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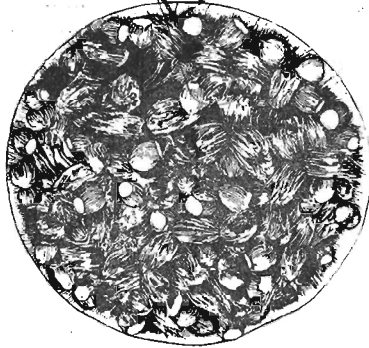
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BULLETIN NO. 52.

APRIL, 1898.

OREGON AGRICULTURAL EXPERIMENT STATION.

HORTICULTURAL DEPARTMENT.



The Cultivation of the Hazel Nut; also Notes on
Varieties of Pears and Peaches.

~~~~~  
By GEORGE COOTE.

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The Bulletins of this Station are sent Free to all Residents of
Oregon who request them.

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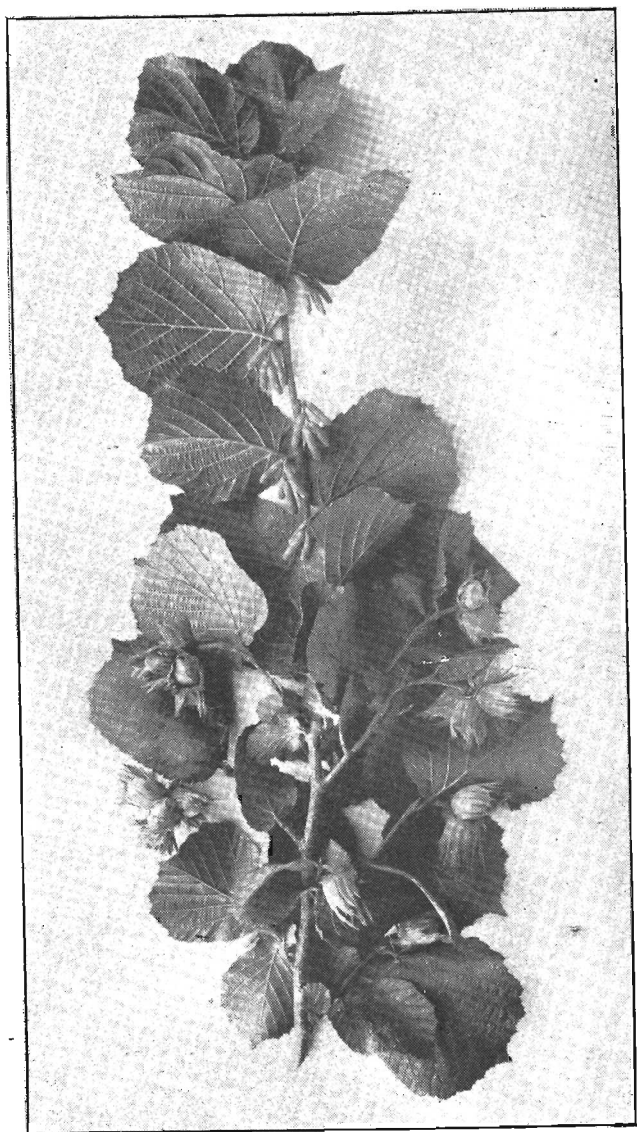
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Cut No. 2.

## The Cultivation of the Hazel Nut.

In the autumn of 1889 there were furnished by the Experiment Station, from the nurseries of O. Dickinson, Salem, Oregon, one dozen two-year old filbert trees. They, however, proved not to be the true filbert, being only varieties of the common English hazel nut. Although they produce a very fair nut, they are of not so good a quality as the Cob nut and filbert.

The hazel nut was formerly divided into two classes, namely, the short bearded, in which the husk extends but little, if any, beyond the nut, and the long or full-bearded, the husk of the latter extending beyond the nut.

The filbert is not a distinct species, but merely a variety of the common hazel nut. The word "filbert" is a corruption of the original English name for this nut, "full-bearded," which was applied to the large and fringed husk, to distinguish it from the

closer covering of the common hazel nut; therefore, the filbert is distinguished by the extension of the husk beyond the point of the nut enclosed, as in the accompanying cut, No. 1.

