

Department of
Horticulture

MICHIGAN
STATE
UNIVERSITY

COMPACT FRUIT TREE

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

Spur Types

Induced Dwarfing

Cultural Practices

Vol. 7, No. 3, April 1974 - Prepared and Edited by R. F. Carlson

THE SEVENTEENTH CONFERENCE - DFTA

The Pantlind Hotel in Grand Rapids provided outstanding facilities for another excellent program. To single out a few facts, which made the conference a success, one must first mention the fine presentations by all the speakers, panel members, and chairmen of the several sessions. Secondly, the large and attentive audience most certainly contributed to the meeting. They came from many states and countries to visit, listen and learn.

Many other subject matters and acts of work added to the packed program. Among these were the folks who put on the opening taste panel, the ones who planned the successful orchard tour, and the Board of Directors who played a large part in laying the ground work of the conference and its program. Our sincere thanks to everyone.

COMPACT COMPOSITE

The proceedings of the conference will be published as Volume 7 of the International Dwarf Fruit Tree Association. Copies will be mailed to members June, 1974.

TREE PLANTING MOST IMPORTANT ROLE FOR SUCCESS--by Robert F. Carlson

Stone Fruit Trees - Trees such as most of the stone fruit are budded low and planted deep with the graft union 4 to 6 inches below ground. This includes peach, cherry, plum, apricot and nectarine trees, because these are mostly budded on standard non-dwarfing seedling rootstocks. However, if the peach or plum trees are budded on the dwarfing seedling rootstocks of sand cherry (Prunus Bessyei) or Nankin Cherry (P. tormentosa), they should be budded high and planted with the graft union at the ground line.

Pome Fruit Trees - Apple trees budded on standard seedling rootstocks also are budded low and planted with the graft union 4 to 6 inches below ground. However, apple varieties budded on dwarfing (clonal) rootstocks must be planted with the graft union at the ground line. If graft union is planted below soil line the variety may "strike" roots and tree uniformity and dwarfing is lost. On the other hand, if the trees are planted with the graft union at varying heights (0 to 10 inches) above the soil line, dwarfing and tree uniformity will vary greatly from tree to tree.

When apple varieties are budded on M.9, M.7 and M.26, the bud ought to be set on the rootstock 14 inches above soil line. This allows for deeper planting in the orchard and better performing trees. Further, the more dwarfing material (shank) built into the tree, the more dwarfing can usually be expected. The shank is the rootstock portion between the roots and the graft union.

Depth of Planting - The type of soil should be considered when planting trees. If the soil has clay in it and tends to compact, then the trees with a long shank should be planted more shallow so that portion of the shank is up to 6 inches above soil line. After the tree has settled (same summer) mound sand or loose friable soil up to the graft union around the base of the trees. Planting too deep on clay type soil can be conducive to collar rot. Trees with a shorter shank such as those varieties on MM 106 and MM 111 can be planted at normal depth which means that the graft union should be at the soil line after the tree has settled.

Type of Hole - Whether hand dug or machine auger dug, the hole should be about 20 inches deep. No need to bring up clay subsoil. The hole diameter should be 18 to 20 inches, or wide enough to hold a well pruned root system. Use the best soil for placing around the roots. Trim off excess and broken roots before planting.

Machine planted trees should conform to suggestions for standard planting as to depth, root spread and anchorage.

These planting hints may seem simple to the experienced grower, however; they are important for getting the tree off to a good start and for insuring better life span and good anchorage of the trees. Each year new people come into the fruit growing business, and these men can make mistakes if not informed about how best to plant and grow fruit trees.

AUSTRALIAN/NEW ZEALAND FRUIT STUDY TOUR

This is the second announcement of the proposed DFTA tour to Australia and New Zealand with tentative dates January 15 to February 13, 1975. A maximum of 34 persons will be going on this Pacific tour. The members will assemble at the Los Angeles Airport for departure for Fiji where the group will visit before embarking on a busy study tour.

Most of the land portion of the tour will be covered by air-conditioned bus to the fruit areas in the states of Victoria and New South Wales in the South and Southeastern parts of Australia.

Leaving Sydney the tour will go down the Goulburn Valley to the Fruit area around Shepparton. This area is mainly under irrigation.

Next the tour will turn northwest to the Murray River Valley from Swan Hill to Mildura. Horticulture research stations in each fruit area will be included in the stops.

Then the group will continue toward Adelaide making stops at Renmark fruit area. From Adelaide, the group will travel by air to Melbourne. Most of one day will be spent visiting a fruit growing area near Melbourne and the Scorsby Hort. Research Station.

After visiting parts of Melbourne and Penguin Parade the group will board a flight to Launceston, Tasmania for a four day visit to fruit growing areas and the Hobart Research Station and Laboratories. In Tasmania, visits to fruit farms will be along a route from Burnie to Devenport to Launceston to Hobart where the Fruit Research Station is located.

From Tasmania the group will move to New Zealand for a look at the fruit industry there. The Havelock North Fruit Tree Research Station will be visited as well as several fruit growers.

Time is allotted for catching up on rest in Hawaii on the way home. Points of interest in major cities will be included along the way. The cost from Los Angeles to Australia and New Zealand and return to Los Angeles is estimated at \$2,132.00. This does not include 2 nights lodging and meals in Hawaii.

Persons interested and for a day-by-day schedule of the complete tour should contact, R. F. Carlson, 303 Horticulture Buidling, Michigan State University, East Lansing, Michigan 48824. Copies have been mailed to those who have previously indicated an interest in this tour.

ANNUAL DUES

The Board of Directors of the DFTA at their December meeting approved an increase of the members dues from \$3.00 to \$5.00 annually. Those who have not yet paid the 1974 dues can mail them to Dwarf Fruit Tree Association, P.O. Box 143, Hartford, Michigan 49057.

ANNUAL MEETINGS

June 2-5, 1974 - International Apple Institute. Marriott Twin Bridge Motel, Washington D.C.

June 24-25, 1974 - Annual Orchard Tour - University Park and the Adams County - Gettysburg area, Pennsylvania.

December 2-5, 1974 - Annual Meeting - Michigan Horticultural Society, Pantlind Hotel, Grand Rapids.

March 12 - 14, 1975 - Eighteenth Annual Conference Dwarf Fruit Tree Association. Pantlind Hotel, Grand Rapids, Michigan.

DWARF FRUIT TREE ASSOCIATION AWARD WINNERS FOR 1974

Congratulations to the deserving winners listed here:

Frank Green - Fruit grower Allen, Michigan. For being one of the first growers in Michigan to plant dwarfed apple trees; and for serving as a board member of the DFTA.

Eric Gunn - Technical Advisory East Kent Packers, England. For his outstanding contribution to the 17th Annual Conference DFTA.

Dr. Aleck Hutckinson - Pomologist, Vineland Fruit Tree Research Station, Canada. For his research and testing of fruit tree root-stock and for his contribution as speaker at past meetings of the DFTA.

Eugene Heuser - Fruit grower and nursery man, Hartford, Michigan. For being the "father" of one of the nurseries in Michigan to commercially propagate dwarf trees for the apple industry.

William Luce - Retired Pomologist and extension worker, Yakima, Washington. For being the leader in Washington in developing and promoting dwarf apple trees and for being on past programs DFTA.

Dr. Howard A. (Jack) Rollins - Head Department Horticulture, Ohio State University. For his many outstanding contributions at annual meetings DFTA and enthusiastic attitude toward the use of compact trees.

