet only in cavity or basin; 3=some light russet streaks on body of fruit; 2=light allover russet, or heavy streaks/patches on body of fruit; 1=solid allover russet, rough, lumpy, or deformed

Flavor (Fl): 5=sweet-tart; 4=sweet; 3=subacid, 2=bland; 1=tart

**PRI SELECTIONS ON TRIAL AT MOUNT VERNON**  
1990-1997

**Discards to 1996**

Coop 25	Excellent firmness and flavor but poor finish, sunburn and russetting
CLR-12T-161	Skin easily blemished, flavor mediocre, poor storage, mildew
CLR-13T-45	Retains flavor well in storage but unattractive, poor finish, cracks
CLR-13T-49	Unattractive, russets, flavor mediocre, declines in storage; very hard
CMR-2T-13	Good flavor but unattractive, ripens unevenly, poor storage
HCR-14T-125	Excellent flavor & storage quality but unattractive, mildew susceptible
HER-4T-20	Small fruit, unattractive, mildew susceptible; flesh v. firm, stores well
HER-10T-108	Unappealing dappled color, poor flavor, becomes mealy in storage
HFR-22T-173	Unattractive, tart, softens in storage, mildew susceptible
PSER-11T-27	Flavor declines rapidly in storage, unattractive, very russeted

**Proposed Discards 1997/98**

Coop 27 (PWR-37T-131)	Unattractive, russets, flavor declines in storage, mildew susceptible
Coop 39 (CLR-20T-14)	Good storage but unattractive, very mildew susceptible
CQR-10T-17	Ripens unevenly, poor finish, severe mildew
HER-3T-139	Unattractive, poor flavor

**New/Not yet fruiting**

Coop 43  
CLR-20T-30  
KIR-11T-86

**Currently on Trial (1997 harvest data)**

The star rating (lefthand column) refers to our overall assessment of each selection's performance, including cumulative records of past performances and our subjective rating of possible future potential.

- 5 = outstanding, the best, very promising
- 4 = good variety, promising
- 3 = acceptable, some faults
- 2 = serious faults
- 1 = unsuitable, not recommended, discard
- blank = not yet evaluated, new planting

We are now using a system for field harvest evaluations that includes a numerical rating for set, size, percent of fruit color, skin finish, and flavor. This allows us to save time in taking field observations, and to quantify observations when preparing post-harvest reports. See endnotes<sup>1</sup> for detailed explanation of ratings. The "disease spots" mentioned in some comments were depressed black lesions on the skin surface of a number of fruits this season. Samples sent to pathology for analysis were diagnosed as having been caused by a yeast. Different levels of fruit damage ranged from very mild (one or two spots per fruit, less than 2 mm in area) to severe (20 or more spots, up to 15 mm in area, over large areas of the fruit). Level of susceptibility appeared to vary with the different selection or variety. We have not seen this problem before,

and it did not appear this season in the apple plots where a standard fungicide spray was applied, but only in the disease resistant block which is unsprayed. We will be on the lookout for any future occurrences.

Ratings of powdery mildew have been taken on the cultivars and selections in the disease resistant block from 1995 to 1997. The data are currently being analyzed, and a discussion of the results prepared for publication.

**Varieties and selections are listed in harvest order:**

*	Cultivar	Pick date	St	Sz	C	Fn	Fl	Comments
4	Williams' Pride	8/06	4	4	90	4	3	good fruit but severe mildew, yellowed leaves
	Pristine	8/08	4	2	5	5	3	1 <sup>st</sup> fruiting impressive; crisp, good flavor, attractive
3	Redfree	8/14-20	3	3	90	5	3	good color & finish, firm, best right off tree
	CMR-4T-18	8/28	1	3	90	4	3	poor set this year
2	PSWR-11T-48	8/29-9/02	4	2/5	80	4	4	size highly variable, spicy flavor, sunburn
	CMR-2T-13	9/01	3	3	90	4	3	good color, firm, russet on some
3	Dayton	9/09	4	3	90	4	5	flavor good, seems to improve as trees mature
2	Prima	9/09	4	3/4	80	4	3	mediocre, softens; inferior to Dayton in flavor, quality
4	CLR-20T-22	9/12-10/06	5	3	90	4	5	excellent flavor, attractive, promising
	Coop 40	9/16	4	2	5	4	3	attractive yellow, small fruit; young trees
	Coop 41	9/16	2	2/3	80	4	3	pinkish red color; young trees
	HWR-19T-18	9/17	3	2/3	90	3	3	attractive color, russets
4	Coop 28	9/17-10/06	4	3	90	4	5	bright red, crisp, sprightly flavor, holds well on tree
2	PWR-11T-128	9/22	2	3	80	4	3	not promising, check in 98

*	Cultivar	Pick date	St	Sz	C	Fn	Fl	Comments
1	CQR-10T-17	9/30	4	3	90	5	5	flavor good, but severe disease spots & mildew
3	Shay	10/03	2	2/3	60	4	3	poor performance this year; disease spots
3	Macfree	10/15-23	5	3	80	4/3	3	late Mac type, flavor good
5	Enterprise	10/17-24	4	3	90	5	5	attractive, firm, crisp, some disease spots
	TNR-10T-11	10/17-24	3	3	90	5	3	young trees; good color & finish, waxy skin late
1	PAR-14T-238	10/24	3	3	40	5	2	unattractive, bland
2	Coop 29	10/24	2	2	0	3	1	poor set, flavor mediocre; potential discard
4	P15R-3T-86	10/24	5	3/4	70	4	5	productive, good flavor, attractive
3	PAR-12T-101	10/24	3	5/4	80	4	5	good flavor, firm, crisp; maybe too large for market
2	Coop 27	10/24	3	4/3	90	5	2	disease spots, flavor off this year, check in 98
3	Jonafree	10/24	4	3	90	5	3	flavor rather tart; disease spots
	Coop 42	11/5	4	4/3	0	4	3	nice finish, firm, rather tart, disease spots; young trees
2	GoldRush	11/7	4	3/2	10	4	5	excellent flavor this year; small, too late most years, disease spots

#### NOTES

1. Fruit set (St): 5=very heavy, all branches densely fruited; 4=moderately heavy, all branches bear some fruit; 3=moderate, some areas of tree not bearing; 2=light, most areas of tree not bearing; 1=very light, few fruits only.

Fruit size (Sz): 5=very large, 4" diameter and above; 4=large, 3-4"; 3=medium, 2.5-3"; 2=below medium, 2-2.5"; 1=small, 2" and below.

Fruit color (C): Total fruit area covered with red blush or stripe (may be 0 for green or

yellow varieties).

Fruit finish(Fn): 5=no russet or skin blemish; 4=russet only in cavity or basin; 3=some light russet streaks on body of fruit; 2=light allover russet, or heavy streaks/patches on body of fruit; 1=solid allover russet, rough, lumpy, or deformed.

Flavor (Fl): 5=sweet-tart; 4=sweet; 3=subacid; 2=bland; 1=tart.

## Results of the 1997 Fertigation Study: The Effect of Potassium and Magnesium Applied Fertility on *Jonagold* Apple Quality

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### Introduction

This experiment was initiated because *Jonagold* quality was diminishing in many orchards. The symptoms matched those of a potassium deficiency in several locations, dull green fruit color with insipid taste. *Jonagold* appears to be a high user of both potassium and magnesium, suggested by the fact that adjacent varieties didn't show symptoms as fast. A 40-bin crop of apples takes out 120 lb/A of  $K_2O$  with the crop alone. Soil analysis shows that drip irrigation leads to a drop in potassium levels. During dry periods the trees in an orchard become dependent on the wetted area or "onion," underneath the drip emitters to provide both soil moisture and mineral nutrition. At this time the fruit is also sizing rapidly and demand for potassium is particularly high.

An off-station experiment in a plot at the Merritt orchard in Skagit County, begun in 1995, was continued in 1996 and 1997 to evaluate the effect on *Jonagold* apple quality of potassium and magnesium applied granularly in the fall and through fertigation during the growing season. In addition, a second plot was evaluated at WSU-Mount Vernon in 1996 and 1997. The latter *Jonagold* orchard was in its fourth leaf in 1997. The site at the station has been under the experimental fertility regime for three years, and 1997 was the second year for data collection at the station site.