Cut No. 2 represents a branch of the common variety which produces the short husk. This is shown so that the difference may be made plain between the variety termed filbert and those that are termed Cob nuts, which are shown in cut No. 2. The filbert is enveloped by a long full-bearded husk, while the Cob nut is short bearded. As there are

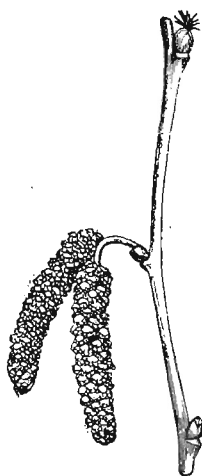


Cut No. 1.

now several varieties between these extremes, the distinction can no longer be maintained.

Cut No. 2 shows the male flowers in their early stage of growth. The filbert is monœcious, *i. e.*, the male and female flowers are

produced on the same tree. The male flowers or catkins begin to form about October 1st; these blooms continue to develop during the winter and their pollen matures about the middle of February. In a few varieties the pollen matures in December, providing the season is mild. For instance, the Barcelona, an early variety, is often in full bloom in December. When the pollen is liberated from the catkin it resembles powdered sulphur and is carried by the wind to the pistils of the female flowers, which are produced at the point of the small round buds of the lateral shoots, as shown in cut No. 3.



Cut No. 3.

After the pollen has been distributed, as above described, a fruitful season is certain, unless the blossoms are overtaken by severe late frosts.

The hazel nut may be propagated by seed cuttings, layering, or by grafting. It is almost impossible to reproduce it true from seed. If propagated from seed, the nuts to be used should be gathered when quite ripe. They should be put in some airy place, in which they are kept from the rain until they freely drop from their husks. After the husk has been removed, the nuts should be laid away in sand in order to keep them moist. The seed should be sown in light, rich soil not later than the middle of November. The plants should be raised with a single stem.

This may be done by removing all lateral shoots that are produced at the collar of the young plant. If treated in this manner, the plant will be ready for grafting or planting in the permanent plantation. Grafting the improved varieties on the common hazel nut is advantageous as it very materially hastens the time of fruiting. The operation should be performed about the end of February or the first of March, but a great deal depends on the advance of the season.

Propagation by cuttings is one of the common modes adapted for the production of plants. These cuttings may be taken from the suckers that are produced around the collar of the plants, providing the parent plants have been grown from cuttings. If

taken from grafted trees, care must be taken not to select any below the union. The cuttings should be in lengths of fifteen to twenty inches, and planted in the nursery row, the same as the currant or gooseberry. This should be done before the end of November. Before planting, all buds excepting two or three at the upper end of the cutting, should be carefully removed. If care is taken in this matter, it will prevent the plants from throwing up suckers in aftergrowth, as the filbert is very apt to do. The young plants should remain in the nursery row two years at least, before being set out.

*Soil and Situation.*—The filbert will grow in almost any kind of soil, but for its better production a good friable loam, lying upon sandstone is most suitable. In strong, moist soils the tree will produce too much wood thus reducing its fruitfulness.

*Culture.*—When planting in the permanent location the trees should be set fifteen feet apart each way. This requires 200 trees per acre and gives plenty of room for cultivation. The filbert thrives in a thorough tillage of the surface soil; the trees should be kept within bounds by pruning. If at any time the trees become stunted they should have a good application of stable, or other manure. When suckers are thrown up at the collar of the tree, the earth should be cleared from around the stem and the buds and young shoots carefully removed. The longer these shoots remain, the weaker will be the growth of the main portion of the tree, as it will be robbed of its just share of nourishment.

*Pruning.*—At the final planting, the trees that have five or six young shoots will require but little pruning back. Those having only two or three should be pruned back to enable them to produce others. Six main shoots will be found sufficient to form the tree. All of the shoots should be trained outward to give them a spreading form. The young growth should be pruned back to nearly half its length each winter, in order that laterals may be formed the entire length of the main branches. Remember at all times to prune so as to produce these laterals, as the fruit is borne on them. If any of the laterals are likely to grow too strong, they should be checked by pruning them back. In the fall the laterals should be shortened nearly to the stem or main branch, in consequence of which two or more shoots will be produced from their base; if the tree is not growing too much to wood, these shoots will produce fruit. If the trees are permitted

to grow unpruned the fruitfulness will be much impaired. Since the laterals bear the most fruit, they should, if possible, be pruned back to a female bud early in the spring—after the catkins have distributed their pollen. The female buds may be readily distinguished by their small thread-like blooms, of a magenta color, protruding from the apex of the bud.

