

The BEE Line

NEWSLETTER OF
WESTERN CASCADE FRUIT SOCIETY
SUMMER 1994

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

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AUG 23 1994

DON'T MISS THE FALL FRUIT SHOW

Saturday November 5, 10:30 a.m. to 5:00 p.m.

Sunday November 6, 10:00 a.m. to 4:00 p.m.

at

EDMONDS COMMUNITY COLLEGE

200th Street SW and 68th W, Lynnwood, Washington

lots of parking!

ADMISSION: Adults \$2.50; Age 16 and under FREE

--APPLE TASTING--FRUIT IDENTIFIED--SPEAKERS--CIDER PRESS RAFFLE--
--YOUR APPLES PRESSED--FRUIT DISPLAYS--EXHIBITS--

PROGRAM DETAILS IN OCTOBER NEWSLETTER

MORE UPCOMING EVENTS

- | | | |
|--------------|--------------|---|
| August 13 | 11:00 - 2:00 | Mt. Vernon Harvest-peaches & plums |
| September 10 | 9:00 - 11:00 | WCFS Board Meeting Mt. Vernon Tree House |
| | 11:00 - 2:00 | Mt. Vernon Harvest-pears & early apples |
| October 1 | 8:30 - 4:00 | Mt. Vernon Apple Harvest/FALL FIELD DAY see schedule page 6 |

PRESIDENTS MESSAGE: Thanks to the efforts of Frank Kirby, a WCFS member in Sidney, B.C., you will all have the opportunity again to visit Summerland B.C. Canadian Fruit Research Station next summer. Frank is on the Board of Directors of NAFEX-(North American Fruit Explorers) who have decided to hold their annual meeting during August of 1995 at Summerland. Frank's efforts were vital in getting the meeting held there.

In order to attend the meeting and tour the Fruit Research Station, you must be a member of NAFEX during August of 1995. You can join NAFEX by sending a check for \$8.00 to: NAFEX, Rt. 1 Box 94, Chapin, IL 62628, and request membership. You will receive quarterly issues of POMONA, the newsletter of NAFEX. It is full of helpful information for the backyard grower.

ITS TIME TO START THINKING ABOUT Submitting fruit for Display at the Fall Fruit Show. If you are considering submitting fruit for this major feature of the Fall Fruit Show these instructions may help you. Prepare a 3" x 5" card for each sample of three to five fruits with the variety name and other information you may wish to share. This could include the harvest date and other pertinent data. If you are submitting more than one kind, they can be arranged alphabetically. Prepare a larger sign with your name and the geographical growing area. Plates, which hold three to five specimen, will be provided. After harvest the fruit will need to be refrigerated to store successfully. If you can, it would be nice to have some fruit for the tasting display. More information next newsletter.

FALL FRUIT SHOW will again have apple identification experts to name your mystery apple. You should select fruit that is typical in color, size and shape for the tree you are trying to identify. Three or four specimen with the stem, washed and free of blemishes, if possible, are desirable. Refrigerate the fruit in a plastic bag if it has to be stored for more than one week. You may be asked: when was the fruit picked? is it from a single tree or from a row of trees? is it from an old orchard or a new planting? how well does the fruit keep? is the tree upright, spreading or willowy? does it bear on the shoot tips? is it damaged by scab or mildew? is it good fresh? is it good cooked? They may want you to leave your name and address with the fruit so you can be contacted later if necessary.

CAN YOU HELP AT THE FALL FRUIT SHOW? Help is needed selling raffle tickets, admission tickets at the entrance, and at the membership table, on Saturday and Sunday. Call Evelyn Hoyme, Treasurer, to volunteer, 485-3835. Help is also needed at the tasting table; let Walt Lyon, 483-5574, or Bill Davis, 771-8978, know. Setting up on Friday evening and/or Saturday morning; call Bill Davis 771-8978. Also to clean up Sunday. Need help at the cider press Saturday and Sunday; contact Ron Schaevitz, 362-1227. If someone calls you for help, please say YES!

IN MEMORIUM

Ben LaLonde, of Sequim on July 9 from cancer at age 85. He was a charter member and treasurer of North Olympic Fruit Club chapter and a WCFS board director from 1984 to 1987. Ben was an active volunteer in his community and in the North Olympic Fruit Club. He will be missed at North Olympic Fruit Club meetings where he was a regular contributor in discussions on fruit growing problems up to last month. He will be remembered for his large collection of choice apples, his unusual fruit and his impressive displays at the Fall Fruit Shows. Our deepest sympathy to Beth.

Dick Rothenberg of Bremerton on May 22 at age 78. Dick was a charter member of the Peninsula Fruit Club chapter and quietly but very actively helped squeeze cider and staff the orchard mason bee information table at our Fall Fruit Shows and at Peninsula activities. He will be remembered for his patience in taking his wife, Pat, to WCFS Board meetings when she served on the Board, for his interest in orchard mason bees, the template he made for drilling holes in blocks and those blocks he gave to friends, bees included. Our deepest sympathy to Pat.