### Methods

The Merritt plot was set up in 1995 as a randomized block design consisting of three treatments replicated four times. Each block contained 6 trees. The station experiment was set up as a randomized block design consisting of three treatments replicated eight times. Each block contained 12 trees. The treatments for both locations were as follows:

1. Irrigation with  $H_2O$  only.
2. Fertigation with  $K_2O$  two times a week.
3. Fertigation with  $K_2O$  and Magnesium two times a week.

Treatments 2 and 3 were given 7 lb/A of  $K_2O$  per week for 10 weeks (muriate of potash and potassium thiosulfate alternated). The total weekly allocation was divided in half and applied at 3.5 lb  $K_2O$ /A twice a week. Treatment 3 also included magnesium (epsom salts- $MgSO_4$ ) at 20 lb/A per week for 18 weeks. The magnesium was also divided in half and applied at 10 lb/A twice a week.

Prior to harvest, three fruit from each treatment replication at both plots were evaluated for starch, soluble solids, and pressure. The Merritt plot was evaluated on 9/4, 9/11, 9/18 and 9/25. The station plot was evaluated on 9/18 and 9/25. Soil, leaf and fruit analyses were done on 7/8, 8/13, 9/10 and 10/1 at both locations.

Treatment plots were amended on 12/4/96 with granular soil applications of potassium, magnesium, and boron. Plots received an equivalent of the following nutrients/planted acre banded on a 4' herbicide strip: Treatment 1 plots received 2 lb boron; treatment 2 plots received 120 lb  $K_2O$  and 2 lb boron; and treatment 3 plots received 120 lb  $K_2O$ , 60 lb magnesium, and 2 lb boron.

## Results

In 1997 an analysis of variance for a randomized block design was again used to statistically calculate all data. Both locations showed no significant differences between treatments in starch conversion, soluble solids, or fruit pressure (Table 1).

Both locations had significant differences in soil potassium between the plots where potassium was added (treatments 2 and 3, maintaining or increasing levels) and the control (treatment 1) showing reduced potassium levels.

Soil sulfur was significantly higher in treatment 3 at both locations. Sulfur was an element in the fertilizer applied to the K + Mg treatment. There was a significant increase of magnesium also in treatment 3. Soil micronutrients zinc, manganese, copper, and iron all increased, particularly in treatment 3, and some of the differences were significant. Boron levels in the soil were significantly lower in treatment 2 than in 1 and 3 at the Merritt location.

Soil pH decreased with fertigation amendments while salts increased. (Decreased pH may account for the increase in micronutrients noted above.) Soil calcium decreased in plots where potassium and magnesium were added (treatments 2 and 3). Soil phosphorus decreased in treatments 2 and 3 as well, to a significant degree in the station plot, and pH may have affected this also.

Leaf analysis showed no increase in potassium and magnesium, even though soil treatments contained higher levels of those elements in treatments 2 and 3 compared to the control. In fact, the trend was to lower leaf potassium in treatments 2 and 3. Leaf micronutrient content trended toward increase at the station plot but toward decrease at the Merritt plot. Leaf calcium was not affected by any treatment, even though soil calcium did show differences.

Fruit analysis again showed no significant differences this year.

## Discussion

Both locations declined significantly in levels of soil potassium in the unamended soils during the first year of each experiment, then remained relatively level in 1997. The 7/10/95 soil analysis of the Merritt plot showed potassium levels above 400 ppm, and by 10/9/96, potassium levels had dropped midway between 200-300 ppm a little more than a year later. However, during 1997 the levels continued to remain in the 220-280 ppm range (Graph 1). A similar scenario is taking place at the station plot. Furthermore, higher soil potassium levels were not reflected in the leaf potassium levels during the late season. In both 1995 and 1996 potassium dropped from August to October, and this trend continued in 1997 (Graph 2). Potash fertigation did not help boost potassium levels. A different method to increase potassium levels may be beneficial, particularly in years when high nitrogen is present in soil.

Fruit color and maturity were noticeably better for 1996 than 1995, and this improvement in color was maintained in 1997. Higher than normal release of nitrogen in August of 1995 increased the leaf ratio of nitrogen to potassium to 2:1. This was well above Stiles' suggested 1.25:1 ratio of nitrogen to potassium. In contrast, the 1996 leaf nitrogen to potassium ratio was 1.18:1. Levels in 1997 ranged from 1.28:1 to 1.59:1, with the average at 1.43:1. In both 1996 and 1997, August rainfall was lower, and nitrogen was not released into the soil at the high rate of 1995. While levels were not as low as Stiles' recommended ratio, it was lower compared to 1995 and we observed better and earlier color in all plots in 1996 and 1997. In addition, higher soil boron levels in 1996 and 1997 may also have affected potassium uptake positively as suggested by Stiles,

indicating that soil boron levels need to be monitored annually.

Since the data indicate that the level of potassium drops significantly from mid-July to harvest, an irrigation-fertigation system has been used for watering, but supplying additional potassium by fertigation has been difficult (Tables 2 and 4, leaf analysis). Management of increased nitrogen complicates the situation further, making it difficult to keep the ratio of nitrogen to potassium close to 1.25:1. For example, in 1997 the soil nitrogen levels were lower in the Merritt plot than the WSU-Mount Vernon plot. This lower nitrogen level at Merritt's was also reflected in the leaf. However, this plot also had lower levels of potassium compared to the station plot. As a result, nitrogen to potassium ratios were similar in both plots, with the station plot having a lower overall ratio of 1.41:1, compared to the Merritt plot at 1.46:1. Both plots could benefit if the nitrogen to potassium rate is managed. Trees in the Merritt plot might benefit from increased leaf potassium, and the station plot might have been improved by reducing nitrogen.

Simply adding potassium is not the answer. If the level of potassium in the soil is sufficient (200 ppm or above), then absorbing excess soil nitrogen with grass or turf cover may bring about the desired ratio, and lead to improved color. This is particularly important during a wet late summer (August and September) when organic matter in the soil is releasing abundant nitrogen which further delays fruit color. In order to increase the levels of fruit potassium it may be best to apply foliar sprays in the late season, or by using some other method.

We know from observation that a monitored fertility program such as described in this trial has produced improved color and maturity indices for most of the growers using it in western Washington. However, the whole solution is not a simple "cookbook" answer. In some fields with adequate fertility, early season stress can be an adverse factor. Stress can result from a number of causes, such as lack of sufficient water, mite infestation, or anything that adversely influences accumulation of carbohydrates and the overall health of the tree. Stress can also affect early nutrient uptake and the resulting fruit quality. Fruit that looks bad in mid July usually looks bad at harvest. Maintaining good plant health in the early season through regular monitoring, and rarely using additional input of nitrogen, is important.

In this study, there has been no significant difference in fruit quality, fruit color, or range of harvest indices to differentiate the control plot, which received water only, from the plots that were fertigated. It should be noted, however, that these plots were on soils which had been well cared for before the trial was initiated and the fruit quality is good in all plots. This indicates that the level of nutrients in the control has not yet dropped below the threshold level for potassium in the soils of these two plots (sandier soils may deplete more quickly). We still need to examine better methods to increase leaf and fruit potassium during the late season that may enhance quality. At present, however, fall application of granular nutrients appears to be the best way to insure that there is a sufficient level of potassium in the soil to keep it above the low threshold level. This restores the nutrients taken out by the previous season's crop, and added fertigation appears not to be necessary.



