Department of Horticulture
MICHIGAN STATE UNIVERSITY

COMPACT FRUIT TREE

ROOTSTOCK BEHAVIOR
SPUR TYPES
INDUCED DWARFING
CULTURAL PRACTICES

THE INTERNATIONAL DWARF FRUIT TREE ASSOCIATION

No. 2, April, 1983 - Prepared by Robert F. Carlson

IDFTA 26th ANNUAL CONFERENCE A HUGE SUCCESS

Moving the annual conference from Michigan to Rochester, New York, proved to be a bonus for the International Dwarf Fruit Tree Association. A record crowd of 667 persons attended the four-day meetings. They came from 32 states, four provinces of Canada, and three other countries.

The credit for success goes to many persons, too numerous to mention, who spent time and effort in making sure that the meeting would be the best. Many New York fruit growers and their families, extension personnel, and others worked for months in conference preparation and detailed planning.

A special thanks goes to the program speakers and section chairmen, who came from near and far to participate. Furthermore, the management and personnel of the Marriott Hotel were most helpful in all meeting, meal, and lodging preparations, for the convenience of everyone.

The papers prepared by the speakers and presented at the meetings will be published in Volume 16 of the Compact Fruit Tree and mailed to members who have paid their 1983 annual dues. Members' names and addresses will be listed in this volume. Those wanting their telephone number listed with their names should send this information in immediately.

FUTURE IDFTA MEETINGS

June 21-24, 1983 - Summer Orchard Study Tour, Young Harris College at Young Harris, Georgia. See page 9 and pre-register now to save $25.

March 4-7, 1984 - Amway Plaza Hotel, Grand Rapids, Michigan. Please put this date on your calendar.

June 18-22, 1984 (tentative) - Summer Orchard Study Tour, New Jersey.

February 24-28, 1985 - Yakima, Washington--the world's largest apple producing area.

PASSING OF THE IDFTA GAVEL - DEL./MM 106

The new president of the Association is Richard Bachman, 3935 Pickerington Road, Carroll, Ohio 43112. Congratulations, Dick! Suggestions for upgrading of the Association can be mailed to him or your secretary.

All of us are proud and privileged to have had Tom Chudleigh, R. R. 3, Milton, Ontario, Canada, as the Association's president for the past two years. He has done an outstanding job at the helm. He will be pleased to hear from you.

The three-year terms of office as IDFTA directors were up for the following people: Virginia Ebers, Michigan; Robert Edwards, Illinois; Richard Bachman, Ohio; Robert Hodge, Pennsylvania; and Evan Milburn, Maryland. The same group was elected for another three-year term by the IDFTA members at the annual business meeting, March 8, 1983. The Board elected Don May of Massachusetts as Vice President.

At the June meeting in Georgia, members of the Association will vote on a IDFTA bylaw change; namely, that beginning in 1983, the term of office as an IDFTA director shall be three consecutive three-year terms, maximum.

The female members of the Association have elected new officers for 1983-84. These are: Chairperson, Vyanne Chandler of Stilesville, Indiana, and Local Arrangement Chairperson, Rosemary Rasch of Grand Rapids, Michigan. Congratulations to these new officers!

CONGRATULATIONS TO THE IDFTA 1983 AWARD WINNERS

Roy C. Rom, Professor of Horticulture, University of Arkansas - To Roy C. Rom, for his outstanding service to the fruit industry, in Arkansas and the nation. His enthusiasm in working with colleagues in improving cultivars and cultural methods has been of great benefit to the fruit grower. In his current position, as President of the American Pomological Society, Roy is very active in keeping the industry informed in research development. The Association is proud to present this award to Roy, for his many contributions to the industry.

Fritz Wafler, fruit grower, Wolcott, New York - To Fritz, for his early interest in growing and producing quality fruit on compact smaller trees. For the past several years, Fritz has been active in this Association, by serving on the research committee and other activities. On his farm, he has tested and evaluated many scion rootstock combinations for the improvement of the fruit industry in New York and other areas. We are proud to present this IDFTA award to Fritz.

Oregon Rootstock, Inc., Woodburn, Oregon - The propagating, testing, and growing of dwarfing rootstocks has been the main purpose of this nursery for 36 years. Mr. Bernard Smith, the "father" of this nursery, and a large family of sons and daughters, first became interested in smaller fruit trees in 1947. Since then, with the capable management of his sons, the nursery has developed outstanding rootstock production systems via layering beds and micropropagation. For these and other reasons, this nursery has become world known for production of quality fruit rootstocks and trees for the industry. For the past and continuous support of this Association by Oregon Rootstock, Inc., we present this award.

IDFTA SPONSORED ROOTSTOCK RESEARCH, 1983

The IDFTA Rootstock Research Committee screened and evaluated 41 research proposals and agreed to fund 29 of these projects for a total of $32,800. The IDFTA Board of Directors approved these projects for funding for one year or

until March, 1984. A committee of six growers and researchers met Saturday, March 5, and drew up a set of twelve guidelines for improving the quality of research, dealing specifically with fruit tree rootstocks. These will be mailed out with requests for new project proposals, in the fall of 1983.

HORTICULTURE SOCIETIES' SPONSORED RESEARCH - 1983

At the IDFTA Annual Conference at Rochester, New York, rootstock research grants were presented as follows:

Pierre Philion, Quebec Fruit Grower Association, Canada, $7232. Part of this money was residual, from the 1982 summer tour in Quebec.

Armin A. Frenz, for the Wisconsin Apple and Horticultural Council, Inc., Henry Mahr, Treasurer, $500.

Emily Hoover, for the Minnesota Apple Growers Association, Gordon Yates, Treasurer, $500.

Robert Best, Treasurer for the New Jersey Apple Institute, Inc., $500.

Jerry L. Chandler, for the Indiana Horticulture Society, Dr. R. A. Hayden, Treasurer, $200.

We also recognize Charles Andre, Pepinieres du Valois, Villers Cotterets, France, for his generous contribution of $1000 during the past two years.

For the Board and members of the IDFTA, we convey sincere thanks and appreciation for these cooperative efforts to improve rootstocks via research and for the eventual improvement of rootstocks for the industry.

Also, the same support goes to the many individual members who, throughout the years, have supported these research programs via small and large donations. It is a program for progress.

