



The Bee Line

NEWSLETTER OF

WESTERN CASCADE FRUIT SOCIETY
A NON-PROFIT EDUCATIONAL ORGANIZATION

Volume 19 Number 4

Fall 1998

Apples Pears Figs Grapes Kiwi Cherries Nectarines Peaches Plums Blackberries Raspberries Strawberries Blueberries Currants Huckleberries Gooseberries Nuts

1998 FALL FRUIT SHOW
SATURDAY OCTOBER 17 9:30 A.M. - 5:00 P.M.
SUNDAY OCTOBER 18 10:00 A.M. - 4:00 P.M.

YOU'LL FIND INSIDE

Page 2	Fall Fruit Show Information	Page 15	The New Rare Fruit Garden in Puyallup
Page 4	'Prince of Peach'	Page 16	There's an Extension Office For You
Page 5	Pluots Update	Page 17	Bending to Pressure
Page 6	Storing Fruit	Page 18	Hard Cider
Page 9	News From Mount Vernon	Page 19	Hard Cider Gaining Popularity
Page 10	A Puzzling Botanical Problem	Page 20	Pasteurizing in a Flash
Page 11	From The Mail Box	Page 21	Bits and Pieces
Page 12	Grafting Corner	Page 22	WCFS Board Members
Page 13	Something's In The Air	Page 23	Survey and Membership Renewal
Page 14	Improved Protocols	Page 24	Web Sites of Interest



DATES TO REMEMBER

October 3	Peninsula Fruit Club Fruit Show at Westside Improvement Club
October 10	North Olympic Fruit Festival (see details on page 21)
October 10	WWTFRF Field Day at Mount Vernon
October 17/18	WCFS Fall Fruit Show
November 1	BC Fruit Tasters Annual Fruit Tasting Festival, Victoria (see details on page 9)

Watch this space each issue for events that may be for you

1998 FALL FRUIT SHOW INFORMATION

DISPLAYING YOUR FRUIT

Orel Vallen says it is not too early to start thinking about what you are going to display on October 17 and 18.

Have **YOU** considered submitting your fruit for display?

This event is **FOR** you and **BY** you. Even if you have only a small selection, it is needed. Visitors need to know how many home orchardists there are, and that we are all active.

The following procedures were designed to make the displays look compatible:

Prepare a 3" x 5" card for each sample of three to five fruits with the variety name and other information you may wish to share. This could include the harvest date and other pertinent data. If you are submitting more than one kind, they can be arranged alphabetically.

Prepare a larger sign with your name and the geographical growing area. Plates, which hold three to five specimen, will be provided.

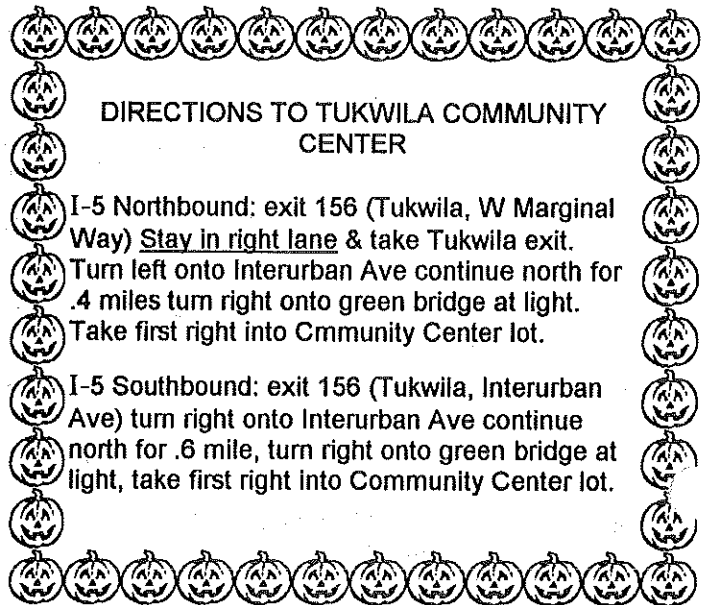
After harvest, the fruit will need to be refrigerated to store successfully. If you can, it would be nice to have some fruit for the tasting table.

DO YOU HAVE A MYSTERY APPLE?

The apple identification experts will be there to name yours. You should select fruit that is typical in color, size and shape for the tree you are trying to identify. To assist them, bring four to six specimens with stems and free of blemishes. If you don't have that many, bring what you can. **DO NOT WASH OR POLISH.** Refrigerate the fruit in a plastic bag if it has to be stored for more than one week. You may be asked the following questions:

- When was the fruit picked?
- Is it from a single tree or a row of trees?
- Is it from an old orchard or a new planting?
- When is the fruit ripe?
- How long does it keep?
- Is the tree upright, spreading or willowy?
- Does it bear on the shoot tips?
- Is it damaged by scab or mildew?
- Is it good fresh?
- Is it good cooked?

This information, published in the summer issue, is being printed again for the benefit of new members. And for those of you who have loaned your newsletter and need the information.



DIRECTIONS TO TUKWILA COMMUNITY CENTER

I-5 Northbound: exit 156 (Tukwila, W Marginal Way) Stay in right lane & take Tukwila exit.

Turn left onto Interurban Ave continue north for .4 miles turn right onto green bridge at light.

Take first right into Community Center lot.

I-5 Southbound: exit 156 (Tukwila, Interurban Ave) turn right onto Interurban Ave continue north for .6 mile, turn right onto green bridge at light, take first right into Community Center lot.

VOLUNTEER VOLUNTEER VOLUNTEER

Volunteers are needed to help in several areas: selling tickets at the door, the education table, membership table, fruit tasting table, setting up Saturday morning, taking down Sunday after the show. It's a lot of fun and you get free admission. Where would you like to help out? Let someone know.

To volunteer call:

Set up or take down:	Orel Vallen	(206) 772-2119
Education Display:	Dick Tilbury	(206) 723-9009
Membership table:	Evelyn Troughton	(206) 282-6191
Door tickets:	Evelyn Troughton	
Tasting table:	To Be Announced in October	

Remember, many hands make light work. And this is a good way to get to know your fellow members.

1998 FALL FRUIT SHOW

SATURDAY OCTOBER 17
9:30 A.M. TO 5:00 P.M.

AND

SUNDAY OCTOBER 18
10:00 A.M. TO 4:00 P.M.

at

Tukwila Community Center
12424 42nd S
Tukwila

LOTS OF FREE PARKING
ADULTS \$3.00
CHILDREN UNDER 16 FREE

SATURDAY PROGRAM

10:30 a.m.	George Pinyuh	Starting a Fruit Garden
1:00 p.m.	Bob Glanzman	The Latest on Kiwis
2:30 p.m.	Ciscoe Morris	Stump Ciscoe

SUNDAY PROGRAM

10:30 a.m.	Orel Vallen	Apple Maggots
1:00 p.m.	Kristan Johnson	Fruit Espaliers
2:30 p.m.	Scott Connor	Edible Landscaping

CONTINUOUS BOTH DAYS

FRUIT TASTING APPLE IDENTIFICATION MASTER GARDENERS

MEMBERS FRUIT EXHIBITS COMMERCIAL EXHIBITS

APPLE MAGGOT DISPLAY

'PRINCE OF PEACH'

by Greg Atkinson

When Jon Rowley came into my kitchen a few weeks ago with two peaches and a funny looking device called a refractometer, I knew something big was happening.

A refractometer is the device that wine makers use to measure the sugar in grapes. A drop of juice goes on the tool, and when it's held up to the light, an instant reading indicates the degree of ripeness based on Brix levels. Higher Brix levels mean higher sugar content.

"We can tell at a glance if the tree has been successful at doing its job of producing ripe fruit," Rowley said. The peaches were from Frog Hollow Farm in California and I had high hopes for them. Last year, when Rowley spearheaded a drive to get tree-ripened frog Hollow Farm peaches into consumers' hands through Queen Anne Thriftway's Peach-O-Rama, the response was universally ecstatic.

"These are early peaches," he said. "And they won't be as good as the peaches that come along a little later in the season. But you can see there is no green at the stem end, and they're showing some nice deep golden color." He cut into the peach and, standing a foot away, I could smell it. My mouth began to water.

"Most commercial peaches have a Brix rating between seven and 11," Rowley said. "We're looking for something in the neighborhood of 13 or 14. Thirteen is our minimum standard, and a lot of our peaches last summer went over 17." A 17 on Rowley's Brix scale for peaches is defined as: "Unbelievable peach. almost goes beyond the human threshold for pleasure."

He put a drop of the abundant juice on the refractometer and held it up to the light. "Well that's better than I expected," he said, passing the tool over to me. I held it up to the light and read the numbers. It was like looking through a spyglass at a graph. The line rested somewhere between 14 and 15, somewhere between excellent and extraordinary on the Brix scale. Finally, I tasted the peach. It was, just as the device had indicated, somewhere between excellent and extraordinary.

Rowley is a Seattle based broker and consultant whose greatest claim to fame is the development of the Copper River salmon phenomenon. He recognized back in 1982 that a good, possibly great thing was going largely to waste when wild King salmon from Alaska was getting pressed into the holds of fishing boats and sloshed around with bilge water before it was sold at a fraction of its real value to salmon canneries.

"I persuaded my fishing buddies that if they could handle the fish properly, I could market it for them as premium fresh fish and get them a better price." So the fish were bled as soon as they were hauled aboard and immediately

iced. The result was a premium commodity that has become a Northwest rite of spring.

When Rowley turned his attention to produce, foodies in the know paid close attention. "It took me about two years to find the kind of peaches I was looking for and to set up a way to get them into stores undamaged," Rowley said. First, he logged more than 2,000 miles—going from farm to farm—looking for the right peaches. He settled on two, Pence Orchards in Washington and Frog Hollow Farm in California. Then he had to develop a way of shipping and handling ripe peaches without damaging them.

"We used the analogy of eggs." Too firm a grasp while picking the fruit or piling the fruit in too many layers would result in an inferior product. So experienced pickers with a "quick, gentle hand" were drafted, and new packaging was commissioned so the peaches could be boxed in a single layer. Handling instructions specified that peaches never be refrigerated. Instead, they are allowed to ripen at ambient temperatures, typically in a cooler that is turned off.

It all sounds simple enough but the shift has been every bit as radical as the new way of handling Copper River salmon was 15 years ago. Picked green and packed in crates several fruits deep, then held in cold storage, peaches sold in supermarkets are generally not worth the bother. They are almost invariably hard, mealy or otherwise unpleasant in texture. And they are uniformly flavorless, as far removed from what peaches ought to be as canned salmon is from fresh Copper River salmon.

