



The Bee Line

NEWSLETTER OF

WESTERN CASCADE FRUIT SOCIETY

A NON-PROFIT EDUCATIONAL ORGANIZATION

Volume 21 Number 2

Spring-Summer 2000

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

Normal, as promised in the winter 2000 issue, is not here yet. Won't be til 2001. Blame it on millenium madness.

You may have noticed the Spring issue didn't arrive in early April as usual. You may also have noticed the dateline - above right in the masthead - "Spring-Summer 2000". The second clue!

Your editor is going to be out of the country in June/July. I am going to England and France. There was no way I could get the summer (July) issue ready before I go, and between the opera and clients and income taxes I was running late for the April deadline.

In order to make this as painless as possible (for me), and to serve WCFS members, this issue is a bigger-than-usual edition. There will be a Summer-Fall edition (also larger) early to mid September, in good time to let you all know about the 2000 Fall Fruit Show.

Look for reports on Brogdale and French orchards in the next issue.

A Message from Our President

Dear WCFS members and fellow fruit growing enthusiasts.

As most of you know, the WCFS is the "parent" organization of the chapters. Our primary function is to put on the Spring rootstock/scionwood sale and the Fall fruit show events. The chapters have meetings, tours and such, which they design for the needs of their membership. Some of the chapters hold their own spring/fall events.

Participation in the WCFS events has been declining and we need your help to reverse this trend. I suspect most of you, as I, have a particular and inexplicable love for and fascination with growing fruit and gardening in general. As with other pursuits in my life, I am drawn to groups of like-minded persons to deepen my experiences and expand my horizons.

This little outpouring of philosophy is a preamble to my request to you to help us increase your participation in and enjoyment of, our activities.

The basics of our events are:

Spring - Rootstock and scion wood sale and educational lectures, held in early March. The rootstocks are bought from commercial sources and the scionwood is contributed by the members.

Fall - Display, tasting, identification of fruit grown by members and educational lectures/presentations, held in late October.

We are open to any suggestions regarding our existing activities and new activities that would elicit your participation. What would you find interesting, informative and fun? In what ways would you be willing to organize, put on, or help in any such activities? Please respond by writing to, calling or emailing me at 4541-130th. Avenue SE, Bellevue, WA 98006, 425-747-4541(h), 425-646-4765(w), email address: primero@earthlink.net, you can also send your ideas to Evelyn Troughton.

Happy gardening,

TK Panni

DATES TO REMEMBER

Jul 15	Mt Vernon Harvest Day - Cherries
Aug 12	Mt Vernon Harvest Day - Peaches & Stone Fruit
Sept 9	WCFS Board Meeting Location to be announced
Sept 9	Mt Vernon Harvest Day - Early Apples & Pears
Oct 7	Mt Vernon Open House, Fall Field Day Late Apple Harvest
Oct 28/29	WCFS Fall Fruit Show Tukwila Community Center
Nov 4/5	North Olympic Fall Fruit Festival - Sequim

The WCFS 20th Annual Spring Meeting

The day was grey and wet. Not a good day to work in the garden or the orchard. A good day to go to Western Cascade Fruit Society's Annual Meeting, Rootstock and Scion Wood Sale.

Not everyone signed in—so we do not have a good count. Thanks to those members and 40 guests who did sign in we know you came from as far north as Vancouver BC and as far south as Rainier, Oregon. We were glad to see you.

Five visitors joined WCFS we welcome Jim Tobiason, Karen Baldrige, Sharon and Tom Charbonnel, and Carrie Little.

Officers and board members elected are:

- President-T.K. Panni
- Vice Pres-Ed Jones
- Secretary-Loretta Walker
- Treasurer-Evelyn Troughton
- 3 year term- T.K. Panni reelected
- Sharon Nowicki reelected

THE WORD WAS SPREAD BY
 Members and Friends
 The Master Gardeners
 Area Nurseries & Garden Clubs
 NW Flower & Garden Show
 Newspapers
 Our Web Site

Many thanks to all the volunteers who were at the Annual Spring Meeting. In order that none of you are slighted, this is a "class action" thank you.

And **thanks** to the Master Gardeners offering their expertise.

And **thanks** to the speakers for sharing their time and expertise.

And **thanks** to you members who attended, hope to see more of you next year.

VIDEOS AVAILABLE

Dick Tilbury writes that he thought the talks by Lon Rombough "were very informative. He did an excellent job and so did Patrick Moore."

Dick video recorded all three lectures and is willing to loan the tapes out to anyone interested.

Dick also forwarded an article written by Lon Rombough, one of the speakers, on Antique Grapes and an article by Patrick Moore on strawberries. He said it covers much of the contents of the lectures. You will find them on pages 4 to 6.

To contact Dick:
 by phone 206.723.9003,
 by e-mail at rtilury_rpt@hotmail.com.
 by US mail 4916 52nd Ave S Seattle 98118.

WCFS CONTRIBUTES TO MOUNT VERNON

At the Board meeting of March 4 the Board of Directors voted to send \$2700 representing the revenues from our Spring Sales and Fall Fruit Shows. This also included individual contributions and the balance of funds in the treasury when South Puget Sound chapter disbanded. On March 10 a check was sent to Chuck Holland, president of Western Washington Tree Fruit Research Foundation (and a member of WCFS).

These WCFS members generously contributed: C. Applegate, R. Axelson, E. Bentley, R. Bourdeau, C. Brown, J. Cannata, L. Davis, W. Durward, M. Geisenhoff, P. Gleb, S. Graves, R. Guthrie, B. Hager, B. Haight, J. Haight, O. Heuscher, M. Johnson, D. Jones, K. Kahn, E. Larcom, R. Leahy, R. Luce, V. Lunzmann, L. Macaraeg, B. McNeil, E. Mildenberger, C. Modena, M. Mullen,

K. Nahurian, C. Perry, C. Petersen, C. Ploeger-Dizon, M. Ryherd, G. Schneider, J. Springer, T. Tobin, R. Tripp, D. Tuma, M. Worthington.

A letter from WWTFRF Corresponding Secretary dated March 20 was received by WCFS Treasurer, Evelyn Troughton.

Dear Evelyn,

On behalf of the Foundation, I would sincerely like to thank you and Western Cascade Fruit Society for the very generous annual donation made to the Western Washington Tree Fruit Research Foundation.

The Western Cascade Fruit Society's donation of \$1663 is greatly appreciated by the Foundation. In addition to \$1663 from WCFS the Foundation really values the \$741 in individual donations from the 39 WCFS members who gave so willingly over

the past two years.

I will write to Susan Barrett and Timothy Driver, CO-Presidents and Robert Smith, Treasurer to let them know that the money for the South Puget Sound Chapter has been received by the Foundation.

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.

Sincerely yours,

Larry Mowrer

NEWS FROM THE CHAPTERS

NORTH OLYMPIC FRUIT CLUB

Elected officers of North Olympic Fruit Club for the next year are:

President Robert Chisick
 Co-Vice Pres. Ken Loghy
 John Raske
 Co-Secretary Nancy Loghy
 Karen Raske
 Treasurer Larry Barello

Robert sends word that North Olympic will be doing a chip bud exchange/grafting this summer and they have scheduled the annual potluck for August. Other plans include a field trip to Victoria to the local (BCFTA) fruit club in October and their annual Fall Fruit Festival in Sequim the first weekend in November.

He adds that they are trying to get a group order together to buy apple presses and are working on ways to increase membership.

TAHOMA CHAPTER

Officers elected at the March meeting are as follows:

President Tim Shouse
 Vice Pres. Leonard Jessen
 Secretary-Treasurer Loretta Walker

Tim also says their meeting location has been moved to the Pierce County Library Administration Bldg. 3002 112th NE—the north east corner of Waller Rd and 112th.

Ed Jones writes a monthly newsletter listing meeting dates and speakers, some information on various subjects and sometimes includes one of Loretta Walker's delicious recipes.

Their April and May meetings were on mole and critter control and were well attended. The June meeting at the new location was well attended, Mike Hughes was the speaker, his subject was rare fruits.

They are working with WSU and Master Gardeners in developing a community center across from the experimental station on Pioneer Road.

SEATTLE TREE FRUIT SOCIETY

Officers and trustees are:

President Marlene Falkenbury
 Secretary John Curry
 Treasurer Jean McGhee
 Trustees Gerry Daily
 Greg Giuliani

Marlene sends the sad news that long time member Phil Swanson died April 14 after a long battle with liver problems. Our condolences to his family.

Phil was always there to help when needed—at the sign in table for spring meeting, membership table, education table. All one needed to do was ask—even at the last moment, and he was there. We shall miss him.

The Des Moines Rotary Club will dedicate a small park in Phil's name (now called Water Tower Park). Donations are welcome to raise funds for playground equipment to finish the park. If we can raise \$500 a plaque will be permanently affixed to the equipment in the name of WCFS. The fundraising end June 28, call Marlene for more information.

PIPER ORCHARD

President Ron Schaevitz
 Treasurer Paul Donaldson

Ron reports that the "flower set in Piper Orchard was very small this year. There is little evidence to date of fruit set. We hope for the best.

On the brighter side, the Seattle Parks Department has chipped all the prunings that the work parties have created over the past three months. These chips have been placed around the bases of the younger trees. The Park Department has also mowed the orchard and promises to mow it again in late June.

As always we are looking for volunteers to help in maintaining the Orchard. Work parties for the rest of the year are: June 17, September 16, October 21, and November 18.

For more information about the Piper Orchard and the work parties call Paul Donaldson on 364-0161."

PENINSULA FRUIT CLUB

The officers terms run from December 1, 1999 to November 30, 2000.

Most recently elected officers are:

President Scott Thompson
 Vice Pres. Paul Weisdepp
 Secretary Barbara Beagle
 Treasurer Linda Macaraeg
 Trustees Mel Armstrong
 Tex Lewis
 Chris Smith

Scott writes, "The Peninsula Fruit Club continues to meet on the second Tuesday of each month at 7 p.m.. Because of the relocation of the Cooperative Extension office in Port Orchard, we are now meeting at the Thriftway supermarket on Olney Road in Port Orchard.

We have recently seen an increase in membership, monthly meetings are well attended as are special events.

In March we had a pruning clinic along the Clear Creek Trail in Silverdale. About 20 members attended as did another 20 visitors. The annual grafting show was held in Poulsbo in conjunction with the Soroptimists' annual Garden Show. The grafting show had been held in Bremerton for the past 11 years, but many of the regular attendees made the trip to Poulsbo, and many novices were introduced to the art of grafting. The grafting show then hit the road, making presentations to the horticulture classes at both North and South Kitsap High Schools.

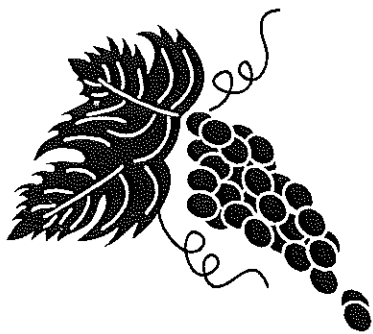
Summer plans include chip budding cherries and an orchard tour.

The fall fruit show will be held in October, although the date and location have yet to be finalized."

PLEASE RETURN NEW
 SURVEY
 YOUR IDEAS ARE
 IMPORTANT

ANTIQUE GRAPES

by Lon Rombough
California Rare Fruit Grower



The current interest in antique apples has spurred people to look for other old fruits, but they would be disappointed with antique grapes, most of which have little but historical value. I say this having done my graduate work with a grape breeder, after which I went on to collect and evaluate over 200 grape varieties, including a fair number of "antique" ones.

For real antiquity, the only truly ancient grapes are selections of *Vitis vinifera*, the species native to the Old World. Many of the oldest are wine grapes, such as Pinot Noir, which can be accurately traced back at least 1600 years in written records, and is probably older. I have one that is certainly older, if the history of it is correct. Called Monte Senario, it is supposed to have been a vine blessed by Christ. It was brought from Jerusalem to Italy by the Crusaders and starts of the vine were carried to Portland, Oregon, in the 1930s to be planted at a monastery there, which is where I got the start of my two vines. Despite such a rich tradition, the white grapes it bears lack distinct flavor and sweetness, being almost bland, and the vine is very weak.

How Old is Antique?

Antique American grapes don't go back all that far. There were few before the late 1700s, except in the far west where the mild, dry climate allowed *vinifera* to grow. Indeed, all the *vinifera* grapes are not hardy beyond zone 7 (6 in a few cases) and all are susceptible to the major American grape pests; the diseases black rot, anthracnose, downy mildew, powdery mildew; and the root insect phyloxera.

loxera.

Until the mid- 1800s, all American grapes were chance seedlings of American species discovered growing in the wild. Table grapes were a minor interest, wine being the main use for grapes in early America since that was the only way fruit could be preserved, and few American grapes even fit that use. The earliest named American grape was probably one called 'Alexander', found by John Alexander, gardener to Governor Penn of Pennsylvania, in the vicinity of Philadelphia, before the Revolutionary War. Discovered in the neighborhood of an old vineyard of European grapes, it was a blue, oval type that very likely was a natural hybrid of *vinifera* and *labrusca*. Used for wine, it passed quickly from the scene when better grapes came along.

Looking at Three Oldies

The three most widely grown American grapes—'Concord', 'Niagara' and 'Catawba'—are antiques, if you define antique as being more than 100 years old. 'Concord' was grown from seed of wild grapes by E.W. Bull of Concord, Mass. about 1845. It was a big improvement because it ripened earlier than other grapes available up to then, was vigorous, reasonably resistant to disease, and reliably productive in a wide range of conditions. But what keeps it around is that when it is cooked for juice or jelly, the flavor and color hold up. Most other grapes develop burnt or other unpleasant tastes when the juice is cooked out of them. Less commonly known, temperance advocates of the time liked it because it was unfit for making dry table wines, though it has come to be used extensively in making sweet kosher wines.

'Catawba', a red variety found about 1801 in North Carolina, was the first American grape with flavor approaching that of the European *Vitis vinifera*. It ripens late, two or more weeks after 'Concord', and is susceptible to all the grape diseases men-

tioned earlier. It was considered to have the best quality of all grapes for much of the 1800s, but there are so many now with equal quality and much better vines, that name recognition is largely what keeps it around.

'Niagara', a green grape dating from 1872, is the latecomer of the big three. It is more cold-tender than Concord, more prone to disease, especially mildew and black rot, and can be excessively vigorous in many soils and climates. Its big advantage is its heavy productivity and the fact that it ripens five to ten days before Concord. It became well-known largely through heavy advertising by its developers, the Niagara Grape Company of Lockport, N.Y.

Problems with Parentage

Even when controlled breeding of grapes began in the 1850s, *Vitis labrusca* in the parentage imparted to most varieties a strong, harsh "foxy" flavor, which can be rank, musky and biting, and the vines were only adapted to specific locales and soil types. In the wrong soil and climate many of the old types have off-flavors, are sour, hard to ripen, prone to lots of disease, and more. Some antiques in my collection are hardly edible in many years. One old hybrid, 'Massasoit' from 1856 usually makes my mouth itch (literally) but produces sweet, aromatic, decently flavored grapes about one year in ten. The rest of the time I give it to unsuspecting visitors for their first taste. After that, the rest of the collection is delicious by comparison.

'Massasoit' was one of a group of selections from a controlled cross between *labrusca* and *vinifera* made by Edward S. Rogers of Salem, Mass., in 1851. The quality of the grapes wasn't high by modern standards, but Rogers' work is the first known instance where it was shown that American grapes could be improved by crossing them with *vinifera*.