## Summary

1. A program of granular nutrient application has probably been the most beneficial in improving fruit quality, combined with continued monitoring of soil elements. Fertigation has not shown itself to be an additional benefit as of yet, in the 3 seasons (2 seasons at the station plot) it has been tested. The control treatment using water alone, provided that a sufficient granular program is maintained, has shown equal performance with fertigated treatments.
2. Early season stress seems to be very detrimental to attaining high quality in *Jonagold*. Good plant health in the early season, and limiting any addition of nitrogen, appears to be most important.
3. Adopting cultural and fertility practices that **decrease** nitrogen and **increase** potassium, particularly in the later season, may assist in maintaining the optimum ratio of nitrogen to potassium at 1.25:1, leading to improved fruit color and quality. Increasing nitrogen uptake by expanding the grass area and narrowing the herbicide strip, or adding potassium in foliar spray, are possible methods.
4. Other watering methods, such as microjets, may increase the overall wetted area of orchard, and possibly increase the potassium uptake due to greater area of root activity.
5. Soil tests are vital in managing an effective nutrition program, and should be used to check for other nutrients such as boron that may need to be supplemented annually. Orchards in western Washington have been significantly improved when a monitored fertility program was in place.

**Table 1. 1997 Merritt Fruit Maturity Tests:**  
9/4/97

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	2.17	11.04	17.19
K <sub>2</sub> O	2.05	11.43	16.92
K <sub>2</sub> O + Mg	2.19	11.10	16.54
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

**1997 Merritt Fruit Maturity Tests: 9/11/97**

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	3.13	11.12	15.67
K <sub>2</sub> O	2.82	11.04	15.42
K <sub>2</sub> O + Mg	3.25	11.27	16.00
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

**1997 Merritt Fruit Maturity Tests: 9/18/97**

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	3.13	11.45	14.88
K <sub>2</sub> O	3.75	11.70	14.13
K <sub>2</sub> O + Mg	3.25	12.80	14.38
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

**1997 Merritt Fruit Maturity Tests: 9/25/97**

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	5.13	12.08	14.69
K <sub>2</sub> O	5.04	12.62	14.71
K <sub>2</sub> O + Mg	5.00	12.14	14.21
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

**Table 3. 1997 WSU-Mount Vernon Fruit Maturity Tests: 9/18**

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	4.63	12.70	13.73
K <sub>2</sub> O	4.42	12.99	14.17
K <sub>2</sub> O + Mg	4.17	12.69	13.42
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

**1997 WSU-Mount Vernon Fruit Maturity Tests: 9/25**

Treatment	Starch	Soluble Solids	Pressure
H <sub>2</sub> O	5.29	12.97	14.00
K <sub>2</sub> O	4.96	13.00	12.56
K <sub>2</sub> O + Mg	4.71	12.73	14.61
<i>P Value</i>			
<i>LSD (p=.05)</i>	<i>NSD</i>	<i>NSD</i>	<i>NSD</i>

Table 2. Soil, leaf and fruit analysis at Merritt orchard  
1997 Soil Analysis - Merritt

Trt	N	P	K	S	B	Zn	Mn	Cu	Fe	Ca	Mg
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	meq/100g	meq/100g
Water .	6.60	14.00	275.20 b	1.00b	1.34a	3.54b	1.46	4.00b	119.20	10.36 a	1.28 b
.....											
K .....	7.80	13.00	557.80 a	26.00 b	1.12b	3.90b	1.48	4.26ab	129.20	8.84a	1.12 b
Mg + K	7.40	13.20	569.60 a	65.60 a	1.32 a	5.04a	1.66	4.80a	146.80	6.62b	3.54 a
P Value		.0006	.0122	.0299	.0054	.0839	.0020	.0001			
LSD											
(P=.05)*	NSD	NSD	116.75	37.466	.1674	.7777	NSD	.7184	NSD	1.5923	.6744
1997 Leaf Analysis - Merritt											
Trt	% N	% S	% P	% K	% Ca	% Mg	B	Zn	Mn	Cu	Fe
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Water .	1.88	.16	.21 b	1.60	1.38	.25	29.25	61.75 a	64.00	7.00	196.25
.....											
K .....	1.86	.16	.22 a	1.70	1.28	.25	30.25	64.25 a	63.50	6.25	175.75
Mg + K	1.96	.16	.19 b	1.53	1.29	.27	27.50	53.75 b	61.25	6.75	168.25
P Value			.0144			.0264					
LSD											
(P=.05)*	NSD	NSD	.0171	NSD	NSD	NSD	NSD	7.1339	NSD	NSD	NSD
1997 Fruit Analysis - Merritt											
Trt	% N	% S	% P	% K	% Ca	% Mg	B	Zn	Mn	Cu	Fe
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Water .	.34	.02	.08	.60	.07	.04	22.25	7.50	6.00	4.50	173.75
.....											
K .....	.31	.02	.09	.75	.06	.04	20.50	5.50	4.75	4.00	124.25
Mg + K	.35	.03	.10	.95	.08	.05	20.75	9.00	6.50	5.00	181.00
P Value											
LSD											
(P=.05)*	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD

\*Values within a column followed by the same letter are not significantly different (P=0.05) according to Fisher's Least Significant Difference Test. NSD=No Significant Difference.

Table 4: Soil, leaf, and fruit analysis at WSU orchard.  
1977 Soil Analysis - WSU Mount Vernon

Trt	N	P	K	S	B	Zn	Mn	Cu	Fe	Ca	Mg
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	meq/100g	meq/100g
Water .	7.80	24.60a	255.20c	4.40b	1.34	5.46	3.30	4.78	63.20b	10.66a	1.60b
.....											
K .....	5.80	20.80b	567.80a	37.40ab	1.42	5.70	3.14	4.72	68.00b	9.84b	1.56b
Mg + K	6.80	19.40b	441.80b	65.80a	1.38	6.00	3.32	5.06	79.60a	7.80c	3.20a

*P Value* . . . . . .0001 .0001

*LSD*  
(*P* = .05) \* *NSD* 3.22 118.63 36.042 *NSD* *NSD* 11.13 .6239 .2735

1997 Leaf Analysis - WSU Mount Vernon

Trt	% N	% S	% P	% K	% Ca	% Mg	B	Zn	Mn	Cu	Fe
							ppm	ppm	ppm	ppm	ppm
Water .	2.10b	.16	.23	1.60	1.17	.23	22.25	14.50	35.50b	7.00	140.75
.....											
K .....	2.27a	.15	.24	1.55	1.27	.23	22.50	14.50	38.00b	7.00	136.75
Mg + K	2.15b	.16	.22	1.45	1.18	.23	23.25	14.75	50.25a	7.00	133.00

*P Value* .0005 .0029

*LSD*  
(*P* = .05) \* .0483 *NSD* *NSD* *NSD* *NSD* 6.4288 *NSD* *NSD*

1997 Fruit Analysis - WSU Mount Vernon

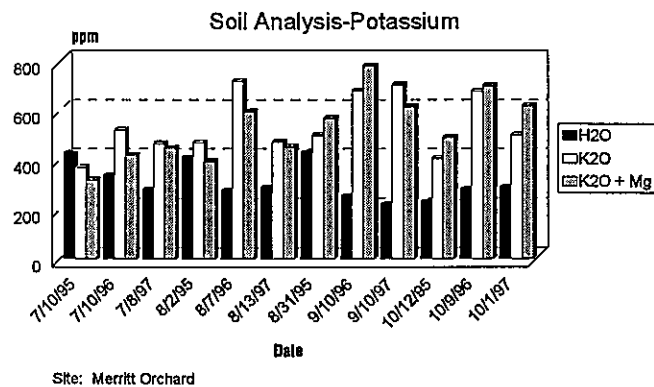
Trt	% N	% S	% P	% K	% Ca	% Mg	B	Zn	Mn	Cu	Fe
							ppm	ppm	ppm	ppm	ppm
Water .	.39	.03	.09	.85	.09	.04	22.50	6.50	6.25	4.25	122.00
.....											
K .....	.40	.03	.10	.88	.08	.05	17.75	5.25	5.75	4.00	119.00
Mg + K	.40	.03	.09	.90	.09	.05	19.25	5.00	5.75	4.00	111.75

*P Value*

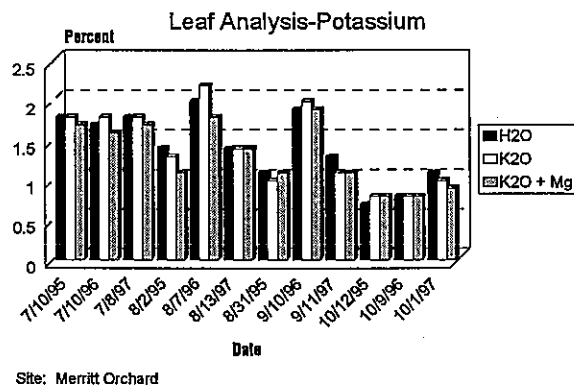
*LSD*  
(*P* = .05) \* *NSD* *NSD* *NSD* *NSD* *NSD* *NSD* *NSD* *NSD* *NSD* *NSD*

\*Values within a column followed by the same letter are not significantly different (*P* = 0.05) according to Fisher's Least Significant Difference Test. *NSD* = No Significant Difference.

