

Department of  
Horticulture

MICHIGAN  
STATE  
UNIVERSITY

# COMPACT FRUIT TREE

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

Spur Types

Induced Dwarfing

Cultural Practices ↓

Vol. 3, No. 9, February 1970 Edited by R. F. Carlson

PROGRAM - THIRTEENTH ANNUAL CONFERENCE DWARF FRUIT TREE ASSOCIATION

March 1-3, 1970 - Hilton Inn, Benton Harbor, Michigan.

THEME: "How to live with compact trees --- expand or intensify?"

SUNDAY MARCH 1 - Chairman: John Bell, Jr., President DFTA.

3:00 p.m. - Registration at the lower level conference rooms. Banquet and luncheon tickets available at the registration desk.

4:00 to 6:00 p.m. - Presidents reception and mixer. Snack bar. Out-of-state and local members welcome.

"Fruits of the Vine and Tree" A chance to sample new fruit products.

Host: Glen Antle, District Marketing Agent, Benton Harbor.

SUNDAY EVENING - Buffet dinner available Sunday afternoon and evening.

Informal get-together with slide session. Bring your most interesting slides for rapid viewing and comments.

MONDAY MORNING - MARCH 2

8:30 a.m. - Registration continued.

10:00 a.m. - Program - Chairman: Dr. Howard Rollins, Jr., VPI, Blacksburg, Va. Opening remarks - John Bell, Jr. - President.

10:10 a.m. - "Orchard observations in Pacific Northwest" - W. S. Carpenter; District Horticulture Agent; Paw Paw, Michigan.

10:45 a.m. - "Dwarfing? - What are some causes?"

Henry Robitaille, Research assistant, Hort. Dept.; M.S.U.

11:00 a.m. - "Light leaves and limbs as factors in fruit quality."

Dr. Donald Heinicke; Wenatchee, Washington.

11:45 a.m. - Questions

12:00 noon - Lunch at lower level rear conference rooms. Menu: Chicken with assorted side dishes.

MONDAY AFTERNOON - Chairman: Richard Mattern, Fruit grower, Holidaysburg, Pa.

1:00 p.m. - "Peach tree problems, pruning and rootstocks and how we handle them in Ontario." Dr. Gerald Weaver; Vineland, Ontario.

1:30 p.m. - A PANEL DISCUSSION: "What lies ahead in fruit varieties, rootstocks, size of orchards, growing and harvesting methods?"

PANELISTS: Dr. Jerome Hull, Dept. of Horticulture, M.S.U. Moderator

- Tom Chudleigh, Fruit Grower; Milton, Ontario, "My views on compact trees and what I expect from them."
- Albert Ten eyck; Fruit grower; Brodhead, Wis. "How I make a living from small acreage of compact trees."
- George Adrain; Fruit grower; Indianapolis, Indiana. "A system of pruning that keeps my trees fruiting and compact."

2:00 p.m. - "Manipulating compact orchards by mechanical and chemical means".  
Frank Owen, Research specialist; HillTop Orchard and Nursery; Harford, Mich.  
W. S. Carpenter; District Hort. Agent; Paw Paw, Michigan.

2:30 p.m. - Coffee break - Courtesy of Dwarf Fruit Tree Association.

2:40 p.m. - "The fruit industry in Rio Negro Valley of Argentina."

Dr. Loren Tukey; Dept. of Hort.; Univ. of Pennsylvania.

3:30 p.m. - A PANEL DISCUSSION: "Trends in planting patterns and handling of compact trees."

- Michigan - Robert F. Carlson, Moderator.
- New York - Richard Norton
- North Carolina - Richard Unrath
- Ohio - Eldon Banta
- Pennsylvania - Loren Tukey

4:30 p.m. - Questions

4:45 p.m. - Adjourn

MONDAY EVENING - Chairman; Kenneth Mc Donald; Fruit grower; Martinsburg, W. Va.

5:30 p.m. - Social hour - Lower level conference rooms.

6:30 p.m. - Banquet - Menu: Prime Rib of Beef and assorted dishes.

8:00 p.m. - George Whaley, Past President DFTA will introduce the speaker.  
Professor A. P. "Tony" Preston; Research Station; East Malling, England.  
"Fruit growing conditions in Australia and New Zealand."

9:00 p.m. - Question and answer session moderated by Kenneth Mc Donald.  
An informal session at which time questions of concern can be brought up for detailed discussion.

10:00 p.m. - Adjourn

TUESDAY MORNING - MARCH 3 - Chairman: Lorne Doud; Fruit grower; Wabash, Indiana.

9:00 a.m. - "Tree spacing and pruning as factors in fruit yields."

Dr. Donald Heinicke; Wenatchee, Washington.

9:45 a.m. - Presentation of honorary awards to past presidents of the Dwarf Fruit Tree Association. Dr. John Carew; Dept. of Horticulture; M.S.U.

10:00 a.m. - Coffee break - Courtesy of Dwarf Fruit Tree Association.

10:15 a.m. - Business meeting - John Bell, Jr., President DFTA

10:20 a.m. - "Recent advances in controlling tree size." Professor A. P. "Tony" Preston; Research Station; East Malling, England.

11:30 a.m. - Questions

12:00 Noon - Buffet lunch - Lower level conference rooms. Menu: Beef tips on noodles.

TUESDAY AFTERNOON - Orchard tours - Co-chairmen - "Stu" Carpenter and Wallace Heuser.

1:00 p.m. - Leave for HillTop orchards where various persons will demonstrate different pruning systems that conform to current tree spacings. The HillTop Orchards and Nursery is located North of I-94 between Lawrence and Hartford.

1:30 p.m. - HillTop Orchard and Nursery.

- Pruning demonstrations of apple and peach trees of different ages.
- Tree spacing systems
- Double and triple rows
- Rootstocks and varieties
- Orchard heating
- Tree hedging and orchard mechanization

Persons involved in the various demonstrations at HillTop.

"Tony" Preston - England

Don Heinicke - Washington

"Mac" Weaver - Canada

"Stu" Carpenter - Michigan

Bob Carlson - Michigan

"Wally" and Bob Heuser - Michigan

Frank Owen - Michigan

4:00 p.m. - Adjourn

WEDNESDAY MARCH 4 - No detailed orchard tours planned. However, out-of-state and instate members are welcome to make arrangements to visit various orchards, storage facilities, and mechanical equipment companies in Michigan. Those persons wishing to make plans for such visits should contact "Wally" Heuser by 12:00 noon, Tuesday or before, or leave note at Registration Tables.

#### NOTES ON ANNUAL CONFERENCE OF THE DWARF FRUIT TREE ASSOCIATION

About 20 persons from United States, Canada and England will participate in a well planned program of the Dwarf Fruit Tree Association March 1 to 3, 1970. The conference will be held at the Hilton Inn, (Exit 28-I-94) Benton Harbor, Michigan. HillTop orchards, Hartford, will be visited during Tuesday afternoon.

During the formal program the various speakers will relate both practical and research experiences in planting and handling compact orchards of various tree densities. The general theme of the conference is: "How to live with compact trees --- Expand or Intensity?"

Professor A. P. "Tony" Preston has spent most of his life researching rootstocks, and pruning methods at the East Malling Research Station, England. In addition he has also traveled far and wide lecturing and observing fruit growing in many countries. At this conference Mr. Preston will show slides of, and explain, some of the orchard techniques in Australia and New Zealand. Being an authority on controlling tree size and fruiting, he will elaborate on this as applied to the present compact orchard practices.

Dr. Donald Heinicke has gained much experience in handling and training compact trees in the Pacific Northwest. Some of his research has dealt with light intensities as related to leaf surface and fruiting of apple trees. At the USDA Research Station at Wenatchee, Washington, he is involved in tree training, varieties, rootstocks, etc.

Dr. Gerald "Mac" Weaver, Vineland, Ontario spent several years at the Harrow Research Station, Ontario in peach breeding. While at Harrow he developed two seed propagated dwarfing peach rootstocks, the "Siberian" and the "Harrow blood." He will discuss these rootstocks as well as relate how they handle peach plantings in Ontario to prolong tree life. He will also, describe how to treat peach canker.

Dr. Loren Tukey, research professor at Pennsylvania State University has been instrumental in experimenting with compact tree training and guiding orchard plantings in Pennsylvania. He has also served as advisor to the fruit industry in Argentina. His experiences there will be covered with color slides and appropriate comments. He will also take part in a panel discussion dealing with planting patterns.

GROWER EXPERIENCES - Often fruit growers "invent" their own methods of planting orchards to fit their particular need, area and land. Such ideas, somewhat different from a standardized practice, can be very useful to other growers planning or extending in the future. For example, Albert Ten Eyck, Wisconsin, is using EM IX and EM 26 to grow small trees, to get high yields, to use local help for pruning and picking, and to make a comfortable living on relatively small acreage. Tom Chudleigh, Ontario, Canada has learned how to use EM IX in his orchard. Much can be gained by listening to his "down to earth" experiences. George Adrain, Indiana is developing modified growing systems to fit his particular area and conditions. Other excellent examples could be cited where a certain individual has taken the initiative to develop both intensive or extensive orcharding to fit a local situation.

Due to a more extensive formal program this year, only half a day is planned for orchard demonstrations.

STATE REPORTS - The activities related to extent of planting compact trees, trends in rootstocks, varieties and tree spacing will be discussed by persons from Michigan, New York, North Carolina, Ohio and Pennsylvania.

Mr. W. S. Carpenter, District Horticultural Agent in Southwestern Michigan spent last summer studying fruit growing in the Pacific Northwest. In his talk during this conference, he will show slides of the progress in compact tree plantings of future orchard expansion possibilities mechanization and of management problems and other trends in the Northwest fruit production areas.

The conference banquet will be held Monday night at 6:30 following an hour informal mixer. Mr. George Whaley past president DFTA will introduce the speaker Professor "Tony" Preston.

ACKNOWLEDGMENT - The Board of Directors and the members of the Dwarf Fruit Tree Association acknowledge with thanks and appreciation the management and personnel at HillTop Orchards and Nursery for annually opening up their facilities for orchard demonstrations.

The 13th annual conference will commence Sunday afternoon, March 1 in the form of an informal presidents reception. At this time arriving members will have the chance to register for the conference and to mingle and visit with fellow fruit growers and guest speakers. During Sunday afternoon and evening an excellent opportunity is offered to get acquainted with men of similar interest and problems.

Room reservations at the Hilton Inn should be made prior to February 15, 1970. Write: Manager, Hilton Inn, 798 Somerlayton Rd., Benton Harbor, Michigan 49002. Or call: 616-927-2211.

Hilton Inn Room Rates (special for members DFTA)

	1 Person	2 Persons	3 Persons	4 Persons
1 Bed (queen size)	\$10	\$14		
2 Bed (queen size)	\$18		\$20	\$24

Other motels are located near the Hilton and in the Benton Harbor area.

