

DWARF FRUIT TREE ASSOCIATION NEWS LETTER



INFORMATION ABOUT SMALLER THAN STANDARD FRUIT TREES

No. 10

April 1960

Edited by R. F. Carlson

THE DWARF FRUIT TREE ASSOCIATION MEETING

An enthusiastic group of fruit growers and horticulturists met at Hill Top Orchards, Hartford, Michigan, for the third annual meeting of the Dwarf Fruit Tree Association and discussed the good and the bad features of dwarf and semi-dwarf fruit trees. Nearly 400 persons were in attendance, from Indiana, Illinois, Virginia, Missouri, Michigan, Minnesota, New York, Ohio, Wisconsin, Ontario, Quebec, and Nova Scotia.

Gordon Yates of Minnesota told the group about his interesting tour of the East Malling Research Station in England and illustrated his talk with colored slides. He brought out some interesting facts of tree culture and contrasted them to our methods of fruit production. The importance of proper pruning and care of young semi-dwarf apple trees was discussed by Professor Karl Brase, Geneva, New York. He emphasized the need of proper spraying and fertilizer practices in the early years to give the trees a good bearing structure.

In the afternoon, Dr. Aleck Hutchinson from Vineland Experiment Station, Canada, discussed some of the results with different dwarfing practices obtained the last 20 years at that Station. He also related their work with dwarfing of stone fruits using the plum rootstocks Brompton and St. Julien A for peach and Prunus fruticosa for sweet cherry. Dr. H. B. Tukey was on hand to summarize the high points of the meeting and to add his helpful comments regarding the growth of interest in smaller fruit trees.

Following the indoor meeting, the group visited a 20-acre block of semi-dwarf Jonathan, Red Delicious and Golden Delicious on EM-VII to observe a pruning experiment, and to watch methods of pruning by leading fruit growers and horticulturists.

The Board of Directors of the Dwarf Fruit Tree Association for 1960 are: Ray Klackle, Wallace Heuser, Jerry Mandigo, Harold Fox and Frank Green from Michigan; Lorne Doud from Indiana; Gordon Yates from Minnesota; and George Whaley from Ontario. Sec.-Treas. is R. F. Carlson, Department of Horticulture, Michigan State University, East Lansing, Michigan.

DWARFING ROOTSTOCKS AND FRUIT TREES AT VINELAND

One of the oldest rootstock experiments on the Station at Vineland consists of 8 varieties of apple on East Malling - IX, planted 10' x 12' and trained on wires. Of the original 46 trees planted, 5 were removed, one died and 40 are still going strong. During the 22 years this experiment has been in progress, a system of clean cultivation with an annual cover crop has been used. The soil is a compact clay loam, under-drained. The vigour of the trees is such that with most varieties, terminal growth above a height of 6 feet has to be removed annually.

The comparative tree size and yield per tree are shown in the following table.

Variety	No. trees	Area x-sect. trunk (sq.cm.)	Cumulative yield (lb.)	Yield per unit area
N. Spy	4	100.9	995	9.9
Delicious	6	68.3	962	14.1
Secor	6	68.8	928	13.5
McIntosh	6	67.9	841	12.4
Cox Orange	5	112.5	716	6.4
Jonathan	5	55.0	657	12.0
Melba	3	50.1	487	9.7
Ely.McIntosh	5	53.3	414	6.5

The other apple rootstock experiments are located on a very fine sandy loam soil. Similar yields per tree to the above have been obtained on EM-IX on the sandy soil, where the trees have been spaced 10' x 20', and supported by individual posts.

The following table shows a comparison of yields for the first 15 years of three East Malling stocks with standard-size trees on French crab. Yields are expressed in bushels (45 lb.) per acre calculated from actual average cumulative yield per tree.

Rootstock	EM IX	EM VII	EM II	Fr. Crab
Spacing	10 x 12	20 x 25	25 x 30	35 x 40
Trees per acre	363	87	58	31
McIntosh	2,985	1,148	1,317	1,466
Delicious	2,702	1,560	--	741
N. Spy	3,162	1,696	--	455

At the end of 21 years, at the spacings shown, yields per acre on EM IX are still more than four times those on French Crab for Delicious and N. Spy and more than twice those for McIntosh on French Crab (Data not shown).