IDFTA PROGRESS RESEARCH REPORT
Scion/Rootstock Effects on Peach Tree Growth and Fruiting

Seeds of three Chinese rootstocks (Tzim Pee Tao, Chui Lum Tao, and Sinung Chui Mi), Bailey, Lovell, and six Harrow selections (H7338013, H7338001, H7141137, H7141041, H7141049, H7141064) were planted in two-gallon pots in March, 1982, and grown in a greenhouse for the 1982 growing season. Rooted cuttings of 4G816 were also grown in the same manner. Each rootstock was budded to 'Loring' and 'Rio-Oso-Gem'. Cuttings of each cultivar were also rooted in August.

The budded trees will be overwintered at 40°F, placed in a warm greenhouse in mid-February, 1983, and set in the field in late May. Eight to ten single-tree replicates will, hopefully, be available for each of the fourteen stock-scion combinations in a randomized complete block design. If trees are available, a second planting will be set in the southern part of the state, on sandy soil. . .Richard Marini, Rutgers University, The State University of New Jersey.

Chemical Identification of Clones/Cultivars

It could be particularly important if one could predict in advance whether a scion rootstock combination would be compatible. It is postulated that this possibly could be done by developing a biochemical marker which could make this prediction.

As a result of two years of IDFTA funding, a method has been established for extraction, concentration, and electrophoresis separation of water soluable protein obtained from peach, nectarine, and plum cambium. Cambium tissue was used because the formation of graft unions can be considered as the generation of new cambium from stock and scion sources. It is hoped that this methodology will help in ascertaining the compatibility between stock and scion in Prunus species.

Using the procedure developed, the protein electrophoregram of the natural plum hybrid Damas 1869 (P. spinosa x P. domestica) was prepared with P. domestica (GF43) and P. spinosa (species) along with that of peach cultivars known to be compatible with Damas 1869 and nectarine cultivars known to be compatible and incompatible with Damas 1869.

Preliminary results indicate that the incompatible nectarine cultivars showed a slow moving protein band not common with peach and nectarine cultivars of known compatibility. Thus, biochemical markers may exist, however, further refinement in procedure, sampling technique, and interpretation must be pursued before definite conclusions are attempted.

The research to date is being summarized and prepared for publication in HortScience.

The researchers are grateful to the IDFTA for providing seed money to get this research started. . .R. C. Rom, F. H. Huang, and S. Tsai, Horticulture Department, University of Arkansas.

IDFTA PROGRESS RESEARCH REPORT

Due to a problem in the overwintering storage, a severe loss of the rooted tomentosa cuttings occured and only clone 2 survived in sufficient numbers to bud this summer. In August, ten trees were budded with each of the following: five peach cultivars, two nectarine cultivars and stanley plum. The same were budded to seedling P. tomentosa as a control. Bud take of most cultivars looks good.

Cuttings of each clone were taken in late June/early July with the following rooting: Clone 1, 75%; Clone 2, 80%; Clone 3, 89%; Clone 4, 68%; and Clone 5, 69%. We now have in excess of 150 well grown plants of each clone ready to go into storage and be planted to the nursery this spring. Again, virus-free buds will be secured for budding in August. . .David Ferree and Fred Hartman, OARDC, Ohio.

1983 IDFTA Summer Tour

The Georgia-South Carolina apple growers have laid out the red carpet and are ready to show "ya'll" some real southern hospitality. Be prepared and surprised! The apple region we will be visiting is in the lower end of the Appalachian Mountains; the orchards are quite steep and provide spectacular scenery.

Tour headquarters will be at Young Harris College in Young Harris, Georgia on US 76. For those coming down I-75, exit at Cleveland Tennessee and take US 64 east toward Murphy, North Carolina, then take US 19 and 129 south into Blairsville to pick up US 76 east to Young Harris. For those coming down I-85, exit at South Carolina 24 north toward Westminster and pick up US 76 west through Clayton into Young Harris. There are ample camping facilities in the area. Please make your own arrangements or information will be available at the desk.

There will be a single departure time from Hartsfield International Airport in Atlanta for those wishing to fly in. The bus(es) will leave at 6:00 pm from the ground transportation area of the baggage pick-up area. Cost will be $20 round trip. Return bus(es) will arrive at the airport Friday morning at approximately 10:30 am. Atlanta's airport is very large; therefore, allow 45-60 minutes between arrival or departure of your flight and the scheduled bus service. The Atlanta airport is also serviced by numerous car rental agencies. Please make your own arrangements for rental cars.

Advance registration is a must to insure adequate space at the college. A fee of $100 per person (U.S. funds)* based on double occupancy will include three nights lodging, meals, bus tour, and entertainment. Deduct $30 per person if you do not plan to sleep in the dorms. Deadline for advance registration is May 20. After this date there is an additional $25 per person late registration fee. Please make checks payable to IDFTA Summer Tour. Send reservations and payment to IDFTA Tour, P.O. Box 655, Ellijay, GA 30540.

P.S. For those wishing to walk down or back, the Appalachian Trail begins in Georgia. For any questions you might have contact the Gilmer Ext. Office (404) 635-4426.

Tuesday, June 21 - Afternoon registration and check in, Young Harris College
Wednesday and Thursday, June 22 and 23 - Orchard tours
Friday, June 24 - Breakfast and check out

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*Foreign checks should be drawn on an American bank, such as a bank draft or a postal money order, in U.S. dollars.

Name(s) _____

Address _____ Number in party _____

_____ Enclosed payment _____
($100 per person
U.S. Funds)

_____

Reserve _____ seats on the Atlanta airport shuttle bus. (Bus will depart promptly at 6:00 pm, June 21)

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SUMMER ORCHARD CARE

Aside from routine pest management, several other tree care chores are in order. With ample rain and warm weather the last week of June in Michigan, luxurious growth took place in well fertilized orchards. Excess growth can be a deterrent to good fruit coloring before harvest.

There are several ways to eliminate some shoot growth in bearing trees. The new shoots, usually in a perpendicular position on lateral branches, are easily pulled off by hand in young trees which are reachable from the ground. A pole pruner or lopper works well, since only minor cuts are needed for light exposure to the fruit.

Non-bearing apple trees need attention during the summer as well. The central leaders in free standing trees often develop double or triple leader shoots at the top. Eliminate all but one.

Spreading desirable branches in young trees can be done any time of the year, but it works especially well in the summer. After two months in position, a spreader can be moved to another location in the tree.

Limb positioners are very useful in developing young trees. These are used extensively in New Zealand and are made from stiff but bendable wires. They are made in a configuration so that they can be hooked on a branch. Once in position, the branch can be bent into place where it should be in the tree. The positioner can be made from galvanized wire, but ready made ones are now available.

COMMENTS FROM OUR IDFTA PRESIDENT

Congratulations to each of you for a successful 26th Annual Meeting of March, 1983.

