



The Bee Line

NEWSLETTER OF

WESTERN CASCADE FRUIT SOCIETY

A NON-PROFIT EDUCATIONAL ORGANIZATION

Volume 19 Number 2

Spring 1998

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

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DATES TO REMEMBER

May 3	Friends Blossom Walk- Brogdale Horticultural Trust, Faversham, Kent, England
June 6-7	Brogdale Open Weekend
July 11	WWTFRF Harvest Day at Mount Vernon—More information in next newsletter
July 25-26	Brogdale Summer Fruit Festival
August 1	WWTFRF Harvest Day at Mount Vernon
August 8	WCFS Board Meeting 10:00 a.m. Federal Way Regional Library
August 15	Bud While You Wait-Brogdale
September 12	WWTFRF Harvest Day at Mount Vernon
Sept. 12-13	Brogdale Cider Festival
October 10	WWTFRF Field Day at Mount Vernon
October 17/18	WCFS Fall Fruit Show

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

ALL ABOUT THE 1998 ANNUAL SPRING MEETING

They came from near and far; from Langley, B.C. to the north, Moscow, Idaho to the east, Longview to the south, Aberdeen to the west and points in between. Port Ludlow, Chimacum, Camano Island, Bellevue, Olympia, Seattle, Redmond, Tacoma, Port Orchard, Woodinville, Leavenworth, Yakima, Lakewood, Vashon, Enumclaw, Monroe, Shoreline, Shelton, Kirkland, Kent, Federal Way, Bothell, Puyallup, Everett, Lynnwood, Milton, Tukwila, Gig Harbor, Edmonds, Gold Bar, Burien, Renton, Graham, Sumner, Orting, Newcastle, Eatonville, Bremerton, Sequim, Steilacoom, Lakebay, Auburn, North Bend, Lopez.

Western Cascade Fruit Society's Annual Spring Meeting and Plant Sale, held on March 7 in Puyallup drew them. One hundred sixty three signatures were recorded, 65 were members. Contributions at the door totaled \$243.00 (one member contributed \$5.00) so it would appear that not every one signed in. And there were many members who were volunteering and did not sign in.

They came for the lectures, the rootstock, the scion wood, the fruiting plants.

Members came to see fellow members that distance prevents seeing more than at the semi annual events WCFS sponsors. They came to nominate candidates for Life Membership, they came in support of WCFS and their love of being a home orchardist and sharing their knowledge with others.

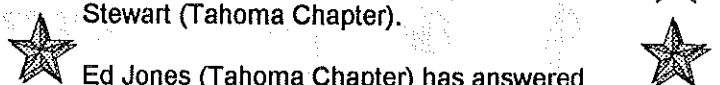
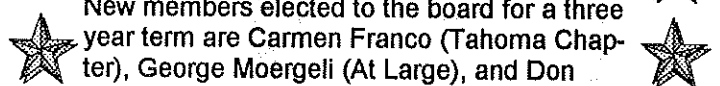
And those who were not members came to hear, to see, to learn. And sixteen became members, WELCOME to all.



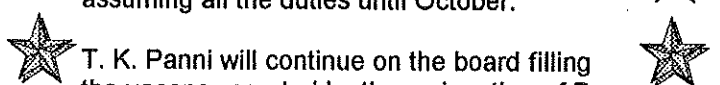
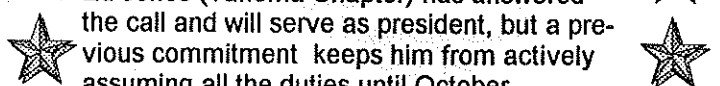
NEW WCFS BOARD MEMBERS



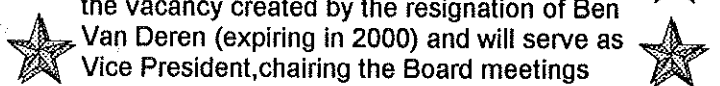
New members elected to the board for a three year term are Carmen Franco (Tahoma Chapter), George Moergeli (At Large), and Don Stewart (Tahoma Chapter).



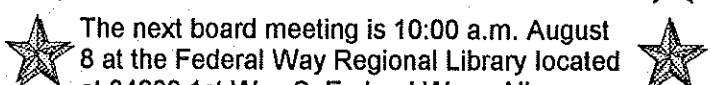
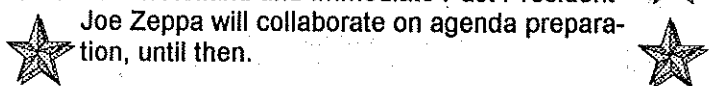
Ed Jones (Tahoma Chapter) has answered the call and will serve as president, but a previous commitment keeps him from actively assuming all the duties until October.



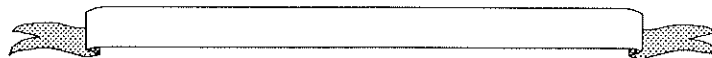
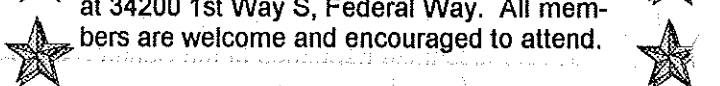
T. K. Panni will continue on the board filling the vacancy created by the resignation of Ben Van Deren (expiring in 2000) and will serve as Vice President, chairing the Board meetings until October. Chuck Holland continues as Secretary and Evelyn Troughton as Treasurer.



Chuck Holland and Immediate Past President Joe Zeppa will collaborate on agenda preparation, until then.



The next board meeting is 10:00 a.m. August 8 at the Federal Way Regional Library located at 34200 1st Way S, Federal Way. All members are welcome and encouraged to attend.



JOE ZEPPA HONORED

Outgoing president, Joe Zeppa, was presented with a plaque in appreciation for his service and leadership to WCFS.

The plaque, adorned with a red apple, was presented by Chuck Holland and reads:

Presented to Joe Zeppa in appreciation of his service as president of Western Cascade Fruit Society 1995 to 1998



AND MORE ABOUT THE 1998 ANNUAL SPRING MEETING AND SALE

You've heard it said:

"The best laid schemes of mice and men
Gang aft a-gley,"
An' lea'e us nought but grief and pain,
For promis'd joy.

Robert Burns (1759 - 1796)
To A Mouse [1785]. Stanza 7

Well, it happened at the Spring Plant Sale. Plants that were supposed to be at the sale never made it. They were shipped to Los Angeles, then back to the vendor and finally sent to Chuck Holland.

But they were in time for Chuck to take them to the open house held in conjunction with WWTFRF at the WSU Mt Vernon Station on March 14. What wasn't sold there Carmen Franco and Ed Jones took to sell at the Puyallup Spring Fair held April 17, 18, and 19.

Sorry for the disappointment and inconvenience, but it is just one of those things that happens from time to time. So, to quote another well known author, "All's well that ends well".

A very nice thing happened at the Spring Sale. A donation in the amount of \$100.00 was presented to WCFS by Trécé Incorporated.

Trécé had an educational display at the Spring Meeting. They manufacture codling moth monitoring systems and lures.

We are most grateful to them for their generosity.



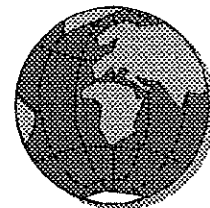
The lectures were very well attended. The high quality of the speakers and their outstanding comments were appreciated by all.

Dick Tilbury video taped all the lectures. The videos are available to chapters for their meetings. Arrangements may be made through Seattle Tree Fruit Society librarian Gerald Daily, (253) 838-6623.

WCFS

AND THE

INTERNET



At the Board meeting held after the plant sale, plans for a web page were discussed and finalized.

Western Cascade Fruit Society now has a page on the World-Wide Web. The page is being designed and constructed by Mary Morris. It includes sections on upcoming events, membership, chapters, and selections from The Bee Line. Our URL (it stands for "Uniform Resource Locator", and amounts to the same thing as "Web address" is:

<http://www.wcfs.org>

In order to see the Web page you need a computer with a modem, and an account on the World-Wide Web. (These are usually called "PPP" accounts or Web accounts.) You also need Web browser software, which is typically free and may come with the operating system of your computer.

Jon Singer, a member of Seattle Tree Fruit Society chapter, was a great help in getting the paper work for domain registration.

Mary Morris would like to have a WCFS member to work with her on what to include on the Web page. A fruit of the month, or tip of the month as a monthly feature, for instance. She would like to be sure there is something every month before it is put in as a regular feature.

Mary's e-mail address is: maryflew@u.washington.edu
Her phone number is: 206-523-6242

PLUS BITS AND PIECES

An experimental sprinkler head may enable tomorrow's growers to direct precise amounts of water and fertilizer to every part of their field, according to the U.S. Dept of Agriculture's Agricultural Research Service (ARS).

Known as a variable-flow sprinkler head, the device would accommodate natural variations in soil type, slope or fertility throughout a field. For example, the sprinkler head could apply smaller amounts of water and fertilizer to sandy areas prone to deep seepage, than to clay soils.

Precise applications of water or fertilizer will reduce the chance that excess water will leach into underground water supplies, carrying farm chemicals with it. When the sprinkler head is perfected, a needle or pin within the new nozzle would move smoothly in and out reducing flow by up to 35% of the nozzle's full capacity. An electrical power source or another component, called a hydraulic accumulator, would control the needle. Either power source can be activated by computer.

LIFE MEMBERSHIPS IN WCFS AWARDED

Four nominations for Life Membership, having been submitted to the Board of Directors, were presented at the Annual Meeting and were unanimously accepted.

Paul Donaldson presented his candidate: "I am nominating Ron Schaevitz for Life Membership in the Western Cascade Fruit Society. Ron has served as President of the Piper Chapter of the WCFS since the time that John Parker served as WCFS president, a period probably over ten years. During this time he has designated the main activities of the members at the monthly work party/meetings of the chapter (except December and June, July and August) at the Piper Orchard in Carkeek Park, Seattle. He has also regularly met with members of the Seattle Parks Department Carkeek Park administrative and work staffs to coordinate their activities with the Chapter's efforts to provide orchard maintenance (such as mowing and removal of prunings and ground litter) and to cooperate in the Chapter's efforts. He recently met with them to establish new directions in ground cover and fruit quality control. Ron's contributions have been special and unique in sustaining the Chapter's success and continuity.

Ron has also participated regularly as a Chapter President in the WCFS Board of Directors meetings where at least during my tenure as president he was an active contributor to the Society's welfare.

I ask for your support in this nomination."

From Donald Stewart: "The following is a petition seeking to award Ed Jones a Lifetime Membership in the Western Cascade Fruit Society.

Ed is a 73 year old man whose whole life is now devoted to volunteer service. In addition to providing the Tahoma Chapter of WCFS with an energetic presidential administration, Ed spends many hours each week working as a WSU Master Gardener. Ed is also involved with public schools. He frequently gives motivational and horticultural talks to student groups in the area. In his church Ed fills many functions, among them the maintenance and oversight of a large 100 year old-plus antique apple orchard.

Under Ed's guidance the Tahoma Chapter membership has grown from 11 to 70. This is in part due to Ed's ability to spread word to the community of the resources we have available to them. Ed also makes a continual effort to insure that each meeting is educational. Every month sees another expert speaker who provides everyone, despite their level of knowledge, with new information on home grown fruit production.