LIFE MEMBERSHIP

AT THE 1994 SPRING MEETING at McCollum Park on March 5, DAVE BATTEY was presented with a life membership for the many hours he devoted to WCFS as a volunteer. He has managed and produced the mailing labels for the newsletter since 1981, and masterminded the bulk mailings in addition to being the historian. Dave edited and published the newsletter from Spring 1991 to Spring 1994, and furnished many interesting articles for our pleasure and edification. Congratulations and many thanks, Dave. Dave has promised more articles for future issues.

CODLING MOTH'S ENEMIES ENLISTED IN CONTROL EFFORT

Good Fruit Grower April 15, 1994

The U.S. Department of Agriculture Agriculture Research Service laboratory in Yakima, Washington, is closing in on the 75th anniversary of the beginning of the quest for scientific solutions to the problems posed by the presence of codling moth in Pacific Northwest pome fruit orchards.

Entomologist E.J. Newcomer arrived in the Yakima Valley in 1919, fully expecting to have the insect under control within three years. Now, on fruit ranches all over the Pacific Northwest, and in city parks and backyards too, the codling moth survives, even thrives, alive and well.

In recent years, one USDA-ARS scientist, insect geneticist Dr. Tom Unruh of Yakima, has focused his study not so much on the codling moth but on its natural enemies, like predators and parasites.

The history of codling moth control measures has been characterized by the rule of unforeseen consequences. That is not to say there have not been solutions. But in several cases, the solutions have caused more problems than they solved. Lead arsenate and DDT are disastrous examples.

What's more, the broad-spectrum pesticide strategies used against codling moth today are in part responsible for the costs of controlling other pests such as pear psylla, tentiform leafminer, and white apple leafhopper, among others.

On the other hand, the end of the Cold War and the opening of former member states of the Soviet Union could reveal unforeseen consequences beneficial to tree fruit pest management in general and codling moth suppression in particular.

Codling moth, its main host, apples, and some parasitoid species are native to parts of Kazakhstan where the climate is similar to that of northcentral Washington State, according to Unruh.

The parasite *Mastrus castaneum* is reputedly a very effective natural enemy of codling moth in pome fruit orchards in the vicinity of Almaty, the capital of Kazakhstan, said Unruh. Parasitized codling moth material recently has been received from Kazakhstan by Unruh in Yakima and entomologist Nick Mills of the University of California at Berkeley.

"The parasite attacks codling moth cocooned larvae under the bark of the tree, with as many as four to five parasites resident in a single host", said Unruh.

He noted there are three generations of codling moth in the Almaty area, but in unsprayed trees where hosts are parasitized (and 60 percent are), codling moth damage can be as low as 30 to 35 percent with one or two worms per fruit.

Unruh was quick to point out that obviously such 30 to 35 percent fruit damage would be unacceptable in commercial orchards. But, he said, such natural control is nonetheless significant.

He explained that, within commercial apple and pear orchards, natural enemies are not likely to represent sufficient suppression of codling populations.

The real significance of predation against moths with agents like *Mastrus*, Unruh foresees, is the degree of control that could be achieved outside of commercial orchards in both cultivated and feral settings.

In unsprayed backyard apple and pear trees, crab apple trees in city parks, and unattended pome fruit trees on abandoned farmsteads, parasitized hosts could significantly reduce the number of codling moth in-flights into commercial blocks.

Unruh observes that, if the numbers of infested fruit in unsprayed trees outside of commercial orchards can be reduced from 100 percent with four to five worms per fruit, to 50 percent with less than two worms per fruit, then the success of soft management programs, in lieu of broad-spectrum pesticides like Guthion, could be significantly enhanced.

CONTINUED ON PAGE 4

Whether or not a broad-spectrum agent like Guthion is used in codling moth control strategies has much to do with other pest management decisions in the orchard. A combination of soft management strategies and biological control of codling moth would open the door for such programs against other pests.

While Guthion represents a cost-effective weapon against codling moth, it results in increased costs in the control of pear psylla by eliminating beneficial insects that prey on psylla nymphs and eggs. At the same time, insect resistance to Guthion is now becoming apparent.

Unruh points out that should biological approaches prove to be an effective substitute for broad spectrum pesticides, secondary pests like tentiform leafminer could be reduced below the threshold of economic damage.

Others, like the apple ermine moth (AEM) could re-surface in commercial orchards. The latter is not a threat in blocks where broad-spectrum programs are in force. Uncontrolled, defoliation could occur when the leaf-feeding moth emerges in orchards that rely on mating disruption for codling moth control.

In anticipation of that eventuality, Unruh has also been examining the possibility of obtaining effective biological control by releasing AEM predators into extra-orchard settings, mostly in western Washington State where the pest is much more prevalent than on the east side of the state.

Unruh has been working with one predator of AEM, *Aganispiis fuscollis*, that parasitizes the insects eggs. Releases were begun in 1988 and have been placed at about 100 sites in feral settings and in backyard trees.

Progress has been slow and illustrates the difficulty of introducing an organism into a new environment and then hoping it can adapt to climatic conditions and simultaneously synchronize with the life cycle stages peculiar to the intended host. In addition, the timing of the parasite's release must be synchronized with the proper life stage of the moth in the field.