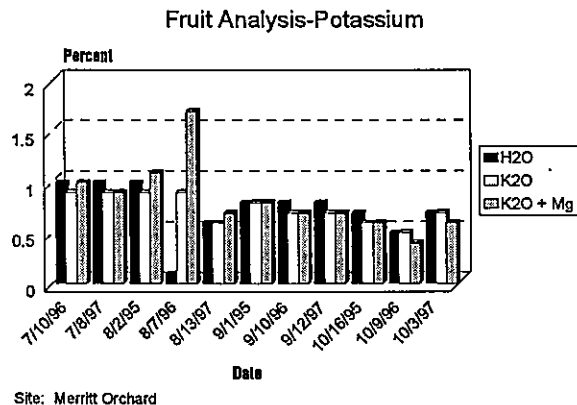
# 1995-1997 Jonagold Fertigation Trial



# 1995-97 Jonagold Fertigation Trial

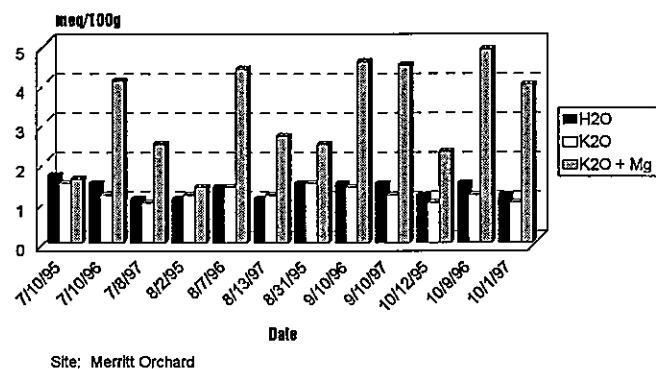


# 1995-1997 Jonagold Fertigation Trial



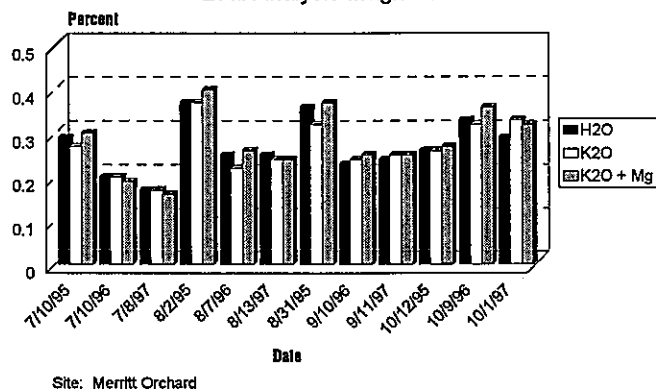
# 1995-1997 Jonagold Fertigation Trial

## Soil Analysis-Magnesium



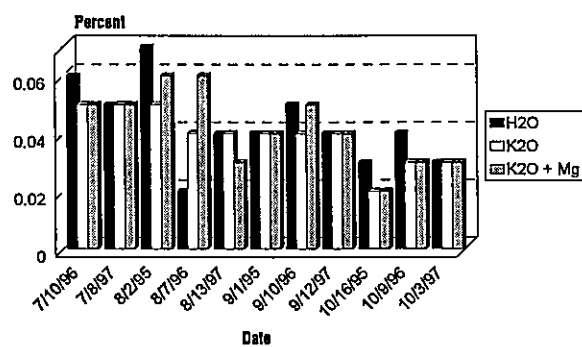
# 1995-97 Jonagold Fertigation Trial

## Leaf Analysis-Magnesium



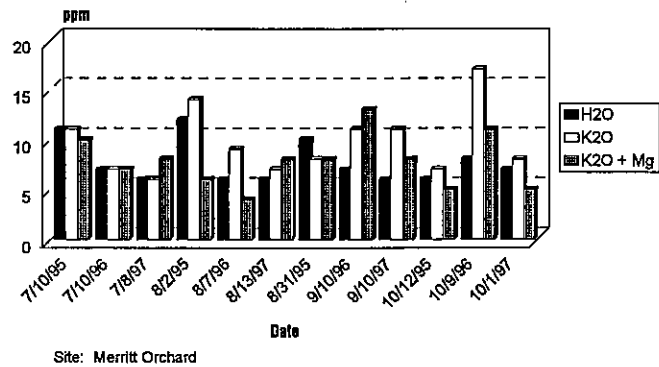
# 1995-1997 Jonagold Fertigation Trial

## Fruit Analysis-Magnesium



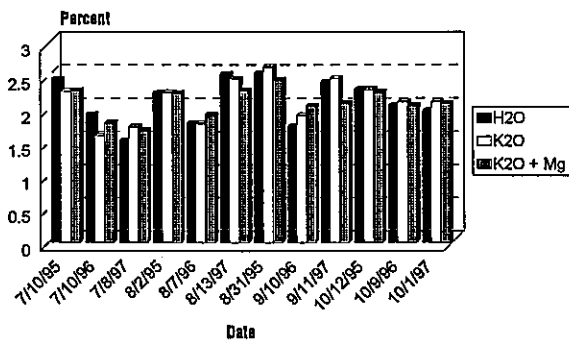
# 1995-1997 Jonagold Fertigation Trial

## Soil Analysis-Nitrogen



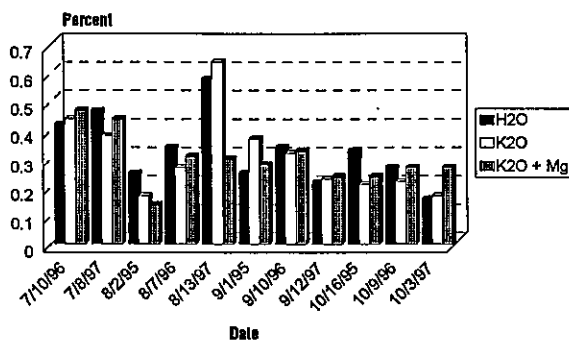
# 1995-1997 Jonagold Fertigation Trial

## Leaf Analysis-Nitrogen



# 1995-1997 Jonagold Fertigation Trial

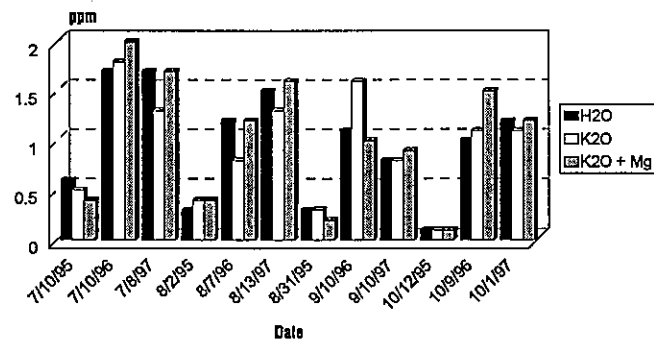
## Fruit Analysis-Nitrogen





# 1995-1997 Jonagold Fertigation Trial

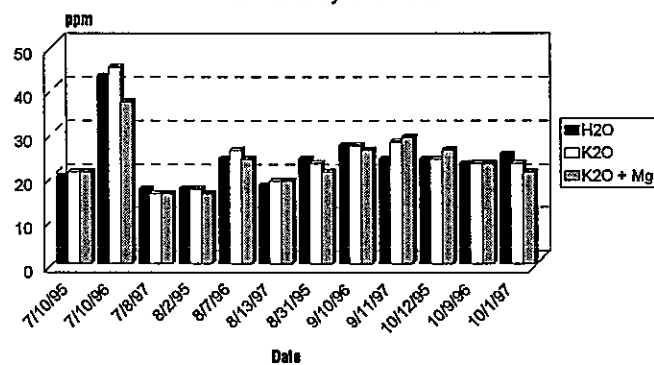
## Soil Analysis-Boron



Site: Merritt Orchard

# 1995-97 Jonagold Fertigation Trial

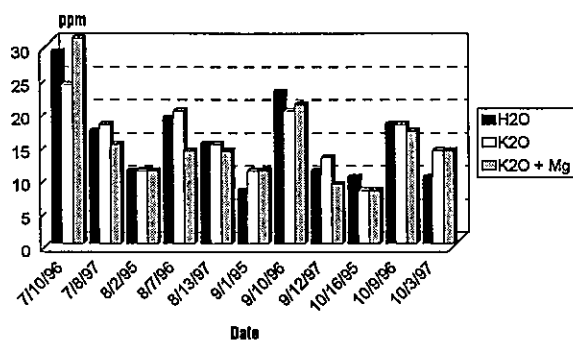
## Leaf Analysis-Boron



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

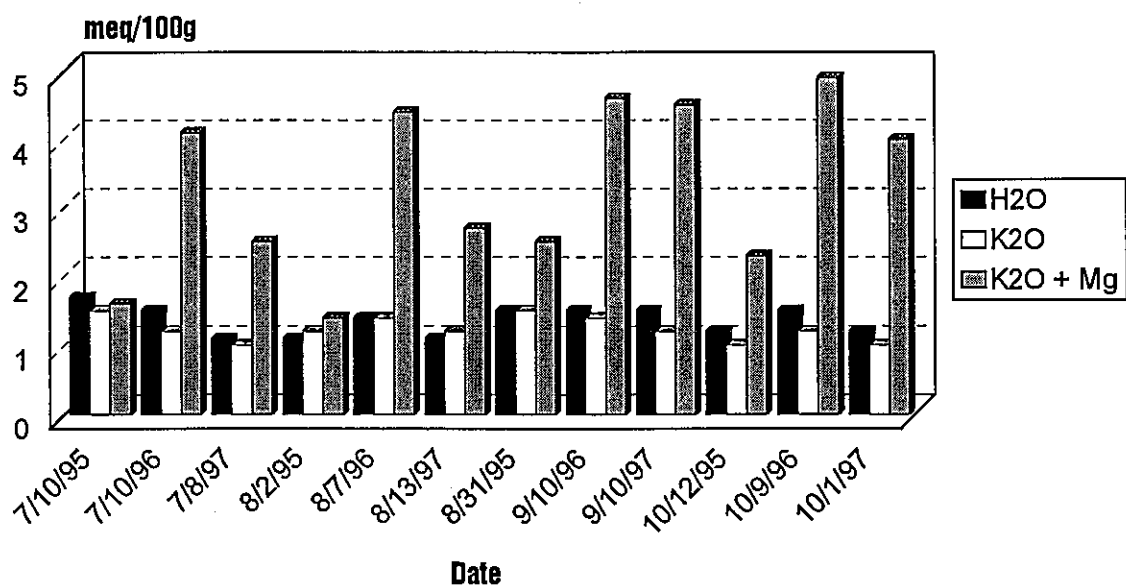
## Fruit Analysis-Boron



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

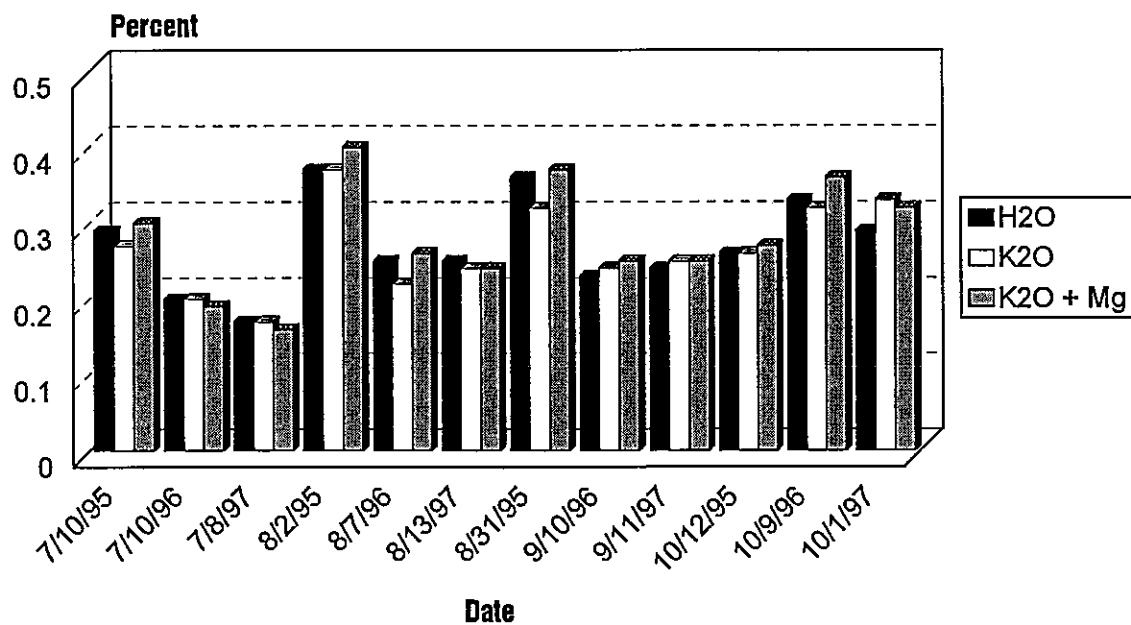
## Soil Analysis-Magnesium



Site: Merritt Orchard

# 1995-97 Jonagold Fertigation Trial

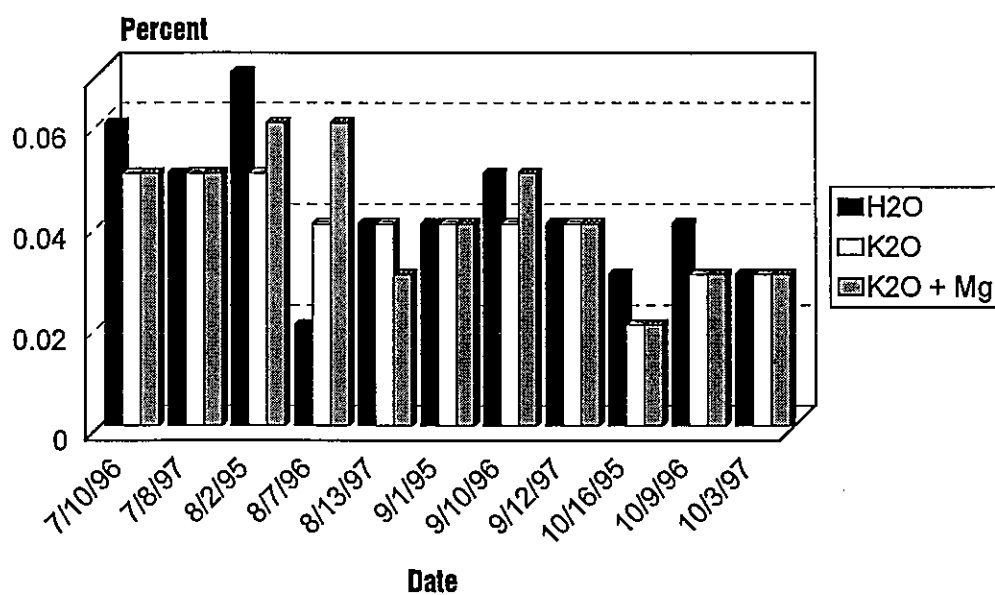
## Leaf Analysis-Magnesium



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

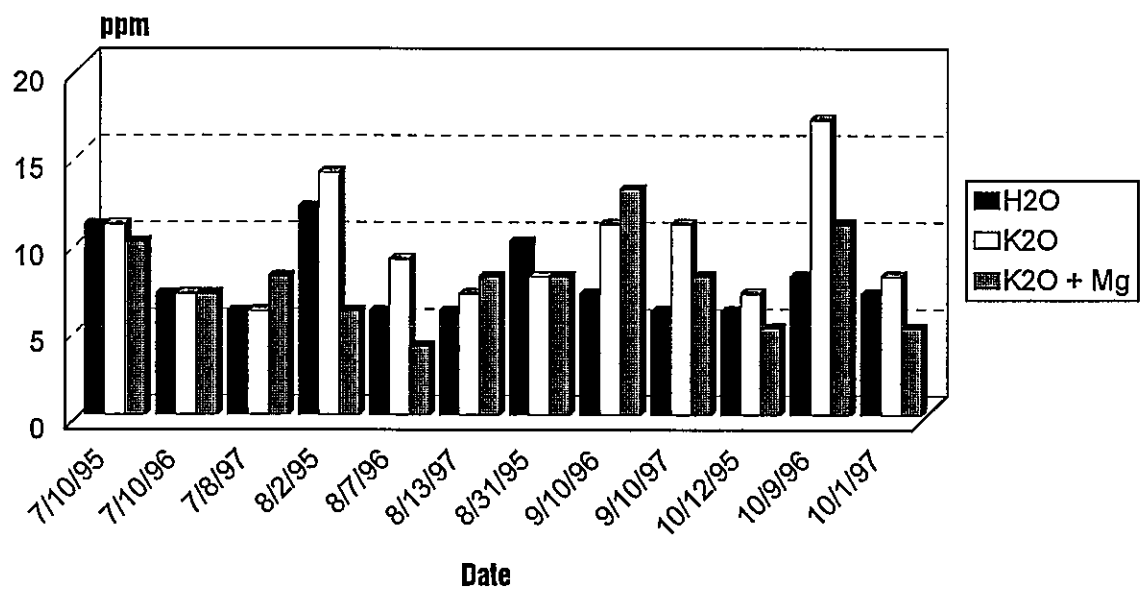
## Fruit Analysis-Magnesium



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

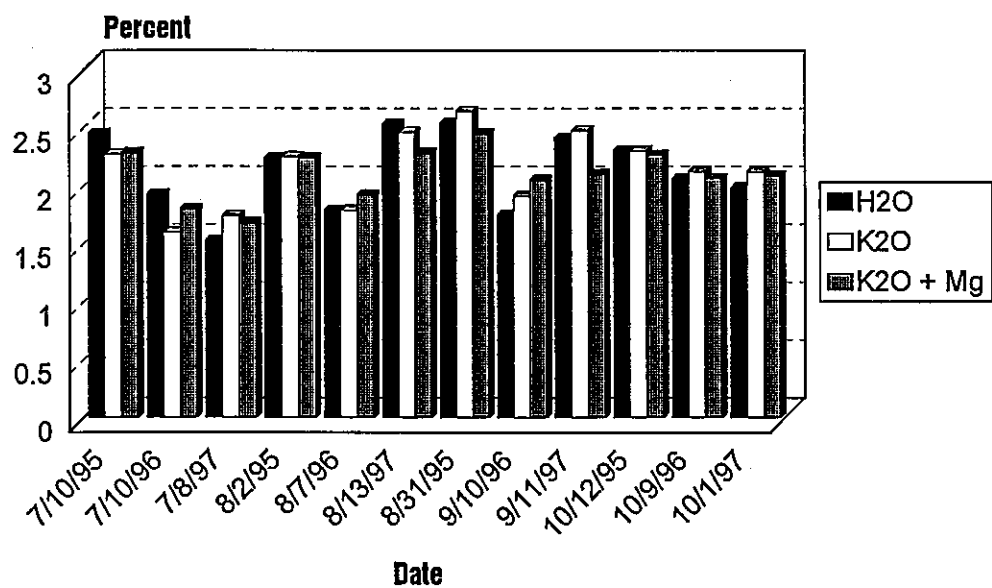
## Soil Analysis-Nitrogen



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

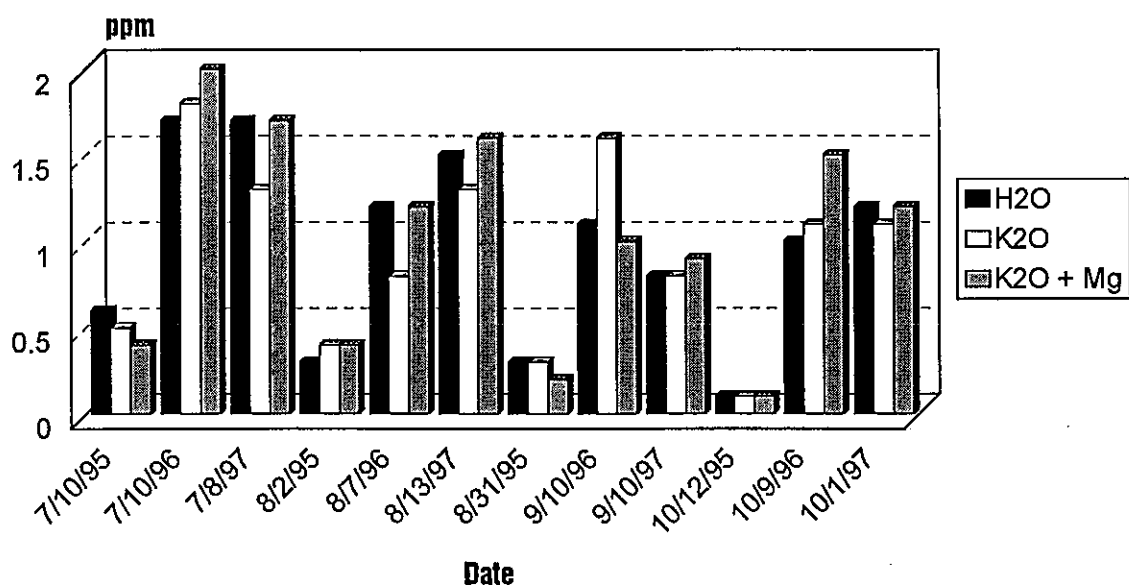
## Leaf Analysis-Nitrogen



Site: Merritt Orchard

# 1995-1997 Jonagold Fertigation Trial

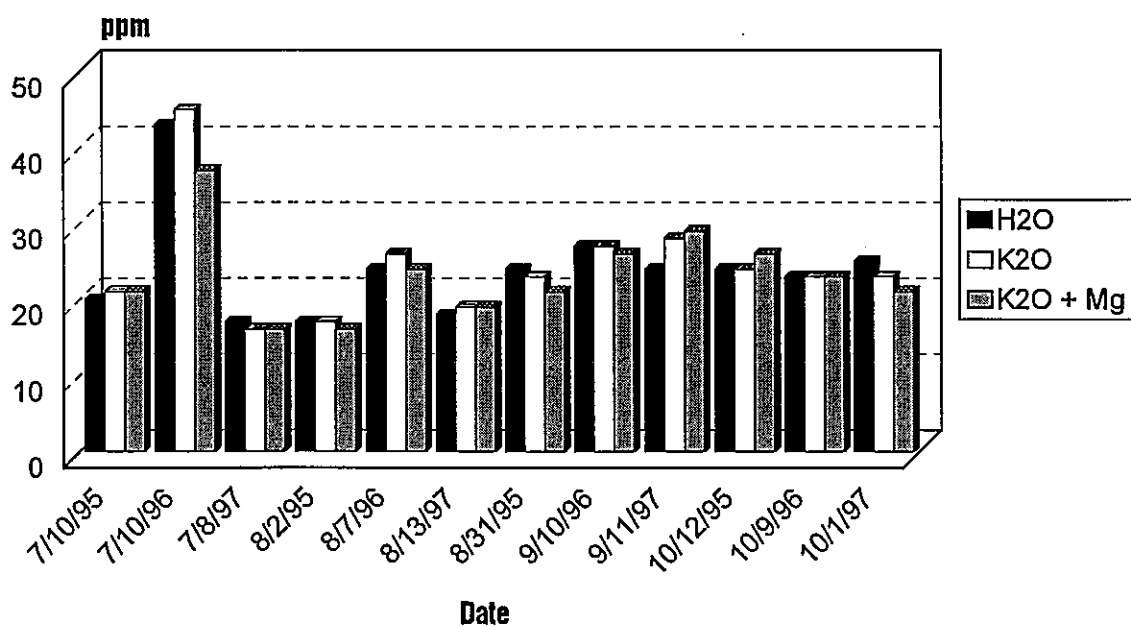
## Soil Analysis-Boron



Site: Merritt Orchard

# 1995-97 Jonagold Fertigation Trial

## Leaf Analysis-Boron

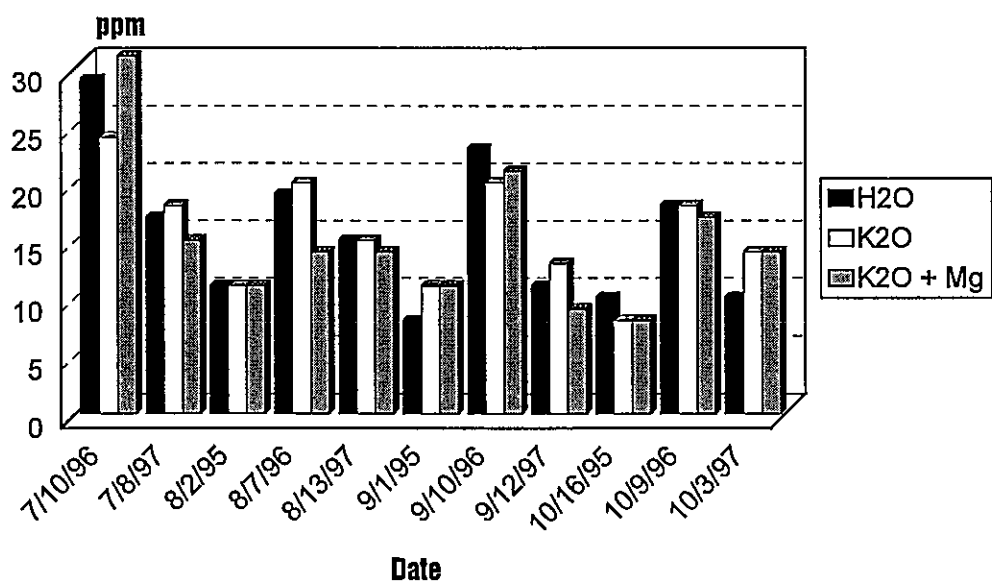


Site: Merritt Orchard



# 1995-1997 Jonagold Fertigation Trial

## Fruit Analysis-Boron



Site: Merritt Orchard

