

## **MSU Extension Publication Archive**

Archive copy of publication, do not use for current recommendations. Up-to-date information about many topics can be obtained from your local Extension office.

Investigation of Apricot Culture in Michigan  
Michigan State University Agricultural Experiment Station  
Special Bulletin  
Stanley Johnston, J.E. Moulton, Horticulture  
Issued March 1961  
19 pages

The PDF file was provided courtesy of the Michigan State University Library

**Scroll down to view the publication.**

26.42

Special Bulletin 434 • 1961

# Investigations in Apricot Culture

## In Michigan



By Stanley Johnston and J. E. Moulton

## MICHIGAN STATE UNIVERSITY

Agricultural Experiment Station • Department of Horticulture • East Lansing

## CONTENTS

History .....	3
Recent Investigations at South Haven .....	3
Excessive Growth of Young Trees .....	4
Loss of Trees from Unfavorable Soil Conditions .....	4
Frost Injury to Developing Young Fruits .....	4
Fruit Setting .....	5
Suggestions for Apricot Culture in Michigan .....	5
Selecting a Suitable Location and Site .....	5
Varieties .....	5
South Haven 6 .....	6
Curtis .....	6
South Haven 7 .....	6
Planting Distance .....	7
The Use of Pollinators .....	7
Training the Young Tree .....	8
Pruning the Third and Fourth Years .....	10
Pruning the Mature Tree .....	11
Soil Management .....	11
Fruit Thinning .....	14
Harvesting .....	14
Winter Injury .....	14
Insects and Diseases .....	15
Precautions in Spraying Apricots .....	16
Precautions of Special Importance that Should be Observed by Prospective Growers of Apricots .....	16
Conclusion .....	17
Acknowledgments .....	17
Apricot Spraying Schedule—1960 .....	18



# Investigations in Apricot Culture in Michigan

By STANLEY JOHNSTON and J. E. MOULTON

DEPARTMENT OF HORTICULTURE

## History

The apricot was not native to America, but seeds were brought here by early settlers from Europe, especially by those from countries adjacent to the Mediterranean. Seedlings were grown in many places in America but a congenial place in which to grow this fruit commercially was not found until it was planted in California and some other Pacific Coast areas. California now produces about 90 percent of the apricots grown in the United States. The rest of the production is accounted for by other far western states.

Many attempts have been made by Eastern and Midwestern Experiment Stations to grow apricots commercially, but without success. T. T. Lyon, donor of the South Haven Experiment Station, planted some apricot trees at South Haven in 1888, and during the next few years. Later, he reported that the trees had not been satisfactorily productive because of the very early season of blossoming, and loss of fruit caused by the *plum curculio*. Also, he said that many trees "sickened and died" for unexplainable reasons.

## Recent Investigations at South Haven

The apricot project was revived at the South Haven Experiment Station in 1939. Since then, over 200 named varieties and numbered selections have been brought into production and evaluated. Nearly half of these were brought to this country from various parts of the world by the United States Department of Agriculture. Trees have been propagated from about 125 old seedlings found in yards and gardens in Michigan. No doubt most of these are descendants of seeds brought to this state by early French explorers. About 1,500 seedlings have been fruited in the apricot breeding project at South Haven.

Three varieties from all of this material seemed to be of sufficient promise to use in rather extensive orchard trials. It is significant that all of these varieties originated in Michigan, two being crossbred seedlings from the Station's breeding plots, and the other came from an old seedling tree found in a garden in the state. The standard varieties from the Pacific Coast states failed completely at South

Haven. These varieties are apparently adapted to growing in an arid region but failed to set fruit consistently in the humid climate of southwestern Michigan.

The three varieties mentioned above, and known as South Haven 6, South Haven 7 and Curtis, are now receiving an extensive orchard trial in Michigan involving about 5,000 trees and 61 locations. About 3,000 of these trees are 4 years old and the others are younger. While these plantings have shown considerable promise, much still needs to be learned about apricot growing in Michigan and it is planned to continue testing these and other new varieties on an expanded scale. The growing of apricots as a commercial enterprise in Michigan cannot yet be recommended. Only trial plantings should be made at this time.