Unruh recalled that in the first year after the initial releases, less than one percent of AEM examined were found to be parasitized. Two years later, the rate was three percent. It jumped to 14 percent, on average, in 1992, and last year, the average was 25 percent per site, with some sites presenting parasitized rates as high as 60 percent.

Apple ermine moth was first detected in the Pacific Northwest in 1982 on British Columbia's Vancouver Island. Gradually, it has been migrating south and east toward commercial apple country eastern Washington State.

In places like Bellingham, in the northwestern part of the state, unsprayed apple trees have been totally defoliated. In 1990, AEM was detected in the eastside counties of Chelan, Kittitas, Grant and Okanogan. By 1992, it was throughout the state of Washington, but rarely in commercial orchards. In Oregon, the first capture was on an island in the Columbia, near the river's mouth, and now it has appeared as far south as Salem.

While AEM is not a serious threat to commercial blocks under standard pest management programs, as biological pest control practice becomes more prevalent, extra-orchard populations of both apple ermine moth and codling moth will need to be monitored and controlled.

An established parasite could be the right hired gun to deliver a take-home message for the moths, wherever they reside.

by PHIL SHELTON

Shelton is a former managing editor of Good Fruit Grower and is based in Yakima, Washington

MISCELLANEOUS BITS AND PIECES

Bob Glanzman reports that there were not enough people interested in displaying fruit at an early fruit show, so none is being planned for this year. If there is more interest in the future, it is not out of the question.

The WCFS Board of Directors met on July 9 at Mt Vernon in the Tree House prior to the cherry harvest. Subjects discussed: Edmonds Community College will be the site of the Fall Fruit Show for 1994. Chairmen for the event reported on their progress. The Northwest Flower Show is scheduled for February 22-26, 1995, WCFS will have a booth, as reported in Spring newsletter. We will also have educational materials available at Sky Nursery for their GARDEN PARTY on Sept 10th & 11th, the theme is "Our Gardening Community", volunteers needed. The Snohomish County Extension Center will not be available for the 1995 Spring Meeting, Scionwood and Rootstock sale, due to construction in the area. Other locations are being researched, reports to be made at next meeting, September 10.

You may have noticed the new heading on the cover page. As your new editor, I thought that a newsletter published namelessly for fourteen or so years needed a name. There is no denying that the bee is very important to all of us interested in fruit production--there have been six articles on bees in the newsletter in the past five years. And so is the WCFS newsletter important to all of us interested in learning about how others are doing in our area - and elsewhere - with fruit production and what is new. I think *The BEE LINE* is an appropriate name. What do you think? Do any of you have another suggestion? Let's see them--send them to the editor, we'll publish them in the October issue and the Board of Directors willing, vote by mail or at the Fall Fruit Show. (They may put out the word for a new editor after this issue!). What do you want to see in the newsletter? Any special information? we'll try to locate it. Questions? we'll try to find answers. There are many very knowledgeable people in this group. This is YOUR newsletter, so let me know, it should be meaningful to you. In addition to which, I need help in filling the pages!

WCFS hats are still available. The price is \$10.00. You'll be able to buy one when you are at Mt Vernon for the peach & plum harvest August 13, or the pears and early apples on September 10 and apples/Field Day on October 1. And if there are any left, they will be at the Fall Fruit Show!

Opportunities abound in WCFS. Each edition we will feature one or two opportunities for you to be active in WCFS. Since the Fall Fruit Show is coming up soon, we'll feature some job descriptions: the fruit tasting table - helping to lay out the apples and other fruit on the assigned tables or serving in one or two hour stints by handing out slices hygienically with the aid of plastic food-handling gloves and paring knives. Fruit display - help set up the tables and implement the plan for displaying the fruit. Raffle ticket sales - serve a two to three hour stint selling tickets. Membership table - answer questions about WCFS, hand out WCFS information and recruiting material, sign up new members (accept their dues and application), collect fees for fruit growing information material. We hope to have enough volunteers that no one will have to have more than a three hour shift, and there will be 2 or 3 on each shift so no one is overwhelmed. Ticket sellers/takers - sell and/or take admission tickets at the door, ask where they heard about the Fall Fruit Show (for publicity effort feedback). Cider pressing team - help with the cider presses one morning or afternoon of the show.

WESTERN WASHINGTON TREE FRUIT RESEARCH FOUNDATION REPORT

1994 HARVEST DAYS: 11:00 a.m. to 2:00 p.m. All WCFS Members are welcome

August 13 - Plums and Peaches

September 10 - Pears and Early Apples

October 1 - Apples and FALL FIELD DAY

FALL FIELD DAY schedule: 8:30 - 9:00 Registration 12:00 - 1:00 Lunch
 9:00 - 10:00 Speaker 1:00 - 2:00 Speaker
 10:00 - 11:00 Speaker & Orchard Tour 2:00 - 3:00 Speaker
 11:00 - 12:00 Speaker 3:00 - Orchard Tour

Speakers will be Dyvon Havens, Skagit County Agent; Insect Control for Tree Fruit
Ralph Byther, Puyallup Research Station; Fall Cleanup and Disease Control
Jacky King, Mt Vernon Research Station; Ornamental Crabapples for Yard and Garden
(At press time, 4th Speaker had not been confirmed); Kiwi Fruit

Speakers schedule will be available at the Field Day.