REGISTRATION INFORMATION - Thirteenth Annual Conference

Early registration is important so that the Hilton Inn management can be alerted in time on conference room space, and on number of persons attending luncheons and banquet Monday and Tuesday.

Registration.....	\$1.00
Monday lunch ticket.....	2.25
Monday evening Banquet.....	5.00
Tuesday lunch ticket.....	2.25
Annual Dues DFTA.....	3.00

The meal cost include tax and services.

Persons wishing to make extended visits of the Michigan Fruit Industry Wednesday, March 4, please leave a note at the registration tables.

STUDY TOURS - sponsored by the Dwarf Fruit Tree Association.

- March 1-3, 1970 - Thirteenth Annual Conference. Hilton Inn; Benton Harbor, Michigan.
- June 10-14, 1970 - Northwest or hard study tour.
- June - July (dates tentative) 1971. European Orchards study tours.

NORTHWEST - Orchard Study Tour - June 10-14, 1970

Each year during the existence of this Association an annual orchard study tour has been held in various fruit areas in the U.S., Canada, and Europe. This will be the first such sponsored tour to the Pacific Northwest fruit areas.

The initial planning for this Northwest orchard study tour includes transportation and lodging. A charter jet plane for 96 passengers and 3 busses have been reserved. The flight will originate in Detroit, go direct to Portland, Oregon where busses will be boarded for tour through Hood River Valley, to Yakima, to Wenatchee, to Summerland, B.C. and to Seattle for the return to Detroit. This will cost \$211 per person.

Since most of the fruit orchards are on irrigated land, and in somewhat different climate, "fruit people" from the Eastern States will find this tour interesting. Some Washington growers will be on the tour to visit with the tour members. Local research and extension persons will give detailed information at each orchard stop; as well as commentary enroute.

Alternate departure point of Northwest tour.

If the charter plane stops at O'Hare air terminal, Chicago, the cost per person will rise. An alternate plan will be to depart from and return to O'Hare in which case the cost should be less. If you have a preference note this on your registration form below.

Specific information on the Northwest study tour will follow in the next Newsletter. It is anticipated that the quota of 96 person for the tour will fill rapidly. Complete the application below and return as soon as possible.

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DWARF FRUIT TREE ASSOCIATION  
WESTERN TOUR  
OFFICIAL REGISTRATION BLANK

Please complete and return to:

Dr. R. F. Carlson  
Department of Horticulture  
Michigan State University  
East Lansing, Michigan 48823

Telephones:  
Office (517) 355-5200  
Home (517) 332-3824

NAME: \_\_\_\_\_ ADDRESS: \_\_\_\_\_  
\_\_\_\_\_  
ZIP \_\_\_\_\_  
TELEPHONE: \_\_\_\_\_

DEPOSIT: \$75.00 by February 28, 1970  
(Please make checks payable to Dwarf Fruit Tree Assoc.)

YOUR COMMENTS:

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Vol. 3, No. 12, July, 1970, Edited by R. F. Carlson

Some Notes from the Northwest Orchard Study Tour  
June 10-14, 1970

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Dr. Robert F. Carlson organized and conducted a fruit study tour to the Pacific Northwest in June, 1970. Ninety-six persons participated in this tour which took them to the fruit producing areas of Yakima and Wenatchee, Washington and to Summerland, British Columbia. In this group were fruit growers, extension and research men: 41 from Michigan; 27 Ontario; 6 Indiana; 6 Wisconsin; 5 Ohio; 3 Illinois; 2 Massachusetts; 2 New Hampshire; 2 Pennsylvania; 1 Connecticut; and 1 from New York.

The comments that follow are some of the observations of the Pacific Northwest fruit industry made by Dr. Carlson and do not necessarily represent the views of the persons who took part in this concentrated study tour.

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## OBSERVATIONS IN THE PACIFIC NORTHWEST

A group of enthusiastic fruit growers, extension and research men went on this exciting and educational five day study tour. They came back with many ideas, many comments, and pleased with results. Most of the persons of this 96-member tour went with the idea of learning what the Northwest is doing. In this day of rapid changes many of these fruit growers realize that they must keep informed, not only in their own area or state but also with what is going on in other states and countries. A charter plane from Chicago brought the group into the fruit belt (Yakima) of Washington, where chartered busses took over the transportation to the various orchards of the important fruit areas.

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## GENERAL OBSERVATIONS AND COMMENTS

The first impression a visitor gets in viewing the Pacific Northwest fruit industry is the extent of young plantings, the tree spacing and the potentials of future plantings. One gains this impressive view mainly from comments and

from the advantage in looking down from higher elevation onto some of these plantings, which are quite extensive.

With these orchards being irrigated, annual growth can be maintained and production realized at an early age. The cost of irrigation ranges from \$10 to \$20 per acre annually, with certain cases as high as \$40/A. This perhaps is not of major concern because holdings are small. For example, we were told that the average apple holdings in the Wenatchee fruit area is 13 acres and that of the State of Washington is 18 acres. Furthermore, spray cost is low. On the average many growers spray only 4 or 5 times annually. No scab sprays are required in most of the orchards. A cost which is not so obvious in Eastern orchards is heating during flowering time. This can be a factor. As a supplement to heating, about 150 wind propeller towers were found in the Yakima fruit area. No one exactly knows how efficient these towers are, but from the extensive use of them they must be doing some good.

Orchard heating costs are variable and generally off-set the savings in spray programs. The smudge pots were still in use this year but are being outlawed. We were told that these smudge pots produced so much smoke in the Yakima valley that airplanes could not land for days.

#### AVAILABILITY OF LABOR

In the Yakima and Wenatchee areas of Washington and in the Summerland Valley fruit area of British Columbia, it appears that labor is presently not a serious problem. It was emphasized that there is no immediate future problem in obtaining labor for orchard management and temporary help during harvesting. Over 50% of the labor involved in orchard operations including harvesting are of local source. The housing facilities for imported labor in the Washington fruit areas have been improved due to law enforcement or migrant housing regulations. The group was shown one such labor camp where each worker was provided with a room in which one bed and kitchen facilities were available. No central dining area was provided mainly because of the mixture of labor employed.

#### AGE OF TREES AND TREE NUMBERS PER ACRE

One does not have to move very far to see different age orchards and even different age trees within a certain orchard. We saw extensive acreage of young orchards with trees from 1 to 5 years of age. Then we also saw many orchards composed of trees varying in age from 1 to 50 years within the orchard.

Interplanting in older orchards was very obvious and of some concern to the Eastern fruit growers who are not generally prone to do this. In getting the true picture of this, one must realize that the holdings are small and the grower hesitates to remove any bearing surface. This being the case, he goes in and plants where old trees die and interplants between old trees in order to build up high density orchards. This, of course, can create a management problem and most likely will be of some concern in the future.

The younger plantings had trees spaced at various distances. Some of these tree spacings may create a management problem in the future, however, this remains to be seen.

#### ROOTSTOCKS AND TREE VIGOR

Many of the younger plantings with trees spaced closely together may hold high production potential and in addition they may hold some problems of overcrowding once they are 10 or 12 years of age. The latter point may, of course, depend on the type of management practices that will go into such high density orchards.

Some of these young orchards were on vigorous rootstocks and in some cases on seedling rootstocks. With uniform moisture conditions provided through irrigation, these trees are going to grow fast and unless they come into bearing early a crowding condition could be the results before much production was obtained.

The fact that many 'spur types' of 'Delicious' and 'Golden Delicious' have been planted, may be a help in controlling tree size. These 'spur types' ordinarily come into bearing sooner than standard varieties. Many of the rootstocks used were EM 26, MM 106, MM 111, EM VII and considerable numbers of seedling rootstocks.

In these high density plantings it is obvious that considerable amounts of hand labor will be required. Unless this labor is available in the future these high density plantings could be neglected and cause a crowding condition with the end results of unproductiveness and considerable amount of alternate tree removals.

#### PRODUCTION FIGURES AND LAND COST

During the tour several production figures were mentioned. These figures varied depending on the age of the trees, number of trees per acre, management practice and so forth. In general figures in boxes per acres varied from 1000 to 4000 loose boxes per acre. Yields of course are relative and are not always accurate unless actually measured. Many of these yield figures are estimates and not the actual but are correct in some and variable in others. In general, the production in the early years of the orchard were impressive and certainly important. These figures were often greater for 'Golden Delicious' and not as high for 'Delicious'. Fruit production has to be high in order to compensate for the various cost including cost of land.

Orchard land suitable for orchard production in the Pacific Northwest is high both in elevation and cost. Bare land apparently could be bought for around \$1000 per acre, however, land with trees on it could vary from \$2000 to \$4000 per acre. Much orchard land apparently is available for future plantings. Before it can be planted, irrigation has to be brought to these unproductive areas.

The fruit industry in the Pacific Northwest is full of confidence. As one optimistic commentator put it: "In the future the State of Washington will produce nearly all the fresh apples for the country."

#### SOME OBSERVATIONS IN B.C.

The production in the fruit areas of B.C. was also equally impressive. In fact many of the orchards there reminded one of the orchards in Holland and France. Tree spacing of 7 x 14' was quite common and apparently productions have been high in these orchards especially with the 'Golden Delicious'. The future potential of fruit growing in the B.C. area are quite impressive.

#### COMMENTS FROM MEMBERS OF NORTHWEST FRUIT STUDY TOUR

"It was a very interesting tour. Exception point of interest was the trellis plantings of Van Roechoedt. I question the technical information gained used under midwest growing conditions. It would be interesting to see the quality of apples produced in some of the plantings we observed."

"I believe each of us now has a personal understanding of where our competition is and what some of their problems are and also the problems that their production will cause for all of us. Next time I would personally like to spend more time in B.C. and would like to see more evening get-togethers with area growers."

"I am aware of the problems involved in working out plans for a study tour that fits the wishes of all concerned. I do believe that we are inclined to cover more ground than is wise in a short time. I would prefer fewer stops per day thus allowing greater opportunity to take notes on good information. To see a good thing is pleasant, but to find out how it was accomplished is the real reason for these tours."

"We have thoroughly enjoyed ourselves, learned a lot, and met a planeload of real nice people. For future tours I might suggest an organized--but informal--session with a group of local growers to share ideas on general grower problems--fruit handling and harvesting techniques."

"I noticed that our hosts tended to show us too much of one thing. We observed winter injury in one orchard and then on to another. Most people on this flight weren't Victorian age people who had to have the information constantly pounded into their heads. I do not think the "High Density" planting of 7 x 14' would work in Michigan without irrigation."

"I suggest that another time there should be set aside a one hour-a-day session for reviewing the day's observations. This might be accomplished by the men being divided into about 3 groups . . . the leader of each group to be an extension man from the area. The purpose would be to evaluate the observations in terms of their applicability to the growers back home."

"This Northwest study tour has been beyond expectations. The accommodations were excellent, the entire tour was well planned and very educational, the

tour guides and growers of Washington State and all others connected with the tour deserve our special thanks.