My personal thank you to each of you for attending our 1983 conference. You are all to be congratulated for your part, whatever it may have been, in making this conference the most successful ever. The people of the state of New York were very congenial hosts. The comments that I received were all positive and share my sentiments.

The 1984 Conference will be March 4-7 in Grand Rapids, Michigan. With the same cooperation from each of you, this can be even another year of growth for the Association.

Plans are now being made for the 1985 Conference to be held in Washington state. I am confident that we can each gain from these areas that we visit.

As you review the program proceedings from the 1983 meeting, may you find a new idea or strengthen your own ideas for the future of your operation. We are certainly grateful to the growers and researchers for sharing the knowledge and experiences with us.

May each of you find your goals a little easier to accomplish because of your association with the International Dwarf Fruit Tree Association.

See you in Grand Rapids in March, 1984. . . Richard Bachman, President

ORCHARD TOUR TO GEORGIA WELL ATTENDED

Four busloads of enthusiastic fruit growers toured apple and peach orchards in northern Georgia and northeastern South Carolina, June 22-23. About two hundred persons had an opportunity to view different cultural and tree training systems, as well as the beautiful mountain scenery in that part of the world.

After having visited many fruit areas during IDFTA orchard tours, one can conclude some areas may be similar, but not alike. Growing fruit trees in areas such as northern Georgia takes more stamina and fortitude than in relatively flat areas such as Michigan or western New York. But, as we saw it, it can be done, and successfully. Whereas the peach crop was spotty, apple orchards appeared to have a full crop.

The Mercier family orchard, run by Bill and son, Tim, seemed to put a lot of emphasis on variety diversification. They had about twenty varieties of different age groups both in commercial size and smaller test orchard size. These were on the leading rootstocks, from M. 26 to MM 111. Bill Mercier stated, "Despite faults with some of the rootstocks, we would not go back to seedling stocks."

Although most of the orchards are on various elevations, the Merciers and other growers favored planting Rome in the lower parts of the orchard, because they seemed to tolerate more spring blossom frost than any other variety.

The Stembridge family orchards were in two different locations, one on the Talona mountain and the other on Yucon heights. Since the mountain views are fantastic from both, they have named their family operations the Panorama Orchards.

Gene Stembridge, having had years of experience working as a researcher, showed the group several interesting test plantings. For example, one small planting of Granny Smith, set 1980 as a trellis, is now being converted to a tree wall, free standing planting.

Many of the orchards in that part of Georgia have been developed on forest land. Consequently, they have had quite a bit of tree loss from a wood borer present in the soil. The borer is referred to as the "giant apple borer", but actually its habitat is in deciduous woods. It remains in the soil as larvae, feeding on woody roots. When apple trees are planted in this soil, the borer (about three to four inches long) bores into the crown and up into the basal part

of the trunk. Gene showed the group samples of the larvae and injured trees. No satisfactory control is available.

Space here does not allow describing several other well managed orchards visited during the two-day tour. However, we appreciate having had the opportunity to visit these farms.

The tour group also had a chance to visit Clemson University, South Carolina, where Robert Andersen, D. C. Coston, John Ridley, David Cain, and other researchers showed work in progress on peach breeding, tree training, etc. They are putting much emphasis on solving the "short life" peach problem by breeding cultivars and rootstocks with superior characteristics to reduce this problem. The "short life" on peach is more prevalent in southern orchards than in the North.

In data presented by John Ridley, peaches are the largest of the fruit crops in South Carolina, valued in 1982 at over 46 million dollars. South Carolina ranks second to California in fresh peach production. Varieties in production are Blake, 9.2%; Red Globe, 8.1%; Redhaven, 7.4%; Coronet, 5.9%; and Junegold and Loring claiming fifth and sixth places. Lovell is the leading rootstock, with some Nemaguard used in areas of rootknot infested soils.

TEST PLANTINGS WITH MARK ROOTSTOCK

Limited numbers of trees for grower test plantings will be available for planting in the spring of 1985 on a first-come basis.

These small grower trials will be under the supervision of the rootstock researcher or extension person in the area where planted.

Orders of fifty trees on micropropagated virus-free rootstock Mark should be made prior to August 1, 1983. These are budding orders. The cost will be $4 per tree to cover growing and handling. Growers interested in getting in on this early grower trial should write today to Mike Smith, Oregon Rootstock, Inc., 10906 Monitor-McKee Rd., N.E., Woodburn, Oregon 97071, or call (503)634-2209.

ROOTSTOCK RESEARCH CONTRIBUTIONS

IDFTA acknowledges with thanks the following major contributions for support in developing fruit trees with dependable rootstocks.

Seven hundred dollars from Guy Ligonniere Nursery, Angers, France. This is their second contribution.

One thousand dollars was received, December, 1982, from Elsie Klackle, Greenville, Michigan, in support of the Ray Klackle Memorial Speaker Fund. This fund is responsible for obtaining top quality speakers for annual programs.

Many members have contributed smaller amounts for the same purpose and are recognized as well, but are too numerous to mention. It all adds up to a better fruit industry.

DATES OF IDFTA MEETINGS

March 4-7, 1984 - Amway Grand Plaza Hotel, Grand Rapids, Michigan. Pre-registration forms will be mailed to members in December, 1983. The Board of Directors, at the June 22, 1983, meeting, agreed that the cost for pre-registration for all persons will be $10, with registration at the meeting at $20 for all.

June 19-22, 1984 - New Jersey Annual Summer Orchard Study Tour. Included in this tour will be peach and apple orchards and market places of several leading fruit products in the Garden State. More detailed information later.

February 24-28, 1985 - The 28th Annual IDFTA Conference, Yakima, Washington. Two or more days of orchard study tours in connection with the conference are in the preliminary planning phase. Tentatively, pre-registration and housing arrangement information will be mailed to members in April, 1984.

June 18-21, 1985 (dates tentative) - Summer Orchard Study Tour, Hudson Valley, New York. This is the major fruit area of eastern New York. Thus, in 1985, members are invited to see the major fruit areas of the eastern and western U.S.

THE NEW COMPACT FRUIT TREE

The proceedings of the 26th Annual Conference, Rochester, New York, have been mailed to IDFTA members. This is Volume 16, 1983. If you have not received this volume, it means the 1983 dues were not paid. A copy will be sent promptly upon receipt of either $45 for late commercial membership dues or $30 for late educational membership dues.

Back volumes (Volumes 7, 11, 13, 14, 15) of the Compact Fruit Tree are available upon request from Horticulture, Michigan State University, East Lansing, Michigan 48824-1112.

