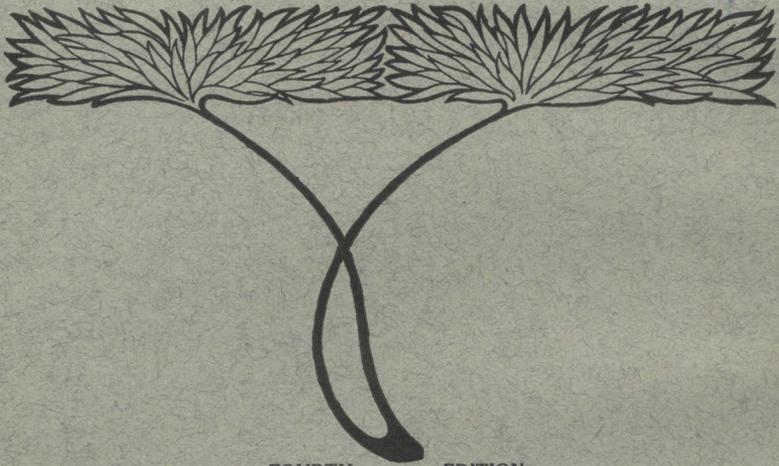


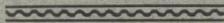
# APPLES

Their Adaptation to the Light  
Soils of Michigan



FOURTH EDITION

By H. H. Dow





# APPLES

## Their Adaptation to the Light Soils of Michigan



APPLES grow and bear with greater or less regularity over a considerable part of North America and Europe, but it is only in comparatively few favored regions where the crops are produced in sufficient amount and with sufficient regularity to make apple growing profitable. Of the few districts that are favored by freedom from late spring frosts, none are more attractive at the present time than our own state of Michigan. Here not only the climate but the soil and market are all propitious.

When my father was a boy, there were not many apple pests, apples grew readily and had practically no market value. As long ago as I can remember, ordinary apples, after being picked up and hauled to a cider mill, were worth only ten cents per bushel, but these orchards no longer raise fruit without care and attention, and it is only where the trees have been intelligently protected by the hand of man that fruit can now be produced satisfactorily.

I believe the lighter soils of this state, which are not adapted to the growing of ordinary farm crops, are better suited to the growing of apples under the system used by the writer and described in the following pages, than the most valuable agricultural lands. Apples raised in this way will compare favorably with those grown in the most favored districts of the Pacific Coast. The cost of raising them is less than the freight alone on the Western apples, and the cost of this kind of land is not to be compared with the high prices paid for the land on which Washington and Oregon fruit is raised. For these reasons I believe that apples are the best money crop a farmer can go into, but to raise them right, the land must be specially prepared, and the right varieties of trees must be planted, and the right care must be given to them. In what follows I will endeavor to give my experience in regard to each of these conditions.

### SOIL.

Rich land that is moist the year around will not raise apples. It may raise apple trees but they bear little fruit. Good apple lands must be deeply and thoroughly drained. Even sand hills may require some drainage, or at least the breaking up of the hard pan that usually exists near the foot of these sand knolls. This drainage is necessary in order that the roots may run down so that they will not be seriously affected by the droughts of summer or the frosts of winter. This deep drainage is also necessary to prevent a poisonous condition of the subsoil, which would be ruinous to the deep running apple roots and more or less injurious to the tree as a whole.

The great benefits of deep roots can be further increased by coaxing the roots down with some fertilizer placed at as great a depth as drainage will make advisable. In my orchard I have dug deep holes with a horse and scraper and filled them in with a mixture of surface soil and subsoil, whereby it is made moderately rich to a depth

of 3 to 4 feet. It is also advisable to put a little bone or other form of phosphate in these deep holes, as our light soil is more deficient in this plant food than in any other essential element.

During the last few years many experiments have been made that show that all forms of phosphate become insoluble almost immediately when mixed with a sufficient amount of soil. On this account it will be impossible to feed the deep roots of a tree with phosphate by spreading it on the surface of the ground. It is, therefore, very important when digging these deep holes to improve the opportunity to get some phosphate where it will feed the deep roots and favor their development.