DWARF FRUIT TREE ASSOCIATION TREASURERS REPORT - December 1, 1973

	Received	Disbursed	Balance
7/15/73 Balance on Hand			2582.70
Received			
Dues & Volumes	1544.00		
Foreign Exchange	.25		
Disbursed			
Printing - Compact Fruit Tree			
And Volumes		2200.00	
Corporate Filing Fee		10.00	
Postage		18.61	
Total	1544.25	2228.61	
Balance			\$1898.34

	Received	Disbursed	Balance
Balance on hand last report 12/1/73			1898.34
Received			
Dues & Volunes	902.50		
Interest on Savings acct.	89.41		
Disbursed			
Travel Expense Conference			
Speaker		479.00	
Printing			
Conference receipts			
& tickets		44.00	
Totals	991.91	523.00	
Balance on Hand 3/11/74			\$2367.25

LODGING RESERVATIONS

Reservations for lodging during the Pennsylvania Orchard Tour (Reserve before June 1, 1974):

Monday, June 24, 1974
Holiday Inn of State College
1450 S. Atherton St.
State College, Pa. 16801

Your name and address:

Tuesday, June 25 - Sheraton Inn, Gettysburg, Pa.

Your name and address:

DWARF FRUIT TREE ASSOCIATION OFFICERS

Pres. Richard Mattern - Pennsylvania
V.P. Albert Ten Eyck - Wisconsin
Kenneth McDonald - West Virginia
Richard Backman - Ohio
Jerry Seitsema - Michigan
Henry Bennett - New York
John Bell, Jr. - Illinois
Lorne Doud - Indiana
Thomas Chudleigh - Ontario
Virginia Ebers - Michigan
Donald May - Maine
Treas. Wallace Heuser
Exec. Sec. - Bob Carlson

DWARFING SWEET CHERRY ROOTSTOCK

A hybrid dwarfing rootstock No. 21 developed at East Malling and tested at National Fruit Trials at Brogdale shows compact tree growth of Merton Glory scion when compared to Fl2/1 rootstock. Several new cherry rootstocks are being tested and screened for resistance to bacterial canker and free from virus diseases.

VARIABILITY IN MINOR ELEMENTS

According to Japanese research Malus sieboldii is low in iron and high in manganese uptake and M.16 is high in iron and low in manganese and iron. M.7 was low in manganese uptake.

PROGRAM FOR SUMMER ORCHARD TOUR -- June 24-26, 1974.

Monday, June 24

P.M. Check into Holiday Inn or other motel at State College, Pa.
8:00 P.M. Assemble meeting rooms - Holiday Inn. Speaker to discuss visit to China.
This will be followed by a Question & Answer Session.

Tuesday, June 25

9:00 A.M. Depart from Holiday Inn for visits to University orchards, University Park. Some items to be observed: Trellised orchard plantings, over-row harvester and other orchard equipment.
12:00 noon Lunch - Details to be announced by hand-out information.
2:00 p.m. Depart by car from University Park to Adams County, noted for diverse orchard plantings and fruit tree nurseries.
5:00 - 6:00 p.m. Check into Sheraton Inn, Gettysburg. Make your own reservations at this motel or others near by before June 1.

Wednesday, June 26

9:00 a.m. - Depart by buses for visits of various orchards and nurseries in Adams County.
12:00 noon Lunch arrangement to be announced.
1:00 p.m. Continue orchard visits
4:00 p.m. Return to Sheraton Inn, Gettysburg.

Orchard tour ends.

Gettysburg is an area of historical drama. So, interested persons may want to spend added time to visit the battle grounds, etc.

LATENT VIRUSES IN POME FRUIT

The EMLA program to "clean" fruit tree varieties and rootstocks from latent viruses is a cooperative project between East Malling and Long Ashton. The project is an excellent one, and one which in the future needs to be established in other areas for the production of healthy source plants of varieties and rootstocks.

Whether or not each Experiment Station in major fruit states should have programs of this sort is debatable. A strong regional project may be more practical to avoid duplication of efforts.

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TENTATIVE PROGRAM PLANS - March 12-14, 1975 - Grand Rapids

The out-of-country guest speaker this year will be Mr. James Goode from East Malling, England. Mr. Goode will speak Thursday, March 13 on "Importance of irrigation timing, and time and rate of nitrogen application for economic apple production". This subject fits well to the slogan of the 18th Annual Dwarf Fruit Tree Association Conference, namely "Dollars and Sense with Compact Trees".

Mr. Goode's (Jim) second appearance Friday a.m. will deal with "Recent research on water relationships of apple trees".

WORDS ABOUT MR. GOODE

Jim Goode joined East Malling Research Station in 1950 to work on effects of soil condition on growth and cropping of fruit trees. This involved cultural and management practices. Now he is concentrating more on interactions of mineral nutrition and water and control of tree stress by misting, trickle irrigation, and liquid feeding. An understanding of how these processes affect crop development and final yields are of concern to him. The entire tree, from the root tip to the fruit, and the environment is involved in his research.

GROWER PANELS WILL FEATURE "KNOW-HOW" - Members of one panel will discuss 15 years or more experience with compact fruit trees. Emphasis to be placed on how compact trees can give good returns, and how to avoid pitfalls in current and future orchard practices. A panel of younger men will emphasize how to "get going" in fruit growing at a time when cost of land, equipment, labor and trees are steadily increasing.

These panels are planned to provide grower participation with information which will be helpful to the fruit industry in making fruit growing efficient and economical. Time will be provided for questions from the audience. It is your program so come prepared to participate.

Australia/New Zealand Fruit Growing Another Feature - Members of a team who participated in the orchard study tour to Australia and New

Zealand will describe and illustrate what they saw and learned from visiting with growers and research men in that part of the world.

Tentative members to participate are: Dr. Arthur Thompson, MD., Chairman; Messrs. Stew Carpenter, Paul Rood and Bob Carlson, MI; Clayton Shaw and Robert Hodge, PA; George Whaley, Canada; and others.

International Fruit Growing Part of Program - How fruit is produced and problems and trends in some of the Mid-Eastern countries and Japan will be described by Dr. Norman Childers, Rutgers University who will be returning in time for the March conference.

Dr. Kenneth Sponsel (M.D.) MN, who spent a month in Japan visiting fruit farms and experiment stations there will present some viewpoints and observations of his visit.

Dr. Loren Tukey, PA, will give his impressions of fruit growing in Poland. He attended the International Horticulture meetings in Warsaw December 1974.

Frank Klackle, District Horticulture Agent, MI, spent part of the summer, 1974, in Western Europe visiting fruit growers and Extension personnel. He will summarize his findings and transpose how these fit into North American fruit growing.

Peach Varieties and Rootstocks - Longer productive life of peach trees is a must for the peach industry to survive. This will be discussed by one or more persons during the March conference.

Banquet and Other Features - The fine annual dinner, prepared by the Pantlind Chef, will be Thursday p.m. followed by an interesting program.

All speakers have not yet been contacted, but these will be included in the detailed program in the February Newsletter.

Reservations for Lodging - In making reservations by phone or correspondence, please mention Dwarf Fruit Tree Association since this will assure special conference room rates.

Tel.: 616-459-7201

Address: Pantlind Hotel
187 Monroe, N.W.
Grand Rapids, MI 49502

Membership Dues - The annual dues (\$5.00) can be paid at conference registration March 12-14 or mailed to P.O. Box 143, Hartford, MI 49057.

Informal Parts of the Program - Wednesday afternoon there will be the usual fruit products tasting and visitation. This will be followed by 2 concurrent evening sessions covering current topics.

