

PAUL THAYER



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THESIS

The Peach Industry
of Michigan
Paul Thayer
1900

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THESIS.

THE PEACH INDUSTRY OF MICHIGAN.

BY

PAUL THAYER

CLASS OF 1900.

MICHIGAN AGRICULTURAL COLLEGE.

JUNE 1900.

THESIS

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Besides her mines and forests, Michigan is justly famed for her agricultural resources. No fruit has done more to attract attention to the fruit belt of Michigan than the peach. For over fifty years the "peach belt" of Michigan has been well known and now, when Michigan peaches are being shipped to the eastern markets and especially to Philadelphia, situated so near to the two greatest peach producing states of the Union, Delaware and Maryland, it would seem that Michigan is not losing her place as regards peach growing.

At present there are over 50000 acres of peach orchard in Michigan, containing between 6500000 and 7500000 trees. The yield of peaches in 1898 was 1872000 bushels and the value of the crop must have been not far from one and one-half million dollars.

Distribution.

Peaches are grown to a greater or less extent in almost every county of the lower peninsula of the state. In the lower four tiers of counties, twenty-eight in all, there are but five which have less than 100 acres each while eight counties have from 1000 to 9000 acres each. There are, however, three more or less distinct "peach belts" or districts. The accompanying map gives the acreage of the counties of the state where it exceeds 100 acres and also the location of the three peach districts.

Peach Belts or Districts.

The first, which may be termed the South Haven District, embraces Van Buren County and portions of Berrien and Allegan Counties, and

contains about 18000 acres of peach orchard. This is the largest district and also the oldest, since it includes the old St. Joseph district of twenty years ago.

The second, or Grand Rapids district, embraces portions of Kent, Ionia, Barry, Ottawa, Muskegon, and Allegan Counties and contains about 13500 acres of orchard.

The third district, which I have called the Oceana district, is considerably smaller. It embraces the portions of Oceana and Mason Counties nearest Lake Michigan, extending down into Muskegon County, and contains about 6000 acres of orchard.

Besides these districts there are other localities where peaches are grown more or less extensively. In the western portion of Benzie County, peaches are beginning to be raised quite extensively. Oakland County contains 1200 acres of orchard scattered quite generally over the county. Peaches are also raised to quite an extent about Ann Arbor and in the northern part of Lenawee County.

History.

The story of the introduction of fruit into Michigan is the story of the settlement of the state. Hardly a pioneer pushed beyond the clearings and homed out for himself a home in the wilderness who did not bring with him the seeds of our common fruits, and, as the forest was cleared from around the dwelling, an orchard of apple, plum, pear and peach trees replaced it. Of course, some locations proved to be unsuitable for fruit, but from the first the Michigan farmer appreciated the value of fruit and whenever possible, provided himself with it.

The history of the peach industry of Benton County is perhaps more interesting than that of any other section of the state. To the student, it has all the extravagance of the story of California in '49. The earliest settlers brought peach pits with them and planted them around their homes. In the thirties peaches were brought down the river by boat from Niles and Royalton and peddled in St. Joseph. In 1839 the first peaches were sent to Chicago from St. Joseph. The next year, Captain Broughton purchased peaches in St. Joseph, packing them in boxes and barrels, and took them to Chicago, selling them at unheard-of prices, a single barrel selling for \$45. This, like the discovery of gold at Sutter's mill, started the "fever" and everyone planted peaches. No improved fruit went to Chicago until 1844 when a very few Crawfords were sent. From 1845 the shipments of fine fruit increased from a few thousand (three-peck) baskets to several thousand in 1855. Many of these peaches were sold in St. Joseph to Chicago buyers for \$3.00 a basket. By 1850 the shipments from St. Joseph amounted to 10000 baskets.