As the weeks of peach season rolled by, I stopped in again from time to time, trying each new variety as it came into season. Each variety is on the market for about two weeks. With each sampling, I was blown away, and I wasn't alone. Rowley had been sending boxes of the peaches to strategic people in the food industry and food people all over the country were beside themselves.

"Those are the peaches that you dream about," Julia Child said. "I took a box of those marvelous peaches with me on vacation to Maine. People literally could not get over the lovely taste and quality and perfume of that fruit. My sister from California said she had never had such a peachy experience! That was true of everyone who tasted them.

New York Times critic Ruth Reichel, who hosts a radio show ate a peach on the air and her New York listeners flooded Frog Hollow Farm with calls for peaches. Emmett Watson called them simply "a nectar of the Gods." And Mauny Kaseburg, KUOW-FM's Radio Gourmet, said, "This is the road to peach enlightenment...and we're now calling Jon the Prince of Peach."

(Continued on page 5)

(Continued from page 4)

Last year, Rowley's first Queen Anne Thriftway Peach-O-Rama promotion sold 62 tons of peaches in eight weeks. This year, the total could go higher. If you buy ripe peaches, handle them carefully. Don't pile them too deep in the bag because they bruise easily. And don't refrigerate them. Peaches lose some of their flavor when they are cold and a few hours in the box can render them mealy or mushy.

Eat them as they are, or if you get carried away and buy more than you can eat on the one day when they are perfectly ripe, consider saving a few for a rainy day.

Greg Atkinson, Canlis executive chef, is the author of "In Season" (Sasquatch 1997). This article was published in the Seattle Times, July 26, 1998 and is used with the author's permission.

HOME CANNED PEACHES WITH VANILLA BEANS

16 "free stone peaches"
4 vanilla beans
6 cups water
3 ½ cups sugar

1. In a canning kettle or a large stock pot filled with boiling water, submerge four wide mouth, quart sized canning jars, and allow jars to simmer while contents are prepared to fill them.

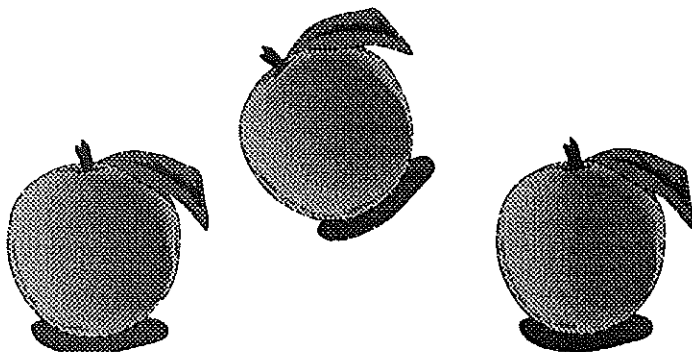
2. In a separate kettle over high heat, bring a large amount of water to a full rolling boil. Fill a sink with ice water.

3. Drop peaches, three or four at a time, into boiling water; after one minute, lift peaches from boiling water with a slotted spoon and transfer at once to sink filled with ice water. Peel peaches by slipping off skins under cold water; then cut each peach in half, and remove pits.

4. Place 7 or 8 peach halves and one vanilla bean in each sterilized jar. In a large saucepan over high heat, combine water, and sugar, and bring syrup to a boil. Pour boiling syrup over peaches, leaving ½-inch head space at the top of each jar. Seal each jar with a new lid.

5. Place sealed jars in canning kettle and when water is boiling, begin timing. Allow jars to boil 30 minutes, then, using special canning tongs, or ordinary tongs and a kitchen towel, lift jars out of boiling water bath and allow to cool undisturbed for several hours or overnight.

Canned peaches will keep for a year if stored in a cool, dark place.



A REPORT ON PLUOTS®

The ever expanding scope of the fruit industry seems to entice the creativity of breeders to develop new and intriguing fruit varieties. Some of these delicious new types of fruit promise to create new opportunities for the tree fruit grower. Zaiger Genetics has introduced the Pluot®.

Pluots® are "interspecifics"—complex hybrids of two or more fruit species. Pluots® interspecifics are derived from plum and apricot, have predominately plum parentage and smooth skins like plums. The complex, intense flavor is unique to interspecifics, much like a blend of fruit juices where the mixture is an improvement over any of the separate ingredients. And, the sugar content is much higher than in standard varieties.

Pluots® require pollenization and although compatibility of certain pollenizers has been confirmed, the ability of these pollenizers to set commercial crops under field conditions has not yet been determined.

I have talked with two home orchardists whom I know have Pluots®.

Gene Lewis, a former WCFS member, and VERY knowledgeable stone fruit enthusiast has two Zaiger varieties: Flavor Queen and Flavor King at his home in Seattle and a Flavor Supreme from Bear Creek Nursery at home and in eastern Washington. He says they have not been prolific bearers thus far on this side of the mountains. The Flavor Queen, which has been part of his orchard for four or five years, ripens about mid August, Flavor King about two weeks later. Gene said he grafted another plum on each tree for pollination "so there would be no excuse"

The Flavor Queen produced 4 or 5 fruit this year. Gene said the size of the tree doesn't warrant the small harvest. It is about 12' tall with a 15' spread, the trunk about 4½". He says he'll give it another year.

The Flavor King produced 3 small fruit this year, its first year of bearing, it is about 6' tall, the trunk about 1", not too many branches.

The fruit of both is "outstanding", "delicious", "excellent" he said at different times during our conversation (my mouth was watering).

The Flavor Supreme plumcot is small, mealy texture, not good tasting. It is light bearing in western Washington.

Paul Hoyme, a WCFS member living in Bothell says his Flavor Queen was not producing (he had no pollinator). The branches were brittle and prone to breaking. He cut it down to about 2' and grafted an apricot, which didn't take.

STORING FRUIT

by Eugene Kupferman

In order for fruit grown in a small orchard to be stored and consumed over several months there are a few things which much be considered. These include the type of fruit, the variety, fruit quality, maturity at harvest and the type of storage available. Half of the challenge comes in selecting and growing fruit with storage potential.

I Choosing the Correct Fruit to Grow

Apples and pears are the tree fruits grown in the Pacific Northwest which can be stored at home. The flesh of apple and pear fruit contain starch which is converted to sugar during storage. The conversion of starch to sugar provides energy for the fruit's life process. Peaches, cherries, nectarines and other "stone fruits" do not lend themselves to storage. Berries or grapes also do not last long. Stone fruits and berries do not store photosynthates as starch, thus they have no reserve and cannot be stored for long periods. Incidentally, it is the starch in apples which makes them taste like a potato when eaten immature.

a) Determine which apple variety to plant:

Variety selection is crucial to successful storage. Summer maturing varieties will not store as well as varieties which mature in the fall. For example, Summerred and Gravenstein can only be stored for one month while Red Delicious, Granny Smith, Rome Beauty or Fuji can be stored four months or longer.

Generally, apples which naturally mature in late September or October have better storage potential than those which mature earlier. For example, Gala, a variety which matures in late August in Eastern Washington, is currently the earliest maturing commercial variety. Unfortunately, Gala loses its flavor in only a few months in even the best commercial controlled atmosphere (CA) storage. On the other hand, Granny Smith, one of the latest maturing varieties, holds its flavor for many months even in less than optimum conditions.

There are many apple varieties which can be grown in Western Washington and Oregon. Many are described in the excellent bulletin by Robert Norton titled *Apple Cultivars for Puget Sound*. It is available from WSU Cooperative Extension offices under the catalog number EB 1436. This publication lists many cultivars and describes bloom dates, scab and mildew susceptibility and most relevant to this discussion, harvest date.

b) Determine which pear variety to plant:

Pear varieties are also stored commercially in Washington and Oregon. The longest storage pear grown commercially is Anjou which matures in September in the Wenatchee River Valley. It is difficult to store varieties which mature before Anjou.

Some of the early maturing pears, like Bartlett, ripen if left on the tree. However, they lack the full flavor and uniform texture of fruit which has been refrigerated before being

ripened. Commercially, warehouses will stimulate uniform ripening by storing fruit in the cold or use ethylene gas before shipment.

After proper storage at precise cold temperatures, winter pears must be allowed to ripen at room temperature for 4-7 days before they will achieve a buttery texture and juicy flesh. Even then, some individual pears fail to ripen for reasons we do not comprehend.

If after this warning you are still interested in growing and storing pears, the best varieties of European pears for Western Washington homeowners would be Comice, Bosc, Highland or El Dorado.

Asian pears are a new introduction into our diet. They are also called oriental pears, Chinese pears, salad pear and apple pear. Since they ripen on the tree and currently have only a short storage season, I will not discuss them here.

II Growing Quality Fruit; Selecting Fruit for Storage

Fruit storage is somewhat like computers—"garbage in, garbage out." Only the highest quality fruit should be stored. This fruit must be strong enough to resist the ever-present fungi. This fruit must be bruise free and without cuts or punctures. Fruit must be high in calcium and have a balanced nutrient content. Growing quality fruit requires a careful blending of fertilizer, pruning and protection.

It is impossible to give a recommendation for the amount or type of fertilizer needed. However, one can gauge fertility on the basis of shoot elongation. The best fruit is grown on a tree with balanced nutrition. Fruit bearing limbs should grow no more than 18" per season. Longer growth indicates the tree is receiving too much fertilizer. In this case, nitrogen fertilizer should be cut back significantly. Growth of less than 10" indicates a need for nitrogen fertilizer. Trees without fruit will have greater extension growth. Trees with too much nitrogen will have fruit which remains green, soft and will not store well.

Calcium sprays build strong cell membranes which resist both fungal diseases and physiological disorders. Washington soils usually have sufficient calcium, and the problem is allocation of calcium within the tree. Therefore, repeated sprays of calcium are important. One spray per season will not get enough calcium on the fruit—6-12 sprays are necessary.

Pruning is a fruit growing imperative. Pruning is an annual event necessary to produce quality fruit. Light is what makes the machine run! Light must penetrate the full canopy and not just the outside perimeter. The leaf to fruit ration affects fruit size and quality. More leaves grow bigger fruit and often higher quality fruit.

Pest control is another imperative since fruit with scab, codling moth or mildew will not store well. The moisture

retained by the fruit in storage depends upon the continuity of the skin and the natural wax (cuticle) layer. Mildew, scab and other surface blemishes provide places for moisture to exit. Therefore, this fruit will not store without shriveling.

Fungi are the most destructive organisms which attack fruit after harvest. It is very important to protect fruit from fungal organisms. Infected fruit placed in storage will at best continue to decay and at worst will spread disease onto healthy fruit. A first step is to reduce the number of fungal spores on the fruit by creating an environment hostile to the growth and spread of the decay organism. Reducing the number of spores can be done in several ways.