Even as much as the Tahoma Chapter's membership has grown, that achievement is overshadowed by the huge increase in exposure that Ed continues to engineer on behalf of WCFS. Ed has invested a great deal of time while

working with the officials of the Western Washington Fair to improve our presence there. As a result of his willingness to be responsive to the Fair's needs, our ability to reach out to the public is at an all time high. In years previous to 1997 we were allowed only a small display area to be used for just a few days during the Fair's run. 1997 saw our display area more than double in size. Our operation time was increased as well, to include all but the first three days of the fair. In 1998 we look to have an even larger area, and the entire duration of the fair in which to occupy it.

Perhaps the most important thing to communicate in the conclusion of this request is the high regard in which Tahoma Chapter holds Ed Jones. He is so much more than just an organizational leader to us all. His willingness and persistence in seeking answers to fruit and other horticultural questions, his energetic enthusiasm, and his insistence that membership in WCFS be made a *positive* experience sets a standard of excellence toward which we all should reach.

Please favor this petition by granting Ed Jones a Lifetime Membership in the Western Cascade Fruit Society as he so deserves."

Orel Vallen and Dick Tilbury submitted to the Board this nomination, presented to the membership by Dick: "In accordance with Article II, Section 2(c) of the WCFS bylaws we hereby submit the name of Joe Zeppa for your consideration as a nominee for Life Membership in the Western Cascade Fruit Society.

Joe is a longtime member of the Society and during that time has held a number of positions that give evidence of his exceptional dedication and service to the organization.

He was elected to the WCFS Board of Directors in March 1991 and then accepted the position of recording secretary in March 1992. He held this position until the spring of 1995. In November 1994 the WCFS Board of Directors established a WCFS Improvement Committee to improve the way the Society is managed and operates. Joe accepted the chairmanship of this committee and four proposals for management improvement were presented at the March 1995 spring meeting.

A further crisis developed at this time in that the nominating committee could find no candidates for the positions of President and Vice President. An executive committee was formed to carry out the functions of President and Vice President of the organization. Joe accepted the chairmanship of this committee. At a board meeting on June 17, 1995 the treasurer reported that in order to file our annual report with the Secretary of State, WCFS must have a president; an executive committee would not suffice. Joe agreed to become the president at this time and was so

elected. He has served as the Society's president ever since and has done an outstanding job.

Joe is truly deserving of the honor of Life Membership considering his dedication to the organization and his outstanding service in promoting the goals of the Society. His leadership in developing improved society management structure and getting us through a leadership crises in 1995 that culminated in his accepting the position of President are all examples of his exceptional dedication to the organization."

The following nomination was also submitted to the Board by Orel Vallen and Dick Tilbury. Orel presented it to the membership: "In accordance with Article II, Section 2(c) of the WCFS bylaws we hereby submit the name of Evelyn Troughton for your consideration as a nominee for Life Membership in the Western Cascade Fruit Society. The bylaws state that life membership may be extended to members of the Society who have shown exceptional dedication, provided exceptional service to the Society and have performed unusual services in promoting the goals of the Society. We know of no other member that better satisfies these qualifications than Evelyn.

In March 1994 she volunteered for the two most time consuming positions in the Society, that of treasurer and

newsletter editor. She still holds these two positions, and her performance during the four years has been nothing short of exceptional. We agree with President Joe Zeppa's statement in the last newsletter: "Special recognition to Evelyn Troughton, the talented editor of The Bee Line which I believe to be the best newsletter in the country." We further believe that special recognition should include the granting of Life Membership status.

Her performance as the Society's treasurer is also deserving of special recognition. Few members are aware of all the time that must be devoted to this position. The uniqueness of our organization in having six chapters greatly magnifies the scope of the job. She must coordinate with all six chapter treasurers regarding dues, membership and an annual report to the State plus form 990 for the IRS.

All this plus maintaining custody of all funds of the Society, keeping account of all receipts and expenditures, maintaining a computerized membership database, coordinating group buys on books and group subscriptions to the Good Fruit Grower magazine, plus supervising the membership table at the Fall Fruit Show and the Spring Event.

Evelyn is truly deserving of the honor of Life Membership considering her dedication to the organization and her outstanding performance as the Society's treasurer and newsletter editor. How could we ever get along without her."

BITS AND PIECES

WEB SITES FOR YOUR INFORMATION

WSU launched a new Internet website called "Gardening in Western Washington", which offers a number of services. "Ask an Expert" connects you to a forum where WSU Master Gardeners will personally answer your questions. The "Library" links you to expert publications written by WSU faculty and staff, "Local Opportunities" informs you about the Master Gardener program and other sources of horticultural information in your county, "Timely Topics" provides a month by month list of garden tips. Soon to come is a special section on "Stewardship Gardening". It will cover issues ranging from water-wise gardening, eco-lawns, and composting, to integrated pest management. You'll find it at <http://gardening.wsu.edu>.

Another WSU website called "Hortsense" provides nearly 700 answer sheets to problems of vegetables, fruit trees, lawns, and landscape trees and shrubs. Each answer sheet briefly describes the problem and tells you what to do about it. For pest problems, both nonchemical and legal chemical management options are listed.

You'll find it at <http://www.coopext.cahe.wsu.edu/~lenora>



Did you know even apples change their names? When the English apple Fiesta was changed to Red Pippin, Bill Martin a grower in the county of Sussex (and a former chair of the Variety Naming Committee at East Malling) expressed unhappiness. He thought it was a "bit dotty as a name—it isn't fully red, and the road is littered with disappointments with any variety associated with the word Pippin", a British magazine *The Fruit Grower* quoted him as saying.

Fiesta/Red Pippin is a cross of Cox's Orange Pippin and Idared from the breedign program in East Malling. It's flavor is tangy, but the color is a muddy red. Although it stores better than Cox, it doesn't seem suited to hot climates reports the Pacific Northwest Fruit Testers Association.

However, another major Fiesta grower in the county of Suffolk supports the name change, pointing out that the variety needs a real English identity and said the Spanish sounding-name could cause confusion among consumers.

This is not the first time a variety has been renamed after introduction to the market. In England, an apple called Thurston August was renamed Discovery after several years, and Mutsu was renamed Crispin. Carousel, a chance seedling discovered in Washington, was renamed Cameo last year because the name already belonged to a California plum!

from Good Fruit Grower, Dec 1996

NEWS FROM THE CHAPTERS

Elections have been held in the chapters and they send news of the newly elected or re-elected officers.

North Olympic Fruit Club officers for 1998/1999 are:

President	Eric Simpson
Vice President	Paul Moore
Secretary	Sandy Moore
Treasurer	Larry Barelo

Seattle Tree Fruit Society officers and board are:

President	Marlene Falkenbury
Treasurer	Dick Tilbury
Secretary	John Curry
Directors	Jerry Daily
	Rita Gill
	Paul Gotz
	Lyle McKnight
	Phil Swanberg

Monthly STFS meetings are now being held at the Center for Urban Horticulture, same dates and time.

Tahoma Chapter officers:

President	Carmen Franco
Vice President	Don Stewart
Treasurer	Pete Abercrombie
Program Chair	Ed Jones

Ed reports that the members are potting trees for the 1999 Spring sale!

Meeting Topics The May meeting will focus on weeds (the care and feeding) by WSU Horticulturist Jim Kropf. June will be gardening in general, and July (unconfirmed at press time) on new and rare fruits plus benefits of summer pruning.

Peninsula Fruit Club announces its officers:

President	Michael Shannon
Vice President	Kirsten Romtvedt
Treasurer	Marc Rimbault
Secretary	June Wamsley
Directors	Lloyd Neilsen
	Ray Mathisen
	Mel Armstrong

SOUTH PUGET SOUND CHAPTER DISBANDS

In January, Co-president Susan Barrett wrote to WCFS Officers and Board the following:

It is with real regret that I notify you that the South Puget Sound Chapter of WCFS is considering disbanding itself. I was directed by the group to write and let you know this and to ask for any help or advice which you could offer to help alleviate our situation.

We have 35 paid members at the moment, less than half of the membership we once had. Our yearly planning meeting yesterday drew 11 attendees, including two couples; one person had come to resign in person from the chapter, citing the press of other obligations.

With the great influx of new home buyers to Thurston County, we know that there is a need to share our knowledge, particularly when many come from other climates or from apartment living, with no fruit growing experience. We presume that an energetic PR campaign, with leaflets provided to the Cooperative Extension office, to area nurseries, and to the Olympia Farmers' Market, might bring in new members.

But we lack the human sparkplug(s) to energize us to this effort. Those of us who are left frequently have demanding jobs, or equally demanding volunteer commitments to the community. We have lost several very active members to illness in the last few years.

Our meetings have been a special experience, with a unique blending of ages, men and women, experience levels, with jobs and titles left at the door and unannounced. We did a numbered signup sheet/door prize, in which members spontaneously brought plants, books, etc., won by a number drawn from a hat, so that almost everyone's yard and memory has been enriched.

Norm Schut, our first president, initiated our meeting pattern on Saturday mornings (at SPSCC), which I thought a clever idea, since for most people that is rare

discretionary time. (Actually, Norm devised the door prize also.) And Ernie Mazzei, our first treasurer, built a data base of members and dues schedules which has proven very useful. For several years, we did excellent local fruit show and tasting, with cider pressing.

Some have wondered if we might change to a week night meeting. Others have wondered if we should expand to a fruit, vegetables, flowers focus. But it seems to come back to a lack of people with the time and energy to provide new leadership.

We have drawn members from a wide area. Yesterday there were attendees from Yelm, Shelton, Aberdeen, Tenino, and Tacoma (Larry Mowrer who has so graciously traveled to be our secretary). One former president came from Amanda Park on Lake Quinault.

Next month on Feb. 21st, (the third Saturday), we will have our annual scion exchange and grafting demonstration. I will notify the local paper(s) of this event. Since Stu Shumway's passing, we no longer have the great reserve of varieties to which we once had access, but we will proceed anyway. But we also will then be discussing final resolution of our chapter's dilemma.

We realize that we can still remain member-at-large of the parent organization, which some of us intend to do. Our treasury contains about \$300 which we can contribute to SPSCC's horticultural program as a scholarship; such a contribution has been an annual pattern for us. Or perhaps we could vote to contribute this money to Mount Vernon.

Thank you for the opportunity to fully explain our situation to you.

On February 21, at the monthly meeting, the members, the eleven who attended, voted to disband. Unanimously, they voted to donate any money left in the treasury to WCFS with the strong recommendation that it be donated to Western Washington Tree Fruit Research Foundation.

DWARFING CHERRY ROOTSTOCK A DREAM COME TRUE?

THE HISTORY AND DEVELOPMENT
of the GISELA Dwarfing Cherry Rootstocks
by Dr. Hanna Schmidt
(Edited by Wallace E. Heuser)

In the early '60's, Giessen University in Giessen, Germany opened an Institute of Pomology and appointed Dr. Werner Gruppe as its head. At that time, Malling IX was fast becoming the apple rootstock of choice in Germany and throughout Europe. This new trend to high density dwarf apple plantings also emphasized the need for dwarfing cherry stocks as there was no comparable dwarfing stock available for sweet cherries. Dr. Gruppe selected this as a major project for the new Institute. He appointed Dr. Hanna Schmidt as the plant breeder.

At that time and still today, *Prunus avium* is the primary rootstock for sweet cherries. After reviewing the many *Prunus avium* variations, it became clear that there were no clones available in that species that would produce the desired dwarfing effect. Drs. Gruppe and Schmidt then decided to do a series of interspecific crosses between several non-vigorous cherry species.