The returns from the industry were immense. In 1865 a block of forty-one Early Crawford trees produced 1100 baskets of fruit selling for \$2200. Allowing one hundred nine trees to the acre, would make the income from an acre of such trees \$5848. In 1865 or '66, five acres of bearing peach trees were bought for \$1350. The first crop yielded \$1800. The orchard was then sold for \$7000. The next crop brought \$2000 and the succeeding crop \$4000.

In 1862, the yellows first made its appearance but it was several years before it became of great importance. In 1869 there

near 19'2 acres of peaches or 352530 trees and in 1872 there were 594462 trees or nearly 5000 acres of peaches in the county. In 1874 careful estimates credited Berrien County with 6000 acres of peach orchard. This was the high tide of the industry; prices were high and profits large, several boat lines did a prosperous business carrying the immense crop to Chicago. It was then that the yellows began its disastrous work. At first, men who noticed the trees ripening prematurely with highly colored fruit, thought they had discovered some new variety and hastened to bud from the diseased trees. As the trees began to die by the hundreds and thousands, the growers began to realize the nature of the scourge but were powerless to prevent it. Orchard after orchard was wiped out. In 1879 the acreage was only 1055; in '82 it was 777, and in 1886 there were only 111 acres of peaches in the county. Then the tide again turned, men found that, while there was no cure or preventive of the yellows, it could be held in check by the prompt destruction of diseased trees, and peach orchards were again planted. Year by year the orchards have increased so that in 1898 there were nearly 4500 acres of peaches in the county.

The first peach pits planted in Van Buren County were planted in 1836. By 1860 several large orchards had been set. After 1870 the planting increased rapidly. The same story of high prices and large returns applies to Van Buren as to Berrien County. From 1881 to 1885 the acreage of peach orchards greatly increased until in 1898 there were 5491 acres in the county. Yellows made its first appearance in 1873 but on account of better control it did much less damage than in Berrien County.

In 1836 there was a peach orchard on Peach Orchard Point in the Kalamazoo River in western Allegan, probably planted by the French traders. The early settlers between 1831 and 1850 planted peach pits and before the war small "hookers" came to Saugatuck for loads of half-grown fuzzy peaches which they sold along the lake farther north. About 1867 - '68 orchards began to be planted for the Chicago market. In 1879 the value of the peaches in the lake shore townships was \$200000 and in Canges alone was \$50000 or \$70000. Since then the orchards have grown until in 1898 they comprised 9141 acres.

The history of the other sections contains nothing of peculiar interest. Peaches were grown at first in limited amount, gradually increasing as the adaptability of the location and the development of outside markets made increase possible, until the present condition has been attained.

Soil.

Probably no state has such a diversity of soils as Michigan. It is rarely necessary to go out of a township to find all gradations from the heaviest to the lightest soils, while often these variations are seen in the same field. Although the location is of much more importance than the soil, yet the nature of the soil is a very important element in deciding the adaptability of land for peaches. A very large porportion of the peaches are grown on light sandy loam such as is termed "oak openings" land. It would seem that soil could hardly be too sandy for peach trees to live for I have seen them on the lake shore half buried in the drifting

sand. That such trees bear as fine fruit as trees on heavier soil cannot be claimed. On the other hand, I have seen peach orchards on quite heavy clay land. Neither of these extremes are typical peach soils for the bulk of the peaches are grown on a soil intermediate between the two.

Location.

More important than the soil is the location. Along the eastern shore of Lake Michigan are grown over half the peaches of the state, protected by the lake. The importance of this lake protection can hardly be estimated. Even near the lake there is not perfect protection from severe winter, and late spring frosts, yet there is never a total loss. Even in 1895 when a severe frost occurred on May 28th, there was a slight crop. The winter protection was well shown in the winter of 1898 - '99 when very severe cold weather was experienced all over the state. In the districts back from the lake, as the Grand Rapids district, Ionia County, Oakland County, Lenawee County and the Ann Arbor region, the loss of trees from freezing was very great, while along the shore of Lake Michigan, as in the South Haven district, the loss was comparatively slight. Even in the South Haven district, distance from the lake affected the condition of the orchards. Orchards away from the lake are usually situated on high land to allow good air drainage. Advantage is often taken of the protection afforded by the small inland lakes. At first the orchards were planted in the valleys to protect them from the bleak winds but soon it was found that the cold air draining from the hills into the valleys was more to