Seeking the Good Antiques

This is not to disparage all old

NEW STRAWBERRY VARIETY FOR LATE SEASON RELEASED

WSU has released its 12th strawberry cultivar, Puget Summer, a late season, fresh market berry with excellent flavor that also appears to be resistant to fruit rot.

Pat Moore, associate scientist and plant breeder at WSU Puyallup Research and Extension Center, said there was much interest in planting the new variety last spring, with several growers planting more than 50,000 plants. Because of grower interest, Puget Summer was released in only six years after the cross was made. The average time to cross release has been ten years.

Puget Summer's strength includes an excellent fresh flavor, Moore said. California can produce strawberries much more cheaply than growers in the Pacific Northwest. The only way Pacific Northwest growers can compete is to offer berries that have better flavor, so flavor is very important.

But the distinguishing characteristic of Puget Summer is when it produces fruit, Moore explained. The new berry produces fruit later than other popular varieties. This can be a great advantage to fresh market strawberry producers, Moore said. Up until two Oregon USDA varieties were released in 1998, strawberry production in the Pacific Northwest was pretty much confined to June. The release of those two varieties and now Puget Summer will extend the season into July.

Puget Summer also appears to resist fruit rot. Moore said in 1997, fruit rot for the test planting at Puyallup averaged 33 percent, and Puget Summer averaged 14 percent. In 1998, the overall average was 22.2 percent, and Puget Summer averaged 7.3 percent. This was in

unsprayed plots. The possible fruit rot resistance is of interest to growers, especially organic growers.

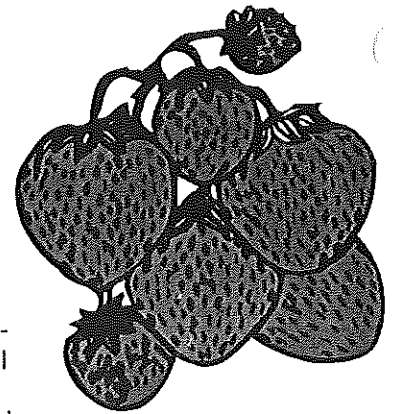
"Only time will tell how important Puget Summer will be," he said. "My guess is that it will be a variety that is grown as a major fresh market variety in the Pacific Northwest, but will not be grown as widely as processing varieties. I would highly recommend it for home gardens."

Moore has had "very favorable" responses to Puget Summer so far. This year Spooner Farms, commercial plant propagators, sold out of all its Puget Summer offerings, around 700 - 800,000 plants. He's also heard from growers who planted the new variety and all of them liked Puget Summer.

"The greatest challenge is that growers are continually saying that they need a new variety or the industry will not survive," Moore said. "If I can develop a new variety that helps the growers, that is very satisfying. Spring 1998, when I distributed some test plants, Kirk Klicker (a Walla Walla grower) was saying that this selection might be what allows their family farm to keep growing strawberries."

This article appeared in the Spring 2000 WSU "Connections" magazine as well as in WSU Week.

Submitted by Dick Tilbury with the notation "a good follow up to Pat's talk at our Spring Meeting."



CITATION COMPATIBILITY

(Continued from page 5)

Interstem

"We can't seem to make up our mind which is the best interstem," he said. "We want to be sure we pick the right one and aren't coming back to growers in five years with a different interstem."

Using interstems on cherries works the opposite of apples, Zaiger noted. The shorter the interstem used on a cherry tree, the shorter the tree. In apples, it is an inverse relationship—short interstems result in larger

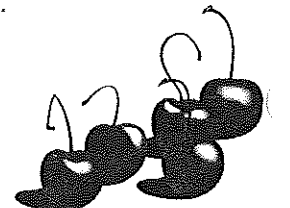
trees. "Don't ask me why it works that way. I wish I knew," he said.

He admitted that interstem trees require an extra grafting step. However, the larger fruit size on a precocious and dwarfing rootstock may pay off in the long term.

Citation trees bear fruit at a young age, around three or four years old. In California, peaches and nectarines are dwarfed to eight to 14 feet tall on Citation; apricots and plums are dwarfed to about three-quarters standard size.

According to Zaiger, Citation is quite cold hardy, and has survived winters in Michigan as well as Washington.

He estimated they are about three years away from publicly releasing an interstem to use for cherry compatibility with Citation.



grapes. 'Norton', found in 1835 in Virginia, is having a resurgence of popularity in Missouri, Arkansas and Virginia for red wine of very good quality, and the vine is extremely disease resistant in a climate that fosters lots of diseases.

"Diamond", a golden-yellow grape from 1873, has a mild, sweet, refined labrusca flavor that earned a reputation by advertising.

'Campbell Early', a black grape from the 1890s, just squeaks into the antique category. A handsome, productive grape, it far outdoes 'Concord' as a blue labrusca-type table and juice variety. Two weeks earlier than 'Concord', it colors before it is fully ripe and over-eager growers who picked it while it was still sour, soured the market in the process.

Antique vs. Modern

If you're an enthusiast, try a number of the old varieties and you might find a few that will do well in your area, but in general, the grapes bred in the twentieth century are more likely to be to your taste. Breeding programs all over the country have produced excellent table and wine grapes. From Geneva, N.Y., come varieties like spicy-sweet, super-early white 'Seneca', or flowery flavored, reddish-blue New York 'Muscat'. In seedless types, there are the white

grapes 'Himrod', 'Interlaken', 'Lake-mont', and the new 'Marquis', as well as blue 'Glenora', among the better known.

From Arkansas comes 'Mars', a seedless offspring of 'Campbell Early', plus red, reliable 'Reliance' (also seedless), and firm-fleshed, seedless red 'Saturn'.

Dwellers in cold climates rejoice in grapes from private breeder Elmer Swenson of northern Wisconsin, such as 'Swenson Red' (seeded, but my all-time favorite) and 'Edelweiss' (like the month earlier, cold-hardy, disease-resistant 'Diamond'), both hardy to -30F or hardy white 'Kay Gray', good to -40F. The University of Minnesota, building on Mr. Swenson's work, is starting to release selections, such as the new, hardy, red wine grape 'Frontenac', with several fine table grapes in advanced testing.

Then there's 'Valiant', a blue, seeded juice grape from South Dakota State U. that takes -50F and more.

In Canada, the Vineland, Ontario station has brought out such gems as firm, red seedless 'Vanessa' that resists rain damage, and 'Ventura', a white wine grape with high disease resistance and good climate adaptability.

There are others, from pro-

grams that have been phased out, such as super-sweet, blue 'Price' (my oldest son's favorite) from Virginia Polytechnic Institute, to name one. And there have been excellent new and not quite new anymore) *vinifera* varieties from the west. From the USDA in Fresno, which gave us 'Flame Seedless', comes DoVine (sic) a white seedless grape developed for raisins, but so early and sweet it's an excellent eating grape, plus releases like 'Fantasy', 'Black Emerald', and more, all seedless. To those we must add the old standby varieties like 'Perlette' and 'Delight' (both white seedless) From the University of California at Davis.

Antique grapes are fine for history buffs, but get some of the new varieties if you are a TASTE buff.

Lon Rombough, a generous contributor to the FRUIT GARDENER during the Year of the Grape, is writing a complete, practical, "hands-on" grape book due for publication this year. If you think you would be interested in the book and want to be kept informed, write him at P. O. Box 365, Aurora OR 97002-0365 or E-mail: <lonrom @hevanet com>.

Ed's Note: Lon's book is due in first half of 2001. I will check back with him regarding a group purchase.

INTERSTEMS WILL ADDRESS CITATION INCOMPATIBILITY

Good Fruit Grower May 15, 1999

Some growers interested in controlling the size of sweet cherry trees have been leery of using dwarfing rootstocks, wondering if they can produce large fruit. A fruit breeder in California has found a rootstock that can increase cherry size and control vigor, and is using interstems to deal with incompatibility.

Floyd Zaiger of Zaiger Genetics, Inc., has found Citation rootstock will achieve large fruit size in Bings and other experimental cherry selections, and depending upon variety, some trees are small enough that cherries can be harvested without use of ladders.

But there is a catch. Citation, a semi-dwarfing rootstock developed by Zaiger Genetics and used to control tree size of stone fruit, is not compatible with cherries.

Zaiger has solved compatibility problems by using interstems on Citation rootstock. Some 15 to 20 different experimental interstems made from hybrid crosses are being evaluated.

The Modesto, California, fruit breeder has been experimenting with cherry interstems for more than ten years. Some trees have been bearing for ten years, while others are just coming into production. Citation was found to "kick up" the

size and Brix of some stone fruit, like apricots and plums. According to Zaiger, Citation increased fruit one size larger in apricots and plums, and increased the sugar level as well.

"Much to our delight, when an interstem was used, Citation did the same thing when we tried it on cherries," he said, "improving size and Brix."

A handful of interstem cherry trees have been sent to Washington for trial, and expanded trials are being planted in California.

The difficulty for Zaiger is in interstem selection.

(Continued on page 6)

Apple Maggot Survey Results

Forty-six surveys were submitted during the period from Spring 1999-one response (referring to the 1998 harvest season), Summer 1999-10 responses, Fall 1999-17 responses to Winter 2000-18 responses.

Some of you reported for the 1998 harvest as well as 1999.

While these responses are not notable for a membership of our size, it does give us a peek into the spread of Apple Maggot Fly in western Washington.

Thanks to all of you who participated, your comments are interesting and appreciated.

"Over the past four years using red sticky balls (3 - 4 per tree) and yellow inside sandwich bags (sticky stuff outside) have reduced maggot infestation from 100% to 15 +/-%"
Olympia member

"I will use traps and spray Imiden regularly. I hauled over 1000 pounds of apples to the recycle. This amount was from the two trees, (Jonagold, Northern Spy) one being 46 years old."
Auburn member

Of the forty six surveys returned over the past year, two are not included in this count.

One response was "not sure", (from Orcas Island). The other respondent did not indicate where the trees are located. This survey reported there was apple maggot damage in "Akane, Alkmene, Golden Delicious, Elstar, Brown Russett, Ashmeads Kernel, Gravenstein, Jonagold, Melrose, Gala, etc. All varieties had some damage". Least affected were Enterprise, Gold Rush and Liberty. The owner did use Ore's boards-18 of them, Gempler's balls-28 of those and 8 Rebell. In 1999 spraying was not done, but in 1998 the trees were sprayed once with Imidan. In 1999 apple maggots were discovered in their Italian prunes-the tree was removed. The only "small success in a very maggoty season is that about August 20 we had to pick our Gravensteins because we were going on a trip. When we took them out of the refrigerator we found that although nearly every apple had been 'stung' the maggots had been killed by the refrigeration before they could do much damage."

THE NOES HAVE IT!

Let us hear the good news first. Twenty three respondents reported no apple maggot. Eight of them also said they had no infestation in 1998. three of them used traps, two sprayed (one of the 'sprayers' also used traps). One respondent who used traps also used an organic spray program. I am assuming that those who did not answer the traps and spray questions did not do either.

These respondents are from:

- 1 Alaska
- 2 Victoria, B.C.
- 6 from Sequim to Hoquiam*
- 5 from Bellingham to Everett
- 7 Seattle area-zips 98023, 98033, 98070, 98106, 98115, 98117, 98146
- 1 from Beaver Oregon
- 1 from North Bend

One of these respondents reported signs of tunneling in Jonathon and Jon-

agold, but had not seen any apple maggot. He mentioned Idagold and Bramley's Seedling had not been affected.

It would be interesting to hear from these folks after the 2000 harvest to see how they are doing. It would be interesting to hear from everyone to learn if the 2000 harvest is an improvement and if so, did they use traps and/or spray.

AND NOW THE BAD NEWS

Three members reported damage in 1998 -Tacoma/Olympia area- naming Akane, Jonagold and Jonathan as hardest hit, Liberty, King and Spartan as least hit. Eighteen reported apple maggot damage in 1999 - seven of them had damage in 1998 - two "very little". Two of the eighteen had no damage in 1998.

Of the varieties hardest hit, only one respondent designated which were the hardest hit, so this report details that these varieties were hit, but not the degree, in the order of times named:

- 6 Jonagold, 5 Akane, 4 King
- 2 Gravenstein, 1 each Northern Spy, Summerred, Prima, Jonathan

Least hit: 5 Spartan, 4 Liberty, 2 King, 1 each Jonagold, Gravenstein, Northern Spy, Holstein, Summerred

Sectioning the respondents into areas: north of Seattle, south of Seattle, east of Seattle and Seattle there was no particular area where one variety of apple was reported hardest hit by more than one member, or least hit by more than one member, with the exception of Spartan which was named as least hit by two respondents in the area south of Seattle.

For 1999 two members, one in Edmonds, one in Seattle -98108, commented that their situation was "complete disaster". Varieties were not named in Edmonds, no traps were used; Seattle named Gravenstein, Yellow Delicious, Granny Smith and used traps. Of the seven who reported spraying two had commercial sprayers, 3 used Diazanon, one use Imoden and one used Malathion. Eight reported using traps. Many commented that traps would

ORCHARDS OF THE WESTERN CASCADE FRUIT SOCIETY
 Fruit News The Magazine of the Friends of Brogdale Spring 2000

Friends' Brogdale Diary had announced the Western Cascade Fruit Society (WCFS) Autumn Show on October 30-31. My time-window for a Seattle niece visit was September 15-26, so no show, but I wrote to the address and made contact with Evelyn Troughton, who e-mailed a welcome. Evelyn is queen bee in the WCFS, and busy. We would meet Tuesday morning to catch the 8.40 am Bainbridge Island ferry, and she would take me to Sequim (pronounced Squim) to meet members and see their fruit collections.

Sequim is at the north east corner of the Olympic Peninsula. It is referred to as the Banana Belt, being partly shadowed by the Olympic Mountains, with an equable climate, but more sunshine than Seattle. "People who don't need the opera and the art gallery retire there." And it is good for growing fruit. Our (and their) supermarket Red Delicious are grown in eastern Washington, over the Cascades, on irrigated land which would otherwise grow scattered Ponderosa pines. Wenatchee is the apple juice capital of the world. West of the Cascades, rainfall is higher, and the water and mountain geography produces a complex pattern of mini climates. Collectors in this region are trying out fruit from wherever, to see what succeeds in their conditions.

We had arranged to meet Chuck Parkman, our local host, at the store in Sequim, which runs as a cross between a farmers' market and an old fashioned country store. Stands glowed with local apples, pears, plums and misshapen peppers and tomatoes, but we had to get on to Larry Barello's fruit collection.

Here were figs off the bush and fig conserve to take home. We plugged in to a commonwealth of fruit folk. "This plum I grew from a stone from a guy with a mink farm in Fall City." I re-encountered Seckel pear, the tiny red one you meet in farmers' markets back east. "Walt Whitman's favourite pear" says Bunyard; and its spicy sweetness transports Americans to Grandma Moses country. Among the apples was the local Chehalis (a town south of Seattle), with "juice to run down to your elbow". Larry was also trying varieties from US breeding programmes: Enterprise from Purdue, and Honeycrisp from Minnesota.

Next stop the Olympic Peninsula Master Gardener Foundation Demonstration Garden. As well as Chehalis and Gala, they were trying Akane from Aomuri, Melrose from Ohio and Freedom bred for high disease resistance and introduced to the area in 1983*. Varieties were grafted on three different stocks to demonstrate growth in their gutsy clay and there was no spraying. Mainly they were showing modern, disease resistant, heavy cropping varieties

for home garden purposes. They looked good. Dungeness crab lunch and a whiff of the Pacific preceded Chuck Parkman's own 300 apple collection. He handed me the advert for their November 6th North Olympic fruit fest, which offers a clinic as well as "hundreds of varieties of apples, pears, nuts, and other fruits for viewing and tasting" and slices of home made apple pies. "What do you do with all of them?" "A lot I juice." but Chuck also showed us his cold store, the back of a refrigerated lorry, ventilated, and fitted with an entrance chamber. It was from there that he extracted his gift to us of the early William's Pride, "new, semi-disease free variety".