Crosses were made between diploid and tetraploid selections of the genus *Eucerasus* and diploid selections of *Pseudocerasus*. Six thousand hybrid seedlings were produced from 1969 to 1972. Several hundred of these seedlings were cloned. The first field plot of grafted cherries was set up with nearly two-hundred rootstock candidates of very different origins. Hedelfingen was selected as the scion variety for all of the tests because of its fairly late fruiting habit.

The trees were evaluated for dwarfing compatibility, disease resistance, suckering and induction of early flowering and fruiting. All of the clones selected for further testing were hybrids within the section *Eucerasus*, mainly triploid hybrids with one tetraploid.

As the size and scope of the project increased, difficulties arose for the small Giessen Institute to do all the necessary propagation and testing of 6,000 seedlings. Agreements were set up with a group of German Nurserymen, called the *Consortium deutscher Baumschulen (CdB)*, and *Hilltop Nurseries and Orchards, Inc.* to support the testing and marketing of the *Giessen* Rootstocks.

With the retirement of Dr. Gruppe, the Institute at Giessen was closed down, and further work at Giessen University was stopped. Some of the material went to other stations for continued observation. The rootstock trials were grubbed out and some of that gene pool was lost. Since the closing of the Giessen Institute, the CdB and other German research stations have continued the development process.

There are at least seven promising hybrid clones from later

crosses that look promising and are in more extensive testing in Europe. These will also be in North America at several locations as a part of the next planting of new cherry rootstocks being assembled for planting by the NC 140 Rootstock Research Group in 1998.

In Germany at this time, the interest and use of dwarfing cherry rootstocks is increasing rapidly. *Gisela*[®] 5 (GI[®] 148-2) is definitely the leader and is in strong demand for planting by German growers. *Gisela*[®] 4 (GI[®] 473-10) is the latest introduction to be released. It was developed later at the Ahrensburg Institute by Dr. Hanna Schmidt. It makes a tree somewhat smaller than *Gisela* 5.

In North America, *Hilltop Orchards and Nurseries, Inc.* originally imported seventeen of the most promising clones. Most of these were included in the 1987 NC 140 Cherry Rootstock Trial Plantings in sixteen locations in the U.S. and Canada. Results from these plantings are now providing much data from the widely varied growing conditions of the different sites.

The most promising clones for North America at this time appear to be: *Gisela*[®] 5 (GI[®] 148-2) which makes a dwarf, very precocious, productive tree 45% or less in size compared to Mazzard. The tree is open and spreading with wide angled side branches. It is hardy with good tolerance to heavy soils, very little suckering, good tolerance to virus infection and good compatibility to a wide range of varieties. Support is suggested as anchorage is moderate. Fruit shape and size are normal.

Gisela[®] 6 (GI[®] 148-1) makes a semi-dwarf tree about 60% of Mazzard. the rootstock stimulates very early blooming and heavy bearing. The tree is very hardy and adapted to heavy soils with good disease resistance and virus tolerance. Variety compatibility is good and suckering is not a problem. The yield efficiency is very good and fruit size holds up well with the heavy cropping. A management system that stimulates and maintains good vigor and annual extension growth to balance the early heavy cropping is a must.

Gisela[®] 7 (GI[®] 148-8) makes a semi dwarf tree about 50% of Mazzard. This rootstock is also very precocious, heavy bearing, hardy, fair anchorage with some suckering. It is adaptable to a wide range of soils and moisture levels, and there have been no variety compatibility problems to date. It has recently shown some sensitivity to *Prunus* Necrotic Ring Spot Virus. The full extent of this potential problem is not known at this time. The trees in the 1987 NC 140 plantings have not shown a problem with natural virus infection in the 8 years to date.

Recent research on virus sensitivity of the *Gisela* rootstocks has confirmed and supported earlier work done in Germany showing that there are varying degrees of sensi-

(Continued on page 8)

(Continued from page 7)

tivity within the group as there are with other cherry rootstocks such as Mazzard, Mahaleb, Colt, etc. The favored clones mentioned above are in the same range of sensitivity that Mazzard and Mahaleb are.

The very dwarfing *Gisela*[®] 1 (GI[®] 172-9) is one of the most sensitive to cherry viruses. There have been a few of these trees sold to date primarily to the garden center market. The usefulness of this and one or two other sensitive clones may be limited because of this sensitivity. More time is needed to learn how these sensitive clones perform in the field under natural conditions.

Ten respected and highly conscientious nurseries in the United States and one in Canada have been licensed to produce finished trees on *Gisela* rootstocks. These nurseries produced and delivered the first commercial crop of

trees to the U.S. industry this Spring of 1995, and a total of over 50,000 trees were planted. The 1996 estimates point to almost doubling this number. Supplies of trees for 1996 are getting very short and many trees are already booked for 1997 delivery. [Editor's note: of the ten nurseries, one is in western Washington - Biringer Nursery, Mt Vernon].

The *Gisela* dwarfing rootstocks provide many advantages for increasing profitability with a minimum of negative exposure. I believe they are going to provide the same basic advantages to cherry growers that the dwarfing apple stocks have done for the apple growers. I also believe that this revolution in cherry production is going to happen much faster than it has with apples.

The continued testing evaluation and marketing of the *Gisela* stocks in North and South America is now the responsibility of GISELA, INC.



It would appear that the above article was written in late spring of 1995.

In January of that year an article by Mitchell Trebon titled "Experts: Jury Still Out on New Cherry Rootstocks" was published in the Capital Press cautioning northwest cherry growers to be patient, quoting two researchers, Frank Kappel of Summerland in British Columbia and Greg Lang of WSU Irrigated Agriculture Research Station in Prosser.

Kappel said they were not ready to make any recommendations. He said some of the rootstocks "particularly a few varieties of the Giessen line are looking quite interesting." However, he stated, each has aspects that could cause problems in the wrong circumstances and that a few are nearly ready for low-level testing in grower's orchards.

Kappel also said that any plantings made at this time should be what one can afford to lose, that the researchers should make the early mistakes.

Lang's program at Prosser, part of the NC-140 program, is testing new rootstocks under varying regional conditions. Lang states that results are variable and incomplete; more data is needed at this time. The "Achilles heel" for some Giessen types could be virus susceptibility, grafting virus-infected buds "can be lethal with some of these rootstocks."

Summerland is looking at other dwarfing rootstocks, including Weiroot from Germany and Edabriz from France. Research on these is still in the beginning stages. Some cultivars aren't dwarfing enough, others are small but not as productive, some flower profusely and produce a heavy crop which will cause smaller fruit if allowed to happen.

TESTING GISELA DWARFING ROOTSTOCK AS RECORDED THROUGH THE YEARS

by Evelyn Troughton

In May, 1995 Renee Stern wrote in *The Grower* regarding high-density cherries (dwarfing varieties) of aspects research has revealed. Giessen rootstocks start flowering and fruiting at age four, compared with year six for Mazzard, but also showed a greater sensitivity to viruses common in the Northwest—prunus necrotic ringspot for one. This virus caused tissue death and bud graft failure in some rootstocks. One of this year's research projects is to inoculate 2-year-old and mature trees with these viruses to see if the tree responds better than the rootstock alone. They also seem to bloom earlier, leading to possible damage from spring frosts, with preliminary data suggesting the trees aren't as hardy in late winter and early spring as Mazzard. The hot, dry summers of eastern Washington have no apparent adverse effects, though no specific tests have focused on that aspect.

In other test areas (Michigan and New York) some trees have lost vigor or unexpectedly died after the sixth or seventh year. This was noted by researchers in the Prosser test block, but heavy fertilizing and strong pruning seemed to avert the decline.

Heavy bearing with good fruit size is the criteria for the future of dwarfing cherries in the industry.

In November, 1995 *Good Fruit Grower* reported, in an article titled "Giessen Rootstocks Show Virus Sensitivity" that although "Giessen rootstocks may be just what growers have been waiting for in terms of dwarfing trees. . . . there is evidence that some of the promising rootstocks may be susceptible to viruses that can devastate an orchard."

In the tests on established trees of five rootstocks, *Gisela* 5 was the least affected, if at all, and *Gisela* 6 showed very

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little reaction. Dr. Gaylord Mink, plant pathologist at Prosser says all Giessen rootstocks are susceptible to viruses in the sense that they can be infected, just like the Mazzard or Mahaleb rootstocks, but they do not all show symptoms and are not adversely affected.

He said scientists in Germany were aware that some in the series were unusually sensitive to viruses before the rootstocks were brought into the United States, but the fact did not get much recognition from the people developing the rootstocks.

In the Prosser tests, when a tolerant variety, such as Bing, is grafted onto a sensitive rootstock, the top of the tree may not be affected initially, but as the virus travels down the tree, there is a strong reaction at and below the graft union, and ultimately, the top of the tree becomes infected. The virus either kills the rootstock outright or creates a barrier at the graft union, which starves the tree, eventually killing it.

Prunus necrotic ringspot and the prune dwarf viruses are spread by bees infected pollen. Thrips also spread the virus in their feeding process by providing an avenue for the virus to get into the tree. Without thrips, even if infected pollen is carried to the flowers, the tree will not become infected.

If the thrips can be controlled, the risk of viruses being spread through infected pollen can be reduced. Thrips lay eggs in the soil and in debris under trees. When the young thrips hatch from the eggs in early spring, they feed on pollen and target the first flowers out. With lots of flowering weeds in the orchard, thrips populations will build up rapidly, and there can be large numbers by the time the cherry blossoms open. With few flowers in the orchard before bloom, the thrips do not have the opportunity to build up.

The consensus is that Gisela is the best hope for a dwarfing cherry, but they are finding things that make people nervous.

In March 1996 Western Fruit Grower reported on Gisela and virus sensitivity was still a concern. Balancing the crop load—crop loads on Gisela 5 after 7 years are comparable to loads on standard cherry trees of the same age—and the amount of annual vegetative vigor needs particular attention. Tree structure was discussed with the aim of protecting cherries from rain cracking and birds. The possibilities are many: Christmas tree, open V, and trellis systems were mentioned.

In April 1997 Farmer-Stockman, a Farm Progress Publication, gave a glowing report on Gisela dwarfing rootstock. Lauding its copious and early bearing in comparison with Mazzard; its hardiness; adaptability to soil types; and structure allowing ease in training. Kat Ricker, author of the article, recommends that any management system selected must allow for annual renewal of shoot growth to balance the early and heavy cropping. Also recommended is an annual removal of 60% to 70% of the canopy in Au-

gust to stimulate shoot growth and to prevent senescence.

"Giselas are as resistant to disease as Mazzards. Early in the testing period, certain Giselas proved less resistant to cherry viruses, but these clones have been pulled off the market. Now pest control remains about the same as standard approaches to cherry tree raising, combating the common culprits of Crown Gall, Cherry Yellow Virus and Prunus Necrotic Ring Spot Circos."

At our Spring Sale in 1995, WCFS had a limited supply of Gisela 5 rootstock. I contacted Chuck Parkman, thinking he may have bought some, asking which rootstock he had, how long in the ground, how many he planted, is it bearing yet?, abundantly?, and is the tree true to size advertised.