be feared than black winds. As regards disposing of the fruit, a good location means one convenient to market or to a shipping point. If there is competition in the carrying of the fruit, as is the case with that grown along the lake shore, which can be shipped either by lake or by rail, there is a decided advantage.

Varieties.

It would seem that no fruit has so many varieties in general cultivation as the peach. With most other fruits there are three or four "standard" varieties which represent the bulk of that fruit raised. Nearly half of the grapes raised - if you exclude the California grapes - are Concord. With peaches, however, there are a great number of varieties.

In response to letters to nurserymen asking for lists of the ten varieties, in order of importance, of which they sold the most, the following twelve lists were received.

1.	2.
Early Crawford.	New Profific.
Late Crawford	Hill's Chilli
Elberta	Fitzgerald
Hill's Chilli	Elberta
Kalamazoo	Late Crawford
Yellow St. John	Beers Smock
Bronson	Engles Mammoth
Beers Smock	Kalamazoo
Barnard	Salway
Gold Drop	Early Crawford

3.

Hill's Chilli
 Gold Drop
 Lemon Free
 Markham
 Beers Smock
 Kalamazoo
 Engles Mammoth
 Bernard
 Crane's Early
 Early Michigan

4.

Lewis Seedling.
 Elberta
 Gold Drop
 Kalamazoo
 Yellow St. John
 Fitzgerald
 Engles Mammoth
 Stevens Rarripe
 Beers Smock
 Crosby

5. 4

Early Crawford.
 Elberta
 Wheatland
 Bridon
 Yellow Rarripe
 Hill's Chilli
 Engles Mammoth
 Mountain Rose
 Smock
 Late Crawford.

6.

Kalamazoo
 Elberta
 Beers Smock
 Hill's Chilli
 Early Crawford
 Late Crawford
 Gold Drop
 Early Bernard
 Lewis Seedling
 Salway

7.

Hill's Chilli
 Kalamazoo
 Late Crawford
 Chair's Choice
 Michigan
 Elberta
 Yellow St. John
 Early Crawford
 Smock
 Triumph

8.

Late Crawford.
 Early Crawford.
 Kalamazoo
 Hill's Chilli
 Yellow St. John
 Gold Drop
 Chair's Choice
 Fitzgerald
 Triumph
 Beers Smock

9.	10.	11.
Kalamazoo	Triumph	Elberta
Gold Mine	Yellow St. John	Early Crawford
Elberta	Barnard	Late Crawford.
Engles Mammoth	Early Crawford	Barnard
Gold Drop	Late Crawford	Fitzgerald
Crane's Early	Early Rivers	Smock
Smock	Hill's Chilli	Hill's Chilli
Salway	Stevens Rareripe	Globe
Snow's Orange	Chair's Choice	Crosby
Lewis Seedling	Smock	Yellow St. John

	12.
Kalamazoo	Hill's Chilli
Conklin	Salway
Gold Drop	Lewis Seedling
Beers Smock	Fitzgerald
Engles Mammoth	Chair's Choice

These answers may be tabulated as follows:-

Smock	12	Early Crawford	7	Salway	4
Hill's Chilli	10	Gold Drop	7	Chair's Choice	3
Elberta	8	Engles Mammoth	7	Triumph	3
Late Crawford	8	Barnard	5	Early Michigan	2
Crane's Early	8	Fitzgerald	5	Stevens Rareripe	2
Yellow St. John	6	Lewis Seedling	4	Crosby	2
Kalamazoo	7				

Gold Mine	Yellow Rareripe
Conklin	Mountain Rose
Lenon Free	Globe
Whetland	New Prolific
Brigdon	Bronson
Markham	Snow's Orange

Lists of prominent peach growers in the different peach growing sections of the state were secured. These were written to for lists of their ten best varieties.