OPEN LETTER FROM A MEMBER

It is difficult for me to evaluate which research project may be most important. But, it seems to me, very little research is being done on the most serious fruit production problem, namely, fireblight.

I have had serious blight problems on my trees on M. 9 and M. 26. Streptomycin does not control it. Concerted research efforts should be made to eliminate fireblight. . . Glenn Wainwright Orchards, Hillsdale, Illinois.

PUBLICATIONS ON PEACH CULTURE

1. Peach Growers Handbook - Coming from a major peach producing state, it has much valuable information on tree culture and care. For more information, write: M. E. Ferree, Extension Horticulture Department, University of Georgia, Athens, Georgia 30602.

2. Another publication on peach culture is available from: Department of Horticulture, Clemson University, Clemson, South Carolina 29631.

Learn more about growing peaches and support IDFTA sponsored peach research.

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IDFTA PROGRAM, MARCH 4-7, 1984

Conference facilities - Those members who knew the old Pantlind Hotel and have not seen the new Amway Grand Plaza Hotel in Grand Rapids will have a pleasant surprise. The inauguration of the renovation of the old Pantlind and the new 28 story addition was held in October, 1983. The 27th Annual Conference will be held in this new Amway Grand Plaza Hotel. Meeting rooms and lodging facilities are more than adequate for the over six hundred persons who will attend the IDFTA conference.

Make reservations now - Enclosed is a hotel room reservation envelope. Pre-registration forms for the conference will be mailed in mid-December or early January.

Billing for 1984 annual dues is also enclosed. In order to receive Volume 17, we will appreciate these dues being paid before the deadline of February 1, 1984, so that a second reminder need not be mailed. Monies in U.S. dollars please.

Some program content - The completed program will be sent to members as soon as completed in January. Some of the features of the program follow.

Three speakers from Europe are featured, namely, from Poland, West Germany, and England. Also speaking will be three Canadians; one from Simcoe will speak on growth control in fruit crops, one from Vineland will discuss European plum rootstocks, and the third, from Nova Scotia, will speak concerning new rootstocks.

There will be three fruit grower panel discussions, one from Ohio and two from Michigan. These panels will bring out practical experiences of rootstocks and tree culture with compact trees.

Four researchers will update some of the progress on IDFTA funded rootstock research projects. The banquet promises to be interesting with good food and a fine program. Also, Wednesday morning, the group will be bused to three orchards for pruning demonstrations and observations of tree management practices.

Prunings - Dormant pruning in apple can be held to a minimum, if the trees are well managed. Pre-harvest or summer pruning usually takes care of most of the vigor control. However, when leaves have dropped, it is easy to see what corrective cuts to make for improving tree form, holding trees within bond, and

avoiding crowding. In other words, dormant pruning involves two or three major, large cuts to remove non-bearing, out-of-position branches. Summer pruning is done in the peripheral area of the trees.

When large branches are removed, the cut surface should be painted, to avoid drying out and interence of decay fungi, which can cause severe trunk damage. A quick-drying, latex paint works well and is easy to apply, even in cold weather.

In some colder climates, severe injury to trees can result if major pruning is done in January. This was observed in parts of Ontario and Quebec during the severe cold of the 1980-81 winter. This, no doubt, will depend on the severity of the weather. February and March are good months to prune. Although, some pruning is done following harvest in November and December.

Pruning of stone fruit trees should be held off until March or, in some cases, until the chance of blossom bud kill is passed. Again, this will vary with location and local climate.

Dr. "Butch" Ferree, Georgia, in discussing pruning of peaches in that state, writes, "Pruning in October, November, December, and January is often the crowning blow to peach trees and is especially critical in orchards under six years old. The tax benefits you might receive by doing all of your pruning before 1984 will not cover the cost of replacing trees killed by 'peach tree short life'. You may have gotten away with that in the past, but the gamble is not worth the risk."

Important factors in pruning include 1) never leave a stub but always make the cut flush with the trunk or sublateral, 2) paint cuts larger than two inches in diameter, 3) remove cut branches from trees, and 4) keep pruners and saws sharp, since this makes the job easier for the operator and makes cleaner cuts.

Collar rot - We are all aware of some rootstocks being less resistant than others to collar rot, also called crown rot. Both terms well describe where the infection occurs, namely, at the ground line and sometimes extending some distance into the root system.

The fungus Phytophthora (several species) effects not only pome rootstocks (such as MM 106, M. 26, and seedlings) but, also, stone fruits (peach, almond, cherries, and plums, in some areas). Several factors will enhance problems with collar rot such as poorly drained soils, winter tree injury, depth of planting rootstock, climate, etc.

Pathologists working with pomologists in several states are trying to find chemical control. Ridomil, a systemic fungicide, is, according to reports, showing good control. Before its use, each state needs clearance approval before it can be applied on both non-bearing and bearing trees. To date, it has been effective as a soil application in the root zone.

Another researcher (R. S. Utkhede) reports, from Summerland, British Columbia, that certain bacterial isolates will inhibit Phytophthora cactorum in laboratory tests but, it yet has to be tested in the field, No doubt, some day there will be perfect control measures but, for now, try to choose the best sites when planting new orchards.

Brief Resumes of Speakers from Europe

Tony Webster, East Malling, England, has several research projects underway. In a recent letter, he lists nine. Briefly combined, these involve evaluation of apple, sweet cherry, and plum rootstocks. Tests are being performed on interstock combinations of apple, sweet cherry, and plum. He is also approaching (via micropropagation and hardwood cuttings) growth of fruit trees on their own roots, that is, bypassing the rootstock system.

In cooperation with Jim Quinlan, he is testing "double P triple 3" for shoot growth control. He is also involved in fruit thinning of plum, which is much needed in the U.S. for peaches.

Dr. Webster is also involved in evaluating apple scion cultivars from both natural and irradiated mutants. Yes, he is also involved in clonal selection testing of hardy ornamentals.

Fritz Lenz from Bonn, Germany, also has a background of pome tree research, from soil adaptabilities to nutrition to fruit set for assurance of annual productivity. We will further inform you of Dr. Lenz when we receive his brief resume.

Alojzy Czynczyk, Skierniewice, Poland, comes from a rather cold country, where only hardy cultivars and rootstocks are used, to obtain dependable cropping of fruit crops, mainly apple. For this reason, Dr. Czynczyk and his associates have spent much research time during the past decades in developing cold resistant cultivars and rootstocks. The next newsletter will cover in more detail his current projects and accomplishments.