If I were going to raise apples on a large scale, I would secure a ditching machine and prepare a long trench where each row of trees was to be placed. This would probably be a cheaper way of making a suitable bed for the trees to grow in than to dig a separate hole for each tree with a horse and scraper.

### **PLANTING THE TREES.**

One of the great objections to planting an orchard is that it takes a number of years before the returns are sufficient to even pay expenses. The time can be cut down by planting early bearing varieties like the Wagener, but in the long run not much time is gained in this way, as most varieties of trees grow so slowly after they begin to bear that it is an excessively long time before an orchard of these early bearing varieties produces a really big and satisfactory crop. I believe the best way to get an orchard in heavy bearing in shortest length of time is to plant two or three trees in a clump and set the clumps about the same distance apart that you would set single trees. In this way we get two or three times the growth we would if only one tree were planted in a place and the form of the tree is better. At first thought it would appear to be better to have, say one tree every ten feet than to have three trees in a clump and the clumps thirty feet apart. This is somewhat similar to the problem of putting three stalks of corn in a hill or drilling in the corn. There is, however, an advantage that is quite important in connection with planting three trees in a clump that does not apply to the planting of corn in hills. In the case of the corn, if the leaves from one stalk blow up against the adjoining stalk, no harm is done, but if the fruit on the end of a long limb on one tree blew up against a limb on the next tree, it would be knocked off or deformed, or injured in some way. If three trees are planted close together the big limbs correspond to the branches of an older tree, and the flexible limbs that sway in the wind would not interfere with each other. When planting three trees in a hill, all the lateral branches should be trimmed off, so that each tree is a whip. They should be set one to two feet apart in the form of a triangle, and each tree should be inclined so that the clump will resemble the head of a well trimmed tree. On very light, well drained land these trees should be set 6 inches to a foot lower than they stood in the nursery. On clay ground, however, they should only be set to such a depth that the graft is well covered. I believe that the added growth the first

season pays for the extra time required to "puddle" each tree in place with a little water. Here again the practice on light soil is different from that on heavy ground, where this "puddling" of the roots at time of planting is not found to be an especial advantage.

I would recommend setting the clumps of trees from twenty-five to thirty feet apart in the rows, and the rows forty feet apart. This distance can be varied somewhat, depending on the variety of apples and the richness of the ground. On very poor, light soil, the distance need not be so great as on richer soil, and Wagener, Wealthy and Oldenburg apples, which never reach great size, will not be crowded for a number of years if set only twenty feet apart in the rows. In any event, it is very desirable that the distance between the rows be much greater than the distance between the trees in the rows, as it is necessary to provide room for the spray wagon which modern methods require.

We sometimes hear of planting trees in hexagons, so as to better utilize the ground. The fact, however, that the roots reach at least twice as far as the limbs, and that the roots will occupy the entire ground no matter what form of planting is adopted, would seem to indicate that there is no advantage whatever in growing trees in this way, and it is a great inconvenience to have the trees so arranged that a spray wagon cannot be easily driven between them.

### CARE.

The care of an orchard is not difficult. On sandy land continual cultivation will destroy all the organic matter and humus in a few years, and consequently this form of culture, which is so highly recommended for heavier soils, is not adapted to light soil. We all know that corn which is full of weeds will not do well, as the weeds sap the moisture and strength that otherwise would go to the corn. In the same way an orchard that is growing other crops is bound to suffer more or less through the encroachment of the accompanying crop. I believe the best way to stimulate the growth of the young trees, and at the same time not wear out the land, is to use some form of mulch next to the tree, and then keep the grass and weeds closely mowed on the rest of the orchard. I have found hardwood sawdust to be an ideal material for mulch around trees. It soon rots and adds fertility to the ground. I think, however, that leaves and weeds or almost any other rubbish would be equally effective. A mulch of clover or clover hay will produce a more vigorous growth of foliage and a deeper green color, in my experience, than I have been able to obtain in any other way. A little tarred paper placed loosely around the trunk of each tree will prevent the mice from girdling the tree during the winters when they have nothing better to eat. The same result can be accomplished by piling a small mound of dirt next to the tree. I have used both methods and have never had a tree girdled when so protected. It is not necessary in this climate to remove the tarred paper in the spring, as some people have stated who have had experience further South. The tarred paper applied the first fall after a tree is set out will last until the tree becomes so large and

old that any further protection is unnecessary.