Orchard Tour Friday Afternoon, March 14, 1975 - An interesting orchard tour in the Grand Rapids vicinity and MSU's Graham Station is being planned by Frank Klackle and Bob Carlson.

A FORMULA FOR TREE DENSITY DETERMINATION

Several factors and questions play a role in determining how many trees to plant per acre. Some of these are listed below:

1. How are the trees to be managed and harvested?
2. What size tree - height and spread - for efficient management?
3. What varieties - for fresh or processing or both?
4. What soil type - good, average or marginal?
5. What rootstock to match spacing - and number of trees/acre?
6. System of tree training - free standing or supported?
7. Type of irrigation and nutrition?
8. Availability of land and labor.

Dr. Arthur Thompson, Maryland, suggests using a formula which combines some of the important factors listed. The formula is:

$$\frac{\text{Var} \times \text{rootstock}}{\text{Tree Training type}} \times \text{management} \\ \text{Soil type (depth and water holding)} = \text{Tree spacing}$$

Example:

$$\frac{\text{Jonathan} \times \text{MMI06}}{\text{Free standing}} \times \text{Excellent management} \\ \text{Sandy loam (good depth and water holding)} = 8 \times 18' \text{ -- } 302 \text{ trees/A}$$

Instead of numbers in this formula, substitute common sense, and find out as much as possible about the particular situation and the purpose of the planting. Ask questions about each factor, for example, how will variety N perform on rootstock M? Or, what varieties are most likely to be in demand the next 10 to 20 years?

INFORMATION TO DFTA MEMBERS

At the DFTA Board meeting in December two items were discussed which will be brought up at the March 1975 business meeting.

1. Several requests have come into the secretary's office asking for life membership in the DFTA. Therefore, the Board proposed a Life Membership of \$100.00
2. Since membership in the DFTA is world wide, the Board proposed changing the official name of the Association from The Midwest Dwarf Fruit Tree Association to The International Dwarf Fruit Tree Association.

Both proposals will require minor changes in the Association Bi-Laws.

DFTA Membership - The membership has steadily increased from about 150 at the inception in 1957 to 1300 current. Although members are from many states and countries, there are growers who are not aware of this educational association. Growers, extension and researchers are invited to become members. Friend Bill Luce, in his column "Bill Luce Says" in the November issue of the Good Fruit Growers, encouraged Washington growers to join the DFTA.

MECHANICAL APPLE HARVESTING -- PROS AND CONS

Growers who are currently harvesting apples by the 2 or 3 different type of available machines are certain that all apples will soon be mechanically harvested. At a recent meeting one grower said, "Check all machines, then buy the one you like and fit your trees to that machine."

That is the current thinking for harvesting standard or larger trees. The more upright growing trees are best because apples have a more uninterrupted fall to the catching frame. Horizontal branches are to be avoided.

This trend will soon change. Just like we have large and small cars, soon we will have large and small harvesters - large ones for widely spaced, taller trees and small one for mini-orchards.

So then, do we fit the trees to the machine or the machine to the trees? Seems to me at this time of mechanical harvesting development, there is a need for give and take in both directions. The engineers need to fall in with the trend in their development and that trend is here - toward smaller trees. The pomologist must teach how to best train the smaller trees to match the smaller machines.

Competition in engineering development will play a large role in that those who come up with machines which are most efficient (least man power) and which harvest non-bruised apples are the machines which will be in demand.

DORMANT PRUNING

The 3 to 5 year apple trees are at a critical age as far as managing them for fruiting or for excessive branch growth. Often it is a temptation to hit them pretty hard eliminating bearing branches and inducing

more tree vigor. At this age period most apple varieties should be coming into good cropping, so it is important not to remove this potential.

Self spreading varieties tend to fruit well on lower branches and close into the leader. This is desirable and must be kept in mind when making quick pruning decisions. Remove only branches which will allow more light to the lower fruitful part of the tree.

The top one third of the tree needs close attention because it often takes off leaving the lower 2/3 in the shade. Eric Gunn said that the grower should be more concerned with the top portion of the trees than the bottom.

Eliminate the upright growing branches which might eventually fruit out and put an umbrella over the tree. Allow the more slender horizontal branches in the top 1/3 to fruit.

In young apple trees it is better to underprune than to overprune. It is easy to cut a branch off, but impossible to put it back onto the tree. Try not to delay fruiting and good yields by taking out more branches than needed for good light exposure.

SPACE FILLERS

The annual dues of the American Society for Horticulture Science in 1944 were \$4.00, now they are \$40.00.

October 20, 1974, a snow storm, 20°F temperature, and hurricane winds hit Nova Scotia and left about 700,000 bushels of apples unharvested. Some of these were later salvaged for apple juice Bob Langley.

In one test planting at East Lansing of several spur type Delicious/M.9 at 6 x 12 planted in 1970, indications are that this spacing is rather wide 5 x 10 would be better. This is on a sandy clay loam and without irrigation.

Dr. Alojzy Czynezyk at the Skierniewice Fruit Research Station, Poland, reported that out of 9 rootstocks tested with 3 varieties, MM106 produced the highest yields. The rootstocks did not influence variety hardiness. However, in another 10-year test planting, M.26, M.11 and Antonovka seedlings were harder than MM11, M.4, MM106, M.9 and M.7.

Dr. Catherine Bailey, Rutgers University, reported on apple breeding at the International Horticulture conference at Warsaw. She said, "The development of good, summer apples requires considerable investment in genetic engineering." "After 40 years New Jersey has named 3 red early midsummer cultivars and one red late summer cultivar with dessert quality and improved shelf life - 'Vista Bella', 'Raritan', 'Jersymac' and 'Mollie's Delicious'."

Dr. V.V. Malichenko, U.S.S.R., reported on apple tree performance in dry areas of S.E. European U.S.S.R. Using wild malus apple selections

and comparing them with domestic varieties he found that -- "under severe continental conditions the genetic properties of the stock's (rootstock's) root system exerts a strong influence on the economic and biological qualities of varieties. It was ascertained that some stocks give a great vitality to the trees increasing their productivity from 20 to 30%".

ROOTSTOCK BREEDING

Several research stations are now well underway in developing improved rootstocks. The chief aims of these projects are to develop rootstocks which are; adaptable to local soil and climatic conditions, resistant to crown rot and fire blight, precocious, hardy, dwarfing and compatible with most varieties. Some of these characteristics also fit rootstocks for the stone fruit trees.

For example, the Balsgard Fruit Breeding Station in Sweden has a program for obtaining winter hardy rootstocks of apple, plum, and cherry. Several research stations in the United States and Canada are well along in testing new selections. The value of wide range testing should not be underestimated. A clone may perform poorly in one area and good in another. So, the exchange of plant material tends to speed the development of improved rootstocks and varieties.

Apple flower bud development - September 13, 1973, the temperature at the Balsgard Station, Sweden, dropped to -3°C (26°F). The fall was cold and the presumption was that this condition was unfavorable for flower bud formation. Flower buds grow and differentiate as long as the temperatures are favorable. What the effects were on the 1974 crop was not known. This is a possible cause of lopsided apples, also.

Summer Orchard Tour - The tentative dates for the annual orchard tour of the Dwarf Fruit Tree Association are the third week in June, possibly June 16-17. The location is not firm, but Ohio's fruit areas are being considered.

Questions Answered March 12-14, 1975 - At the conference program at Pantlind Hotel, Grand Rapids, MI, ample time will be allowed for answering questions on orchard management, pruning, rootstocks, varieties, soil preference, nutrition, irrigation, tree propagation, interstocks, tree spacing and so forth. The questions can be brought to the meeting or sent to 303 Hort., Michigan State University. Or, better yet, ask them right from where you are sitting at the conference.