There will be the fruit display as usual, and the Master Gardeners will be there with information and bulletins.

TREASURERS REPORT* as of May 15, 1994

Assets: cash \$12,648.53
Liabilities: commitments to WSU \$12,000.00

Income: donations 3/1-5/15 \$ 3,927.37
Expenses: Field Day \$ 368.89
 Office/Mailing \$ 70.17
Net Income \$ 3,488.61

MEMBERSHIP INFORMATION** as of May 21, 1994

322 paid members
159 paid in 1993 but not in 1994

Dues paid in 1994 \$6659.80
Field Day Only \$ 510.00
Extra Donations \$2802.00
Total Donations \$9961.80**

*Note to Treasurer's Report: based on current receipts and expenditures it appears that some monies will be available, beyond our present commitment to WSU of \$12,000.00 a year, to defray part of Jacky's salary. The precise amount will be determined over the next several months. This will be discussed at October 1 meeting.

**Our membership chairmen Larry Mowrer and Charley Bergeron and all of us wish to thank our many members who are keeping the fruit testing going. Thank you. Another big thank you to the Western Cascade Fruit Society which donated \$1500.00. We would also like to thank the more than 70 people who donated monies beyond the membership dues. We are proving that involved citizens can keep important activities going.

FROM THE MOUNT VERNON RESEARCH STATION

JACKY KING is now classified as WSU staff member. She has previously been paid as a time slip worker. This solidifies her position and insures that we will continue to benefit from the great research and writing she does. Another excellent worker, Babette Malone, has been added to the staff. The bad news is that we and other interest groups have to pick up the tab since WSU is not paying it. WWTFRF will take the matter up at their October 1 board meeting.

NEW VARIETIES PLANTED: For the first time in more than three years new varieties have been planted for testing. In a few years these should yield a few excellent cultivars for Western Washington growers. Among the 25 new stone fruit cultivars are some promising white flesh peaches and nectarines and some black apricots. New pears and apples are in as well. New test selections came from many sources including Floyd Zaiger, Harrow, PRI and New York stations. Also from Raintree Nursery and AgriSun.

DR. ROBERT NORTON was fully retired as of July 1. He and his wife, Carol, are operating AppleCorps Consulting and are available as private consultants. We offer congratulations on retiring, wish them success in this new venture, and extend our gratitude for all they have done for WCFS.

CALL FOR VOLUNTEERS: Gary Moulton needs volunteers at the station on a regular, perhaps weekly, basis to help with the work. WSU has reduced his field help and he is hard pressed to get everything done. Volunteers can help with collecting specimens of the various fruit during the harvest season. Gary reports that the Tilbury's and John Davey were very helpful last summer as harvest volunteers. If you want to help call Gary at the station 206 424-6121.

1994 TREE FRUIT RESEARCH WSU - MOUNT VERNON

Over the winter of 1993 and spring 1994, our emphasis was on the consolidation of existing plantings, and the layout and establishment of new plots. The old stone fruit plot adjacent to the station and highway was eliminated, and some of the trees transplanted to fill in other plots. We also renovated the planting of ornamental crabapples to include trees temporarily planted in other sections, and it is now complete. Young trees that had been held in nursery area during the two years when planting was restricted have been moved out into the various blocks, the nursery area was cleared of older, overgrown rootstocks and new rootstocks planted.

Besides additions to the existing tree fruit plots, we have put in extensive new plantings. The two largest are a 500 tree high density apple block consisting of four different Jonagold strains, to be used for future research on cultural practices, and a trial plot of Bosc pears, including pollinizer trees of Concord, Conference, and Starkrimson. Smaller plantings include a new stone fruit block to test some of the newer varieties that may have potential in this climate, several new cider apple varieties, and a row of leaf curl resistant peaches for further evaluation.

In the area of small fruits, in cooperation with Dr. Pat Moore's program in Puyallup, we planted a new commercial blueberry trial of over 45 varieties, some new introductions and some old standards for comparison. The strawberry trials of 1992-1993 are continuing this year, and some additions have been made to the current raspberry selection trials.

All of this has kept us very busy throughout the spring; in addition to preparing ground and planting the trees, the irrigation systems for many of these areas had to be installed also. This year we again have off-station field tests, which include a small thinning trial of Gala apples, and an experiment to see if the finish of Jonagold apples in commercial orchards can be improved by certain spray treatments.

In terms of personnel in the research program, Dr. Norton will be completely retired as of July 1. Gary Moulton has been helped by the authorization by WSU for two part time staff positions, Jackie King and Babette Malone. However, their salaries and benefits are not funded by WSU, but rather by grant money coming into the tree fruit program, and will last only as long as this support is available from outside sources. These commitments make budgeting very tight, and we are trying to come up with potential sources of funding for our programs.