Painting the trunk with a strong solution of Lime Sulphur Solution will probably prove to be the best and cheapest protection against mice and rabbits, but the practice is still too new to be sure of the results.

### **PRUNING.**

The trimming of a tree is a very simple matter. Never cut off the end of a limb, as it tends to make the tree too dense and bushy. Each year a certain number of limbs will have to be thinned out to prevent their crossing and interfering with other limbs. In this way sunlight and air are admitted to the tree and higher colored and more perfect fruit is produced. The cutting out of large limbs will almost always produce suckers, and when these suckers are cut out it is very liable to start another growth of suckers. It is, therefore, always best to go slow in trimming, and err on the side of pruning too little rather than too much. If suckers are trimmed out during the summer, it is less liable to start a new growth than if they are cut out in the winter. Trimming, however, is usually done in the winter, because there is more time to do this work and it is also easier to see what pruning should be done when there are no leaves on the trees. There are no Experiment Station results published that prove one part of the winter is better than another for doing this work. There is, however, experimental evidence that trees which are excessively pruned will not bear as young or as well as those which are only very lightly pruned.\*

### **FORM OF TREE.**

The form of tree called for by modern conditions is that of a big bush rather than a round head on top of a long trunk, where it is out of reach. There are many advantages that the low form of head possesses. Time that would otherwise be spent in growing a trunk is saved, the branches are accessible from the ground for spraying, trimming and picking the fruit, and the wind is not so strong near the ground as it is higher up, and if the fruit should be blown off, the danger of injury is much less than if it dropped a greater distance. A low limb heavily loaded with fruit will bend to the ground and rest there without breaking the tree when bearing a load of fruit that a higher limb could not sustain.

These advantages are so great that they cannot be ignored, and are recognized to such an extent in orange growing districts that the tall trees have in some cases been cut down and the ground immediately planted to young trees in order that the desirable bush form might be secured.

### **SPRAYING.**

There is no spray that is a cure for all the diseases to which a fruit tree is heir. Fortunately, however, there are fungicidal sprays

\*Woburn Experiment Station, England.

that will make a tree practically immune to all kinds of scab, rot, mildew and rust; there are arsenical sprays that will poison any insect that eats the leaves, and there is a Lime-Sulphur spray which will destroy all forms of scale. There is no spray that will satisfactorily kill the small green lice (*Aphis*) which suck the sap from young leaves and cause them to curl.

To kill San Jose scale and all forms of bark lice, the tree should be sprayed with Lime-Sulphur mixture when it is in a dormant condition, preferably in March or April before the buds develop. If San Jose scale is present, one part of concentrated Lime Sulphur Solution must be used in eight parts of water. For other forms of scale this strength of solution is not necessary. For the general disinfecting of an orchard from fungus growths of one kind or another, as well as the destruction of moderate amounts of Oyster Shell Scale and Woolly *Aphis*, one part of concentrated Lime Sulphur Solution to twelve parts of water is ample. This strength of spray is corrosive to foliage and cannot be used in the spring after the leaves have begun to form, although no harm will be done by spraying after the buds have swelled to several times their original size.