From the South Haven District I received six lists of ten varieties each and one of eight varieties. A summary of the seven lists is as follows.

Snock	7	Hale's Early	3	Conklin
Gold Drop	6	Kalamazoo	2	Late Crawford
Lewis Seedling	6	Early Crawford	2	Globe
Engles Mammoth	6	Jacques Rareripe	2	Hill's Chilli
Elberta	4	Oldmixon	2	Rives Favorite
Salway	3	Brandywine	2	Wark
Yellow St. John	2)	3	2	Foster
Crane's Early	1)			
Stevens Ear ripe	3	Barnard		Clifton Allen
Crosby	3	Mountain Rose		Keyport White

From the Grand Rapids District three reports were received summarized as follows:-

Smock	3	Barnard	2	Snow's Orange
Hill's Chilli	3	Kalamazoo		Crosby
Early Crawford	3	Fitzgerald		Hale's Early
Late Crawford	3	Chair's Choice		Reves Favorite
Early Michigan	3	Yellow St. John		Oceana
Elberta	2	Triumph		Jacques Eareripe

From the Oceana district four reports were received summarized as follows:-

Cold Drop	4	Barnard	2	Early Michigan
Hill's Chilli	3	Hale's Early	2	Globe
Crane's Early	3	Bronson	2	Reves Favorite
Early Rivers	3	Kalamazoo		Jacques Eareripe
Engles Mammoth	2	Elberta		Davidson
Conklin	2	Salway		Olmstead's Best
Beers Smock	2	Lenon Free		Wonderful
Early Crawford	2	Markham		Wager.

From Ann Arbor and Lenawee four reports were received summarized as follows:-

Early Crawford	4	Crosby	2	Cold Drop
Late Crawford	4	Stump	2	Salway
Elberta	3	Barnard	2	Crane's Early
Smock	3	Mountain Rose	2	Triumph
Oldmixon	3	Hill's Chilli		Kalamazoo

Wheatland	Susquehanna
Red Cheek	Early Rivers
Hale's Early	Foster
Richmond	Schumaker
	Wager

As a final summary of all the reports, the following are the varieties that received mention five times or above in the thirty reports.

Smock	27	Elberta	16	Hale's Early	7
Hill's Chilli	18	Engles Mammoth	15	Early Michigan	6
Early Crawford	18	Kalamazoo	12	Triumph	5
Cold Drop	18	Barnard	12	Stevens Rareripe	5
Late Crawford	16	Lewis Seedling	10	Oldmixon	5
Yellow St. John	9)	Salway	9	Bronson	5
Crane's Early	7)	Crosby	8		
	16	Fitzgerald			

A careful examination of these summarized lists will show a very marked similarity in the ranking of varieties. While the relative positions of the varieties differ in the different summaries yet the order of importance of varieties as given by the nursery-men, the growers in the South Haven district, and the growers in the Grand Rapids district, correspond in a very marked degree to each other and to the final summary.

In answer to requests to the various nurserymen to send the names of promising new varieties, the following names were given:-

Fitzgerald	Pierces Yellow	New Prolific
Chair's Choice	Garman	Lockwood
Mc Alister	Gold Mine	Billmeyer
Banner	Triumph	Aylesworth Late
Matthews Beauty	Davidson	Admiral Dewey

Cultivation.