Chuck purred through his orchard. "Keswick Codlin, heavy bearing, lovely flavour. Golden Nugget, the favourite eater of that old Dutch feller who used to come to our shows. Tolman's Sweet, an old apple from back east." Macoun, Lubsk Queen, Black Oxford, Merton Delight. Each was known for flavour, vigour, ripening, cropping, keeping qualities. Each also trailed its history and associations. This was a Brogdale walk eight time zones away, made possible through an entry in the Brogdale calendar. William's Pride made a splendid pinkish smush for "Peasant-girl-in-a-veil", for the niece's new folks, for my farewell meal. And we look forward to seeing Evelyn when she visits next September.

Thank you Western Cascade Fruit Society. Happy Millennium.

Catherine Olver

**Apple varieties for Puget Sound. performance trials 1963-1985. R.A.Norton & J.King. Washington State University Cooperative Extension, Northwestern Washington Research & Extension Centre, Mount Vernon, WA.*

Editor's note: In the Fall 1999 Bee Line I related the story of Catherine's visit to the Seattle area and our tour of the orchards of Chuck Parkman and Larry Barello in Sequim. Catherine reported on her adventure to our area, which I thought you would find interesting.



Catherine Olver with Williams Pride at Autumn Friends Day Brogdale

ALL M.9 CLONES PERFORM EQUALLY WELL IN ORCHARD

DIFFERENCES IN PERFORMANCE between the various Mailing 9 clone rootstocks are so small that growers need not be concerned about which clone their nursery supplies, according to Dr. Bruce Barritt, Washington State University (WSU) horticulturist.

A rootstock trial that Barritt is in charge of at WSU's Columbia View site north of Wenatchee includes several M.9 clones, along with other rootstocks the size of M.26 and smaller. It is part of a national NC-140 rootstock trial planted in 30 locations in North America.

The clones include M.9 NIC 29, developed by the René Nicolai Nursery in Belgium; the M.9 EMLA from East Malling, England; M.9 Pajam 1 and M.9 Pajam 2 from France; M.9 Fleuren 56 from the Netherlands; and M.9 NAKB 337 (often referred to as 337), also from the Netherlands, which is one of the most widely planted.

Barritt told growers at the WSU Tree Fruit Research and Extension Center's field day that they should not worry if a nursery tells them it has M.9 with a number they don't understand. "Almost all the M.9s are going to do well. They're going to be precocious and are going to give vigor control."

He said the differences between the clones in the orchard is relatively small with a variation of plus or minus 10%. The more significant differences are in how easily they can be propagated.

Barritt said a more vigorous rootstock than M.9 may be the best choice for replant sites where there are arsenic residues.

"Fifty or eighty parts per million of arsenic severely affects tree growth, and we don't generally recommend M.9 as rootstock on those kinds of sites," he said. "If you have a site without a lot of vigor, use M.26."

If there are no arsenic residues, a replant site can be fumigated with Vapam and M.9 rootstocks will perform well, he added.

Also in the NC-140 trial are Geneva 11 and Geneva 65, two new

rootstocks from Cornell University's breeding program in Geneva, New York, which were developed for their fireblight resistance. However, it appears that some of the plant material was mixed up during propagation, and the rootstocks are not what they were thought to be at the time of planting. As a result, their commercial release will be delayed.

Barritt said the fireblight-resistant rootstocks being developed at Geneva show promise. "But I'm not going to get excited about them and start recommending them until we have eight to ten years of data," he added.

The winter-hardy Budagovsky 9, which is in the trial, is becoming more widely planted, and nurseries are producing more. It is equal to M.9 in quality, Barritt said.

Asked about any problems with suckering, Barritt said it does not sucker as badly as M.7, but suckers on B.9 tend to be noticeable because the leaves are red. When grown as a tree, B.9 has red leaves.

Mailing 26 has a number of drawbacks, including a tendency to produce burr knots, and sensitivity to dry conditions and fireblight. If fireblight gets into the tree, it can travel down to the root-stock and kill the tree. G.11 should have been an alternative in that size range, but because of the mix-up will not be available for some time.

Barritt said the best alternative he has found to M.26 is Ottawa 3, which is a little smaller than M.26. However, it is extremely difficult to propagate and is not popular with nurseries. "It's hard to get something into the indus-

try that the nurseries are unhappy about," he said. "It probably won't be grown."

During the field day, growers also saw a systems trial designed to compare the Güttingen V system, with spindle trees planted at an angle; a double-row vertical system with trees planted six feet apart, and three feet between the double rows; and the Tatura trellis, in which trees are trained in a plane along wires. They were all planted at 1,000 trees per acre.

As well as comparing the different systems, Barritt is studying the effect of tree height. Half the trees are being allowed to grow to ten feet, and the other half are held at seven feet.

In Europe, most orchards are pedestrian orchards, which allow work to be done from the ground without ladders. However, Barritt said he has always felt there is a sacrifice in yield if the trees are limited to seven feet, and he believes there is also some difference in fruit quality, because every part of the tree is exposed to sunlight, which leads to sunburn.

Barritt said there is a basic principle in tree fruit science that early production is directly related to tree density and light interception. The more trees you plant, the more fruit they produce on a per acre basis.

As expected, the trees are now in the fourth leaf and only small differences have been seen between yields from the three systems.

Asked what differences he expects to see, Barritt said there are likely to be differences in fruit quality, particularly color.

MIKE SHANNON'S TIPS ON ESPALIER

BENEFITS

- Looks great in landscape
- Takes less space
- Trees are short, picking fruit easier
- More space for different fruit trees
- Easier to identify problem pests and diseases
- Easier to apply dormant & fungi sprays

DRAWBACKS

- Attention during growing season (staking, tying, summer pruning)
- Fruit quantity less, same quality
- Needs more water-mulching helps
- Fruit and tree trunk susceptible to sun scald

Mike welcomes your call for more information: sos@sinclair.net 253.373.9489

Among Sweet Grapes: Tips from a Special Vineyard

by Emily Ecker September 1999

Close your eyes and picture this. A warm September sun slants low in the late afternoon sky. The golden light bounces off a ripe cluster of grapes hanging heavy on the vine, illuminating the reds and purples of the fruit, promising a sweet juice surprise inside. The large green leaves fan faintly in the soft breeze. The foxy tang of muscat flavors the air.

You are probably wondering where you are. The south of France? A country vineyard in Italy? No. You're standing in a residential yard in Milton, a town just east of Tacoma, where David Johnson tends to a special northwest vineyard.

Johnson has been cultivating and hybridizing grapes in his 50' x 100' sideyard for just over fifteen years. In the process he's learned a lot about coaxing ripe fruit from vines in a cool wet climate that is less than ideal for good grape production.

When I first visited Johnson's vineyard in June, the clusters of tiny green bud-like flowers were in bloom. He was busy bringing pollen from the male flowers of selected vines to the female flowers of other vines he wished to cross with them. [He enjoys playing the mad scientist and especially savors varieties with muscat flavor, which he describes as "kind of like Earl Grey tea but more flowery". "Flavor," he claims, "is the pinnacle of success. If the fruit doesn't have flavor, I don't want it."

His greatest success so far is a cross he named Czar-Nicholas. This table grape produces big meaty berries that have a slight blueberry flavor. The leaves turn beautiful shades of red in the fall.

Another of Johnson's hybrids, Coignetiae x ES 2-4-7 (female), blends the vigor of a vine from the cool island climate of Hokkaido, Japan with a heartland Wisconsin hybrid created by Elmer Swenson. A cross between ES 5-14 and Orange Muscat also looks promising. He says it has the rich flavor of the Orange parent and is a lot more resistant to powdery mildew.

Johnson passed on to me some of his secrets of successful grape growing. First he chooses (or creates) grape varieties that are disease resistant and capable of ripening with the available heat in our area. Johnson's top ten grapes for cultivation in Western Washington are: Alden, Price, Canadice, NY 30454, Steuben, and Czar-Nicholas for table grapes, and Landot, Pearl de Csaba (table/wine), Ortega, and ES 5-17 x Orange Muscat for wine grapes.

He also warns that not all the varieties that are available at local garden retailers are suitable for this area. Grapes to avoid are Concord, White Reising, Thompson Seedless, Black Monukka, and Chardonnay. "It's like somebody trying to plant a cantaloupe up here. You can do it, but why bother?" Johnson explains.

Johnson's grapes are situated on a south facing slope on top of a hill. The site takes full advantage of available sunlight and has good air circulation and drainage. He brought in a lot of sand and tilled the soil well to create the ideal sandy loam soil grapes need to really grow. The slightly raised beds allow the soil to warm earlier in the spring and lengthen the growing period in the fall by letting the cold air run off to lower ground. Black river stones and plastic milk jugs full of tea are scattered here and there underneath the vines. The dark colors soak up the day's warmth and act as little heaters into the evening.

"Grapes don't like too much water or nitrogen." Johnson advises, "So plant them away from plants that are well fed like grass or vegetables." Johnson only soaks his vineyard twice during the dry season, in mid-July and again the first week of August. New vines, however, need water about once a week. He uses a fertilizer that's relatively low in nitrogen (N) and high in potassium (K), such as a 5-10-10 (N-P-K) blend. He keeps the vine beds weeded and grows garlic and asparagus here and there in his rows "to confuse root

parasites".

Johnson trains his vines on a sturdy wire trellis. The posts are about four feet high with wires at each foot. He prunes them back in the winter so that two canes (10-14 buds long) run along the second wire from the top and the ends are bent down towards the second or third wire down and tied there. The overall effect resembles an umbrella shape. Johnson cautions that there's a lot of bad information circulating on how to prune a grapevine. "So much of the so-called old country wisdom you hear over the fence is nonsense. Spur pruning, leaving very, short spurs of one to two buds, may be easy but you will get much less fruit if any."

People grow grapes for many reasons. Some enjoy the fresh fruit. Some make jelly or wine. Some just seek a little summertime shade under the arbor and enjoy the ornamental beauty of the leaves and vines. For Johnson, it's all this and more. His garden, which also includes apples, gooseberries, black currants, figs, apricots, boysenberries, quince, tomatoes, peppers and more, is his way of living out his world view. "I hate corporate agriculture, the monoculture of mass-produced genetic clones. Not only does it provide the consumer with sour grapes, but it endangers the precious genetic information within all the varieties that aren't commercially grown. I would like to see more people of modest means be fruitful. I believe in that."

David Johnson is a member of Western Cascade Fruit Society.

In 1991 he was one of the speakers at our Annual Spring Meeting, his subject "Growing Grapes in South Sound Region".

VITICULTURE BASICS FOR THE PUGET SOUND REGION

by DAVID JOHNSON

Site Considerations.

The ideal site for grape growing is a south to southwest slope with well-drained sandy loam at least three feet deep. Grapes need as much sun as you can allow the vine. While some shade is unavoidable in most yards it should only be a couple of hours in the early morning at most. The vines will grow in a shady area but will produce little if any fruit. If you have a shady yard you should consider planting something else. There should be no large trees within 20 feet of the vines since the tree roots will compete with the grape and take up the water and fertilizer applied. Our native conifers such as Douglas Fir are the worst offenders.

2. Soil Preparation.

The vines should be planted on a slightly raised bed. This allows the soil to dry and warm earlier in the spring and lengthens the frost-free period a few days in that the colder air can run off to lower ground. The ideal soil mix is a very sandy loam. Dark Stones or gravel are additionally helpful to warm the site, which helps to ripen the fruit. Clay and high organic soils are cold and slow to warm up in the spring, hence a good vegetable garden soil is not a good vineyard soil.

3. Training the vine (pruning)

I encourage people to contact me on this topic in person. It is hard to explain in print to where people "get it". However, I will suggest that in the cool northwest, vines should be cane-pruned, with two canes, each cane from 10 to 14 buds long. The american "labrusca" types like concord can handle more buds and can be pruned to a total of four canes of 10 to 14 buds long. Leaving very short spurs of 1 to 2 buds may be easy, but you will get much less fruit "if any". I will comment here that so much of the so-called old country wisdom you hear over the fence about training grapes is nonsense.

4. Support Method (trellising)

The best method to train the vine is on a wire trellis with at least 4 to 6 wires spaced along a steel or wooden post about 3½ to 4½ feet high. The canes should be run along the second wire from the top and bent down towards the ends to the second or third wire down and tied there. A "deadman" is needed at the trellis end or the post must be set in concrete. Vines should never be spaced closer than 6 feet in the row. Crowding increases disease problems such as mildew and botrytis and the mutual shading caused by overlapping leaves will lower fruit production. 8 feet is generally ideal unless you have a weak grower like Delaware or Couderc 299-35.

5. Diseases and Insects

The two most serious diseases on grapes locally are botrytis and powdery mildew. Powdery mildew can be controlled with wettable sulfur powder, which, at present is readily available to home gardeners. In general, the pure Vinifera type grapes are susceptible to powdery mildew while most of the labrusca and hybrids resist it fairly well. As for Botrytis, the loose clustered types tend to do better while the tight-clustered wine types like Riesling and Muller-Thurgau are at risk. Good air circulation that allows the clusters to dry rapidly after rain is helpful. Best to plant resistant types or refer to the WSU extension bulletin on grape disease control.

TABLE GRAPES in ripening order

1. **Interlaken** a very early yellow seedless, vine of medium vigor. One of the first to ripen and, in a hot summer can be used for raisins
2. **Pearl de Csaba** a very early muscat table/wine grape of fairly high vigor. Seeded, but less than most grapes. Pure vinifera so will need to be sprayed for mildew. Best on sandier soils
3. **Canadice** an early reddish seed

less grape with a mild concord flavor produces very full clusters and quite disease resistant. A bit more vigorous than Interlaken

4. **Don Muscat x Brandis** a new hybrid of my own breeding work. Reddish--violet clusters of very fruity berries. It is seeded, but has perfect flowers and highly flavored. Vine is fairly vigorous
5. **Glenora** a midseason blue grape that has a rich fruity flavor. Vine is vigorous with concord-like foliage. Seeded table grape.
6. **Czar-Nicholas** a midseason blue violet table grape with fairly large berries. The fruit is seeded, but less so than Concord. This variety also rates high as a fall ornamental with bright reddish leaf colors in a pattern over yellow and green.
7. **Boizeau** an unusual hybrid of vitis Coignetiae and Raisin de Palestine. The vine was grown from seed in Milton and has large clusters of medium sized dark blue berries. Vigor is medium high and the flavor is good.

WINE GRAPES

8. **Landot 4511** a French hybrid for red wine. Produces very large clusters and will need some cluster thinning. Makes one of the best red wines I've tasted from local grapes. Actually has some body and fullness.
9. **ES 5-14x Orange Muscat** an early white for white wine. Ripens very early and should do well even in cool gardens. My own cross.
10. **Siegerrebe** an early pinkish grape with high potential brix it is not all that productive, but the quality is high and can be used to blend with other grapes to pick up flavor and aroma. Pure vinifera, will need to be sprayed for mildew.

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Dick Tilbury forwarded these two articles of interest. He noted that Dr Dean Glawe heads all of western Washington research stations and has a strong desire/goal to build up the Mt Vernon station. He and Gary Moulton were in college together at WSU.