In the search for varieties that might succeed in Michigan, it was necessary to bring about 2,500 trees into production. These were grown on three sites having different soil types and variable degrees of freedom from frost. Later, there were opportunities to observe trees of selected varieties growing in orchard trial plantings in a number of locations in western Michigan. From these experiences, it was apparent that the following problems were the ones that caused the greatest losses of trees and fruit:

**Excessive Growth of Young Trees.** Young apricot trees usually make much more growth than young peach trees. They will often make 4 or 5 feet of new terminal growth in a season until the trees are in full bearing. Such trees do not mature their wood properly and are very susceptible to winter injury.

**Loss of Trees from Unfavorable Soil Conditions.** It is evident that apricot trees grow better and live longer on deep, well-drained soils. Poor subsoils of any kind will result in the death of many trees and the poor growth of others. Heavy soils should not be used for apricots as such soils are likely to be poorly drained.

**Frost Injury to Developing Young Fruits.** It has been observed at South Haven that apricot blossoms will withstand about as much frost as peach blossoms. However, the apricot blossoms about a week earlier than the peach and the blossom shucks are shed earlier, leaving the small green fruits exposed at an earlier date when frost is more likely to occur. At this stage, the small fruits may be killed by a temperature of 29° F. Therefore, it is essential that apricots be grown on practically frost-free sites.

**Fruit Setting.** Because of their early blossoming habit, apricots are more likely to encounter unfavorable weather during the fruit setting period. Early spring weather in Michigan is likely to be cold and often rainy. Hundreds of apricot varieties have been discarded at South Haven because of inability to set fruit satisfactorily in such weather. More needs to be learned about the ability of apricots to set fruit in the various fruit growing regions of Michigan.

## **SUGGESTIONS FOR APRICOT CULTURE IN MICHIGAN**

The following brief cultural directions are offered as a guide to Michigan fruit growers who wish to try growing apricots. Because of the limited knowledge available about growing this fruit under our climatic conditions, it is urged that plantings be made at first on a very conservative basis.

### **Selecting a Suitable Location and Site**

Growing apricots for commercial production in Michigan should only be attempted in areas generally recognized as suitable for peaches or possibly cherries. It is not yet known how well the apricot will set fruit as far north as the Traverse region. Young orchards are now growing in that area.

Because of their early blossoming habit, apricots should be planted only on the most frost-free sites.

Apricots may not set fruit satisfactorily within a quarter-mile of the Great Lakes where fog is often prevalent in early spring during the blossoming season.

Apricots in Michigan are budded on peach rootstocks and will do best on soils well suited to peaches. This rootstock has been generally satisfactory to date. Experiments are underway with other rootstocks.

Apricots under trial have done especially well on deep, well-drained soils. Poor subsoils of any kind have resulted in the death of many trees and the poor growth of others.

### **Varieties**

The only apricot varieties recommended for trial in Michigan are three now being rather extensively tested in the state. Brief descriptions of these varieties, in order of ripening, are as follows:

**South Haven 6.** A selection from the apricot breeding project at South Haven. Average first ripening date at South Haven, July 23. The tree has been vigorous and productive. The fruit is medium in size, bright golden in color and of sprightly flavor. Does not drop when ripe and is firm.

**Curtis.** A seedling found in the garden of the late Frank J. Curtis of Charlotte, Michigan. Mr. Curtis generously gave the Experiment Station permission to use his variety in any way that seemed best in attempts to develop an apricot industry in the state. Ripens at South Haven about 4 days later than South Haven 6. The tree grows very upright and open. Fruits are of medium size, round, rich golden with a bright red blush, and of excellent flavor. The fruit drops moderately when ripe and is of medium firmness. (Fig. 1).

**South Haven 7.** A selection from the apricot breeding project at South Haven. Average first ripening date at South Haven, August 1. Large, vigorous, productive tree. Fruit medium-large, mostly golden with a faint red blush. The orange colored flesh is firm and of excellent flavor. (Fig. 2).



Fig. 1. The Curtis apricot. Found as a seedling growing in the garden of the late Frank J. Curtis of Charlotte, Michigan.



Fig. 3. An orchard of crossbred apricot seedlings at the South Haven Experiment Station. Trees are grown close together in the row to conserve space as over 95 percent of them are discarded the first year they produce fruit.

### Training the Young Tree

Because of the susceptibility of rapidly growing young apricot trees to winter injury, it is of great importance to use extra care in training the young tree.

Apricot trees have been trained in Michigan both by the open-center and central-leader methods. The latter method seems to be preferable.