General growing conditions are so different such as the spray program, water conditions, climate, rootstocks and soils. We have the same end results in mind, growing the best apple we know with knowledge gained from other growers."

"The western trip was excellent, very thorough and complete."

"Very much impressed by the close planting, however, with our soil types we may have trouble with high density on a dwarf root without irrigation. The Canadian growers have put much more effort and time in training of their trees. The European influence is definitely evident in the B.C. area. One of the most impressive orchards was the Hanson, Yakima block that is programmed to produce 1 million bushel. The other facet is that this block could be viewed in its entirety from a high advantage point.

It sure must be wonderful to spray when you want to, and not have to worry about scab."

"The trip was very satisfactory, educational for the time and money involved. I was especially impressed with the 17 year old Van Roehoudt orchard where he convinced me that dwarf trees can be kept in bounds. I wish we had had one or two stops where the training program had failed, so we could have learned from their mistakes. Perhaps too much time spent at 2 and 3 year old orchards. Anybody can look good at that age. It will take me some time to absorb all that I saw but I am sure that I will be able to see my own problems clearer because of the trip."

"Most certainly, this has been by far the most informative and interesting orchard tour I have ever attended. I was greatly impressed by the extensive use of spreaders in trees from their second leaf on through the eighth leaf. The pruning and shape of the main stem trees has shown me that there is room for improvement in our shaping techniques. We saw all facets of the Northwest fruit industry from extreme close planting to their mistakes, (in my opinion) of interplanting occasional young trees in their older, inefficient, winter injured blocks.

The tour was perfectly planned in great detail and I would very much like to repeat it."

"My impressions were:

1. Very well organized
2. Excellent presentation by Research and Extension
3. Gave an opportunity to observe and benefit from experiences of growth in a different area which would not have been possible to an individual
4. Most certainly tours should be continued.
5. Tour programs should continue to be concentrated so as to see and learn as much as possible in the time spent.
6. No criticism."

"We've had a most wonderful trip (a well planned trip). We had good tour guides in the Northwest. This has been a very educational tour.

We saw different spacing, different cultural practices, central leader on peaches, and oblique palmette systems of training. The punctuality and timing of the tour was impressive.

We enjoyed meeting the other growers and learning of their experiences."

"We have enjoyed the tour very much and wish to thank those people responsible for arranging it. It has been very interesting seeing the orchards in Washington and B.C. and how they are grown and managed compared to ours. We would have liked to have had a free day to sightsee in Vancouver before returning home. Also would have been interested in seeing more packing houses."

"We have enjoyed the trip very much. I never realized the extent to which the area is expanding. I could never have made the trip in any other way.

The work in the Northwest is very impressive but I am sure I'll come back to earth and not remove all my old trees when I've had a little time to reflect.

I feel I have a much better understanding of reasons for central leader training of apples and am excited now about growing peaches on smaller trees at closer spacing.

My wife has learned more in the last five days about apples that I have taught her in eight years. An excellent trip."

"Very educational experience. I feel perhaps we tried to see too many things in too short a time. Tour was well planned and everyone very willing to be of assistance."

"For a tour of this length it would be wise to consider at least one side trip...Perhaps one afternoon.

The orchards visited were of great interest, however, there was some repetition. It would be interesting to see some small and medium holdings with comments on some mistake made.

I am sure the ladies would have enjoyed more planned programs suited to their tastes.

Growers are interested in what happens to their product after it leaves the farm. Some time could have been spent with shippers and packing facilities for an exchange of information. The growers should be encouraged to produce for the Market.

Please understand the planning was excellent."

"In four days we got an impressive insight into what is happening in the use of compact trees and production in general in Washington and British Columbia. A well planned and conducted trip."

"I had an extremely pleasant and interesting trip, it was well planned and well conducted. I think we should have this kind of tour more often, once a year if possible. I think we should know what our competition is doing, what their problems are and how they cope with them. I think we should all share our experiences."

"I am sure that anyone interested in what other growers are doing would profit from a so well organized trip as we have just completed. It was a well organized and wonderful tour."

"All in all, an excellent tour. I would not change it much if another trip was planned. A little fuller account of the country - geology - soil and climate would be welcome to me.

I volunteer to provide this for Ontario if a tour from the West is arranged through Michigan into Ontario. Thank you for your part."

"I would like to spend more time and effort looking at older plantings on various rootstocks and new varieties. Also an evening meeting with the marketing personnel of the sales group would be interesting."

"It's been a wonderful trip and experience. I know we will be able to take a closer look at our trees at home."

"We would like to thank the Dwarf Tree Committee for the outstanding way they conducted the tour. We feel that we have learned a lot. We appreciated the arrangements that were made for this trip."

"I felt the excursion was interesting and beneficial, although a great deal of repetition could have been avoided by reducing orchard visits. More involvement in packing operations and their operations would have proved interesting. Also a sideline tour of the scenic area would have been appreciated."

"I would have liked to see more scenic attractions of the area such as snow in the mountains. However, we enjoyed the trip very much. The tour was handled well and we saw so much in such a short time. In general, an excellent tour but perhaps a little too much repetition. I suggest a future tour to Nova Scotia."

"A wonderful trip and a chance of a life time. I went for business and not for play. However, I also enjoyed the trip from a pleasure standpoint."

"A few comments: (1) Something more arranged for the ladies. Example, bus to Vancouver at some additional charge would have been appreciated. (2) An hour question and answer period in a classroom or similar facility at Summerland might have been worthwhile. (3) Generally the program was excellent. A good look at some useful orchards, excellent personnel as tour guides, and timing excellent."

"A very well organized trip which covered all details of orchard plantings. Only problem was the crowding of such an itinerary in a few days. I believe the Chamber of Commerce should have been contacted to have welcomed us. A very informative trip and one to be remembered the remainder of my life. United Airlines was very gracious and I very much enjoyed traveling with them."

"The trip was good but should have taken in more packing facilities and marketing. There could have been a break in the tour, as orchards began to look alike. The guides were very cooperative; and the tour very well organized."

"I feel the tour was very well arranged both in farm visits and in timing. One or two suggestions which I might offer are: I wish that we could have seen one of the large packing operations at work.

I feel that many of the operations which we visited indicate the future and the challenge which we face in the future.

In the main I was well pleased with the hosts and tour guides. I was a bit disappointed in the fact that we had been presented with a bill for the apple juice, and also one meal was a bit disappointing. Many thanks again for your excellent work."

"We thoroughly enjoyed the trip, and are ready to go again next week."

"We had a wonderful trip and saw many new plantings and new ideas. Many of these things would not be practical for us, but worth looking into to improve our own operations."

"If it's comments you want, we heard quite a few. They liked a few trees and they enjoyed the view. They like the apples but not the racks. They are glad to go home but some would go back. They enjoyed the sun and can't figure yet if that wasn't rain how come we got wet. They enjoyed meeting new friends and also the old. They enjoyed the vacation from TV and the news. They enjoyed all the gals who served us juice and now its all over and all have been had. I'm sure the good comments far out weigh the bad."

EDITORS NOTE: The members of the Dwarf Fruit Tree Association wish to extend a special thanks to fruit growers, extension and research men in Washington and British Columbia for making their facilities available, and for their time spent in showing and explaining local fruit growing to the tour members.

PUBLICATIONS AVAILABLE

Write: 303 Dept. of Hort. MSU, E. Lansing, Michigan. 48823

1. "Starch Content in Cherry Stems Near Losi of Graft, Banding and Scoring"
2. "Graft Union Behavior in Certain Species of Malus and Prunus."
3. "Characteristics and Propagation of Rootstocks for Decilious Fruits in North Central Region, 1966-67."
4. "Apple Trees--Dwarfing and Propagation."
5. "Special Cherry Report 1968-1969"--Research Report 101.

14th ANNUAL CONFERENCE DFTA--MARCH 8-9, 1971.

Department of  
Horticulture

MICHIGAN  
STATE  
UNIVERSITY

# COMPACT FRUIT TREE

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

Spur Types

Induced Dwarfing

Cultural Practices

Vol. 3, No. 10, March, 1970, Edited by F. F. Carlson.

## NORTHWEST ORCHARD STUDY TOUR

Each summer since the origin of the DFTA a tour to an important fruit growing area has taken place. These tours have taken members to Canada, Europe and areas in the U.S.A. This year for the first time of this Association a tour is planned to the Northwest, Oregon, Washington and British Columbia fruit areas.

The charter plane will leave June 10, either from Metropolitan, Detroit, or O'Hare, Chicago. The majority have shown an interest to depart from O'Hare. If this is the case, connecting flights are being planned from other areas to meet with the charter in Chicago (time to be announced).

Arrival in Portland, Oregon will be Wednesday morning. Busses will depart immediately for Hood River where fruit tree research will be seen. Each bus will have a commentator, knowledgeable of the fruit industry to give details of interest along the route. Enroute to Yakima, one or more stops in the Roza, Columbia Basin area will be made. Each stop will provide a chance to see and discuss in some detail every aspect of fruit growing.

Comprehensive stops of this nature will be made in the Yakima, Wenatchee and Summerland areas. A detailed schedule with descriptions will be announced in the April newsletter. Tentatively, a program will be planned for the ladies who do not wish to see orchards, storages, nurseries and packing operations.

The dates are June 10-14, 1970. Reservations will be accepted until the charter plane is filled or until April 1, 1970.

## Tree Populations

These are only suggestions and will depend on management, soil, variety, rootstock, etc.

### Tree Populations

<u>Low Density</u>	
30x30	48 T/A
20x30	72 T/A

<u>Medium Density</u>	
20x20	108 T/A
12x20	181 T/A

<u>High Density</u>	
10x16	272 T/A
6x14	518 T/A

## ANOTHER SUCCESSFUL DWARF FRUIT TREE MEETING

The interest in compact fruit trees apparently is still very high as was shown by the large attendance at the 13th Annual Conference of the Dwarf Fruit Tree Association. Many fruit growers, extension and research men came from as far as Nova Scotia, Arkansas and other states in between to listen or to participate in the program. The weather was favorable, although not the best, which contributed to an interesting conference.

The theme of the conference "How to live with compact trees--expand or intensify?" certainly was developed throughout the conference. Without doubt, those who attended the conference returned home with many valuable hints and ideas which they can apply to their own operations.

During the Sunday afternoon and evening, a social gathering was held merely to welcome both in-state and out-of-state members to the conference. In addition, Glenn Antle, District Marketing Agent, Benton Harbor demonstrated various fruit and juice combinations used in making pies and soft drinks. This was an added feature to the conference and certainly was very well attended. Following this interesting taste panel, the group was entertained by color slide session showing various topics related to compact trees in different areas of the country.

### Formal Program of Excellent Quality

Monday morning Mr. W. S. Carpenter, District Horticultural Agent, Paw-Paw, Michigan, started the meeting by discussing some of his observations made of orchard in the Pacific Northwest. His pictures showing aerial views of extent of plantings in the Northwest were very impressive. He also covered some of the aspects of controlling growth by the use of Alar. He also commented on the severe tree injury from cold which occurred in December of 1968. Trees that had cropped heavily the same year, were the ones that suffered the most from this unusual low winter temperature.