NEW ASSISTANT DIRECTOR OF DEVELOPMENT

The College of Agriculture and Home Economics (CAHE) has a new assistant director of development. Phyllis Baxter assumed her duties at WSU's Puyallup Research and Extension Center in September 1999. She reports dually to Dean Glawe, director of the Puyallup center, and to Patrick Kramer, CAHE director of development.

Baxter, formerly assistant director of development for WSU's College of Science, says her new position is a "great fit" for her. "What I enjoyed about fundraising in the College of Science was talking to people about science and WSU's research." With a bachelor's degree from UCLA in biology and a master's degree from WSU in environmental science, Baxter's strong science background coupled with her joy of interacting with people made that job a natural fit, she said.

"My new position in the College of Agriculture and Home Economics is that same ideal fit for me - working with researchers in the natural resource sciences and talking to alumni about the work they do."

In her new position, Baxter's top priority will be a major capital fundraising project for **new facilities and renovations at WSU's Mr. Vernon Research and Extension Center**. Soon, Baxter and consultant Mary Lou LaPierre will be conducting a feasibility study to determine the community's strength of support and gifting potential. Once the study is complete, Baxter will begin the fundraising campaign.

In addition to her fundraising activities, Baxter will be working closely with all of WSU's research and extension activities on the West side in an effort to increase WSU's visibility in communities and to area alumni.

"Many people don't know what goes on at our research stations and that we are working on projects with relevance to their communities," Baxter said, "My job is to help increase people's awareness of all the West side stations and be an ambassador for the College of Agriculture and Home Economics."

As assistant development director for CAHE, Baxter will be actively raising funds for student scholarships, research, teaching, and extension.

This article by Joanne Buteau was printed in the Spring 2000 *Connections*, a publication of CAHE.

WSU-MOUNT VERNON ON THE INTERNET

Welcome to our web site at <http://mtvernon.wsu.edu> where you can find information on our programs, projects, and links to other agricultural information sites. The site is currently "under construction" so that new pages for the different departments, for reports and data, and links to other sites are being added as they are put together. Please visit the site often to explore the newest updates.

At present the department page that is the most complete is the one for Fruit Horticulture. To reach it, go to the Mount Vernon station home page, point with the mouse pointer to the underlined heading **Fruit Horticulture**, and click on it. That takes you to the introductory page for the department. If you want to go direct to the Fruit Horticulture page instead, it is <http://mtvernon.wsu.edu/frt-hort/fruit-horticulture.htm>.

At the left side of the opening page is a list of items, called the navigation bar, which shows the main topics that are included under Fruit Horticulture. The navigation bar will appear on each of the subsequent pages, so that by pointing and clicking on the topic that interests you (for example, **Tree Fruit**) you can access that subject area. From that page, you can go on to the various sub-topics (apples, pears, etc) or to a new topic (say, Grapes) by pointing and clicking on the navigation bar at the side of the page.

At the bottom of each page is another navigation aid, which allows you to go back to the top of the page you are on, back to the Mount Vernon home page, or on to another topic by pointing and clicking on the underlined subject.

The main subject pages and sub-topics in Fruit Horticulture all have navigation bars allowing easy access to the information contained in them. Some of the pages that you may access, such as annual reports, bloom data, and informational handouts may NOT have navigation bars (these are usually indicated by a "spiral notebook" logo along the left margin.) To return to the previous pages from these items, point to the BACK key on your control panel and click on it. We will be adding navigation bars to all our files as soon as possible.

One of the most useful topics is one labeled "FAQ" or Frequently Asked Questions, and it is often a good idea to check that one first, since it may take you to the information you want right away. For the Fruit Horticulture department, if you think of a question that you would like to see in FAQ, please e-mail Jacky King at kingjack@wsu.edu and we will try to include it in future updates. Also if you know of other web sites that you think should be added to our "Links" page, let us know so we can check them out and add them to our site.

We hope that you enjoy exploring our Mount Vernon web site and that the information you find is useful in answering your questions.

See page 18 for more web sites

MOUNT VERNON REPORT - 1999

CHERRIES

Pollination conditions were "good enough" in the spring that most varieties set plenty of fruit for evaluation and harvest. **Angela, Viscount, Emperor Francis, Kristin** and **Hardy Giant** were reliably productive. This year both the mature cherry plot and the Gisela rootstock test plot were covered by a netting framework protecting the crop from bird damage. Two varieties on Gisela 5, **Lapins** and **Sweetheart**, produced impressive yields, **Early Burlat** and **Hudson** produced moderate to good yields.

Trees of the newer varieties and selections produced specimens for preliminary evaluation. Some late ripening sweet cherry varieties looked promising. These included **Lapins, Sweetheart, and Hudson**, also **Regina** on young trees. **Hartland** and **Attika**, both early midseason varieties produced sample fruit with good appearance and flavor on young trees. **Bing** and **Rainier** looked good, and **Rainier**, which normally produces a light crop on standard rootstocks, cropped well on the Gisela stock.

Discard: Sunburst

Most of the apricots set fruit in 1999, and evaluations were made this year on several new varieties. **Puget Gold** reliably set fruit, and though **Alfred, Harglow** and **Sunglo** did not have much fruit, the flavor and quality were good. New trees of those varieties on Citation dwarf rootstock will be planted in spring 2000 to see whether the productivity will improve when tree vigor is more restricted. Trees were rated for their susceptibility to pseudomonas infection in spring 1999, to add to our long term evaluations.

Discard: Royal Rosa

PEACH

Conditions for pollination of peaches were not at the optimum in 1999. Weather was cool, and the bloom about 10 to 14 days later than in 1998. Set was poor in many of the peach varieties in the 1994 block,

even though trees are in their sixth leaf and should be reaching mature production. Several varieties were marked for discard due to poor production. Among the early season peaches, **Sentry** had a moderate set and was again notable for good size, quality, and relatively few split pits; it ripens in mid to late July.

Reliable producers like **Harbelle, Harken, and Redhaven** consistently showed a good set of fruit. After several years on trial, **Newhaven** appears to have high fruit quality, but is only moderately productive.

In the new stone fruit block, we were able to evaluate most of the varieties planted in 1994. Unfortunately, most of the white flesh peach varieties tested in the 1994 planting cropped very lightly. **Snowbrite**, an early variety ripe about a week before **Redhaven**, is somewhat prone to split pits but attractive and tasty. **White Lady**, ripe with **Redhaven**, is very sweet and almost entirely free stone. **Sugar Lady**, about a week after **Redhaven**, had very high levels of sugar at harvest. However, we would like to see more consistent productivity in these white fleshed varieties before recommending any of them, and will continue to bring in new introductions that may perform better.

Discard: Double Jewel, July Sun, Kern Sun, Nerland, Rich Lady, Snow King, Mary Jane (Strahl), Summer Sweet, Tuma, Zee Lady

NECTARINE

At bloom time nectarines suffered the same cool, wet conditions as the peaches, and bloom was also later than usual for them. **Arctic Glo**, a white-fleshed nectarine ripe about a week before **Redhaven**, will get another look next year to see if it is worth keeping. Cracking and rot affected it this year, although fruit flavor was good.

Later on in August the warm, dry days contributed to better results with some of the midseason varieties. **Hardired** and **Tasty Gold**, both yellow fleshed nectarines ripe about 10-15 days after **Redhaven**, have been con-

sistently productive, and both are good flavored and attractive. In 1999, however, **Tasty Gold** suffered from bad cracking, and many fruits were very small.

Discard: Arctic Queen, Heavenly White, Summer Beaut, Zee Grand

PLUM

The late, cold spring adversely affected the set in many of the early-blooming plum varieties in 1999. **Beauty** and young trees of **Methley** both produced sparse crops. **Early Laxton** produced a heavy crop and fruit quality was again excellent though ripening was considerably later than usual. The two purple-leaf plums **Cocheco** and **Hollywood** both had little fruit in 1999. In the case of **Hollywood** this may have been partly due to the extremely heavy crop load the previous year.

European plums, blooming later, were little affected with respect to set, though they did ripen about 10-14 days later on average. **Imperial Epineuse, Valor** and **Victory** produced very heavy crops of excellent quality fruit, and many branches had to be propped for extra support. Trees of **Seneca** yielded a full crop of large, high quality fruit; it is still the standard for quality of the European type plums. The yellow plum tested as 'Fritz seedling' is now designated **Schoolhouse** plum; it is a productive late season variety, with flavorful fruit. Two European type plums, **Longjohn** and **Castleton**, have been introduced by Geneva. In particular **Longjohn**, ripe in early September, rated high in fruit production with distinctive long oval shaped fruit of good flavor. **Castleton** is similar to a large Italian prune, and this year suffered considerable cracking and rot. **Kirke's Blue**, an established English variety, looked promising this year; the roundish freestone fruit has dense sweet flesh suited to fresh eating, drying, and culinary uses.

Discard: Earliqueen, Vanier, 64-339, 7404-1, 8155-70, 8327-65

(Continued on page 14)

(Continued from page 13)

PEAR

Set was good to very good on most of the mature trees. Opening the season in early August was a very early variety, **Bella de Guigno**, which fruited for the first time. The pears were attractively blushed, with a light, pleasant flavor, good right off the tree. About two weeks later **Ubileen** and **Harrow Delight** followed, both with moderately heavy crops of good quality fruit. **Ubileen** has rather melting flesh with light, sweet flavor whereas **Harrow Delight** is firmer and denser in texture, and stores better. It is also consistently productive.

Young trees of **Cascade** are producing well, and so far do not show a tendency to alternate bearing. Among varieties fruiting for the first time in 1999, among the most interesting was the late ripening German variety **Forelle**, so named because the large, conspicuous white spots on the red blushed areas of the fruit are similar to those of the trout (forelle in German). We look forward to seeing how this variety performs in the coming year.

Yields of **Bosc** and **Concorde** were high, and **Conference** again had heavy yields of excellent quality, sweet flavored fruit. The latter variety is a consistent producer of excellent quality fruit that stores well, a great choice for growers in western Washington. It is the number one commercial pear in Holland and Belgium. Trees of **Cornice** on Quince A produced a moderate crop of fruit, but less than in 1998. Fruit from standard **Bosc** and from **Bronze Beauty** and **Golden Russet** strains all were fully russeted and quite attractive.

A new pear block was established with introductions of European and Asian pear varieties, along with some trees transplanted from the pear blocks that were removed in spring 1999.

Discard: **Blancia, Warren**

ASIAN PEAR

In 1999 conditions at bloom time were less than ideal, and the fruit set

of the different varieties varied from heavy to fairly light. Young trees of **Hamese #1**, the earliest-ripening variety, produced a good crop of sweet yellow-skinned fruit. **Ichiban Nashi, Chojuro, and Yongi** set a moderate crop, and ripened to good quality as the weather improved in August and September. **Shinseiki** had a lighter set in 1999 than usual. **Yoinashi** was severely damaged by *Pseudomonas* this year. In previous years it had seemed to be resistant to this disease, which also reduces bloom and fruit set in affected trees. Young trees of **Atago** are just beginning production, and look promising for high quality fruit in the late season, with tan skin, uniform size, and good flavor. **Mishirasu** produced some good fruit on young trees; these trees replace the original one which was removed in 1999.

Discard: **None**

APPLE

In 1999 fruit set for apples was good, and there were very few instances where productivity was low. Ripening dates were approximately two weeks later than 1998 due to the slow late spring, although certain varieties appeared very little affected by this difference in temperature. The latest ripening varieties were still in the orchard as late as mid November, which is quite unusual. In determining optimum harvest for a specific variety, we relied extensively on indices of starch conversion, fruit firmness, and soluble solids (sugars) as well as external color. Yields in general were good and fruit quality was high.

Early Season (Disease resistant varieties are covered in a separate section, below.)

Among the early season varieties ripe before Gravenstein that did well this year are **Sunrise** and **Homei Tsugaru**. Just after Gravenstein season, **Aroma, Alkmene, and Sansa** all were productive. In particular **Aroma** set

well but like many early varieties, variable color and ripeness make it necessary to do repeated pickings.

Midseason

Several red strains of **Gala** being evaluated produced good quality fruit this year. **Regal Gala (Fulford)** is distinguished for its size, uniformity, good flavor and even color, nearly 100% blush red. Young trees of **Royal, Ultrared, and Galaxy** strains all had very good color, as expected in small trees with high light exposure. Red color in **Scarlet Gala** was only marginally better than standard **Gala**.

Several strains of Jonagold are being evaluated for their potential in both commercial and home orchards. **Jonagored, Rubinstar, DeCoster** and **Jomured** have the most red color of the strains tested here, followed by **King (Jored)**. All of these strains yield some fruit with 100% red color, the difference being that the first four seem to produce a higher amount of all-red fruit per tree. Fruit of **King (Jored)** were very attractive this year and can sell well if a bicolor apple is desired.

In the same season, **Honeycrisp** produced large, very crisp fruit with good color. The fruit was from young trees well exposed to sun. This variety looks good for potential commercial production in our area. If harvested when fully ripe, fruit stays crisp in storage well into spring. Fruit picked too early will develop scald in storage, and it is recommended that storage temperatures be kept at 34-36° F for best results.

Fiesta, a cross of Cox's Orange Pippin very successful in our area, produced a good crop, and **Karmijn de Sonnaville**, another Cox cross, produced well although subject as usual to some sunburn and water core. Karmijn's high acid and high sugar content make it very popular as a gourmet apple. Two red strains of **Elstar** that we have evaluated since 1987 have recently been named. **Elista (Daliest) and Elton (Daliter)** both have the lively flavor of **Elstar**. We are keeping **Elista**, which usually has more highly red colored fruit.

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McIntosh Types

The **McIntosh** variety is very popular in the eastern U.S., and several strains that we are testing have done well here. **Jonamac** in early mid season, **Spartan** in late mid season, and **Empire** in the late season are great Mac crosses that adapt very well to our area. **Redcort**, a red sport of Cortland, has a unique tart flavor at first picking in mid September, and retains its firmness for later pickings; **Empire** and **Redcort** store better than the other Mac types.

The different Mac types and strains ripen at various times throughout the season. **Marshall Mac** appears to ripen about a week earlier than Pioneer Mac. Compact Mac, ripe with Marshall, is a tree of upright-columnar habit with good quality fruit, useful where space is limited. **Thorne Empire** is eye-catching with its unusual blackish-red color, and exhibits the good **Empire** flavor and keeping quality. Two new Mac types, **Mor-spur Mac** and **Improved McIntosh**, produced their first fruit in 1999 and await further evaluation.

Cider Apples

Trees in a replicated plot of cider apples -selected for hard (fermented) cider production-were harvested for pressing by a group of local cider makers, coordinated by Bruce Dunlop (360-468-4620). The plot established in 1994 contains five trees each of the varieties **Brown Snout**, **Foxwhelp**, **Muscadet de Dieppe**, **Taylor's**, **Vilberie** and **Yarlington Mill**. A planting of variety specimen trees established in 1976-80 was removed this year after some of the best performing varieties were propagated to the nursery in 1998. The young trees were added to the replicated plot in late 1999 and included **Brown's Apple**, **Chisel Jersey**, **Dabinert**, **Harry Masters' Jersey**, **Kingston Black** and **Michelin**.

Late Season

Although the 1999 season was later than 1998, the weather continued good through the end of October, which allowed many of the later varieties to ripen successfully. The yellow

apples were particularly good. **Shizuka** ripened slightly earlier than last year, with excellent quality. **Orin**, **SunCrisp** and **Mutsu** all developed good flavor, though fruits of **Orin** were small due to insufficient thinning.

