

1-39.
TEXAS AGRICULTURAL EXPERIMENT STATION.

BULLETIN No. 39.

JULY, 1896.

THE PEACH.

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THE PEACH:

1. NOTES ON VARIETIES.

- | | |
|--|--|
| I. Varieties belonging to Peen-To race. | IV. Varieties belonging to North China race. |
| II. Varieties belonging to South China race. | V. Varieties belonging to Persian race. |
| III. Varieties belonging to Spanish race. | VI. Varieties unclassified. |

(Pages 803 to 823.)

2. VARIETIES FOR DIFFERENT CLIMATES.

(Pages 823 to 824.)

3. RULES OF NOMENCLATURE.

(Page 824.)

4. ORIGIN OF THE PEACH.

(Pages 825 to 826.)

5. CLASSIFICATION OF VARIETIES.

- | | |
|-----------------------|-----------------------|
| I. Peen-To race. | IV. North China race. |
| II. South China race. | V. Persian Race. |
| III. Spanish race. | |

(Pages 826 to 832.)

6. HINTS ON ORCHARD SETTING.

- | | |
|-----------------|--------------|
| The site. | How to set. |
| The soil. | Pruning. |
| The young tree. | Cultivation. |

(Pages 832 to 838.)

7. DORMANT BUDDING.

(Pages 839 to 840.)

8. DISEASES AND INJURIOUS INSECTS.

- | | |
|-------------|------------------|
| Black spot. | Aphids. |
| Root tumor. | Leaf Footed bug. |
| Root knot. | The borer. |
| Curculio. | |

(Pages 840 to 847.)

9. PEACHES RECOMMENDED BY TEXAS HORTICULTURISTS.

(Pages 847 to 848.)

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THE PEACH.

BY R. H. PRICE, B. S.

That the peach, when well matured, is one of the most delicious and wholesome fruits of our climate needs no proof. Its season of usefulness begins with the latter part of May and lasts till October.

Unlike the apple, there are varieties which fruit well along the Gulf coast; others grow well in the more northern parts of the State.

There are varieties which will stand considerable drouth with impunity, if the soil is well cultivated. Hence, with all the variations found in the soil and climate of the State, there is no part where some varieties will not grow and fruit with fair success.

That this fruit can be grown with some success even with neglect is evidenced by the fact that around most lonely rural homes a peach tree may be found growing as a silent companion on hard, uncultivated ground, bearing some peaches for its ungrateful owner.

VALUE OF THE PEACH CROP.

The peach industry is a growing one in the State. For instance, in the counties of Ellis, Limestone and Smith, many carloads are shipped to northern markets. Land for peaches has greatly increased in value. According to the report of the Commissioner of Agriculture for 1894, there were then 42,914 acres in peaches. The crop was valued at \$685,956. According to these statistics, the value of the crop per acre that year was \$15.98. According to the same report, the value of cotton per acre that year was \$12.20.

THE EXPERIMENTAL ORCHARD.

The trees in the orchard were set by my predecessor, Prof. T. L. Brunk, during the winter of 1888-89. The soil is a rather stiff, heavy clay loam, of medium fertility. Surface drainage is good. The trees were set 20x20 feet apart. Good cultivation has been given. The trees began to bear during the summer of 1892, but no notes were taken until 1893. Notes were then taken on blooming and fruiting each year afterward, and I have made a study of the varieties each year since.

1. NOTES ON VARIETIES.

While a full set of notes were taken each year on blooming and fruiting, and recorded in permanent printed blanks, only those notes which are of the most practical use to the grower will appear here because space will not permit to go farther into detail. I have been much assisted in

taking these notes by Prof. H. Ness, the assistant in the horticultural department, and Mr. A. M. Ferguson, a post-graduate in the same department.

In reading over these notes, it will be observed that by far the largest number of varieties have given no results which would warrant their further cultivation. To the soil and climate may be partly due the fact that some varieties have not done better, particularly in regard to the late varieties, but I am convinced that most of the nurserymen of the State are selling too many varieties, some of which are either of little value or so closely resemble another variety that they could easily be dispensed with without detriment to a valuable fruit list for this State. This impression has forced itself upon my mind after testing a large number of varieties in this latitude, which is somewhat central, and by studying the peach in more northern and southern localities of the State. In regard to our list, it may also be stated that there are a few new, valuable varieties grown which have not been set long enough to bear with us, and hence do not appear in our final bearing list.

The varieties are divided into groups according to the classification described on page 829.

The following distinctions in sizes are made: Very large, large, medium, small, and very small. Size is a quality which will vary with variety, season, latitude and the number of fruit appearing on the tree. Chinese Cling is regarded as a very large peach, and the Honey as a small one. Between these two we have various gradations: Very large, $2\frac{1}{2}$ to 3 inches in diameter; medium, $1\frac{1}{2}$ to 2 inches, and small, 1 to $1\frac{1}{2}$ inches. The size of flower depends upon the race to which a variety belongs, and will be given in the classification.

I. VARIETIES BELONGING TO PEEN-TO RACE.*

Peen-To (fig. 1).—Medium size, flat, color greenish white with a few red spots; cling, sweet, juicy, sometimes with peculiar noyau flavor; tree vigorous, holds foliage late and blooms very early; ripened fruit, June 20th; glands reniform

Angel and *Waldo* varieties, which are seedlings of Peen-to, are described on pages 818 and 819.

II. VARIETIES BELONGING TO SOUTH CHINA RACE.

Climax.—Small, round to oval, freestone; color, cream with red cheek; flesh white, flavor very sweet and fairly good; ripe June 25th; tree a vigorous grower and inclined to overbear in southern part of the State; fruit should be thinned to increase the size; foliage with reniform glands. Introduced by G. L. Tabor in 1886.

Coleman.—Size medium, ovate, freestone; cream-colored, with red cheek; flesh white; flavor sweet and very fair; ripens with Climax; one of the largest of its class; tree vigorous and productive in Southern Texas, inclined to overbear; glands reniform to round. Originated by Thomas Coleman, near Rockport, Texas.

Early China.—Size medium, oval, with sharply recurved point, freestone; color cream, with bright red cheek; flesh white, pinkish around

* For Classification, see page 829.

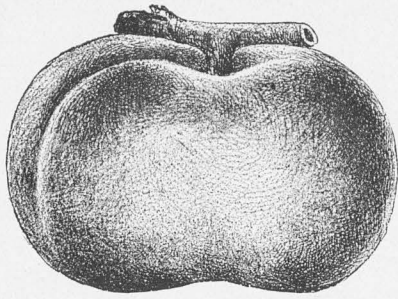


FIG. 1. *Peen-To Race.*
(Var. *Peen-To.*)

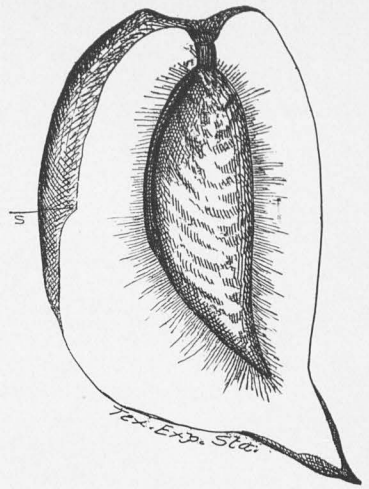


FIG. 2. *South Chinese Race.*
(Var. *Honey.*)
S. Extent of suture.