What and Where to Plant

Winter is here and spring is around the corner. Many decisions have been made on what and where to plant. But, for the one who did not order two years in advance, it is still time to reevaluate.

First, check the "old" orchard. Is it over thirty years old and in what condition are the trees? Have the trees overgrown their space and are they producing good fruit, including size and color? If the old orchard is due to come out, that is, if it is not paying its keep, it might be best to remove part or all of it. The day is here when it does not pay to grow below-standard quality fruit. Allow a year or two to get the land into good condition before planting.

New varieties are introduced each year. It might be best to check around to see what the trend is with new introductions, such as marketing acceptance and availability. There are several "mainstay" varieties which do not readily fade out of production.

What rootstocks to order for the varieties must be considered before ordering. That is, the grower has to decide what system best fits his orchard management program. Will it be high, medium, or low tree density? Since a range of apple rootstocks are available to suit a certain tree spacing, it is preferable to check with local extension people or nurseries for answers. The soil classification, for example, plays a role in determining the rootstock to use. A vigorous rootstock and variety on a strong soil can be a problem, unless tree spacing is adjusted accordingly.

Many of these questions can be answered by attending annual fruit growers' meetings in the States and provinces. There is no need for hesitation, because the time and money spent in going to educational meetings and fruit schools really pays off in the long run.

New Apple Cultivars

The Japanese tree fruit breeders have a list of interesting new apple selections, some of which are planted by growers in Japan and tested in the United States. The following are from Nakajima-Tenkohen Nursery, Yamagato Prefecture. Here, only fruit color, maturity dates, parents, and texture are listed.

Kogetsu - (Golden Delicious x Jonathan) red; late September; excellent flavor.

Senshu - (Toko x Fuji) light red; late September; crisp, good texture and flavor.

Yoko - (Golden Delicious seedling) red; mid October; fresh taste and good quality.

Kitanosachi - (Tsugaru x Am. summer permain) red; early September; sweet sub-acid.

Hokuto - (Fuji x Mutsu) red; mid October; good quality.

Natsumidori - (Kitakami x Mekuio) green/yellow; early August or Vista Bella season.

There are other new introductions, however, this a sample of new apple cultivars in the making. Some may become useful in the western world. Other more tested Japanese cultivars are: Mutsu, Orin, Jumbo Orin, Fuji, and Akane.

Meeting Reminders

December 5-8, 1983: Michigan Horticulture Society, Grand Rapids, Michigan
December 5-7, 1983: Washington State Horticulture Society, Wenatchee, Washington
February 18-23, 1984: National Peach Council, Myrtle Beach, South Carolina
March 4-6, 1984: 27th Annual IDFTA Conference, Grand Rapids, Michigan
June 19-22, 1984: IDFTA Summer Orchard Tour, New Brunswick, New Jersey
February 24-28, 1985: IDFTA 28th Annual Conference, Yakima, Washington
June 18-21, 1985· IDFTA Summer Orchard Tour, Hudson Valley, New York

Make plans to attend these meetings. The June meetings often can be combined with family vacations. We also want to remind you to attend your state horticultural meetings during the winter months. At these in-state meetings, you can learn about local recommendations very important to fruit growing. And, join the IDFTA now. Seventy percent of dues goes to rootstock research.

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No. 3, June, 1983 - Prepared by Robert F. Carlson

1983 SUMMER TOUR - JUNE 21-24

The three-day tour and meetings in northern Georgia promise to be most interesting and educational. Many surprises are planned by the organizing group of M. E. "Butch" Ferree, Gene Stembridge, R. M. Crassweller, and others. The meeting site is Young Harris College, in Young Harris, Georgia, which is near the North Carolina border. Yes, there are apples in "them there mountains", but there is also an abundance of peach growing in Georgia, as well as in the surrounding states of the Carolinas and Tennessee.

For those families combining vacation with business, the area provides great camping and site-seeing in the southern Appalachian Mountains, south of the Great Smokey Mountains.

For registration information, please refer to the April Newsletter (No. 2), or contact IDFTA Tour, P.O. Box 655, Ellijay, Georgia 30540. For further details about the Appalachian Trail, call (404)635-4426.

TREE PLANTING REMINDERS

Post planting treatment of fruit trees is highly important to develop well-formed, compact, and fruitful trees. For example, one-year old cherry trees should be whipped and headed back. That is, remove all branches and head whip to thirty inches or less, depending on tree size.

In peach trees, one or two branches can be left, providing these have wide, strong angles. If not, remove all branches and stub the leader to the appropriate height; small caliper low and big caliper high.

Apple trees can also be tall, lanky, and top-heavy, if not treated after planting. Heading the one-year old tree twenty to thirty inches (depending on vigor) from the ground is a must for good tree form.

June is an excellent time to put clothespins in the crotch angles of newly formed shoots on the central stem. Select three to four shoots the first year. It has been proven by research and practical observations that secondary shoots on a "whipped" tree form wider crotch angles than the original branches removed from the whip. These new branches are the ones to spread.

NORTHWEST DWARF FRUIT TREE ASSOCIATION CLOSES

A chapter in dwarf fruit tree development has come to an end, after serving its purpose since 1962. This association was initiated under the leadership of the capable pomologist, Bill Luce, in Washington. Truly, it served as a tremendous influence and stimulus in getting growers acquainted with performance of dwarfing rootstocks in apple production. Bill was the first president of the association. This writer attended some of their meetings and well-planned orchard tours.

Majorie McCormick, Yakima, Washington, former secretary/treasurer, recently sent a check to the IDFTA for $537.56; thus, closing out the account. It is to be used for furthering rootstock research sponsored by the International Dwarf Tree Association. The decision to close the account was made by Hugh Hargrave, James Ballard, Majorie McCormick, Charles Worthen, and Harry Hurlburt, all of Washington.

For the directors and members of the IDFTA, we convey thanks and extend an invitation to the former members to join the IDFTA. Many are already members of this active association. All growers and related industry personnel are welcome.

OTHER RESEARCH CONTRIBUTIONS

Norman Reath, Agricultural Research Director of Gerber Products Company, Fremont, Michigan, recently sent a check for $2500 to further research, with special emphasis that it be used for peach research, to help solve the many problems with this fruit crop. This is the second Gerber contribution in recent years. A sincere thanks to Gerber, from all of us, for this fine support.

BOOKS ON FRUIT PRODUCTION

Drs. Norman Childers and Tom van der Zwet have just authored a book, The Pear--Cultivars to Marketing. It has many practical articles pertaining to pear production.