Reliable varieties **Melrose**, **Red Boskoop**, **Empire** and **Sayaka** were all very productive. **Braeburn** produced a good crop of fruit, sized medium and above, with plenty of color and little russet. Young trees of the **Hillwell Braeburn** (red) strain yielded several boxes of very attractive fruit, most of which was 90% colored or better. The storage quality of **Braeburn** is very good, and fruit of both standard and **Hillwell Braeburn** that had been left in the field were still hanging on the trees in good eating condition in early January. Commercial production of **Braeburn** is a possible consideration, especially on M9 rootstock, which contributes to earlier ripening.

Several strains of Fuji (**Standard**, **Yataka**, and **Akifu**) were harvested in late October and early November. Much of the fruit had water core and russeting, which would seriously reduce the quality for commercial markets. **Beni Shogun**, a new earlier ripening Fuji type, is very promising for both those home orchardists who want to grow Fuji and for potential commercial markets. It ripened about two weeks ahead of the standard Fuji strains even in this late year, with very attractive color and full flavor, but like standard Fuji it has some russet.

New Evaluations

Chinook (BC 8S-27-51) was productive, and fruits were very firm with good flavor but the size was small, and color quite variable. Recent B.C. introductions **Silken** (ripe late September) and **Creston** (ripe early October) were topworked on mature trees and had their first fruit in 1999. Both had large yellow apples and we look forward to seeing what they will do in the coming season as the trees settle into production.

New varieties that caught our attention in the mid season were two selections from the Delbard Nursery

breeding program in France. **Del-royal** is a very pretty roundish red apple with a smooth finish and sweet-tart flavor, and **Deljeni** is an attractive yellow apple, often with a blushed cheek, and sweet flavor. Also from Delbard, ripening in mid to late October, were **Delblush**, a yellow apple with attractive coppery pink blush and excellent flavor, and **Chevadel**, a bright red, firm apple with very good sweet-tart flavor.

Greensleeves, an English introduction, is an attractive green-skinned fruit with lively subacid flavor. **RubINETTE** is small, with russeted yellow skin, but is very productive and its excellent flavor recommends it for home gardens.

In the **Colonnade** series, **Emerald Spire** had a full crop of orange-blushed green fruit with a smooth, attractive finish, sweet-tart flavor, and rather tender flesh texture. **Crimson Spire** also fruited heavily in its first season, with attractive round dark red fruit with a lively sweet-tart flavor. The Colonnade apples with their narrow upright growth habit are well suited for small yards and container growing, as is the Maypole red-flowering crabapple (see below).

Disease Resistant Cultivars and Selections

These trees did not receive any fungicide treatment, so that their resistance to disease could be evaluated. Though bred for scab immunity, the resistance to other diseases such as powdery mildew can vary from resistant to quite susceptible, as has been shown in ratings taken over the years. In 1999 the same outbreak of black spots on the fruit was seen as in the two previous years, although most varieties were not as severely affected as in 1998. The cause still has not been identified. This emphasizes the point that growing scab immune varieties does not guarantee a trouble-free orchard or undamaged fruit, and that an organic spray program may still be needed.

This year the test block first begun in 1990 was removed and a new disease resistant plot established. Those varieties and selections that

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performed well in 1990-99 were moved to the new plot, as well as the young trees planted in 1998-99 that have just begun to be evaluated. Many selections that have not done well were eliminated and only the best were kept.

In the early season **Pristine**, a yellow apple ripening two weeks before Gravenstein, is emerging as one of the best early varieties, with a fine smooth finish and crisp texture. **Williams' Pride**, about a week after **Pristine**, is flavorful and productive but susceptible to mildew. **Dayton** has crisp, juicy, flavorful fruit, relatively unaffected by fruit blemishes. It has better quality than **Prima** in the same mid September season, and keeps longer. **Liberty** ripens about two weeks later, but fruit is on the small side and needs heavy thinning; it has good color and flavor. In the late season **Enterprise** was again quite productive, with large attractive fruit that stored well, though some fruit was damaged by black spots. Flavor is fair to good, and it is one of the best keepers among scab immune varieties, with fruit quality similar to **Rome Beauty**. While **GoldRush** has sprightly sweet-tart flavor when ripe and is an excellent keeper, it has serious drawbacks in the Puget Sound region. The fruit is late ripening, may fail to reach good flavor even hanging on the tree well into November, and often has unattractive russet. Only try it in the warmer climate areas. Three selections from Geneva, ripe in late September, continue to look good.

Discard: BC 8C-28-27, Chehalis, Delbardestivale, Elton (Daliter), Fushai, Gala, Scarlet, NJ 112, NY 652, NY 674, Orin, Senshu, Sunset, Ultragold

Discard: Scab Immune Varieties/ Selections: GoldRush, Jonafree, Novamac, Prima, Redfree, Shay, Coop 27, Coop 28, Coop 29, Coop 39, Coop 42, NY 61343-1, NY 61345-2, NY 66325-139, NY 74828-12, NY 74840-1, CMR-4T-18, CQR-10T-17, PAR-14T-238, PWR-31T-131, PSWR-11T-48

UNUSUAL FRUIT

With the help of a special donation in 1997, we initiated a planting of unusual fruit for evaluation that we hope to increase in future. We are testing a number of uncommon kinds of tree and bush fruit to see if they are well adapted to western Washington conditions, and to look at any specific cultural needs that may apply to growing them in our area. Among the fruit kinds that have been planted are figs, kiwi varieties (both *Actinidia deliciosa* and *A. arguta* clones), black, red and white currants, persimmons, paw paws, and some new seedless grape varieties. Some of the uncommon bush fruits include aronia, mulberry, elderberry, honeyberry, sea buckthorn, mountain ash, cornelian cherry, azerole, and sorbus.

In 1999 we saw some fruit on the aronia and the sea buckthorn; the latter in particular appears to be very productive even when young. The sea buckthorn fruits are yellow-orange, small (about 3/8"-1/2" in length) and oval-cylindrical; the orange juice is subacid to tart and very similar in flavor to citrus.

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

CRABAPPLE

The evaluation of ornamental crabapples for disease resistance begun in 1984 continues with new additions as well as the establishment of several proven varieties in a rootstock trial. The established varieties chosen for the rootstock trial included those with high resistance to scab, excellent ornamental quality, and a wide range of tree habits and bloom times. The varieties are **Christmas Holly**, **Evereste**, **Golden Raindrops**, **Molten Lava**, **Malus x zumi 'calocarpa'**, **Prairifire** and **Sugar Tyme**. The rootstocks used in this trial include M 27, M 9, M 26, M 111, Budagovski 118, Budagovski 490,

Cornell Geneva 228, Cornell Geneva 778, and Domestic seedling. Measurements of tree diameter were taken at planting in April 1997, in March 1998, and November 1998 to see if any significant differences in size were observable. Preliminary observation seems to indicate that there are size differences between the rootstocks that are consistent across the different crabapple varieties. We hope to continue the trial for about three more years to see the effects in more mature trees.

Several introductions being evaluated for disease resistance and ornamental quality look promising. **Adirondack** is a white-blooming, upright tree with good scab resistance and small, pinkish-orange fruit that lasts well into the winter. **Morning Sun** also keeps its lemon yellow fruit to January and beyond. Two varieties that continue to be outstanding and highly recommended are **Golden Raindrops** (yellow fruit) and **Evereste** (large red orange fruit). Both are immune to scab. Other varieties noted for winter color this year were **White Angel** (very profuse dark red fruit), **Donald Wyman** (small bright red fruit), **Indian Magic** (orange fruit), **Lancelot** (small yellow fruit, compact growth habit) and **Sugar Tyme** (dark red fruit).

Still needed is a pink flowered crabapple with upright habit and disease resistance. **Maypole**, from the Colonnade series, is very narrowly upright with profuse deep pink flowers and bronze green leaves, but is also somewhat scab susceptible. **Prairie Maid** has deep-pink flowers in contrast to green leaves slightly tinged with bronze. It shows good disease resistance, and the small red fruits color up early; birds like them so the tree has little color after the leaves are gone but also no messy fruit. In 1999 we acquired some new crabapple introductions that may fill in some landscape niches in the future. They include **Cinderella**, **King Arthur**, and **Pink Princess**.

Some seedlings of local origin may have potential for future development. **Pink Cloud** has pink double

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flowers, bronze leaves and large, tart red fruit. It also appears to have some resistance to scab. Another seedling cross is a semi-double, white flowered tree with narrowly upright habit which would be suitable for street side ornamental planting, especially as it sets little or no fruit to drop and make a mess. A cross of Alkmene X Prima made here at the station in 1990 resulted in an upright-spreading crabapple with scab immunity; it has white flowers and large, persistent bright yellow fruit, tart but edible. Pollination trials in 1998 showed that this seedling will pollinate both Jonagold and Fuji. These seedlings are being evaluated for possible introduction.

For a copy of the complete **Harvest Report - 1999**, including tables of harvest data on all the tree fruit varieties that were evaluated this year, please send \$10 to Fruit Horticulture Department, WSU- Mount Vernon, 16650 State Route 536, Mount Vernon, WA 98273 Checks should be made payable to Washington State University.

ACKNOWLEDGMENTS

The assistance and support in our tree fruit projects provided by the members and board of the Western Washington Tree Fruit Research Foundation, the

Western Cascade Fruit Society, the Seattle Tree Fruit Society, and those at the Northwest Agricultural Research Foundation, the Washington State Nursery and Landscape Association and local fruit growers are most gratefully acknowledged. The contribution of nurseries that have donated trees and materials, and the many individual volunteers who have given their time and help are also very much appreciated, and recognized with our thanks.

This report was published in the Western Washington Tree Fruit Research Foundation's February, 2000 newsletter.

Our Harvest Volunteers - A Great Season and Many Thanks!

Once again our WWTFRF members have come forward to help with the pressure of the harvest season at the Mount Vernon Research Station. Volunteer crews of pickers contributed many hours, come rain, shine or fog, to help the staff handle the fruit harvest and data collection, and special needs such as fruit thinning, in the 1999 season. Pickers in the Jonagold test block harvested some 15 bins of apples for market on two picking days, and in the Bosc pear orchard picked and weighed the fruit for harvest records. For the first time, volunteers worked with the staff and summer crew to pick blueberries for harvest records. After the data was collected, the pickers took home half of the fruit for themselves and the rest went to market. The proceeds from all fruit sales go to support the tree fruit research program so the time contributed by the volunteers actually helps twice: it reduces the time and expense of data collection, and the sales bring in money for the program. These funds can pay for needed equipment items that are usually not provided for in grants. Plus, the volunteers carry home a load of select fruit and berries - a good deal for all! Special mention goes to **Larry Mowrer** for his work in coordinating the picking days and managing the call list. Any-

one interested in volunteering for the 2000 season please contact him at 360-766-8043.

WITH GRATEFUL THANKS TO

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A lot of work goes on "behind the scenes" in keeping our WWTFRF organization running smoothly and making it possible to accomplish our goals of supporting tree fruit research. We are lucky in that we have a lot of good people helping to keep track of membership and fees, manage our budget, edit and distribute the newsletter, organize events, recruit and work with member volunteers, and launch our Demonstration Garden project. The individual members of our Board of Directors have taken on many of these tasks, and we at WWTFRF and the staff of WSU - Mount Vernon would like to express our appreciation for their efforts and support. Our thanks to Sam Benowitz, **Charlie Bergeron**, Joe Biringer, Claude Dilly, **Marlene Falkenbury**, **Chuck Holland**, **Kristan Johnson**, Georgene Lee, Linda Markholt, Alan Merritt, **Larry Mowrer**, **Bob Norton**, **T.K. Panni**, and Kim Siebert.

**TREE FRUIT ON THE WEB
SOME SITES YOU MAY WANT TO LOOK INTO**

The Pennsylvania State College of Agricultural Sciences has a strong Tree Fruit Research staff. This is their list of WWW sites for tree fruit growers, taken from their Tree Fruit Production Guide for 2000/2001

- Adams County Nursery, Aspers PA<http://www.acnursery.com/>
- Apple Crop Electronic Discussion Group<http://www.virtualorchard.net/applecrop.html>
- Apple Rootstock Breeding and Evaluation Program .. <http://www.nysaes.conmll.edu/hort/breeders/appleroots/appleroostocks.html>
- Boyer's Nursery, Biglerville, PA<http://www.bojernurseries.com/index.htm>
- Brandt's Fruit Trees, Parker, WA<http://www.ewbrandt.com/bft/>
- C & O Nursery, Wenatchee, WA<http://www.c-onursery.com/>
- C & P Green Book of Pesticide Labels<http://greenbook.net/free.asp>
- C.D.M.S. Pesticide & M.S.D.S. Labels<http://www.cdms.net/manuf/manuf.asp>
- Cherry Marketing Institute<http://www.cherrymkt.org/>
- Cornell Scaffolds Newsletter<http://www.nysaes.cornell.edu/ent/scaffolds/>
- Dave Wilson's Nurseries, CA<http://www.ewbrandt.com/dwn/index.html>
- Four Mile Nursery, Canby, OR<http://www.fourmile.com/>
- Good Fruit Grower.<http://www.goodfruit.com/index2.shtml>
- Greentree Nursery, LaGrange, CA<http://greentreenursery.com/>
- Hilltop Nurseries, Hartford, MI<http://hilltopnurseries.com/>
- International Dwarf Fruit Tree Association<http://www.IDFTA.org/>
- International Fruit Variety Data Base<http://www.agnic.org/agdb/ifvdb.html>
- Johnson Nurseries, Ellijay, GA<http://www.johnsonnursery.com/>
- Massachusetts Fruit Noteshttp://www.unix.oit.umass.edu/~autio/Fruit_Notes/FruitNotes.htm
- Meadow Lake Nursery, McMinnville, OR<http://www.meadow-lake.com/index.html>
- Michigan Apple Committee<http://www.MichiganApples.com/>
- Mid-Atlantic Regional Fruit Loop<http://www.caf.wvu.edu/kearneysville/wyufarm8.html>
- New Zealand Hort Net<http://www.hortnet.co.nz/>
- North Carolina Apple Newsletter<http://henderson.ces.state.nc.us/newsletters/>
- Northwest Pear Bureau<http://www.usapears.com/>
- Penn State Tree Fruit Production Guide<http://tfpg.cas.psu.edu>
- Penn State Department of Horticulture<http://hortweb.cas.psu.edu/>
- Pennsylvania Department of Agriculture<http://www.pda.state.pa.us/>
- Photo Herbarium<http://ext.agn.uiuc.edu/wssa/subpages/weed/herbarium0.html>
- Plum Pox in PA<http://www.cas.psu.edu/docs/issucs/plumpox/>
- Pro Tree Nursery, Brentwood, CA<http://www.protreenurseries.com/>
- Real Cider & Perry Page<http://web.bham.ac.uk/graftong/cidcr/homepage.tmn>
- Sierra Gold Nurseries, Yuba City, CA<http://www.sierragoldtrees.com>
- TRECO, Woodburn, OR<http://www.treco.nu>
- U.C. Davis Fruit and Nut Information Center.<http://fruitsandnuts.ucdavis.edu/>
- U.S. Apple Association<http://www.usapple.org/>
- U.S. Apple & Pear Marketing Board<http://www.fruit-usa.com/>
- U.S.D.A. Economics & Statistics Service<http://usda.mannlib.cornell.edu/>
- Van Well Nurseries, Wenatchee, WA<http://www.vanwell.net/>
- Virtual Orchard<http://www.virtualorchard.net/>
- Waffler Nurseries, Wolcott, NY<http://www.wafflernursery.com/>
- Washington Tree Fruit Extension<http://fruit.wsu.edu/>
- WeatherNet Weather Sites<http://cirrus.sprl.umich.edu/wxnet/servcrs.html>
- Weed Information/Identification<http://bluestem.hort.purdue.edu/plant/weeds.html>
- Willow Drive Nursery, Ephrata, WA<http://www.willowdrive.com/INDEX.HTML>

New Biofungicide Treats Apples and Oranges Alike

By Judy McBride

APPLES and oranges are all the same to biofungicides. First introduced in the U.S. four years ago as a result of Agricultural Research Service (ARS) patents, these nontoxic biological coatings are replacing synthetic chemicals for controlling rot-causing fungi on apples, pears, and citrus after harvest.