Chuck replied: I have 4 cherry trees on Gisela 5 Rootstocks which were purchased and planted in winter of 1996-97. They have heavy bloom this spring which will be first year of production so can't tell about fruit size. Saw various Gisela rootstocks on several different varieties of fruit at the WSU Prosser Station during the IDFTA conference in February. Found I should have pruned the central leader heavily to get a Spanish Bush type tree which is easier to net against birds. I suggest a tour of the Prosser Gisela planting for those who want to see tree size for each rootstock and pruning method.

Chuck also told me he has color slides of Prosser planting showing size and pruning styles of each Gisela rootstock which he would show at a future meeting.

Evidently, Chuck did not purchase any of the Gisela rootstock we had.

In conclusion, let me say that in a recent conversation with Bob Norton and as he stated at our Spring meeting, Gisela 5 is best for western Washington.

Many thanks to Chuck Parkman for supplying the material for this dwarfing cherry rootstock article.



Gisela at Mount Vernon

I talked with Jackie King at the WSU Mt Vernon Experimental Station about the Gisela test planting there, which was started in 1995.

The test plot consists of several clones, including one Gisela 5, a 148-8 (Gisela 7) and several other, which she did not identify. The rootstocks are grafted with Lapin, Stella, and Bing varieties. The Gisela 5 had a few blooms last year, and this spring it is in full bloom.

THE ROOTS of CHERRY GROWERS' FUTURES

New Weiroot and Gisela rootstocks could open up a whole new world for U.S. sweet cherry growers.
It's time to start seeing how they grow in your area.

GOING WITH GISELA

by Gregory A. Lang

There is a time-warp on the horizon for sweet cherry orchardists, with new genetic tools that may change forever how cherries are grown. Many exciting new rootstocks are now moving through various research trials and into grower test plots.

The most amazing traits of these new rootstocks are the induction of precocious bloom (often significant by the third year, compared to about year 6 with Mazzard or Mahaleb) and varying levels of vigor control. Like the early days of transitioning from seedling rootstock-based large apple trees to today's highly productive, precocious clonal rootstock-based miniature apple trees, the learning curve for cherry growers over the next decade will be steep. As sweet cherries are inherently of higher production risk than apples, moving through this transition is likely to be more difficult than simply generalizing the lessons learned over decades of apple research.

The first of these rootstocks on the North American scene have been the Gisela series from Giessen, Germany, and the Gran Manier series from Gemloux, Belgium. These were among 24 different cherry rootstocks planted in research plots across the continent in the 1978-88 NC-140 regional rootstock trials, and thus scientists and growers now have had about a decade of limited experience with them. Many questions have been answered, at least partially, and many remain.

One of the critical screening tests is for sensitivity to common pollen-borne viruses, such as prune dwarf virus (PDV) and Prunus necrotic ringspot virus (PNRSV) that often are found in older sweet cherry orchards without causing overtly negative effects; in fact, some strains of these viruses may elicit subtle horticultural benefits, like firmer or sweeter fruit. Mazzard, Mahaleb, and Colt appear to be very tolerant to these viruses — hence, we should expect nothing less from any new rootstocks.

It should go without saying that any rootstocks listed among the front-runners provide excellent precocity, giving enough fruit for harvest in the third or fourth leaf (see Table 1), and remain highly productive when managed appropriately as the orchard matures. All of the Gisela rootstocks tested to date appear to have winter hardiness equal to, or better than, Mazzard. The 148 series

(including Gisela 5 and 6) tend to exhibit wider branch angles than trees on Mazzard and have dense root systems with a high percentage of fine roots — these have tended to be among the best performers thus far. Also, vigor on these rootstocks is nearly normal (see Table 1) until significant fruiting begins.

Waiting For Answers

Thus far, it seems clear that proper development of young tree canopy structure is critical, considering the strong effect that precocious fruiting can have on tree vigor and allocation of resources for growth and fruiting, and maintaining a balance between cropping and new leaf area is essential for consistent production of high quality fruit. But questions still remain when it comes to orchard longevity. The oldest sweet cherry trees on Gisela rootstocks in the U.S. are only now approaching about 12 years old; even in Germany, the oldest test plots are only between 15 and 20 years old. Soil adaptability traits have not been characterized yet in the U.S., nor has research yet attempted to identify particular sensitivities or tolerances to nematodes or diseases like phytophthora, Armillaria, Verticillium, crown gall, etc. And, finally, tree availability from nurseries is a major limiting factor at the moment.

However, it is somewhat obvious that the year of first yield will be similar for a precocious orchard planted in 2001-2002 compared to a non-precocious orchard planted in 1999! It may be worth the wait for some growers, considering the cost of borrowed money, the possible income from farming future orchard ground until trees are available, and the fact that more will be known about the management and disadvantages of these currently exciting plant materials in a few more years.

Table 1

Third season yield and tree vigor of Bing cherry on standard and promising new rootstocks in Pasco

Rootstock	Yield (lb/tree)	Vigor(% of Mazzard (sdlg))
Mazzard	0	100
Gisela 5	10.0	105
Gisela 6	12.6	122

Lang is Associate Professor and *Prunus* Program Leader, Washington State University, Prosser

The above article, Going With Gisela, and the second part, Working With Weiroot, on page 11 were published in the April, 1998 issue of Western Fruit Grower

WORKING WITH WEIROOT

by Lynn Long

For years, cherry growers have recognized the advantages of growing small trees on dwarf rootstock. They've observed the revolution that has taken place in the apple industry due to dwarfing rootstocks, and longed to take part in it. They've realized the potential that these rootstocks provided the apple industry for increased production and productivity. They've seen crops being produced in the second or third leaf and mature trees harvested from the ground, without tall ladders.

However, good dwarfing rootstocks have eluded the cherry grower. That is until recently. After 10 years of trials in the U.S. and comprehensive scientific investigation in Germany, scientists in the western U.S. finally have the data to justify grower trials of a limited number of Gisela rootstocks. This is an important and exciting step, but growers have yet to validate the results of the scientists. Another German rootstock series has not had the level of scientific scrutiny associated with the Gisela series, but has been accepted and used commercially by foreign growers for a number of years. This is the Weiroot series making up 80% of the new plantings in the Franconia region of Germany. Weiroot will soon be available to American growers and deserves a closer look.

The Weiroot rootstocks were originally selected from wild sour cherry (*Prunus cerasus*) seeds growing in the mountainous regions of Bavaria. These alpine sources assured scientists that the plant material would be winter hardy, a problem in Bavaria for the more sensitive Colt rootstock out of England.

After years of testing by scientists and extension personnel, two series of releases were eventually made. The first generation of releases included Weiroot 10, 13, and 14 — of which Weiroot 13 was the most popular and widely planted. All of these selections were relatively vigorous, reducing growth by 20% to 30%. These rootstocks introduced the concept of size control to Franconian growers. Coupled with the poor soils of the area, they provided increased precocity along with reduced tree height, giving growers the ability to grow a 15-foot tree. In fact, Weiroot 13 became so popular that it replaced Mazzard F 12/1 as the standard for the region.

However, the goal of scientists was to provide growers with a range of tree vigor and not simply a semi-dwarf tree. Therefore, a second generation of releases was made, which included Weiroot 154, 158, 53, and 72. These rootstocks provided growers with true dwarf alternatives to the standard rootstocks. From this series of releases, Weiroot 154 and 158, providing 50% reduction in vigor, have proven to be the most satisfactory. Weiroot 53 and 72, at 25% to 30% the size of F 12/1, have shown more problems with mortality than the other selections and have not been as widely accepted.

Probably the most exciting aspect about the Weiroot rootstocks are their ability to maintain fruit size while reducing tree size. It is this factor alone that has caused disappointment in other potentially promising cherry rootstocks. The

data reported in the table below was collected by Tobias Vogel, Extension Agent for the Franconia area of Germany. Vogel states that years of data substantiates that cherries grown on Weiroot 10 produce fruit of similar size to that grown on F 12/1. He therefore considers Weiroot 10 as the check.

While growers in the Franconia region of Germany have been successful utilizing Weiroot rootstocks in their commercial production, scientists and growers in other regions of Europe have not always shared that success. Reports of high mortality rates, especially with Weiroot 53 and 72, have caused scientists to speculate on the reason for these failures. Concerns have been expressed over issues of cultivar compatibility and virus susceptibility. Cultivar compatibility has been suspected in both German and Swiss trials after significant mortality occurred. However, Bavarian scientists successfully combined 70 different cultivars with the Weiroot rootstocks. Compatibility problems occurred only with Van, and that only on a limited number of rootstocks such as Weiroot 14.

For good reason there is much excitement and expectation surrounding the Weiroot rootstocks. German growers are successfully growing excellent cherry crops with these rootstocks even now. However, it must be remembered that these rootstocks have not been tested in the U.S. Differences in soil, climate, and diseases can drastically affect the way a rootstock will perform. In addition, tests have not been conducted to determine whether these rootstocks are compatible with our cultivars or whether they are sensitive to our viruses.

The Weiroot rootstocks will be included in the next NC-140 trial for direct comparison against the better Gisela rootstocks. In addition, a consortium of scientists from Oregon and Washington, called the Genotype Research Consortium, will be testing the Weiroot stocks for susceptibilities. As scientists evaluate these rootstocks, growers should consider small test plots to determine their suitability for their local conditions.

Long is Extension Agent, Oregon State University Extension Service, The Dalles, Oregon.

Fruit weight and cumulative yield (1992-1994) across various cultivars on five rootstocks.

Rootstock	Yield (kg/tree)	Fruit size (g)	% Weiroot 10
Weiroot 10	12.5	7.95	100
Gisela 5	9.8	8.09	+1.8
Weiroot 158	10.1	8.18	+2.9
Weiroot 53	8.7	7.98	+0.4
Weiroot 72	6.2	7.73	-2.8

SWEET CHERRIES WITHIN REACH

Dwarfing rootstocks and self-fertile varieties give you the upper hand

by Robert A. Norton

Gardeners like to visualize doing such fantastic things as picking heaps of perfectly ripe, juicy, sweet cherries from their own trees. If you've actually tried to grow them, you know a cherry tree's source of torment can be bottomless: excessive growth, pollination problems, diseases that rot the fruit or kill the tree, ravenous birds that always seem to hear poet Thomas Campion's "Cherry Ripe" clarion a moment ahead of you. It's all so familiar.

But for the first time in my 40 years of growing sweet cherries—and I've grown them in Washington, California, Utah, Michigan, New Jersey, and Connecticut—I am downright enthusiastic about the home gardener's chances at real success. From the orchards of Giessen, Germany, has come a series of dwarfing rootstocks that keep trees small and manageable. Matched with grafts that don't need a mate for pollination, the rootstock produces a nearly ideal tree for the kitchen garden. With proper care and the right techniques, you can make your cherry dream come true.

A Winning Combination

Almost all fruit trees are grafted onto a rootstock, a major determinant in a tree's size, pest and disease resistance, and cold hardiness. You usually can see a bit of a crook or swelling in the stem at the graft point of a tree you buy from a nursery.

While dwarfing rootstocks for apples are common, there hasn't been a satisfactory one for cherries until recently. The Giessen rootstocks developed by Werner Gruppe and Hanna Schmidt work well, far better than some of the others that have come along, such as Stockton Morello, which produced too many suckers. The Giessen series, which has been available in North America for only the past few years and marketed mainly to commercial growers under the name Gisela, varies in the amount of dwarfing the different types impart. For example, Gisela 5 holds down growth to about 45% of a traditional full size tree on Mazzard rootstock, Gisela 6 about 70%, and Gisela 7 about 50%.