Apple (*Malus domestica* 'Jonagold')

Scab: *Venturia inaequalis*

Powdery Mildew: *Podosphaera leucotricha*

G. A. Moulton, J. King, L. Price and B. Darland  
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Mount Vernon, WA 98273

APPLE SCAB AND POWDERY MILDEW FUNGICIDE TRIAL, 1997: The sterol inhibitor fungicide, Procure (imidazole) was applied by itself and in combination with the protectants Thiram(tetramethylthiuram disulfide), Captan, and Dithane (mancozeb) for control of apple scab and powdery mildew on the susceptible apple cultivar, *Jonagold* at WSU-Mount Vernon. Plots were arranged in a randomized block design in which there were four treatments replicated four times. Each plot replicate contained twelve trees. Fungicides were applied with a backpack airblast sprayer at a rate of 80 gal/A. Spray application dates were as follows: 4 April, 8 May, 23 May, 5 June, 20 June, 10 July, and 23 July. Each plot was evaluated for scab lesions and powdery mildew strikes on 16 May, 2 June, 12 June, 30 June, 3 July, and 27 August. Powdery mildew strikes were rated as percent of terminal shoots infected. An analysis of variance was done on the area under the disease progress curve for powdery mildew. An analysis using a chi square was done for scab to show frequency.

All fungicide treatments provided control of apple scab throughout the season. No scab lesions were detected on leaves or fruit in the test plots, except on one replication nearest to an unsprayed control area. This area probably was exposed to pressure by asexual spores from that nearby plot. Unsprayed trees there were being used to verify the presence of scab and showed that disease pressure existed if no fungicide applications were made. All fungicides did a good job of scab control as the amount of scab in the treated plots was insignificant. All fungicide treatments also provided control of powdery mildew with no significant differences detected. However, mildew existed more abundantly than scab throughout the plot. This showed that the materials were all good for scab, but were just moderately effective for mildew. The trend showed that some additional control for mildew existed when Thiram and/or Mancozeb were applied, but it was not significant. No phytotoxicity or adverse effects were observed in any of the treatments.