Just before the buds open, the trees should again be sprayed with a fungicidal spray. Formerly Bordeaux Mixture was considered the best material for this spraying. More recent results indicate that Lime Sulphur is much better, as well as cheaper, for this use, and as there is no solid material present in the mixture, there is no clogging of the spray nozzles and no bad results if the mixture is not agitated. One part of concentrated Lime Sulphur Solution to forty of water, or even one part to sixty of water, seems to be effective for holding the fungus in check at this time. As soon as the petals have fallen, another spraying should be given, consisting of one gallon of Lime Sulphur Solution to forty to sixty gallons of water, to which two pounds of Arsenate of Lead should be added. This spraying should be repeated as soon as the wind has changed, so that every part of the tree may be thoroughly protected. It is extremely unpleasant to attempt to spray when little or no wind is blowing, and only the upper side of the leaves are usually covered. If, however, there is a wind of sufficient force to blow the leaves first one way and then another, and produce many eddy currents, a thorough coating of the leaves on the windward side of the tree can be secured, and spraying under these conditions is more economical than when the excess of spray solution falls to the ground immediately under the trees instead of being blown to the adjoining trees. As it is impossible to spray against the wind, complete protection can only be secured by repeating the spraying when the wind has changed.

Spraying is absolutely essential for perfect fruit, and thorough spraying is very difficult to obtain on a large scale without a power-driven pump, but when properly equipped, the grower finds it an easy matter to produce ninety-five per cent. of his fruit free from worms or scab.

## VARIETIES OF APPLES.

I have tested something over eighty varieties of apples, and can recommend only five or six for commercial use in my locality.

**Grimes' Golden** I would place first of these, as the tree will equal any other in rapidity of growth, it comes into bearing when four or five years old, and continues to grow well after coming into bearing. The tree is hardy and is of a desirable form; in fact, the only criticism I have of this apple is that it is yellow, whereas a dark red apple usually brings a better price. This, however, may not always be so, as there is no other golden yellow apple on the market during the early part of the winter when Grimes' Golden are in their prime. There are many red apples on the market at this time that have a very inferior quality, and it may be that these poor red apples will stimulate the demand for a golden yellow apple. A tree of Grimes' Golden, with irrigation, should bear annually and not less than two barrels per tree after the trees are eight or ten years old. This apple is very easily kept free of every fungus growth, and only a moderate amount of spraying is necessary to ensure over ninety per cent. perfect fruit.

**Snow, or Fameuse**, as nurserymen call it, is possibly the next most valuable apple for this climate. The tree is hardy and a rapid grower. In this respect it is about equal to Grimes' Golden. I do not think it is quite as productive, and it will not come into bearing quite as young. The apples, however, will sell for a high price. Central Michigan, where my orchard is located, seems to be perfectly adapted for the growth of Snow apples, and as this variety is not sent East from the Pacific Coast, it may be that the very highest price could be obtained for this apple on account of its high quality, fine flavor and freedom from Western competition. It is the most difficult of all ordinary fruit to keep free from scab, and on this account perfect specimens are rarely obtained except with thorough spraying. This variety is somewhat subject to blight, and extreme care is necessary to keep blighted limbs cut out on their appearance, and the knife used to do this work should be dipped in concentrated Lime Sulphur Solution before each cut is made, so that there will be no danger of inoculating the wound with the spores of the blight. If possible, also paint the part of the tree exposed by the cut with concentrated Lime Sulphur Solution. I believe a commercial orchard should contain a considerable percentage of Snow apples.

**Wealthy** is a red, fall apple and in cold storage becomes a winter apple. It is the most beautiful apple of its season and the quality is very good. It would probably bring more money than any other apple that could be marketed before winter apples are ready to pick. The tree is perfectly hardy. I think a commercial orchard should contain a large percentage of Wealthy apples.

Wealthy is probably more susceptible to blight than Snow apples, and consequently must be carefully watched to see that this very dangerous disease does not become established.

**Jonathan** with me has not been as productive as either of the above mentioned varieties; neither is the tree as rapid a grower,

and it requires a much richer soil. I think it would prove a profitable variety to raise on rich land, and Jonathan apples bring fancy prices.

**Spy**—The main objection to this variety is that it takes ten to twelve years before it begins to bear. In the meantime, however, the tree is growing rapidly, and when it begins to bear it has a crop worth while. It is especially adapted for soils that are not rich and where conditions are not favorable, and a planter should give preference to this variety if the trees are to be planted where they will not receive personal care and attention. My Spy trees have not once failed to bear a fair crop of apples in the last twelve years. Under high culture the fruit develops bitter spots under the skin before the apple is ripe. I believe this is the same as the so-called "Baldwin Spot."