Trees on Giessen rootstocks also produce fruit earlier, usually by the third year. Most other types take four or five years.

Pollination isn't the problem it once was. Cross-pollination with another variety used to be essential, and not just any variety would do. If your orchard had just 'Bing', 'Royal Anne', and 'Lambert', you wouldn't get a single cherry because those varieties don't cross. New varieties make cross-pollination much easier.

But what if you want just one tree? Well, English and Canadian scientists have developed sweet cherries that are self-fertile, just like most peaches and sour cherries. I have one of these varieties, 'Lapins', grafted on my Gisela 5 rootstock, and I see it as nearly the epitome of a back-

yard cherry tree. Careful management will keep the tree about 6 ft. or 7 ft. tall and about as wide, with cherry production running about 20 lb. to 30 lb. annually. That's plenty to keep my family regular. Who needs a cherry tree 20 ft. tall?

You can expand your options with "two-way" or "three-way" trees, those with multiple varieties grafted on one root, though managing them can be more difficult.

Do You Have What It Takes?

It's a tree. But that doesn't mean you can grow it in the woods. Cherry trees require 8 to 10 hours of direct sunlight daily. Winter temperatures should rarely fall below -10° F, but there needs to be enough chill to keep the trees dormant until it's time to bloom. It also can't be too hot, not over 100° F. High temperatures and high humidity encourage disease.

If you have soggy, shallow soil, or heavy clay, perhaps you'd better stick to apples, pears, or plums. Cherries like well-drained soil. The Giselas have shallower root systems and require more frequent watering in summer than the bigger trees.

The prevalence and persistence of pests and disease depends on your area. We don't have many insects in my region of the Columbia Basin. We do have the cherry fruit fly and, being in a major commercial fruit-growing region, we must spray for it. One cherry fruit fly in a delivery to a commercial packing house can condemn the whole orchard because the maggots eat the fruit on the way to market. In other areas, you may be plagued by plum curculio, aphids, pear slugs, mites, wood borers, cherry sawfly, and other creepy crawlers. Some of these, such as aphids and pear slugs, cause minor damage and don't really require control.

For the birds, cloaking the tree with about \$15 worth of 1-in. polypropylene mesh should pay for itself in frustration relief in a single season.

Bacterial canker, common in areas afflicted with wet, cold winters, can kill the tree. In wet, warm springs, brown rot can destroy the blossoms or fruit. Spraying a fungicide is a must.

Cherries are more often than not over-fertilized, so go slowly with the stuff. Wait and see how the tree grows. If annual growth of new shoots is at least 12 in., don't worry. If it is less, some nitrogen might be in order.

Like most fruit trees, cherry trees need about 1 in. of water per week during the active growing period. The Giselas, with their shallow roots, do not tolerate drought well. Keep competing vegetation away.

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Three Tricks for Keeping Your Tree Fruitful

If you buy a new tree, it is usually best to maintain a cone shape with a single central leader like a Christmas tree.

The important thing in training a sweet cherry is to allow enough space between main branches, and to encourage the development of small fruiting branches. The more you prune a cherry tree, the larger the fruit size will be, within limits, but also the smaller the crop and the greater the stimulation of vegetative growth. I would tend to go easy on the pruning, especially when the tree is young.

Winter pruning should be avoided in many parts of the country because it encourages the spread of bacterial canker. Prune so that air circulates easily through the branches. Foliage stays drier, which helps prevent disease.

Short circuit unwanted growth. A good trick for managing the size and shape of the tree is tipping. If new shoots are a foot or more in length by the first of July, just pinch out the tip of any new growth that exceed 12 in. to 16 in. Then the shoots will start to make numerous side branches

at the tip, which will help to control height and provide more fruiting branches.

Force bud development. Sweet cherries have a tendency toward long, bare branches, devoid of fruit. Cutting a notch through the bark to the inner hardwood just above a dormant bud often stimulates the bud to grow, a technique that can be used to encourage low, fruitful branching. Eventually these buds along the trunk and branches will die if they aren't stimulated. So it's best to do your notching early on wood no older than two years.

Bend branches and spur fruiting. Sweet cherry trees, more than any other fruit type, reach for the sky. The more vertical the branch, the more vegetative the growth. By bending branches 30 to 60 degrees, you will have fewer leaves and more fruit. It's easy to tie down or brace a branch with a grooved piece of wood. Tree scientists believe that bending branches slows the draining of hormones that are critical for fruiting.

And the fruit is what we want. Despite the obstacles, the royal thrill of picking sweet cherries makes it all worthwhile. Let the birds eat cake.



Tipping encourages better branching. Pinch out the tips of vigorous shoots to encourage side branching and keep the tree from getting too tall.



Cut a notch above a dormant bud to stimulate growth along bare branches of the tree. This will help keep fruiting wood where you can easily reach it.



Bend branches away from vertical to encourage fruit development.

VERTICAL AXIS: The perfect apple planting system?

compiled from an article by

Stephen Hoying & Terence L. Robinson, Cornell University
as published in The Great Lakes Growers News—April 1997

Ask any commercial fruit grower and he will tell you there is no perfect planting system.

They might be right, but Hoying and Robinson think the Vertical Axis System is pretty close to perfect for New York and the Northeast. They say this apple planting system is productive and precocious and begins to produce fruit as early as the second leaf. It easily has the ability to produce more than 1,000 bushels of fruit per acre by the sixth leaf.

In addition to the fruit being of the highest quality with color, soluble solids and size (due to the good light exposure and distribution through the tree), this system is easy and inexpensive to train and prune during the formative years. They say that these costs are about 25% of that of the slender spindle at the same tree density and rootstock. Pruning is easy at maturity as well.

This system originated in France and is now used throughout the world. Variations are known as French Axe, Slender Pyramid, Triple Axe, or just plain Axe.

The Vertical Axis System is based on three principles.

Principle 1: The tree is grown rapidly to approximately 10 feet in height by the end of the third growing season. The mature height of the system is determined by the choice of the rootstock, support system, and leader management. Mature height rarely exceeds 15 feet.

In New York and the Northeast, one of the M.9 clones or B.9 is ideal but weak varieties can be grown successfully on Interstem or M.26. When more vigorous stocks are combined with vigorous varieties, trees are more difficult to manage. The leader is never headed except when necessary at planting to establish permanent scaffolds or balance the top with the root system. The rapidly growing leader must be supported by fastening to a stake as it grows. Vertical growth is maximized by never heading and by stunting competitive shoots as they are produced by a technique known as "pinching". Pinching is simply the removal of the growing tip of all competitive shoots that sprout 12 inches below the position of the original leader bud that season. Pinching starts when competitive shoots reach four to six inches in length and is repeated as new buds form on pinched shoots and regrowth occurs. Strongly growing varieties such as Crispin or Gala may need pinching two or three times during each of the first three growing seasons. Weaker varieties such as Empire may only need to be pinched once.

Principle 2: Only minimal pruning is done during the formative years.

The central leader is not pruned before crop has bent it over except to completely remove the occasional strong competitive shoot missed during the pinching process. Permanent bottom tier scaffolds are spread or tied to 45° or below to produce calm fruitful scaffolds appropriate for the spacing. Emphasis on spreading and bending instead of pruning encourages the rapid filling of space, early fruiting, and because of the early fruiting a good balance between vegetative growth and fruit production.

Principle 3: Use only renewal pruning on mature trees.

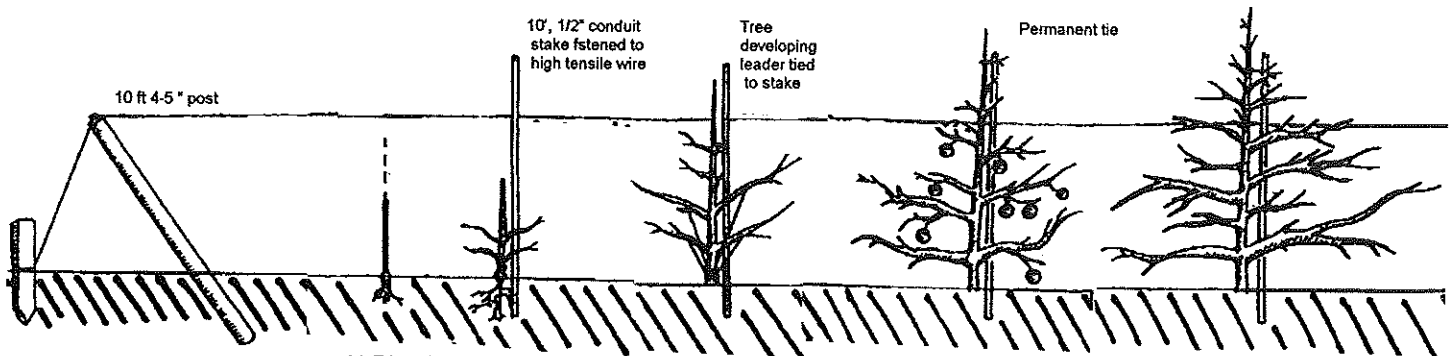
The only permanent wood in the tree is the central axe and the permanent bottom tier scaffolds. As trees mature, scaffolds are gradually thinned to three or four with the proper vigor and position. Only small caliper fruiting wood is allowed to remain throughout the rest of the tree. When branches exceed one inch in diameter they are removed completely using a bevel cut. Adventitious buds on this small stub sprout producing weaker fruitful wood in its place. The leader is not pruned until fruit bends it over and weakens it. When necessary drooping wood is pruned back to weak uprights branches that replace it.

By following these three principles you will produce an orchard with tall narrow trees with virtually no permanent wood. These very narrow trees intercept nearly all the light available to them. The abundance of light ensures the production of healthy fruit buds, excellent fruit set, and near perfect fruit quality, particularly color.

Training trees specifically to this system is unique. It utilizes the principles of fruiting versus vegetative growth shifting more toward the fruit bud differentiation and fruiting rather than toward the vegetative side. Initially trees are headed to stimulate the growth of permanent bottom tier scaffolds. Like most other systems a minimum of four scaffolds are required. Unfeathered trees are headed with a cut 8 inches above where you want scaffolds. The more scaffolds, the better. These scaffolds should have good crotch angles and not be of a greater diameter than the leader. This is the last time the leader is headed in the life of the tree. In the second leaf immediate competition with the leader is removed and the growing tips of all shoots that originate 14 inches below the insertion of the leader are pinched. The tree is rapidly grown to a height of 10 feet or the top of the support system. The lack of heading will allow fruit bud formation rapidly and then fruiting vigor levels in the top are easily managed by early and heavy cropping. The leader is tied permanently at the top of the post as soon as crop threatens to lower it. After permanent tying crop loads are allowed to bend and even break the leader. If leaders break, they are removed to the nearest suitable branch to replace it.

The support system is simple and cheap to install. It consists of a single wire trellis with 10 foot long 3 - 4 inch in-lines approximately 50 feet apart. The end posts are angled and anchors consist of driven four to five inch round posts to a depth of at least 36 inches. The wire is run over the top of the end and in-line posts fastened with galvanized 3/4 inch 12-gauge staples. Each row is tightened using a wire strainer. There are many ways to support the tree. The most common are individual conduit metal stakes and bamboo.

How much does the vertical axe cost, how many trees per acre, and which rootstock do we use? The cost is competitive with other planting systems at the same density.