Dr. Childers' 888 page book on fruit nutrition is nearly out of print. It is a textbook for pomology students and interested, related personnel. Although in need of updating, it contains a wealth of useful information on tree fertilizer and nutrition. Persons interested in the above-mentioned books should contact Horticultural Publications, 3906 N. W. 31st Place, Gainesville, Florida 32606.

IDFTA SPONSORED RESEARCH--CHANGES IN GRAFT UNION

Graft union combinations of apple (Malus domestica Borkh.) have been observed by light and scanning electron microscopy in relation to incompatibility and for subsequent evaluation, on a qualitative basis for potassium and calcium, by the electron microprobe.

Tissue variability occurred within the stock/scion union and in combinations such as Granny Smith/M. 26, MM 106, and M. 9. Growth anomalies were found as follows: excessive development of phloem on the trunk opposite to the site where the rootstock was cut off; meristematic growth between the scion and the rootstock

was erratic where subsequent vascular tissue developed radially (or on a bias rather than longitudinally) and this growth influence extended through the functioning phloem; growth of the meristematic tissue varied, with Granny Smith exhibiting multiple divisions within the meristem (thus forming vascular tissues which were numerous and small, but which did not develop a unified vascular system); radial-ray growth (extending through pith to phloem) of both stock and scion formed a 45° angle at the juncture of the graft union, as contrasted to a horizontal line of development in the union itself; xylem tissue in MM 106 was oriented in a longitudinal pattern as contrasted to radial development in Granny Smith: xylem rays were thick-walled and did not progress in a straight line radially; swirling of vascular tissues was evident.

Potassium and calcium increased in ascending order for the following tissues: xylem, non-functioning phloem; cambium; meristematic or growing point and functioning phloem. Although variable throughout the outer epidermis, phloem, cambium and secondary xylem, a great amount of these elements was found in the functioning phloem. Rootstocks such as M. 9, having a thick bark, will have a much greater portion of non-functioning phloem as compared with M. 7 or MM 106. In some T-bud combinations, phloem development varied as much as fifty percent in thickness. Less abnormal phloem growth was found in chip-budded trees. . . R. K. Simons and M. C. Chu, Department of Horticulture, University of Illinois, Urbana.

IDFTA SPONSORED RESEARCH--RESPONSES OF INTERSTEM APPLE TREES TO PLANTING DEPTH

J. Costante (UVM) and W. Lord (UMASS)

The interstem depth planting study was initiated in 1976 at Green Mountain Orchards, Putney, Vermont. It involved Macspur, Oregon Spur Delicious, Rogers McIntosh, and Empire on M. 9/MM 106 or M. 9/MM 111. The planting treatments were: a) the soil line approximately two inches below the stempiece/rootstock union, b) the soil line at the mid-section of the stempiece, and, c) the soil line approximately two inches below the stempiece/cultivar union. The principal objective was to determine the influence of scion/interstem union depth in soil on tree growth, productivity, and root suckering.

Summary of Results

1. After seven growing seasons, interstem trees of Oregon Spur Red Delicious are smaller and less productive than similar trees of Empire, Macspur, and Rogers Red McIntosh.

2. Fruit set and yield was higher for trees on M. 9/MM 106 than on M. 9/MM 111, with the exception of Oregon Spur Red Delicious.

3. All cultivars are larger on M. 9/MM 106 than on M. 9/MM 111.

4. Presently, the only influence of planting depth is on severity of suckering. Rogers Red McIntosh, Empire, and Macspur trees planted with the soil line two inches below the interstem/rootstock union have produced more suckers than trees with 50% or 25% of the stempiece above the ground. The M. 9/MM 111 interstem combination is inducing more suckering than the combination of M. 9/MM 106. Suckering appears most severe on Empire and the least on Oregon Spur Red Delicious.

5. Suckering seems to be related to less growth and yield, particularly on McIntosh and Macspur.

6. Although these findings are preliminary (until the final data is analyzed), the data does indicate that suckering can be reduced in interstem trees by deeper planting. Our present recommendation is in agreement with these findings.

Publications

1. Costante, J. F., W. J. Lord, S. Lacasse and D. Howard. 1982. Responses of interstem apple trees in planting depth. Compact Fruit Tree, Volume 15: 25-29.

2. Costante, J. F. and W. J. Lord. 1981. Responses of interstem apple trees to planting depth. Progress report for 1980. Proc. New England Fruit Meetings, Volume 87: 107-110.

3. Costante, J. F. and W. J. Lord. 1980. Progress report: responses of interstem apple trees to planting depth. Compact Fruit Tree, Volume 13: 31-33.

REVISED BOOK

Modern Fruit Science, by Norm Childers, is just off the press as an updated revision. See page 11 for address.

AMENDMENT OF IDFTA BYLAWS

The IDFTA Board of Directors, at their March 6, 1983, meeting, recommended that the terms of office of Directors be amended as follows: "A Board member can serve a maximum of three (3) consecutive three (3) year terms." This is an addition to the Bylaws, Article VI, Section III.

The members of the Association will vote on this addition to the bylaws at the June, 1983, meeting.

IDFTA NEWSLETTER
Prepared by Robert F. Carlson

SUPPLEMENT TO THE PROGRAM FOR THE 26TH ANNUAL CONFERENCE

Marriott Thruway Hotel

Rochester, New York

March 6-10, 1983

This will be the first time out of Michigan for the IDFTA Annual Conference. The program features speakers Rudolf Novak, Austria, and David Atkinson, England, who will discuss various management, cultural, and nutritional practices of small fruit trees in their countries. International exchange of growing and producing is invaluable.

New York fruit growers will relate their experiences, with the use of a range of apple rootstock and interstems to maintain trees smaller and more manageable for more efficient production. One panel of four growers will perform Monday afternoon, March 7, and the second panel of four, Tuesday, forenoon. There is much to be learned from listening to growers tell of performance of scion/rootstock combinations under different soil types and training systems.

The evening sessions will not allow for much socializing. Beginning Sunday night, March 5, a full two hour session on the latest fruit growing situations and mechanization in Australia and New Zealand will be discussed by researchers and growers who just returned from these countries. In other words, this information is hot, because this panel of eight will hardly have recovered from jet lag.

Monday night's program is filled with two concurrent sessions, one covering stone fruit, the other, pome fruit. Subject matter in these sessions varies from tree propagation to micropropagation to pruning. Ample time is allowed for questions and discussion in these two sessions.