1. Fruit should be sprayed with a fungicide as per your WSU County Agent's advice. This reduces the possibility of infection during the growing season and reduces the number of spores in the tree canopy. However, when too much fungicide is used, the number of spores resistant to the fungicide increases, and control is reduced. Therefore, limit sprays to recommended levels and be careful as to timing of application.

2. Do not harvest fruit which has fallen to the ground as it is likely to be infected. Fruit growing close to the ground in contact with grass or soil should be considered infected as well.

3. Bruising of fruit should be avoided at any cost. Bruised fruit does not taste or look appealing. Do not store seriously bruised fruit—it will not improve in storage, rather it will deteriorate very rapidly. Bruised fruit becomes easily infected by fungi which can then go on to infect healthy fruit in storage. Bruised fruit respire more rapidly than healthy fruit and will speed the ripening of other fruit in storage. Commercial growers hire people at harvest to check the amount and type of bruising appearing on the fruit as its brought into the warehouse. It is sad to see the amount of cullage coming from warehouses which can be attributed to bruises.

III Harvest Maturity

I remember my aunt and uncle had several fruit trees. They refused to let anything go to waste, so they would try to use every fruit their trees produced. Also, they were always late harvesting to get full flavor, and by the end of harvest season they were salvaging fruit which had fallen to the ground. Delaying harvest and picking fruit from the ground are both natural tendencies, but these fruit are not suited for storage. As a consequence, all winter long we were treated to poor quality, overmature fruit. Had they harvested on time and been selective in fruit they placed in storage, we would have had better fruit.

Determining when to harvest apples and pears for storage is very difficult. The basic principle is to harvest fruit for longer-term commercial storage when fruit respiration is at a low ebb. This low ebb comes just before the fruit is ready to eat off the tree; before it develops full flavor. Once it is ready to eat off the tree there is very little starch reserve for storage. Fruit begins its final decline, the rate

of respiration increases, and it becomes increasingly difficult to store so that it will have an acceptable eating quality after storage. Fruit designated to be stored 3-4 months must be harvested well before it achieves the best edible quality on the tree, and it will develop flavor and aroma in storage, as the starch converts to sugars.

How then does one determine when to harvest? It is very difficult. Let me give you a short explanation of how the apple industry decides when to harvest. The industry has funded a laboratory to which fruit from 50-70 orchards is brought each week, starting in August. The lab analyzes the fruit for 11 different horticultural indicators including flesh color, firmness, the quantity of sugars, acids, ethylene and respiration. The lab reports are discussed by industry horticulturists at weekly meetings. The horticulturists combine the scientific information with their own experience and send out an advisory statement to the growers. This is a long way of explaining that we are dealing with a biological system influenced not only by the tree, but by weather and man. Scientists have not fully unlocked the keys to ripening.

To the backyard horticulturist, I would suggest several things you can do to determine the progress of maturity of the fruit on your tree. First, get a notebook in which you can write (and keep) notes from year to year. Start 3 weeks before you expect to harvest. You can determine the approximate harvest dates from nursery catalogs, WSU Cooperative Extension, or Master Gardeners. You will need to sacrifice a number of fruit. Pick 2-3 fruits on the south side of each tree; pick those on the sunny upper part of the tree as they mature first. Note the skin color of each fruit. The background color changes in most varieties from green to white then to yellow as the fruit matures.

I would perform a number of tests on the fruit and mark the results in your notebook for future reference. If you have several trees and are serious about fruit growing you may wish to invest in a pressure tester (about \$150). A pressure tester is a plunger with a dial. Testing the firmness of several fruits can help determine when the fruits are maturing. Remove the skin of the fruit by making two shallow cuts on opposite sides of the fruit—preferably not on the sunny side of the fruit (as this will be softer). Usually there are two tips provided with the pressure tester. Select the apple tip (the larger one) and push the plunger into the fruit while holding the fruit against an immovable object. Insert the plunger up to the mark on the tip (about ¼ inch). Record the reading from the dial and average all readings for that variety. This is your average firmness for that variety that week.

Then cut each fruit horizontally through the seed cavity. Look at the color of the fruit flesh. Most varieties will begin to change from green to white flesh as they mature. Once they are white fleshed they will not continue to increase in size. When the flesh turns yellow it is too late to store the fruit as there will be little starch.

Obtain a solution of iodine from a veterinarian and place it in a spray bottle. Spray the cut surface. Be careful not to

(Continued on page 8)

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get the iodine solution on your clothing as it will stain. When the iodine contacts the starch in the flesh of the fruit the flesh turns blue/black where starch is present and remains white where it is absent. Look at the pattern. In many fruits, and depending on the desired length of storage, 25-50% of the fruit's flesh should be blue/black when the fruit is ready to be harvested for storage. This figure is broad because the fruit variety, length of storage, and type of storage will dictate the desired amount of starch. You will notice that the starch 'clears' progressively from the core area out to the skin. A very immature apple or pear has starch all the way to the core. A very edible fruit has no starch remaining and no storage potential.

Apples and pears will get easier and easier to remove from the tree. They will begin to separate with a snap rather than being removed with broken stems.

Pears are very tricky since they do not soften appreciably as they mature. The industry uses a combination of temperature records, firmness, skin finish and ease of separation to determine harvest maturity.

In summary, you can keep track of the maturation of apples and pears by using flesh color, background color of the skin, uniform seed color, starch and firmness. Now that you have accumulated the information the decision of when to harvest must be made. Consider harvesting apples when the background skin color turns white, the starch has cleared from $\frac{1}{2}$ to $\frac{3}{4}$ of the flesh and the firmness has not dropped. Pears should be harvested when the seeds have turned a uniform dark color, fruit finish is smooth and half the starch has cleared. Again, pears will be firm at harvest and only soften after storage.

Try picking the same variety on two harvest dates a week apart and see which one comes out of storage with better edible quality. After a few seasons you'll get the hang of it.

IV Minimizing Decay in Storage

As noted above, healthy fruit are less susceptible to decay. Bruised fruit, overripe fruit, and fruit picked from the orchard floor are all candidates for decay. Fruit which has russet, scab or insects are subject to shrivel in storage. So select your fruit with great care.

Reduce decay organisms coming in on fruit by following an appropriate fungicide program throughout the growing season. Researchers have found that a spray of fungicide two weeks prior to harvest will reduce decay. Also, the application of Nutraphos 24, a nutrient spray, has also helped reduce decay.

Following harvest some orchardists have had luck with the application of a chlorine spray onto fruit in the bin. Others use a fungicide after harvest and before storage. If the storage does not have good air circulation, it is important to have the fruit somewhat dry when entering the storage room.

V Storage Techniques for Small Growers

The basic principle of fruit storage is to slow the respiration of the fruit to the bare minimum necessary to support life and still provide quality fruit after storage. This can be done by reducing the temperature. In most cases, 32° - 34° F is ideal for apples and pears. A few apple varieties like Spartan and McIntosh will suffer chilling damage at 32°F so these can be stored at 36°F. The faster the "Field heat" is removed, the colder the fruit is held and the more controlled the temperature, the longer it can be stored.

Another way to reduce respiration is to lower oxygen. This is called CA—Controlled Atmosphere storage, and 50% of Washington's commercially grown fruit goes into CA storage each year. CA storage is atmosphere modification in refrigerated rooms.

Backyard gardeners may wish to purchase a used refrigerator to keep the longest storage fruit, and use a root cellar for shorter term storage. Fruit should be dry and isolated from each other by paper wrap and enclosed in a plastic sack to prevent moisture loss. Obtain used apple boxes from grocery stores and line the box with a plastic bag. Pencil size holes should be made in the plastic bag for ventilation. Avoid having apples and pears in the same plastic bag since the apples easily give off a gaseous hormone ethylene, which will stimulate the ripening of pears. Inspect the fruit at weekly intervals and promptly remove any which have rotted as they will give off both ethylene and fungal spores.

Do NOT store apples with potatoes or they will pick up off flavors. Don't store apples with carrots or the carrots will taste funny.

In summary, choose the correct variety, grow it well, and harvest it at the proper stage of maturity. Protect it from fungi, select only high quality fruit. Use low temperature and possibly low oxygen to preserve quality.

Editor's note: Eugene Kupferman is a WSU Horticulturist at Wenatchee. The above article was prepared for Western Cascade Fruit Society at the request of Chuck Parkman and was first published in the Fall 1996 Bee Line. Dick Tilbury suggested we print it again as a timely article and sent along this footnote.

Dr Kupferman thoroughly covers the subject of fruit maturity (when to harvest) and offers excellent advice on keeping a notebook to record maturity observations and testing results. One summer we helped Jacky King at the WSU Mt. Vernon research station as she selected apples for picking and cold storage. She used the starch iodine test on a sampling of fruit from each tree to determine maturity and picking selection. This testing was done in the orchard and apples exhibiting the desired starch/sugar balance were harvested (Dr Kupferman covers this technique in his article). After transporting the harvested apples to the lab, Jacky had us run pressure tests and refractometer (sugar content) tests on representative samples of the fruit harvested. All of this test information plus taste observations were recorded prior to the apples going into cold storage. I recently asked Jacky about judging

(Continued from page 8)

apples for maturity/picking and she still considers the starch iodine test the most reliable. Christmas will be coming soon and testing for apple maturity offers the following gift selections for the avid hobby orchardist:

- a spray bottle of iodine solution
- a fruit firmness pressure tester (penetrometer) We have an Italian pressure tester purchased from McCormick Fruit Tech in Yakima
- an optical refractometer for measuring sugar content (note ads in Good Fruit Grower)
- a notebook for recording maturity observations and test data

ANNUAL FRUIT TASTING FESTIVAL

The British Columbia Fruit Tasters Association has scheduled this annual event for Sunday, November 1 from 1:30 to 4:00 p.m. It will be at Strawberry Vale Community Hall 11 High Street, Victoria.

There will be:

Fresh fruit for display and sampling, dried fruit, and unusual fruit.

Pies, cakes, jams, jellies, candies, syrups (all from fruit, of course).

Sampling of baked goodies, wines and ciders.

You will have the opportunity to evaluate new apple selections in a taste test.

A juicing demonstration and sampling.

Raffles.

A catalog table for exotic fruit stock.

How to get there:

For a day trip: the Victoria Clipper departs Seattle at 8:30 AM arrives Victoria at 11:00 AM departs Victoria at 6:00 PM arriving Seattle at 8:30 PM Round trip fare is \$89; senior \$79.

For a longer stay: The Princess Marguerite departs Seattle at 1:00 p.m. arriving Victoria 5:30 p.m. departs Victoria 7:30 a.m. arriving Seattle at noon.

For more information contact:

Cider Press editor Barbara Chernick (250) 642-5825,
Email: barbcher@islandnet.com.