In a planting of 5-year-old trees of McIntosh, the new rootstocks Malling-Merton-104 has given the largest tree and the highest average yield (18 lb.) per tree in 1959. MM-106 gave the second highest average yield (15 lb.) and the highest yield per unit area of trunk cross-section. EM-II and the Swedish selection A-2 (Alnarp-2) each averaged 9 lb. per tree. A-2 has given a smaller tree than EM-II up to the

present; EM-XVI has borne no fruit yet. Trees on MM-101 and -102 (neither available commercially) are smaller than those on EM II with slightly lower average yield. MM-106 promises to give a tree about one-half standard size (similar to EM VII) or slightly smaller but perhaps better yielding on the sandy loam at Vineland.

Limited tests at Vineland indicate that St. Julien A plum is satisfactory for Golden Jubilee, Veteran, Elberta and possibly Redhaven. On a poorly drained heavy clay soil all trees on St. Julien A have survived while only 60 percent of those on peach roots are alive after 12 years. Trees have been almost equally dwarfed on both rootstocks on the clay soil, but yields have been higher on the St. Julien A rootstock. On tilled sandy loam soil, the latter rootstock has been very dwarfing to Golden Jubilee resulting in earlier bearing and double the cumulative yield over peach seedling rootstock at the end of five years. Kroosje plum has been unsatisfactory for most, if not all, of the six varieties grown on it. Prunus besseyi has been entirely unsuccessful while P. tomentosa has not been sufficiently tested for peach.

Very limited trials with the latter two Prunus species have shown that dwarf plum trees can be obtained on seedlings of each. Performance however, tends to vary with the individual seedling. Shiro and Grand Duke varieties tend to mature their fruit a week earlier on some seedlings of P. tomentosa.

High budding of sweet cherry on Mahaleb has resulted in some dwarfing, accompanied by a comparable decrease in yield. Two winter-hardy seedling rootstocks under test as rootstocks for sweet and sour cherry are P. fruticosa and P. dropmoreana. While the former suckers rather freely, the latter does not. Neither hold immediate promise as a satisfactory dwarfing stock for cherries.

A planting of dwarf pear at Vineland, budded directly on Quinces A and C, is now 22 years old. Of 36 trees of 5 varieties, only 8 have died, 3 of which were Bartlett on Quince A and 2 were Clapp on Quince C. These losses indicate a degree of incompatibility. A planting of Bartlett and Bosc on 4 intermediate stocks on Quince A is now 10 years old. In this experiment, Bartlett has given highest yields on Old Home intermediate, while Bosc has yielded best directly on Quince A. The latter combination however, makes a poor nursery tree. Duchess intermediate has given largest fruit size for Bartlett and also good size for Bosc. The dwarf pears are trained on wires....Abstract of talk given by Dr. Aleck Hutchinson, Vineland, Ontario, at the Third Annual Meeting of the Dwarf Fruit Tree Association.

ALNARP-2, A SWEDISH APPLE ROOTSTOCK

In 1920 a group of 24 apple clones were imported to Alnarp's Fruit Tree Station in southern Sweden. From this group, the rootstock A-2 (abbreviation for Alnarp-2) was selected and developed. In 1944 A-2 was released to a nursery to be increased and propagated to certain apple varieties.

According to Dr. Emil Johansson who has developed this stock, A-2 is quite vigorous and hardy and some varieties budded on it approach the size of those on East Malling XVI. However, like other rootstocks, A-2 will dwarf certain varieties more than

others. For example, McIntosh/A-2 will be about 3/4 the size of Brambley/A-2 after nine years in the orchard. Trees on A-2 are well anchored and come into production the fourth year. Certain varieties/A-2 tested at Alnarp (such as Cox Orange, Gul Rickar, Laxtons Supurb, Belle de Boskoop, etc.) have out-yielded the same varieties on both EM-XIII and XVI. Trees with A-2 rootstock have been planted in many parts of Sweden for hardiness evaluations. Out of ten trees set at Kalix, northern Sweden in 1944, nine were still growing well in 1948. A survey taken in 1952 showed that 11.08 percent of all the apple trees planted in Sweden were on the A-2 rootstock.

The A-2 rootstock has an upright growth habit with a zigzag stem similar to EM-I in the stool-bed. It has a reddish gray-brown bark with conspicuous yellow round lenticles. The leaves are broad oval-shaped with a pointed apex and are usually dark green. The stock matures and drops its leaves earlier in the fall than most of the EM-series. It produces many well-rooted shoots in the stool-bed and can also be propagated by hardwood cuttings.

In this country A-2 has not been tested to a great extent, but warrants further evaluations, especially as a rootstock for the less vigorous varieties. It is hoped that a small number of trees on A-2 will be made available by some nurseries for test plantings in the spring of 1962.....R. F. Carlson, Department of Horticulture, Michigan State University, East Lansing, Michigan.