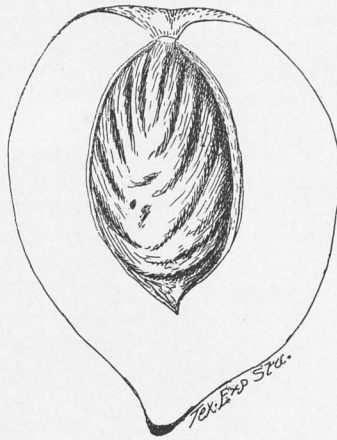


FIG. 3. *Spanish Race.* (Var. *Texas.*)

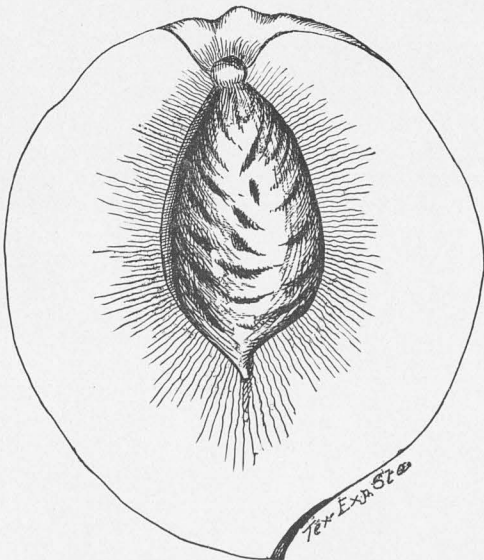


FIG. 4. *North China Race.*

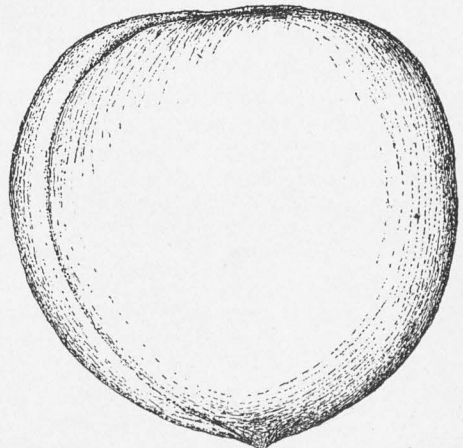


FIG. 5. *Persian Race.* (Var. *Alexander.*)

CUTS CONTRASTING THE FIVE CLASSIFIED RACES OF THE PEACH.

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stone; flavor very sweet, quality only fair; ripened June 19th; tree a vigorous grower and heavy yielder in Southern Texas, overbears and needs to be thinned; has not failed to bear a heavy crop in four years; the bloom will resist considerable frost without injury; glands frequently wanting, round. Originated in South Texas.

Honey (fig. 2).—Size medium to small, oblong, ovate, freestone; color cream, with deep red cheek; flesh white, red around stone; flavor sweet, juicy and only fair; ripened July 1st; tree only fairly vigorous here, quite productive, inclined to overbear, needs to be thinned; not as good as some of its American seedlings; glands sometimes wanting, reniform; supposed to be the parent of a new race possessing a peculiar honey sweetness. The one grown mostly in this country was raised by Charles Downing many years since from seed brought from China and presented to him. (Downing's Fruits and Fruit Trees of America.) "The original tree never fruited, but a budded tree was given to the late Henry Lyons, Esq., of Columbia, S. C., about 1855. The variety was placed in the hands of Mr. P. J. Berkman, of Augusta, Ga., and the only stock held by him until 1858, when it was sent out for the first time. The variety was not found to be valuable at Augusta, but when it was sent to Florida and Texas, into its natural and proper climate, it was found to possess special merit." Onderdonk. Reproduces fairly true from seed, as evidenced by the seedlings we have which have come from it.

Pallas.—Size medium, roundish to ovate, freestone; color light cream, splashed with red; flesh white; flavor very sweet, juicy, fair quality; ripened June 30th; tree fairly vigorous and productive; glands often wanting, small, round; possesses considerable Persian blood; seedling of Honey.

III. VARIETIES BELONGING TO SPANISH RACE.

Cobler (Indian).—Size rather small, roundish; color light yellow, mottled and streaked with purple; color of flesh is purple, shading to yellowish white near stone, clingstone; flavor sub-acid and quite pleasant; ripe July 20th; tree is fairly vigorous and bears well. Originated in Texas.

Columbia.—Medium to small, round with slightly projecting apex; color greenish yellow with dark red stripes; heavy down; free; ripe August 1st; would ship well, flavor sub-acid and very pleasant; tree is medium size and very prolific; glands reniform. About same as Infant Wonder. A valuable peach of its size and season. Has some Persian blood.

Druid (Hill).—Size rather small, round; color, yellow; flesh, yellowish white; flavor sweetish and rather poor; ripened July 29th; tree only fairly productive, vigorous; glands reniform.

Galveston.—Size medium, roundish; color, cream, with light red cheek; flavor sub-acid; ripe July 30th; tree very vigorous and productive, inclined to overbear; glands few and reniform. Originated in Southern Texas.

Guadalupe.—So small here that it is no good; ripens in August; flavor sub-acid; clingstone; tree very vigorous. Originated in Southern Texas.

La Reine.—Size rather small, oblong; color, greenish, with red cheek; flesh rather white, red at stone; clingstone; ripens August 5th; tree vigorous; not recommended here. Introduced by G. L. Tabor in 1889.

Lulu.—Rather small; color, greenish yellow; flavor rather acid and quality very poor; tree is fairly hardy and productive; glands many, round; ripens August 6th; a poor peach here. From South Texas.

Onderdonk.—Medium size, oblong, flattened, pointed at apex, freestone; color, lemon yellow; flesh, yellow; flavor a little acid, fair quality; ripened August 6th; tree vigorous and productive; glands reniform. Originated by G. Onderdonk, Nursery, Texas.

Sanders (Cling).—Size rather small, ovate, with acute apex; color, cream; flesh, yellowish green; clingstone; ripened August 4th; has peculiar vinous flavor, like all of its class; tree vigorous and productive; glands reniform.

Texas (fig. 3).—Medium size, oblong, flattened, apex pointed; color, greenish yellow, with red cheek; flavor, sub-acid, very fair quality; ripened August 12th; semi-clingstone; glands reniform; tree very large and inclined to overbear. Originated and introduced by G. Onderdonk, Nursery, Texas. Valuable late peach for the coast country.

Victoria.—Size medium, roundish to oblong, somewhat flattened, apex slightly pointed; color, lemon yellow; flesh, yellow; freestone; flavor sub-acid, very fair quality; tree inclined to overbear; among the largest of the whole orchard; glands reniform; ripened fruit August 6th; one of the best varieties of its class. Introduced in 1889 by G. L. Tabor, Glen St. Mary, Fla.

IV. VARIETIES BELONGING TO NORTH CHINA GROUP.

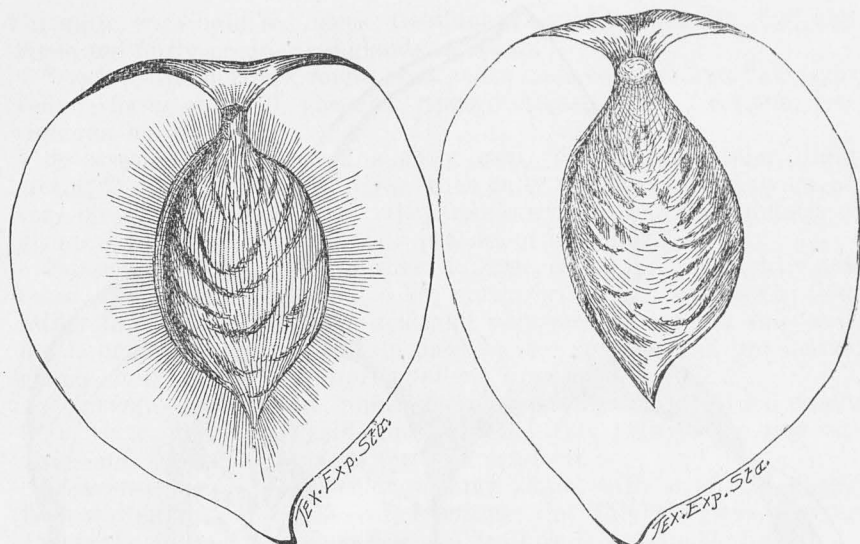
Albert (Sidney).—Size medium to large, ovate and abruptly pointed at apex; color, light cream, with red cheek; flavor sub-acid and pleasant; freestone; tree vigorous and productive; ripened fruit July 18th; glands reniform; a valuable peach.

Berneice.—Size medium, ovate conical; color, greenish yellow, streaked with red; flesh whitish yellow; flavor sub-acid and quite pleasant; half-freestone; ripe July 18th; tree fairly vigorous and productive.