At present, we have received grants from various agencies for specific projects. The Washington State Nursery and Landscape Association granted \$3000.00 to support the stone fruit variety trials and \$3000.00 for ornamental crabapple trials. Central Washington Nurserymen's Improvement Institute granted \$1900.00 for a study on pollinizer crabapples for commercial apple orchards. There is a possibility that we may also get money to support the Bosc pear trial from the northwest Agriculture Research Foundation, and contributions to the Jonagold trial plot from commercial apple growers in Skagit and Whatcom counties. Both of these possibilities have not yet been confirmed, though some contributions of materials such as irrigation supplies and support posts have been donated. We continue to look for other potential sources of funds, and very much appreciate the help that has been given us by the WWTFRF members.

Gary A. Moulton and Jacky King
a letter to WWTFRF

NEWS FROM THE CHAPTERS

North Olympic Fruit Club president, Bill Rosenberg, invites all WCFS members to their Fall Orchard Tour on October 22. Save this date, it sounds great. Details in the October newsletter

Peninsula Fruit Club president, Pam Buck, sends news that their February grafting demonstration, held at the Bremerton Regional Library was well attended and the hands on grafting demonstration at South Kitsap High School was a success. The Club provided enough root stock and scion wood so that all the participants were able to graft and take home a tree. More members have started apple rootstock stooling beds at home. They have had programs on chemical spraying options, foliar feeding with chemical fertilizers mixed with biostimulants (plant hormones), roundhouse discussion on greenhouse and seed starting; orchard tours hosted by members, and are planning a fruit show scheduled for October 15 at the West Side Improvement Center in Bremerton.

Piper Orchard Chapter president, Ron Schaevitz, reminds us that their work parties, to which ALL are welcome are held on the third Saturday of each month from 10:00 a.m. to 3:00 p.m. with the exception of the months of June, July and December. During the work parties the never-ending task of orchard maintenance is accomplished with members proficient in pruning, thinning, harvesting, etc. sharing their knowledge with those less experienced. On September 17, the orchard group will, for the sixth year, be pressing apples from the orchard at the annual Seattle Adopt-A-Park volunteer appreciation picnic. Since the 17th is a normal work party day, they will be harvesting apples in the morning and pressing/picnicking in the afternoon. Additional information can be had by calling Paul Donaldson at 364-0161 or Ron at 362-1227.

Seattle Tree Fruit Society president, Marlene Falkenbury, reports that their membership maintains the status quo, some do not renew, new members come in. They have had interesting programs on subjects ranging from organic pest control to safe fruit preservation. The orchard tours have been most interesting, usually at members homes. The August 20 tour is to Tom and Sue Barry's Canyon Park Orchard and in September to Piper Orchard for the work party. Orel Vallen has been demonstrating his apple fly maggot traps and showing how to build them. Two findings have been made in the North end of Seattle. Orel can be contacted at 772-2119 if anyone is interested in more information

Tahoma Chapter has a new president, Leonard Jessen. Hopefully we'll have some news from them in the next newsletter.



Thanks to all of you who gave me material and/or suggestions for this newsletter: Marilyn Tilbury, Ed Lewis, Chuck Parkman, Marlene Falkenburg, Pam Buck, Ron Schaevitz, Bill Rosenberg, and my husband, Paul.

With contributions from all of the membership at one time or another, this will be an easy (and fun) job. If you see something that you think the rest of us would enjoy reading, please send it to me. If you can write something for publication, your by-line will be there!

Evelyn

A FEW WORDS ABOUT GRAFTING

Many new WCFS members have indicated on their registration form that they would like to know more about grafting, so we are presenting this hoping that it will help. We'll start with a basic premise followed by three methods of bud grafting on pages 10, 11 and 12.

Grafting is a technique of joining two parts of different plants together in such a way that they will unite and continue their growth as one plant.

One part, called the scion, is usually a stem from the plant to be propagated. This is grafted onto a root system from another plant, which is called the rootstock (also, the stock or understock). All the various techniques of joining plants are called grafting, although, when buds only are joined to the rootstock, it is commonly called budding. (This is the method we are going to address in this issue after these few words). There are two basic grafting positions: apical grafting, in which the top of the rootstock is removed and is replaced with the scion; and side grafting, in which the scion is grafted on to the side of the rootstock and the rootstock above the graft is not removed until after a union is achieved.

Perhaps the most useful reason for grafting is to transfer the benefits of a particular rootstock on to another plant. Various fruit tree rootstocks have been developed to control both the size and fruiting vigor of other varieties of fruit tree. Other advantages that a rootstock might possess are resistance to pests and diseases; toleration of high soil-moisture levels and salt concentrations; and toleration of high alkalinity levels in the soil. The more rootstock incorporated into a new plant, the more influence the rootstock will have.

Another advantage of grafting is that more than one scion can be joined onto a plant. This is particularly useful with fruit trees as a suitable pollinator variety can be grafted into a tree already grafted with another variety. It also allows one to have several varieties on one tree if your planting area is limited.

To graft successfully, it is vitally important to position the various tissues of the stem correctly so that the stem can make a quick and continuous union. The cambium is the actively growing part of the stem that lies just under the bark. This cambium layer on both the scion and the rootstock must be positioned so they are absolutely adjacent to each other, or at least in as much contact as possible.