**Project No.:** 13K-3455-4663

**Title:** Jonagold Test Block and Culture Studies

**Personnel:** Gary Moulton, Scientific Assistant, WSU-Mt. Vernon  
Les Price, Field Technologist, WSU-Mount Vernon  
Jacqueline King, Technical Farm Laborer, WSU-Mt. Vernon

**Reporting Period:** 1997

**Accomplishments:**

Several experiments were conducted in the Jonagold plot in 1997. A fertigation fertility trial with two treatments, plus control, was continued. The treatments were 1) twice weekly supplement of K alone, 2) twice weekly supplements of K plus Mg, and 3) control - water only. Data for this experiment was taken in 1997 for the second year at the station plot and for the third year at the off-station commercial plot at Merritt orchard. Data collected included fruit, leaf, and soil analysis of the different treatments. Beginning about 4 weeks before anticipated harvest, fruit starch, pressure, and soluble solids were recorded.

The second experiment performed at the on-station block was a spray program for control of scab and mildew, using different fungicides at varied rates of application. It consisted of four treatments replicated three times. Trees were rated for observed scab and mildew. In addition, a post harvest fungicide trial of Thiram was conducted, with spray applications just before harvest, followed up by a storage evaluation of treated fruit for amount and type of rot, to be evaluated in December, February, and April. These projects were funded by a chemical company.

An experiment was also conducted on the effect of irrigation deficit on fruit size and maturity, in which irrigation was cut off to replicated areas of the block, in two-week increments beginning July 1. In each replication, ten fruit on a branch were numbered and measured, and the measurements repeated monthly until harvest. At harvest the fruit were measured, weighed, and tested for maturity indices (pressure, soluble solids, and starch conversion.)