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Seasons Greetings - Since this is December, the Board of Directors, DFTA, and your secretary take this opportunity to wish all of you a very Merry Christmas and a happy, healthy, and prosperous 1975.

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PROGRAM

Seventeenth Annual Conference
Dwarf Fruit Tree Association
March 13-15, 1974
Pantlind Hotel
Grand Rapids, Michigan

"PRIORITIES IN PRODUCTION AND INTEGRATION
OF COMPACT TREES WITH MECHANIZATION"

WEDNESDAY afternoon - March 13

- 2:00 p.m. - Registration begins in Lower Lobby.
- 2:00 p.m. - 5:00 p.m. - VISITATION and TASTING FRUIT PRODUCTS. GLEN
ANTLE and FRANK KLACKLE - Co-Chairmen.
- 6:00 p.m. - MEALTIME - In your favorite dining room at the PANTLIND
or other restaurants in the city.

WEDNESDAY evening

- 8:00 p.m. - Two Concurrent Sessions.

SESSION I - Kent State Room

Topics: Fertilizer, Irrigation, Scab Control and Spray Equipment.

Discussion Leader: MR. JORDON TATTER, Paw Paw, Michigan.

Panel: DR. AL KENWORTHY, M.S.U., "Steps to Meet Shortage of Fertilizer--
Trickle Irrigation, a Case in Point".
DR. ALAN JONES, M.S.U., "Trends in Control of Scab and Other
Fruit Diseases."
MR. KENNETH McDONALD, Martinsburg, W. Va., "Spray Equipment
and How We Control Fruit Pests in West Virginia".

SESSION II - Continental Room

Topics: Over-the-Row Harvesting, Tree Training and Fruit Handling.

Discussion Leader: DR. R. F. CARLSON, M.S.U.

Panel: MR. BERNIE TENNES, M.S.U., "Concepts of Mechanizing for Over-the-Row Harvesting".
DR. LOREN TUKEY, Penn. State Univ., "Tree Trellising in Relation to Mechanical Harvesting".
DR. DONALD DEWEY, M.S.U., "Maintaining Quality of Mechanically Harvested Fruit".

9:30 p.m. - Ball Room - Summaries from recorders of SESSIONS I and II.

Recorder SESSION I - DR. JEROME HULL, M.S.U.

Recorder SESSION II - DR. FRANK DENNIS, M.S.U.

10:00 p.m. - Adjourn

THURSDAY morning - March 14 - Pantlind Ballroom

Session Chairman: President DFTA RICHARD MATTERN

9:00 a.m. - Welcome and Announcements - RICHARD MATTERN, Pennsylvania

9:10 a.m. - DR. NORMAN CHILDERS, Rutgers Univ., New Jersey, "Variety Behavior, Culture and Care, Using M.26 Rootstock".

9:30 a.m. - MR. ERIC GUNN, Kent, England, "The East Kent Packers, Grower Relations, and Apple Marketing".

10:20 a.m. - Short break.

10:30 a.m. - Session Chairman: MR. JERRY SIETSEMA, Michigan

Topic: Grower Experiences in Fruit Production.

Panel: MR. HOWARD ATKINS, Amherst, Mass., "Varieties, Rootstocks, and How They are Fit into Retail Fruit Marketing".
MR. JOSEPH GARRETT, Versailles, Kentucky, "Use of M.9 and M.26 in High Density Trellis Apple Plantings".
MR. MAYNARD TEACH, Gays Mills, Wisconsin, "How We Cope with Winter Injury, Collar Rot and Tree Losses".

11:30 a.m. - MR. LORNE DOUD, Indiana. Question and Answer Session.
Write your questions and stuff the question box.

12:00 noon - Lunch in the Cafeteria or several restaurants in the Pantlind.

LADIES PROGRAM - Thursday March 14

Saddler Room - Chairman, MRS. HAROLD THOME, 2:00 p.m. - 4:00 p.m.. Speaker with slides. For detailed Ladies Program, check at registration desk.

THURSDAY afternoon - March 14

Session Chairman: MR. JOHN BELL, Barrington, Illinois.

1:00 p.m. - Business Meeting - RICHARD MATTERN, Pa.

1:15 p.m. - Topic: Young Men Discuss Fruit Growing.

Panel: MR. VERNON K. BULL, Casnovia, Michigan. "Gaining Experience from Visiting Other Fruit Growing States and Mexico".
MR. WILLIAM AUSTIN, Hartford, Michigan, "Growing Fresh Market Fruit Means Keeping Ahead of Problems".
MR. CURTIS HOWELL, Sparta, Michigan, "How We Manage Apple Trees--Learning and Looking Ahead".
MR. DAVID MATTERN, Hollidaysberg, Pa., "Growing into the Family Fruit Business Gradually".

2:30 p.m. - MR. ROBERT EDWARDS, Poplar Grove, Ill., "Apples are Our Business--How We Strive Toward Quality".

3:00 p.m. - Short Break.

3:15 p.m. - Session Chairman: RICHARD BACKMAN, Ohio

DR. RICHARD HAYDEN, Purdue University, "Training Peach Trees for High Production and Harvesting Efficiency" (including 5 minute movie).

4:00 p.m. - MR. CHRIS DOLL, Illinois, "Performance of MM 111 and Other Rootstocks in Southwestern Illinois".

4:30 p.m. - MR. FRANCIS KIRBY, New York, "A Grower's Viewpoint of Medium to High Density Orchards and Marketing in Western New York".

5:00 p.m. - Adjourn.

THURSDAY evening -March 14

7:00 p.m. - BANQUET - \$5.25, including tax and gratuities.

Master of Ceremonies - DR. H. JOHN CAREW, M.S.U.

Invocation - MR. KENNETH MCDONALD, W. Va.

Menu -

Fruit Cocktail
Nice Assorted Relishes
Roast Sirloin of Beef (Natural Sauce with Mushrooms)
Special Baked Potato
Buttered Fresh Cut Green Beans
Tossed Green Salad
Choice of Dressings
Assorted Dinner Rolls
Dutch Apple Pie
Coffee

- 8:15 p.m. - Countries and States Represented and Recognitions.
- 8:30 p.m. - DR. G. E. "GENE" STEMBRIDGE, South Carolina, "My Sabbatical Appraising Fruit Tree Culture in Australia and New Zealand".
- 9:30 p.m. - Adjourn for informal visits.

FRIDAY morning - March 15

Session Chairman - MR. TOM CHUDLEIGH, Canada.

- 9:00 a.m. - DR. JAMES CUMMINS and MR. RICHARD NORTON, New York, "Present and Forecast for the Future of M.9 and M.26 in Western New York".
- 9:45 a.m. - MR. ERIC GUNN, England, "Shaping Over-Grown Apple Trees without Sacrificing Yield and Quality".
- 10:30 a.m. - Question Session and Announcements.
- 10:45 a.m. - Orchard Tour Announcement - FRANK KLACKLE.
- 11:00 a.m. - Lunch - Pantlind Cafeteria and other restaurants open.

FRIDAY afternoon - Orchard Tour.

Leaders: MR. FRANK KLACKLE, MR. JAMES BREINLING AND ROBERT CARLSON.

12:00 noon - Busses will load in front of Pantlind Hotel.

First Orchard Stop: HAROLD THOME, 2137-7 Mi. Rd.,
Comstock Park

Second Orchard Stop: RONALD KLENK, 3888-10 Mi. Rd.,
Sparta and RALPH SUCCOP, 3703-10 Mi. Rd., Sparta.