Now, ARS has signed an agreement with Micro-Flo, Memphis, TN, to finish development of the next generation of biofungicides for fruit packinghouses. Micro-Flo expects to have a product on the market within two years.

Unlike the earlier biofungicides, the new coating has a kickback effect. It stops fungi that already had a toehold on the fruit, says ARS' Charles Wilson, who also developed one of the earlier products. Micro-Flo researcher Ahmed El Ghaouth is working with Wilson at ARS' Appalachian Fruit Research Station, Kearneysville, WV.

The new coating combines two bioactive substances with the yeast *Candida saitoana*. Innocuous to people, the yeast is a formidable competitor against the fungi that attack fresh fruits. The bioactive substances are chitosan and a synthetic sugar used as a glucose substitute.

Chitosan acts as a natural fungicide and turns on defensive enzymes in the fruit itself. It also forms a film on the fruit that holds in carbon dioxide, thus increasing shelf life. The synthetic sugar, on the other hand, tricks the fungi into perceiving it as food, but they can't use it.

In several years of tests in commercial packing houses in California and Florida, the new biofungicide proved as effective as the two leading synthetic fungicides. Under the new agreement, Micro-Flo and ARS scientists will optimize its formulation and fine tune its application.

PLANNING FOR RENOVATIONS

On June 2 a meeting at the Mount Vernon Research and Extension Center was held. A tour of the facilities was included. Among those attending were Dr Dean Glawe, Phyllis Baxter (see article page 12) the Dean of the College of Agriculture and Home Economics.

Claude Dilly and Larry Mowrer of WWTFRF were tour guides through the Foundation's Display Garden.

Look for more information regarding this meeting in next issue of The Bee Line.

Codling moth treatment performs well in field tests

By Tam Moore Capital Press Writer

PORTLAND -- The U.S. developer of a codling moth orchard treatment is claiming victory after extensive field trials in three Western states. The name "attracticide" was coined to fit the bait-and-kill combination.

Last Call, as the product is named, mixes an insect-attracting pheromone and a lethal insecticide, Permethrin at 6 percent strength, all in a sticky droplet. It kills or causes central nervous system damage to the codling moth male. About 1,200 droplets per acre, or four or five per tree, are recommended treatment in pear and apple. Codling moths attack apple, pear and walnuts with larvae that make fruit and nuts worthless.

"It was more effective than mating disruption or insecticide programs by themselves," said Philipp Kirsch, who coordinated the 1999 trials for Portland-based IPM Technologies Inc. UAP Pacific, a chemical distributor, worked with IPM in the 25 test orchards. At 1999 prices, Last Call cost about \$45 an acre in material costs plus labor of application for each treatment.

The formulation is the work of Novartis, a global chemical company, which turned U.S. marketing over to IPM. Last Call is registered for apples, pears, Asian pears and walnuts in Oregon and Washington. Cal EPA gave experimental clearance for partial season testing in California.

The moth killer was first used commercially during the 1998 season in Switzerland. Testing expanded to France and Italy in 1999. The Italian strategy may be attractive to U.S. growers using mating disruption programs. It involves treating irregular sized and small blocks, including backyard fruit trees, to reduce problems with codling moth pressure from outside mating disruption blocks.

Good news for growers worried about application costs came from West Coast tests. Kirsch said as the season progressed with reapplication intervals of five weeks, all people involved became quicker with the technique. Last Call is dispensed through a pole-mounted aerosol can that's taped on an upper tree branch.

Kirsch said the company engineered a new dispensing pole that should make application even easier. IPM is working on pheromone attractants for 16 other insect pests. It also markets insect traps and pheromone attractants.

For six years, West Coast orchardists have flooded pear and apple blocks with scent so male codling moths become confused and can't find a female, thus ending one of the pests many generations before its larvae are born.

This article appeared in the January 15, 2000 issue of The Capital Press

GRANT GIVES HOPE TO APPLE GROWERS

MOUNT VERNON, Wash -- The tangy sweetness of apples grown in Western Washington is well-known to discriminating customers.

But leveraging that quality in the marketplace and maximizing profits is a challenge for Skagit and Whatcom county growers due to the industry's lack of infrastructure on the west side of the mountains.

The good news is that the state has approved funding for a study to explore the feasibility of establishing a controlled atmosphere storage facility for the region.

The \$30,000 in-state rural economic development funds for the study will come through the Community Economic Revitalization Board and will match local contributions of \$10,000.

Of that match, the county contributed \$5,000; the port of Skagit County, \$2,500; and the apple growers of the two counties -- through the Northwest Agricultural Research Foundation -- \$2,500.

Westside growers currently send most of their apples to Eastern Washington packinghouses.

A CA facility in this region would enable them to extend the shelf life of their fruit and therefore give them more local control over when, where and how their fruit is marketed and sold.

If the study determines that a CA storage facility is economically viable, developing one in this region could serve as the keystone investment in the long-discussed agricultural industrial park.

"This grant is a critical piece in the puzzle of keeping agriculture in the area," said Bob Rose, executive director of Skagitians to Preserve Farmland, a citizen-based group that coordinated the effort to secure the funding. It (a CA facility) would be a fulcrum point for the economic-development side of agriculture."

With its cool maritime climate, the region produces extremely high quality varietal apples such as the versatile Jonagold. But low apple

prices, combined with the elimination of previously available markets, threaten to destroy an industry just now reaching the critical mass of production necessary to support such a facility.

Most of the 500-plus acres planted in the region is less than five years old and just coming into full production.

A CA facility in the region also has the potential to help other growers as well, among them vegetable, blueberry and nursery growers, who would be able to use the facility during the months when it isn't being used to store apples.

Alan Merritt, co-owner of Merritt Apples Inc., which specializes in Jonagold, Gravenstein and Gala apples, said he is encouraged by the good news and the community support behind it.

"By moving fruit to Eastern Washington, we lose our identity," he said. "We think apples grown in Western Washington should have their own identity."

Rose Merritt, co-owner, said a CA storage facility would also give growers the ability to hold the fruit until market conditions are right.

The season, which begins with the fresh-market crop, follows up with cold-storage apples and then with apples from New Zealand.

"We've got to get past all of that," said Rose. "This would give us some breathing room. Right now there's so much pressure for us to move product. This would give us time to do some marketing."

The Merritts have a cold-storage facility, but cold storage can only keep apples through December. A CA storage facility can keep apples in good condition for up to six months.

Rose said that having to sell their apples when all the other apples are on the market forces them to sell at lower prices.

"Timing is everything," she said about capturing good prices.

When looking at the bottomline, a CA storage facility also adds up to

considerable cost savings. Skagit County growers, for example, ship about 12,000 bins a year to Eastern Washington, where they are kept in CA storage. At \$25 per bin in transportation and storage expenses, about \$300,000 leaves the county each year.

"That's more than one-quarter of a million dollars that leaks out of the region and goes to Eastern Washington," Bob Rose said.

Skagit County Commissioner Harvey Wolden pointed to a tax of 6 1/4 cents per thousand dollars of assessed value that voters approved for farmland preservation.

"It's incumbent on us to exploit every opportunity we can to develop a marketing arm that will help sustain agriculture," he said. "We're not going to create any more land, but something like this could help make agriculture sustainable for a long time." Adding urgency to the need for a CA storage facility in the region is an apple maggot quarantine that threatens Whatcom and Skagit growers' viability.

Although the apple maggot has not been reported in any commercial orchards in the two counties, Eastern Washington packinghouses are already refusing apples from the region in fear of cross-contamination.

Rose also manages a gift shop at the orchard's cold storage facility, where customers come to buy apples and apple-related products.

This article by Cookson Beecher was published in the December 17, 1999 issue of the Capital Press.

Editor's note: Alan Merritt is the son of Les Merritt one of the founding members of WCFS, elected to the Board in February 1983. A spring 1984 newsletter lists him as a speaker at the spring meeting. His subject, "My Experience in Developing a Gravenstein Apple. The summer 1984 newsletter notes the August 18 tour to Merritt's Orchard.

THE BRITISH COLUMBIA FRUIT TESTERS (BCTFA) FALL FRUIT SHOW by CHUCK PARKMAN

The 1999 BCTFA Fall Fruit Show was held October 10 and 11 at the CanWest Mall, 2945 Jacklin Rd. Victoria.

Because I live directly across the Strait of Juan de Fuca from Victoria and can look out my window and see buildings in Victoria, I decided to attend to see if I could get any ideas for our fruit show. I got plenty of ideas.

We drove to Port Angeles and boarded the 8:20 a.m. Coho ferry as foot passengers for \$13.50 round trip fare. From the Coho ferry dock in Victoria we walked two blocks to the Crystal Palace bus stop. There were two bus routes that would take us to the CanWest Mall, so taking the first bus to arrive (for \$1.75 senior fare) we were at the Mall in 25 minutes.

I started looking for a vacant store where I assumed the show would be held. When we walked through the the main entrance of the mall our search was over. There in the middle of the mall's pedestrian walk area was a long series of double tables covered with fruit displays. BCFTA volunteers were between the two rows of tables answering questions of the mall shoppers who had stopped to look at the displays.

I searched for and found Frank Besier, president of BCFTA at the membership desk. Frank had come up with the idea several years ago of holding the fruit show in the center of the mall. One mall he contacted wanted to charge rent, so he went to another mall that offered the space free because of the non-profit educational nature of the show.

The CanWest Mall did a study and found the apple show brought in about 3500 people to see the show who otherwise would not have been at the mall, thus justifying the rent-free use by BCFTA. The stores in the mall were very happy with the arrangement.

I believe WCFS Board members should seriously consider holding our Fall Fruit Show at one of the greater Seattle area malls. I believe a minimum of ten times more people would see the show than do with the present arrangement. There is no need to ask for an entry donation as there is no rent to pay.

BCFTA was expecting to sign up a minimum of 25 or 30 new members at the show. They had decided not to have a fruit tasting table, liability was the main reason, but I believe it would be a popular feature if an adequate supply of fruit could be located.

We took a bus back to the Coho Ferry dock, caught the 3 p.m. ferry to Port Angeles and were home by 5 p.m.

I called the management of the Landing Mall in Port Angeles to see if they would be agreeable to supply free space for North Olympic Fruit Club's Fall Fruit Festival and received a favorable response. Our problem is there are not thousands of shoppers in the Landing Mall, but a dozen at one time would be a crowd.

This fruit show in a mall should work in Silverdale, Tacoma, Seattle, Bellevue or any large populated area.

I suggest a WCFS board member try to attend the show in Victoria this year.

SCIENTISTS DEVELOP DWARF PEAR TREE

Agricultural Research Service

THE FIRST GENETICALLY engineered dwarf pear tree of an existing variety has been developed by Agricultural Research Service scientists. Dwarf trees are more productive than traditional-size trees and offer growers other advantages as well.

The size and shape of fruit trees are vitally important to growers for ease of tending and picking, as well as yield. In apples, special rootstocks are commonly used to dwarf the varieties grafted onto them.

ARS horticulturists Ralph Scorza and Richard Bell at the Appalachian Fruit Research Station in Kearnesyville, W.V., dwarfed Bosc pear trees by inserting a gene originally isolated from a bacterium. The new dwarf trees are growing in greenhouses at the lab, and the scientists expect the trees to bear fruit in about two or three years.

The research can go two ways: The gene may be used to dwarf scions, the tree shoots grafted onto dwarfing rootstocks, or to impart dwarf-producing properties to the rootstocks. Scorza and colleagues are already working with other dwarfing genes for transfer into pear.

The bacterial gene can be used to dwarf rootstocks or to make the scion--the top part of the tree--smaller or dwarf. According to Bell, the pear industry relies on only a few major varieties and needs to improve them. Dwarfing

will do that.

In addition to being more productive, dwarf fruit trees allow high-density plantings of smaller trees that can produce more fruit in the same area of land than the larger, standard-size trees. And they're easier to manage, prune, spray and harvest. Fruit from a dwarf tree is the same size as fruit from a normal tree.

For those growers not interested in dwarf trees, Scorza and colleagues have developed a peach tree with a new, columnar shape. Perfect for the home gardener with limited space, the columnar tree has upright, narrow branches that grow close to the tree trunk without shading other fruit or vegetables that may be growing nearby.

Like dwarfs, the columnar trees require much less management and will allow high-density growing. They eliminate the large space necessary between traditional trees. Therefore, chemicals and fertilizer need be applied only to a very small area, saving the grower money and reducing environmental impacts. Compared to traditional size trees, at least three times as many columnar trees can be grown per unit of land.

These new trees—which bear excellent quality fruit—are expected to be available to home gardeners within the next few years.

IN THE MOOD FOR SOMETHING NEW? TRY A SORBOPEAR

Bu Suzanne Johnson - Capital Press Staff Writer

CORVALLIS, Ore. October 1999--

They brought in a bumper crop of sorbopyrus at the USDA/Agricultural Research Service germplasm repository this year. A bumper crop of what? Sorbopyrus? Is that something new the plant scientists have created?

New, no, not particularly. Sorbopyrus fruit originated sometime before 1610, the result of a cross between the two genera (or classes) Sorbus, or mountain ash, and Pyrus, or pear.

On the surface of it, it seems an unlikely pairing: the small, bright orange berries of the mountain ash, and the comparatively large, yellow-green Bartlett-type pear. But they're both pome fruit, meaning they carry encapsulated seeds inside their bodies.

The pear's flavor is celebrated, but if you bit into one of the fruits of the mountain ash, you'd probably spit it right back out. It is, said Kim Hummer, research leader and curator at the facility, "edible, but not eatable" -- a true mouth puckerer.

Not so the sorbopyrus. "I visited a sixth-grade class and cut the fruits open and let the kids look at them and taste them," Hummer said. "The response was fairly positive. Out of 33 kids in the class, maybe five or six said 'I don't like that.' The majority of them said it was really tasty."

To the layman, the sorbopyrus looks a lot like the Asian pear, but with a beautiful red blush where it's been exposed to the sun. The taste is closer to that of the European pear. Its crunch quotient is somewhere between the two: It's not as smooth as the European but doesn't have quite the snap of the Asian with its high water content.

If not taste, the sorbus conferred something else on its offspring that Northwest growers, in particular, should appreciate: cold hardiness and resistance to scab and pseudomonas. It may or may not be resistant to fire-blight, Hummer said. It'll have to be planted in other locations where fireblight is a problem to determine that.

Sorbopyrus is a slow grower. The tree that Hummer and her associates picked this year is 15 years old. It wasn't the first year the tree bore fruit, but it was the first good crop of what Hummer calls "sorbopear" to come off the tree so it occurred to us we should just let people know about this ... because it's an unusual tree with tasty and unusual fruit."