The successful formation of a graft also depends on making and matching cuts quickly and cleanly: the cut surfaces must be placed in contact with the minimum of delay. Should the surfaces dry out, the tissues will die and so make an effective barrier to the development of a successful union.

The making of a graft union is only partly due to successful carpentry. Much also depends on providing suitable conditions for the tissues to develop and grow to form a successful union. In effect, this means that water loss must be prevented and warmth must be provided round the grafted parts by carefully covering them until they have joined together.

Traditionally, the grafted parts have been covered and tied together with raffia, but most grafts now are enclosed by 1/2" wide clear polyethylene strip. This has the advantage of completely surrounding and sealing the cut areas, so reducing water loss to a minimum.

Once the grafted parts have successfully united, the development of the new plant depends on preventing any further competition from the rootstock. Therefore, always remove all subsequent growths from anywhere on the rootstock.

Although it is theoretically possible to graft at almost any time of the year, the best season for most grafting is in the spring. Budding, however, must normally wait until midsummer when the bark lifts easily from the wood on the rootstock.

Tools and materials needed: a sharp knife; 1/2" polyethylene tape

Tips for successful grafting: choose healthy, disease-free material for the scion; one year old twigs that are free from winter injury make the best scion wood. They should be well hardened. Material used for budding should have plump, well developed buds. Practice on some junk pieces first. (Overheard one successful grafter tell how he always practices first since bud grafting is not done regularly-like weeding-). Make sure cambiums of stock and scion touch. Use a sharp knife - a smooth, level surface is essential for maximum contact between stock and scion.

NOW IS THE TIME FOR BUDDING

Chip-Budding, T-Budding and Double ended Chip Budding

CHIP-BUDDING

(From Plant Propagation by Philip McMillan Browse)

Chip-budding is perhaps the easiest way to bud a plant as it involves relatively few actions and, more importantly, it provides greater cambial contact between rootstock and scion than T-budding. A "chip" of bark and wood is removed from the rootstock and replaced with a "chip" of similar dimensions carrying a bud from the plant to be propagated.

For your bud, choose a shoot of current year's growth, of similar diameter as the rootstock so that it is easy to match cuts, and with well-matured buds, at least toward their base. Discard the top growth and carefully remove all the leaves flush with the stem. Figure 1.

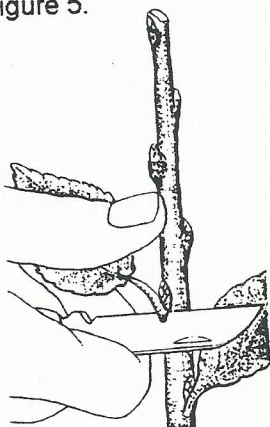
Make a 1/4" cut down into the rootstock stem, at an angle of about 45 degrees. Start a top cut 1 1/4" above the lower cut and angle it down to join the basal cut; remove the chip. Figure 2.

Select a stem, or bud stick, that has a similar diameter to the rootstock so that it is easy to match the cuts.

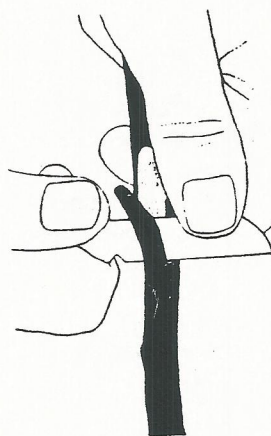
Make exactly similar cuts on the bud stick as on the rootstock, ensuring that a bud is included midway down the chip. Figure 3.

Tuck the bud chip into position on the rootstock and wrap with polyethylene tape, overlapping the tape so that it seals the chip completely. Then label. Figure 4.

After 3 to 4 weeks the bud will have united with the rootstock and the tape can be removed, so allowing the bud to swell. Figure 5.



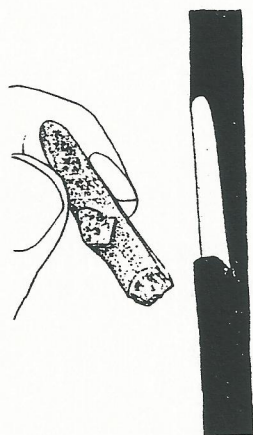
1 Discard the softer top growth on each bud stick. Remove all the leaves flush with the stem.



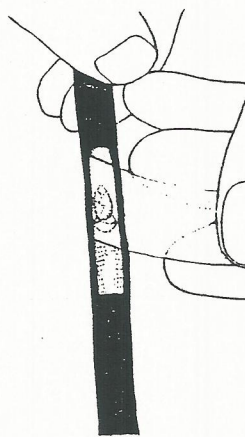
2 Make a 1/4 in cut down into the rootstock stem. Slice down to it from 1 1/4 in up the stem. Remove the chip.



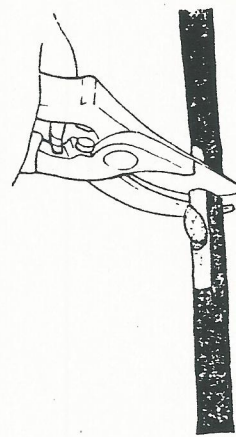
3 Make exactly similar cuts on the bud stick, ensuring that a bud is included midway down the chip.