Then, Tuesday evening, there is the annual banquet with prime roast beef and all the extras. There will be a presentation of awards to three IDFTA members for outstanding accomplishments in some phase of fruit production. Dr. Donald Barton, former director of the Geneva fruit tree research station, will give a message on the station's contributions to growing quality fruit in the future.

The next day, Wednesday, will be a full, 8:00 a.m. to 4:00 p.m., day of viewing various orchard planting systems in western New York. This will be a dandy tour because some panel members' orchards will be visited. Come prepared for March weather. Bus and lunch tickets are available at the registration desk.

thinking in terms of current tree training. Whether the weak growth of high-budded trees is acceptable or not, depends on the situation. Liebster (1968) and Van Rooyen (1975) considered growth of higher budded trees (20-30 cm high) in their trials too weak. It is demonstrated here that a combination of methods to restrict growth resulted in very small trees: virus-infected Starkspur, high-budded on the weak rootstock M. 9, planted on replant soil. Even with the vigorous variety Cox's Orange Pippin no useful trees were obtained when budded at 30 cm or higher. However, it remains to be seen whether budding heights up to 25 cm may be useful to restrict growth of virus-free trees of vigorous varieties on fresh land. . .H. P. van Ooosten, Holland

IDFTA SUPPORTED RESEARCH

Leaves from own rooted 'Loring' peach were found to contain higher Ca and mg levels than did 'Loring' budded to 'Siberian C', 'Nemaguard', 'Lovell', or 'Halford' rootstocks. One potential explanation could be the blockage of Ca transport by the bud union. Faust and Fogle suggest that the graft union may hinder the translocation of Ca into the scion. They have reported higher leaf Ca content in rootstock leaf tissue than in the leaf tissue of the scion cultivar. Also, smaller quantities of ^{45}Ca were found in scions of 'McIntosh'/Malling (M) 9 scions than in scions of 'McIntosh'/EM 16, although the Ca levels at the bud unions did not differ, suggesting that 'McIntosh'/M. 9 graft unions impeded Ca transport. It also has been reported that Mo was found only in the roots and rootstock of 'Lanes Prince Albert' apple/M. 9 but was absent in the scion. Although these studies suggest blockage of Ca transport by graft unions, further study would seem necessary before a conclusion can be reached. It would be of interest to see if own rooted Red Delicious cultivars would have a lower incidence calcium related physiological disorder common to fruit of this cultivar. . .Gary A. Couvillon, University of Georgia, Athens, Georgia

UNUSUAL WINTER--SO FAR!

December temperatures in Michigan varied between 9°F to 33°F above normal for the month. This caused some bud activity in fruit trees, especially peaches. The month of January is starting out unusally warm, also, but not as in December. Although secondary dormancy will occur, buds tend to be more vulnerable to sudden drops in temperatures. Therefore, what happens from the second week in January to spring will tell the real story.

As far as pruning now or later, it might be advisable to delay pruning young fruit trees until late February and March, especially stone fruits. Therefore, prune old and overgrown trees first and hold back on others. Better to have a full tree and some fruit than a thin tree and no fruit.

ADDITIONAL CONFERENCE NOTES

1. Marriott Thruway motel is near Throughway 90 at Exit 46. Then take 390 north to Rt. 253 west. Then left to Rt. 15 south. Left to motel--1/4 mile.

2. Persons coming by air to Rochester, pick up the phone and call Marriott Thruway for free pick-up to the motel.

3. Bring your swimsuit for relaxing at the pool before or after meeting time.

Department of Horticulture
MICHIGAN STATE UNIVERSITY

COMPACT FRUIT TREE

ROOTSTOCK BEHAVIOR
SPUR TYPES
INDUCED DWARFING
CULTURAL PRACTICES

THE INTERNATIONAL DWARF FRUIT TREE ASSOCIATION

No. 5, October, 1983 - Prepared by Robert F. Carlson

27TH ANNUAL IDFTA CONFERENCE

Three speakers from Europe will highlight the annual conference, March 4-7, 1984.

East Malling, England: Dr. Tony Webster, specialist in stone and pome fruit rootstocks, will report the latest research and field performance of new cherry and plum rootstocks, which have both dwarfing and improved productivity factors. Tony is the successor to Tony Preston, world-known rootstock researcher, who retired a few years ago. Mr. Webster will also give an update on performance of new apple rootstocks bred at East Malling, as well as cultural management techniques.

University of Bonn, Germany: Dr. Fritz Lenz, researcher in fruit production, will discuss strategies used in improving tree and fruit qualities in Europe. In a second talk, he will discuss water and nutrient supply to fruit trees for maximum yields. From a humble beginning in the Baltic countries, over the years, he has established himself as a researcher in fruit production, dealing with basic factors as to "cause and effect".

Research Institute, Skierniewice, Poland: Dr. Alojzy (Aleck) Czynczyk has been involved in developing and testing the Polish hardy apple rootstocks, known as the "P-series". Some of these apple rootstocks are being tested in the U.S. and Canada and recently included in the NC-140 state cooperative projects. Having compared the P-series with the Malling and Malling Merton series since their introduction, Aleck will discuss and update their performance as to cold hardiness and soil adaptabilities. He will also elaborate on trends of fruit production as it now exists in Poland.

IDFTA is sponsoring his travel expenses from Warsaw to Grand Rapids, and his return to Warsaw. He is not allowed to take any Polish currency out of Poland, hence, any other visits within the U.S. or Canada would have to be financed by parties requesting such visits. If any horticulture group or research station wishes to sponsor Dr. Czynczyk for speaking or visiting, please contact this office, 301 Horticulture, Michigan State University, East Lansing, Michigan 48824-1112, soon, so that travel time for him can be arranged.

FRUIT TREE STUDY TOUR TO ISRAEL, GREECE, AND ITALY
March 16 to April 8, 1984

Next year, IDFTA is sponsoring another study tour to three countries which are much involved in fruit production. The tour is planned to see trees in bloom and, for this reason, it will start in Israel and terminate in northern Italy. It will offer a chance to see various tree training methods prior to foliage expansion, as well as the use of new and old rootstocks, cultivars of both pome and stone fruits, and even some citrus.

The above dates may vary at either end by a day or two, however, air space is confirmed, starting from New York, March 16, and returning there on April 8. In-country travel plans are not yet finalized, but major apple and peach growing areas will be included, as well as visits to nurseries and research stations involved in rootstock and variety advancements and management.

Persons interested in this study tour should write Dr. Robert F. Carlson, 301 Horticulture, Michigan State University, East Lansing, Michigan 48824-1112.