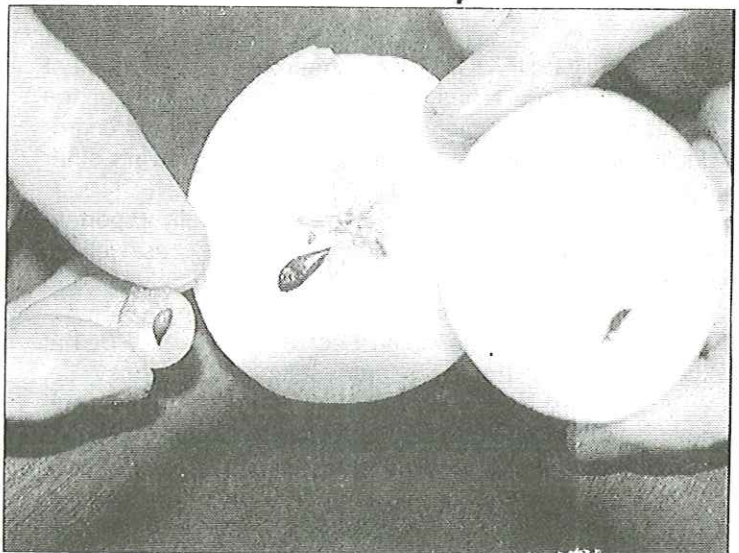
The tree and its foliage show traits of both parents. As is the mountain ash, it is vigorous and fairly large. The undersides of the leaves are fuzzy, which results from the mountain ash's influence, and the leaf edges are serrated, a characteristic of both the pear and the mountain ash.

Because sorbopyrus is an intergeneric cross, it cannot produce viable seed -- capable of germination and thus reproduction. Its seeds are thin and shriveled-looking, compared with the plump seeds of the pear and the mountain ash. Sorbopyrus can be propagated only by grafting onto a pear rootstock.

The flesh in the center of the fruit browns within a week after it is picked, so unless plant breeders can find a way to extend its keepability, Hummer doesn't see sorbopyrus as a commercial crop.

But for the backyard gardener or grower with a niche such as the popular weekend farmers' markets, it could be a winner.

"I think this is more in the homeowner category," she said. "But the shape and the flavor are so interesting Several nurseries have obtained wood from us. If people started asking for it, they would propagate more."



NONBEARING — Dissection of fruits from the mountain ash, pear and sorbopyrus (a nonproducing cross between the ash and pear) shows the differences in their seeds. The thin seed of the sorbopyrus is not viable and so cannot produce offspring. It must be grafted onto pear rootstock to produce fruit.

APPLES AS AN ANTIOXIDANT

The Fruit Grower News - January 1999

Can an apple a day really keep the doctor away? Chang Y. Lee of Cornell University's Department of Food Science and Technology thinks so and believes he knows why.

In a paper delivered at last summer's annual meeting of the Institute of Food Technologists, Lee described the antioxidant activities of apples and other ways in which they contribute to the diet.

A group of naturally-occurring chemical components - known phytochemicals, polyphenols or flavonoids, have antioxidant activity. Antioxidants work against supercharged molecules called "free radicals," which damage many body tissues. Damage from free radicals can be a factor in certain cancers, heart disease, stroke, senility and other conditions.

Research shows that flavonoids in foods such as tea, onions and red wine may reduce the risk of coronary disease in elderly men. The major antioxidant component in apples are polyphenols. In particular, the skin of apples contains effective polyphenols known as quercetin glycosides and phloretin glycosides.

The nutritional benefits of antioxidants in foods such as apples depends on how many of these nutrients are in a given food, but also how much of that food is consumed by individuals.

"Regardless of the concentration of bioactive compounds, the contribution of the bioactivity in our diet will be negligible if the consumption of these foods is low," said Lee.

Many Americans are allowing the apple to provide its antioxidant benefits, eating 19.3 pounds per capita of fresh fruit and 47 pounds total, Lee's study measured the antioxidant activity in various apple cultivars and evaluated the importance of apple antioxidant activity in the diet relative to other fruits and vegetables.

Twenty-four cultivars were studied, and exhibited a wide range of antioxidant activity. They can be divided into three groups - high (more than 60% antioxidant activity),

medium (40%-60%) and low (below 40%).

Groupings of cultivars and their antioxidant activity percent-ages are:

High:

Fuji, 98.3;
Spartan, 81.5
Pioneer McIntosh, 76
Red Delicious, 75.7
Liberty, 72.5
Granny Smith, 72.1
Jonathan, 72;
Northern Spy, 61.5.

Medium:

Cox Orange Pippin, 58.9
Rome Spuree, 57.2
NY 6'74, 51.9
Freedom, 51.2
Idared, 50.9
Red Cort, 49.4
Gala, 47.7
Rhode Island Greening 44.6
Crispin, 40.9.

Low:

RubINETte, 34.5
Jenagold, 24.2
Jenamac, 19.4
Empire, Golden Delicious,
Gingergold, less than 10

How do apples compare with other common fruits and vegetables in antioxidant activity? The average antioxidant activity of all the apple varieties studied was 65%. Grapes, pears and peaches have higher antioxidant activity than apples, bananas are similar while oranges and grape-fruits have lower activity. Among vegetables, garlic, broccoli and tomatoes had higher activity than apples while spinach, carrots, onions and green pepper had lesser activity.

Since the exact daily antioxidant dietary requirement is not yet known, Lee is reluctant to draw any conclusions on the data.

"However, strong evidence as shown here is that apples contain important antioxidants...and exhibit significantly high antioxidant activity," said Lee.

"Therefore, in order to maximize apple antioxidant activity, consumption of apples with skins is highly desirable."

APPLE FUTURE PRESERVED

Apple germplasm from Asia's disappearing apple forests is being preserved at the U.S. Department of Agriculture's Plant Genetic Resources Unit at Geneva, New York.

The unit's staff have made expeditions to the apple forests of Kazakhstan, where apples are believed to have originated, to look for material that may have disease resistance or horticultural value that could be useful in breeding apples for the future. Representatives of other apple-producing countries, such as South Africa, New Zealand, and Australia, are doing likewise.

Dr. Jim McPherson, associate professor with the horticultural sciences department at Geneva, said the forests in Kazakhstan have been depleted by 90% since 1935 because of degradation by animals, erosion, and development. People have been cutting apple trees down for firewood. McPherson said the apple forests are no longer being protected, and the genetic base is being lost.

The unit's staff are planning expeditions to other areas where wild apples grow, including China's Sichuan Province, where up to 20 different species of apples still grow in reserves and native forests.

The unit collects, maintains, and documents germplasm from apples, grapes, and sour cherries, and distributes material to public and private organizations. Material is usually brought into the country as seeds, as scion wood must be put through quarantine.

Apples have been maintained in field plantings, but researchers at the National Seed Storage Laboratory in Colorado have developed ways to preserve material as dormant buds in liquid nitrogen to increase the security of the collection. It is also cheaper than maintaining field-grown plants.

Staff in Geneva have begun to characterize the collection and develop a database. Through genetic fingerprinting, they are identifying and eliminating duplicates, and are avoiding acquiring plants that are unlikely to be useful.

WATCH OUT! Pesticides Can Be Hazardous To Bees, Too!

Original Data From U.C. Davis, 1972; updated 1981 and 1997. This list is not all inclusive and new, or seldom used materials may not be included. Check with applicators, extension offices or growers to positively ID a chemical before application.

Group 1 - Highly Toxic - Severe losses may be expected if the following materials are used when bees are present at treatment time or within a few days thereafter, except as indicated by footnotes.

Aldrin ²	(dimethoate) ²	Furgdan ^{®2}	Mustang
admire,	Danitol	Gardona ^{®2}	Orthene
ammo	Dasanit [®] (fensulfothion)	Guthion [®]	Pa ^{®athion2}
Arsenicals ²	DDVP (dichlorvos)	(azinphosmethyl) ²	Penncap-M
Ambush	Decis	heptachlor ²	Phosdrine
asana	Diazinon ²	imidan [®]	(mevinphos) ³
Azodrin	Dibrom [®] (naled) ^{2 3}	Lannate [®] (Nudrin)	Pounce
(crotonamide) ²	Dieldrin ²	(methomyl) ²	Pydrin
Baygon [®]	Dimecron [®]	lindane ²	Sevin[®]
Baytex [®]	(phosphamidon) ²	Lorsban	(carbaryl) ²
(fenthion)	Dursban ^{®2}	malathion ^{2 4} (cythion)	Sumithion [®]
Baythroid	Ekamet	Matacil [®]	Supracide
BHC ²	EPN ²	Mesuro [®]	Temik [®]
Bidrin ^{®2} (dicrotophos)	Ethyl Guthlon [®]	Metacide [®]	aldicarb) ^{2 7}
Bux ⁻ (RE-5353)	(azinphosethyl) ²	methyl parathion ²	TEPP ^{2 3}
Capture	Famophos [®]	Methyl Trithion [®]	Vapona
Chlorthion [®]	(famphur)	Mobam [®]	zectran ^{®2}
Cygon [®] DE-FEND [®]	Folithion	Monitor ^{®2}	Zlnophos [®]

Group 2 - Moderately Toxic. These can be used around bees if dosage, timing, and method of application are correct, but should not be applied directly on bees in the *field or at the colonies*.

Abar ^{* 2}	DDT ²	Meta-Systax R [®]	Scout
Abate ^{®2}	Curacron	(oxydemetonmethyl)	Tartar emetic
Biothion [®]	Croneton	mirex	Thimet [®] (phorate) ²⁶
Agritox [®]	Di-Syston [®] (disulfoton) ⁶	Mocap	Thiodan
Banol [®]	Dyfonate	Perthane ^{®2}	(endosulfan) ²
Bolstar	endothion	Phosalone [®]	Trithion [®]
Carzol [®] (formetanate) ²	endrin ²	Phosve [®]	Vydate
chlordane ²	Korlan [®] (ronnel)	Pounce	(carbophenothion)
Ciodrin [®]	Larvin	Pyramat [®]	Zephyr
Counter	Meta Systox [®]	Sevin XLR	Zolone
Co-Ral [®] {coumaphos}	(methyl demeton)	Systox [*] {demeton) ²	

Group 3 - Relatively Nontoxic. These can be used around bees with a minimum of injury. Herbicides and fungicides not included in this list.

INSECTICIDES	Dilan ^{®2}	Mavrik [®]	Pentac [®]
Acaraben [®]	Dimite [®] (DMC)	Methoxychlor ²	Phostex [®]
{chlorobenzilate}	D N O C H P	Mitox [®]	Pyre thrin
allethrin	(dinitrocyclohexyphenol)	(chlorbenside)	Rotenone ²
Altosid	Dylax [®] (trichlorfon)	Morestan [®]	ryania ²
Aramite [®]	Eradex [®]	Morocide [®] (binapacryl)	sabadilla ^{2 *}
Baam	Ethion ²	Murvesco [®] fenson)	Saphos [®] (menazon)
Birlane	Fundal [®]	Nemagon ^{®2}	Strobane [®]
<i>Bacillus thuringiensis</i>	Galecron [®]	Neotran ^{®2}	Sulphenone [®]
Cryolite ²	(chlorophenamidine)	Nicotine ²	Tedion [®] (tetradifon)
comite	Heliothis virus	Omite [®]	Toxaphene ² Tetram
Delnav [®] (dioxathion)	Kelthane [®] (dicofol) ²	OMPA (schradan)	Zardex
Dessin [®]	Kepone [®]	Ovotran [®] (ovex)	

2 These materials, in addition to having been laboratory tested, have been field tested mainly on seed alfalfa or cotton, citrus, ladino clover, milo, and sweet corn. All others were laboratory tested only. Further field testing may change the group location of some of these materials.

3 Dibrom[®], Phosdrin[®] and TEPP have such short residual activity that they kill only bees contacted at treatment time or shortly thereafter. These materials, usually safe to use when bees are not in flight, are not safe to use around colonies.

4 Malathion has been used on thousands of acres of blooming alfalfa without serious loss of bees. However, occasional heavy losses have occurred, particularly under high temperature conditions. If applied to alfalfa in bloom, it should be only as a spray, and treatment should be made during the night or early in the morning when bees are not foraging in the field. Do not use undiluted technical malathion spray around bees.

5 Sabadilla, when used as a 20 percent dust, may cause bee losses.

6 DI-Syston[®] and other systemics used as seed treatments have not caused bee losses.

7 Temik[®], although highly toxic to bees as a contact poison, is used only in granular form and extensive field usage has not

PROMISING NEW FUNGICIDE PERFORMS WELL IN TRIALS

Tree Fruit Magazine September/October 1999

Independent research is proving the efficacy of a naturally-derived fungicide on tough fruit and nut diseases, even in seasons with exceptional pressure.

Sovran fungicide, recently registered by the U.S. Environmental Protection Agency, is the latest product developed from strobilurins - a novel class of chemistry derived from naturally occurring mushrooms. Researchers across the country have announced trial results comparing the new fungicide from BASF Agricultural Products against industry standards and other upcoming products. Studies indicate Sovran offers excellent control of diseases in apples, pears, grapes and pecans.

Wayne Wilcox, professor of plant pathology at Cornell University, tested Sovran for control of apple scab and grape powdery mildew.

"Last year was not a typical season for scab. We had very high disease pressure," he said.

Of 24 fungicide treatments in Wilcox's test orchard, programs that began with a high rate of Sovran performed as well as or better than any other treatment.

"In this trial, we were unable to

get into the orchard and spray until one week after the first infection period occurred," he said. "We had significantly better results when the first spray was Sovran or a related material. These strobilurin fungicides essentially shut down further disease spread with their strong anti-sporulant effects."

According to Jerry Minore, BASF fungicide market manager, Sovran fungicide performs well after infection because it has kickback activity for up to 96 hours following infection. Kresoximmethyl, the active ingredient in Sovran, has a unique mode of action.

This new product also performed well in Wilcox's tests on grapes.

"Sovran proved to be excellent on powdery mildew, which is consistently the most important disease for grape growers. It also provided excellent control of black rot and was acceptable on downy mildew," Wilcox said.

In apple powdery mildew trials completed at Oregon State University, Sovran again performed well. While more than 30 percent of untreated apple leaves were in-

fectured with powdery mildew, only about one percent of leaves treated with Sovran showed disease symptoms.

Jay Pscheidt, extension plant pathology specialist with Oregon State University, said, "Sovran performed very well, as good as, if not better than the standards. Additionally, Sovran controlled necrotic leaf spot better than the standards."

Research in pears and pecans indicates Sovran will offer an effective control for those crops, as well. Sovran proved more effective for controlling pear fruit scab than other commercial products. Plus, Sovran can be applied at lower use rates.

Trials have shown Sovran fungicide also will be an effective tool in preventing resistance. Pscheidt says Sovran will help extend the life of existing fungicides.

"Sovran and the strobilurins will be a critical resistance management tool in years to come," he said. "DMI resistance is increasing, but using a completely different chemistry should help prevent this problem before it develops, or becomes more widespread."

Mike Shannon, past president of Peninsula Fruit Club, e-mailed

February 4:

Hi Evelyn,

I just received my Bee Line yesterday. Looking at the back page I think that I better pay my dues or you'll take me off the mailing list. I like the Bee Line. It has a lot of good information to read.

Last year my apples did pretty good. I monitor the apple maggots, and I only had to spray two times. I must have got them at the right time. I only had a few apples that got the bug. The rest were fine. I've been growing fruit trees for sometime now without spraying, but the apple maggots were getting too many of my fruits. I either have to spray or give up my hobby due to the apple mag-

gots.

I have 46 apple & 3 pear trees. I train all of the them to a trellis. Growing my fruit trees on a trellis or Espalier type trees has it advantages and disadvantages. Only a nut like myself would put over forty fruit trees in a backyard.