Henry Robitaille, graduate research assistant, Horticulture Department, M.S.U., explained in some detail some of the growth regulating factors that play a roll in dwarfing of trees. He believes that very minute quantities of both gibberellic acid and abscisic acid probably are some of the growth factors playing an influencing roll in dwarfing as well in conditions leading to flowering and precocity of the scion variety.

Dr. Don Heinicke, Fruit Tree Research Station, Washington, elaborated on the importance of light and quality of light in the production of fruit. He emphasized the fact that shading often reduces fruit size as well as quality. Thus he feels that the growing of the trees, the annual management and light plays a tremendous roll in fruit production and in maintaining compact trees. Much of the fruiting area can be lost if the trees are allowed to produce a large canopy of growth and thus shading out nearly half of the center and lower parts of the tree.

On Tuesday, Don Heinicke discussed in some detail motives of training Red Delicious and spur-type apple trees. The spreading of branches in upright growing apple trees is important to allow ample light into the trees and to initiate more flowering and fruiting spurs. The spreading of young fruit trees was further demonstrated by Don Heinicke in the orchard during the Tuesday afternoon orchard tour. (Continued in next newsletter).

## OHIO FRUIT INDUSTRY TRENDS AND THEIR RELATIONSHIP TO RESEARCH

The fruit industry in Ohio is undergoing rapid changes and adjustments, quite similar to those in other states and countries. Many of the problems and situations confronting Ohio producers are very much like those needing attention in other areas. A change or shift in the kind and number of cultivars planted, in the type of rootstock used, or in tree spacings and planting distances may, and often does, require a change in research programs. The opposite is likewise true--the products of research are basic causes of changes and trends in the industry.

Three fruit tree surveys have been conducted in Ohio during recent years--in 1959, 1965, and 1968. Each survey contains statistics pertaining to cultivars, numbers, types and ages of apple, peach, and cherry trees, as well as number, size, and distribution of orchards in the state. The surveys of 1959 and 1968 also include similar statistics on grapes in Ohio. Each has been conducted jointly by the U.S. Department of Agriculture Statistical Reporting Service and the Ohio Department of Agriculture.

The surveys reveal a slight downward trend in acres, tree numbers, and numbers of orchards and vineyards from 1959 to 1968. There was a slight rise in these statistics in 1965 for apples and cherries. The most striking reduction occurred in peach tree numbers, where there has been about a 32% reduction since 1959. This can be largely accounted for by the severe low temperature injury to peach trees in the winter of 1962-63. Many injured trees were removed in 1963-64 but many more remained until later for removal. New peach plantings have not been at a sufficient rate to offset the trees lost directly and indirectly from the 1962-63 effects. Although statistics are not available, the 1969 peach tree plantings seem to be rather large in comparison with those of recent years.

Since much of agricultural research is designed to solve existing problems and to prevent the development of new or anticipated problems, the trend in tree numbers indicates probable areas for research emphasis. Two such areas which appear to be in need of more intensive research are:

1. Winter hardiness of peach cultivars and rootstocks.
2. Frost protection methods for orchards and small fruits.

In addition to size-controlling rootstocks, there is also a decided trend to increased plantings of spur-type trees of cultivars where these are available, such as Delicious and Golden Delicious. This trend presents several implications for needed research to assist Ohio fruit producers. Among those to be considered are:

1. Tree spacing and planting designs for maximum efficiency in production practices and maximum yields of high quality fruit.
2. Tree training systems and pruning procedures for given tree sizes which will maximize the yield of high quality fruit per tree, utilizing mechanization to as great a degree as possible for achieving greatest labor efficiency. Such research is needed for peaches and other stone fruits, as well as for apples.

3. Mechanized harvesting of all fruits for processing and mechanized assistance to hand picking of apples for fresh market selling.
4. Consumer harvesting techniques for tree fruits, especially in view of the use of smaller trees more closely planted than was formerly the case.
5. Utilization of lighter or smaller orchard equipment in closer spaced plantings, especially the high concentrate sprayers for disease and insect control.

Areas of fruit production in Ohio appear to be shifting only slightly. The Northeast district remains first in apple tree numbers and second in peach tree numbers. The North Central district remains first in peach tree numbers and second in apple tree numbers. Some significant comparisons are as follows:

1. Semi-dwarf apple tree numbers in the North Central district increased about three times from 1959 to 1968. During the same period in the Northeast district, they increased about six and a half times.
2. Standard apple tree numbers in the North Central district decreased approximately 19% from 1959 to 1968 and declined about 25% in the Northeast district during the same period.
3. Peach tree numbers in the North Central district declined about 40% from 1959 to 1968 and in the Northeast district about 27% during the same period.
4. Semi-dwarf apple tree numbers have increased markedly in all areas of the state since 1959, with an especially great increase in the Central district.
5. Peach tree numbers have increased since 1959 in these districts and counties: Northwest and West Central districts, Sandusky and Stark counties.

Any shift in fruit producing areas may have implications for needed research in specific phases of soil management and nutrition, as well as pest control practices, mechanization, and cultivar performance. The slight changes which have taken place in Ohio do not at present indicate an overwhelming need for specific research under different soil and climatic conditions than is already underway. The branches of the Ohio Agricultural Research and Development Center where fruit research is now in progress should provide very useful information for the immediate as well as the distant future.

The less hardy cultivars have declined most rapidly in tree numbers. Some newer cultivars, such as Washington, Richhaven, and Redskin, show a decline in tree numbers since 1965, probably because of undesirable tree or fruit characteristics. The only two cultivars showing an increase in tree numbers since 1965 are Sunhaven and Loring. There have been significant numbers of new peach cultivars planted during the past 5 years but their total tree numbers were still below the level for reporting individual cultivars in the 1968 survey.

This trend in peach cultivars indicates a continued need for evaluating all new cultivars under Ohio conditions before recommending them for commercial planting. A shift in commercial acreages of a given cultivar or group of cultivars implies a need for additional research in nutrition, fruit thinning, pruning, tree training, and harvesting techniques.

The never-ending changes taking place in the Ohio fruit industry are the products of research. At the same time, they indicate the need for increased research in new facets of production and marketing.

Eldon S. Banta, Extension Fruit Specialist, The Ohio State University

#### OBSERVATIONS OF A WASHINGTON NURSERYMAN AND GROWER

Tree Size: Under Washington growing conditions of irrigation and longer growing season than some other fruit areas, it appears that MM 106 rootstock will produce a larger tree than MM 111. This is especially true of young nursery trees. "The only real semidwarf rootstock is EM VII." It produces a smaller tree than MM 106 and MM 111, with most varieties, in the nursery and in the orchard. "In our state MM 111 and EM VII look good".

Tree Injury: In the winter of 1968-69 EM 26 was the only rootstock injured in the stoolbed. It appears to be nearly as tender to cold as EM IX.

Tree Pruning: Spur strains of some varieties form poor branch angles, while the regular varieties form better branches. Heading spur-trees 12 to 15 inches above the graft improves the tree in the form of more spreading branches. Regular varieties of Rome and Tidemans Red can be headed 5 to 6 feet. This high heading will bring the tree into fruiting sooner. Scoring above the leaf-bud will form a branch where it should be.

Tree Vigor: Tipping or cutting upright growing terminals will not prevent rank growth. It will stimulate more vigorous growth. To reduce branch vigor, it is best to "stub," that is leave a foot or so of the branch, rather than to cut it clean near the leader. The "stub" will use some of the trees' energy and not divert it to another branch. Trees low in vigor should be pruned without leaving "stubs".

Tree Planter: Using our hedgerow tree planter, 3 to 4 men can plant 600 trees per hour. This machine will make a trench 14" wide and 16" deep. Two men place the trees in the trench and these trees are covered by 2 opposing moleboard plows. The machine is tractor pulled....Carl Perleberg, Columbia Basin Nursery, Quincy, Washington.

Ed. Note - Branch "stubbing" experiments of several varieties were carried out 14 years ago by the late Jerry Mandigo and MSU pomologist. These tests confirm Mr. Perleberg's experiences in that the "stubs" reduced growth, especially with Red Delicious, McIntosh, and Northern Spy. It was found that non-fruiting "stubs" should be removed 3 to 4 years later since they were often over-shadowed at that time.

## ARGENTINA'S APPLE INDUSTRY IN THE RIO NEGRO VALLEY

The Rio Negro Valley of Argentina is located southwest of Buenos Aires about 800 miles, and on about the 39th parallel south. At the western end of the Valley the Rio Neuguen and Rio Limay join to form the Rio Negro which flows almost due east to the Atlantic Ocean. A diversion dam on the Rio Neuguen provides irrigation water for this desert area. The Valley is about 88 miles long and 3 1/2 to 8 miles wide, and is actually an old river bottom and flood plain. It consists of about 180,000 acres of land under irrigation. About 55,000 acres are devoted to apples, 12,000 to pears and 40,000 to wine grapes. Vegetables and other fruits are also grown.

Fruit production in the Valley actually began with the construction of the dam across the Rio Neuguen in 1921, but the industry was not commercially oriented until 1923. Exportation of apples and pears gained significance in the 1930's. In 1945, the first regional cold storage plant began operation. A few years ago, the largest capacity packing facility in the world was constructed at Cipolletti, the packing center of the Rio Negro Valley. Pears were initially the major crop of the Valley, but since the early 1940's, apples have become more important.

Almost all the apples and pears are produced for the fresh market. Production in 1968 was 337,000 tons of apples and 75,000 tons of pears, or about 72% and 67%, respectively, of the production in Argentina. Mendoza, the second most important region, produced about 18% and 25%, respectively. By 1973, total production of apples and pears is expected to be about 500,000 tons. This represents a growth of 14,000 tons annually for the next 5 years.

Average yield per acre is about 425 boxes for apples, and 330 boxes for pears, but a good crop is about 800 and 650 boxes, respectively. Fruit is usually packed in wooden boxes.

In 1968, about 50% of the apples and pears were exported. Europe received about 57% of the apples and 65% of the pears, which went mainly to Germany, Holland, and Sweden. However, Brazil is the largest importing country, and some fruit, mainly pears, is shipped to the United States.

The main apple varieties are Delicious, Granny Smith, and Rome Beauty, but there are plantings of Golden Delicious, Winesap, Yellow Newtown Pippin, Jonathan, and King David. Pears are mainly Williams (Bartlett), and Packham's Triumph, although Winter Bartlett, and Anjou are also grown.

Bloom begins about mid-September and continues for 10 days to 2 weeks. Harvest commences about mid-February with Delicious, and continues until early April when the last of the Granny Smith are picked. The industry is geared largely to "pick, pack and ship", but an increasingly larger percentage of the crop is being packed out of storage. Such fruit would be mostly for domestic sales and for shipment to Brazil.