NEWS FROM MOUNT VERNON

In the Spring 1995 Bee Line an announcement from Mount Vernon was made that they had acquired 500 apricot seeds from 5 different apricot varieties and selections. They were looking for interested people to help with the evaluation. This is an update on that project.

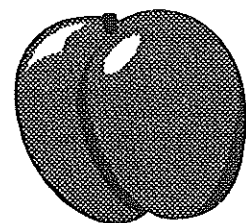
APRICOT SEEDLINGS DISTRIBUTED FOR TRIAL by Gary Moulton and Jacky King, WSU - Mount Vernon

In 1995 we first proposed the idea that, in cooperation with the fruit testing program at WSU-Mount Vernon, home orchardists could help with a research project to evaluate apricot seedlings to find any with superior disease resistance, productivity, and quality. At the research station we did not have the space to grow out a large group of seedlings, nor the time to care for them. However, we could collect seeds from some of the best performing varieties, start the seedlings, and then distribute them to interested people who would plant them at home, and report back to us as a central "clearing house" if any of the trees were promising.

The project was initiated in 1996, with seeds of Gibb, Harlayne, Stella, Southwick, HW 414, and HW 8208064. Some seeds came from the research station and some from the breeding program at Harrow, Ontario, which emphasizes disease resistance. In the spring of 1997 some 200 seedlings trees were distributed, and in 1998 about 40 more that were too small the previous year were handed out. About 75 people took part in the distribution, some taking one or two trees and others as many as 6, depending on the space they had available. They are from areas all over the Puget Sound, from Ferndale and Bellingham to Seattle and Olympia, including sites in the San Juan Islands.

Because seedlings take longer to begin producing than grafting trees, it will probably be a few years yet before any reports of promising new trees start coming in to us. In the meantime we are collecting seeds from our better varieties like Harglow, Patterson, and Puget Gold to start a new batch of seedlings for distribution in 1999-2000. We have also collected seeds from some of our Asian pear varieties and started those seedlings. If there is as much interest in the Asian pears as was shown for the apricots, we may distribute some of them too.

Editor's note: When it is announced that more seedlings are ready to find a home, I will endeavor to let you know so that you may become a "foster home" too. We hope to have a report for you on a more regular basis from Mount Vernon.



A PUZZLING BOTANICAL QUESTION

by Glenn Young

When we undertake to reproduce trees through grafting we are generally trying to achieve the benefits of a desired variety and at the same time control the size, resistance to virus and insects, and adaptation to the soil conditions in which they will be grown. This process requires that the rootstock and the scion be compatible. Also by taking our scion from adult growth we can avoid the delaying effects of juvenility and thereby produce fruit several years earlier.

Experienced grafters know that for a graft to be successful a careful matching of the cambium must be made. When we think only of the cambium layer however we fail to give enough consideration to what makes up the complete vascular system of the tree.

A tree's vascular system is far more complex than most grafters realize. The cambium lies between the phloem and the xylem and is made up of meristematic cells capable of dividing and forming new cells. The xylem is a compound tissue that helps provide support and conducts water and nutrients upward from the roots; it consists of tracheids, vessels, parenchyma cells and woody fibers. The phloem is that part of the vascular bundle consisting of sieve tubes, companion cells, parenchyma, and fibers. These form the conducting tissue which returns the carbohydrates formed in the leaves by photosynthesis to nourish the plant and its fruit.

Parenchyma cells develop from and around wounded plant tissue at the junction of the scion and the stock. This mass forms what we refer to as the callus and is vital to the healing process of a successful graft. Newly formed callus which is in line with the cambium differentiates into cambium cells that produce new vascular tissue with the cells to the inside forming xylem tissue and those on the outside forming phloem tissue. This new vascular connection between the scion and the stock is necessary to the success of the graft.

The scion used must have a bud, terminal meristematic tissue, to resume growth and to supply carbohydrates from photosynthesis to the tree and its root system. The original parts, the scion and the stock, never grow together as can be observed by taking a one or two year graft and slicing it longitudinally at a 90 degree angle to the original cut and looking at the joint. The union within the new plant is made by the addition of cells formed subsequent to the graft. No cells from the stock pass to the scion or from the scion back to the stock.

In the grafting process some of the cells in both the scion and stock are damaged and killed. The residue from these damaged cells remains in the recesses between the subsequently formed parenchyma cells and seems to secrete materials that promote rapid adhesion. Within any asexually reproduced plant where a scion other than that of the stock is used there will be some genetic difference between the scion and the stock. In most plants of the same family these differences are not readily observable. Not all cases of incompatibility are necessarily undesirable. These differences account for our ability

to bring about dwarfing and many other desirable characteristics in our trees.

In some trees, however, we can observe these characteristics in ways other than the resultant size of the tree. Translocational incompatibility can occur due to anatomical disturbance at the graft union. This disturbance can act much like girdling of the tree. I have observed what appears to be such a translocational incompatibility in apple trees in my own orchard.

In two cases, the scion has significantly overgrown the stock. The first is an 'Anna' apple that I grafted onto an 'Ein Sheimer' on 2-2-91. On this tree, the scion has an overgrowth approximately 7" in diameter whereas the 'Ein Sheimer' stock is approximately 4" in diameter. I have an 'Anna' apple grafted on 1-10-89 onto EMLA 106 rootstock that shows no overgrowth. The graft onto the 'Ein Sheimer' consistently produces larger fruit and at a much earlier date than that grown on the EMLA 106 which shows no overgrowth. Late in the season, the 'Anna'/'Ein Sheimer' starts to show a chlorotic condition that causes the top leaves of the tree to become almost white. My research indicates that this is again due to translocational incompatibility.

In the second case I grafted a 'Fuji' scion onto a 'Gordon' apple which is located only 20 feet away from the mother 'Fuji' tree. The 'Fuji' branch grew vigorously and after only five years has overgrown the 'Gordon' host stock. The 'Gordon' branch at the graft union is about 3" in diameter whereas the 'Fuji' scion branch is almost 4 1/2". The 'Fuji' branch has produced larger fruit about six weeks earlier than the tree from which I took the scion.

If both the above examples had been the exclusive growth on the plant I believe there is a reasonable chance that the trees might have been short-lived. However, the 'Anna' has 'Ein Sheimer' nurse branches that provide the nourishment to the stock and root system. The 'Fuji' has 'Gordon' nurse branches that sustain its stock and root system. Without these nurse branches the carbohydrates necessary to keep the trees alive might not have been sufficient.

The translocation difficulties resulting from decreased flow through the cellular structure at the graft union appears to have caused the increased carbohydrates to accumulate immediately above the graft causing the overgrowth. When the concentration of carbohydrates reached a point of saturation, I believe they were diverted to the fruit causing it to grow larger and ripen earlier than the same variety on a more compatible rootstock.

I know that this limited testing is not enough to prove my hypothesis conclusively. However, I have been unable even with substantial reading to find another explanation for the ripening date acceleration and increased size of the fruit. I would like to have the benefit of the thoughts of others and especially those who have made scientific studies of this most interesting phenomenon.

The author, California Rare Fruit Growers president, wrote this article for their Fruit Grower magazine, which Chuck Parkman has shared with us. Thanks Chuck.

FROM THE MAIL BOX

Western Cascade Fruit Society Editor

My wife and I are in the process of planting a two acre orchard of traditional English and French Cider apples, with the intent of producing a traditional European style cider. We are having the trees made up by Joe Beringer in Mount Vernon. The majority of budwood is coming from Mount Vernon Research Station. We would like to locate other varieties which are not in the Mount Vernon collection as potential source of budwood. Two varieties we would very much like to locate are Crimson King, a sharp and Major, a bittersharp. Are there any collectors who would like to share their knowledge and help us with putting together a Northwest directory on traditional cider apples? I would like to know who is growing what varieties and what successes or problems they are experiencing.

For those so inclined we maintain a webpage at:

<http://ourworld.compuserve.com/homepages/baylonanderson>

Many thanks for your newsletter, it contains a wealth of information for small growers.

Richard Anderson
18156 SE 42nd PI
Issaquah, WA 98027
email BaylonAnderson@compuserve.com

August 18, 1998

Evelyn Troughton, Treasurer
Western Cascade Fruit Society
2625 13th Ave W Unit 306
Seattle, WA 98119

Dear Evelyn:

On behalf of the Foundation, I would like to thank you and the **WESTERN CASCADE FRUIT SOCIETY** for the very generous donation made to the Western Washington Tree Fruit Research Foundation.

The Western Cascade Fruit Society's donation of \$2,797.00 is greatly appreciated by the Foundation. In addition to \$2,500.00 from Western Cascade Fruit Society, the foundation really values the \$297.00 in individual donations from Society members.

The funds will be put to good use by the staff at the station to support their continuing tree fruit research at the WSU Mount Vernon research station.

Larry G. Mowrer
Corresponding Secretary
Western Washington Tree Fruit Research Foundation

Editor's note: when the donation was sent to WWTFRF, the individual contributors were named.

In the summer of 1996 my wife and I, on the return leg of a trip to Turkey, were fortunate to be able to stop in London, England for a few days - our first visit.

One of the main reasons I wanted to see London, in addition to the city's many historical and cultural attractions, was the opportunity to visit the National Fruit Collection, Brogdale Horticultural Trust, in Faversham, Kent, about an hour's train ride from central London.

As a novice apple grower with 40 or so antique apple trees, I was eager to see Brogdale Farm which has the world's largest single collection of temperate stone fruits. Kent has long been considered the garden of England, and the trip out from London was a showcase of bountiful fruit, grain and cereal crops.

At Brogdale, our volunteer guide was very informative, pointing out interesting varieties, including the apple that Newton used in his famous experiment on gravity, a variety named The Maid of Kent.

All of the apple trees are grown on dwarfing root stock, and each variety has two trees, I assume for insurance in case something happens to one tree.

In August, a few of the early apple trees were ripe or nearly so, and it was a temptation not to taste the beautiful fruit, some of it already windfallen. Our guide asked us to wait until the end of the tour, when we could taste and buy some of the available ripe fruit. It was a fabulous sight to see so many different and beautiful apples in a single farm.

After the tour we had a good lunch and bought some apples, cook books and some very tasty cider.

The guided tours are offered from Easter to November, and there are fruit trees and scion wood for sale as well as exhibits and workshops throughout the year.

The Brogdale Trust has a quarterly newsletter - Fruit News. Their address is:

National Fruit Collection Brogdale Horticultural Trust
Brogdale Road, Faversham
Kent, United Kingdom ME138XZ
(0795 535286/535462)

Michael Dedrick
2110 E Mercer
Seattle, WA 98112
(see companion article on page 12)

GRAFTERS' CORNER

by Jeremy Slane

Published in Fruit News, Summer 1998
The Magazine of the Friends of Brogdale

The apple blossom this spring in the London suburbs was exceptionally heavy due presumably to the loss of crop last year to frost, and rather prolonged by cool wet weather in April and a warm sunny spell from the second week in May. Even some of my budded stocks joined in the show although usually centre buds from a budstick rarely contain blossom. Some of the espaliers formed blossom to the top buds where they had been headed back to make additional tiers. If the blossom is pinched away, the bud eventually leafs out but with several weak shoots, which should be reduced to one.