Farmers in nearly all sections of the state give the peach orchards good cultivation, much better than they give their apple orchards. It is a very rare occurrence, in travelling over the country, to see a peach orchard grown up to grass and weeds as are so many apple orchards. The usual cultivation begins with the shallow plowing of the ground as early in the spring as is safe. Too early plowing may start the buds too soon and render them susceptible to frosts, while too late plowing permits too great loss of moisture. This is followed by the continuous use of a light smoothing harrow, going over the ground once a week or oftener, or after every rain. If the soil tends to become hard, it is customary to plow it or harrow it with a springtooth harrow two or three times during the season. About the first of August cultivation ceases and sometimes a cover crop is sowed. The tendency at present seems to be toward the use of a springtooth harrow rather than a plow to give the ground a general stirring once a month or so, always following it with the smoothing harrow.

Twice each year the trees are, or should be, carefully examined for borers and the borers removed. Some try preventives but the old method of examination seems the most satisfactory.

Pruning.

In the larger and older districts, as the South Haven and Grand Rapids districts, the trees are, as a rule, carefully pruned, the prevailing method being heading in so as to give a low vase-shaped head. Sufficient wood is removed from the inside of the tree to permit the entrance of the sun. In newer sections, as the Oceana district, or in sections where peaches are grown in smaller amount, there is less attention given to careful systematic pruning.

Thinning.

The one phase of peach growing that has come into prominence in the past few years is the thinning of the fruit in the early summer. It was but a few years ago that the only thinning done was in years of exceeding plenty when a portion of the fruit would be removed to prevent the breaking of the limbs. As never half enough peaches were removed, the limbs would bend as the peaches swelled and the farmer would be kept hard at work placing props under his trees to keep them from breaking. The crop obtained depended entirely upon the season. If the season was favorable, with plenty of rain, he would obtain a large crop of undersized peaches; but if the weather was dry, he would have only a lot of half grown peaches, little larger than hickory nuts and worthless for any market. Since then, the farmers who have made peaches a specialty have found that careful, systematic thinning is profitable. When done thoroughly, the trees are gone over as carefully as in picking and the peaches are removed so as to leave but one or two on each short shoot. The rule is to thin so that the peaches shall

be six inches apart but many growers extend the distance to eight inches as it is a difficult matter to thin the trees sufficiently. This thinning is done during the first half of June, or as soon as the peaches are large enough to be easily removed. When the trees are thinned at this time the crop, while of nearly the same bulk, is much finer in quality and the tree is in better shape for a crop the succeeding year. In the South Haven district, nearly all the farmers make a regular business of thinning their trees each spring unless the indications point to a very light crop. Around Grand Rapids, the growers thin quite thoroughly, but east of Grand Rapids nearer Ionia, only a few growers thin to any extent. In the Oceana district, there is but little thinning done, a few of the best growers being the only ones to thin. The tendency is, however, toward more careful thinning. In Lenawee and Ann Arbor and the lesser peach districts of the state, little or no attention is paid to this most important element in peach culture.

Packages.

There are various forms and sizes of packages in use over the state. The standard, and the package probably most used is the ordinary bushel basket. A package coming into quite general use, especially for those peaches which are used solely for the table or eating out of hand, as the earlier peaches, is the Climax fifth bushel. It is a very handy basket and is of convenient size. In some localities, half-bushel and third-bushel baskets are used, as well as crates. The Florida six-basket crate, which holds about two-thirds of a bushel, is much used in the South Haven district. Its use is restricted to fancy fruit by its expensiveness, though

some shippers attempt to take advantage of this custom and ship medium or ordinary fruit in it with the hope that the package will be sold unopened and the shipper receive more than the actual value of the fruit. Other crates are used as the plum crate, and the Delaware (grape) crate, which are made with a single tier of baskets instead of two, as in the Florida crate, and which have four, six, or eight, square or oblong shallow baskets. Along the lake shore peaches are packed chiefly in bushel and fifth-bushel baskets, while on the Grand Rapids market, the bushel basket is almost the only package.

Marketing.