Apple trees are grown mainly on seedling and Northern Spy rootstocks, although use of the size-controlling rootstocks is increasing. Future plantings will be Delicious on seedlings and Granny Smith on EM IV. Both spur and red color types of delicious will be used. Plantings on EM IX are increasing in popularity. During the next 3 years, a local nurseryman will have for sale a total of about 700,000 trees on EM IX. In the next 5 years, about 10% of the industry will be using some form of a wire trellis, irrespective of rootstock.

Trees are usually planted 21 by 21 feet in about 2-acre blocks. Because of the possible occurrence of high winds in the Valley at almost any time of the year and then up to 75 miles per hour for several days, each block of trees is enclosed with a double row of tall Poplar trees. In addition, fruit tree limbs are tied to poles, or props, to reduce further the possibility of wind damage to the fruit. This need for propping controls to a large extent commercial tree form.

Trees are started as are openvase and trained with the main scaffolds radiating out as spokes in a wagon wheel. A series of vertical fins are formed around the tree by stocking lateral growth. These fins are kept fairly narrow by tip pruning and may number from 6 to 8 per tree. All the limbs making up a fin are then tied to a pole which serves as a prop. This method of tree training can be considered as a form of trellising, and thus can be termed "fin-trellising".

The recent interest in the Valley in going to a wire-trellis is largely because of its lower cost for propping, both materials and labor. However, the true merits of a trellis and a trellis-hedgerow are rapidly being recognized. It is interesting to note that the present method of tree training followed in the Valley needs only a slight modification for its effective use with mechanical picking platforms. In this regard, they are in a more favorable position as an industry than we are in the States.

Much more can be said about the fruit industry in the Rio Negro Valley, and in the other parts of Argentine as well, but neither time or space will permit. Although the Valley is young, it can truly be classed as one of the important apple and pear areas in the world. We owe it to ourselves, to learn more about our brother to the far south. His industry does have something to tell us.

Loren D. Tukey, Department of Horticulture, The Pennsylvania State University.

#### Northwest Fruit Tree Study Tour - June 1970

In brief what you will see:

- June 10 - Fruit tree research. Hood River, Oregon
- June 11 - Fruit industry of Yakima district
- June 12 - Fruit tree research and industry in Wenatchee district.
- June 13 - Fruit research and fruit industry Summerland, B.C.
- June 14 - Return home.

INVITATION FROM TREE FRUIT RESEARCH CENTER  
WENATCHEE, WASHINGTON

TO OUR FRIENDS OF THE DWARF FRUIT TREE ASSOCIATION

We cordially invite you to visit us during your northwest tour in June. The Tree Fruit Research Center was established by Washington State University in 1937 to aid the fruit industries in solving their many problems in fruit production, handling and marketing. The Center has approximately 150 acres of research orchards and over 100,000 square feet of laboratory, greenhouse and office space. Cooperative research problems are conducted by a professional staff of 30 which includes various U. S. Department of Agriculture Divisions, the U. S. Weather Bureau, the U. S. Food and Drug Administration as well as Washington State University.

Some of the current research programs include management of high density plantings, training and pruning, rootstocks and varieties, chemical and biological control of insects, effect of pesticides in the environment, identification and control of diseases, winter hardiness and cold injury, freeze protection, chemical weed control, orchard soil management and nutrition, chemical control of flowering, growth, fruit shape, fruit maturity and fruit abscission, climate and fruit quality, picking aids and mechanical harvesting, harvest maturity and storage and shipping.

These research activities are designed to assist Washington's fruit growers in solving today's problems and in meeting tomorrow's challenges. We think your visit here will be educational and enjoyable.

Sincerely,

*Paul Larson*

Superintendent

R. Del.	DWARF FRUIT TREE ASSOCIATION	Cherries
G. Del.	WESTERN TOUR	Rootstocks
Spur Mac.	OFFICIAL REGISTRATION BLANK	Research
Primegold		Densities

Please complete and return to:

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ZIP \_\_\_\_\_  
TELEPHONE: \_\_\_\_\_

DEPOSIT: \$75.00 by April 1, 1970  
(Please make checks payable to Dwarf Fruit Tree Assoc.)

YOUR COMMENTS:

Department of  
Horticulture

MICHIGAN  
STATE  
UNIVERSITY

# COMPACT FRUIT TREE

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

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Vol. 3, No. 11, May, 1970, Edited by R. F. Carlson

## ORCHARD STUDY TOUR

The study tour June 10-14, 1970 to Washington and British Columbia is now filled. The charter plane carrying 96 fruit growers and pomologist will leave Chicago Wednesday June 10 at 9:00 a.m.

Persons driving to O'Hare air port should contact Mr. John Bell Jr., Barrington, Illinois for free parking at his place. Bus transportation from Bell's to O'Hare and from O'Hare to Bell's will be available at \$1.00 per person.

The charter plane will arrive Yakima, Washington 11:30 a.m. where buses will be boarded for transportation to the various orchards in that part of Washington. Mr. Jim Ballard and associates will provide audio description on the buses and at the stops.

Thursday afternoon the group will head North to the Wenatchee fruit area where Dr. Paul Larsen and his associates will provide tour leadership and detailed information. The Fruit Tree Research Station will be one of the high light visits. A dinner (outside barbeque) is being planned for Thursday evening at the Research Station. Some of the local growers will join here.

Friday afternoon the buses will take the tour members further north to Summerland B.C. Here Dr. Donald Fisher and his associates will explain research in progress at the Summerland Horticultural Experiment Station. Several growers orchards will also be seen in the area on Saturday.

Sunday a.m., the group will return via Grand Coulee Dam to Spokane where the charter plane will depart at 3:00 p.m. Arrival at O'Hare is 8:05 p.m.

## THE ANNUAL CONFERENCE DFTA

The Fourteenth annual conference is tentatively scheduled for March 8 and 9, 1971. Program suggestions will be appreciated from members of the association.

## FUTURE DFTA CONFERENCES

1972 March 13-14  
1973 March 12-13  
1974 March 11-12  
1975 March 10-11

## ABSTRACTS AND PAPERS FROM 13<sup>th</sup> ANNUAL CONFERENCE

### Stone Fruit; Rootstocks

Dr. Gerald Weaver, Vineland, Ontario, discussed and described some of the rootstocks developed in that area to control tree size of peaches. He named two peach rootstocks; the Siberian and the Harrow Blood. The Siberian will produce a peach tree 1/2 the size of a standard tree and the Harrow Blood is somewhat more vigorous. This means that more trees can be planted per acre and thus acreage yields are increased.

### Grower's Experiences

A panel of fruit growers discussed some of their views and operations concerning the use of compact trees. Albert Ten Eyck, Broadhead, Wisconsin, told about his experiences in growing small trees both for pick-your-own and for easy of handling under small acreage conditions. It is not so much the number of acres that count, but more the proper handling and net returns from each acre. In other words, he stressed that there is still a place for small fruit growers who know how to manage the help, and know how to take care of smaller trees when planted up to 500 units per acre. EM IX and 26 rootstocks have been cropping well under his management.

George Adrian, Indianapolis, Indiana, described his pruning techniques in holding trees to an adequate height without sacrificing yields. In his pruning operations he trained his help to make certain cuts which would uniformly control the growth. He did not allow anyone to make a cut on second years growth, but only on on-year-old growth. In so doing, he can control tree size without reducing yield.

George Whaley, Ruthven, Ontario filled in for Tom Chudleigh, a fruit grower from Ontario who could not come due to illness. George mentioned that EM IX, if properly managed, will control growth and keep trees small for easy handling and picking. In his own operations Mr. Whaley has under commercial test several varieties on several rootstocks. To-date he thinks that McIntosh/MM106 on the better soils will give a quite large tree. His experience with East Malling VII rootstock has been satisfactory also.

### Fruit Growing In Argentina

Dr. Loren Tukey, Pennsylvania State University, described, in some detail, the management of orchards in the Rio Nigro valley of Argentina. He said that the fruit is not stored, but goes directly from the orchards to the shipping terminal where it is then shipped to other countries of Europe. Growers in Argentina may not be operating like those in other countries, but they, in their own way, use techniques which may be used elsewhere someday.

A panel of members from Michigan, New York, North Carolina, Ohio and Pennsylvania, discussed briefly planting trends in these major fruit growing areas. It was obvious from this panel discussion that most areas are rapidly shifting from standard trees to smaller trees and in so doing are planting more trees per care.

### English Researcher Tells of Fruit Growing In New Zealand, Australia and England

In 1962, Professor Tony Preston from East Malling Research Station, appeared on the Annual Program of the Dwarf Fruit Tree Association. At that time, he created a tremendous amount of interest in smaller than standard trees. At

this 13th annual conference he told of his travel experiences in Australia and New Zealand. Among other items, he mentioned that the S.W. part of southwestern Australia has a tremendous potential for fruit growing.

On Tuesday, Professor Tony Preston described some of the recent advances in controlling tree size in England. He told of several of the research experiments involving pruning to develop scaffold branches by selective bud pruning. Such trees remain fruiting rather than vegetative. He also mentioned that in planting trees, it is best not to crowd roots, but rather partly prune them.

Frank Owen, Hartford, Michigan, discussed the use of the hedging and topping machine for eliminating some of the over-growth of larger trees. He thinks that this machine has a place where major branches need to be reduced back or lowered to improve both management and harvesting conditions of the trees.

#### Presentation of Dwarf Fruit Tree Award

Dr. John Carew, Department of Horticulture, Michigan State University, presented the Dwarf Fruit Tree Association Award to past presidents of the association and also one award to Tony Preston. These awards signify excellent leadership and contribution to the association and to the development of high density plantings.

#### COMPACT TREES, LOW ACREAGE AND MANAGEMENT = PROFITS

I am a lazy individual with a few expensive tastes, and apple growing is the only thing I know which will allow me a satisfactory income together with a considerable amount of free time.

Most of you will feel this statement is fictitious, and will not understand when I say that you are wrong. The fact is that my dislike for steady work and my strong affinity for profit gives me a tremendous advantage over the apple grower who approaches his business with the object of achieving, first, the highest possible production and other factors secondary. I do not understand the grower with 125 acres of apples who says: "I'm not making any money. I need another 100 acres." Nor do I understand the grower who stretched the interval between sprays in bad weather in order to save \$5.00 per acre on a crop with a potential value of \$200.00 per acre.

Our chief worry is the fear that our production from 50 acres may grow to such a point that the gross and net per bushel will fall and we won't have any fun - just work.

Our primary goal is the production of apples which will sell in any season. Our next objective is to produce no more than our market will absorb. It is our intention to have only compact trees in our orchard within a few years. At that time, we expect to reduce our acreage by nearly 40% with little or no decrease in production.

Not being overwhelmed by excess production, we do not feel compelled to pick and sell immature apples, especially since our gross is not increased

by such sales and since our repeat business depends on high color, high quality and superior flavor. Approximately 95% of our retail sales consist of Fancy and Extra Fancy apples. Off-grade fruit is sold to truckers or thrown away. We make no cider and sell nothing except apples. We usually advertise with four newspapers and three radio stations.