Becquett Free.—Size large, roundish and slightly conical; color, greenish white, streaked with red; flavor mild sub-acid and quite pleasant; freestone; ripened July 10th; tree vigorous and fairly productive; glands reniform; promises to be very valuable further north in the State.

Chinese Cling (fig. 4).—Size very large, oval to conical, with rather abruptly pointed apex; color, greenish yellow, with small red cheek; flavor pleasant sub-acid; clingstone; ripened fruit July 14th; glands reniform; tree is weak here and bears lightly. At Nursery, Texas, near the coast, I have found it to be almost a dwarf; further north in the State, at Tyler, it bears well. It is now almost discarded, owing to the fact of its more valuable seedlings. Perhaps no other peach in the world to-day has a more valuable offspring. It was introduced in France from China about 50 years ago, under the name of Shanghai.

Curtis (Cling).—Medium size, round to slightly oblong; color, clear yellowish white; flavor sub-acid and of high quality; clingstone; ripened July 5th; tree vigorous and productive; glands small, round. A seedling which originated on the experimental grounds here and named after Prof. G. W. Curtis, who was formerly director of the Station. We have a number of trees propagated from the original seedling and have borne a good crop at their fourth year. A promising variety.

FIG. 6. *Elberta*. (Original.)FIG. 7. *Family Favorite*. (Original.)

Elberta (fig. 6).—Size medium to large, oblong, slightly flattened, apex pointed; color, golden yellow, with red cheek, very handsome; flesh yellow; flavor sub-acid and very fair quality; freestone; ripened July 10th; tree fairly vigorous and moderately productive. A little too far south for it here; glands globose to reniform; a valuable shipping and market peach, owing to its handsome color and firm flesh. Originated in Georgia on the farm of Hon. Samuel Rumph, in Houston county. To-day it is one of the great market peaches of that State.

Family Favorite (fig. 7).—Large size, round, with small abrupt apex; color, greenish white, with small red cheek; flavor sub-acid and very good; half-clingstone; ripened July 1st; tree large, vigorous and very productive; glands round. An excellent family peach and would ship well, but is not highly enough colored to be attractive in the market. Introduced by T. V. Munson.

Ford (No. 1).—Medium size, round; color, greenish yellow; flavor pleasant, sub-acid; clingstone; ripened very early, June 14th; tree vigorous, but shy bearer this far south; glands few, reniform.

Gen. Lee.—Medium size, roundish; color, creamy white; flavor pleasant, sub-acid; cling; ripened July 10th; tree vigorous, but shy bearer this far south.

Haupt's August.—Has done no good here.

Henrietta.—Medium size, round, with abrupt apex; color, greenish yellow, with red cheek; flesh yellow; flavor acid, quality only fair; cling; tree fairly vigorous and moderately productive; glands reniform; not desirable here.

Juno.—Size rather small, round, with obtuse apex; color, cream, with small red cheek; flesh same; cling; flavor mild acid, rather poor; ripe August 12th; tree hardy and productive; glands reniform; fruit too small.

Mamie Ross (fig. 8).—Size large, roundish, with obtuse point; color,

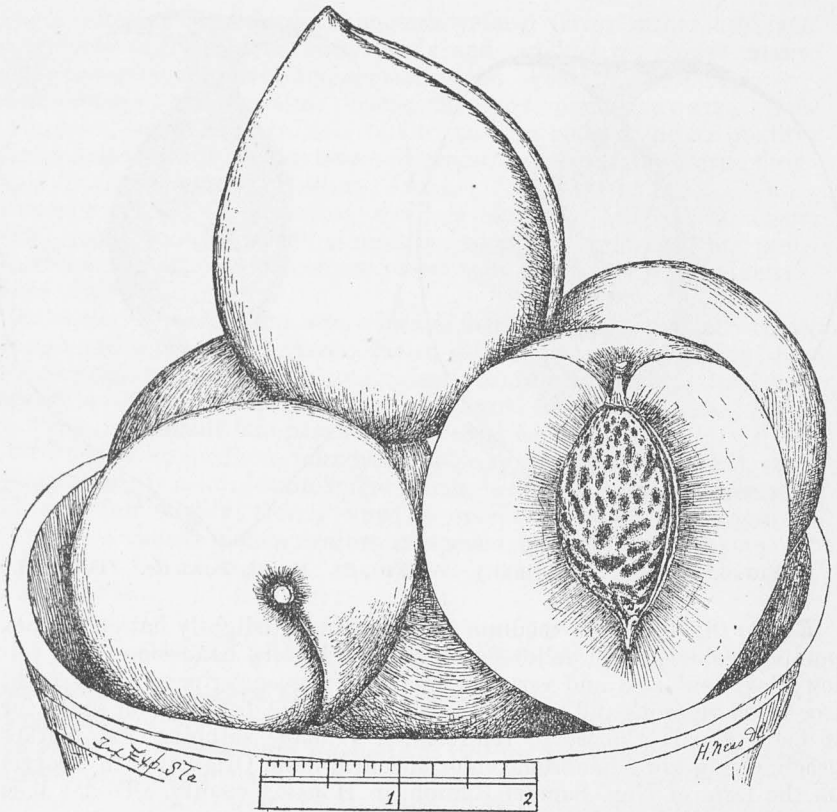


FIG. 8. *Mamie Ross*, reduced one-third in size. (Original.)

light cream, small red cheek; flesh rather soft when fully ripe, like most of its class; flavor sub-acid, very good; half-cling; ripened June 23d; tree vigorous and moderately productive here; further north, at Waco, it is very productive and much larger in size; glands small, reniform. This peach originated on the farm of Captain A. J. Ross, Dallas, Texas, about fifteen years ago and was introduced by J. M. Howell, of the same place. It is one of the best early peaches for table use and market now grown in the State.

Miss Lolo.—Medium to large, roundish, sometimes slightly pointed; color, light cream, with small red cheek; flavor sub-acid and quite good; half-cling; ripened June 28th. Follows *Mamie Ross*, and resembles it very much in fruit. Tree large and vigorous, and bears well; glands small, reniform. Originated at Mexia, Texas, and was named by J. W. Stubenrauch, of the same place. A valuable peach, especially for family use.

Oriole. — Medium size, ovate, obtuse apex; color, greenish yellow, splashed with red; flavor rather sweet, quality good; clingstone; ripened July 19th; tree vigorous and productive; glands reniform. Has some Persian blood.

Price's (Free).—Medium size, roundish, slightly pointed; color, green-

ish white, with light red cheek; freestone; ripened August 4th; tree vigorous and fairly productive; glands reniform.

Smock.—Medium size, round, with acute apex; color, cream; flesh light yellow; flavor sub-acid, pleasant; ripened August 15th; freestone; tree vigorous, but shy bearer.

Spottswood.—Large, round, slightly oval, blunt apex; color, light cream; flesh rather soft and juicy when fully ripe; flavor slightly sweet, very pleasant; free; ripe July 11th; tree fairly vigorous and productive; glands reniform. One of the best peaches of its season.

Stonewall Jackson.—Size medium to large, rather oblong, slightly flattened, apex abruptly pointed; color, cream, with small red cheek; flesh rather firm; cling; flavor sub-acid and very pleasant; would ship well, but is not an attractive peach in market; tree vigorous and productive; glands small, round to reniform, yellow; ripened July 16th.

Sylphide.—Medium size, roundish; color, cream, with small red cheek; flesh white; flavor mild acid, good; ripened July 19th; cling; tree vigorous and productive; glands few and reniform.

Thurber.—Large, oval; color, creamy white, with small red cheek; flesh white; flavor pleasant acid; freestone; ripe July 22d; tree vigorous and fairly productive; glands few and reniform. A valuable peach.

V. VARIETIES BELONGING TO THE PERSIAN RACE.

Alexander (figs. 5 and 9).—Medium size, round, deep suture; color, pale white, with dark red cheek over a large part next to sun; flesh pale white, juicy and tender, sub-acid, quality good; half-freestone; ripened May 27th; a valuable market variety, owing to its earliness and handsome color; tree a shy bearer here this far south; glands globose. One of the most valuable early peaches for family use and for market, but it should not be planted largely in extreme Southern Texas.