Third Orchard Stop: DIETRICH BROS., 18520-24th Ave.,
Conklin.

A handout describing the orchard stops will be available during the Conference.

Room Reservations - Pantlind Hotel

Telephone No. (616) 459-7201

Address: 187 Monroe N.W.
Grand Rapids, Michigan 49502

Room Rates: Room for one person - \$14.50, \$16.50

Room for two persons - \$17.50, \$19.00

Room for three persons - \$25.50, \$28.50

Room for four persons - \$29.00, \$32.00

FREE PARKING

CONFERENCE REGISTRATION - Pantlind Lower Lobby

Wednesday - 2:00 to 8:00 p.m.

Thursday - 8:00 a.m. to 6:00 p.m.

Friday - 8:00 to 11:00 a.m.

Registration \$1.00

Annual dues \$5.00

Banquet \$5.25

Bus Ticket \$2.00

TRAVEL

Good airline travel service is available to and from Grand Rapids, Michigan. To those who travel by car, please keep your gas tank full and be thankful you came to Grand Rapids March 13-15, 1974.

SUMMER ORCHARD TOUR

This year the DFTA tour will be in Pennsylvania. Tentatively, dates are June 24-26, 1974. Definite dates and detailed program will be announced at the March Conference and in the next (April) Newsletter.

INTERNATIONAL HORTICULTURE SOCIETY CONGRESS

The Congress meets in Warsaw, Poland September 10-19, 1974. For travel information, contact College Travel Office, P.O. Box 1608, East Lansing, Michigan 48823.

SPEAKER FROM ENGLAND

MR. ERIC GUNN comes well qualified to speak on tree management and fruit marketing. He has been employed by the advisory services in England, and more recently associated with East Kent Packers at Faversham. Mr. Gunn worked 14 years as a Horticultural advisor for the Ministry of Agriculture and 6 years at the Efford Experimental Horticulture Station. In 1971 he accepted the position as Technical Advisor with the East Kent Packers at Faversham, Kent. He can use a small chainsaw to his advantage in shaping over-grown trees. He will demonstrate this during the Friday Orchard Tour.

FOR THE QUESTION BOX

Write your questions below. These will be answered to the best of the experts knowledge at the conference and published (with answers) in the next Newsletter. Please indicate STATE or COUNTRY originating Questions. Either mail the Questions to 303 Horticulture Building, Michigan State University, East Lansing Michigan 48824 or bring them to the conference and place in the Question Box.

AUSTRALIA, NEW ZEALAND - Fruit Study Tour

Recent interest for a study tour to Australia and New Zealand has triggered requests for survey to determine practicality of planning such a trip. The Board of Directors DFTA at a recent meeting, concurred on sponsoring the tour. Tentative dates are January-February 1975. Members will be considered on a first come basis.

If you, or if you know of someone interested in this tour, please return questions below to 303 Horticulture Building, Michigan State University, East Lansing, Michigan 48824.

_____ I or we definitely plan to attend this tour.

_____ I or we tentatively plan to attend this tour.

NAME _____

ADDRESS _____

Department of
Horticulture

MICHIGAN
STATE
UNIVERSITY

COMPACT FRUIT TREE

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

Spur Types

Induced Dwarfing

Cultural Practices

Vol. 7, No. 4, June 1974 - Prepared and Edited by R. F. Carlson

SUMMER PRUNING IS AN ART

As with dormant pruning, summer pruning is done for a special set of reasons. Whenever a shoot or a branch is removed from a tree, certain changes occur in part or all of that tree. The direction of growth will change depending where the cut was made and how much was removed. A cut made in the summer will remove from very few leaves to several hundred leaves, again depending on how many shoots or branches were removed. This will change the light exposure and the growth rate of the tree.

Timing is important: The trees are more responsive to summer pruning than to dormant pruning, especially at certain times of the active growing season. When summer pruning is done only to reduce growth of the tree, it should be done in early June by nipping of the tender shoots near the base or pulling off some at random. However, if done both to reduce tree growth and to induce fruit spurs on remaining shoots, the pruning should be done in July. Make the cut so that 4 to 6 buds remain at base of current shoot growth. This will reduce growth with minimum regrowth. For more spur development on the young shoot, remove only the tender succulent tip of random shoots on the branch.

Experience, varieties, rootstocks: Summer pruning involves more than just cutting of shoots. It includes removing of entire branches, spreading branches and "tucking under" of slender shoots to change their direction of growth. All this knowledge is acquired from experience and doing what will give the best response. Each variety and each scion/rootstock combination will respond differently to both dormant and summer pruning. Try a few trees of each, especially in high density plantings, and you will find the results satisfactory.

PEACH ROOTSTOCK HARDINESS

In a study of rootstock hardiness by electric conductance it was shown that some rootstocks will transmit varying degrees of cold hardiness to the scion variety. Using this method the results were more clearcut in early winter than in late winter.

"--in general, (the rootstocks) 'New' and 'Harrow Blood' transmitted more hardiness to scions than did 'Siberian C' or 'Rutgers Red Leaf'. 'Siberian C' was generally better than 'Rutgers Red Leaf'--Chaplin and Schneider. J. Amer. Soc. Hort. Sci. 99(3):231-234. 1974.

MALLING 27 -- AN UPDATED LOOK

With more interest in smaller apple trees, reduced growing costs and high production per acre, new rootstocks are needed to fit changing methods of production. Rootstocks which produce smaller trees usually grow less each year and thus require less pruning time which is a factor in reducing labor cost. In growing less, these small trees tend to fruit more and annually per unit of branch area than larger trees. These are key items to higher production per dollar growing costs.

Well tested and proven rootstocks: Some of the rootstocks now in commercial use have had 20 or more years of testing under varying conditions. These are: M.7, M.9, M.26 and MM 106 and MM 111. These are currently suggested for varying tree spacing and these will be around until better rootstocks are developed.

Status of M.27: Much has been spoken and asked about the performance and availability of this newer rootstock developed at East Malling. Some of the questions asked: How soon will M.27 be available to nurserymen and for orchard use? What size tree will it make? If smaller than M.9, will it be practical for a commercial orchard? Will M.27 be free standing or will it need staking or trellis training? How hardy is it and is it resistant to collar rot?

Availability: The first M.27 (cross of M.13 x M.9) apparently were not totally virus-free, and therefore had to be "re-checked". Reports from England indicate that the nuclear stock now produced under the EMLA project are virus free. When adequate supplies are propagated, the rootstock should be available in small quantities to interested nurseries according to correspondence with East Malling. Incidentally, M.27 (the first released) is being tested at some experiment stations both as single and double grafted trees.

Few characteristics of M.27: According to Tony Preston of East Malling, M.27 is more dwarfing than M.9 and it crops in proportion to its tree size. Usually, the smaller the tree the less bearing surface per tree, and to compensate this, more trees are needed per acre to produce comparable yields to larger trees. In test plantings the trees have been staked indicating that M.27 does not make a free-standing tree. M.27 does not sucker which is an advantage in its favor. Its relative tolerance to collar rot has not been noted.

The future of M.27: Obviously, when available in large enough quantities for larger test plantings by experiment stations and cooperating growers, several years will be needed to establish its commercial merits. Several factors must be determined, such as: its response to locally grown varieties, to local climate and soil conditions, to systems of tree training, to yield in relation to tree densities, and its resistance to collar rot, fire blight and sudden temperature changes etc.