A large proportion, probably not far from 50%, of the Michigan peaches are handled by commission men in Chicago and Milwaukee, yet each year more and more peaches are disposed of through other means. There is more or less dissatisfaction always experienced in dealing with commission men. The opportunity which the commission man has to make false returns is so great that the farmer constantly feels that he is being wronged whether he is or not. With the exception of the counties in the eastern part of the state, Washtenaw and Lenawee, where the industry is not so large nor so localized as in the western part, there seems to be an increasing tendency to sell, whenever possible, at home. The reports show that a larger proportion of the crop is sold each year.

In Mason County the peaches have been shipped to Milwaukee until the last two or three years, when they have been sold to buyers. In Oceana, the bulk is shipped to Chicago and Milwaukee while the

tendency is to sell more to buyers who ship in car lots. The shipping points are Shelby, Pentwater, Hart, Mears, and New Era.

In the disposition of fruit, Grand Rapids is peculiar. All the fruit raised within hauling distance of Grand Rapids is brought to a marketplace and sold there to buyers. A few years ago, some of the growers became dissatisfied with the prices received from the buyers and tried shipping, but soon returned to the former plan. The peaches in eastern Ottawa County go to the Grand Rapids market while those along the lake are shipped from Holland and Grand Haven to Milwaukee and Chicago.

The growers in the vicinity of Lowell sold to buyers in 1898, but previous to that time, they shipped to towns and cities in the state. Lowell is quite a shipping point, sending out fifteen to twenty cars a day in the height of the season. In Ionia County, the peaches are mostly sold to buyers, shipping on commission not being found satisfactory. The fruit is shipped from Sargene and Clarksville, Sargene alone shipping 60000 bushels in 1898. It is sent to local points east in the state. In some instances it has been sent to New York and New England.

The Allegan and Van Buren peaches that are shipped go to Chicago and Milwaukee by daily lines of steamers. Besides this, there are the stations of East Soudack, New Richmond, Fenville, Pearl, Bravo and Hopperstown on the Pere Marquette, which aggregate 1500000 baskets in a single season, shipping as high as 80000 baskets, or forty cars in a single day.

Almost all the peaches in Berrien County pass through Benton

Harbor or St. Joseph. These towns are each on the Pere Marquette while each has railroad connection with Indiana, Benton Harbor having a branch of the "Big Four" and St. Joseph a line running to South Bend and now the property of the "I.I.I." road. They are also connected with Chicago and Milwaukee by two boat lines, one line operating a fleet of four large vessels. Until a few years ago nearly all of the peaches were sent to Chicago and Milwaukee but now a considerable portion is sent to Indiana. In 1897 and 1898 the "Big Four" hauled about 400 cars of peaches each year averaging 10000 lbs. to a car, while in 1896 - 7 - 8 the "Vandalia" (now the "I.I.I.") hauled from St. Joseph from five to ten cars a day during the two months of peach and grape season. Besides this there are a number of buyers who ship direct to the East in car lots.

Of course the peaches in Ann Arbor and Lenawee district go chiefly to commission men in Detroit and Toledo.

Cooperative Packing.

Some attempts at cooperative packing have been made with very good success. Oceana has one packing house at Shelby and there are two at Fennville in Allegan County. These packing houses seem to be eminently satisfactory and the reports received from them set forth the advantages of the system. They seem to be economy in the purchase of packages, in packing and handling; handling in car lots and thus attracting buyers; and establishing fixed and uniform grades of fruit so that the buyers can, by examining a few

packages, know what the shipment contains, or after once purchasing can order by wire. The supporters of this system believe, and rightly too, that a buyer will give more per bushel if he can examine a few baskets at the packing house and give his order, knowing that his car will be filled with a certain grade of peaches, uniformly packed, than he will give if he has to buy by the wagon load, examining each load, running more risk of dishonest packing, and having no uniformity whatever in peaches or in packing.

Yellows.