Amsden.—Size rather large, round, slightly flattened; color, creamy white, beautifully splashed with red; flavor pleasant sub-acid; half-free; ripe June 10th; tree vigorous, but a shy bearer this far south. Resembles *Alexander* very much, but is some later.

Amelia.—Large, oval, apex pointed; color, rich yellow, beautiful red cheek; flesh yellowish white, rather firm; flavor pleasant sub-acid, quality good; ripe July 1st; half-clingstone; tree vigorous, but not very productive this far south. Originated in Missouri.

Annie (Wylie).—Fruit very small; has done no good here.

Baldwin (Late).—Has borne but little here; done no good.

Barnes.—Size medium to small, round; color, dark greenish yellow, with numerous red streaks; flesh reddish yellow, firm; flavor sub-acid and quite fair; ripened August 21st; cling; tree vigorous and only fairly productive; has some Spanish blood. Originated in Bell county, Texas, by Barnes Parker.

Beatrice.—Medium size to small, round; color, yellowish white, streaked with red; flavor mild acid and very fair quality; free; tree rather weak grower, shy bearer; ripe June 5th; glands round.

Beauchamp.—Medium size, round, with sharp point at apex; color, yellow, with red cheek; flesh yellow and rather firm; flavor mild acid, quality only fair; free; ripe August 20th; tree rather weak grower and shy bearer; glands large, reniform.

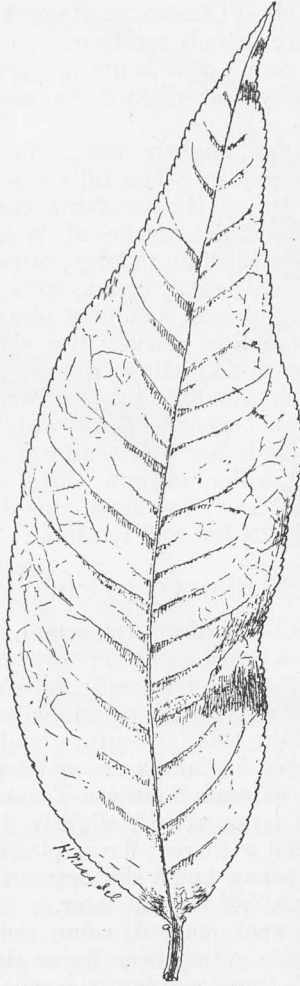


FIG. 9. *Alexander Leaf.*

Becquett Late.—Medium to small, oval; color, light yellow; sub-acid and quite good; free; ripe August 11th; tree a vigorous grower and productive; glands reniform.

Bexar.—Size medium to small, ovate; color, light cream; flavor a little acid; freestone; ripe August 14th; tree vigorous and moderately productive; glands globose.

Blood (Cling).—Medium size, round to oval, apex with obtuse point; color, very dark red, flesh same; flavor only fair; cling; ripe August 14th; resembles Raisin Cling; tree fairly vigorous, but not as productive as others of same type; glands reniform.

Benango.—Has not fruited.

Christiana.—Round to oval, medium size; color, yellow; flesh soft and mealy; free; flavor a little sweet and quality fair; ripe July 25th; tree vigorous, but not productive; glands round. Originated at Pomaria, S. C.

Clarissa.—Medium size, roundish; color, yellow, with crimson cheek; flavor sub-acid and very good; free; ripened July 15th; tree vigorous, but a shy bearer. A promising peach in a climate to which it is better suited.

Comet.—Rather small, round; color, yellowish white; free; flavor a little acid, but quality very fair; tree not a vigorous grower, shy bearer; glands small, reniform. English origin.

Conkling.—Medium to large, oblong, somewhat flattened; color, yellow, with deep red cheek; flesh yellow and rather soft; flavor sub-acid, quality only fair; free; ripe July 25th; tree a vigorous grower, shy bearer; glands small, globose. A promising variety for more northern climates.

Countess.—Medium size, round; color, creamy white, with red cheek; flavor pleasant acid, rich and juicy; semi-cling; ripe July 1st. A very fair peach; has a mixture of Spanish and Persian blood.

Cowan (Late).—Very small, round; ripens in September; glands reniform; has not done any good here.

Crawford's Late.—A well-known old variety, which needs no description. It ripens here August 1st. Shy bearer this far south, and, in fact, it seems to me, judging from what I see of it at other places, that the variety is failing.

Crimson (Beauty).—Medium size; ripens very late; shy bearer; has done no good here.

Crockett (Late White).—Rather small, oval; color, white; freestone; ripened August 6th; tree fairly vigorous and productive; glands reniform; origin, New Jersey; has some Spanish blood. A very fair late peach.

Crothers.—Medium size, round, with acute apex; color, cream; free; flavor rather acid; tree fairly vigorous, not productive; ripened July 7th; glands small, slightly reniform.

Dowling (June).—Medium size, round, slight projecting apex; color, cream, with red cheek; flavor sub-acid and quite good; cling; ripe July 8th; tree vigorous and productive; no glands.

Downing.—Has not fruited.

Duff (Yellow).—Medium size, ovate, with acute apex; color, light yellow; flesh firm; flavor sub-acid, very fair; cling; ripe July 20th; tree vigorous and productive; glands small, round; a good shipping variety.

Duggar (Golden).—Size rather large, roundish; color, beautiful yellow, with crimson cheek; flavor pleasant sub-acid; free; ripened July 20th; tree does not grow tall, shy bearer this far south; glands round; a valuable peach for market where it is adapted.

Early George (Royal).—Rather small, round; color, white, splashed with red; flavor a little acid, only fair; free; ripened July 15th; tree fairly vigorous, shy bearer here; glands round.

Elmira.—Medium size, round; color, cream, with deep red cheek; flavor a little acid, only fair; cling; ripe June 25th; tree vigorous and productive; glands globose. A fair clingstone peach. Originated in Mississippi.

Foster.—Medium size, broadly ovate, apex pointed; color, yellow, with large deep red cheek; flavor sweet when fully ripe and quite good; free; ripened June 27th; tree a vigorous grower, but only fairly productive here; glands small, round. A showy peach.

Ford's No. 2.—Medium size, oval, with pointed apex; color, rich yellow.

low, splashed with red; flesh rather firm; flavor sub-acid, but very good; free; ripened July 24th; tree fairly vigorous, but not productive.

Flewellen.—Has not fruited.

Gaylord.—Medium size, round, with pointed apex; color, creamy white, heavy down; free; ripe July 7th; tree fairly vigorous, but not productive; glands large and round. Resembles Crothers. Originated in Mississippi.

Gem (Cling).—Fair size; very late; shy bearer; glands reniform; has some North Chinese blood.

Gen. Taylor.—Medium size, roundish, ovate, apex obtuse; color, creamy white, with red cheek; flavor very fair; ripened June 24th; tree vigorous and productive; glands reniform. A very fair clingstone.

Glendale (Beauty).—Medium to large, ovate, with acute apex; color, yellow; flesh, firm; flavor sweet and quite good; freestone; ripened July 11th; tree vigorous, but not productive here; glands large, round. A very fair peach; would ship well.

Gov. Briggs.—Medium size to large, roundish, much flattened; color, yellow, with deep red cheek; flavor sub-acid and very good; free; ripened June 24th; tree vigorous, but shy bearer; glands small, round. A very handsome peach, with firm flesh, and in higher altitudes, where it is better adapted, no doubt would be profitable.

Golden Drop.—Medium size, round, with pointed apex; color, yellow; flesh, firm; flavor sweet and pleasant; semi-cling; ripened July 25th; tree fairly vigorous, shy bearer.

Hale Early.—Medium size, round, slightly flattened; color, creamy white, light red cheek; flavor sweet and very fine; semi-cling; ripened June 25th; tree vigorous, but shy bearer; glands small, round. A good peach where it does well. Originated in Summit county, Ohio.

Haupt (Extra).—Medium size, oval, with pointed apex; color, creamy white, with red cheek; cling; flavor rather acid, but good; ripe July 24th; tree vigorous, but not productive; glands round. A very fair peach.