Smaller fruit trees, whether hand or machine harvested, will continue to be the trend and need in the future. So, M.27 along with other newer fruit tree rootstocks will be given deserved and adequate testing before suggested for commercial orchard use. Research in developing new and better rootstocks is slow and time consuming. However, the efforts expended are warranted, because today, as in the past, the grower cannot afford to make mistakes.

CARE OF NEWLY PLANTED FRUIT TREES

Its too late now to re-set trees which were planted with the graft union too high or too low. If high, mount soil up to the graft. If low, put gravel around graft.

Fertilizer should be applied shortly after planting, but not after July 1 during active growth. For good growth (depending on soil) about 1/8 lb. actual N applied a foot away from the trunk and spread around the tree is adequate.

June and July often has dry periods, and that is a good time to water newly set trees.

A complete spray program should be followed to keep insects and diseases from slowing growth.

Clothes pins should be used to spread newly formed branches, especially of spur 'Delicious'. Snap them on the trunk above the branch and "lay" the branch in between the handle forcing it to a 45° angle.

If time permits, rub off excess shoots on the leader, thus starting to develop permanent branches. Lowest branch should be about 18" above ground.

Check the trees for sunken settling areas around the base and fill and level soil so that graft is showing above ground.

After the trees have settled, and before winter, add gravel or pea stone around base of trunk. Three to 4 shovels per tree will suffice as a start.

Before onset of winter, apply rodent control material and screens to avoid tree losses during the dormant season.

FRUIT TREE AVAILABILITY IN THE NEAR FUTURE

Stone fruits: Montmorency tart cherry trees will be in limited supply for another 5 to 10 years, because many orchards are old with trees declining and some orchards with tree improperly spaced and in need for re-planting for maximum production. Judging by cost increases of foods, prices for cherries no doubt will continue to be good, even though continuing to fluctuate from one year to the next.

Due to new variety introductions of sweet cherries for both fresh and processed market, new plantings will be made, and older orchards removed and replanted. Trees of certain varieties will continue to be in short supply. Sweet varieties budded on 'Mazzard F12/1' also are not as available because of limited and difficult propagation of this clonal rootstock.

Peach trees in general will be in good supply, except for certain varieties budded on special seedling rootstocks. The supply of 'Siberian C' seedling rootstock could be limited for several years, and practically non-available in some years, due to spring frost causing loss of a year's seed in the seed orchards. Many peach varieties therefore will continue to be budded on 'Halford', 'Read Leaved' and other peach seedling lines. Incidentally, 'Suncling' seedlings make uniform trees and should be used, when available.

Plum, nectarine and apricot trees in general are available from many nurseries, however, special variety/rootstock combinations always will be in limited supply.

Pome Fruit: For several reasons some apple tree combinations will be in short supply in the next few years: Growers are planting more trees per acre; the most dwarfing rootstocks M.9 and M.26 were all depleted due to unpredicted demand; and in some cases due to loss of trees in the nurseries from unseasonable low temperatures. In 1974 many orders of these smaller compact trees could not be filled. M.7 rootstock and varieties on it also were lacking especially of wanted combinations. Varieties on MM 106 and MM 11 were in good supply.

Because smaller, slower growing trees will be planted in the future, the supply will be limited the next several years. It takes up to 10 years to increase propagation to full capacity of the rootstocks. Before planting trees on M.9, the grower should make sure that his soil is suitable, his interest and knowledge of handling these trees is genuine, and his capability of providing initial planting cost of trees, stake or trellis support. The free standing trees on rootstocks M.7 and M.26 will be in high demand and rather short supply the next decade.

Pre-Planting orders: To insure getting trees of the right variety and rootstock orders should be in 2 years in advance of planting. June and July is a good time to send budding orders in to your favorite nursery.

PUBLICATIONS AVAILABLE ON REQUEST

1. "The Dwarf Fruit Tree Association of North America--Its Origin, Growth and Development".
This 7-page publication was published in London, England in Vol. 11. Fruit Present and Future in 1973. It describes in detail the purpose, activities and programs of the DFTA.
2. "Characteristics and Propagation of Rootstocks for Deciduous Fruits in the North Central Region, 1966-67".
3. "Some Endogenous Rooting Factors Associated with Rooting of M.2 and MM 106 Apple Clones".
4. "The Spartlet Pear"
5. "Myrobalan Selections as Rootstocks for Plum"
6. "Growth and Compatibility Characteristics of Crabapple/Rootstock Combinations".
7. "Propagation Methods of Fruit Tree Cultivars from Hardwood Cuttings".
8. "Starch Content in Cherry Stems Near Loci of Graft, Banding and Scoring".
9. "Graft Union Behavior of Certain Species of Malus and Prunus"
10. "The Incidence of Scion-Rooting of Apple Cultivars Planted at Different Soil Depths".
11. "Developing Dwarf Apple Trees"

These can be ordered by number from 303 Horticulture Building, Department of Horticulture, Michigan State University, East Lansing, Michigan 48824.

INTERNATIONAL FRUIT STUDY TOURS

1975 (January 15 - February 13) Australia and New Zealand.

Brochure is available describing stops at Experiment Stations and different fruit areas in these countries. Deposit required by August 1, 1974 and mailed to 303 Horticulture Building (\$100.00), Department of Horticulture, Michigan State University, East Lansing, Michigan 48824, and made payable to the Dwarf Fruit Tree Association.

1976 (Summer) China - Purpose: To study Chinese fruit culture and to exchange information with growers and research personnel of USA and China. Maximum persons to participate in this fruit culture exchange tour will be 32 persons. Since considerable time is required to plan this tour, interested persons should contact one of the addresses listed below before August 1, 1974: Ten Eyck Fruit Farm, R.F.D. 2, Brodhead, Wisc. 53520 or 303 Horticulture Building, Department of Horticulture, Michigan State University, East Lansing, Michigan 48824.

EIGHTEENTH ANNUAL CONFERENCE - DFTA

March 12-14, 1975 - Pantlind Hotel, Grand Rapids, Michigan. Members are asked to send suggestions to the secretary for program format, panels, speakers and tours in order to make this another top-notch educational fruit conference.

RANDOM NOTES

The following notes are taken from Dr. Donald Dewey's report on a recent trip to Washington.

"Criterion is being planted as a promising new 'Golden Delicious' strain. It has a bright yellow color and a clear, waxy finish. It is a cross of 'Golden Delicious' and 'Red Delicious' and shows the characteristic and desired 5 bumps at the calyx end.

A new tree replanting innovation is to individually fumigate the replacement tree holes with methyl bromide. The holes are dug, treated and covered with polyethylene film for several weeks prior to planting. The effect is not fully understood since it may provide nematode control or increase the destruction of toxic accumulations of arsenic. It is interesting, however, that nemacides used alone in the holes are generally not effective."

ABSTRACT NOTE

In abstracting from data compiled by William E. Smith, New Jersey, we note that yield and production cost was influenced by the rootstock. For example, 10-year yield of 'Red Stayman' on seedling was 1884 bu./A with a production cost per bu. of \$1.74. And that of 'Red Stayman' on MM 106 was 5915 bu./A and a cost per bu. of \$1.07. Another factor that influenced this difference was the number of tree units per acre--42 with seedling and 260 trees per acre using MM 106. The MM 106 trees were trellised and kept at 8' in height. Those on seedling were free standing and up to 20' in height.

CHERRY ROOTSTOCK NOTE

Montmorency budded on Prunus dropmoriana apparently is not a totally compatible combination. In limited tests, several trees died before the 6th year, were not productive and lacked general tree and bud hardiness.