4 Tuck the bud chip into position on the rootstock. Cover the chip with clear polyethylene tape; then label.



5 Remove the tape once the bud has united with the rootstock.



6 Cut the rootstock right back, close above the bud, in winter. The bud will grow out the next season.

T-BUDDING

(From Plant Propagation by Philip McMillan Browse)

T-budding (a.k.a. shield-budding) is a traditional way to propagate a plant. A bud from the plant to be propagated is placed behind the bark of the rootstock so that the back of the bud and the exposed surface of the rootstock wood are in contact. However, this technique can only be carried out when the bark of the rootstock lifts easily; the best time is July and August.

Make a T-shaped incision through the bark by cutting a horizontal slit and then a vertical downward incision sufficiently large to take a suitable bud. The taut bark will begin to spring away from the wood underneath. Loosen the two flaps slightly to receive the bud. Figure 1.

The budding material should be the current year's growth with plump, healthy buds. Remove the leaves, but retain about 1/2" of each leaf stalk attached to the stem. Always select buds from the middle of a stem where the buds are mature. Do not take them from the bottom of the stem because they may be latent, nor from the top where they will be immature. Figure 2.

Cut shallowly into the stem about 1/4" below a mature bud Figure 3; when past it, lift off the bud together with a tail of bark. Ensure the cut is deep enough to avoid damaging the "eye" of the bud. Figure 4.

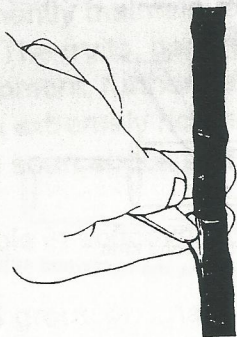
Remove any wood from under the bark by bending the bark outward and flicking the wood out. If the bud trace comes out with the wood, the bud is not mature and should be discarded. Figure 5.

Using the leaf stalk as a handle, slip the bud into the T-cut on the rootstock, and trim off the tail flush with the horizontal cut. Figure 6.

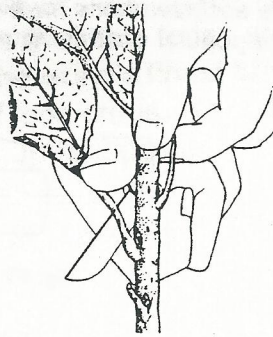
Wrap the budded rootstock with clear polyethylene tape, leaving the bud and leaf stalk exposed, and label it. (Some very successful with T-budding prefer to use elastic bands, snugly wrapped over the polyethylene to further ensure a "take", removing it after 2 weeks). Figure 7.

After 3 to 4 weeks the bud will have united with the rootstock and the tape can be removed. Figure 8.

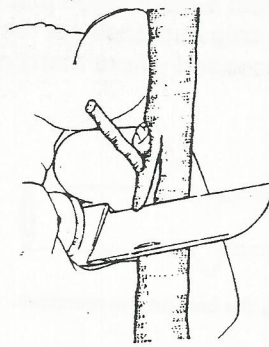
In late winter/early spring, cut back the top of the rootstock to just above the bud, which will then grow out during the following spring. Figure 9.



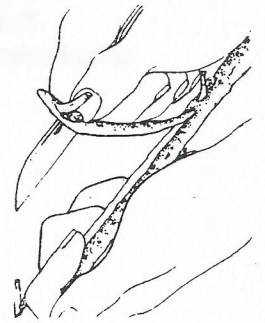
1 Make a T-shaped incision through the bark. Loosen the two flaps of bark.



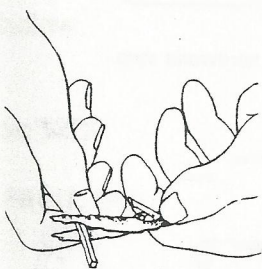
2 Remove the leaves but retain 1/2 in of each leaf-stalk on the stem.



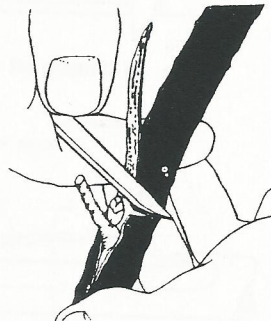
3 Cut shallowly into the stem about 1/4 in below a mature bud.



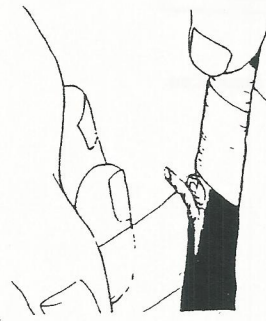
4 Cut shallowly underneath the bud. Lift it off once the knife is past it.



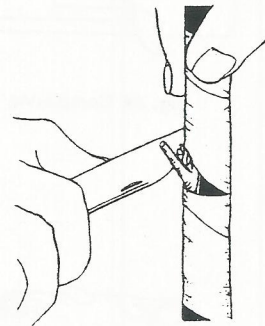
5 Bend the bark outward and flick out any wood underneath the bark.