This disease has played such an important part in the history of the peach industry of this country that a word regarding its history will not be out of place. It was first noticed in the orchards near Philadelphia nearly a century ago and early received the name of yellows from the appearance of the affected tree during the late stages of the disease. It has at different times been ascribed to conditions of the soil, of weather, and to injuries from insects or animals but as yet no cause can be found. There have been a number of epidemics of the disease, the one most affecting Michigan being in 18~~56~~⁵⁷ - 7 - 8. Its history in Michigan has been told in connection with the history of the counties.

Since these epidemics the growers in the South Haven district feel able to cope with the disease. While no cure or preventive is known, a prompt destruction of affected trees holds the disease well in check. Each township has its yellows commissioners yet but few peach growers wait for the commissioner but carefully guard their own orchards by constant watchfulness. Of course

there are farmers who are negligent and commissioners who are lax but the yellows is well held in check. The loss would be hard to fix but for the South Haven district 15% would be a fair estimate of annual loss. In Oceana 1/2% is reported while in Mason County there is no loss. In the Grand Rapids district the loss is slight, yellows first appearing there in 1883. There is no yellows at Ann Arbor. }

The symptoms of the disease are such that a person acquainted with the disease can at a single careful glance pronounce a tree either healthy or diseased. In a bearing tree, the first symptom is the prematurely ripened, highly-colored fruit. When a single tree or a single limb ripens before the rest, it is a suspicious sign, especially when the peaches are large and highly colored. In diseased peaches, the cheek, or perhaps the entire skin, is covered with small round blotches of a duller deeper red than the surrounding. On cutting the peach open, the red blotches are seen to extend through the flesh to the pit. The next stage is the appearance of bunches of fine, wiry shoots on the trunk and branches. The leaves on these shoots are slender and the shoots are so characteristic that a single shoot bearing perhaps no more than four or six leaves is sufficient to cause a careful observer to condemn the tree. Following this second stage, the tree rapidly shows loss of vitality, the leaves turn yellow and the third or fourth year of the disease, the tree dies. There is no cure and the axe and fire is the only resort in protecting the remaining trees.

"Little Peaches" and Fungus Diseases.

A new disease appearing in Allegan County and other portions of the South Haven district is that known as "little peaches". The first symptom is the stoppage of growth in the fruit when about the size of hickory nuts. The roots are affected, the root hairs apparently dying. The next year the trees show yellow foliage, poor growth, with fine, wiry shoots, and in some ways resemble trees badly affected with yellows. The disease is usually fatal the second year. The contagiousness of the disease is not yet known but if contagious, it bids fair to be more dreaded than yellows.

Leaf Curl, *Ecniscus deformans*, is a disease which of late years has threatened to be quite serious. It is a fungus disease which starts inside the bud scales and hence is almost inaccessible by fungicides. As the leaves open the fungus grows in the leaf, thickening, deforming, and curling it. The under side of the curled leaf usually has a whitish appearance. All the affected leaves turn yellow and fall so that trees badly attacked become nearly ~~leaf~~^{leaf}-less. Some varieties are especially subject, as the Elberta. Experiments here and elsewhere seem to show the value of spraying with copper sulphate or Bordeaux in the winter or early spring.

The common rot, *Monilia fructigena*, is sometimes the cause of serious loss, especially in wet seasons and upon earlier varieties. The later fruit is very seldom attacked. Hale's Early is an especially susceptible variety. The winter spraying recommended for

leaf curl is beneficial as is also thinning of the fruit.

There are other diseases affecting the peach but none of general economic importance.

Insect Enemies.

The peach borer, *Sannin^{ia}ra exitiosa*, is the most serious insect pest. A century ago, before the yellows was known, peach growers recognized this insect ^{as} for a dangerous enemy. The adult is a wasp-like moth which lays its eggs on the bark of the tree near the ground during June, July and August. The larvae bore into the bark and spend a year eating channels in the inner bark. About the only remedy is a careful inspection of the trees and destruction of the insects in the fall and spring. Preventives have been tried but have proved either costly or ineffectual.