At Planting

1. Adjust graft union to 3" above soil level, tamp soil around roots
2. Remove all scaffolds below 22" using a flush cut.
3. Trees with less than 3 feathers should be headed at 32" and all feathers removed using a bevel cut
4. Trees with 3 or more scaffolds (10" long) should be headed 12" above the uppermost scaffold with all scaffolds headed by removing 1/3 their length.

Soon after planting:

1. Install tree support system that will allow tree to be supported to 10 feet.
2. Attach tree to support system with a permanent tree tie above first tier of scaffolds leaving a 2" diameter loop to allow for trunk growth.

First Leaf

1/4 to 1 inch growth

1. Rub off second and third buds below the chosen leader bud to eliminate competitors to the leader shoot.
2. Deflower tree.

2-4 inches growth

1. Attach clothespin to new side shoots to promote favorable crotch angles.

July

1. Tie developing leader to support system with Max Tapener.
2. Remove clothespins.

Second Leaf

Dormant

1. DO NOT HEAD THE LEADER OR PRUNE TREES.
2. If additional scaffolds are needed score above appropriate trunk buds.

Four to six inches growth

1. Pinch lateral shoots in top 1/4 portion of last year's leader growth removing the terminal bud and 4-5 leaves of the lateral shoot.

June 15

1. Re-pinch all lateral shoots in top 1/4 of last year's growth.
2. Tie developing leader to support system with Max Tapener.
3. Remove all fruit on 1 yr old wood and hand thin remaining fruits to 6" apart.

Mid July

1. Same as June 15
2. Tie leader to support system with a permanent tree tie at 6' height and tie developing leader to support system with Max Tapener
3. Tie down 4 to 5 permanent lower scaffold branches to the horizontal
4. Position other vigorous upright shoots below the horizontal.

Third Leaf

Dormant

1. DO NOT HEAD THE LEADER
2. Tie down vigorous upright limbs below the horizontal overlooked during second summer.

Four to six inches growth

1. Pinch lateral shoots in top 1/4 portion of last year's leader growth removing the terminal bud and 4 to 5 leaves of the lateral shoot.

June 15

1. Re-pinch all lateral shoots in top 1/4 of last year's growth.
2. Tie developing leader to support system with Max Tapener.
3. Hand thin to single fruits spaced 4" apart.

Mid July

1. Same as June 15
2. Tie leader to support system with a permanent tree tie at 8' height. Tie developing leader to support system with Max Tapener.
3. Position vigorous upright shoots below horizontal with elastics, weights, tape or string.

August

1. Tie up lower scaffolds not expected to support the crop. Alternatively, do not tie up but prune back scaffolds to prevent limb breakage, and preserve tree structure.

Fourth Leaf

Dormant

1. DO NOT HEAD THE LEADER.
2. Remove limbs that are overly vigorous.

July

1. Position vigorous upright limbs below the horizontal with elastics, weights, tape or string.
2. Tie leader to support system with a permanent tie at the top of the pole.

August

1. Lightly summer prune to encourage light penetration and maintain pyramidal tree shape.

Fifth Through Sixth Leaf

Dormant

1. DO NOT HEAD THE LEADER
2. Shorten bottom tier scaffolds where needed back to side branch to facilitate movement of equipment and preserve fruit quality on lower limbs.
3. In each year remove one of the least desirable lower tier scaffold branches until only four remain.
4. Shorten branches that have become pendant back to horizontal portion of the branch.
5. Remove up to one vigorous upper scaffold limb each year to begin renewal of fruiting branches.

Seventh Through Twentieth Leaf

Dormant

1. Shorten bottom tier scaffolds by pruning back to side branch
2. Remove and renew 1 to 2 vigorous upper scaffold limbs each year preserving all weak fruiting wood and permanent lower tier scaffolds
3. Shorten leader down to desired height by cutting to a fruitful side branch.

August

1. Summer prune as necessary to maintain pyramidal tree shape and encourage light penetration

RECIPE FOR SMALLER PLUM TREES

by Steve Jackson

A broad range of dwarfing rootstocks for plums, such as those available for dwarfing apples, are currently not available. *Prunus tomentosa* or *P. besseyi* dwarf plums, but are short lived. Pixie certainly is dwarfing (about 40% of standard), but there are complaints about small fruit size even with proper thinning. Citation (about 60% of standard) may be one of the best to try, but is currently in limited supply. St. Julian A (about 75% of standard) is widely adapted. All of the rootstocks mentioned so far sucker not at all to very little. Myrobalan B is 100% of standard and suckers moderately.

While waiting for the dwarfing plum rootstock picture to more fully develop, perhaps it may be more helpful to focus on dwarfing plums through managed growing and/or training systems. Here is a recipe for smaller (dwarf?) plum trees.

Year #1: prune whips back to between 25" to 30" and train for low-headed plum trees to grow open-center with three or four main scaffold leaders. Manipulate the main scaffolds by spreading branches early on, checking often to attain wide angle crotches (40° to 60°) and not allowing narrow "Y" crotches to form. Thin out any arising wolf branches that challenge the shape or compete too strongly with the main leaders. Lightly head the main leader during the dormant season at the end of year #1.

Year #2: continue pruning for shape by pinching off poorly placed vertical growth to three buds to keep the center open. Subdue poorly-placed, vertical growing green shoots before they become inwardly growing wood that shades the center and challenges the open center shape. Encourage the growth of weak leaders by raising to 90°. Subdue discordant vigorous growth by lowering to below 45° until the others catch up.

In early summer it is possible to very judiciously thin out two or three poorly-placed branches to save the shape. Pinch for a second time the soft green shoots (back to three of four buds) to keep the center open.

At the end of summer, from mid-July on, begin pulling down the tips of vertical growing leaders and tying them to the tips of the bottom leaders, thereby forming arches. Try to get the base 1/3 of the leaders to conform with to the 45° to 60° angle for training and allow the arch to lignify.

Year #3: we can strangle/garrote the main trunk utilizing regular electrical wire used in home wiring. Apply a moderately tight garrote in spring before growth begins. As the season progresses, don't allow the wire to become overgrown or break the bark. Remove the wire in the fall. This should block carbohydrates and useful assimilates up high in the fruit zone and block excess movement of nitrogen to the tops, thereby forcing vigorously-growing scaffolds into the fruiting habit.

Summer prune as in year #2 to transform what would have been useless, poorly-placed wood into fruit buds. The object of this system is to train main scaffold branches to 45° to 60°, curb and channel excessive juvenile vigor and growth and induce early cropping. Early, heavy cropping will slow growth and ultimately dwarf the tree somewhat.

The main concept of this system is to devigorate the tops and invigorate the bottoms while transforming vigorous wood into more fruitful wood. The point is to change the vertical aspect of the leaders into a more horizontal one through arching.

Current growing wisdom dictates no dormant pruning of young fruit trees until they begin fruiting. After year #1, any dormant pruning done to young plum trees is counter productive, invigorating juvenile wood growth and delaying flowering and fruiting.

Since vertical branches often grow much more vigorously than do horizontal ones, we must not permit the strong new vertical growth of the leaders to remain vertical and lignify. It must be pulled down and subdued. Young, vigorously-growing trees often respond to horizontal tying by producing many more flower than old fruitful trees.¹ This method works best on young trees and is not recommended for older trees unless they are vigorous. Plum flower bud initiation begins in mid-July and lasts until about December first.² In order to maximize increased flower-bud formation, it is best to perform this operation from mid-July through August.

An important side note about stone fruit is that their fruit buds don't give rise to foliage (in contrast with pome fruit).³ Pome fruit require about fifty leaves per fruit. Unless long vegetative shoots are retained as photosynthesis power partners for the plum fruit bud, the fruit bud spur will rapidly lead to depletion.⁴ Arching retains the starches and stored assimilates reserved in leaders that would be lost if they were pruned off. The vegetative shoots that arise from the arch help to give sustenance to the fruit bud. Arching allows for an annual renewal system of spurs that is easy to attain.

While it is not fully proven that arching, bending and horizontal tying lead to greatly-increased flower bud initiation with all varieties, rootstocks, soils and climates, it can be shown that tying of young, vigorous growing upright leaders to the horizontal leads to reduced terminal growth and results in increased lateral spur growth. Such arching, when performed expeditiously on young plum trees, leads to early, heavy fruiting which in turn results in a moderate dwarfing effect upon the tree and a smaller, dwarfed plum tree.

^{1,2,3,4} I have borrowed quite a bit and cited from an extremely informative piece; Fruitfulness in Pome and Stone Fruit by Verlay E. Ulmer, WSU Extension bulletin No.665. However, those interested in more information on arching must refer to The Pruning of Fruit Trees by Paul Chamagat, chapter ten: The Principles of Arching Applied to Pruning Practice. His writing on this subject is a timeless and comprehensive masterpiece.

This article was published in Pomona, Spring 1998. Steve Jackson is a WCFS member, has served on the Board, is affiliated with Seattle Tree Fruit Society chapter, and also handles the rootstock for our Spring Sale.

THE ORIGIN OF THE MONSTER BERRIES OF PUGET SOUND

by Dave Battey

Last time we learned that the local "wild" blackberries, the Evergreen Cutleaf and Himalayan, that are rapidly taking over the Pacific Northwest, were imported by Euro-Americans. This week we will learn more about their "roots".

The Evergreen Cutleaf blackberry, (*Rubus laciniatus*) retains its leaves all winter, ripens from July to November, and loses berry size if there is not enough moisture available during the growing season. From my personal observation it is slowly being replaced by the more aggressive Himalayan berry. The Evergreen came to us in a rather exotic and indirect way. This berry was taken from Europe to the islands of the South Pacific, where it still grows very well in the wild.

Early on it was known as the Oregon Cutleaf because a Frenchman introduced it in to Oregon from the South Pacific around 1875. It should be recognized that Washington owes much of her early cultivated fruit to pioneer nurseries in Oregon. The Oregon Cutleaf was quickly propagated and disbursed among the coastal states where it escaped cultivation due to the large number of birds and animals that love its fruit and spread the seed in their droppings.

Later it was recognized that this berry was a form of the common European bramble, *Rubus fruticosus*, considered a native of Europe.

The Himalayan berry, the round leafed monster that spreads so quickly, has an even more interesting origin. In the 1880's, Luther Burbank, the "Plant Wizard" of California, received some blackberry seeds from India from "high up in the Himalayan mountains." These were part of a seed exchange program, where he would exchange seeds from his "improved" varieties for exotic varieties to use in his research.

According to Burbank, "It would appear that transplantation to an altogether new soil and climate had the same stimulating effect on this blackberry that we have seen manifested in the case of the Japanese plum and sundry other plants. There appeared among seedlings of the second generation an individual that was a very marked improvement over its parents."

Luther Burbank's literature states that this "exceptional seedling" was cultivated and propagated, and its qualities proved so unique that it was introduced in 1885 via a special circular to nurseries, being christened the "Himalayan Giant."

After a decade of probation, the Himalayan took its place as the pre-eminent blackberry on the Pacific Coast and even elsewhere in the United States and the world. For several years the blackberry could not be propagated fast enough to meet the demands of the public.

Promotional literature for the berry raptured, "A single cane may grow twenty feet — even fifty feet, in one season and obtain the base cane diameter of almost 1 1/2 inches. Aggregate cane growth of a single plant in a single season may exceed 1,000 feet — one fifth of a mile.