*Gathering and Storing.*—Nuts may be gathered for immediate use as soon as the husk begins to turn brown; but for keeping they should not be gathered until ready to drop from the tree. Be careful to gather them when perfectly dry. If desired, varieties of the filbert may be stored away in their husk, care being taken to have them perfectly dry, as the base of the husk is succulent. After becoming thoroughly dry they may be fumigated with sulphur which will keep them from molding and also bright in color. Another way is to pack the nuts in barrels, sprinkling them with a small quantity of salt. If the barrels are then kept cool and dry the nuts will keep.

*Varieties.*—Red Filbert (Syn.), Red Hazel, Avelinier. Husk long, tubular, hispid, nut medium size, ovate, shell a trifle thicker than some other varieties, kernel covered with pellicle, flavor good, a great producer.

*White Filbert (White Avelinier).*—Husk long, tubular, contracted at the apex of nut, hispid, nut medium sized, shell the same in texture as the above variety, kernel covered with a white pellicle, flavor excellent, a great producer; this and the preceding are both of extra quality and keep well in the husk.

*Barcelona (Syn.)*—Downton Large, Prolific, Dwarf Prolific, Glasgow Prolific, Saint Grisier, Great Cob. Husk short, hispid, nut large, short, ovate, slightly compressed, shell of medium thickness and rather hard, but well filled by the kernel, of good quality, resembling very closely the Barcelona nut of commerce, tree of upright, medium growth and extra good producer. This variety is a very early bloomer, commencing to open its flowers as early as December 25th, some seasons. It is from six weeks to two months earlier than other varieties in blooming.

*The Purple-leaved Filbert* is grown more for ornamental purposes, on account of its purple foliage, although the nuts are of good quality. The nut closely resembles that of the red filbert, though it is a trifle smaller.

The product from an acre of seven-year old trees will average about ninety-six dollars, putting the price at the low estimate of six cents per pound wholesale. The retail prices run from nine to ten cents per pound.

The cultivation of the filbert ought to be taken up by the horticulturists of this State, especially in the Willamette valley, where the nut does so well.

Few are aware of the amount paid to foreign countries each year for nuts of all kinds. During the year 1897, it is claimed that over \$2,200,000 worth of nuts came into the United States from foreign countries.

The following list of walnuts and chestnuts have been planted out on the experimental grounds during 1897, which will be reported upon as they progress:

Parrisienne, Poorman, Cluster, Meylan, Lacinated, Weeping, Mayette, Franquette, Vourey, California Paper Shell, Chaberte.

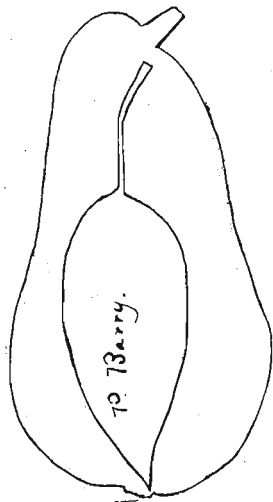
Second Generation Seedling Walnuts—Franquette, Parrisienne, Chaberte, After St. John, Vourey, Cluster, Præparturiens, Alpine, Mammoth.

Chestnuts—Maroon or French Chestnuts (grafted), Combale, Avant, Chatæne, Nouzillard, Bertrand, Quercy, Chalan.