WHAT KIND OF PRODUCTION FROM DWARFED TREES?

To the question, "What kind of production can we expect from dwarfed trees," I always refer back to the production record of the dwarf planting made in 1941 at Lafayette, Indiana. These trees were planted on more vigorously growing rootstocks than most growers are thinking of today but they do indicate a trend, particularly since they were grown under as near commercial methods as possible in an orchard of this kind. Originally there were twenty trees to a variety/rootstock combination which has been reduced in later years to open up the planting. When yields were based on only a few trees they have been indicated in parentheses.

Variety/Rootstock	Average yield in bushels per tree per year for the first:				Ave. per acre yield per year over 19 years.*
	9 yrs.	13 yrs.	16 yrs.	19 yrs.	
Gallia Beauty/EM I	4.0	6.3	7.1	7.5	540 bu.
EM XIII	2.8	6.3	7.2	8.2	590 bu.
EM XVI	3.4	6.7	8.0	10.5	756 bu.
Turley/EM I	7.0	9.0	9.4	11.8	850 bu.
EM XIII	2.0	4.3	6.9	10.2	735 bu.
EM XII	6.5	8.4	(9.1)	Out	-
Delicious/EM I	2.4	7.7	(8.0)	(9.4)	(676 bu.)
EM XIII	Trace	4.5	(5.1)	(6.6)	(475 bu.)
G. Delicious/EM I	2.6	4.1	(5.3)	(6.5)	(468 bu.)

*Based on 72 trees per acre at 20 x 30 planting distance.

To have individual tree yields of this kind over a 19 year period is remarkable and becomes even more impressive when one expresses this average yield on a per acre basis. Truly outstanding yields were found in 1957 when Turley trees on EM I averaged 25.6 bushels per tree or 1840 bushels per acre and Delicious on the same rootstock averaged 26.8 bushels per tree or 1930 bushels per acre. Certainly such yields are encouraging to fruit growers planting dwarfed trees.....R.B. Tukey, Purdue University, Lafayette, Indiana.

DWARF FRUIT TREE SURVEY

In order to keep pace with the progress of growing smaller than standard trees, the members of the Dwarf Fruit Tree Association were asked to supply information on such matters as number of trees planted, rootstocks used, yields obtained, etc. An annual survey of this sort would be of great value to everyone concerned with the growing of smaller fruit trees. Since only a small portion of the members responded to this first survey no conclusive trends showed up at this time. Request as to the results of this survey has come in and these results are summarized here:

1. The majority of the dwarf and semi-dwarf trees in commercial orchards have been planted since 1956.
2. The rootstocks East Malling II, VII, IX and the Clark have been used most extensively.
3. As to the best variety/rootstock combination, the response was: "Too early to tell." However, many favored varieties on either or both of EM-II and VII.
4. Because of the young age of most of the orchards, the yield records submitted were insignificant.
5. A sample of states submitting information as to number of trees planted and to be planted are listed below.

State	Number of replies	Number of trees planted	Number of trees to be planted in 1960
Michigan	46	36,754	9,095
Illinois	4	6,758	3,300
Washington	2	4,344	8,000
Indiana	3	3,315	--
Pennsylvania	3	1,398	2,160
Minnesota	3	1,900	2,100
Missouri	2	1,386	--
Wisconsin	7	195	268
Vermont	1	2,700	650

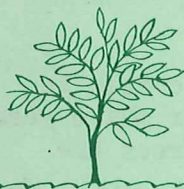
SUMMER TOUR OF THE
DWARF FRUIT TREE ASSOCIATION

At the Board of Directors meeting of the Dwarf Fruit Tree Association, March 9, 1960 an invitation was extended to the Association by Professor Karl Brase to visit the orchards at the Geneva Experiment Station, Geneva, New York, as well as other dwarf and semi-dwarf orchards in western New York. The date of this meeting is Monday July 18, 1960. The group is to meet 10:00 a.m. at the Geneva Agricultural Experiment Station where the orchard tour will start. The Association members can combine this tour with a family vacation to Niagara Falls, Watkins Glenn and many other places of interest in the Finger Lakes area of New York. Details of this Summer Tour will be forthcoming in the next News Letter, so mark July 18 on your calendar.

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RANDOM NOTES ON A RECENT TRIP TO EUROPE

Apple EM-VII and EM-II are still the standard semi-dwarfing rootstocks for the apple in England, but some of the newer rootstocks are making their way. For example, the Malling Merten (MM) apple rootstocks are doing better than some of us had suspected. MM-104 and MM-111 seem better anchored than EM-IV and VII and, if anything better croppers.