As for fruit production, the Himalayan far surpasses any blackberry ever known. A single bush may bear 200 pounds per season. If not pruned, the vines of the Himalayan will grow to a length of 100 feet or more, just like grapevines. They seem to be strongly disease resistant and can survive the harsh cold of the northern United States."

This propaganda is a little overblown. The Himalayan berry does grow like a weed here in the mild moist climate of the Pacific Northwest, but it does not thrive in the harsh winters of the continental United States. In a serious understatement, a California horticultural book from 1914 states that the Himalayan is "somewhat difficult to manage".

However, just like its main competitor, the Evergreen Cutleaf, the Himalayan blackberry has been found to be literally the same as a European variety, *Rubus procerus*. This certainly makes some sense, since the British would be likely to take European berries with them to India.

So we've done it to ourselves. Look what the Himalayan has done in just 113 years, and the Evergreen in 123 years. Unlike most edible plants imported from Europe, the two monster berries had an indirect route to Puget Sound, which has lent an exotic aura to them. Like many other introduced plants, they quickly become pests.

APPLE MAGGOT UPDATE

As Reported in
20th Annual March Message
To Massachusetts Tree Fruit Growers (1998)
BY

Ronald Prokopy, Starker Wright, William Coli and Craig Hollinsworth
Department of Entomology, University of Massachusetts

Editor's note: The following information on Apple Maggot Flies (AMF) and the Food Quality Protection Act (FQPA) was extracted from the 20th Annual March Message and forwarded to me by Dick Tilbury, with the comment that he thought they were pertinent and timely to use. Dick was kind enough to make footnotes for clarity.

APPLE MAGGOT (AMF)

1997 Activity. As in 1996, AMF captures on red sphere monitoring traps and AMF injury to fruit at harvest were below normal. This was true in Massachusetts and most other New England states. AMF pupae overwinter in the soil and require rainfall to stimulate adult emergence. Very dry soil in June and July was not conducive to emergence, but emergence did get underway in earnest in August. Peak AMF populations in commercial orchards occurred from mid-August to mid-September in Massachusetts.

New Findings. A journal article by Trimble and Solymar in Ontario showed that 3-4 perimeter-row sprays in Imidan¹ were equivalent to 3-4 full orchard sprays of Imidan in providing AMF control in both years of testing. We found the same to be true in Massachusetts during extensive tests of perimeter-row sprays against AMF from 1986-1994. So this is a viable option for AMF control provided that there is no within-orchard emergence of AMF from fallen fruit of the previous year (early-ripening cultivars are especially prone to AMF larvae completing development before frost and giving rise to within-orchard emergence.)

Reissig evaluated different insecticides against AMF in New York in 1997 and found that 3 treatments of Guthion² reduced damage by a large AMF population by 100% compared with 72% reduction in damage by Lorsban and 0% reduction by Diazinon or Provado.

Thresholds for Treatment. We continue to recommend hanging unbaited sticky-coated red spheres to monitor AMF and spraying when an average of 2 AMF per trap has been reached. Traps should be hung in early July.³ Continue monitoring in late-ripening cultivars through September.

Monitoring Aid. Sticky red spheres that mimic ripe Delicious apples are an excellent aid in monitoring AMF abundance. They are especially helpful in June and July for determining first arrival of flies in early variety blocks and in August and September for determining arrival of late season flies immigrating into blocks of Delicious and other late season varieties. Traps should be positioned in late June for early-developing and mid-season varieties and in early July for late developing varieties. Sticky red spheres baited with synthetic apple volatiles developed in New York are 2-4 times more effective in capturing AMF than unbaited sticky spheres alone.⁴ Traps should be cleaned of insects and debris regularly, preferably once every 2 weeks, as capturing effectiveness will decrease with the accumulation of dead insects. Several variations of sticky red spheres, including lightweight plastic molded traps, are available from the IPM products division of Gempler's

Footnotes by Dick Tilbury

1. Imidan (Phosmet) is an organophosphate insecticide excellent for control of codling moth and apple maggot flies. It has a non-restrictive use label and therefore can be used by homeowners. It is manufactured by the Gowan Co.

2. Guthion (azinphos methyl) is an organophosphate insecticide manufactured by the Bayer Corp. It is a restricted use pesticide. Requires pesticide applicators license to buy and use.

3. by mid June for us

4. Synthetic apple volatile (butyl hexanoate) lures are available from the following:

Gempler's
100 Countryside Dr.
P.O. Box 270
Belleville, WI 53508
(800) 382-8473 (orders)
(800) 332-6744 (customer service)
Apple Maggot Lures - catalog No. R04101

UPDATE ON DEVELOPMENT OF PESTICIDE TREATED SPHERES FOR CONTROLLING APPLE MAGGOT

Over the last three field seasons, we conducted studies aimed at development of pesticide-treated spheres (PTS) as a substitute for sticky spheres for direct control of apple maggot flies. In concept, a PTS would be coated with a mixture of insecticide, sugar and latex paint (which extends the effectiveness of insecticide). A fly landing on such a sphere would feed, ingest insecticide, and die before damaging any fruit. The need to use Tangletrap to capture alighting flies would be eliminated. Our earlier trials indicated that dimethoate was the most effective among orchard-labeled insecticides for use on these spheres, but its high human toxicity poses too great a risk to the handler. In 1996, we found that the newly-labeled insecticide imidacloprid is a safer alternative to dimethoate and seemingly as effective.

Table sugar has proven to be by far the most effective fly feeding stimulant. However, while mixing with latex paint preserves the residual activity of the insecticide, all sugar is lost from the sphere surface following rainfall. We have taken 2 separate approaches to preserving residual activity of sucrose:

1. development of a method in which the activity of sucrose is extended on reusable wooden spheres, which are annually coated with a mixture of sucrose, insecticides and latex paint; and
2. development of a method in which the entire sphere body is constructed of a mixture of sucrose, flour and glycerin, coated with a mixture of insecticide and latex paint, creating a biodegradable sphere.

In 1997, we conducted two experiments leading to refinement of the latex and toxicant formulation and evaluation of each sphere type for direct control of apple maggot in commercial orchards.

Evaluation of Sphere Components

In our first experiment of 1997, we evaluated in lab studies three formulations of imidacloprid (EC, WP, technical grade) in combination with each of three formulations (flat, semi-gloss, gloss) of each of four commercial brands of latex paint (36 treatments in all). We found the EC and WP formulations of imidacloprid in Glidden Red Latex Gloss Enamel paint to be the most promising. We then placed wooden spheres coated with two concentrations of each formulation of imidacloprid in orchard trees and evaluated them for their ability to kill apple maggot flies at 0, 3, 6, 9 and 12 weeks after placement.

After 12 weeks of exposure to sunlight and 11 inches of natural rainfall, wooden spheres treated with 1.5% a.i. imidacloprid WP in glidden paint killed 90% of arriving flies. Such treatment also rendered all flies incapable of laying eggs after feeding, and required that a fly feed on the surface of a sphere for only one minute to ingest enough toxicant to die. Performance of wooden spheres treated with 1.5% imidacloprid EC was slightly inferior, killing 87% of arriving flies. At lower concentrations (0.5% a.i.) neither the WP or EC formulation performed as well (75% and 45% kill, respectively) as the 1.5% a.i. WP formulation.

This work has provided us with a formulation of a low dose

of a safe and highly effective insecticide (1.5% a.i. imidacloprid WP) that can be combined with a particular type of paint (Glidden Red Latex Gloss Enamel) which offers very long and effective activity under field conditions.

Evaluation of Pesticide-Treated Spheres in Commercial Orchards

Two sphere types were developed in an attempt to extend the residual activity of sucrose on the sphere surface. Each wooden PTS was fitted with a 3-cm-diameter ring of specially formulated caramelized sucrose around the hook at the top of the sphere. The idea is to have the sucrose spread evenly down the sides of the sphere after each rainfall, continually replenishing the sugar supply on the sphere surface. For sugar/flour biodegradable spheres, the following composition of ingredients proved best: sucrose/fructose syrup (25%), pregelatinized corn flour (25%), wheat flour (25%), glycerin (10%) and water (15%). After hardening in the laboratory, such spheres emit a continuous supply of sugar to the surface, without regard to the amount of rainfall.

The effectiveness of our best wooden PTS and our best sugar/flour PTS were compared with sticky-coated spheres for direct season-long control of apple maggot flies. In all, we used eight orchards, each having four blocks of medium-sized trees (49 trees/block). Each block receiving spheres was surrounded by 26 spheres of the same type 5 meters apart, each baited with butyl hexanoate.

In short, sugar/flour PTS coated with 1.5% imidacloprid in Glidden paint performed as well as sticky spheres (.32% injured fruit) in providing direct control of apple maggot. Wooden PTS coated with 1.5% imidacloprid and fitted with a 3-cm-diameter sucrose ring were inferior (.56% injured fruit). None of the sphere types provided quite as good control as 2-3 insecticide sprays (.11% injured fruit).

Although all sphere types used in the field trial performed quite well in the face of high fly pressure, shortcomings need to be addressed and improvements need to be made before future use of PTS in controlling apple maggot in commercial orchard IPM blocks. Regarding wooden PTS, the caramelized sucrose rings melted away before the end of the field season, contributing to the reduced effectiveness of these spheres. Some of the sugar/flour PTS were eaten by birds and rodents while others were overgrown by fungi on the sphere surface, thus reducing the number of effective spheres comprising the barrier to fly entry into some blocks.

Future Plans

For 1998 deployment of wooden PTS, we plan to reformulate the sucrose ring atop the sphere to improve residual effectiveness of the spheres. For sugar/flour biodegradable PTS, we will evaluate various bird/rodent feeding deterrents and various fungicides incorporated into the body of the sphere.

UPDATE OF THE FOOD QUALITY PROTECTION ACT (FQPA): WHAT'S NEXT?

In last year's March Message, we first called attention to the potential changes in registration of crop protection chemicals (especially for "minor uses" registrations) that could result from passage of the Food Quality Protection Act of 1996. This legislation, which passed Congress unanimously in August of 1996, was intended to address problems caused by the outdated Delaney Amendment. At a recent USDA-sponsored meeting on FQPA in St. Louis, an EPA representative described the implications of the act with a sports analogy that "the height of the hurdle has been raised." He added that "a variety of factors have changed the way we do business" and that "it should come as no surprise that the world of OPs (41 registrations and 1,400 tolerances) is in trouble." According to the representative, the driving factor behind FQPA is "kid's risk," and that by law, EPA is no longer allowed to consider the benefits of pesticides in making registration decisions.

Some of the major changes in how food safety will be determined under the legislation include:

- 1 setting a new, unified standard of "a reasonable certainty of no harm" for both fresh and processed food (recall that Delaney only addressed carcinogens in processed food);
- 2 a requirement that all routes of potential exposure to pesticides be considered, not just dietary (i.e. water, residential and all other non-dietary routes such as structural, lawn care, etc.);
- 3 consideration of risk not on a material-by-material basis but for all materials with a common mode of action (e.g. the organophosphates and carbamates);
- 4 use of information on children's food consumption patterns (pre and postnatal) in setting tolerances for additives and residues, and use of a higher (10x) safety factor than presently required;
- 5 assessment of potential endocrine disruptors in food;
- 6 a requirement for point of purchase information in stores to inform consumers about health effects of pesticides and how to avoid risks; and
- 7 EPA review of all tolerances within 10 years.

On the plus side, the act calls for expedited registration of "reduced risk" pesticides, especially those which would reduce use of older, more risky pesticides, and promotes the development and registration of "biopesticides."