## Varieties of Pears.

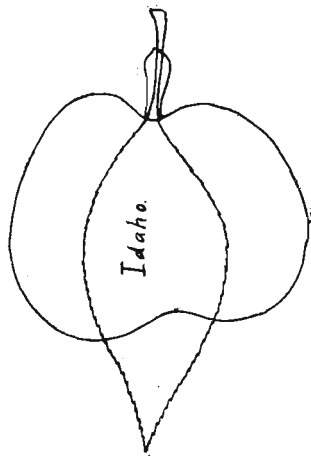
The following notes on varieties of pears are accompanied by outline drawings of each variety; and in some instances, the form of leaf growth is shown:



P. BARRY.—Raised by S. B. Fox, San Jose, California. It has been growing in our experimental orchard since 1891, and has proved to be productive; does not bloom so early as many other varieties, which is greatly in its favor. Tree perfectly hardy, and a straggling grower, of a dwarf habit, productive; fruit medium to large; elongated, pyriform, skin very thickly covered with russett, underlaid with yellow, stalk from half-inch to three-quarters of an inch in length, obliquely set in a very small cavity, often lipped, calyx small, open, basin small, regular, flesh whitish, fine,

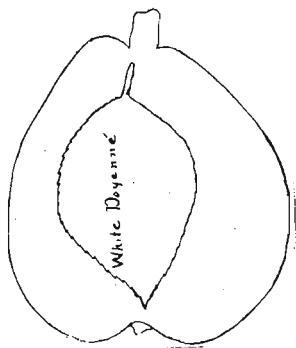
juicy, melting, sweet. Season, December and January.

IDAHO.—Tree an upright grower, wood resembling that of the Bartlett to a great extent, quite hardy, fruit medium to large, oblate, regular, golden yellow, many russet dots; cavity irregular, rather deep; basin shallow, flesh melting, of a moderate quality. Season, early in fall.



The above variety has never given satisfaction here. It has been on the experiment grounds since 1890, but with no good results, although the tree makes excellent growth, both on the pear and quince stock, but on neither of these stocks is it a successful producer.

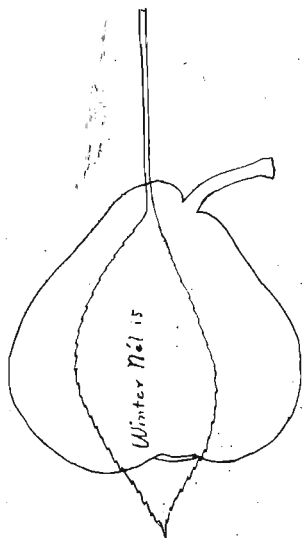
WHITE DOYENNE (*Syn.*)— Fall Butter, Yellow Butter, Beurre, Beurre Blanc, Pine Pear; and it does not stop here, as it goes



under many other names too numerous to mention, better to speak of it under the first name. It is a fine fall pear, tree a medium grower. Some years the fruit is inclined to crack, but not often in this climate. Fruit of medium size, regular in form, oblate, clear, pale yellow, regularly speckled with dark dots, occasionally with reddish cheek; stalk varies from one-half to three-quarters of an inch in length, calyx small, closed and set in a shallow

basin; flesh white, of excellent quality. Season, from September to middle of November.

WINTER NELIS.—This is an old variety and cannot be too highly recommended as being worthy of more general cultivation both as a market and home fruit, owing to its numerous good qualities. It should be grafted on to the pear stock, as it does not thrive well on the quince; when worked on the latter the wood becomes diseased much more than when grafted on to the pear, as the fruit is liable to crack, and the wood growth is weak. Have experimented with both stocks, and find that the pear stock is always preferable. Tree makes a rather slender growth, especially the young shoots. The wood is sprinkled with small brown dots. Fruit of medium size, turbinate; eye large, open, set in a shallow depression, stalk long, of medium thickness, inserted in a small cavity; skin yellowish green, much speckled, and some times almost entirely covered with dark brown russet; flesh yellowish white, buttery, melting, with a very high flavor, saccharine juice; a most excellent winter pear; in use, December and January.