Surprisingly too, the very dwarf EM-IX is gaining - not only in England but all over Europe, put up on wire trellises with some reported fantastic yields of 300 bushel per acre at three years of age and 1000 to 1500 bushels at five and six years. In this new procedure, Golden Delicious - rapidly becoming a most sought after apple in Europe - and the new Spur-type Delicious varieties are replacing the old terminal-bearing, willowy and larger growing hyphenated varieties.

It is interesting to see the many novel and unique forms of growing dwarf apple trees on EM-IX on wires, and dwarf pear trees on quinces on wires. The situation reminds one very much of pruning methods for the grapes of a number of years back. It will be remembered that at that time many individuals had their own methods of pruning and each one had its exponents. Thus, there was the Munson system used in the south, the Chautauque system used in western New York, the Umbrella system, the two-arm Kniffin and the four-arm Kniffin. These were modified variously by individuals to provide a great array of competitive and argumentative methods. Little by little, however, the four-arm Kniffin took over.

Apparently this same sort of operation is now in progress in Europe with dwarf apple and pear trees. For example, in the Angers section of France, some two hundred miles southwest of Paris, there are found quite a number of special pruning forms. There is the Lapage system, which is really not new, which involves bending the branches in half-crescents for three stages of height. Then there is the Marchand system which consists of planting a tree at a 45 degree angle and then taking seven branches obliquely off from this main stem - all

being tied to the wire. This last is a very simple system with much promise. The Delbard system is much like the old Belgian fence, the number of branches, the planting distances and so on depending upon the vigor of the scion variety and the nature of the rootstock. Each grower has his own system and is violently and enthusiastically favorable towards it.

In general trees are planted 6 feet apart in rows 9 feet apart. The talk in this section is 150 to 200 bushels of Golden Delicious the second or third year and 400 to 500 bushels the third or fourth year from the time the trees are planted.

While trained trees are, of course, nothing new to Europe, it is interesting to see this general procedure returning in a rather large way, but modified to meet present ideas and economics.

I, for one, never believed that this system would develop as favorably in modern horticulture as it apparently is doing. Nor did I ever believe that American fruit growers would turn to the EM-IX rootstock and apple tree planted close together and supported on wires. But here in this country, we too, are seeing something of this same development. Perhaps it will be in the hands of subsistence and part time growers near large cities. Who knows? The final answer will come from the experiences of growers, and in this the Dwarf Fruit Tree Association will be of tremendous help since it provides a vehicle for exchange of opinions and ideas.....H. B. Tukey, Department of Horticulture, Michigan State University, East Lansing, Michigan.

EARLY PRODUCTION

The fruit yields recorded below are of interest to us since the American varieties, Golden Delicious and Jonathan, were used in this orchard test. This is a translation from a Dutch publication. Of interest is the early fruiting and a tendency toward annual fruiting on these rootstocks, M-IV and M-IX.

Yields in Bushels per Acre (689 trees per acre)

Year after Planting	<u>Golden Delicious</u>		<u>Jonathan</u>	
	M-IV	M-IX	M-IV	M-IX
1st	0.0 bu.	0.0 bu.	0.0 bu.	0.0 bu.
2nd	6.6	33.4	0.0	0.0
3rd	222.7	371.8	232.0	219.0
4th	311.7	249.4	441.1	220.0
5th	396.4	418.6	120.4	62.3
6th	1561.0	946.1	835.0	394.0
7th	739.2	550.0	904.4	298.4
8th	1314.5	825.0	757.1	247.0

PROGRAM - SUMMER MEETING

DWARF FRUIT TREE ASSOCIATION

July 18 and 19, 1960

Monday, July 18 Geneva, New York

10:00 a.m. Administration Building New York State Agricultural Experiment Station, Geneva, New York. Welcome - Director of the Experiment Station. Announcements and tour procedure.

10:30 a.m. Experimental plantings of dwarf and semi-dwarf orchards at the Station - Professor Karl Brase.

Stop 1-Clonal apple rootstock production - Mother beds of various ages of EM, MM, and Geneva selected clones; the characteristic growth of each clone. Also 18 year old specimen plants of the EM group that show growth habits and size of individual plants.

Stop 2-Rootstock effects on growth and fruiting of apple varieties including true dwarf trees on EM IX, trees on standard rootstocks and restricted in growth by an interstock of either Em IX or EM VIII; trees on EM VII and II compared with standard trees on seedling rootstocks. Growth effects of an EM IX bark ring and inverted varietal bark ring. Effects of apomictic seedling rootstocks of the species Malus sikkimensis, M. toringoides, and M. platycarpa (Rosedale clone) and also Malus baccata as a rootstock.