Apricot trees received from the nursery are usually well branched. The trunk should be headed at about 30 inches, and two branches carefully selected for the main scaffolds. The lower one should be about 16 inches above the ground. The other should be on the opposite side of the tree and usually a few inches higher, but the scaffolds may be directly opposite if they have wide angles at the point of attachment with the trunk. Wide-angled scaffold branches are very important. (See Figures 4 and 5). Head the selected scaffold branches to about a foot in length.

Sometimes no suitable scaffold branches can be found on the nursery tree. In such cases, head the tree at about 30 inches and head back the strongest branches on the trunk about a foot from



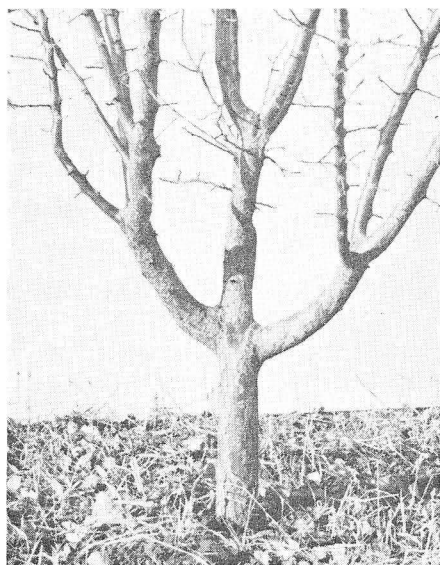


Figure 4

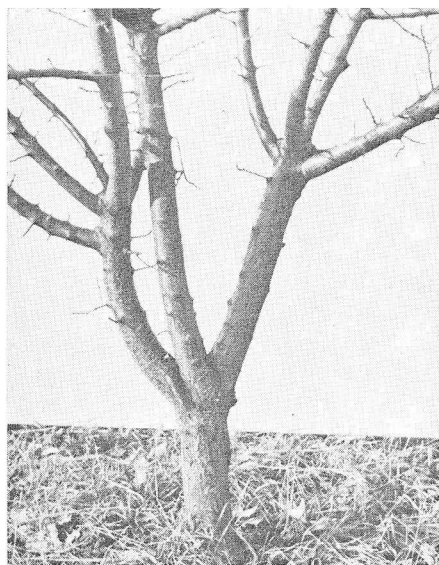


Figure 5

Fig. 4. A well-trained young tree with two wide-angled scaffold branches and the central leader. The main scaffold branches are almost opposite each other which is a satisfactory arrangement if the angles at the point of attachment with the trunk are wide. Wide-angled scaffolds have great structural strength and are highly resistant to winter injury. Compare with Fig. 5. The side scaffold branches should be pruned more than the central-leader so that it will be larger. Otherwise, it will be outgrown and dwarfed.

Fig. 5. A 3-year-old central-leader tree with the scaffold branches having sharp angles at the point of attachment with the trunk. Note that winter injury has already damaged the crotches. These branches will split off from the trunk as soon as the tree produces a full crop. Compare with Fig. 4.

the ground to short stubs about 2 inches in length. These will produce lateral branches during the first year in the orchard from which main scaffold branches can be chosen the following spring. Also, shoots will develop along the trunk from latent buds and one or more of these may provide suitable scaffold branches.

Pruning the spring of the second year should consist of removing surplus branches that have grown from the trunk, and heading back the selected scaffold branches and the central-leader. The leading shoot of each main scaffold branch should be headed back to about 2 feet in length, if it has exceeded that amount of growth. This will encourage side branching and the development of a strong, well-branched tree. The central-leader should be left 12 to 18 inches longer than the side scaffolds. Otherwise, it is likely to be outgrown

and dwarfed, making it possibly necessary to remove it when the tree becomes larger.

Leaving numerous scaffold branches on the trunk is hazardous. Too many scaffolds result in crowding and the formation of sharp-angled crotches that make poor unions with the trunk. (Fig. 6). These poor unions do not mature properly in the fall and are very susceptible to winter injury. (Fig. 7). Eliminating excess scaffolds should be done not later than the spring of the third growing season. Removing extra scaffolds when they are large will probably be too late to prevent winter injury in the crotches, and large pruning wounds will be left which will not heal satisfactorily.