ON THE ROAD--SUMMER, 1983

While surface travelling to the southeastern U.S. and westward to central Minnesota, in August, we observed tremendous variations in the effects of lack of moisture or abundance of it. Temperatures in the high 90's added to the almost burning up of annual vegetation and wilting of fruit trees and forests. This was especially true "as we saw it" while in North Carolina, then moving west into Tennessee and north to Kentucky and Ohio. A gradual "greening up" was observed as we travelled into northern Ohio and Michigan, which was almost a relief from the parchment brown elsewhere.

A few days later, while travelling into Illinois, Wisconsin, and Minnesota, a whole set of different situations were prevalent. Although some dry spells occurred earlier, crops in general, corn for example, were good. One grower in Minnesota said he had earlier harvested oats yielding three hundred bushels per acre and he proudly showed us ears of dented corn, nine inches long. He had planted this in late April.

Passing through Lake City, Minnesota, we could not resist visiting the Pepin Orchards, owned and operated by Dennis Courtier. His orchard is located on a 475 foot bluff, above the Mississippi River. The river, for several miles along Route 61, is wide, forming Lake Pepin. Several apple growers are located on the many bluffs where air drainage is no problem. Moisture here was not problem either; as a result, fruit size was very good, but lacking in color. Cooler nights were the wish of the day. Dennis was harvesting Paulared apples, averaging over three inches each.

While at the Pepin orchards, Dennis pointed out the site he is preparing for the 1984 NC-140 Cooperative Planting. The University of Minnesota cooperator is Dr. Emily Hoover. Alongside this planting, Dennis will plant some of his choice variety rootstock selections for comparison. He seemed to favor M. 7a for his soil and climate.

We also visited Dowd Orchards, Hartford, Michigan, where they were picking well-colored Paulared. Parts of their orchards are under irrigation and, hence, fruit size of most varieties appeared normal for the season.

Indeed, the summer of 1983 is one to remember. This again proves that there are no days or years alike, nor areas, soils, or climates. Many farmers and fruit growers will end up with meager crops, whereas some will have a good year.

By the way, the reason for this August travel was a wedding in Lexington, North Carolina, and a Golden Wedding Anniversary in Belgrade, Minnesota. However, having spent most of a lifetime studying, researching, and working with plants, one cannot help observing farms along the way.

RANDOM NOTES

Peach: While in Korea and Japan in the summer of 1982, we observed that some of the peach varieties are the white fleshed types. In fact, due to their high sugar content, they seemed to be favored. Some of the newer introductions are free-stone as compared to other cling-stone sorts. Professor Sung-Do Oh said that the Sunagowase cultivar (a chance seedling) is partially free stone and ripens in mid-July in Korea. Other free stone, white fleshed varieties are Nunomewase, which ripens in early July, and Okubo, ripening in mid-August. The postfix "wase" means early ripening.

Tree spacing: In a note from Robert Norton and G. Moulton, Northwestern Washington Research and Extension Unit at Mount Vernon, Washington, five factors are listed to consider in determining apple tree spacing: 1) natural vigor of cultivar (including spur type), 2) rootstock, 3) soil type, fertility, and cropping history, 4) training method, and 5) pruning. We add a sixth, orchard management.

They also group varieties according to vigor (please see table below) and suggest tree spacings on different rootstocks.

Rootstock		Vigor Group*			
		A	B	C	D
		(Approx. In-Row Spacing, In Feet)			
Very Dwarf	M. 27	2	4	6	8
Dwarf	EM 9	4	6	6-8	8
	M. 26	6-8	8-10	10-12	12-14
	Mark	6-8	8-10	10-12	12-14
Semi-Dwarf	EM 7	10	12	14-16	18-20
	M. 7a, EMLA 7	10-12	12-14	16	20
Moderately Vigorous	MM 106	12-14	14-16	16-20	20-24
	MM 111	14	16	20	24
Vigorous	Seedling	16	20	24	28

*Tree Vigor Categories (please see top of next page)

Group A (Low)	- Delicious, Discovery, Jonamac, Spur Golden
Group B (Moderate)	- Akane, Empire, Gala, Golden Delicious, Hawaii, Macoun, Melrose, Paulared, Prima, Spartan, Summerred, Tydeman's Red
Group C (Vigorous)	- Buckley Giant, Chehalis, Granny Smith, King, Jonagold, Lodi, Red Delicious (non-spur type), Yellow Transparent
Group D (Very Vigorous)	- Gravenstein, Mutsu, Northern Spy, Yellow Newtown

Pear: For centuries, the Swedes have had a fondness for pear. In fact, I have stopped a few times to visit the century old red pear tree, growing in the small town of Granna, Sweden. This tree, some years ago, tipped over and, from the midpoint, it again grew into its current horizontal and vertical growth position. As in many European countries, fresh pears and apples are extensively eaten and enjoyed as dessert. The researchers at Alnarp and Ronneby have two dwarfing pear clones, P. 10030 and P. 10029, in their pear research programs.

Etiolation: What is it? It is the changing of condition of a shoot or branch by excluding light for a period during growth. The process takes place in stoolbed propagation of rootstocks. It is a pre-conditioning factor for initiating new roots on the stem in the stoolbed where moisture is also a contributing factor. An etiolated stem is pale and whitish, compared to its normal brown appearance. Dr. Steve Doud found, in 1974, that etiolation improves rooting of both hard and soft wood cuttings of peach and apple.

Position budding: Budding high on the shank of the more dwarfing rootstocks for deeper planting has been the practice for about fifteen years. This practice accomplishes two major things: namely, improved tree anchorage and less sucker growth. Having a ten-inch rootstock shank below ground surface means that, after three to six years, new roots are initiated (etiolation process) and developed on the shank, thus helping to stabilize the trees. Current research at East Malling indicates that new root-promoting chemicals can be applied to the shank to speed up the root initiation. The method is not yet in commercial practice, but certainly could be useful.

Double P Triple 3 (PP333): This growth controlling chemical is studied in major world fruit growing areas. Reports indicate that it can control vigor if applied either as a foliar or soil application. It is another chemical which may come into practical usage in the future and bears observation. It also has been found to increase flower bud initiation and fruit set, which would be very useful in non-precocious cultivars.

Modern Fruit Science: This is the name of the revised edition of Dr. Norman Childers' book. It is very inclusive and practical, covering pomology topics from rootstock propagation and orchard culture to fruit storage. In the cover photo are Richard Breeden and Mary Edwards, both from Illinois orchards. For a copy of this book, please address your request to: Horticultural Publications, 3906 N.W. 31 Place, Gainesville, Florida 32606.