**Mother** is a very beautiful, early winter apple resembling the Spitzenburg. The tree, however, is hardier and I think more productive, although not so rapid a grower. I believe this apple is superior in flavor and aroma to the Spitzenburg, although more mild. Mother apples are not grown commercially by any one so far as I know, and only a few nurseries have the trees to offer. There would be no advantage in planting them except on well drained, rich ground that could be favored by a supply of irrigating water at least once should a drought occur, but under these conditions I do not think it is equalled in flavor and appearance by any other apple.

The Department of Agriculture for Ireland gives a list of apples which they consider best. This list does not include a single variety that originated in America, except Mother, but this variety is very highly recommended.

Mother apples do not tend to grow in clusters, and a very high percentage of the fruit produced is perfect. The Year Book of the U. S. Department of Agriculture for the year 1909 speaks very highly of this variety.

**Wagener** is the most prolific bearer of all apples that I have tested. It begins to bear when very young. It grows very rapidly until it begins to bear, after which time it is not as good a grower as any of the preceding varieties. For this reason it is especially well adapted to be used as a filler, and for this purpose it probably has no equal, Wealthy being the only other highly desirable apple that is adapted to use as a filler. Wagener apples have an attractive appearance, are good keepers and have a very pleasant but mild flavor. The three principal objections to this variety are as follows: The apples tend to grow in clusters, whereby the percentage of symmetrical and perfect fruit is not what it otherwise would be. The tree blights somewhat and it requires considerable attention to cut out blighted wood before the blight has time to spread, and on this account the Wagener apples should not be planted in orchards that are not going to receive constant attention during the growing season. Wageners are also somewhat susceptible to sun scald, but this can probably be thoroughly controlled by rendering the trunks of the trees light colored by the use of lime-sulphur or a mixture of lime-sulphur and lime applied to the tree late in the fall.

**Oldenburg**—For a summer or fall apple this variety is very good.

The tree is hardy, prolific and comes into bearing when five or six years old, and if a market could be found for these apples, they would undoubtedly be profitable.

**MacIntosh** resembles the Snow, except that it is larger and higher colored. In many localities it is considered a very desirable apple commercially. Like the Snow, it requires very thorough spraying in order to get perfect fruit. I do not think the flavor of this apple is even approximately equal to Snow, although many consider it very good, and as it is less liable to blight and probably more productive than the Snow apple, the desirability of planting MacIntosh instead of Snow apples depends upon whether the market calls for a good-looking apple or a very highly flavored apple.

**Yellow Bellflower**—This is a good quality yellow winter apple. The tree is hardy and a rapid grower. I would recommend the planting of a few of these trees in a commercial orchard and using them for a trap to bait the Codling Moth. For some reason which I have never heard explained, the Codling Moth seems to prefer this variety of apples to any other, and it might be that where there were a number of these trees, the moth would abandon the other trees in favor of the Yellow Bellflower, in which case it would only be necessary to use the poison spray on these trees. In my own experience, ninety-eight per cent. of the fruit on most other varieties will be free from worms, and at the same time more than one-half of the Bellflowers will be wormy. In all desirable features it compares very closely with Grimes' Golden. Possibly the flavor is not as good, but the apples keep a little better.

**Golden Russet**—The tree is thrifty and hardy and reasonably productive, and would probably prove profitable, although some of the above varieties would be more profitable.

**Primate** is a very desirable early apple for home use. The tree is hardy and does not blight. The fruit is not especially susceptible to scab, and the quality of the fruit is the best of its season. The greenish color of the fruit does not make it particularly attractive as a market fruit, and the fact that the fruit does not ripen evenly is against it for market use, but very much in its favor for the home orchard, where specimens begin to ripen the first of August and continue to ripen throughout the month, and specimens that are not over ripe may frequently be obtained in September.