Heath Cling.—No good here; tree rather dwarf.

Howell Cling.—Medium size, roundish, with acute apex; color, creamy white; flavor very fair; cling; ripened August 21st; tree fairly vigorous and productive; glands small, reniform.

Hynes (Surprise).—Medium size, roundish, slightly flattened, with acute point; color, cream, splashed with red, almost entirely red when exposed to sun; flavor mild acid, very good; semi-cling; ripe June 28th; tree vigorous and fairly prolific; glands globose. A valuable peach for table use.

Ispahan.—Medium size, round; color, yellow, with light red cheek; shy bearer here; glands reniform.

Jennie (Worthem).—Small, ovate, with acute point; color, yellow, with red cheek; rich, sub-acid, vinous flavor; free; ripe July 8th; tree a vigorous grower, shy bearer; glands reniform.

June Rose.—Medium size, round, flattened some; color, greenish white, with red cheek; free; pleasant, sub-acid; ripe July 20th; tree fairly vigorous and moderately productive. A very fair peach, but there are several others of the same season better.

Lady Ingold.—Medium to large, roundish, flattened some, with acute apex; color, yellow, with large red cheek; flesh rather soft; flavor sub-acid and very good; ripe July 14th; free; tree very vigorous grower and

productive; glands globose. One of the most valuable of its season tested here.

Lady Parham.—Has not fruited.

Lonoke.—Has not fruited.

Lemon (Cling).—Rather small; yellow; acid; very shy bearer here.

Lipscomb (Prize).—Small, round; color, yellow, with red cheek; flavor sub-acid, good; half-cling; ripe June 22d; tree vigorous, but not productive; glands reniform.

Longworthy.—Small, round; color, pale white, with red cheek; flavor pleasant sub-acid; cling; ripe July 22d; tree vigorous, but shy bearer; glands reniform.

Louise (Early).—Small, roundish; color, creamy white, with red cheek; cling; ripe June 20th; flavor sweet and very fair; tree vigorous, but not productive; glands reniform.

Minnie.—Large, oval, apex with acute point; color, greenish white, with small red cheek; free; flavor pleasant, sub-acid; ripe June 27th; tree vigorous and productive; glands reniform. A valuable peach.

Mitchell.—Medium size, round, with prominent acute apex; color, light cream; flavor sub-acid, with a slightly bitter taste; ripe August 4th; tree not productive here.

Monticola.—Large, round; color, beautiful yellow, with heavy red cheek; flavor pleasant, acid; tree a shy bearer; glands reniform. A valuable market peach where it bears.

Mountain (Rose).—Medium size, round; color, light green, with heavy red cheek; flavor pleasant, sub-acid; free; ripe July 1st; tree vigorous and productive; glands globose. A valuable and reliable peach.

Mrs. Brett.—Medium size, round; color, white, with crimson cheek; flavor pleasant sub-acid, quality good; free; ripe June 29th; tree vigorous and fairly productive; glands globose. A very fair peach.

Nelson (Cling).—Small; very late; has done no good here.

Old Mixon Cling.—Medium size, oval, apex with acute point; color, cream, with small red cheek; flavor sub-acid and quite pleasant; cling; ripe July 25th; tree vigorous and productive; glands round. A well-known peach of good quality.

Old Mixon Free.—Medium size, round, with acute apex; color, cream, with small red cheek; flavor sub-acid and very pleasant; free; ripe July 29th; vigorous and fairly productive; glands round. A good late peach.

Pansy.—Medium size, roundish; color, yellow, with dark red cheek; flesh, yellow, red next to stone, firm; flavor sweet and very pleasant; free; ripe June 28th; tree vigorous, but not productive here; glands yellow, reniform.

Picquet Late.—Medium size, oval, apex smooth; color, light yellow; flesh firm; flavor sub-acid, quite pleasant; free; ripe August 11th; tree large and vigorous, productive; glands reniform.

Princess (of Wales).—Medium size, roundish, slightly oval; color, light green, with red cheek; flesh soft; flavor very good; free; ripe July 5th; tree vigorous and productive; glands dark, reniform. A very fair peach.

Raisin (Cling).—Small, oval, with acute apex; color, yellow, streaked with dark red; flavor sub-acid; ripe August 14th; tree vigorous and productive. Indian type.

Reagen.—Large, round; color, greenish white, with red cheek; flavor

pleasant acid; free; ripe July 25th; tree a weak grower and shy bearer here. A fine peach further north, where it would do well.

Red River.—Medium size, round; color, not red as name would indicate, light cream; flavor sub-acid and quite pleasant; cling; ripe July 16th; tree vigorous, but not productive; glands few and slightly reniform. A fine table peach. Introduced by T. V. Munson.

Reeves (Favorite).—Medium size, round, broad at basin; color, creamy yellow, with very dark red cheek; flavor mild acid and very pleasant; free; ripe July 8th; tree vigorous, but not productive here. A very fair peach.

Ren.—Medium size, round, with acute point; color, yellow, splashed with red; flavor pleasant acid; cling; ripe June 24th; tree vigorous, but not productive; glands large, reniform.

Ringold.—Medium size, oval, with acute apex; color, cream; flesh, firm; flavor only fair; cling; ripe August 10th; tree vigorous, but not productive.

Rivers (Early).—Rather small, round, much flattened, no suture; color, creamy white, with red cheek; free; flavor not decided, quite fair; ripened June 21st; tree of fair size and very prolific; glands round to reniform. A very small peach.

Rutter.—Small, late, tree has done no good.

St. John (Yellow, Fletias).—Medium size, roundish; color, yellow, heavily splashed with red; flavor very fair; ripe June 24th; free; tree vigorous, but not productive. A well-known old peach.

Scott (Scott's October).—Medium size, oval; yellow, with large red cheek; pleasant acid; free, ripe July 23d; tree rather weak, has borne scarcely any here. Originated at Columbia, S. C.

Scruggs.—Medium size, ovate; yellow, with small red cheek; sub-acid, rather poor quality; ripened August 11th; tree vigorous and productive; glands reniform.

Tillotson (Early).—Medium size, round, slightly flattened; color, light cream, heavily splashed with red; flavor a little acid, but very good when fully ripe; semi-cling; ripe June 24th; tree fairly vigorous and quite productive; glands few, round. A good, small early peach.

Salway.—Medium size, round; yellow, with small red cheek; flavor mild acid, good; free; ripened July 25th; tree vigorous, but very shy bearer.

Sloan (Carolina).—Medium size, oval; yellowish, with bright red cheek; flesh firm; flavor sub-acid and pleasant; free; ripe July 29th; tree vigorous, but only fairly productive; glands round. A good peach for shipping, and also for table use.

Susquehanna.—Rather small, round; yellow, with marbled cheek; pleasant sub-acid; free; ripe July 28th; tree a weak grower and shy bearer.

Troth (Early).—Small, round; creamy white, red cheek; flavor good; ripe June 22d; tree vigorous, but shy bearer this far south.

Tippecanoe.—Medium size, round; yellow, with tinge of red; flavor rather insipid; ripe July 22d; cling; tree shy bearer; glands reniform.

Tarbell.—Small, roundish; yellowish white; flavor only fair; ripe August 8th; free; tree rather weak and shy bearer; glands reniform.

Tuskana.—Medium to large, roundish; yellow, with large deep red

cheek; flavor very good; cling; ripened July 5th; tree a vigorous grower, but a very shy bearer here; glands reniform.

Utatis.—Small, ovate; cream-colored; flavor very fair; free; ripe August 11th; tree a vigorous grower, but shy bearer; glands reniform.

Vorhees No. 1.—Medium size, ovate, pointed apex; yellow, with red cheek; good quality; ripe June 24th; free; tree a vigorous grower, but not productive; glands round.

Walker.—Medium size; ripe August 20th; not productive.

Wheatland.—Medium to large, ovate, with small, acute apex; yellow, with deep red cheek; sub-acid and very pleasant; free; ripe July 29th; tree a vigorous grower, but shy bearer; glands globose.