Over the last two years I have experimented with different forms of budding on apples. Experts all seem to give differing advice. The stocks were M26 and MM106. In July 1996 I used chip buds and in 1997 I used "T" buds, some with the woody part left in and some with it taken out. For me, the "T" buds were the most successful, either with the "T" at the top or at the bottom. Removal of the woody part of the bud I found beneficial.

Apples I find are the easiest to bud and an ideal starting point for beginners. The rind lifts very easily and heals well. For plums, with their rather chunky buds, chip budding I find more amenable, especially with Pixy stocks where the rind does not lift easily and tends to fragment.

In all cases my notes show that I have more success with stocks that have been planted out rather than pot grown. My attempts with Pixy stocks in large polythene pots and kept in a polytunnel were a complete failure. There was excessive bleeding when the stock was cut back. Pixy, with its weak roots, seems to be very sensitive to lack of good water levels.

I also experimented with trying to find out how soon the buds could be unwrapped. It was surprising how quickly the cambium layers united. My results seemed to indicate that four weeks was enough time and it was detrimental to leave the buds wrapped more than six weeks.

Ever the Optimist, I tried budding rather late in the season (July and August are the prescribed months). Some buds of American Mother in late September failed to grow out, but early September "T" buds were successful. The budding season for apples in the south east would therefore seem to be the 9-10 weeks from 1 July.

Notching (cutting out a crescent shaped piece of rind just above the dormant bud) is often recommended in growing apples in restricted form, but how effective is it? I find it works well if done at budburst but not at other times. Dormant buds seem to become more and more dormant as the seasons pass and notching cannot work miracles. The introduction of a "T" bud into the bare section of stem and subsequent notching produces a strong shoot even in thickish rinds, and is very useful in cordons.

I should be pleased to hear of other grafters experiences, how to prevent bleeding of stocks and any "sure fire" cures for pear midge which has plagued me this year.

J. C. Slane
4 Parkview House
Stanmore Hall
Stanmore, Middx HA7 3DT

Editor's note: Jeremy also contributes to The Bee Line

BROGDALE REVISITED

by Dick Tilbury

"...we visited the Brogdale Horticultural Trust at Faversham where we were welcomed by Dr. Joan Morgan, Brogdale trustee and co-author of *The Book of Apples*; Dr David Penell, director of the Brogdale Horticultural Trust; and Brian Self, retired from East Malling Research Station and now chairman of the RHS fruit and vegetable committee and a Friend of Brogdale.

Brogdale was formerly run by the Ministry of Agriculture and contained all the National Fruit Collection for Great Britain. Under budget constraints inaugurated by the Thatcher government the ministry decided to close the site in 1990. Through the effort of his Royal Highness The Prince of Wales (Charlie) and many others, the Brogdale Horticultural Trust, a nonprofit foundation, was formed and bought the research station to preserve the fruit collection.

The foundation depends upon donations and memberships in Friends of Brogdale for financing. Safeway Stores is

currently funding the new strawberry collection. The foundation's goals are to 1) create a Museum of Fruit, 2) develop new research facilities, 3) consolidate the collection and 4) strengthen public relations.

Brogdale covers some 150 acres and contains the largest apple collection in the world, some 2300 varieties along with 500 varieties of pear, 350 of plum, 220 of cherry as well as currents, gooseberries, nuts, medlars and quinces. New strawberry and vine collections are being added.

It was a marvelous experience to accompany Joan and Brian through the apple collection. Any apple variety that our group expressed an interest in seeing, Joan would look up the row and location in her catalog of cultivars and lead us to the tree. Joan is probably the only person alive to have tasted and cataloged almost every one of the world's apple varieties. It was truly a memorable visit.

The above is an excerpt from Dick's account of the western Europe Apple Buff's tour with Dr Norton, October 1994

SOMETHING'S IN THE AIR

A new mating disruption technique

Not so long ago, using pheromones for pest control meant spending many tedious hours in the vineyard or orchard, hanging hundreds of tiny dispensers throughout acres and acres and hoping for the best. With the new "puffer" pheromone dispenser, however, times have changed. Developed by Harry Shorey, an entomologist at the University of California-Riverside, this creative, practical, and almost effortless mating disruption technique brings the sample technology behind bathroom air freshener dispensers out into the field. And the best part—this low maintenance, affordable, and environmentally friendly pest control option could be commercially available as soon as next year.

Getting Innovative

Shorey first came up with the automatic dispenser idea in the mid-70s, when pheromone dissemination was first explored as a mating disruption technique. His search for a simple, effective means of pheromone distribution led to the puffer. "Although the prevailing wisdom indicated that the best mating disruption might be obtained through having many small pheromone evaporators placed in trees or on the crop, I wondered whether it might be just as effective to have relatively few, massive evaporators, spaced at considerable distances from each other," Shorey says. "As we got into testing this idea, it proved to be true that for the species of moths we were working on, it didn't matter whether there were many tiny evaporators spaced close to each other, or relatively few massive evaporators, as long as the critical quantity of pheromone was maintained in the insects' environment."

Too Much Of A Good Thing

Taking advantage of a moth's natural life cycle, the puffer mimics the female's mating signal, releasing a distinct scent in order to attract a male. Unlike the female, however, the dispenser fills the air so full of pheromones that it almost eliminates the possibility of a male finding a mate. "The idea behind mating disruption is jamming the signal," Shorey says. With the moths unable to mate, crops are protected from infestation by damaging larvae.

The puffer has many advantages over more conventional mating disruption techniques, Shorey says. Equivalent to 5 to 10 million moths, a single puff becomes a mile-wide swath that can move as far as 10 miles downwind and is not affected by temperature or wind velocity.

The dispenser releases pheromones at a constant level throughout the season, "so the amount of pheromone released from a 200-day can on the 200th day after it was placed in the field is at the same strength as the first puff 200 days earlier," he says. With the puffer, pheromones can also be combined into single aerosol cans, making simultaneous control of multiple pests on a crop possible.

Likely to reduce growers' pesticide costs, the puffer is relatively inexpensive and costs about \$45 to \$65 per acre for season-long control.

Outstanding In The Field

In previous research, Shorey placed one beet armyworm pheromone puffer per acre in a 160-acre block of tomatoes and in another trial, one puffer for each 50 acres in a 9-square mile area. In both experiments, Shorey got about 75% control of the beet armyworm moth egg laying.

In 1997 trials, Shorey successfully experimented with puffers to protect a range of fruit and nut crops and their common pests, including walnuts (codling moths and navel orangeworms); apples and pears (codling moths); almonds (peach twig borers); pistachios (navel orangeworms); dates (carob moths); grapes (omnivorous leafrollers and raisin moths); and peaches (oriental fruitmoths, omnivorous leafrollers, and peach twig borers). All results were promising, he says.

To The Test

It isn't always easy being an innovator, Shorey has found. While growers have been receptive to the puffer, many of his fellow researchers have expressed reservations about its scientific value. "There has been considerable skepticism among my scientific colleagues, who often don't think the puffer concept has sufficient merit to warrant the expenditure of research money in proving it out," he says. With its promising development and increasing effectiveness, however, the puffer may prove them wrong.

The latest in puffer technology is undergoing a massive season-long trial run this year with 10,000 dispensers being tested throughout the San Joaquin valley and in coastal areas near Oxnard, CA. Dispensers will be placed around the perimeter of 40-acre blocks within agricultural areas at an average of one to two dispensers per acre. Easy to install, the puffers are hung on tree branches along the borders of the blocks. "The installer never has to enter the interior of the block," Shorey says.

In a new technological twist, puffer cabinets can be attached to stakes in the ground and protect pheromones from chancel breakdown by placing them in an oxygen-free environment.

Not your typical kitchen cabinet, these storage containers have computer chips that automatically turn the dispenser off when temperatures drop to a level where the pests are inactive. The dispensers can be programmed to release pheromones at particular times, such as when the insects are most active. For the grower's convenience, adjustments can be made by remote control—much like one used for a television.

Shorey is confident about the puffer's future application. "There is a lot of excitement among growers concerning the potential for puffers in providing an easier-to-apply, manageable mating disruption system for some agricultural crops," he says.

The above article by Cynthia Greenleaf was published in the May, 1998 Fruit Grower

IMPROVED PROTOCOLS FOR OBTAINING TREE FRUIT VARIETIES

by W. E. Howell and K. C. Eastwell

Changes occurred last year that significantly improved importation of fruit tree clones into the United States. These modifications accelerate the rate at which new cultivars or clones are put into the hands of researchers, nurseries, and growers, and provide more options for importing propagation material from foreign sources.

Recent success in marketing new apple varieties such as Fuji, Gala, and Braeburn has encouraged the fruit tree industry's interest in new varieties, especially those from foreign sources. Interest in importing new selections from breeding programs and distinct sport mutations from orchards is at an all-time high. However, to help protect the industry, not only from viral agents but also from other pests and pathogens that may be hitchhiking on imported bud wood, the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) will allow importation of apple, pear, and all stone fruit propagation material only under certain conditions.

To safeguard our industry, legal entry of fruit tree propagation material into the country is only allowed by any of these three pathways:

- 1) from certified Canadian programs (import permit required);
- 2) from any of five approved European certification programs (post-entry quarantine permit and a two-growing-season observation period regulatory personnel are required; or
- 3) through one of the two approved quarantine facilities (an import permit is held by a scientist at each site) at USDA Agriculture Research Service (ARS), Beltsville, Maryland, and National Research Support Project Number 5 (NRSP-5, formerly known as the Interregional Project-2 [IR-2] at Washington State University's Irrigated Agriculture Research and Extension Center (WSU-IAREC), Prosser.

The time required for bud wood to be released from quarantine depends upon the pathway. If cultivars of interest are found in one of the approved foreign certification programs, the importation process can occur as quickly as ordering them from a local nursery, but with considerably more paperwork. The convenience relies on the good fortune that someone in that other country invested the time and resources to have the cultivar tested and approved for the foreign certification program.

Most of the less-known cultivars or selections cannot be found in one of the approved certification programs, in which case the selection must be imported through facilities at Beltsville or Prosser. In the past, this entailed long delays before the sponsor would receive the bud wood.