NOTE FROM FRANK GREEN -- Former Director and 1974 Award Winner, DFTA.

I would like to take this opportunity to thank the Dwarf Fruit Tree Association for the award given to me and received for me by Thomas Hughes. Sorry to have missed this meeting, but sent Tom in my place.

It was a real gamble in 1954 to set the dwarfing rootstock trees, which were ordered in 1952. I still remember what you said when I came to Michigan State to see your trial plantings, after I had ordered the trees for 20 acres. You told me, "at this time, we at Michigan State are only recommending these semi dwarfs on a trial basis, and not for large commercial planting." This really shook me, but it was too late, my trees were already budded and growing in Loren Doud's nursery. However, after talking with you, I did increase the planting space from 20 x 20' to 20 x 28'. This has proven to be plenty close.

You and Tony Preston stopped to visit my orchard once when it was newly set. Tony asked, if I would be satisfied with 500 bushel per acre average annual production. I told him that I would. He said, he was surprised to hear the night before on the west side of the state they would not.

The state yield on standard trees at that time was 360 bushel per acre. Our average 30 year production on standard trees is 388 bushel per acre. My average production for the past 13 years for the 27 acres of semi-dwarfs set in 1954 is 400 bushel per acre, short of the 500 I was looking for. The last 13 years we have had 4 severe frosts and some damage several times. Four different years we averaged over 500 bushels per acre. We will have to solve our frost problems before our production will increase.

If I were to set another semi dwarf orchard in the future, I probably would use none of the rootstocks that I have now. Results from recent research plantings at MSU and elsewhere would be a determining factor in what to plant in way of varieties and rootstocks.

Ed. Note: Thanks for your note. Both of us no doubt have gained from several years experience. Bob

OWN-ROOTED SPUR 'GOLDEN DELICIOUS'

In one of our trial plantings at MSU we have the Frazer strain of spur 'Golden Delicious' on its own roots (propagated from cuttings) and on rootstock MM III. The own rooted 'Golden Delicious', 6 years after planting are approximately 2 times as large as those on MM III. The spur characteristics are the same in both cases.

Department of
Horticulture

MICHIGAN
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Vol. 8, No. 1, October 1974 - Prepared and Edited by R.F. Carlson

FUNDING ROOTSTOCK RESEARCH

Apple rootstocks now used for tree size control originated in several places of the world and were categorized at East Malling, England. Others have come from controlled breeding projects. These have served as a good foundation for size controlled trees. However, since soils and growing conditions are variable from country to country, state to state, and county to county, these rootstocks cannot possibly be asked to perform around the world. Locally produced rootstocks are needed for all fruit crops; apples, apricots, cherries, oranges, peaches, pears and plums.

In the future, fruit growing will depend heavily on varieties, rootstocks, orchard management and marketing. All four need research and teaching. Rootstock research is the concern of the DFTA.

Rootstock needs and demands are fantastic. At the Dwarf Fruit Tree Association Board of Directors meeting in June, 1974, the discussion centered on how to support a rootstock research program which will give more impetus to finding new, better and dependable rootstocks. How to implement a support program to further current rootstock research projects was part of the discussion.

Currently two or more rootstock projects aimed at introducing improved clones are in progress on this continent. These need financial support for the basic research, for evaluating performance and for testing all practical aspects of new scion/rootstock combinations.

For example, in 1958 a rootstock project to develop new apple rootstock was initiated in the Hort. Dept. at Michigan State University. About the same time, one was started at Experiment Station Geneva, New York. Others have been in progress for longer time in other states and Canada. Although these of necessity are long term projects, they can be "speeded up" by supporting research funds. A tremendous amount of work is required evaluating, propagating, field testing, grafting and budding, virus indexing, and increasing new rootstock clones. Persons with skilled hands and capable of keen observations are part of these projects. These are expensive, but without them progress is very slow. Also required are research facilities, which are costly.

How to implement the funding program for rootstock research was not totally agreed upon by the Directors. One director (name withheld temporarily) pledged \$100.00 annually for an indefinite time. The financial support could come from growers, institutes, associations, foundations, etc. Amounts pledged could be flexible. Funds given for research generally are considered tax exempt.

The vehicle for collecting such research funds will be the Dwarf Fruit Tree Association. Checks should be made out to that association and designated for rootstock research. From time to time grants from this fund will be set up with different departments at institutions having an active rootstock program. The decision on how to allocate these research funds will rest with the Board of Directors, DFTA.

Recognition of persons or institutions contributing to this rootstock research program will be given in the associations newsletter Compact Fruit Tree and at annual meetings. Checks to the association (marked for rootstock research) should be mailed to P.O. Box 143, Hartford, MI 49057, or to 303 Hort., Michigan State University, E. Lansing, MI 48824.

TREE DENSITY IN PERSPECTIVE

Much is said and written about tree spacing which indicates a need for conformity. Often the grower is left confused as to what route to take. This can be good because he then asks the most important question -- "If you were planting, how would you combine all the facts and come up with a productive orchard?" This makes one think.

Transition period - The old orchards with widely spaced trees are gradually removed. New plantings are taking their places after a year or two of soil building. All this is expensive, but necessary. Added to this the cost of establishing the new orchard, cropping cannot be delayed, but must come within 5 years.

Facts to consider - Important facts play a deciding role in how the new orchard should be planted and the grower needs to weigh these carefully. Some of these are: 1) The location and the soil types involved. 2) How will these orchards be managed as to tree size suitable for current trends of mechanization? 3) How much hand labor (if any) will be required for proper tree management and production? 4) What varieties will remain salable the next 20 years? 5) What rootstocks should these be on to best match the variety and tree spacing system? 6) What will it cost per acre for trees and growing till production will off-set expenses? And 7) What tree spacing?

Blunt facts as of now - Under Michigan conditions, the average grower of 100 or more acres should not plant much over 218 trees per acre. At this spacing (10 x 20), with the best varieties and rootstocks, he can with good management, join the 1000 bushel/A club in the sixth to eighth year. Such operator will grow a free-standing tree with a maximum height of 10 feet. The rootstocks to choose from will be M.7 and M.26, on a sandy soil MM106. Spur type varieties on M.7 or M.26 could be planted somewhat closer -- up to 300 trees/A.

The smaller grower can plant more trees per acre, because much of the hand work can be a family operation. Training small trees looks simple, but often it's hard to teach the labor crew. So, the small grower wants to plant 484 trees/A at 6 x 15 feet. Should he buy trees on M.9? On a sandy, droughty soil we think not. M.9 will do best on a deep loam soil, well drained, but yet with good moisture retention. M.26 is better, but can with some varieties be too vigorous for a 500 T/A spacing. The advantage with M.26 is that it can be trained into a free standing tree, saving the cost of posts, or posts and wires, needed for M.9.

Tree spacing should also be judged on the vigor of the variety. Apple variety vigor can be classed: a) precocious ones, b) spur types, and c) vigorous sorts.

For example - Do not plant McIntosh, Delicious, Mutsu, Northern Spy, or Winesap on MM106 or MM111 closer than 14 x 24 feet. Jonathan, Golden Delicious, Rome, Idared on MM106 could go in at 10' x 20', or on M.26 or M.7 at 8' x 18'. Spur types could go in a foot or two closer on the more dwarfing rootstocks.

Simple Summary: For best results, know your soil productivity, the vigor and precocity of the variety, the dwarfing range of the rootstocks, and most important, the management of the trees after planting. Mix these ingredients in right proportions and the results will be good annual production of quality fruit -- and perhaps a lush, tasty applesauce cake.