VI. VARIETIES NOT CLASSIFIED.

In this list are included varieties which are so mixed as to their origin and therefore varied in botanical characters, that they are not decided enough to go in either race.

Alice (Haupt).—Medium size, ovate; light cream colored; pleasant sub-acid; ripe June 26th; half-cling; tree vigorous and productive; glands reniform. A very fair peach for family use and local markets. Has considerable Persian blood. Originated on the farm of W. W. Haupt, in Hays county, Texas.

Barnard.—Medium size, roundish; yellow, splashed with red; sub-acid, very pleasant flavor; ripe July 3d; tree fairly vigorous and moderately productive; glands reniform. A very fair peach; has considerable Persian blood.

Baldwin (Late).—Very late; has done no good here.

Beer (Smock).—Small, oval; yellow, with marbled cheek; free; ripe July 28th; tree not vigorous, shy bearer; glands small, reniform.

Beckett Cling.—Medium to large, ovate, with acute apex; greenish white, with light red cheek; flavor very fair; cling; ripe July 17th; tree vigorous and productive; glands reniform. A very fair peach. Has both Persian and North China blood.

Bilyeu (Late October).—Very late here; cling; glands round; has done no good. Originated in Caroline county, Md., and introduced by S. C. Bilyeu.

Bishop (Early).—Large, broad, oval; cream-colored, splashed with red; flavor mild acid, good; ripe June 20th; free; tree vigorous and productive; glands small, reniform. Has both Persian and North China blood. A valuable peach for table use and for market.

Bonitio.—Medium to small, roundish, with acute projection; cling; ripe July 25th; cream-colored; tree vigorous and productive; glands reniform. Has both Spanish and Persian blood.

Bronaugh (Cling).—Very late; has done no good here; glands reniform.

Bokharia No. 1.—Medium size, ovate; creamy yellow, splashed with red, flesh red around stone; free; ripe July 25th; sub-acid, very good; tree vigorous, but not productive; glands many, reniform. Has both Persian and North China blood.

Bokharia No. 2.—Small, white, free, sub-acid, shy bearer; has done no good here.

Calaway (Cling).—Very late; has done no good here; has both Persian and North China blood.

Chinese Blood.—Small, ovate, with acute apex; yellowish green, with large red cheek; cling; ripe July 3d; rather sweet, pleasant vinous flavor, resembling Chinese Cling; has considerable Persian blood; tree vigorous and fairly productive.

Eaton (Golden).—Small, round; yellow; rather acid; cling; ripe July 10th; tree vigorous and productive; glands reniform.

Eldred (Cling).—Medium size, roundish; cream-colored, with small red cheek; juicy, sub-acid and quite good; ripe June 26th; cling; tree vigorous and productive; glands round. Originated on the farm of W. R. Eldred, Washington county, Texas. A valuable peach.

English.—Medium size, oval, with pointed apex; white, flesh firm; flavor only fair; cling; ripe August 15th; tree fairly vigorous, but not productive; glands globose.

Easter (Down).—Yellow, with red cheek; cling; acid; ripe July 25th; no glands.

Falcon.—Medium size, ovate, with small, acute apex; cream-colored, with red cheek; very pleasant acid; free; ripe July 22d; flesh firm; tree vigorous, but not productive. Has both North Chinese and Persian blood. A valuable peach, both for table and for shipping.

Gen. Grant.—Medium size to small, oval; greenish white; cling; ripe August 8th; very fair flavor; tree vigorous and productive.

George 4th.—Small, round; white, red cheek; pleasant sub-acid; ripe July 20th; glands round; shy bearer.

Good's (October).—About same as Cobler Indian.

Graves (Early).—Has not fruited.

Houpt (October).—Has not fruited.

Hilard (October).—Small, very late; has done no good here.

Knight (Cling).—Medium size to small, roundish; yellow, striped and splashed with red; flesh firm; very fair flavor; heavy down; ripe August 14th; cling; tree rather dwarf, very prolific; glands reniform. Closely resembles Raison Cling.

Leopard.—About same as Blood Cling; has done no good.

Lord Palmerston.—Large, whitish, with pink cheek; sub-acid and quite good; ripened August 1st. English origin.

Miner.—Medium size, oval, with large apex; yellow, sub-acid, pleasant; ripe July 11th; tree fairly vigorous, but shy bearer; glands many, reniform.

Morris (White).—Very late, shy bearer, glands small, reniform; of little promise here.

Muskogee.—Medium size, oval, with acute apex; greenish white, streaked with red; free; flavor sub-acid, very fair; ripe August 14th; tree fairly vigorous and productive; glands reniform; resembles Columbia, but not as good. Has Spanish blood.

Orange (Cling).—Rather small, ovate, with pointed apex; light orange; sweetish, pleasant; cling; ripe July 25th; tree vigorous and productive; glands dark brown, reniform; resembles Duff Yellow.

Rosedale (September).—Small, cling, yellow; sub-acid, fair flavor; ripened August 25th; glands reniform; shy bearer. Originated in Southern Texas.

Ringold.—Medium size, oval, with small pointed apex; cream-colored; cling; ripe August 10th; tree vigorous and fairly productive; glands globose. A very fair late peach.

Ruple (Cling.)—Small, oval, small acute apex; light orange; very fair flavor; cling; ripe July 13th; tree vigorous and productive; glands globose; resembles Orange Cling. Has Spanish blood. Originated by T. V. Munson.

Schumaker.—Has not borne.

Sneed.—A valuable early peach in northern part of the State, but has not been in our test long enough to fruit here. Originated by J. L. T. Sneed, Tennessee.

Sea Eagle.—Medium size, oval, with acute apex; creamy white, with red cheek; sub-acid, pleasant; free; ripe July 19th; vigorous and productive; glands reniform. A good peach.

Sener.—Very late; of little promise here.

Stump (The World.)—Medium size, roundish; creamy white, with red cheek; sub-acid, juicy and pleasant; free. A very fair well-known peach. Has Persian blood.

Snow.—Small, round; creamy yellow; cling; ripe July 25th; glands small, globose. Has both Spanish and Persian blood.

Squaw.—Small, yellow, free, ripe July 22d; glands small, reniform. A poor peach here.

Topaz.—Has borne but few fruit; ripened October 5th; free.

Van Buren (Dwarf.)—Large, yellow, round, with prominent projection at apex; flesh yellow and firm; cling; vinous flavor; tree upright; dwarf; shy bearer.

Yellow August.—Very late; has done no good here.

TEST OF VARIETIES AT HULEN, GALVESTON COUNTY, TEXAS, BY PROF. F. W. MALLY.

At my request, Prof. Mally has given me a report on his experiments with peaches, from which I have taken those notes on varieties which were not in our orchard. In the table, however, the period of ripening of some other varieties is given also for comparison:

"The soil is, on the whole, a sandy loam, underlaid with a white gravelly marl at a depth of from 15 inches to 2 feet. In some portions a slight admixture of black, clayey soil enters into the composition, with a yellowish to red gravelly subsoil at various depths from 3 to 5 feet. This prairie land was broken from July to October in the fall of 1893. It was cross-plowed and well pulverized before planting in January and February, 1894.

"The trees used were well grown, one year budded stock, grading 3 to 4 feet. The lateral roots were all well cut back, leaving from 1 to 2 inches of some roots, as judgment in any case might dictate. They were planted fully as deep as the trees had stood in the nursery row, and the tops cut back to 1 foot, or not to exceed 18 inches.

"The first season was one of excessive rain, and but little judicious cultivation could be given the young trees. As a result of the excessive wet weather several varieties, notably Honey, Waldo and Angel, died out badly where drainage was lacking. Pallas and Imperial died plentifully, too, though not to the extent of the three first mentioned. On well drained soils the varieties named made a healthy, vigorous growth. The first summer, therefore, the orchards did not get the frequent cultivation which should be given young orchards.

"The first winter little pruning was practiced, further than to cut out interfering branches and such limbs as had a tendency to spread too near the ground. We believe our failure to cut back the 'leaders' of the principal limbs and branches was an error. This is indicated by the satisfactory results following our having cut them back about one-third the second winter.