Stop 3-Growth effects of Malling Merton (MM) 104, 106, 109, and 111 rootstocks with Red Delicious, McIntosh, and Monroe varieties.

1:00 p.m. Lunch - Local restaurant near the station.

2:00 p.m. Tour of new food science building. Showing new methods and procedures of research in food technology - Staff.

3:30 p.m. Continuation of viewing rootstock work and discussions of pruning and training young and bearing trees - Research staff and commercial growers.

5:00 p.m. Newark - Rose Gardens of Jackson Perkins. This and other sites will be of special interest to the family. Dinner - on your own.

Tuesday, July 19 Visits to several commercial dwarf orchards.

8:30 a.m. Meet at Sodus Fruit Farm, Sodus New York.

Stop 1-Extensive orchard plantings of Red Delicious, Golden Delicious, and McIntosh on EM VII and II. Some of plantings are now of fruiting age. View of Lake Ontario and the large orchards of the Sodus Fruit Farm.

Stop 2-Boller Farm, Idared with interstock of EM IX. 22 year old Red Delicious and McIntosh on EM I. Idared and Monroe on EM II - trees are in their ninth growing season.

Stop 3-Sargent Farm. Clark Dwarf Trees severely pruned at planting showing more uniform size of fruit bearing top, and also, trees with interstock of EM IX 2 years in the location.

Stop 4-Home Farm. Some 24 year old McIntosh trees on EM XIII in a low area which in the spring is always wet. Trees have persisted and are healthy, exhibiting adaptability of this rootstock clone to this type of location. Golden Delicious/EM VII with various pruning systems; 2 to 3 years in location. Large block of R. I Greening/EM XIII in their 4th growing season, and also, experimental plantings for fruit tree virus studies - particularly stone fruit.

After stop 4, the group will proceed along Lake Ontario through the main fruit area of Wayne County. This county is the largest apple growing area in New York State.

- 11:00 a.m. Stop 5-Schumaker Farm Comparison of Clark Dwarf and interstock trees produced by the Geneva method using EMIX as the interstock. From there the group will go to Gerber Baby Foods Plant in Rochester.
- 1:00 p.m. Lunch at the Gerber Baby Foods Plant located on Buffalo Road, west side of Rochester. Courtesy of Gerber's.
- 1:45 p.m. Tour of the Gerber Baby Foods Plant, one of the most modern baby food processing plants in existence.
- 3:00 p.m. After lunch the group will proceed on Lake Ontario Parkway to Austin Farm, Hamlin, New York.
- Stop 6-Clark Dwarf trees and recently planted trees on EM I, II, VII, and interstock trees on EM VIII/XII. This planting serves as a test for nematode controls for new orchard planting sites.
- Stop 7-Janaes Oaks Orchard. Lyndonville, New York. Commercial orchard planting on EM VII, II, and XIII, with Monroe and Idared varieties. EM XIII used only in wet locations.
- 5:30 p.m. The tour will end with an evening meal (on your own) at the famous "Apple Grove Inn", Medina, New York.

SUPPLIMENTARY MEMBERSHIP LIST

Andrus, Melvin, Route 4, Box 211, South Haven, Michigan
Babcock, John, Route 2, Keeler Road, Hartford, Michigan
Crosby, Edwin A., Nat. Cannery Assn., 1133-20th St., N. E., Washington 6, D. C.
Ferree, Ray, Coop. Ext. Work, State of S. Carolina, Clemson, S. C.
Hall, Robert L., Route 1, Box 129, Buchanan, Michigan
Heck, E. L. Route 2, W. Myers Road, Shelby, Ohio
Mawby Orchards, 2984 Three Mile Road, N. E., Grand Rapids 5, Michigan
Miller, J. E., Nurseries, Canandaigua, New York
Philbrick, David R., 2284 Edgelow Road, Victoria, B. C., Canada
Premo, George W., Premo Orchards, Richland Center, Wisconsin.
Reynolds, Dr. Lawrence, 2100 Seminole, Detroit 14, Michigan
Sorensen, Earl R., Route 2, Fennville, Michigan
Styer, Thomas, Route 1, Box 250, Langhorn, Pa.
Surgeon, John O., Crafton, Illinois
Tanis, Clifford F., Route 5, O-51 Burton Road, Grand Rapids, Michigan
Tukey, Dr. H. B., Dept. of Horticulture, M. S. U., East Lansing, Michigan
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