**Williams** (sometimes called "William's Favorite") is an early red apple of a most beautiful appearance and of very good flavor, and the tree is hardy. It would probably be profitable commercially where a fancy price could be obtained for a fancy apple.

In the above I have recommended nothing but high quality fruit, and I know of no high quality varieties aside from the above that it would pay to plant in a commercial orchard in Michigan.

**Baldwin** is not very hardy and is slow coming into bearing. **Rhode Island Greening** bears but little fruit in this climate. **Roxbury Russet** is not hardy. These are the varieties which are mostly grown in the apple districts of New England and Western New York.

Probably an orchard composed of **Grimes' Golden**, **Wealthy** and **Snow**, with **Spy** apples for the poorest land on the ridges, and **Jonathan** for the richest soil, with the addition of a few **Bellflowers** to trap the worms, would be more profitable than an orchard with a greater number of varieties.

Do not plant varieties of apples that are especially susceptible to blight, as the disease is very contagious and hard to cure, but may be controlled if the following varieties are not planted: All varieties of **Crab Apples**, **Sutton**, **Gravenstein**, **Tolman's Sweet**, and, to a less extent, **Yellow Transparent**, **Alexander** and all other Russian apples.

### GROWTH OF TREES.

In my own orchard I have followed the ideas above outlined to a greater or less extent, and the growth of the different varieties of trees is shown in the following table:

During the first nine years of their life the following trees increased in diameter at the rate per year indicated. The diameter refers to the spread of the limbs.

Between 9 and 12 years the corresponding rate of growth was as indicated:

VARIETY	First 9 Years	9th Year to 12th Year	REMARKS
BALDWIN .....			Not hardy when young. Sometimes hardy after reaching bearing age, and then a prolific and desirable apple.
BARRY .....			Extremely rapid grower, but blights very badly.
BEN DAVIS .....			Rapid grower.
COX'S ORANGE PIPPIN..	1 ft., 4 in.	1 ft., 4 in.	Not hardy. Apple not attractive color.
ESOPUS SPITZENBURG ..	2 ft., 0 in.	1 ft., 8 in.	Not hardy. Blights somewhat but desirable for home use.
FAMEUSE (SNOW) .....	2 ft., 6½ in.	1 ft., 8 in.	Blights some but otherwise very desirable.
GOLDEN RUSSET .....	2 ft., 3 in.	1 ft., 4 in.	Hardy.
GOLDEN SWEET .....	2 ft., 8 in.	1 ft., 8 in.	Hardy; not very prolific.
GRAVENSTEIN .....	1 ft., 8 in.	2 ft., 0 in.	Blights badly. Sun scalds. Not very prolific.
GRIMES' GOLDEN .....	2 ft., 2 in.	2 ft., 4 in.	Desirable every way except in color of fruit.
JEFFERIS.....	1 ft., 4½ in.	1 ft., 4 in.	Very high quality; not very prolific but bears some fruit annually. Very desirable for home use.
JONATHAN .....	2 ft., 0 in.	1 ft., 4 in.	Desirable.
LADY'S SWEET .....	1 ft., 8 in.	1 ft., 8 in.	Best winter sweet apple.
MANN .....	2 ft., 1½ in.	1 ft., 0 in.	Poor quality. Not prolific.
MACINTOSH RED.....	2 ft., 3 in.	1 ft., 0 in.	Desirable winter apple; very fine color; prolific; scabs badly; quality not equal to Fameuse.
MOTHER .....	1 ft., 0 in.	1 ft., 4 in.	Highest quality.