Most of my trees I grafted during the past 11 years. I believe that is how long I have been with the Peninsula Fruit Club. I used M-27, M-9, P-22, M-26, M-27, Bud-9/111, M-7 and MM-111. Some of my trees have multiple cultivators.

Growing espalier fruit trees is definitely the way to go. It may take more time during the summer months to care for espalier trees but it's worth it.

My favorite eating apples are

Yoko, Ozark Gold, Spartan and Honey Chrisp. Every year it's harder to wait during the fall months for the fruit to ripen.

I still chip-bud a few trees each year and give them to friends when they are two years old. The grafting is what makes our hobbies so enjoyable.

P.S.

Evelyn, you can put this letter in the Bee Line if you want.

E's note: See page 9 for Mike's thoughts on espalier.

EVALUATION OF FLINT and SOVRAN, TWO NEW STROBILURINE FUNGICIDES, AGAINST APPLE DISEASES

Daniel Cooley and Arthur Tuttle
Department of Microbiology, University of Massachusetts

Joe Sinuk
Department of Plant & Soil Sciences, University of Massachusetts

Heather Faubert
Department of Plant Sciences, University of Rhode Island

For the first time in many years, the agricultural chemical industry is releasing new types of fungicides for control of apple diseases. One new class of fungicides, the strobilurines, is particularly interesting. The first registered versions of these on apples are Flint® (trifloxystrobin) and Sovran® (kresoxim-methyl). The original discovery of this class of chemistry was in a forest mushroom, *Strobilurus tenacellus*. In a natural setting, the mushroom produces a chemical called strobilurine to fight off other fungi that may be trying to feed off the forest debris, or off the mushroom itself. Strobilurine A is a natural fungicide. Several companies have synthesized versions of chemicals similar to Strobilurine A, collectively called strobilurines, and are completing evaluation and registration of them.

These fungicides offer some interesting opportunities for apple growers. They are very effective against scab and flyspeck, the two key fungal diseases of apple in New England. In addition, they have a very clean bill of health on the environmental front, with low toxicity to mammals, bees, birds, and earthworms. While toxic to fish and other aquatic organisms, strobilurines are broken down very quickly, and tests show that under normal use patterns, they will not reach water before they break down.

It will also be important to use them wisely, since it will be relatively easy for pathogens to develop resistance to them. Indications are that the resistance that develops will be "all or nothing." That is, if resistance develops, it will come on with little warning, probably leaving significant disease in the wake.

The manufacturers recognize the

potential for resistance and attempted to address the problem by limiting the total number of applications that can be made in a year, the amount of material that may be applied in a year, and the number of consecutive sprays of strobilurines that may be applied. There are differences between the two labels in these respects. The Flint label uses a more cautious approach. For Sovran, the manufacturer "recommends" no more than three applications in a row. The Flint label states "use a maximum of two consecutive applications." The Sovran label says "do not make more than six applications per season". The Flint label carries a five application limit. The Sovran label states that Sovran should not be used as the last fungicide application of the season, while Flint does not have that restriction on the label.

At the very least, the label recommendations and limits should be followed strictly. A conservative approach would be a four application per season limit, with a maximum of two consecutive applications. All strobilurines have the same mode of action, so the limit of four applications per season would apply to the total number of Sovran and Flint sprays. Because strobilurines work well on fruit scab and other diseases, there is no compelling reason to tank-mix them with a broad-spectrum protectant as there is with the sterol inhibitor fungicides. Rather, the manufacturers have chosen to recommend alternating pairs of applications. Pairs of applications made 7 to 10 days apart sounds similar to the "back-to-back" applications recommended for the SI fungicides such as Rubigan and Nova. However, the important point with the strobilurines is to use a different class of fungicide after making

two strobilurine applications in order to reduce the chances that resistance will develop. There certainly are a number of unanswered questions about the best way to manage resistance, but that probably argues for taking a relatively cautious approach to using the strobilurines.

Both products exhibit excellent post-infection efficacy, similar to the 4-day activity of the SI fungicides. As you might expect with this sort of post-infection efficacy, the strobilurines are somewhat systemic. The strobilurines show some protectant activity, probably on the order of 3 to 6 days. Therefore, recommended intervals between applications are 7 to 10 days.

We have tested Flint for the last two years in scab trials, and looked at Sovran in a flyspeck trial this past year. In addition, several other researchers have run tests of one or both of these fungicides in recent years. We show some of the results of our trials here. The scab trials were done at the Horticultural Research Center in Belchertown, with an airblast sprayer. The fungicides were applied on schedules that would normally be used in a growers orchard. However, the manufacturer of Flint wanted to include another new fungicide, Vanguard (cyprodonil) in the tests, Vanguard represents another new class of fungicide chemistry, but appears to be of limited value to apple growers.

Table 1 includes 1998 results. It shows that the Flint treatment performed as well as standard Rubigan or Nova plus Dithane treatments against fruit and foliar scab. While the percentages were slightly different, the differences were not significant. By comparison, a low rate of Dithane (1 lb. / 100 gal.) did a relatively poor job of controlling early foliar scab. However, by the

(Continued on page 28)

THE BEE LINE

Table 1. Effects of sterol inhibitors, mancozeb, and a cyprodinil/trifloxystrobin treatment on the incidence of Scab in mature McIntosh, Belchertown, MA, 1998.

Primary scab season fungicides (per 100 gnl.)	Summer fungicides (per 100 gal.)	Scab incidence (%)			
		Terminals	Clusters	Fruit	Fruit (harvest)
Nova 40W+ Dithane 75DF (1.7oz. + 1 lb.)	Captan 50W (1 lb.)	0.4 c	0.0 c	0.6 b	1.8 b
Rubigan 1.6 EC+ Dithane 75DF (2.7 oz. + 1 lb.)	Captan 50W (1 lb.)	1.1 c	0.8 c	1.2 b	1.6 b
Dithane 75DF (1 lb.)	Captan 50W (1 lb.)	14.0 b	11.7 b	2.5 b	1.0 b
Vanguard 75WG [pink, bloom]; Flint 50WG [petal fall, 1st cov.] (1.7 oz.; 0.75 oz.)	Flint 50WG+ Captan (2.25 oz. + 1 lb.)	2.0 c	0.4 c	1.2 b	3.2 b
Untreated control		57.0	59.9 a	23.7 a	50.0 a

* Means within columns not followed by the same letter are significantly different at odds of 19 to 1.

Table 2. Effects of cyprodonil and trifloxystrobin on incidence of scab in mature McIntosh, Belchertown, MA, 1999.

Primary scab season fungicides (per 100 gal.)	Summer fungicides (per 100 gal.)	Scab incidence (%)			
		Terminals	Clusters	Fruit	Fruit (harvest)
Vanguard 75WG (1.7 oz.) 2 applications; then Vanguard 75WG (1.7 oz.) plus Dithane 75 DF (1 lb.) through petal fall	Flint 50 WG (0.7 oz.) 10 days after pf; 14 - 21 days	6b	9c	1b	2b
Vanguard 75WG (1.7 oz.) 2 applications; then Vanguard 75WG (1.7 oz.) plus Dithane 75 DF (1 lb) through petal fall	Flint 50 WG (0.7 oz.) 21 days after pf; 21 - 28 days	4b	5bc	0b	1b
Flint 50 WG (0.7 oz.)	Captan 50W (1 lb.)	0b	0c	0b	0b
Untreated control		31a	20a	4a	4a

* Means within columns not followed by the same letter are significantly different at odds of 19 to 1.

(Continued from page 26)

end of the summer, following three applications of captan on all treatments, fruit in the Dithane treatment were comparable to those in the other fungicide treatments.

In the 1998 test (Table 2), Vanguard performed well when used in combination with the strobilurine. However, the 1999 test suggested that Vanguard may not be carrying much of the load in Flint/Vanguard combinations. While the differences generally were not significant, there was no scab where Flint was used alone, but 4 to 5 % foliar scab in treatments where Vanguard was used in the early season. Scab on fruit at harvest was similar. While this test is not conclusive, data from the Hudson Valley Lab (Rosenberger et al., 1998) showed clearly that Vanguard did not control scab as well as Flint when both were used on a 10-day spray interval during the exceptionally wet 1998 season. (Table 3).

Tests for flyspeck control in Belchertown have been less conclusive. This year, the dry weather and the low inoculum in Belchertown made it unlikely that we would get flyspeck. Therefore, we did a single-application test in a block of Liberty trees at the University of Rhode Island East Farm in Kingston. By the time the application was made on July 29, flyspeck was already evident in the test block. Test trees received

no fungicides for the season except for the application that was part of this test. Flint and Sovran were compared to Benlate plus captan and to calcium chloride. The results are shown in Table 4 and Figure 1.

Strobilurines performed as well as or better than the best standard treatment, Benlate plus Captan, in a single application. The difference between Flint and Sovran may be due to a rate effect, as it has been suggested that Sovran should be used at twice the Flint rate for equivalent activity. The single application of calcium chloride did not significantly reduce flyspeck at harvest, but did appear to slow the epidemic. It also appears that the effect of the strobilurines lasted for approximately 3 weeks, at which point the rate of flyspeck-symptom appearance in both strobilurine treatments and the Benlate/captan treatment were similar. The early effect meant that at harvest, Flint was still significantly better than Benlate/captan in terms of flyspeck control.

The strobilurines may represent a real opportunity to improve our summer-disease management. So far, no interactions with mite management have appeared. Residue problems with the strobilurines, as compared to Benlate or captan, might be expected to be minimal. Rather than focusing the strobilurines on scab, it might be useful to reserve at least a couple of applications for flyspeck.

So, should Flint or Sovran be purchased for the 2000 growing season? Both materials have performed very well against scab and flyspeck, so the limiting factor will probably be price. The chemical companies are aware of this, and will probably price the strobilurines to be competitive with the combined cost of an SI plus protectant. Captan or mancozeb alone probably will be cheaper. If price is an issue and growers cut strobilurine rates below the label minimums, then control may not be very good, especially without a protectant to act as a back-up.

Strobilurines are good antisporelants. That is, they prevent active scab from producing large numbers of viable conidia that can cause more infections. They will do a good job stopping or slowing an epidemic. However, more than 96 hrs after the start of an infection, it is unlikely that strobilurines will stop symptom development. With the SI fungicides, applications a few days beyond the 96-hour post-infection recommendation would usually stop symptom development, or limit it to yellow spotting. This will probably not be the case with the strobilurines. In addition, post-infection use will hurry the process to resistance development.

Another factor to consider is what might be called "new product caution." With any new product, unforeseen circumstances may yield unex-

Table 3. Effects of cyprodonil and trifloxystrobin on incidence of scab in mature Jersey mac, Highland, NY, 1998 (Adapted from Rosenberger et al., 1998).

Fungicide (per 100 gal.)	Scab Incidence (%)		
	Terminals	Clusters	Fruit (harvest)
Vanguard 75WG (1.68 oz.) 2 applications; then Flint 50 WG (0.75 oz.) 2 applications; then Flint 50 WG (0.75 oz.) plus Captan 50W (12 oz.).	3.2 b	30.1 b	54.3 b
Flint 50 WG (0.75 oz.)	0.1 c	2.0c	19.2c
Flint 50 WG (0.5 oz.)	0.6 c	3.4 c	26.6 bc
Untreated control	67.5 a	97.5 a	100.0 a

* Means within columns not followed by the same letter are significantly different at odds of 19 to 1.

THE BEE LINE

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pected performance problems. While the strobilurines look great, it might be prudent to use them on a limited basis for a year or two. A lot will be learned about the strobilurines as commercial growers begin to use them. In short, use them where the price and timing fits your needs, but do not abuse them by cutting rates, or applying extra applications.

Table 4. Flyspeck severity in apples treated with a single fungicide application on July 29, 1999, Kingston, RI.

Treatment	Flyspeck*
Check	2.73 a
Calcium chloride 80% 10 lbs. / acre	2.46 a
Benlate 50 WP 9 oz. / acre plus captan 50W 3 lbs. / acre	1.64 b
Sovran 3.2 oz. / acre	1.41 bc
Flint 2 oz. / acre	1.14 c

*Rating for each fruit: 0=clean; 1=<10%; 2=10-40%; 3=>40%, Means not followed by the same letter are significantly different at odds of 19 to 1.

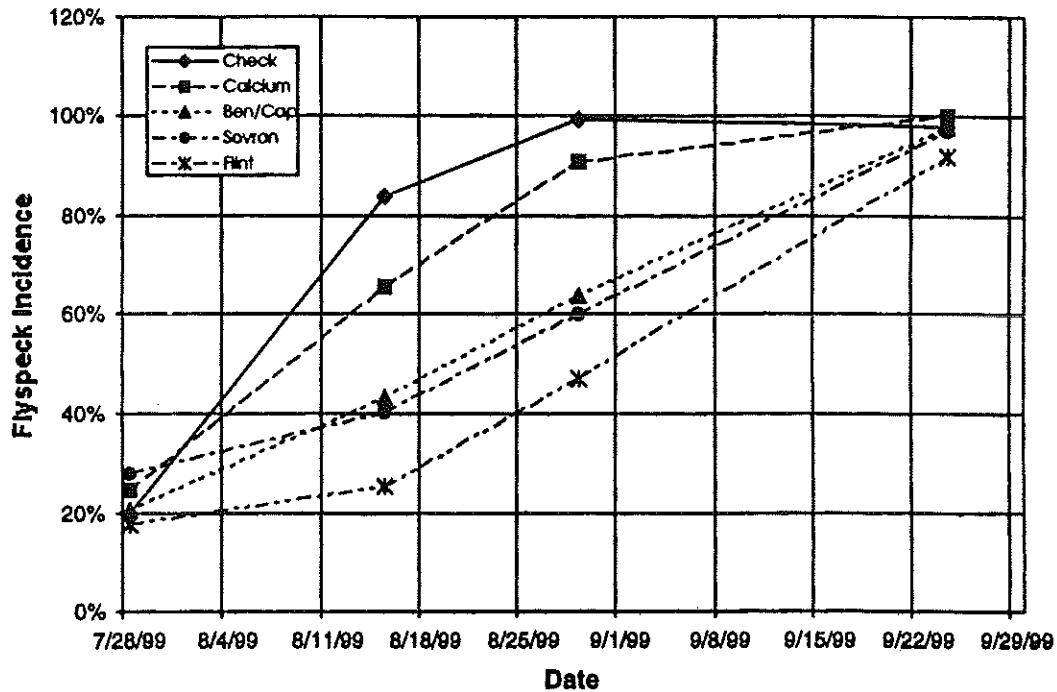


Figure 1. Percentages of fruit showing flyspeck symptoms following sprays with calcium chloride and three different fungicide treatments, Kingston, RI, 1999.

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NEXT NEWSLETTER SEPTEMBER 2000

THE BEE LINE

WE WANT TO HEAR FROM YOU

JUST AS PROMISED, HERE IS A NEW SURVEY Please take the time to respond so the Board can plan speakers at the events so you will want to attend. We also want to know what you want to read about in The Bee Line.

What changes in the Spring Annual Meeting would induce you to attend? _____

How about the Fall Fruit Show? _____

What topic would you like addressed? _____

A specific speaker? _____

Do you like the 3 column look? yes _____ no _____

Is it easier to read? yes _____ no _____ More difficult to read? yes _____ no _____

What area do you have for planting? city lot _____ acreage _____ how many _____ acres

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- BOARD MEMBER FALL FRUIT SHOW COMMITTEE CHAIR FIELD TRIPS SPRING MEETING
- ARRANGING FOR SPEAKERS NEWSLETTER MAILING OTHER _____

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Apples Pears Peaches Plums Cherries Kiwis Nuts Berries Other: _____

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