We have spent 25 years building up a retail business at the farm. Most of our customers come back year after year from a distance of 10 to 50 miles or more. We begin selling our 35 varieties (half a dozen account for most of our crop) in early August and are usually finished by Nov. 1st. Most of our sales take place during the last six weeks of our season, and 2000 bushels per week is not unusual. We do some wholesale business. A factor we feel is most important in measuring our success is the average gross price (selling price) per bushel for all apples picked. During the last eight or ten years our best figure has been \$4.69.

We have had few labor problems since 1967, and do not expect much trouble in the future. We now hire only good conscientious people, give them all the apples they can use and pay them well. As we get more compact trees in production, we expect to see our best pickers earning \$50.00 to \$60.00 per day.

Next to profit, the single thing we most enjoy about growing apples is the setting out, and bringing into production, of a new block of trees.

Dwarf or compact trees offer the opportunity to do this many more times in a lifetime than would be possible with standard trees.

We set out our first compact trees, Clark Dwarfs, in 1954 and 1955. We still have most of these trees, but they have been somewhat disappointing, partly because of haphazard pruning. These trees are hard to thin, suffer in dry weather and are less winter hardy than standard trees of the same variety.

In 1962, we set out a small block of trees on EM IX, the varieties being Ida Red, McIntosh, Red Delicious and Gol. Del. A post was set with each tree, and the trees were spaced 5 x 20'. Again, our pruning hasn't been perfect and we consider these trees to be lacking somewhat in vigor in our climate, but the Ida Red has produced at the rate of 800 bushels per acre consistently and the Macs have also done very well. The Del. have not done so well, but they are not dependable at our location on any rootstock. Goldens have produced better than the Reds, but are plagued with much russeting, even when Goldens on standard trees are clean. We intent to change our spray program on compact Goldens in an effort to eliminate russeting.

In 1960, we set out a block of Jonathan on EM II and EM VII, Ida Red on EM II and Starkrimson, root unknown though it is one of the Malling series. Apacing is 16 x 28' which we now know is much too far apart. These trees are in rocky soil, but did well the first year, and poorly the second due to dry weather. We believe that failing to irrigate these trees cost us two or three years growth and production and made the pruning job much more difficult. However, these trees are producing well, except for the Red Del. in some seasons. Again, our pruning has left something to be desired and we know that this block of trees could look better and probably could produce more, but we are not too unhappy with them.

After a goodly amount of research and study, we finally reached a decision regarding the orchard we desire for the future and in 1968 we set out a block of trees, in good soil, on EM 26, spaced 7 x 15' (140 trees to the acre) with a post at each tree. The varieties are McIntosh, Spartan and Red and Golden Del. These trees have done very well in their two seasons of growth. In 1969 many of the Mac trees grew 4', and the Spartan generally did nearly as well. The Delicious and Golden Del. growth has been somewhat less, but quite adequate. Some of the Delicious and Golden Del. are spur types and after the first season we feared that we had made a mistake with these trees on EM 26. However, we now feel that the combination of a spur on EM 26 may make as perfect a tree as is possible with the stock now available. We will set another block of trees on EM 26 in the spring of 1971 at the same spacing. All trees on Em 26 will be irrigated with overhead sprinklers.

We feel that a compact tree orchard should be set out in good soil only and irrigation must be available. Proper pruning is absolutely necessary and no pruning should be done with a mechanical hedger at any age. We feel that mechanical hedging is a stop-gap measure, a temporarily popular practice which will soon be abandoned. Although one cannot change the fundamental growth characteristics of a tree. Mechanical pruning assumes this end. Eventually, chemical growth regulators may be the answer to the pruning problem. Until that day comes, the grower with a high regard for his trees and for high quality apples will prune by the old methods.

The small tree hedge-row orchard should be set with the assumption that the fruit will be picked by hand. The grower planning on mechanical picking should set a larger tree, which will be severely pruned so that fruit will not strike branches and spurs as it falls. If mechanical picking is ever employed in a medge row orchard, the machine will have to be far more sophisticated than anything now in sight. Shaking won't do.

We all know that we face the possiblility of very bad apple markets for the next few years due to great over-production. I'd like to suggest that we look to the future and pull out the old marginal orchards now. TEN EYCK FRUIT FARM, R. F. D. 2, BRODHEAD, WISCONSIN 53520

#### TRENDS IN PLANTING PATTERNS AND HANDLING OF COMPACT TREES

If the 1969 production estimates compiled by NAI are proven correct, North Carolina is now seventh in total apple production in the nation with 6,719,695 bushels produced (Table 1).

Table 1.

N. C. APPLE PRODUCTION (BU.)  
\*(County Agent's estimate)

1962	3,365,440
1963	3,193,351
1964	2,959,470
1965	5,694,733
1966	3,437,753
1967	4,408,932
1968	5,176,944
1969*	6,719,695

North Carolina currently devotes 17,009 acres to apple production with a total of 957,430 trees, 566,689 or 59% of these are of bearing age. Of the apples produced in 1969: 31% were Red Delicious, 25% Rome, 19% Golden Delicious, 13% Stayman and all others accounted for 12% (Table 2 and 3).

Table 2.

		<u>N. C. APPLE TREE SURVEY</u>	
		<u>1964</u>	<u>1968</u>
Total Acres		15,806	17,009
Total Trees		817,185	957,430
Bearing		455,053 (56%)	566,689 (59%)
Non-bearing		362,132 (44%)	390,741 (41%)

Table 3.

1969 N. C. Apple Production  
6,719,695 bu.

Red Delicious	31%
Rome	25%
Golden Delicious	19%
Stayman	13%
Others	12%

Four varieties account for 94% of all trees in North Carolina today. The national trend toward a two variety apple industry is clearly evident in North Carolina. Red and Golden Delicious account for 72% of the States tree population (51% Red and 21% Golden Delicious) (Table 4). Of those trees planted in the past 5 years the trend is even more striking. 80% of all trees under 5 years of age are of the Delicious varieties (56% Red and 30% Golden Delicious) and the planting estimated for '69-'70 show no reversal of this trend (Table 5). Thus, the pattern of production 10-15 years from now is being sent.

Table 4.

<u>VARIETIES AS % OF TOTAL TREES REPORTED</u>		
	<u>1964</u>	<u>1968</u>
4 leading var.	90%	94%
All del. var.	64%	72%
Golden Del.	16%	21%
Red Del.	48%	51%
Spur & size controlled stocks	21%	29%
Standard stock	27%	22%

Table 5.

<u>N. C. APPLE TREE SURVEY VARIETY AS % OF TOTAL TREES - "UNDER 5 YEARS OF AGE"</u>			
	<u>1964</u>	<u>1968</u>	<u>Est. 1969</u>
All delicious var.	81%	86%	86%
Golden Delicious	20%	30%	33%
Red Delicious	61%	56%	55%
Standard size trees	22%	12%	10%
Size controlled trees	40%	44%	45%

Many of these young orchards very likely will be mechanically harvested. Data just released in the 1969 apple tree survey showed that 42% of all trees in North Carolina are "size controlled" (either spur or on clonal stocks) (Table 6). Of non-bearing trees 51% are size controlled. The major portion of "size controlled" trees in North Carolina are spur type varieties on seedling stocks. Because the amount was so small, the 1969 survey pools clonal stocks with spur varieties in the "size controlled" group. The amount of clonal stock trees has increased since 1964, however the total is probably still under 5%. The most popular clonal stock is MM 106 which is being

used in combination with "non-spur" strains of Red Delicious. Some of the other MM stocks are also being tried on a small scale. Because of the presence of woolly aphids in North Carolina essentially no EM stocks are being considered.

Table 6.

N. C. APPLE TREE SURVEY

<u>1968</u>	<u>Size Controlled</u>	<u>Standard</u>
Total Trees	42%	58%
Non-bearing trees	51%	49%

Of the 51% of North Carolina's trees which are Red Delicious, 29% are size controlled while 22% are standard trees (Table 4). However, of the trees under 5 years of age, 56% are Red Delicious (44% size controlled and 12% standard trees) (Table 5). This trend to size controlled plantings of Red Delicious is accompanied by a similar trend for Golden Delicious. A trend toward compact orchard plantings is also evident in North Carolina. One of the oldest apple producing counties in North Carolina, Henderson Co., has an average of only 44 trees per acre. On the other hand, a relative newcomer to apple production, Lincoln Co., which has planted 95% of its trees in the last 10 years, averages 86 trees per acre. This is the best estimate available of the recent planting trend and is reasonably typical of the state wide trend over the last 10 years.

To date there are no hedgerow or trellised plantings in North Carolina. The entire state's commercial production is on conventional or mold and hold pruned trees trained mostly to a central or modified central leader. North Carolina has high density plantings as close as 4 1/2' in the row and some large orchards planted 6 1/4' x 24'. These plantings are all spur type strains on seedling roots. The original thinking was to remove every other tree as they begin to crowd, however by fanning the filler tree it has not yet been necessary to remove any trees in these plantings. There are many blocks of trees planted 10'-14' x 20'-24' which are not experiencing any management difficulties.

The philosophy of handling compact plantings has been based on only one goal; early and continuous fruiting. In North Carolina the ability to achieve this goal has largely dictated the degree of success or failure with high density plantings. Scoring and growth regulator sprays, to encourage early fruiting and good return bloom, have been successfully used by some growers to aid in achieving this goal.

Compact plantings require an adequate but controlled nutritional program along with continued fruiting to prevent excessive vegetative growth. Where problems have occurred they have resulted from: (1) heavy fertilization in anticipation of a crop which was lost resulting in excessive and uncontrolled vegetative growth or (2) from the failure of trees (for reasons of over cropping young trees, drought, etc.) to initiate good return bloom. Many young orchards had particularly light bloom in 1969, possibly as a result of the extremely dry conditions which occurred in late summer and fall of 1968.

For greatest success and orchard longevity of compact plantings in North Carolina, every effort must be made to insure continuous crop loads. This necessitates the use of whatever practices are necessary to: prevent frost damage, insure good pollination, provide proper thinning and, if necessary apply growth regulators to insure return bloom. The use of split applications of fertilizers or supplemental foliar feeding is also necessary to prevent over fertilization until a good crop load is insured.. In addition the use of irrigation may be necessary, as a result of the higher water plantings, when natural rainfall is limited. . . .C. R. Unrath, North Carolina State University.

ORCHARD STUDY TOUR - June 10-14, 1970

Wednesday June 10 Yakima,

9:00 a.m. Depart from O'Hare (Breakfast in flight).

11:30 a.m. Arrive Yakima

12:00 noon Lunch stop (to be arranged)

Wednesday Afternoon Stops:

Tour upper valley with "stops" (bus unloads) at Lookout Point, Jim Matson, Marley Warehouse, and George Moore's central leader MM 106 & EM VII block.