IMPROVED PROTOCOLS

Advances in disease diagnosis, especially those for phytoplasmas, ushered in the most recent improvements in protocols for importation of foreign introductions. Apple

proliferation phytoplasma is an agent of great quarantine significance. This phytoplasma, which has not been detected in North America but spreads naturally in Europe, causes witches' broom, poor tree growth, and poor fruit development. In addition, it is difficult to detect the agent with standard techniques at importation facilities such as those at NRSP-5 and USDA-ARS. Since it is readily eliminated by heat therapy, NRSP-5 has been required in recent years to perform heat therapy on all imported fruit tree cultivars to ensure that this agent is not introduced through the importation program.

As a result of this policy, all clones were subjected to heat therapy, even those that tested negative for pathogens in all tests. This prolonged the residency time of accessions in quarantine, and some participants in the fruit tree industry expressed concern that heat therapy may induce genetic change in some clones.

In response, a collaborative research effort by scientists in Washington, California, Maryland, and Germany validated new polymerase chain reaction detection procedures for this and other phytoplasmas. Results of these tests indicate that apple proliferation can be quickly detected in dormant bud wood collected from diseased trees.

Furthermore, trees propagated from this bud wood tested negative during the following spring and autumn, suggesting that apple proliferation cannot readily survive in fully dormant bud wood. Therefore, in combination with improved detection methods, it is safe to import material without heat therapy, if the wood is collected from fully dormant trees.

This strategy may apply to the safe importation of all pome and stone fruit propagation material from countries known to have any one of several phytoplasmas. APHIS now requires the NRSP-5 importation facility to test for phytoplasma by polymerase chain reaction, but no longer requires every item to undergo heat therapy.

FOUR MONTHS

This change means that when tests for pathogens in imported material are negative, bud wood could be released from quarantine in four months. For example, a virus-free apple cultivar received at NRSP-5 from Japan in January can be released as early as May on a provisional basis. Pome fruit from areas where apple proliferation is found, such as Europe, and all stone fruit selections would be available for provisional release in August or September.

The provisional release allows the sponsor to evaluate and propagate the material at a state-approved site until subsequent testing confirms the absence of disease agents.

If an accession tests positive for disease agents, release

(Continued on page 15)

(Continued from page 14)

from quarantine will be delayed. Positive-testing clones could be handled in any of three ways:

- 1) destroyed
- 2) subjected to heat therapy to remove the contaminating disease agent, or
- 3) for non-toxic viruses, released for observation at a test site approved and monitored by the appropriate state department of agriculture.

Because of the time required for heat therapy, the first release of heat treated clones will be delayed by one to two years depending upon success of the therapy treatments. During therapy, heat treatment and growout of the shoot-tip propagated trees requires eight to ten months. The propagated trees must then be re-tested for disease agents. If tests are negative, bud wood can be released to the sponsor on a provisional basis as described above. Additional test results must be completed before unconditional release is provided.

OBSERVATION BLOCK

The current permit protocols also afford the opportunity for a quarantine observation block to be established at WSU-IAREC, Prosser. Fruit tree selections for this block require testing only for disease agents that spread rapidly in the field such as phytoplasma, nepoviruses, and plum pox virus. Accessions that test negative for these agents could be planted into the quarantine observation block and their horticulture characteristics evaluated over the next several years.

Several specifications for the block are required, including isolation, escorted access routing inspection by NRSP-5 and the Washington State Department of Agriculture personnel, etc. Although this block has been approved and considered, neither the block nor funding for it have been established. It appears that an observation block may not be needed at this time because of the other improve-

ments made in the plant importation protocols.

Over the last 12 years, plant importation times have been reduced significantly. Prior to an importation site being established and funded by service fees at NRSP-5, importation often took three to ten years. At NRSP-5 the quarantine time averaged around 1½ years before first releases were made. With the new protocols established this year, importation sponsors can anticipate receiving bud wood of their disease-free selections during the first growing season.

Additional improvements and time reductions in the quarantine facility will be, as in the past, directly related to research in this area. Present improvements are a result of research lead by scientists at WSU-IAREC, Prosser, in cooperation with NRSP-5 and scientists from other fruit-growing areas in this country and abroad. Much of the research has been funded in part by the Washington Tree Fruit Research Commission, by the nursery industries in Washington, Oregon, and California, and by Washington State University. As evaluation of new cultivars becomes more important to the fruit tree industry, it is imperative to continue research in the area to verify and improve plant introduction protocols.

Use of these improved protocols is not restricted to foreign clones. NRSP-5 uses the same or similar procedures for promising fruit tree clones from domestic sources to help them qualify for state supervised certification programs. Certified stock helps growers avoid problems with graft-transmissible disease. It also helps with the international exchange of domestic and foreign cultivars.

Bill Howell is Manager, National Research Supports Project-5 (NRSP-5), and K. C. Eastwell is Director, NRSP-5. This article appeared in Good Fruit Grower, February 1, 1998.

THE RARE FRUIT GARDEN

In 1997 your Board voted to donate \$500 to help establish a Rare Fruit Garden in Puyallup, again this year the Board voted an additional \$500. The Garden, located on Pioneer, across the street from the Experimental Station, is open Sunday and Wednesday mornings. They are looking for more volunteers so they can extend their hours.

Ed Jones, Tahoma Chapter, has sent the following information.

Plants, donated and purchased, are:

- Persimmons — Meader, Slate and Izy
- Paw Paw — Prolific, Mango and two seedlings
- Figs — Mission and Negronne
- Arguta — Anna-a female and male, US 119 Citrange
- Keraji Mandarin, Razzlequat, Car-Norte Avocado,
- E George Fejioa, Serviceberry, Medlar, Black Currant,
- Gooseberry, and Seaberry.

They have ordered a sign "Rare Fruit Demo Garden" and inscribed "Sponsored by Western Cascade Fruit Society" and our logo is included, which should be in place in the next couple of months.

All trees will be identified by specie and variety, and as either purchased or donated. Research is under way for appropriate signs. The area they have is not large as they have few plants, but they have been promised more space, up to two acres, as they acquire more. Cold hardy, supposedly, plants selected include the donut peach. They are ever on the lookout for plants that will survive the climate.

To get there: southbound on 512, exit on Pioneer and continue west through Puyallup past the Methodist Church (location of Spring Meeting) about one mile. Look for Master Gardener demo sign on right.



A HANDY GUIDE TO YOUR LOCAL COUNTY EXTENSION OFFICES
For Your Information and Convenience

WSU Cooperative Extension Clallam County
223 E 4th Street
Port Angeles, WA 98362-3098
360-

WSU Cooperative Extension Clark County
11104 NE 149th St Bldg C Suite 100
Brush Prairie, WA 98606
360-

WSU Cooperative Extension Cowlitz County
Administration Annex
207 4th Ave N
Kelso, WA 98626
360-

WSU Cooperative Extension Grays Harbor County
P.O. Box 552
100 W Broadway
Montesano, WA 98563
360-

WSU Cooperative Extension Island County
P.O. Box 5000
501 N Center
Coopeville, WA 98239-9751
360-

WSU Cooperative Extension Jefferson County
201 W Patison
Port Hadlock, WA 98339-9751
360-

WSU Cooperative Extension King County
700 5th Ave Suite 3700
Seattle, WA 98104-5037
206-296-3900

Center for Urban Horticulture
P.O. Box 354115
3501 NE 41st St
Seattle, WA 98195-4115
206-296-3900

WSU Cooperative Extension Kitsap County
614 Division St MS-16
Port Orchard, WA 98366
360-876-7157

WSU Cooperative Extension Lewis County
Courthouse Annex
345 W Main
Chehalis, WA 97542
360-

WSU Cooperative Extension Mason County
North 11840 Hwy 101
Shelton, WA 98548
360-

WSU Cooperative Extension Pacific County
P.O. Box 88
South Bend, WA 98586-0088
360-

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BENDING TO PRESSURE

Bending Over Backwards to Increase Yield from Western Fruit Grower

Leo Dietrich, an apple grower from Conklin, Michigan has tried bending the leaders on some two-year-old trees to control tree vigor and possibly increase yields as well.

In a planting of Northern Spys on Mark rootstock, he went through the orchard in mid to late April before blossom and bent the leader over at a 180° angle. The leader was tied to a nail driven into the trunk about 4 inches above the ground at a 10° angle.

The trees were left in this position for about one month until the first of June. The leader was then untied and bent back over 180° in the opposite direction and tied down again, reversing the procedure.

It was left in that position for another month and on about July 1 the leader was returned to an upright position and fastened to the bamboo stake with a tape gun. When it was returned to the upright position it had 4 to 6 inch lateral shoots that originated at almost a 90° angle to the leader.

All major scaffold branches were tied down to a 90° angle and tied to the nail using a two-ply cotton twine.

The process is rather labor intensive, but results in earlier production. More fruit spurs are formed, a difference that can be seen even in the dormant season. Varieties that respond best include Northern Spy, Gala and Fuji.

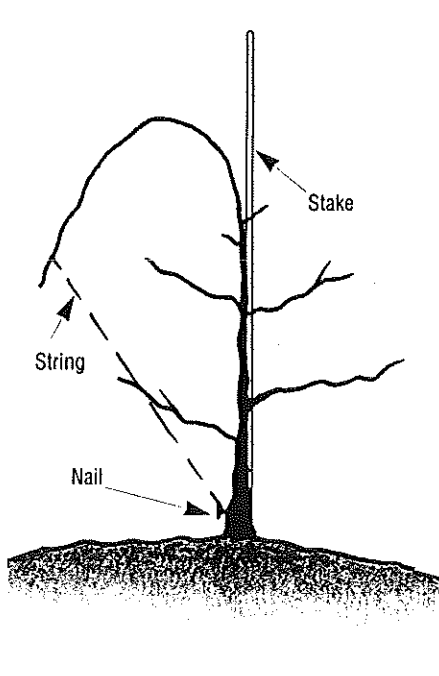


FIGURE 1
Beginning in mid to late April, Dietrich ties the leader over at a 180° angle. A string runs to a nail driven into the base of the trunk.

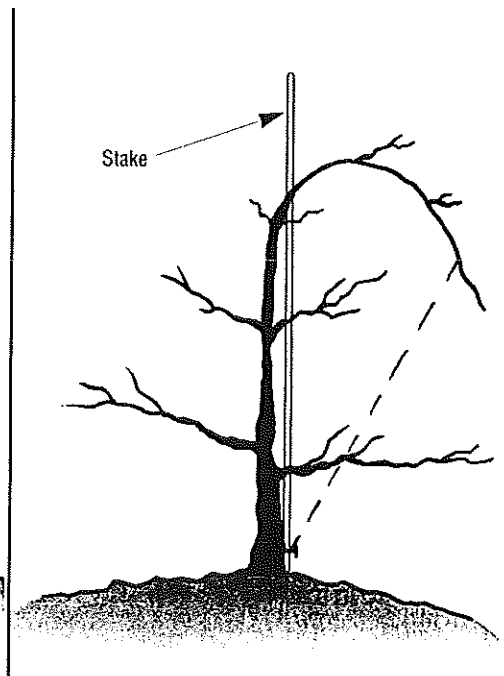


FIGURE 2
Around the beginning of June Dietrich rebends the leader in the opposite direction. As with the earlier bend, a string runs from the leader to a nail in the trunk, holding the leader at a 180° angle. Note small lateral branches developing on leader.