**Results:**

To date, results of the fertigation fertility trial showed no difference between the treatments. However, the soil test showed a very significant drop in soil potassium from 450 ppm in the beginning of the experiment (July 1995) to 250-280 ppm at the end of this year in the drip onion. We anticipate that in the next year or so a threshold of deficiency may be reached. The fertility trials on station will also be continued for a few more seasons.

Results of the apple scab and powdery mildew trial showed no significant differences among the treatments. All fungicide treatments provided control of apple

scab and powdery mildew throughout the season. No phytotoxicity or adverse effects were observed in any of the treatments. Results of the deficit irrigation trial showed no significant differences this year. In future we would begin fruit diameter measurements at the point of the first cutoff of irrigation in July.

**Recommendations:**

Based on this trial and on other observations, it is evident that management of the nitrogen-potassium balance for optimum quality in Jonagold orchards is a complex problem. Simply adding potassium is not the answer, particularly in case of a wet late summer when organic matter in the soil is releasing abundant nitrogen. Suggested practices would include the following:

1. A program of granular nutrient application has been beneficial in improving fruit quality, combined with continued monitoring of soil elements. Fertigation in itself is not shown to be an additional benefit.
2. Early season stress seems to be very detrimental to attaining high quality in Jonagold. Good plant health in the early season, and limiting any addition of nitrogen, appear to be most important.
3. Aim at maintaining an optimum ratio of nitrogen to potassium at 1.25:1 for improved color and quality. Increasing nitrogen uptake from the soil by expanding the grass area of the orchard and narrowing the herbicide strip, or adding potassium in foliar spray, are possible methods.
4. Other watering methods, such as microjets, that increase the overall wetted area of orchard can be used to potentially increase potassium uptake due to greater area of root activity.
5. Soil tests are vital in managing an effective nutrition program, and should be used to check for other micronutrients that may need to be supplemented annually.