"During the second and the present summer seasons reasonable, though

not frequent, cultivation was given. Both seasons are well known throughout South Texas as having been afflicted with long drouths. At no time has the cultivation been frequent enough to maintain what is designated as frequent, clean cultivation. Several times abundant crops of grass grew up in the orchard. As soon as possible this was plowed under, though not in the heat of summer, at least not during the months of July and August."

Angel (Peen-To): "Freestone; fruit small; diameters $1\frac{1}{2}$ to $1\frac{3}{4}$ inches; shape round or nearly so; skin pale yellowish or sprinkled with red, or more frequently splashed with a red cheek; flesh white or tinged greenish, reddish about the pit; badly subject to 'black spot' disease of fruits."

For further details of this disease, see discussion of it on page 840.

"With us, this variety has been thoroughly disappointing, despite the fact that it is so highly praised in Florida and by Florida nurserymen as being well adapted to coastwise Texas. In some especially favored localities it may be valuable, but with us the fruit has been small and so acid as to be almost bitter. We note, however, that there is less acidity in the fruit from our three-year-old trees, and it may be possible that as the trees become older the fruit will be both larger and of better quality. Another factor may enter more largely into the successful fruiting of this variety than some others, and that is the question of fertilizing. This variety is so vigorous and productive that it is very desirable to overcome the tendency to undue acidity, and if age and fertilizing may possibly correct it we certainly can afford the expense of making the necessary tests and experiments with methods of bringing about this result. We recommend it to every orchardist for thorough trial, though not for extensive planting. This year it began ripening July 1st, fully half the crop being marketable by July 10th, and practically all by July 14th. Scattering peaches were found as late as July 20th." Introduced by G. L. Tabor, of Florida, in 1889.

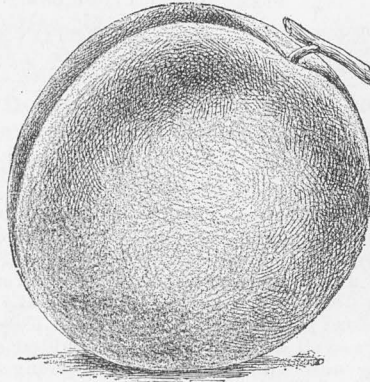


FIG. 10. *Angel* (Peen-To type.)

Early Cream (Honey): "Freestone; fruit resembles Honey in shape, but smaller and point not, or but slightly, recurved; skin yellow or pale yellow, sprinkled with red, sometimes a red flush at the base; flesh sweet, juicy, plainly a Honey flavor, and good quality. Two-year trees ripened fruit last year on July 15th. This year the same trees began ripening fruit on July 11th. Tree a vigorous grower and inclined to overbear. Fruit is smaller than Imperial, and not really necessary to make a succession for a commercial orchard. No family orchard should be without it."

Florida Crawford (Spanish): "Freestone; large to very large; diameter $2\frac{1}{4}$ to $2\frac{1}{2}$ inches; roundish oblong, somewhat bellied with shallow suture; skin pale yellow to deep rich yellow, frequently with a reddish blush at the base; flesh yellow, sparsely sprinkled with red about the pit; firm, juicy, slightly vinous, and of the best quality when fully ripe; moderately prolific. Began

ripening this year July 26th and continued until August 11th; fruit firm and will prove a good shipper. One of the best August peaches for extensive planting." Introduced by G. L. Tabor, of Florida, in 1891.

Imperial (Honey): "Freestone; medium size; diameter 2 to 2 $\frac{3}{8}$ inches; roundish oblong; skin yellowish, tinged greenish, usually washed with red on the sunny side. As a rule, not bellied or sutured, but occasionally showing the characteristic Honey belly, with distinct and slightly recurved point; fruit rather more hairy than Honey, Pallas or Early Cream, which ripen ahead of it; flesh white, slightly reddish at the pit, juicy, of excellent quality, with perceptible Honey flavor; ripened this year July 20th; quite subject to 'black spot.' Probably the best late July peach of the Honey strain, and worthy of more extensive planting." Introduced by G. L. Tabor in 1889.

Japan Dwarf Blood (Oriental): "Freestone; medium size; beautifully colored; flesh juicy, streaked with red, and of excellent quality; ripens just ahead of or with Alexander. Our two-year trees ripened fruit this year on June 1st and continued until June 11th. Tree a dwarf grower and said to be a shy bearer, though we can not state from experience in our own orchards. It is so much superior to the Alexander in quality, and ripens so early, that we are inclined to consider it worthy of more general planting, even though it may be a shy bearer when young."

Oviedo (Honey): "Freestone; fruit small; roundish oblong; slightly bellied, with usually a recurved point; skin pale yellow or rich cream color, usually with a red blush on the sunny side; flesh white, sparsely streaked with red, deeply colored red about the pit; firm, with perceptible Honey flavor. Three-year trees began ripening fruit July 12th; fruit was greatly affected with 'black spot' disease and cracked badly, due, probably, to the heavy rains following an excessive drouth. If later experience should note a continuance of this weakness, it will have to be discarded. Tree an unusually vigorous grower."

Sangmel (Honey): "Cling; medium size; roundish oblong, pointed; skin white, overspread with red; flesh white, streaked with red; firm, juicy, sweet, and of high flavor. This variety fruited with us for the first time this year. Scattering ripe peaches were picked July 12th and continued until July 19th. It is the most promising early July cling thus far fruited with us and we consider it worthy of more extensive planting, and should at least be found in every orchard." Introduced by G. L. Tabor in 1892.

Triana (Honey): "Freestone; our two-year trees ripened fruit July 17th last year; no fruit this year, and hence no further experience or recommendations of this variety. Said by some to be promising, or at least worthy of a trial. This sentiment we indorse."

Waldo (Peen-To): "Freestone; small to medium; roundish oblong; skin light salmon to darker, with a pretty red blush or cheek at the base on the side next to the sun; flesh white, tinged yellowish, red about the pit; juicy, very sweet and of excellent quality. Decidedly our favorite for an early peach. It is a regular and heavy bearer and requires severe thinning to keep it from overbearing. Our two-year Waldo trees ripened fruit July 6th, 1895, and continued until July 15th. This year the trees began to have scattering ripe peaches June 11th and continued until July 2d. Fully three-fourths of the crop ripened between June 18th and 27th. This is doubtless the best money-making peach which can be placed in our coast country orchards and deserves extensive planting. Attacked quite freely by 'black spot.'" See treatment for this fungus on page 839. This peach was first brought into notice by T. K. Godbey, of Waldo, Fla., but it was brought into more public notice by G. L. Tabor.

Comparative dates of ripening for the seasons of 1895 and 1896 arranged in the order of ripening at Hulen, Texas.

Variety.	1895. Two-year trees.	1896. Three-year trees.	No. of days earlier in '96.
Japan Dwarf Blood		June 1 to 11	.....
Alexander	June 5 to 11		
Waldo	July 6 to 15	June 11 to July 2	25
Honey	July 4	June 22 to July 4	12
Angel		July 1 to 20	.....
Family Favorite	July 27	July 7 to 18	20
Pallas	July 13	July 9 to 19	4
Chinese Free	July 22	July 10 to 24	12
Early Cream	July 15	July 11	4
Triana	July 17		13
Thurber	July 24	July 11 to 20	.....
Colon		July 12	.....
Oviedo		July 12	.....
Onderdonk		July 14 to August 10	.....
Sangmel		July 19	.....
Imperial		July 20	.....
Countess		July 21 to August 12	.....
Carpenter's Cling		July 22 to August 1	.....
Florida Crawford		July 26 to August 11	.....

"If we were to confine our planting of a peach orchard strictly to such varieties as we felt were of the greatest commercial value for extensive planting, we would select, primarily, for a complete succession, Waldo, Family Favorite, Chinese Free, Turber, Onderdonk, Imperial and Florida Crawford. Of these, Waldo, Family Favorite, Chinese Free and Thurber are found to have fluctuated greatly in the time of ripening for the two years given. If this is a natural tendency of these varieties, it becomes a matter of business to prevent the occurrence of a gap, as it were, in the succession of peaches by adding such varieties as ripen either a few days earlier or later than the preceding or succeeding variety in the succession. To avoid this vacancy, we would add Pallas, for example, to protect the succession between Family Favorite and Chinese Free, and Early Cream as a link between Chinese Free, Thurber and Imperial."