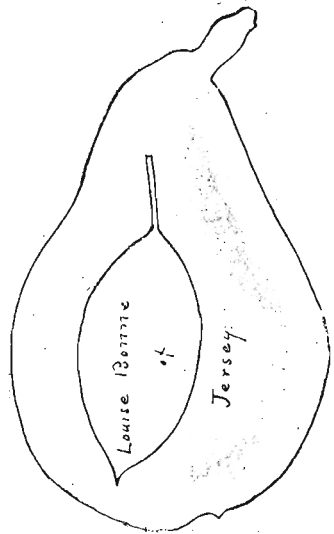
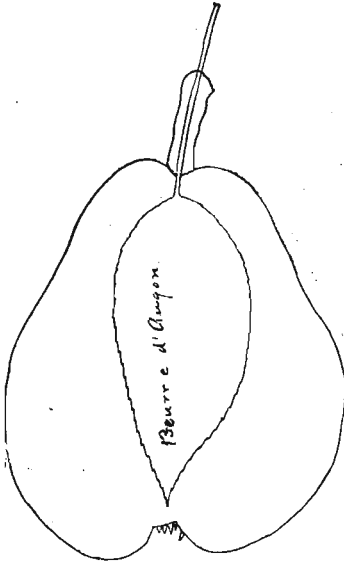


BEURRE D' ANJOU.—A variety that grows well in this locality; is quite hardy in every respect, as well as being valuable for late

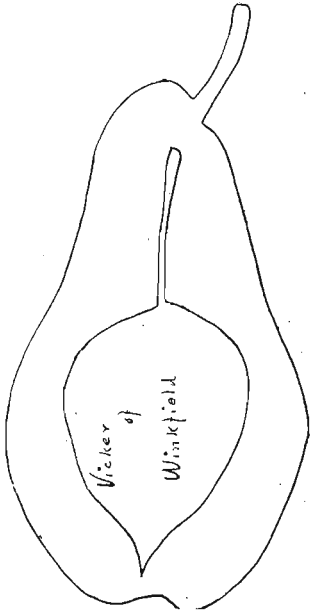
fall use; quite productive. I would not recommend it for long shipment on account of the short duration of its keeping qualities; for home market and for home use it is quite valuable, as it very rarely fails to produce fruit, even under the most trying circumstances. No orchard should be considered complete without a few trees of this variety. Tree quite healthy, and a free grower when grafted onto the pear stock; fruit large, obtuse, pyriform, stem thick, varying in length, inserted in a cavity, surrounded by russet, calyx small, open, in a small basin, skin of a greenish

color, intermixed with brown and crimson dots; flesh whitish, a little coarse, melting, juicy, perfumed, very good.

LOUISE BONNE (of Jersey)—Shoots long, vigorous, of a dark purplish brown, producing a number of spots on the wood; fruit large, pyriform, eye medium size, open, set in a small shallow, even, round depression; stalk thick, of medium length, sometimes curved, scarcely sunken at its insertion; obliquely set, skin smooth, on the shaded side green at first, changing to greenish yellow when fully ripe; brownish red, thickly set with pale brown dots on the side next the sun; flesh whitish yellow, melting, very sugary, rich and high flavored, valuable variety; in season during October. The tree



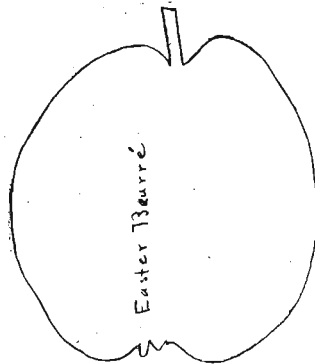
is of an upright habit, hardy, great producer, succeeds well as a standard, and will do well on the quince stock.



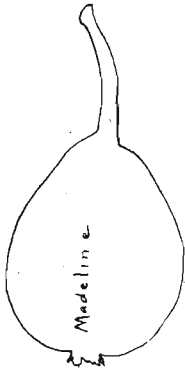
VICAR OF WINKFIELD.—A large, well formed variety of a third-rate quality as a dessert or table fruit; is often met with in the Willamette valley; in some localities seems to be perfectly at home, while in others it is not. It is a great producer, and, consequently, may often be seen breaking down under its immense crop of fruit. Tree of a drooping form of growth, is more or less subject to fire blight; young shoots of a dark green color; fruit large, long pyriform, skin smooth, pale yellow, brownish cheek next the sun, marked with brown dots; stalk from an inch to an inch and a half long, obliquely inserted; no depression, calyx large and open, slightly sunken basin; flesh green-

ish white, juicy, buttery, good flavor. Season, during December and January. A good cooking variety.