### Pruning the Third and Fourth Years

By the third and fourth growing seasons, the trees are beginning to produce fruit. The main framework of the tree has been established, and the pruning to be done is mostly to remove additional branches that may come from the trunk, and to head back new

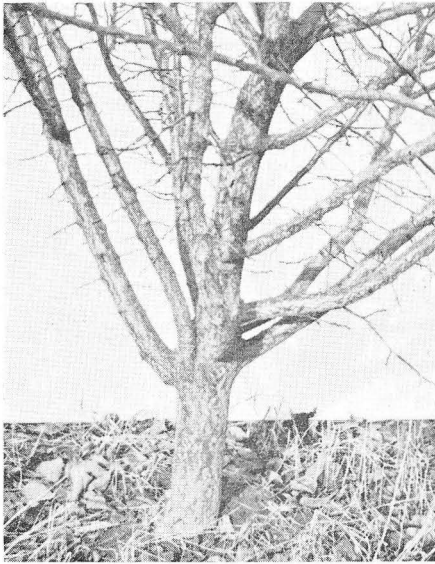


Figure 6

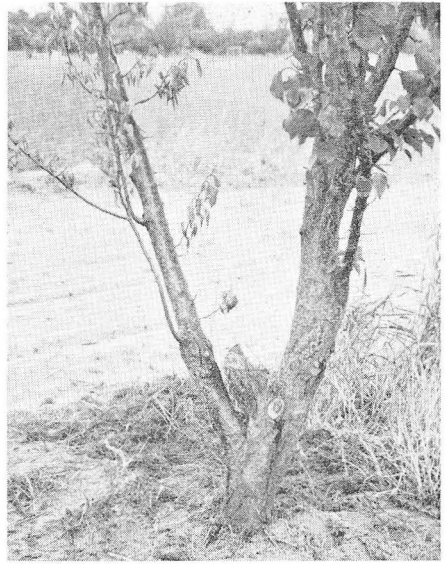


Figure 7

Fig. 6. A tree at the end of the fourth growing season with far too many scaffold branches. Two, or at the most, three, is the correct number to retain. To remove the excess branches at this age leaves rather large wounds that often do not heal satisfactorily.

Fig. 7. The end result of retaining too many scaffold branches and ones having sharp angles at the point of attachment with the trunk.

terminal growth if it exceeds 2 feet in length. A small amount of thinning out may be necessary where branches are too thick or rubbing, and broken branches should be removed.

### **Pruning the Mature Tree**

The apricot produces most of its fruit on rather short-lived spurs. The principal problem with mature trees, therefore, is to remove branches loaded with old spurs and to keep the trees producing good replacement wood.

To accomplish the above objectives will require a combination of thinning out weak branches and others having old weak spurs, and heading back new wood to the first strong lateral branch. Mature trees must make from 16 to 24 inches of new terminal growth a year to maintain satisfactory annual production. If less growth is made, the trees will fall into a biennial bearing habit in which they will produce a large crop of small apricots every other year. Briefly, pruning the mature tree becomes largely a matter of maintaining a sufficient number of strong spurs to produce a satisfactory crop and enough new growth to produce spurs for future fruit production.

### **Soil Management**

It has been mentioned that young apricot trees, under average growing conditions, usually make an excessive amount of annual growth. New terminal growth 4 or 5 feet in length is not uncommon. Trees growing so vigorously mature late in the fall and often the maturing process is not completed before temperatures drop low enough in November to cause serious injury. Apricot trees should not make more than 2 feet of annual growth for safety in Michigan.

While excessive growth is largely a problem with young trees not yet in bearing, it can be serious with trees in their early productive years if they should lose their crop because of frost or inadequate pollination. After the trees are about 10 years of age, the danger of excessive growth as a factor making them more susceptible to winter injury is largely over.

It is of paramount importance that the apricot grower do everything within his power to control the amount of growth made by his trees. Growth can be regulated quite satisfactorily through proper soil management which includes the type of culture used, cultivation or sod, and the use of fertilizers and cover crops.



Fig. 8. A young apricot orchard, in its fourth growing season, that has been grown under the cultivation and cover crop system. The trees have made slightly too much growth but are in generally good condition with only a small amount of winter injury present. Trees of this age making more growth would be in serious danger of severe winter injury.

If the young apricot orchard is cultivated, cultivation should cease by early June and a cover crop sown. (Fig. 8). When the orchard is in production, cultivation can be continued longer. If the trees are carrying a full crop, it may continue until about August 1. If trees of bearing age have lost their crop in the spring, cultivation should cease earlier.