DFTA - EIGHTEENTH CONFERENCE - 1975

Wednesday to Friday - March 12-14, Pantlind Hotel, Grand Rapids, MI
For confirmed hotel reservations call 616-459-7201.

Conference slogan: "Dollars and Sense with Compact Trees". Twenty year's grower experience with compact trees will be discussed by prominent men who have learned from experience how best to handle smaller trees. Also, there will be research data presented on soil/tree/moisture relationship as traced over a period of years.

Questions: The purpose of any conference is to bring the audience up to date on research results and relate these to practicality and to learn from experience of growing and production from different areas. A second reason is to answer questions and clear up misinterpreted information. More time will be allowed for free discussion between audience, speakers, and panel members. To make this phase of the program stimulating and interesting, come prepared to ask and to answer questions. Or, if you prefer, send the questions to 303 Hort., Michigan State University.

SUCKER CONTROL AFTER PRUNING

At the 19th International Horticulture meeting, Warsaw, Poland, out of many reports, one dealt with shoot control. The research was done by A. Blanco and J.E. Jackson of East Malling.

Where large pruning cuts were made, shoot regrowth from this area was reduced by painting the stubs with "tree-coat" (same as a water soluble grafting compound) containing 1% NAA. This appears to be a practical method, especially where several large branches are removed or reduced from a tree. Pruning and painting during March appeared to be an effective time.

PEACH TREE DENSITY

Also reported at the meeting in Poland was work on peach tree density by F. Loriti, et. al., Pisa, Italy. Tree densities of peach trees have increased and growth control affected by the palmette system of tree training. The author mentioned that root competition between more trees per acre also tends to reduce growth, or have a dwarfing effect. Up to 1200 trees per acre was compared with conventional of 250 trees per acre. Yield and fruit size were related to number of trees per acre and also affected by variety response. Note: Palmette tree training means spreading of branches in opposite directions from the leader in one plane forming a very narrow hedge.

QUOTES ON TREE PHYSIOLOGY

Also reported at some length at Poland were papers on tree physiology by Drs. F.R. Tubbs from England, and R.F. Carlson, U.S.A. These quotes are reported here to re-emphasize the complexity of grafted trees. Quote by Dr. Tubbs:

"Trees such as those described today are of especial value in that they present uniquely favorable material for the study, firstly, of the growth regulatory mechanism of root and shoot in the fruiting or non-fruiting tree, with their interplay in the tree as a whole, and secondly, of the energy resources of the tree whose allocation and partition within it such mechanisms control; thereby determining the every-changing seasonal growth of the tree together with its accompanying expression in the many aspects of the physiological anatomy of tree (Beakbane, 1974, Tubbs, 1973)."

And quote from Dr. Carlson:

"Although much research has been done on many aspects of scion/rootstock combinations, the fundamental causes of dwarfing and congeniality of these have not been resolved. They may never be resolved because of variation in plant materials. However, general relationships of interrelated physiological and biochemical factors reacting in graft unions no doubt will be clearly defined and enumerated as a result of future research."

APRICOT BUD HARDINESS IMPROVED

A report by Dr. M.M. Sarkisova, U.S.S.R., illustrated that some growth regulating materials will increase cold resistance in apricot buds. Treated with 2-chloro-trimethyl ammonium liquid, 26% of the buds survived as compared to total

loss of buds on untreated trees. The materials NAA and GA₃ did not give as high increase in bud cold resistance. The treatments were injected into the trees August 15 to September 15.

HARDINESS STUDY

Dr. A. Czynczyk from the Skierniewice station in Poland reported that precocity was most pronounced with MM106, and that some of the other rootstocks in the test did not greatly modify the precocity of the variety. He also said that varieties on A.2, MM104, M.11, M.26, and Antonovka were not damaged from cold as much as other rootstocks in the test planting.

PRUNING SEASON IS HERE

Some growers prefer to start pruning after the fruit is off and few leaves still on the trees. This is fine for older apple trees and most varieties. However, younger vigorously growing trees in higher densities should not be touched with pruners until they are fully defoliated and dormant. February and March is a better time to prune young or newly established orchards.

The older trees that have to be reduced in size for efficiency sake should be worked over first. Remove at base 2 or 3 main branches and then shorten and shape remaining scaffolds to lower the crown. A fair amount of wood removed from old bearing trees does not appreciably reduce the yield. It does improve quality and saves on fertilizers.

Prune young trees very little the first four years. Let them grow to form fruit buds. In the meantime, do more branch spreading of upright growing varieties.

UPCOMING MEETINGS

We are not attempting to list all state horticultural meetings, but only a sample. All are important to the fruit industry, and we hope that you will take the time to attend and participate in some of them.

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|----------------------|--|
| December 2-6, 1974: | Michigan Horticulture Society. Pantlind Hotel, Grand Rapids, Michigan. |
| January 8-9, 1975: | New England Fruit Meeting. New Hampshire Highway Motel. Concord, New Hampshire. |
| January 14-16, 1975: | Joint meeting of The American Pomological Society and the Illinois State Horticulture Society. Ramada Inn, Belleville, Illinois. |
| March 12-14, 1975: | International Dwarf Fruit Tree Association. Pantlind Hotel, Grand Rapids, Michigan. |

LOOKING FOR CHRISTMAS GIFTS

Here is a book which is not outdated and which serves as a good reference on origin of most of the commercial apple varieties. Rootstocks for these varieties are also discussed in the book. The title is "North American Apple Varieties - Rootstocks, Outlook". The cost is \$8.50 per book and can be obtained by sending a check to American Fruit Grower, Willoghby, Ohio 44094, or MSU Press, P.O. Box 550, E. Lansing, Michigan 48823.

NEW APPLE VARIETIES GAINING IN POPULARITY

'Paulared' introduced in Michigan about 12 years ago is proving productive and in demand as an early fall apple. It is ready for harvest the last week in August, and can be "spot-picked" starting August 20. Paulared colors well, tastes good and stores until Christmas.

'Empire' a New York introduction, is gaining popularity because it colors better than regular McIntosh. It has some of the characteristics of both its parents McIntosh and Delicious. It matures about 12 days after McIntosh and stores well; and is precocious starting to fruit in the second leaf in the orchard.

'Jerseymac' another McIntosh type of recent entry into commercial plantings is good for the early roadside market. This one came out of New Jersey breeding program and it appears promising as an early August apple.

'Viking' from Wisconsin, attractive red, matures mid-August, is another one making its mark among the large apple family. New varieties must have qualities different than the standard sorts. Barring unforeseen characteristics, it appears that these are a few new ones which will make it. Others are making inroads.

THE MEADOW ORCHARD -- PROGRESS?

Both the old and new version of the meadow orchard was reported on at the conference in Poland, September 10-19, 1974. The work is done at Long Ashton England. Trying to tame a tree, which likes to grow tall and fruit irregularly, into the size of a raspberry plant or cornplant is not easy. It helps if both the rootstock and the variety has precocity characteristics so that vegetative shoot growth is held to a minimum. This is necessary when considering several thousand trees per acre. With no speedy and cheap method of propagating trees, this system could be expensive. Even so, the system is working on an experimental scale and limited grower trials in England. More needs to be accomplished on propagation, on initiation of flower buds, and on mechanization.

A FINAL NOTE

While in Poland, I learned that the virus disorder "bark proliferation" has been injected into American apple varieties with unfavorable results showing that they are sensitive. This virus is not in North American and it appears that we must try to keep it out along with others such as the Plum Pox (Sharka) disease.