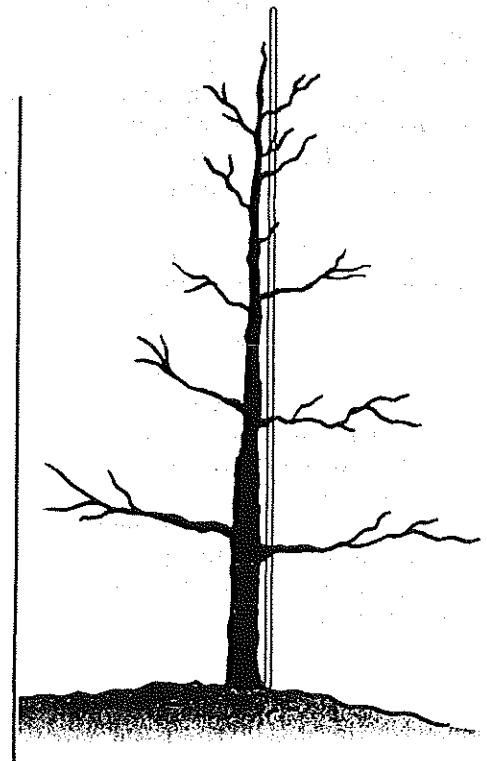


FIGURE 3
Figure 3 shows the leader after it is returned to its original position in early July. Several 4 to 6 inch lateral shoots, at a 90° angle to the leader, developed.

HARD PRESSED

by Gregory Roberts
Seattle P-I Food Writer

As apples go, the ones heaped in a bin by the Wax Orchards packing plant didn't look like much; blotchy red, lumpy and kind of on the puny side.

But to Ron Irvine, they gleamed like jewels in the sun breaks on Vashon Island - so much so that he scrambled on all fours to retrieve the smallest, apricot sized specimens as they fell through the rollers of a rinsing machine. Not a commonplace Red Delicious or McIntosh crop, the rare Kingston Black apples pack the kind of sharp, acidic juice Irvine anticipates will ferment into first-rate cider.

It is Irvine's goal to change America's attitudes about cider - or rather, to put his spin on the shift in attitudes already under way.

Not so many years ago, cider, to Americans, meant the fruity, unfermented stuff familiar from Halloween parties and harvest fairs, a drink suitable for all ages.

Also known as sweet cider, that drink sometimes is defined as the fresh-pressed, unfiltered precursor to apple juice. But commercial producers can and do use the terms interchangeably.

Nowadays, more and more supermarkets stock shelves full of "hard" cider, meaning the fermented, alcoholic kind. More and more brewpubs, too, carry draft cider-with-a-kick along with their pale ales and porters.

While still just a drop in the alcoholic beverage ocean, sales of hard cider are booming. The rapid growth of the market has attracted such industry giants as E&J Gallo, makers of the Hornsby's cider line.

U.S. commercial brands sold by the six-pack generally range in alcohol content from 5 to 6 percent, making them slightly more potent than ordinary beer and about half as strong as a typical wine. Some, including the Washington state brands Spire and Spanish Peaks, incorporate cider concentrate in their manufacture.

Prices compare to those for the premium craft beers usually sold in the same department, falling between \$6 and \$8 for a six pack.

As the packaging and store placement suggest, producers tout hard cider as a less bitter, easy-drinking alternative to beer. But Irvine has another idea. "Beer is appreciated as a recreational drink," he said on the morning he crushed his Kingston Blacks at Wax Orchards. "Wine is appreciated at the dinner table. I think cider should be appreciated at the dinner table, too.

Since 1988, Irvine has turned out a limited annual run of Centennial Cider, a 7-percent-alcohol drink corked in wine bottles at Vashon Winery.

Irvine, an author who chronicled the Washington wine industry in his book, "The Wine Project," assists in the winemaking at Vashon. He's the former owner of Pike and Western, a Seattle wine store that sells his cider for \$6.95 a 750-milliliter bottle.

For his first bottlings, Irvine, like most cidemakers, blended juice from several apple varieties. In his case, they were provided by the Washington State University

agricultural research station in Mount Vernon: Chisel Jersey, Muscat de Lense, Bulmer's Norman, Cox's Orange Pippin, Eastern Northern Spy, Pomme Gris, Sweet Alfred, Geaveston Fanny, Yellow Bellflower and more.

But fluctuations in ripening rates bedeviled his attempts at consistency, so now he's headed in a different direction. "My goal is to make varietal cider from an individual (type of) apple," he said.

Enter the Kingston Black. Irvine believes it's an apple with enough character to stand up to the flavor-eroding effects of fermentation (he's also making - with less enthusiasm - a Cox's Orange Pippin varietal cider).

After locating a Kingston Black grower on Bainbridge Island, Irvine ferried the crop to Vashon and Wax Orchards, where he borrows the cider-making equipment from the fruit processing operation owned by Robert and Betsy Sestrap.

From their initial plunge in the water rinse, the apples ride a conveyer belt to a high speed crusher, which reduces the fruit to porridgelike pulp. Wrapped in cheesecloth like soggy pillows, the pulp is stacked in a hydraulic press to squeeze out the juice.

From there, Irvine trucks the juice to the winery for fermentation in stainless-steel barrels, where yeasts convert the sugar in the juice to alcohol. After aging, the cider may be blended with unfermented juice to soften and sweeten it before bottling.

Irvine fell in love with cider years ago while traveling in England and France, where the cidemaking tradition is alive and well. It's an art that had largely died out in America, despite its former prominence.

Hard cider basically was the country's beverage of choice from Colonial times through most of the 19th century, an era when alcohol was an essential preservative. For a variety of reasons - the temperance movement, urbanization, the rise of beers cheaply produced from grains - cider withered in popularity.

Prohibition pretty much put the nail in the coffin - or barrel.

The interest in authentic, distinctive beverages that has fueled the microbrewery boom also is boosting the cider revival. Irvine, though, isn't looking to make a fortune from fermented apple juice.

"I've kind of decided, at least intellectually, that I would never be crazy enough to do this as a business," he said. "But emotionally, it drives me crazy that there is a market there and no one is really reaching it. So I've tried to encourage others by example, and maybe the big guys will move in."

Given the region's maritime climate, which provides growing conditions akin to those in the historical cider centers of western France and western England, Irvine said the time and place are right for cider.

This article appeared in the October 22, 1997 issue of the Seattle P-I.

PREPARATION OF APPLE CIDER

Prepared by Eli Gold (a WCFS member) from information obtained from Tony Gomez, Seattle-King County Department of Public Health and Drs Val Hillers and R. H. Dougherty, WSU Extension, and Dr Robert Wesley, FDA, Bothell.

Whenever fruit or fruit products (or any food) has contact with animal excreta directly or indirectly, there is the possibility of contamination with microorganisms or bacteria which can cause disease in humans. If that food is then kept at a temperature of 45° or more, there is the opportunity for the organisms to multiply and reach more dangerous concentrations. Heating liquid foods to temperature of 160° or more and holding them at that temperature for at least 10 minutes kills disease causing bacteria reducing the risk of food borne disease, but the pasteurizing process may affect the taste of the food or the content of desired heat-labile substances.

It is recommended by WSU Extension that if cider is to be

made from fallen fruit, the apples should be washed, then squeezed, pasteurized at 160° and stored at a temperature of 45° or less.

If it is desired to make fresh apple cider or juice which is not to be pasteurized, the following procedure, suggested by WSU Extension "will reduce but not completely eliminate the risk of E. coli 0157:H7". Cider prepared in this way can be pasteurized for even greater safety.

1. Use apples picked directly from the tree, not allowed to touch the ground.
2. Wash thoroughly with water containing small amount of soap or detergent.
3. Soak one minute in solution containing 1 teaspoon chlorine bleach per gallon of water, then rinse in clean water.
4. Squeeze.
5. Keep cider refrigerated.

HARD CIDER POPULARITY GROWS

The recent reported sale of the Green Mountain Winery, a.k.a. the Joseph Cerniglia Winery, for \$11 million to the Stroh's Brewing Company highlights the possibilities of a market that has been quietly growing in the past few years for "hard" or European-style cider.

A popular drink in pre-industrial age America and still a popular drink in England, France and Spain, "cider" as hard cider is referred to both in this country and abroad, is re-emerging as an alternative to beer and wine. Several dozen cideries have grown up in the U.S., including such market heavyweights as Green Mountain Winery, the maker of Woodchuck brand, and Gallo Wineries, the maker of Hornsby's. Also competing for market share here are European cideries such as Woodpecker & Strongbow and Taunton Blackthorn, along with several dozen smaller American cideries.

For the uninitiated, cider is a mildly alcoholic product (4-12% alcohol, although 5% is standard) made from the juice of apples. It is available in a variety of styles, including draft, farmhouse, French and apple wine, and can be found dry or sweet and still or effervescent. Like a sweet cider, it is made from a blend of apples. Several hundred types of blending apples are used in Europe, many of which can be substituted for with readily obtainable local varieties such as McIntosh, Fuji, Yellow Delicious and Gala. The juice of these apples, the so-called sweet and tart varieties, is often blended in the European-style ciders with 10-20% of the so-called bittersweet and bittersweet varieties.

Directing apple production towards the production of cider offers several potential benefits to apple growers, according to Ian Merwin, a professor of fruit science at Cornell University and cider aficionado. Because fruit appearance is irrelevant for apples pressed for cider, orchards dedicated to cider production are low input and amenable to organic production, requiring fewer sprays for pests and other diseases and requiring a less rigorous pruning system. E.Coli and other bacterial contamination is not a concern in

the production of cider as it is in the production of sweet cider, because the alcohol in fermented cider is naturally antiseptic. Finally, prices for the finished product: \$7-10 for a 750-milliliter bottle of artisanal cider and \$1 for a 12-ounce bottle of draft cider offer a grower-producer obvious rewards.

The ultimate question, though, is whether current market growth is sustainable. Jim Kalec, general sales manager for Mayer Brothers, an upstate-New York producer of sweet cider since 11852 and now a producer of a draft cider marketed under the "Rebel" brand, is both enthusiastic and cautious. His experience is that the cider market at this point is a microniche market, "growing, but off of an incredibly small base."