It has been observed that apricots grow well in sod if the grass is kept mowed until August. One apricot trial orchard in Michigan was planted in sod; the grass was mowed occasionally through the summer, and an area a few feet wide around the tree was kept cultivated with a tree hoe until August. (Fig. 9). The same purpose can be accomplished by cultivating a narrow strip on each side of the tree row and allowing the rest of the row middles to remain in sod. Erosion would be greater on hilly land using this method than by just keeping an area hoed around the tree.

If the sod culture method is used, adequate protection must be taken against field mice.

Little is known about fertilizing apricot trees in Michigan, except that they respond quickly to applications of nitrogen. The importance of phosphorous and potash in apricot culture remains to be determined. There apparently is no harm in applying these materials, but it is not known if they are beneficial.

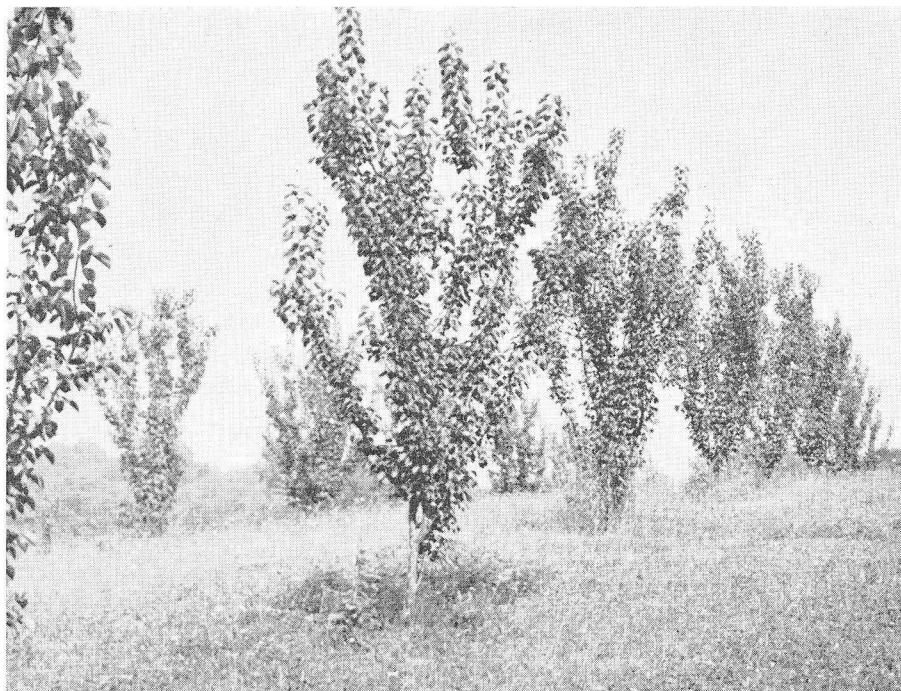


Fig. 9. Apricot trees in their fourth growing season that were planted in sod. The grass was mowed occasionally until August, and an area a few wide wide around the trees was cultivated with a mechanical tree hoe until midsummer. Fertilizer was used sparingly. The trees have grown a trifle slowly, but no winter injury is present and they have an excellent chance of going safely through the hazardous years until they are mature and then much less likely to be injured by low temperatures.

Young trees, if growing on reasonably fertile soil, should not receive nitrogen because of their tendency to make excessive growth. As they become older, nitrogen should gradually be applied in quantities sufficient to obtain the desired amount of new growth each year. This will call for careful study on the part of each grower. No blanket rate of application can be given. The urea form of nitrogen is not recommended for apricots.

If young bearing trees lose their crop in the spring, there is great danger of excessive growth. It is suggested that bearing trees receive half of their nitrogen in early spring and that the remainder be withheld until early June. Then, if a crop is present, the rest of the nitrogen should be applied.

Cover crops to use may be those commonly used by peach growers, such as Sudan grass, rye or wheat.



## **Fruit Thinning**

After apricot trees come into production, they often set extremely heavy crops in some years. The fruit should be thinned under such conditions, or it will be small in size and the trees will overbear to the extent that they may not produce a good crop the following year.