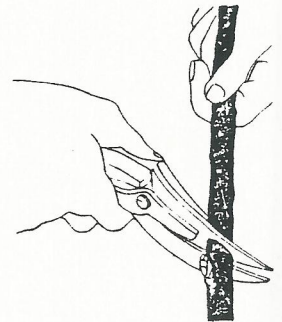
6 Slip the bud into the T-cut on the rootstock. Trim the tail neatly.



7 Tie with polyethylene tape, leaving the bud and leaf stalk exposed. Label clearly.



8 Remove the tape once the bud has united with the rootstock.



9 Cut back the top of the rootstock in late winter/early spring.

DOUBLE ENDED CHIP BUD

submitted by
Henry Hartmann Jersey Persimmon Farm New Jersey
as published in POMONA, Summer '94 issue

There are some trees that strongly resist propagation via budding. I ran into one of these species a while ago and for a couple of years, my field budding results with oriental persimmon were a disaster. Finally, a double-ended chip bud was used with good results. This configuration requires the bark of the rootstock to slip.

Figure #1 shows front and end views of the final fitting of scion wood to rootstock. The end view reveals a mismatch between cambium layers. This is intentional. By the time these cambium layers are ready to unite, the rootstock will have grown and the cambiums will be closer. The initial healing occurs topside under the flaps.

The technique used to accomplish this double-ended chip bud is as follows: The first cut goes on the rootstock. Figure #2 shows a knife blade inserted through the side of the stem and being carefully drawn along the stem to maintain a constant width of cut. The slit bark is then bisected into two equal length flaps. Figure #3 shows the initial step in removing the hardwood portion beneath each flap. The knife is worked down the cambium layer for complete separation as shown in Figure #4. Figure #5 shows how each flap of bark is bent way back (135 degrees) to cut out each strip of hardwood. The scion wood is cut as shown in Figure #6. Slipping the scion wood under the flaps should look somewhat like the views in Figure #1. A wrap of parafilm is first applied to preserve the moisture. The parafilm covers all cuts and the bud. A final wrap of whatever you wish to use (string, cotton cloth, plastic film, tape, etc.) is applied all over the parafilm, except the bud, to hold the assembly tight. Healing takes at least three weeks. Remove the wrapping after the bud has grown at least six inches.

A few tips to enhance success are:

1. Never let your skin touch any cut wood surface where it is expected to heal. Oil on the skin is the culprit.
2. Should the bud break through the parafilm and then stagnate, cover the opening with another piece of parafilm.
3. Florist wrap parafilm is much better and cheaper than laboratory parafilm.
4. A swipe or two with a razor blade plane makes the bottom of the scion wood perfectly flat.

This double-ended chip bud does not require accurate fitting for success. The budding process may seem complicated, but it has succeeded where many other popular configurations have failed.

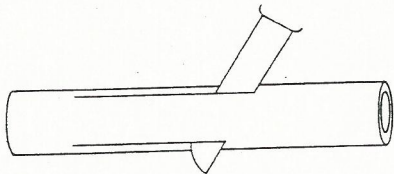


Fig. #2 Slitting the bark on the rootstock.

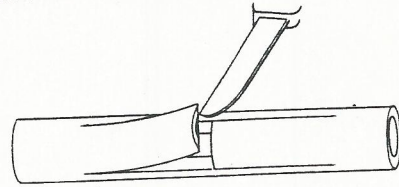


Fig. #3 Starting to separate the hardwood strip.

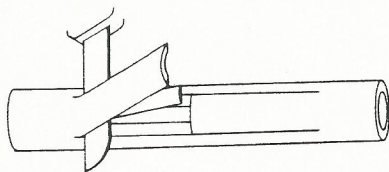


Fig. #4 Completing the separation.

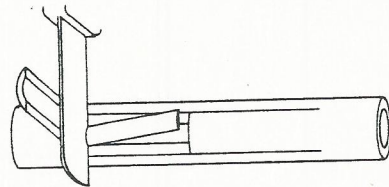


Fig. #5 Cutting off the hardwood strip.

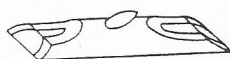


Fig. #6 The finished scion bud wood.

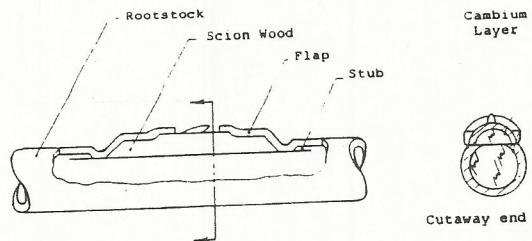


Figure #1 Finished double-ended chip bud minus wrappings.

Has anyone tried this method? Is it better than the conventional method? Let us hear from you!

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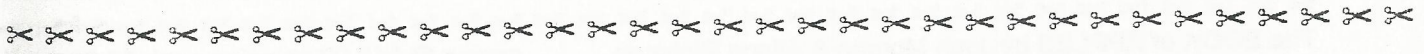
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