EASTER BEURRE.—Tree not very thrifty with us. Moderate producer, does well on the quince stock, may be grown either as a standard or pyramid. The pyramid form of training is preferable, as the fruit is heavy, consequently is not so easily affected by the action of the wind. It is advisable to gather the fruit early, that is, as soon as it has nearly matured on the tree. If permitted to remain too long, it is liable to become mellow. When gathering care must be taken to handle the fruit carefully, treating it in the same way we would handle eggs—so that the fruit may not become bruised in any way. This.



is essential to its perfect keeping. In season, from January to April. A valuable variety.



**MADELINE, OR CITRON DES CARMES.**—One of the earliest varieties of pears grown. Tree of medium upright growth, shoots of chestnut color, with a great many specks, is inclined to bloom early, therefore, is often cut by frost. Not a variety for general planting; one or two trees is sufficient for family use as an early pear, since it matures its fruit in July. Fruit a little below the medium; skin smooth, yellowish green, with a faint blush next to the sun; flesh greenish white, juicy and rich, subject to canker.

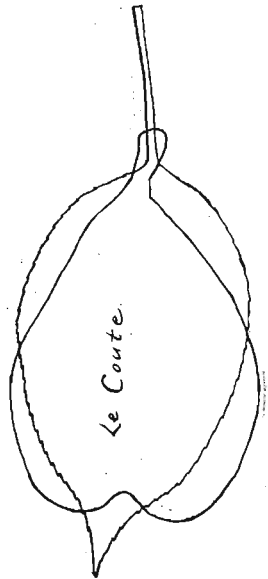
**LE CONTE.**—Tree a vigorous grower, quite hardy, and very productive. Fruit medium in size; skin yellow, good quality; commencing to mature the end of September; continuing in season about thirty days. The great fault with this variety is its tendency to bloom very early and its liability to be cut by frost.

The above cuts are one-half natural size.

Seven years ago an experiment was made, in which the Bartlett pear was "top-grafted" on the Pound pear, for the purpose of determining the influence of stock on the size of the fruit.

In order that the Bartlett pear might not be influenced by the stock of the Pound pear, it was doubly worked; that is, a Bartlett scion was grafted onto a Bartlett the second year, thus lessening the influence of the stock over the scion. The next year scions were taken from the double worked tree and grafted on the pound pear stock. These scions made a strong growth each succeeding year; and, finally, when the fruit was produced, a marked change, both in size and form, had taken place.

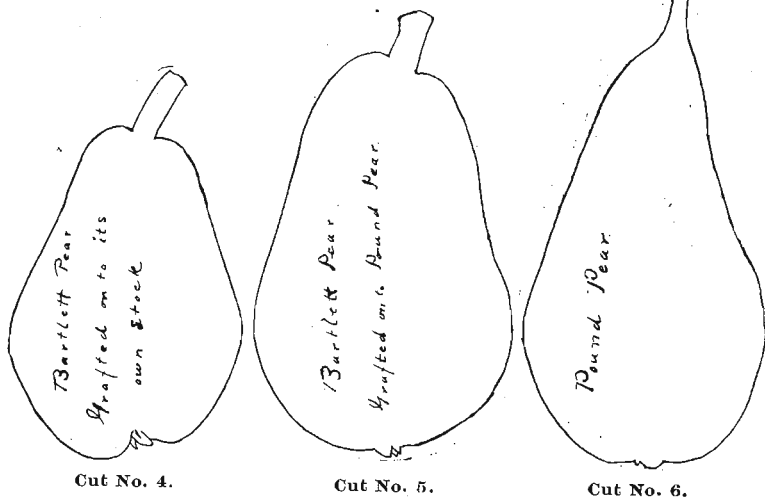
Also the keeping qualities of the fruit was improved and the season of maturity was prolonged nine or ten days.



Cut No. 4 shows the form of growth of the Bartlett grafted on its own stock.

Cut No. 5 shows the Bartlett grafted on the Pound pear stock.

Cut No. 6 shows the Pound pear grown on the same tree as the Bartlett pear in cut No. 5.



The above experiment was carried out to show the necessity of choosing variety of stock for the better production of fruit.

## Varieties of Peaches.

Notes on three varieties of Peaches grown in the Greenhouse for the purpose of determining more fully the influence of Climate on Curl Leaf.