Hand thinning is slow work and it has been found that apricots can be thinned quite satisfactorily with a thinning pole. This pole should be made of bamboo or light wood, and a piece of rubber hose about a foot in length should be slipped over the upper end of the pole. Thinning is done by gently rubbing and tapping the branches. Hard blows should not be used as all of the fruits will be knocked off for a considerable distance from the point of contact. With a little practice, a good job of thinning can be done by this method.

Thinning should start as soon as the normal drop has occurred. Usually the fruits will be from  $\frac{3}{4}$  of an inch to 1 inch in length at that time.

## **Harvesting**

Harvesting should start when the fruits are well colored and still moderately firm. Fruits picked too soon will be dull in appearance and of poor flavor. South Haven 6 can usually be harvested almost entirely in one picking because the fruits are firm and do not drop prematurely. South Haven 7 and Curtis usually require two pickings because of less even ripening.

Apricots are moderately tender and should be handled carefully. Fruits going to processors will be put in their containers. The best package for fresh market has not been determined, but it seems that a small package will be desirable.

## **Winter Injury**

The danger of winter injury to trees that have been growing too fast and that have been improperly pruned in the early years has been mentioned.

The most common type of winter injury to fast growing apricot trees occurs on the trunk and crotches of the scaffold branches on the southwest side of the tree. The temperature of the bark in this area becomes rather high on warm, sunny days in winter. At night the temperature may drop rather quickly to well below freezing. The sudden extremes in temperature may cause serious injury to this part

of the tree. A board wide enough to shade the trunk and driven into the ground close to the southwest side of the tree will often prevent this type of injury.

Trees sometimes sway enough through the growing season to open holes in the ground around the base of the trunk. If water accumulates in these holes and freezes, this vital part of the tree may be so seriously injured that the tree will die. The grower should go through his orchard in late fall before freezing weather arrives and fill all openings at the base of the tree.

### Insects and Diseases

By far the most important insect attacking apricot fruits is the *plum curculio*. In the early days of apricot investigations at South Haven, arsenate of lead was the only material available to use in attempting to control this pest. Satisfactory control using this material was practically impossible. Since the introduction of methoxychlor and parathion, it has not been difficult to control *curculio*. Other newer materials also show promise.

The *peach tree borer* causes some injury to apricot trees in certain areas in California but has been of minor importance to date in Michigan. However, apricot trees grown in Michigan are budded on peach rootstocks, which increases the hazard of difficulty with this pest. The bud union should be placed 4 inches below the surface at planting time to lessen the danger of infestation at the crown, and it would be a wise precaution to spray the trees for control of this insect in the same manner as recommended for peach trees.

There are a few other insects of minor importance attacking apricots. These can be controlled by following the Spraying Calendar as shown on page 18.

*Brown rot* infection of blossoms can be especially serious as the infection will travel down the fruit spur stems into the branches where large cankers may develop. Spraying with Captan when the blossoms are in the balloon pink stage, in bloom if the weather is rainy, and at petal fall, has given excellent control of blossom rot.

Later sprays of Captan continuing practically to harvest have given good control of brown rot on the ripening fruits.

Some difficulty has been experienced with *peach scab* at South Haven on apricots growing near peach plantings, and Captan has been only partially effective in controlling the disease. Injury to apricots from the use of sulfur has frequently been reported in Cali-

fornia. Experiments are underway in Michigan to find a better control for peach scab on apricots. Fortunately, this situation is not serious at present.

Apricot trees are susceptible to infection from *Verticillium wilt*. This disease is very prevalent in Michigan on a number of plants and is commonly found in raspberries, strawberries, tomatoes, potatoes, peppers and melons. Avoid using land for apricots that has grown any of these crops within 5 years.

Infection of trees takes place through the root system, and death takes place slowly, often not until the trees are 3 or 4 years of age. The principal reason for using peach rootstocks for apricots in Michigan has been the much greater resistance of peach roots to infection from *Verticillium wilt*.

### **Precautions in Spraying Apricots**

Because of repeated reports from California on the injurious effects of sulfur when used as a spray on apricots, this material is not recommended for use on apricots in Michigan at this time.

A few instances of injury to apricot trees from the use of dieldrin are on record and the use of this material cannot now be recommended.