6:00 p.m. Arrive Shinook Motel

Casual social hour and smorgasbord dinner with Yakima fruit growers at motel.

Thursday, June 11

7:30 a.m. Board bus with luggage for tour of lower Yakima valley. Tentative bus stops include:

- 1) John White's 30 acres of Goldens in 9<sup>th</sup> leaf on MM 106. 10 x 20 central leader.
- 2) Hanson Fruits large EM VII (open center tree training!) Planting includes two nearly mature trees of Granny Smith. These two extreme contrasts of orchard management have interesting records of production. (John White is ahead).
- 3) The Rod Daniels EM VII central leader 10 x 20 oldest (12<sup>th</sup> leaf) Malling stocked orchard in the valley.
- 4) Hoekman-Salverda 110-acre planting of Prime Gold on seedling. Contrast of overtree sprinkling, dragline, & central leader training.

12:30 p.m. Lunch (Box lunch to be arranged)

Thursday Afternoon tentative stops:

- 1) Tom Sewell's full dwarf trellised planting of EM IX and EM 26 Golden, Spartan and Red Delicious. Overtree sprinkling.
- 2) Hansen's Valley Roz square mile of new mass media management. 18 overtree wind machines in 10 x 20 EM VII & MM 106 Reds and Goldens 8 & 9 years old. Never had a sprayer in the orchard yet!
- 3) Everett Brandt's high density apple and pear trees.

On to Columbia Basin via scenic Ellensburg Canyon, new freeway to Vantage. Rest stop at Ginkgo State Park.

3:00 p.m. Dale Gibson's high density orchard near Quincy

6:00 p.m. Arrive Cascadian Motor Inn, Wenatchee

7:00 p.m. Barbeque dinner at Fruit Tree Research Station (to be arranged).

8:30 p.m. Informal discussion period

Friday, June 12

7:30 a.m. Fruit Tree Research Station

10:00 a.m. Proceed to Orchards: Brays Landing fruit area, & Lake Chelan.

12:30 p.m. Lunch (to be arranged)

Friday Afternoon

2:30 p.m. Orchard stops at Okanogan and Tonesket

4:00 p.m. Proceed to Penticton

6:00 p.m. Arrive Penticton Motel

Saturday June 13 & Saturday Afternoon

7:30 a.m. Summerland Research Station 12:00 noon Lunch Aft: Orchard tours.

Sunday: Return to Spokane and Chicago.

# COMPACT FRUIT TREE

Department of  
Horticulture

MICHIGAN  
STATE  
UNIVERSITY

DWARF FRUIT TREE ASSOCIATION

Rootstock Behavior

Spur Types

Induced Dwarfing

Cultural Practices

Vol. 3, No. 13, October, 1970, Edited by R. F. Carlson

## EAST MALLING 26 --- PROGRESS AND PERFORMANCE

East Malling 26 is a new rootstock as far as commercial production in North America is concerned. Very little yield data are available on the performance in relation to other rootstocks. The size control capabilities of this rootstock is well known. However, the compatibility with various commercial varieties and strains of varieties have not been completely studied and tested.

Progress made - A great number of trees have been propagated and planted in both experimental and in commercial orchards using EM 26. Most of these trees are rather young and not many are in production at this time. It will take several years yet before actual production records will be available at research stations and in commercial trials.

Performance - To date no serious faults have shown up with this rootstock and it is anticipated that it will be a rootstock which will fill an important place in controlling tree size in commercial orchards. This rootstock is an improvement over East Malling IX in that it has somewhat better anchorage, it is slightly more vigorous, and it is precocious. EM 26 has an advantage in being more compatible with the 'Red Delicious' variety and spur types of this than EM IX. However, not all of the 'Red Delicious' strains and spur types have been tested in experimental or commercial plantings. It is suspected that there will be a difference in response from the different combinations of the 'Red Delicious' gamut.

Improvement - EM 26 is better than EM IX with 'Red Delicious', mainly because it grows better and does not show the severe measles condition often found with 'Red Delicious' on EM IX. Due to its added vigor, EM 26 will be an improvement over EM IX especially for some varieties which do not perform as well on other rootstocks. Both EM IX and EM 26 will be useful in certain scion/rootstock combinations and in different tree spacing systems.

Characteristics - EM IX is not completely strong as far as root system is concerned, because it has brittle wood structure. EM 26 has similar characteristics of being brittle in wood structure and can break more easily than some of the more vigorous rootstocks. Consequently, some trees on EM 26 will need support in the form of staking or trellising. In other words, many of the trees of certain varieties on EM 26 will be free standing and will perhaps not need any support during the life-time of the tree. However, under certain conditions, some trees will lean or even topple over, depending on the

variety, the orchard site and on the soil type. The rootstock portion of EM 26 trees overgrow the scion similar to that of EM IX.

Combinations - As previously mentioned, all varieties have not been tested on this rootstock. Under certain conditions, 'Golden Delicious'/EM 26 for example, will make very small trees with this rootstock but this could be an advantage especially in high density plantings. In our test plantings, 'Red Delicious', 'McIntosh' and 'Jonathan' are doing well. However, as with other rootstocks there are certain varietal responses that show up in the rootstock and visa versa.

Site, Soil - The orchard site and the soil, being variable, will influence rootstock performance. To date no detrimental effects from soil responses have been observed with EM 26. A heavy soil will cause more trees to lean. Recommendations are, of course, to plant only on well drained soils.

Important place - Em 26 will fill an important vacuum in the apple rootstock series, especially in high density plantings. Most trees of most varieties on this rootstock can be spaced very close together. An average of 450 trees per acre could be established without any serious crowding of trees at maturity with such varieties as 'Red Delicious', 'Golden Delicious' and 'Jonathan'. This would mean a tree spacing in the vicinity of 6 x 16, or 8 x 12 feet depending on many factors -- management being prime.

Suggestion - Since all possibilities are not known about this rootstock it is suggested that plantings be limited and that other rootstocks such as MM 106 or EM VII also be used. Tree size is manipulated by rootstock from small to large trees as follows: EM IX, EM 26, EM VII, MM 106 and MM 111. The first two require a good uniform moisture retaining soil and the latter four are adaptable to a wider variation of soil types. None will stand a poorly drained soil. As the vigor of the variety and the rootstock increases, the spacing between trees should increase.

Selective - In selecting scion/root combinations, chose the combination that will suit the particular situation of the anticipated management and production scheme. All trees should be budded on the stock 12 to 16 inches above ground. This will provide better anchorage of trees in the orchard. Know the vigor potential of the variety and the rootstock that you select for your particular spacing system. High density plantings require more rootstock size control than do low density orchards..... R. F. Carlson, Hort. Dept. MSU.

#### VISITORS FROM JAPAN

Eleven men representing Japan's Fruit Growers Cooperative Association visited East Lansing, Friday, September 25, 1970. They spent most of the day with Dr. R. F. Carlson, who discussed rootstocks and varieties and with Dr. Donald Dewey relative to fruit storage conditions. They also were given the opportunity to visit the MSH Horticultural Research Center where they saw different studies in dwarfing. Dr. S. Honma was the interpreter. The group enjoyed the day of concentrated study at MSU. The following data is interesting. How does it compare to yours?

WORK LOAD CATEGORIES ---- APPLE PRODUCTION IN JAPAN

Labor Requirements per Acre

<u>Work Categories</u>	<u>Man Hours/Acre</u>	<u>Percent</u>
Pruning and training the trees	144.0	7.7
Application of fertilizer and tilling	17.6	1.0
Mowing in and around the orchard	20.0	1.1
Controlling orchard pests and weeds	420.0	22.7
Pollination (artificial)	94.4	5.1
Fruit thinning	275.6	14.9
Bagging fruit on the trees	181.2	9.8
Removing the bags	11.0	6.0
Managing fruit coloring (sun exposure and Chemical)	254.0	13.7
Supporting tree branches (propping)	41.2	2.2
Disposing of fruit drops	4.8	0.3
Harvesting the Crop	288.0	15.5
Total -- (231 8-hr days/A)	1851.6	100.0

SOME OBSERVATIONS OF THE NORTHWEST FRUIT INDUSTRY

The Northwest fruit industry, as observed during the Dwarf Fruit Tree Study Tour, June 10-14, 1970 has the advantage of being concentrated in localized areas where everyone is concerned with mutual problems. Problems in the Northwest are similar to the ones confronting growers in the Midwest. In general, all fruit areas are converting to more production units per acre in order to utilize, to the fullest extent, high priced land, labor, water, soil type and equipment.

Comparisons - Some immediate comparisons between orchards of the Northwest and the Midwest are quite striking. Leaf surface on trees growing in the Northwest is much greater with some leaf diameter being 4" or more. Light quality is better under Northwest conditions. Growers in the Northwest are more concerned with proper utilization of light. Tree branch propping has been abandoned in both areas. The Northwest grower has either converted large acreages to the new spur types or the use of pruning techniques to stiffen limbs of regular strains in order to enhance fruit bud formation and to prevent limb rub and sun burn. Pinching-off of the upright water sprouts is used to increase fruit bud formation at the base of the sprout.

Rootstocks - East Malling VII, EM 26, EM IX, MM 106 and MM 111 are used for dwarfing stocks. However, approximately half of the red strains that are planted in this area are spur types. 'Top Red' is the cultivar used for most of the non-spur plantings of 'Red Delicious'. Some growers have been inclined to plant trees using EM 26 rootstock for high density plantings, and appear to be quite happy with the tree performance. One grower complained about winter damage to the scion growing on EM 26. Another grower expressed concern that 'Golden Delicious'/EM 26 has a tendency to set too many fruit. Some of these growers recommended EM 26 for hedge plantings. Yield data of variety/EM 26 yet not available.

Cold tree injury - The January 1968 freeze eliminated more than 400,000 trees over 20 years old in Wenatchee and the Chelan districts. This was evident to tour members by the amount of tree removal; and the poor performance of the remaining weak trees which will produce a crop of poor quality fruit this year. These trees will be replaced by young plantings to increase the present tree population of 1.5 million trees under 12 years of age. New orchards are being planted as fast as possible in order to replace this tree loss. It was observed that the red spur types survived the 1968 freeze better than the regular 'Red Delicious'. Also, the 1968 freeze caused no more injury to clonal rootstocks than to those on seedling rootstocks.

Reported Yields - Some phenomenal yields were reported from the high density plantings. Recorded cumulative yields of different cultivars growing on EM IX over a 10-year period were as follows:

Lodi	2663	boxes/acre**	
Jonathan	4999	"	"
Red Delicious	7232	"	"
Golden Delicious	5522	"	"
Rome Beauty	9669	"	"
Winesap	6391	"	"

\*\*Based on a 33 lb. lug.