VARIETY	First 9 Years	9th Year to 12th Year	REMARKS
NEWTON PIPPIN .....	1 ft., 4 in.	0 ft., 4 in.	Neither prolific nor hardy.
NORTHERN SPY .....	2 ft., 0 in.	2 ft., 0 in.	Highest quality. Especially desirable for poor land.
OLDENBURG .....	1 ft., 9½ in.	1 ft., 4 in.	Good early apple. Hardy.
POMME GRIESE.....	1 ft., 6 in.	1 ft., 4 in.	Very small but a highly flavored russet.
PRIMATE .....	1 ft., 8 in.	1 ft., 4 in.	High quality; desirable for home use; summer apple.
PORTER .....	1 ft., 6 in.	1 ft., 8 in.	High quality; desirable for home use; fall apple.
PUMPKIN SWEET .....	1 ft., 6 in.		Very good fall apple, desirable for the home orchard.
RED CANADA (Steel's Red)	1 ft., 7 in.	2 ft., 0 in.	A late keeper; high color and best quality; desirable in all respects except rather slow grower.
RHODE ISLAND GREEN- ING .....	2 ft., 3 in.	3 ft., 4 in.	Not prolific.
ROXBURY RUSSET .....			Not hardy.
SWEET BOUGH .....			High quality. Moderately hardy.
STAYMAN .....	2 ft., 5 in.	1 ft., 0 in.	Hardy and may prove very desirable.
STUMP .....	1 ft., 4 in.	0 ft., 8 in.	Slow grower; not productive.
SUTTON BEAUTY .....	1 ft., 0 in.		Blights badly.
TOLMAN'S SWEET .....	2 ft., 0 in.	1 ft., 4 in.	Blights badly; not equal to Lady's Sweet.
TOMPKINS KING .....	2 ft., 6 in.	2 ft., 6 in.	Not very hardy or productive.
WAGENER .....	1 ft., 7 in.	2 ft., 0 in.	Extremely productive; blights and sun scalds to a limited extent.
WALBRIDGE .....			Rapid grower; hardy; Poor quality.
WEALTHY .....	1 ft., 11 in.	0 ft., 8 in.	Probably best apple of its season, which follows Oldenburg.
YELLOW BELLFLOWER .....			Strong grower. Desirable but probably not equal to Grimes' Golden.
YELLOW TRANSPARENT	1 ft., 4 in.	1 ft., 4 in.	Poor quality. Blights somewhat.
YORK IMPERIAL .....	1 ft., 7½ in.	1 ft., 0 in.	Does not come into bearing until 10 or 12 years old; not very prolific; hardy.

The maximum amount of fruit that a tree will hold is shown by the following chart:

### CURVE OF MAXIMUM APPLE CROPS

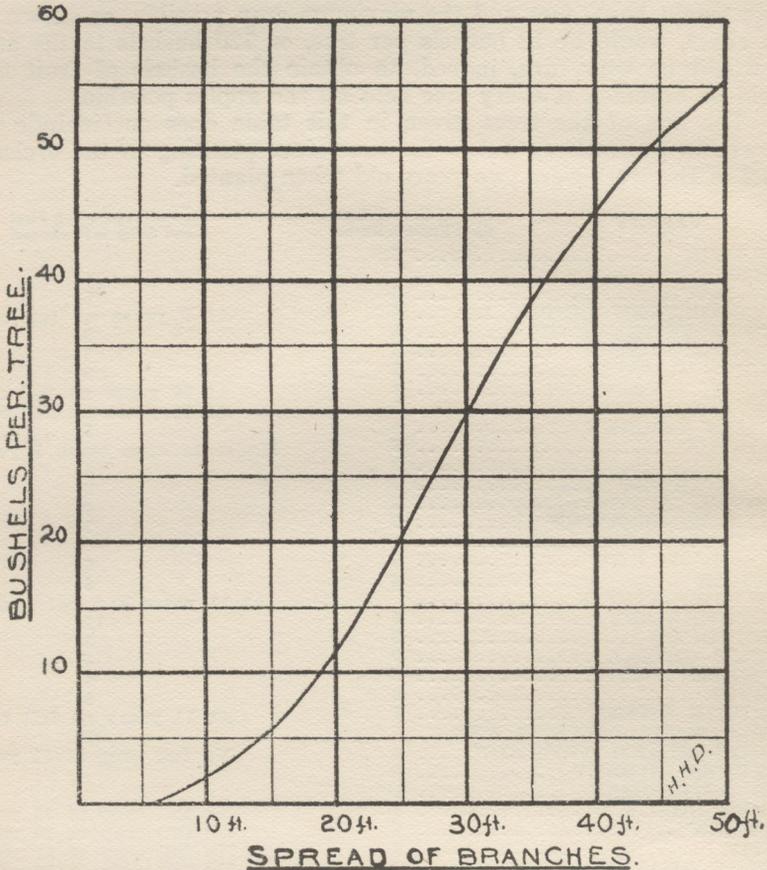


Chart showing the largest possible crop of apples that various sized trees can bear.