### **Precautions of Special Importance That Should Be Observed by Prospective Growers of Apricots**

1. Do not plant apricots in Michigan except in locations recognized as suitable for peach culture. It is not known at present if apricots will succeed in the cherry producing area of the north-western part of the Lower Peninsula. However, young orchards in this area will soon be in production.
2. Plant only on sites that are practically frost-free, and that have deep, well drained soils.
3. Do not plant on land that has grown crops within the past 5 years especially susceptible to verticillium wilt. Such crops include raspberries, strawberries, tomatoes, potatoes, peppers and melons.
4. Plant only varieties recommended by the Michigan Agricultural Experiment Station.
5. Grow young trees slowly, and also trees in their early productive years that may grow too much when they fail to set a crop. New growth should not exceed 2 feet in length annually. Young trees

on reasonably fertile land should not receive nitrogen fertilizer for fear of causing too much growth. Also, such trees should receive little cultivation, or be grown in sod that is kept mowed. As trees become older and are in production, fertilizer will need to be increased sufficiently to insure an annual growth of 16 to 24 inches if good production is to be maintained.

6. Train young trees very carefully. The central-leader system seems best for apricots in Michigan. It is extremely important to restrict the number of main scaffold branches to two, or at the most three. Crotches formed by crowded scaffold branches are very susceptible to winter injury.
7. If fruit set is heavy, thin adequately. Otherwise, fruits will be small and trees will become biennial in bearing habit.
8. Control blossom rot. If not controlled, a large portion of the crop will be lost and brown rot cankers will develop on the branches.
9. Control *plum curculio*. This pest can easily destroy an entire apricot crop if it is not kept under control.
10. Until further notice, avoid the use of sulfur and dieldrin in spraying apricots.

## CONCLUSION

The growing of apricots in Michigan must be considered as still in the trial stage. Therefore, plantings should be small until more is known about the culture of this fruit under climatic conditions prevailing in this state.

## ACKNOWLEDGMENTS

The authors wish to express their thanks to Ray Hutson, Entomology Department; E. J. Klos, Department of Botany and Plant Pathology; and Arthur E. Mitchell, Department of Horticulture, for helpful suggestions for controlling insects and diseases of apricots.

## APRICOT SPRAYING SCHEDULE

TIME	MATERIALS PER 100 GALLONS	TO CONTROL
<b>BLOOM:</b> (Beginning with bal- loon pink and con- tinuing through bloom).  It is extremely important to control brown rot during bloom.	Captan (50% W.P.)—2 lbs.	Brown rot (blossom blight)
<b>SHUCK SPLIT:</b> (Beginning at shuck split and continuing for 4 weeks at 5-7 day intervals de- pending on amount of rain -5 days in rainy periods).	Captan (50% W.P.)—2 lbs. and Methoxychlor (50% W.P.)—2 lbs.	Brown rot and Peach scab  Curculio, oriental fruit moth, and tarnished plant bug
<b>BEGINNING JULY 1:</b> (Continuing at 7-10 day intervals until harvest).	Captan (50% W.P.)—2 lbs. and Methoxychlor (50% W.P.)—2 lbs.	Brown rot and peach scab  Apple maggot, lecan- ium scale, peach tree borer, oriental fruit moth





In the above photograph, the late Frank J. Curtis and Mrs. Stanley Johnston are admiring some of the fine fruits picked from his old seedling apricot tree. This tree was given to Mr. Curtis by a neighbor about 1930. It was then a small seedling that had grown under a larger seedling tree. Mr. Curtis planted it in his garden. When this picture was taken in 1951 the old tree was about 40 feet in height and had a spread of about 30 feet.

Mr. Curtis was anxious to help develop an apricot industry in Michigan and gave the Michigan Agricultural Experiment Station the right to use his variety in any way that might be of benefit to this research project. It shows some promise as a commercial variety and has been useful in apricot breeding.

Apricot seedlings have been grown in Michigan since the time of the earliest white settlers who brought seeds with them from Europe. Accordingly, over 300 years of apricot variety selection has been going on within the state. Trees propagated from about 125 of these seedlings have been grown at the South Haven Experiment Station. So far, the Curtis apricot (see picture page 19) has been the best of these, but it is believed that there may be others of great value in the state.

In 1958 an apricot seedling was found in the northeastern part of the Lower Peninsula that is apparently unusually hardy. The fruits are not satisfactory for commercial use, but the variety has already been used in breeding in an attempt to transmit its hardiness to other varieties.

It will be much appreciated if residents of the state will notify the South Haven Experiment Station, South Haven, Michigan, if they know of an apricot seedling tree that seems to be hardy and productive. Such a tree might be of great value to the Michigan fruit industry.