In the year 1890 the Station planted in the experimental orchard 36 varieties of peaches. The following year all varieties were affected more or less with a disease commonly known as curl leaf—*Exoascus deformans* (Berk.). Experiments were made from time to time with the several formulas for the prevention of this disease, but without success. In consequence of the disease that part of the tree which was exposed died leaving only the non-exposed part of the stem and the roots perfectly healthy.

In order to gain more information as to whether the disease was caused by climatic changes or not; it was decided to take up three of the most affected varieties, in order that they might be protected from these changes during the winter and spring. On the 16th of December, 1893, before frost had affected the trees in any way, the following trees were selected for the purpose, namely, Pallas, Indian Blood and Comet. They were carefully taken up and placed into half-barrels. Two days later they were placed in the greenhouse and a careful observation of the temperature was made and recorded three times each day—at 7 o'clock in the morning, at noon, and at 5:30 in the evening—care being taken at all times not to permit the temperature to fall below the freezing point. All three varieties made excellent growth during the season and were perfectly free from the disease. On account of the trees being badly affected the previous season, no bearing wood was made; therefore, no fruit was produced the first season of the experiment. The trees were permitted to remain in the greenhouse until all danger of frost was over, and on the first of June they were placed outside for the summer months. No record of temperature was taken after March 31, 1894, as the trees had developed into full growth.

The following fall, October 1st, the trees were placed in the greenhouse. During this season no record of temperature was taken, care being taken to keep the temperature from falling below the freezing point.

On January 17, 1895, Pallas opened its first bloom buds; January 23d it was in full bloom; February 7th the fruit had fully set, and on June 6th the first fruit matured.

Comet opened its first bloom on January 30th; was in full bloom February 10, 1895, its fruit being set by February 20th, and matured its first fruit July 10th.

Indian blood produced its first bloom February 4, 1895; was in full bloom February 13th; had set its fruit by the 25th of February, and matured its first ripe fruit August 6th.

During the second season the same cultivation was kept up as in the first year; but through it all not a sign of curl leaf was noticeable at any time.

For the purpose of inoculating the disease into the healthy trees, buds were taken from diseased trees growing in the orchard; these buds were inserted in the young wood of each healthy tree grown in the greenhouse. This was done without success. The buds put forth their young growth with but little sign of the disease, only the first two or three small leaves being affected, and these very little. They soon dropped off, and the remainder of the leaves and wood were perfectly healthy, leaving no signs of infection; but after the test was over, the trees were planted in the orchard again in the fall, and in the following spring the disease attacked them severely, so much so that the trees died.

For preventing curl leaf we have found that the lime, sulphur and salt mixture used as a spray on the trees in their dormant state, just before the buds commence to open, is beneficial.



# DAILY RECORD OF TEMPERATURE

Taken for the purpose of determining the cause of, curl leaf. This experiment was made during growing period of some peach trees that were planted in half barrels and placed in the greenhouse.

| DECEMBER, 1893. |          |       |          | FEBRUARY, 1894. |          |       |          |
|-----------------|----------|-------|----------|-----------------|----------|-------|----------|
| Date.           | Morning. | Noon. | Evening. | Date.           | Morning. | Noon. | Evening. |
| 18.             | 51       | 52    | 51       | 1.              | 46       | 60    | 53       |
| 19.             | 48       | 60    | 54       | 2.              | 45       | 50    | 48       |
| 20.             | 52       | 56    | 54       | 3.              | 48       | 56    | 58       |
| 21.             | 54       | 56    | 54       | 4.              | 48       | 62    | 52       |
| 22.             | 52       | 54    | 58       | 5.              | 50       | 62    | 56       |
| 23.             | 50       | 52    | 58       | 6.              | 48       | 54    | 52       |
| 24.             | 55       | 50    | 55       | 7.              | 47       | 50    | 52       |
| 25.             | 46       | 50    | 54       | 8.              | 44       | 48    | 50       |
| 26.             | 42       | 58    | 54       | 10.             | 51       | 55    | 54       |
| 27.             | 41       | 56    | 50       | 11.             | 42       | 56    | 55       |