By combining the chart and the table, it will show the possible yield of various varieties of fruit for different aged trees. For example, the table shows that the Wagener tree increased in spread of the branches at the rate of 1 foot 7 inches per year for the first nine years. At the end of this period the tree, therefore, had a diameter of a little over 14 feet. By referring to the chart it will be found that 14 feet corresponds to about five bushels per tree. It should be understood that this is the maximum crop that a tree of this size can bear and, of course, very few trees ever bear the maximum crop, but providing each tree in an acre bore all it would hold and there were 60 trees to the acre, it is evident it would be possible for this acre of trees to carry 300 bushels of apples. Where there are 60 trees to

the acre, they would not begin to crowd each other until after the limbs had a spread of 20 feet or more. On older and larger trees a bigger output is possible. For example, from this same table, if the Wageners were twelve years old instead of nine, the spread of the trees would be 20 feet and the maximum crop possible, as shown by the chart, would be 12 bushels per tree, or 720 bushels to the acre. It would be very rare, indeed, to obtain the bushels of fruit that could be obtained if every tree held all the apples possible.

The age of the trees given in this table does not include the growth in the nursery but is the time since planting in the orchard. Most of the trees were two years old when planted.

VARIETY	Age of Tree When First Fruit is Borne	Age of Tree when First Good Crop is Produced
BALDWIN	5	
BARRY		
BEN DAVIS	3	5
COX'S ORANGE PIPPIN	7	At 9 years no full crop
ESOPUS SPITZENBURG	5	9
FAMEUSE (SNOW)	5	7
GOLDEN RUSSET	5	9
GOLDEN SWEET	4	At 10 years no full crop
GRAVESTAIN	5	At 11 years no full crop
GRIMES' GOLDEN	4	5
JEFFERIS	6	Moderate crop since 7 years
JONATHAN	3	8
LADY'S SWEET	9	9
TITOVKA	2	4
BELLE DE BOSCOMP	2	7
MANN		
MACINTOSH RED	4	6
MOTHER	4	6
NEWTOWN PIPPIN		At 11 years had not fruited
NORTHERN SPY	5	11
OLDENBURG	3	5
POMME GRIESE	3	4
PRIMATE	5	6
PORTER	6	9
PUMPKIN SWEET	7	At 11 years no full crop
RED CANADA (STEEL'S RED)	5	8
RHODE ISLAND GREENING	4	No full crop at 11 years
ROXBURY RUSSET	5	
RED ASTRACHAN	4	
SWEET BOUGH	3	No full crop at 11 years
STAYMAN	6	No full crop at 10 years
STUMP	9	No full crop at 11 years
SUTTON BEAUTY	8	No full crop at 10 years
TOLMAN'S SWEET	6	9
TOMPKINS KING	7	9
WAGENER	3	4
WALBRIDGE	4	5
WEALTHY	3	4
YELLOW BELLFLOWER		6 or 7 years
YELLOW TRANSPARENT	3	5
YORK IMPERIAL	10	No full crop at 10 years
WILLIAM'S FAVORITE	4	6

¶ The best flavored dessert apples, arranged according to their season of ripening in the writer's orchard are as follows:

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Early Harvest

Primate

Early Joe

Jefferis

Porter

Autumn Swaar

King

Mother

Snow

Grimes Golden

Spy

Spitzenburg

Red Canada

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### SWEET APPLES

Sweet Bough

Golden Sweet

Pumpkin Russet

Lady Sweet

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### RUSSETS

Pomme Griese

Golden Russet

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