Other impressive yields per acre included 2500 boxes from 12-year-old 'Golden Delicious'/EM VII and 1950 boxes from 'Red Delicious'/EM VII. When these trees are allowed to produce more than 2500 boxes/acre, biennial bearing occurs. One pound of Alar/100 gallons of water was used on 'Red Delicious' and two pounds of Alar per 100 gallons of water was used on 'Golden Delicious' 10-14 days after full bloom to retard growth. This has helped the trees to stay within the 2500 box/acre annual production. Heavy thinning will provide this level of production and will also produce better fruit condition for storage.

Other impressions are listed as follows:

1. Chelan Growers packing house: A special grader was designed for 'Golden Delicious'. This might be adaptable for 'McIntosh' or any type of fruit that is susceptible to bruising.
2. Spraying one-mile square of apples with a fixed wing aircraft in 4.5 hours. Also, total spraying for the season included 3 cover and 1 dormant sprays.
3. Pruning: Growers using detailed pruning system followed the central leader type tree training. Lateral branches on spur types were braced, thus forcing fruit buds along the basal region of the limb with additional pinching-off of upright water sprouts during the early summer to promote bud formation.
4. Some growers have observed that parathion will russet 'Golden Delicious' within 15 days after petal fall. Water will also cause russet under some drying conditions.

5. Tree uniformity of the EM IX, VII, MM 106 and MM 111 rootstocks was consistent. Planting distances for spur types on dwarfing rootstocks varied with soil type, water holding capacity, grower, and climatic conditions. For example, a spur 'Golden Delicious' grows slowly on soils that have arsenic toxicity. A soil type that is low in fertility may reduce tree size by 50 percent.
6. Collar root does not appear to be a problem for MM 106 in the Washington area. However, it was observed in British Columbia districts where interplanting of tomatoes, potatoes and strawberries was practiced. These trees had grass growing around the trunks, preventing this area from drying, and thus making it possible for disease organisms to survive. Considerable tree trunk damage from winter injury was observed, which may also contribute to the collar rot problem that has been reported on MM 106. It has been observed that interplanting of row crops in orchards facilitates winter injury to the trees.
7. Mildew: If growers in the Midwest had as much mildew as observed in Washington, their spray schedule would quickly be revised. In Illinois, it would cause much russetting of the fruit.
8. Tree hedging on apples: Mechanical hedging will cause excessive shading resulting in the initiation of excessive bitter pit.... Roy Simons, Dept. of Hort. University of Illinois, Urbana, Ill.

#### EMXI OF DOUBTFUL VALUE FOR U. S. GROWERS

Semi-Standard Rootstock - 'Pracht's Doucin', EM XI, is a clonal rootstock much used in northern Europe, especially north Germany. EM XI is now being introduced for commercial trial in the United States by several nurseries. Enough research results have accumulated from abroad to permit some evaluation of this stock in comparison with other hardy stocks.

Hardiness - Winter hardiness has been cited as the major advantage of EM XI. However, Lapins in British Columbia, found it to be moderately hardy to hardy, similar to EM XVI, and less hardy than 'Hibernal', 'Robusta No. 5', and 'Antonovka'.

Trials - At the Skierniewice Station in Poland, Dr. Stanislaw Zagaja has reported the following comparisons from long term trials with EM XI and with seedlings of 'Common Antonovka':

	EM XI	'Common Antonovka' seedlings
Tree Size	80% of standard	80% of standard
Productivity	Average	Above average
Precocity	Average	Early fruiting
Anchorage	Good	Excellent
Winter Hardiness	Hardy	Extremely hardy
Virus content	Virus-free	Virus-free
Crown Gall	Extremely susceptible	Tolerant
Wooly Apple Aphids	Susceptible	Resistant tendency
Collar Rot	Susceptible	Resistant tendency
Apple Scap	Susceptible	Resistant tendency
Powdery Mildew	Susceptible	Resistant tendency

Disadvantages - For the nurseryman, the extreme crown gall susceptibility of EM XI is a major disadvantage; an infection can sweep through a stoolbed like wildfire. Introduction of systemic aphicides has reduced the seriousness of the woolly aphid problem in the stoolbed, and certainly scab and mildew can be controlled; nevertheless, the added costs of such spray programs should be considered. The collar rot susceptibility of EM XI will be of critical importance in areas where this disease has already shown itself a menace. In addition, EM XI has been reported very susceptible to Proliferation disease, a virus not now in the U.S.

Doubtful Rootstock - It is doubtful that EM XI offers a single advantage over 'Common Antonovka' seedlings for use in the United States. With its unusual range of pest susceptibilities this rootstock cannot be recommended for orchard planting. Seedlings of 'Common Antonovka' seem a desirable alternative.....  
J. N. Cummins, N.Y. State Agr. Exp. Station, Geneva, NY.

#### A NEW BOOK ON APPLES SOON AVAILABLE

A book entitled "North American Apples: Varieties, Rootstocks, Outlook" will be ready December 1, 1970. It is sponsored by the American Pomological Society, contains 13 chapters describing old and standard varieties, their origin and commercial value and rootstocks. The authors of this book are well known men who have worked most of their lives with apple trees in research teaching and extension capacities.

Authors - Dr. Aurthur French, Massachusetts has written 2 chapters on apple history; Dr. Emery C. Wilcox, Washington a chapter on "Trends in current apple varieties; Virginia Maas, Washington has written 2 chapters describing the 'Red and 'Golden Delicious' varieties; Dr. Paul Larsen, Washington has detailed a chapter on the 'Jonathan' variety; Dr. Harry Upshall, Ontario has edited the book and authored two chapters on 'McIntosh' and 'Northern Spy'; Dr. James Mowrey, Illinois has described the 'Rome' and its relatives; Dr. E. S. Degman, Washington has covered 'Winesap' in every respect; Dr. H. A. Rollins, Jr. has described the 'York Imperial' and another chapter on "Orchards of Tomorrow"; and, lastly a chapter with illustrations on rootstocks by Dr. R. F. Carlson, Michigan.

Available in December - Since the book is still in the printing stage, no price has been set. However, advance orders for one or more books can be made by writing to: Michigan State University Press, Box 550, East Lansing, Michigan 48823.

#### ANNUAL CONFERENCES

##### December 1, 2 and 3, 1970

-- Michigan State Horticultural Society - Centennial Conference - Pantlind Hotel, Grand Rapids.

##### December 8 and 9, 1970

-- American Pomological Society - Annual Conference, Park Motor Hotel, Niagara Falls, Ontario, Canada

##### March 8 and 9, 1971

-- Dwarf Fruit Tree Association - Fourteenth Annual Conference - The Hilton Inn, Benton Harbor, Michigan

## CHARACTERISTICS OF NEW CULTIVARS

"Let me now outline the characters we look for in new cultivars. First of all a new cultivar must be a regular cropper, bearing annually and not biennially. This is essential in order to maintain a regular supply of fruit to the market. The second character is yield. A new cultivar must crop heavily, in fact generally more heavily than the standard cultivar with which it is being compared. Yield is of vital importance if we are going to compete with the E.E.C. countries, particularly with regard to apples. 'Golden Delicious' in France yields 1,000 bushels or more per acre as compared with 600 bushels (per acre) from a (good) modern orchard of 'Cox's Orange Pippin' in England. New cultivars, if they are to compete with 'Golden Delicious', must give us yields in the region of at least 1,000 bushels to the acre when grown in this country. The next factor is size. The day of the small apple is over, and the buying public is now demanding larger fruits. The question of size is reflected in the market returns. As soon as the fruit size starts to fall below 2 1/2 inches in diameter so does the price start to decrease. Personally, if I may just digress for a moment, I think this is a mistake, because I feel certain that parents with a young family do not wish to purchase apples which have to be cut in order to share them round. I mention this point because there are housewives in the audience and, as the final purchasers of fruit, it must be they who can influence size.

Then comes appearance. A new cultivar must have a certain degree of eye appeal. It can be a green, yellow, red or partly red fruit, but it must look attractive. It must, of course, be firm in order to travel to market, and last, by no means least, it should be of good eating quality. Cultivars which are not hardy or are highly susceptible to disfiguring blemishes are to be avoided. Inherent health is all-important and the production of healthy stocks and maintaining them in the connection is something which we at the National Fruit Trials must bear in mind at all times.

These are briefly the characters we look for. Of course, one could add that one must attempt to extend the season by discovering good latekeeping apples and pears, to supplement those cultivars already grown on a large scale.

Summarizing, the characters which I have listed are: regularity of cropping, high yield, hardiness, good size, eye appeal and good eating quality." J.M.S. Potter, O.B.E., N.D.H. Director National Fruit Trials England. Quoted from Journal of the Royal Horticultural Society Vol. XCV, May, 1970.

## PREVIEW OF ORCHARD STUDY TOUR TO EUROPE

England - Prof. Tony Preston and other research workers at East Malling will be on hand to show the group fruit tree research in progress at that station. A full day is being planned for East Malling. Another day will be spent visiting grower's orchard in the Suffolk area near Cambridge.

Scotland - Dr. C. A. Wood, Agricultural College Auchincruive, AYR, has kindly offered his aid in viewing fruit production there. Time will be allowed to see some historic sites.

Germany - Dr. Gerhard Bunemann at the Institute fur Obstbau, Berlin will be of great help in handling the language in that area. There will be a chance to see fruit growing in Herford region and a visit to the area between Berlin and the "Wall" if time permits. And, perhaps the cherry orchard near Braunschweig would be of interest.

Austria - Dr. Karl Raffer and Mr. Konig are well aquianted with fruit growing in Austria. The Steinmark fruit area would be of interest. There may also be time to see the Lippizians in Vi-enna.

Yugoslavia - Although the plans to see the fruit regions of Belgrade - Smederova are tentative, this would be most interesting. We are still waiting for replies from Dr. Stanisa A. Pounovic, Institute Za Vocarstrvo, Cacak.

Italy - This country is full of fruit growing and nursery production. Several persons in Italy have offered to help with guiding the group there. Since fruit areas of Northern Italy were visited in 1964, the area near Florence and Rome are now on the tentative agenda. A full day in Rome is being planned.

SUGGESTIONS: Since the countries to be visited and travel program are still flexible, there is still time for suggestions from members of the DFTA. Such suggestions should reach us before November 1, 1970.

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#### PROPOSED 1971 EUROPEAN ORCHARD STUDY TOUR

The Board of Directors have unanomously voted to have an orchard tour to study fruit growing in other countries during late June and early July, 1971.

The tentative countries to be visited are: Italy, Yugoslavia, Austria, Germany England and Scotland. Detains as to cost and program will follow.

There is considerable interest in this tour. Attempts will be made to accomodate all wanting to join the group in seeing fruit growing in Europe.

In order to organize and formulate an interesting study tour we are asking for some information at this time. No deposit now.

Please fill in the appropriate category below and return immediately to 303 Hort., MSU, East Lansing, Michigan 48823.

     1. I or we are definitely planning to go on this tour.

Number of us going     .

     2. I or we are tentatively planning to go on this tour.

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"Do not be afraid to do more than what you are paid to do" R. Tuttle

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