Orchards in western Washington have been significantly improved when a monitored fertility program was in place.

**Publications:**

Fully detailed reports on the results of the fertigation trial and of the spray trial are available on request. Reports of the deficit irrigation trial are being analyzed, and the results of the post-harvest storage trial will be completed by April 1998, with report to follow.

**Project No.:** 13K-3455-5664

**Title:** Commercial Production Methods for Bosc Pear

**Personnel:** Gary Moulton, Scientific Assistant, WSU-Mount Vernon  
Jacqueline King, Technical Farm Laborer, WSU-Mount Vernon

**Reporting Period:** 1997

**Accomplishments:**

A test planting of Bosc pear was continued to compare productivity of selected rootstocks and training systems, test pollinizer varieties, and gather information on the commercial potential of Bosc pear. The 7-year trial will cover rootstock comparison of young trees and 3-4 years of harvest data from trees in production, plus comparison of two training systems for productivity, fruit quality and marketability. Trees of Bosc on Quince A and C were rebudded in August 1995. These trees are being used to compare a V-trellis versus a standard planting. Trees of Bosc planted in 1994 on OH X F217 and interstem Provence Quince rootstocks accomplished good growth in 1996.

Pollinizer trees of the varieties Comice, Concord, Conference, and Starkrimson are growing well. These included imported trees of Conference and Concord grafted on Quince C which produced fruit in the first year after planting. This encourages consideration of the Quince C stock as one that promotes early bearing and high productivity. The fruit of Concorde and Conference was well sized and of good quality, suggesting that they may have sales potential besides their use as pollinators. Conference in particular has an attractive light russet pattern that may appeal to customers and is currently the number one variety in Europe. Though prices of Bosc pear have fluctuated, the high quality of fruit produced in western Washington tests still supports the idea of its being grown here as an alternative crop.

**Results:**

Yield data for all plots in production in 1997, taken at harvest, are shown in the table included as Appendix A.

**Publications:**

None.

**APPENDIX A:**

**Table 1. Yield data for Bosc test plot, harvest 1997.**

Cv./Rootstock	Spacing	No. of Trees	Total Yield	Lbs/Tree	Lbs/Plot
Bosc/Provence Quince	8'	6	124.2	20.7	124.2
Bosc/Provence Quince	4'	60	736.4	12.3	147.2
Bosc/OHXF 217	8'	30	790.4	26.3	158.1
Bosc/OHXF 217	4'	12	120.1	10.0	120.1
Concorde/Quince C	8'	24	971.2	40.5	242.8
Conference/Quince C	8'	24	1052.8	43.9	263.3

USDA-ARS Agreement # 58-1931-6-036 (1996)

PEAR EVALUATION TRIAL 1997

G.A. Moulton, J. King and L. Price

WSU-Mount Vernon

Interim Report

In April 1996 a plot consisting of 8 pear selections and 1 cultivar (Potomac), a total of 30 trees, was established at the Mount Vernon, WA research station. One tree of the selection 76128-009 that failed to leaf out and subsequently died was replaced by a new tree in 1997, and additional trees of selections 67218-083 (3) and 76115-010 (2) were added at the same time. The planting now consists of 4 trees each of Potomac, 66125-035, 66170-047, 67218-083, 71655-014, 76115-010, 76128-009 and 78304-057, and 3 trees of 66131-021, for a total of 35 trees..

In July 1997 ratings of the trees were taken for scab and mildew. Scab was rated as in 1996 by the per cent (%) of total leaves visibly affected. Mildew was rated by a subjective evaluation of per cent of shoot tips infected (% strikes.) At the time this rating was taken there was some damage by pear slug but there did not seem to be any difference in amount of damage among the varieties/selections and it was not a serious problem. Results of the scab and mildew evaluation are shown in Table 1, below.

**Table 1. Scab and mildew ratings 1997**

Scab = % affected leaves

Mildew = % affected shoot tips

\*Tree planted 1997

Cultivar/Selection	Scab/Mildew	Tree 1	Tree 2	Tree 3	Tree 4	Average
Potomac	S	0	5	0	5	2.5
	M	20	40	0	0	15
66125-035	S	5	0	0	10	3.75
	M	20	10	10	10	12.5
66131-021	S	5	0	0		1.67
	M	0	40	0		13.3
66170-047	S	5	5	5	0	3.75
	M	0	0	0	10	2.5
67218-083	S	0	0*	5*	10*	3.75
	M	0	0	0	0	0
71655-014	S	5	5	0	5	3.75
	M	0	30	0	0	7.5
76115-010	S	10	5	10*	0*	6.25

Cultivar/Selection	Scab/Mildew	Tree 1	Tree 2	Tree 3	Tree 4	Average
	M	30	20	10	50	27.5
76128-009	S	0	0	0*	0	0
	M	0	0	0	0	0
78304-057	S	5	5	5	0	3.75
	M	5	20	0	10	8.75

In 1997 the level of both pear scab and powdery mildew was high due largely to abundant rainfall which provided good conditions for infection to occur. Therefore the absence of either scab or mildew in trees of **76128-009** suggests that its level of resistance to infection is high. Also showing little infection by scab was **66131-021**; other selections with a low level of mildew infection overall were **67218-083** and **66170-047**.

On November 12, 1997 the trunk diameters of all the trees in the plot were measured at 30 cm. above ground level, using a caliper. The results are shown in Table 2, below. The amount of increase over 1996 is shown in parenthesis for each tree planted in 1996; trees planted in 1997 are indicated by an asterisk (\*).

**Table 2. Trunk diameters, November 12, 1997**

Cultivar /Selection	Tree 1	Tree 2	Tree 3	Tree 4	Average	% Increase
Potomac	33.7 (14.7)	35.1 (15.1)	31.0 (13.0)	29.4 (12.4)	32.3 (13.8)	43
66125-035	20.6 (7.6)	16.8 (4.8)	29.7 (12.7)	28.5 (12.5)	23.9 (9.4)	39
66131-021	28.8 (12.8)	23.0 (10.0)	31.2 (14.2)	missing	27.7 (12.4)	45
66170-047	26.1 (9.1)	32.8 (14.8)	26.2 (7.2)	27.7 (12.7)	28.2 (10.9)	39
67218-083	26.0 (11.0)	12.5*	13.1*	17.5*	26.0 (11.0) 14.4*	42
71655-014	36.7 (16.7)	25.2 (11.2)	35.2 (18.2)	39.6 (17.6)	34.2 (15.9)	46
76115-010	29.8 (10.8)	25.8 (12.8)	19.7*	8.1*	27.8 (11.8) 13.9*	42
76128-009	36.1 (14.1)	34.2 (13.2)	16.5*	39.3 (17.3)	36.5 (14.8) 16.5*	41
78304-057	29.5 (13.5)	29.2 (14.2)	32.3 (14.3)	30.5 (15.5)	30.4 (14.4)	47



The table below (Table 3) summarizes the results of scab and mildew ratings from both 1996 and 1997. The basis for rating mildew was changed in 1997 to an estimated percent of shoot tips affected, rather than as in 1996 when mildew was rated by counting the number of affected shoot tips. Another factor is that in 1996 there was only one tree of 67218-083, so that its ratings for that year in both scab and mildew are not replicated. However, the relative incidence of disease infection among the different selections shows considerable similarity in both years, both as to the selections showing the lowest rate of infection and those showing the highest.

**Table 3. Summary of 1996-97 scab and mildew ratings, averaged.**

Cultivar/Selection	Scab 97	Scab 96	Mildew 97	Mildew 96
Potomac	2.50	1.25	15	0.25
66125-035	3.75	2.50	12.5	0.25
66131-021	1.67	0	13.3	0.66
66170-047	3.75	3.75	2.5	0
67218-083	3.75	----	0	----
71655-014	3.75	1.25	7.5	0
76115-010	6.25	0	27.5	0.50
76128-009	0	0	0	0
78304-057	3.75	0	8.75	0

It appears that selection 76128-009 is not only the least affected by scab and mildew infection, but also the most vigorous at this point. So far there has not been any fruit produced on any of the trees in this plot.