| 28.             | 46       | 52    | 54       | 12.             | 44       | 60    | 52       |
| 29.             | 51       | 59    | 50       | 13.             | 45       | 58    | 54       |
| 30.             | 53       | 55    | 56       | 14.             | 46       | 60    | 48       |
| 31.             | 52½      | 53    | 54       | 15.             | 44       | 60    | 48       |
|                 |          |       |          | 16.             | 44       | 54    | 48       |
|                 |          |       |          | 17.             | 45       | 47    | 44       |
|                 |          |       |          | 18.             | 45       | 50    | 48       |
|                 |          |       |          | 19.             | 42       | 50    | 44       |
|                 |          |       |          | 20.             | 40       | 54    | 49       |
|                 |          |       |          | 21.             | 40       | 55    | 59       |
|                 |          |       |          | 22.             | 47       | 65    | 64       |
|                 |          |       |          | 23.             | 49       | 62    | 58       |
|                 |          |       |          | 24.             | 50       | 62    | 62       |
|                 |          |       |          | 25.             | 55       | 60    | 54       |
|                 |          |       |          | 26.             | 53       | 58    | 56       |
|                 |          |       |          | 27.             | 52       | 58    | 60       |
|                 |          |       |          | 28.             | 56       | 58    | 56       |
|                 |          |       |          |                 |          |       |          |
| JANUARY, 1894.  |          |       |          | MARCH, 1894.    |          |       |          |
| Date.           | Morning. | Noon. | Evening. | Date.           | Morning. | Noon. | Evening. |
| 1.              | 50       | 53    | 52       | 1.              | 50       | 54    | 52       |
| 2.              | 46       | 56    | 53       | 2.              | 42       | 64    | 56       |
| 3.              | 44       | 52    | 50       | 3.              | 41       | 60    | 50       |
| 4.              | 43       | 58    | 52       | 4.              | 53       | 60    | 58       |
| 5.              | 43       | 54    | 52       | 5.              | 42       | 60    | 56       |
| 6.              | 45       | 50    | 55       | 6.              | 52       | 60    | 55       |
| 7.              | 46       | 57    | 53       | 7.              | 59       | 60    | 58       |
| 8.              | 44       | 56    | 54       | 8.              | 44       | 50    | 48       |
| 9.              | 52       | 54    | 55       | 9.              | 44       | 60    | 54       |
| 10.             | 56       | 60    | 64       | 10.             | 44       | 51    | 41       |
| 11.             | 64       | 56    | 58       | 11.             | 50       | 58    | 54       |
| 12.             | 60       | 60    | 64       | 12.             | 50       | 60    | 54       |
| 13.             | 62       | 60    | 60       | 13.             | 50       | 58    | 52       |
| 14.             | 56       | 54    | 52       | 14.             | 43       | 52    | 50       |
| 15.             | 46       | 50    | 52       | 15.             | 50       | 50    | 50       |
| 16.             | 46       | 52    | 48       | 16.             | 47       | 56    | 52       |
| 17.             | 47       | 50    | 50       | 17.             | 34       | 52    | 46       |
| 18.             | 46       | 50    | 54       | 18.             | 50       | 63    | 56       |
| 19.             | 44       | 54    | 52       | 19.             | 35       | 65    | 56       |
| 20.             | 50       | 54    | 56       | 20.             | 44       | 80    | 57       |
| 21.             | 53       | 63    | 58       | 21.             | 45       | 80    | 58       |
| 22.             | 53       | 56    | 54       | 22.             | 50       | 80    | 58       |
| 23.             | 48       | 60    | 54       | 23.             | 42       | 85    | 74       |
| 24.             | 54       | 56    | 55       | 24.             | 52       | 80    | 70       |
| 25.             | 48       | 56    | 54       | 25.             | 54       | 80    | 72       |
| 26.             | 44       | 50    | 55       | 26.             | 50       | 65    | 54       |
| 27.             | 50       | 50    | 52       | 27.             | 60       | 70    | 65       |
| 28.             | 47       | 56    | 54       | 28.             | 50       | 70    | 58       |
| 29.             | 50       | 59    | 56       | 29.             | 57       | 60    | 58       |
| 30.             | 42       | 67    | 60       | 30.             | 52       | 64    | 57       |
| 31.             | 39       | 66    | 60       | 31.             | 50       | 70    | 60       |