Dwarf Apple Trees at The Kentucky Experiment Station

By C. S. Waltman

In April 1943 a small planting of dwarf apple trees was started at the Kentucky Experiment Station. Three trees of Turley and three of Delicious which were propagated on Malling IX rootstock were used and two trees of Turley on Malling VII were planted at the same time. In April 1944 ten more trees were planted and these were all Golden Delicious. These trees were propagated on the following rootstocks: two on Malling II, two on Malling IV, four on Malling VII and two on Malling I.

Reasons For Trials

We were interested in testing these stocks under Kentucky conditions for several reasons. First, we wanted to observe the response which these stocks made to our particular soil and climatic conditions. Second, we wished to determine the response of a few of our commonly grown varieties on dwarf as compared with standard stocks. Third, we were anxious to determine the desirability of some of the more common Malling stocks for use by those people who wish to have a few apple trees in a limited back yard planting.

The Malling IX stock produces a tree that is very dwarf as compared with the same variety grown on standard stock. There is however, quite a difference in the vigor of different varieties on this stock. There is also a difference in the amount of time required after planting for different varieties to come into production. For example, Turley shows less vigor and produces earlier than Delicious. The Delicious trees have made considerably more growth and, perhaps for this reason, have borne less fruit up to the present time than Turley.

Yield Records

The yield records for all trees are given in the table. In the case of Turley the yields during 1946 were exceptional,even though the trees were only in their fourth growing season. The Turley trees on Malling IX stock were so loaded with fruit that special support had to be provided to keep the branches from being broken and the trees from being uprooted. A point of special interest for both Turley and Delicious was that the fruits were of excellent size and were more highly colored than fruits of the same kind from standard trees. There was also

a tendency for the fruits from the dwarf trees to mature slightly earlier than on regular trees.

Malling VII produces a dwarf tree but this stock is somewhat less dwarfing than Malling IX. Malling VII develops a tree which fruits early in life but during 1946 was not quite equal in production to those on Malling IX.

All of the Golden Delicious trees were set one year later than the Turley and Delicious and therefore were in their third growing season in 1946. Two of the trees on Malling IV stocks were completely cut off by field mice after on season of growth and were replaced in the spring of 1945. Even these replacement trees produced a few fruits in their second growing season. The trees of this variety are still too young to give any clear indication of how they will respond in growth and production on the different stocks except that the trees on Malling I are definitely the most vigorous and those on Malling II show the least vigor.

The yield records for the trees during 1946 and the number of fruits being carried by the same trees on July 15, 1947 are shown in the following table.

Variety and Stock	Ave. No. of Fruits 1946	Ave. No. of Fruits July 15, 1947
ROW 1 SET IN 1943		
3 Turley on M IX	72	37
3 Delicious on M IX	8	34
2 Turley on M VII	44	38
1 Golden Delicious on M I	8	46
ROW 2 SET IN 1944		
2 Golden Delicious on M II	26	26
2 Golden Delicious on M IV	16	42
2 Golden Delicious on M VII	18	48
1 Golden Delicious on M I	28	35
REPLACEMENT TREES SET IN 1945		
2 Golden Delicious on M VII	5	31

Turley on Malling VII dwarf apple stock.

Value and Limitations of Dwarfs

Dwarf trees appear to be promising for those who have only a limited amount of planting space, even though they possess certain characteristics which necessitate careful handling. They must be set carefully and not too deeply to avoid roots forming at points above the graft union. Such scion rooting will partially or wholly destroy the effect of the dwarfing stock.

Some of the dwarf stocks have a rather shallow and brittle root system and this requires that the trees be given some form of support. Posts driven near the trees or a trellis form of support serves well for this purpose.

Tests made over the country to date indicate that several of the dwarf stocks possess wide adaptability from the stand-

point of both soil and climate and there is no definite indication that trees on dwarf stocks are predestined to a shorter life than the same varieties on standard stocks. The way the trees are handled with reference to pruning and the way they are supported will largely determine their length of life.

In general, dwarf trees require heavier pruning than standard trees because they have a tendency to over-bear. Their relatively shallow and limited root system does not form an exceptionally firm anchor and because of this, the top should be kept within reasonable growth limits.

The cost of trees is relatively high but they may be set as close as fifteen or twenty feet and the spraying and harvesting operations are easily handled.

Golden Delicious on Malling IV dwarf stock.

A PRINCIPLE FOR MAINTAINING EARTHWORMS IN FARM SOILS

By H. Hopp and P. J. Linder

(U. S. Dept. of Agr.)
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During recent years a number of writers have published material on organic gardening. In conjunction with this topic the earthworms in the soil have received considerable attention. Many articles have been written extolling their desirable qualities.

The report of the authors of this paper contains nothing regarding the beneficial effects of earthworms but does discuss the importance of freezing temperatures which may kill large numbers in the fall of the year. Evidence is cited to show that earthwarms were most active and grew best at 36°F. and were killed at 32°F.

In cultivated land the temperature of the top few inches of soil may drop rapidly to 32°F. or below. Such sudden reduction in temperature may destroy large numbers of earthworms which have not yet descended to lower depths. Surface mulches of organic material help prevent such drops in soil temperature and aid materially in the survival of earthworms. Earthworms also survived satisfactorily in soil under a sod where sudden freezing in the fall did not occur. —W.P.J.