The curculio is apt to sting a few of the earliest varieties but as its injuries are confined almost entirely to a few varieties its injuries are not great. The curculio stings the peach, making a crescent-shaped cut, and deposits an egg. As the egg hatches, the larva eats to the pit and then around the pit. The ravages of this insect rarely make it of economic importance.

Other insects attack the peach, as the twig borer, but their injury in this state is so localized or so slight as not to be treated in this article.

Tendencies and Outlook.

At present the tendency seems toward more careful and thorough cultivation and more rigorous thinning, so as to produce a better quality of fruit. The impetus seems to be toward excellence of

quality rather than bulk. There is an increasing tendency to sell to buyers rather than to ship to commission men, and a slight trend toward cooperation in packing and selling.

The fancy prices received twenty years ago cannot be expected by growers at present. The poor, undersized peaches that brought a good, fair price then are not profitable now. Fine fruit will always bring a good price whenever it can be got to the consumer. The man who lives in the peach belt, where his market is assured, or who lives outside the peach belt, but in a favorable location with a good local market, can, by keeping up with the industry, make a good income by raising fine (not necessarily fancy) peaches.

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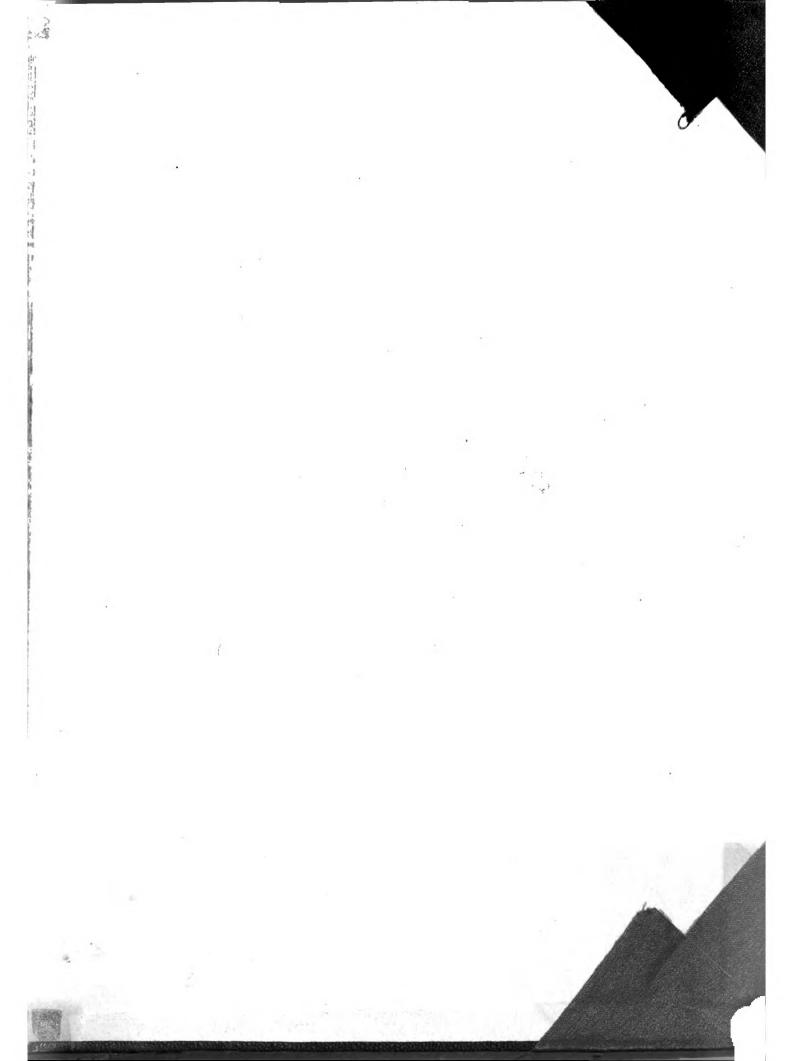
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