Kalec finds the product to be very popular, especially among males aged 21-30 and college students, but difficult to get distributed into markets. Although he reports that Rebel is the number one selling brand in Pennsylvania, many distributors, large supermarket chains and bars in his home-base of upstate New York are reluctant to carry the product if they already sell a competitor, typically either Woodchuck or Hornsby's.

The marketing situation may differ for ciders produced under a federal farm winery permit. Typically small in size and producers of a more individualistic product, farm-produced ciders benefit from their association with a particular orchard and orchardist, just as wines often benefit from their association with a particular vineyard and wine-maker. Although not yet tried in this country, a "route de cidre" is found in France's apple country. A cider "trail" among regional cider makers is a potentially profitable marketing strategy for farm winery cider.

The question for producers large and small, is whether cider is here to stay. With the time and money it takes to get an orchard up and into production, not to mention the cost of cider-making equipment, apple growers and potential cider makers will be asking themselves this same question.

PASTEURIZE IN A FLASH

Flash pasteurization may head off E. Coli without sacrificing fresh cider flavor.

Used to be you could pick up some apples off the ground, press them, and sell what came out. But times are changing, regulations are coming, and nothing is as simple as it used to be.

There's nothing like the taste of fresh apple cider—few will argue that. Some growers have turned to pasteurization in the interest of safety in response to the public scrutiny that resulted from *E. coli* outbreaks in 1996.

But some argue that pasteurized cider just doesn't taste like fresh. So what's the answer? Take the risk that public fear will limit sales of your fresh product, or pasteurize and sell something that many would call apple juice.

A Happy Medium

Fortunately, technology has come to the rescue in the form of flash pasteurization, which seems to be a happy medium between no protection at all and cooking the cider till it's no longer cider. Flash pasteurization accomplishes the same goal as conventional pasteurization—controlling microbes in cider—but doesn't distort raw cider's taste.

With flash pasteurization, the cider is heated to a certain temperature for a certain amount of time then immediately chilled and placed into containers. In conventional juice pasteurization, the heated juice goes into the container while it is still hot and is left to gradually cool on its own. Essentially, the juice continues to cook for a while after it has been bottled.

"The whole process is done in less than two minutes' time," says Bill Beiersdorfer of Beiersdorfer Orchard, Guilford, IN. "When we say 'flash,' it isn't like a flashbulb—so many people think it's like that."

Beiersdorfer uses a flash pasteurization system from Thermaline Inc. in Auburn, WA. He liked the equipment so much that he agreed to represent the company in the Midwest.

During the flash pasteurization, the cider travels through the pasteurizer on opposite sides of stainless steel plates on its way into and out of the system. Heat transferred through the steel preheats the cider on the way in and cools it on the way out. Very little energy is spent bringing the cider the rest of the way to the peak temperature of chilling it to the final storage temperature, says Beiersdorfer.

During the actual pasteurization, the cider is heated to 162°F for 15 seconds at a rate of 15 gallons per minute. Current research by Cornell University has shown that heating the cider to 160° for 6 seconds is enough to kill the potentially deadly *E. coli* 0157:H7. However, says Julia Stewart Daly, director of communications for the U.S. Apple Association, federal guidelines have not yet been set for either time or temperature in flash pasteurization.

Flash Pasteurization Does The Job

With a proposed rule by the FDA under evaluation by the Office of Management and Budget (OMB) that could force growers to kill 99.999% of microbes, it's crucial to

grower using the system that it actually works.

"I feel very comfortable with it," says Lloyd Hays of Hays Orchard, Columbiana, OH, who uses a milk pasteurizer for his cider. He can process up to 25 gallons per minute. The cider runs through a closed system, other than the brief time that the bottles ride along the conveyer before being filled, he says. In addition, he has made it a stern policy that workers follow the strictest regimen of cleanliness.

"We are no longer apple cider makers, We are processing plants. I have done everything in my ability to try to put out a good product," Hays says.

Eliminate Risks

But besides sanitizing your equipment and making sure your workers wash their hands, there are other safeguards that are of utmost importance to ensure the product is indeed pasteurized.

"One is a temperature recorder that records what you did and what you didn't do," says Beiersdorfer, "You can't change it. It does it automatically." But it takes more than temperature control. If the pasteurizing temperature drops below the minimum allowed, you don't want the cider to run through the system and be bottled. Therefore, it must be diverted and heated until it has reached the desired temperature.

Daly says that as the industry begins to set standards for flash pasteurization, these types of provisions should be made standard. "A time and temperature recorder should be mandatory," she says. "You need to be able to demonstrate that you've heated the cider well. Also, divert valves should be automatic, not manual.

Fresh Taste In A Flash

Some people argue that pasteurized cider just can't hold a candle to its fresh cousin. In preparation for an Indiana industry meeting last summer at Beiersdorfer Orchard, some Purdue representatives were given say-old samples of fresh and flash-pasteurized cider, and they couldn't tell the difference.

About 10 days later, meeting attendees were offered samples, and 80% picked the flash-pasteurized cider as better tasting. His answer: raw cider still had bacteria in it that over time begins to degrade the cider. In the pasteurized cider, microbes were killed and the cider was still in its uncontaminated state and so had not degraded. "I'll challenge anybody to tell the difference," says Hays.

Flash pasteurization may take care of the taste issue, but there is still the cost issue. Small producers may be able to get a system for under \$20,000, but most will have to pay more. The yet to be published FDA guidelines will determine whether that cost will be the price of doing business in the cider industry.

This article, by Laura S. Burgard, was published in Fruit Grower, March 1998

BITS AND PIECES

BIG RED GALA

Rocky Meadow Orchard and Nursery of New Salisbury, Indiana has released its newly patented cultivar, Big Red Gala. Propagation and distribution rights have been assigned to Protree Nurseries of Brentwood, California.

The new apple is a limb sport discovered in 1992 by Tina Fackler, daughter of Rocky Mountain owner Ed Fackler. As the name indicates, Big Red Gala is 30-40% larger than other strains. It has a medium-red blush. Harvest dates and times are similar to other strains.

Most evaluation of the tree has been done by Rocky Meadow, located in southern Indiana, and in central California, according to Ed Fackler. More recent plantings have been established in Ohio, Michigan, New York, Virginia, Georgia and Washington, primarily in commercial production orchards.

Big Red Gala trees have been planted in test plots at Purdue University, the University of Kentucky, Ohio State University, Michigan State University and the University of Massachusetts. Purdue's Jules Janick is looking at the apple in an effort to ascertain possible changes in genetic makeup. Initial tests indicate that it has retained Gala's diploid characteristics.

Flesh density for Big Red Gala is much greater than regular Gala apples. The typical weight of the fruit is 380 grams as compared to 20 grams for regular strains.

Protree is licensed to propagate the tree in France, Germany and Italy and will soon be licensed in Chile. Rocky Mountain has also retained propagation rights, and limited quantities of trees are available for 1999 planting.

For more information, call Ed or Tina Thackler at (812) 347-2213 or Richard Chevez of Protree at (800) 634-1671.

NORTH OLYMPIC FRUIT FESTIVAL

Presented by North Olympic Fruit Club

On October 10, 1998 from 10:00 a.m. to 3:00 p.m., the North Olympic Fruit Festival will be held in the Sequim Prairie Grange Hall on McLeary Road near Sequim, Washington.

Delectable home made apple pies hot from the oven with cheese, ice cream or just plain delicious will be available for purchase.

Admission is \$1.00 donation suggested per person or \$2.00 per family.

Videos on a variety of fruit tree problems and remedies as well as pruning tips will also be shown.

There will be apple-tasting tables available for a wide variety of locally grown apples and attendees will have the opportunity to purchase apples from bulk produced by local orchardists. On hand also will be an information booth for the local chapter of beekeepers and an exhibit of bee houses for orchard mason bees.

Those wishing to have their unknown apples identified can do so by participating in an apple naming from the Tukwila apple group the following week.

A stamped self-addressed envelope attached to the bag containing a good selection of apples along with pertinent information will net a good identification if it is possible.

For further information, contact Paul Moore at 360-683-5748 or Erik Simpson at 360-6684.

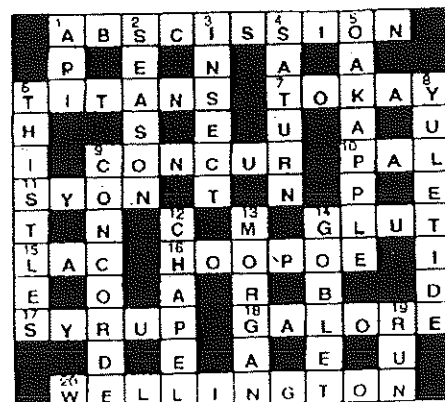
POST-HARVEST AND HARVEST GUIDE

Apple Harvesting, Handling and Storage, NRAES-112, provides an overview of current issues in harvest and post-harvest technology. The 84 page publication is the proceedings from the Harvesting, Handling and Storage Workshop, held on August 14, 1997 at Cornell University. The book will interest fruit growers, horticulturists, fruit and vegetable scientists, and specialists in related areas of agricultural engineering.

Apple Harvesting, Handling, and Storage, NRAES-112, is available for \$15 per copy (plus \$3.50 shipping and handling) from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, N.Y. 14853-5701.

Additional information or catalogues: (607) 255-7654 or Email at nrase@cornell.edu.

SOLUTION TO PUZZLE IN SUMMER NEWSLETTER



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If your address label has the renewal date highlighted in **RED**, this is your last newsletter
 if it is highlighted in **YELLOW**, your membership dues are delinquent
 if it is highlighted in **GREEN** your dues are payable before the next newsletter

The Bee Line is the newsletter of the Western Cascade Fruit Society.
 It is published quarterly; January, April, July and October and is included with membership.

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NEXT NEWSLETTER JANUARY 1999

WE WANT TO HEAR FROM YOU

Your Board of Directors needs guidance, as does your newsletter editor. So we are trying to make it easier for you. As you renew your membership would you let us know what you think. You may respond even though your membership is not due for renewal!

Are you interested in articles on vegetable or other gardening? No ___ Yes ___ What? _____

What would you like to read about? _____

Please be specific use a separate sheet if you need to

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What changes would you like to see at the Fall Fruit Show? _____

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What changes would you suggest for the Spring Sale/Meeting? _____

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What topics for speakers? _____

Is there a particular speaker you would like to have? No ___ Yes ___ Name _____

How else can we help the home orchardist? _____

What area do you have for planting, acreage (how much?) or city lot? _____

Any other comments? _____

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FALL 1998
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British Columbia Fruit Testers Association	http://www.islandnet.com/~bcfta/
California Rare Fruit Group	http://www.crfg.org/
Good Fruit Grower	http://www.goodfruit.com
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