Although EPA is still sorting through a number of issues (such as the 10X safety factor and whether pesticide registrants will henceforth be required to conduct *in utero* cancer studies), their representative at the St. Louis meeting reported that the agency has what it considers to be good data "on the hazard side." They also have information of dietary exposure, although more data are needed.

Currently, EPA has very little data on drinking water and residential exposure. In the absence of site-specific data, EPA uses very conservative models, both of which are based on a "static farm pond" source. The actual monitoring data they have available is better, but still conservative, since it tends to come from "hot spots which result in a lot of hits" (i.e. pesticide detections). Their dilemma is associated with whether an absence of data means that they should continue to use conservative assumptions, or not do so until

data are called in. According to the spokesman, EPA is proceeding on a conservative track, using "default assumptions" of maximum use frequency, maximum rate and maximum allowable residue. In keeping with this conservative approach, EPA will not even use a "zero" for residues when presented with actual monitoring results, instead using "one-half of the limit of detection."

Consequently, even though non-dietary and water exposures have not been factored in, their so-called "risk cup" (meaning the total amount of pesticide a person could be exposed to every day for 70 years without additional risk) is already full for the OPs. One pesticide registrant reported that 14% of the "risk cup" was filled by chlorpyrifos alone.

So what is next? It should be pointed out that it is still somewhat early in the process, since, while EPA chose to first examine the situation with the OPs and carbamates, they will next conduct a similar review of pesticides with chronic health flags (B1 and B2 carcinogens), pesticides with other modes of action (e.g. pyrethroids) and ultimately pesticide inert ingredients.

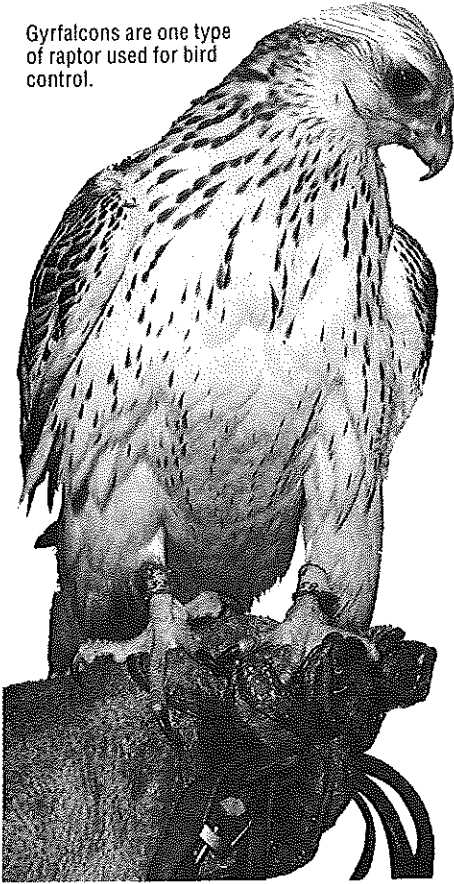
Whatever happens, change will not be immediate, since EPA has until August of 1999 to make a finding and determine what to do. Among the options available to the agency are registration revocation, issuing "time-limited tolerances," modifying tolerances, allowing certain uses by "prescription" or doing nothing. Given the current watchdog group focus on FQPA, the last option is thought to be highly unlikely. Alternatively, Congress could push EPA to defer taking any drastic steps without reliable data on use patterns and rates and real exposure. Recently, 45 members of the House Agriculture Committee signed and sent EPA a letter suggesting that the agency is using much more conservative assumptions than Congress had ever intended. If current conservative assumptions are used, it has been estimated that under a worst-case scenario, 70-80% of OP and carbamate uses could be canceled within the next 5 years. As Leonard Gianessi pointed out in his presentation in St. Louis, this would result in a "fundamental change" for US agriculture, given that OPs are used on over 64 million acres, and carbamates on 19 million acres. However, Gianessi pointed out also that while OP sales are estimated at \$237 million annually, \$128 million of this is on cotton alone, and that the fate of OP and carbamate use on Massachusetts crops will ultimately depend on decisions taken by the registrants.

In the meantime, grower groups still have an opportunity to submit real-world data to EPA and USDA on regional patterns and levels of pesticide use and actual residues. The USDA expects to complete gathering data for submission later this year on actual food consumption patterns, especially of infants and children. We have also learned that a group of registrants have entered into a secrecy agreement to jointly develop aggregate risk assessment data for all of their OPs, and that this should be completed by the Fall of 1998. Some large agricultural states (e.g. California, Florida, Texas, Michigan) are actively working on data submissions for major crops. How, or if, such submissions are conducted for minor crops (given the absence of staff and money to conduct the required work) remains an unanswered question.

Gyrfalcons are one type of raptor used for bird control.

Birds Vs. Birds

Peregrine falcons are a natural enemy of starlings that can destroy your grapes



Like a horde of raiding barbarians, starlings have invaded your vineyard. The ripening grapes are bounty, and what they don't carry off, they peck and damage. Saving the grapes seems hopeless.

But wait. Suddenly the starlings stop feeding. Nervously, they move from the vines to telephone wires. And soon these pests are high-tailing it out of the area as if they saw a spectre. The crop is saved—but by what?

The answer circles above: a peregrine falcon. While only about the size of a crow, the falcon's blinding speed—more than 200 miles per hour in dives—makes it a fearsome predator. Its prey include starlings, blackbirds, jays, and other birds, which it catches in the air.

Natural Enemy

Licensed falconer Tom Stephan of Air Superiority Falconry Services has successfully used falcons at two different vineyards to curtail bird damage. Falcons, he said, are quite different from many other raptors. First, their primary prey are other birds, rather than rodents and other small animals. Second, they catch their victims in the air, not on the ground. Finally, falcons are not a do-it-yourself project. These protected birds are brought to the site by a licensed falconer for a specific period of time.

For best results, falcons should be brought in before pest birds develop a feeding pattern, although these predators can still be remarkably effective at driving out birds even after feeding has started.

Arriving at a vineyard, the falconer releases the falcon, which flies a few hundred yards up. Then as the falconer twirls a baited lure, the falcon dives at it, and is rewarded with the bait. As this is repeated, birds in the area stop feeding and begin to scatter. The goal is not for the falcon to catch the pest birds, but to scare them out of the vineyard.

"The falcon is a stimulus that creates two zones—a flight zone and a fright zone—," explained Stephan. "At one vineyard, I'd release the falcon in the center of the vineyard, and have it dive at the lure. Every bird in a 70 to 100 acre area left (flight), and any bird within site of the falcon, even up to a mile away, stopped feeding and moved from the vines up to the telephone wires (fright)."

The falcon creates a cone-shaped area of protection beneath it. The higher it flies, the wider the zone of protection. Falcons "love to soar," said Stephan. He works with his falcons to encourage them to fly high. One technique used by some falconers is to attach a lure to a tethered helium balloon which is flown at about 1000 feet. The falcon will fly high above the balloon in order to dive at the bait.

Effective Control

The vineyard owners Stephan has worked with have been very happy with the results. "One vineyard manager hired me for a day on a trial basis," he said. Within a short time, using the falcon and a gun, Stephan had killed 11 starlings and driven the rest out of the vineyard. "The manager had been sending two men out in the vineyards every day with guns, and he said I was more effective in a few hours than they had been in a week."

Generally vineyards do not need season-long protection, but control efforts should start before large populations of birds are attracted to the ripening grapes. Time of day is also important. "In the morning until around 10 o'clock and after about 3 o'clock until dusk are the key times for starlings," Stephan said.

Falcons are compatible with other forms of bird control, such as noisemakers. But falcons have two advantages: they can be used in areas where noisemakers can't (such as where neighbors are close by), and pest birds don't lose their fear of this high speed predator.

While the falcon is a formidable predator, it does have enemies. Most losses are at the hands of man—transformers and electric wires that cause electrocution, or people with guns (shooting these protected birds is a federal offense). But perhaps the most fearsome natural enemy of a falcon is another bird of prey—the golden eagle. Stephan warned that falcons should not be released in areas where golden eagles are nesting. The high-flying eagle is much larger than the falcon, and also possesses a high-speed dive that it uses to knock the falcon out of the air.

Stephan concluded that "Falcons are the most environmentally sound, quietest, and perhaps most effective method of controlling starlings. Nothing scares them like falcons."

This article, by Gary Acuff, appeared in the April 1998 issue of *Western Fruit Grower*

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if it is highlighted in **GREEN** your dues are payable before the next newsletter

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

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SEND IN YOUR E-MAIL ADDRESS AND WE WILL START A FILE OF WCFS MEMBERS

NEXT NEWSLETTER JULY 1998
(I'll do the best I can)

WE WANT TO HEAR FROM YOU

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

Do you like the 2 column format? Yes _____ No _____ Didn't notice _____ Doesn't matter _____

What would you like to read about? _____

Please be specific use a separate sheet if you need to

What changes would you make in The Bee Line? _____

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

Location? _____

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

Location? _____

What topics for speakers? _____

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

How else can we help the home orchardist? _____

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

Any other comments? _____

WESTERN CASCADE FRUIT SOCIETY MEMBERSHIP INFORMATION

Please indicate at large WCFS membership or affiliation with a chapter. Dues are as noted.

Name(s) _____ New
 Renewal

Street Address _____

City, State, Zip _____

Phone _____ E-MAIL ADDRESS _____

_____ Member at Large	\$10.00	_____ Seattle Tree Fruit	\$18.00
_____ North Olympic	\$10.00	(includes monthly newsletter)	
_____ Peninsula-Kitsap	\$10.00	_____ Tahoma	\$10.00
_____ Piper Orchard	\$10.00		
_____ Donation for Western Washington fruit research at Mt. Vernon			

HOW CAN YOU HELP THIS YEAR? PLEASE CIRCLE AS MANY AS POSSIBLE

BOARD MEMBER FALL FRUIT SHOW COMMITTEE CHAIR FIELD TRIPS SPRING MEETING

ARRANGING FOR SPEAKERS NEWSLETTER MAILING OTHER _____

TELL US YOUR FRUIT INTEREST, SO WE CAN PUBLISH ARTICLES OF INTEREST FOR ALL

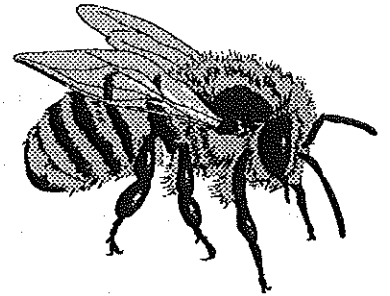
Apples Pears Peaches Plums Cherries Kiwis Nuts Berries Other: _____

Make checks payable to **WESTERN CASCADE FRUIT SOCIETY** and mail to:
WCFS Treasurer, 2625 13th Ave W - Unit 306, Seattle, WA 98119-2054

**SPRING 1998
YOU'LL FIND IT HERE!**

The table of contents has been relocated to page 1. A note was made that the survey was not responded to because the reader did not want to lose it by responding, so we are making it easier for you to help your board and editor!

So this space is available, any ideas? It has been suggested that if there were someone who is good at cartooning a sketch relevant to WCFS, or the season, whatever, could be placed here. I would be happy to hear from you.



**WESTERN CASCADE FRUIT SOCIETY EDITOR
2625 13th Ave W Unit 306
Seattle, WA 98119-2054**

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