Date of Blooming and Ripening at College Station in 1895.

Name of Variety.	Date of Blooming.	When Ripe.	Cling or Free-Stone.
Albert (Sidney)*	March 20	June 30	Free.
Alexander	March 22	May 27	Semi-Cling.
Alice (Haupt)	March 23	July 26	Semi-Cling.
Amsden	March 26	June 16	Semi-Cling.
Amelia	March 25	June 21	Semi-Cling.
Annie (Wylie)	March 23	.....	.....
Baldwin (Late)	March 25	.....	.....
Barnard	March 25	July 14	Free.
Barnes	March 18	Aug. 21	Semi-Cling.
Beatrice	March 27	June 5	Free.
Beauchamp	March 27	Aug. 20	Free.
Beers (Smock)	March 23	July 28	Free.
Becquett Cling	March 25	July 19	Cling.
Becquett Free	March 25	July 10	Free.
Berneice	March 23	.....	Semi-Cling.
Bexar	March 25	Aug. 8	Free.
Bilyeu (Late October)	March 25	Sept. 1	Cling.

Date of Blooming and Ripening at College Station in 1895—continued.

Name of Variety.	Date of Blooming.	When Ripe.	Cling or Free-Stone.
Bishop (Early).....	March 25	June 20	Free.
Blood (Cling).....	March 25	Aug. 14	Cling.
Bonango.....	March 20	Sept. 9	Free.
Bonitio.....	March 13	July 25	Cling.
Bronaugh (Cling).....	March 23	Aug. 20	Cling.
Butter.....	March 18	.....	.....
Bokharia No. 1.....	March 23	.....	.....
Bokharia No. 2.....	March 25	July 20	Free.
Cobler (Indian).....	Feb'y 24	July 15	Cling.
Calaway (Cling).....	March 18	August	Cling.
Carpenter (Cling).....	March 12	August	Cling.
Chinese Blood.....	March 20	July 10	Cling.
Chinese Cling.....	March 21	July 14	Cling.
Christiana.....	March 23	July 25	Free.
Clarissa.....	March 23	July 25	Free.
Climax.....	March 19	June 26	Semi-Cling.
Coleman.....	March 13	June 20	Free.
Columbia.....	March 13	July 25	Free.
Comet.....	March 25	July 20	Free.
Conkling.....	March 25	July 25	Free.
Countess.....	March 9	July 1	Semi-Cling.
Cowan (Late).....	March 3	August	Cling.
Crawford Late.....	March 23	July —	Free.
Crimson (Beauty).....	March 23	Aug. 25	.....
Crocket (Late).....	March 25	Aug. 6	Free.
Crother.....	March 23	July 10	Free.
Curtis (Cling).....	March 10	July 10	Cling.
Dowling (June).....	March 9	June 30	Cling.
Downing.....	March 26	.....	.....
Druid (Hill).....	March 9	July 10	Cling.
Duff (Yellow).....	March 18	June 28	Cling.
Duggar (Golden).....	.....	July 20	Free.
Early China.....	March 19	June 19	Free.
Early Royal (George).....	March 26	July 15	Free.
Eaton (Golden).....	March 23	July 10	Cling.
Elberta.....	March 23	July 10	Free.
Eldred (Cling).....	March 25	June 26	Cling.
Elmira.....	March 23	July 10	Cling.
English.....	March 23	Aug. 15	Cling.
Esther (Down).....	March 26	July 25	Cling.
Falcon.....	March 23	July 10	Free.
Family Favorite.....	March 23	June 25	Semi-Cling.
Ford (No. 1).....	March 23	June 14	Cling.
Ford (No. 2).....	March 23	July 30	Free.
Foster.....	March 23	July 27	Free.
Gaylord.....	March 25	July 7	Free.
Galveston.....	March 13	Aug. 1	Cling.
Gem (Cling).....	March 25	Aug. 18	Cling.
Gen. Grant.....	March 18	Aug. 8	Cling.
Gen. Lee.....	March 23	July 16	Cling.
Gen. Taylor.....	March 22	July 24	Cling.
George 4th.....	March 9	July 20	Free.
Glendale (Beauty).....	March 26	July 11	Free.
Gov. Briggs.....	March 23	June 24	Free.
Golden Drop.....	March 13	July 25	Semi-Cling.
Graves (Early).....	.....	.....	.....
Guadaloupe.....	March 18	Aug. 20	.....
Hale Early.....	March 27	June 25	Semi-Cling.
Hale Cling.....	March 12	June 25	Cling.
Haupt August.....	March 23	.....	.....

Date of Blooming and Ripening at College Station in 1895—continued.

Name of Variety.	Date of Blooming.	When Ripe.	Cling or Free-Stone.
Haupt Extra	March 23	July 20	Cling.
Henrietta	March 25	Aug. 4	Cling.
Henkel	March 18	June 27	Free.
Heath Cling	March 26	.....	.....
Honey	March 13	July 1	Free.
Howell Cling	March 25	Aug. 1	Cling.
Hyne (Surprise)	March 28	July 1	Semi-Cling.
Ispaham	March 25	July 25	Free.
Jack Ross	March 23	.....	.....
Jennie (Worthem)	March 23	June 27	Free.
June (Rose)	March 26	July 20	Free.
Juno	March 25	Aug. 12	Cling.
Lady Ingold	March 23	July 14	Free.
Lady Palmerston	March 25	Aug. 11	Free.
La Reine	March 13	.....	.....
Langworthy	March 20	July 22	Free.
Lemon (Cling)	March 26	.....	Cling.
Lipscomb (Prize)	March 23	June 22	Semi-Cling.
Lord Palmerston	March 23	July 25	.....
Louise (Early)	March 27	June 18	Semi-Cling.
Lulu	March 9	Aug. 8	.....
Mamie Ross	March 23	June 23	Semi-Cling.
Miner	March 27	July 11	Free.
Mitchell	March 23	Aug. 4	Cling.
Miss Lolo	March 27	June 19	Semi-Cling.
Morris (White)	March 18	August	.....
Mixon Cling	March 28	July 25	Cling.
Mixon Free	March 25	July 25	Free.
Mountain (Rose)	March 23	June 24	Free.
Mrs. Brett	March 25	July 29	Free.
Muskogee	March 23	Aug. 4	Free.
Monticola	March 22	July 28	Free.
Nelson Cling	March 25	August	Cling.
North China No. 1	March 18	July 5	Cling.
Onderdonk	March 9	July 25	Cling.
Orange (Cling)	March 26	July 25	Cling.
Oriole	March 23	July 25	Cling.
Pallas	March 20	June 17	Free.
Pansy	March 13	June 28	Free.
Peen-To	Jan'y 23	June 20	Cling.
Picquett Late	March 25	Aug. 4	Free.
Prices (Free)	March 25	Aug. 4	Free.
Princess (of Wales)	March 23	July 20	Free.
Reagan	March 23	July 25	Free.
Raisin (Cling)	March 25	Aug. 25	Cling.
Reeves' Favorite	March 22	June 28	Free.
Ren	March 23	June 30	Cling.
Rosedale (September)	March 18	.....	Cling.
Red River	March 26	June 16	Cling.
Ringold	March 25	Aug. 10	Cling.
Rivers (Early)	March 26	June 21	Free.
Rupley (Cling)	March 9	July 12	Free.
Rutter	.....	July 25	Free.
Scott (October)	March 20	August	Free.
Schumaker	March 20	.....	.....
Scruggs	March 25	Aug. 1	Free.
Smock	March 22	Aug. 23	Free.
Sneed	March 25	.....	.....
Salway	March 25	July 25	Free.
Sea Eagle	March 18	July 20	Free.

Date of Blooming and Ripening at College Station in 1895—continued.

Name of Variety.	Date of Blooming.	When Ripe.	Cling or Free-Stone.
Sener	March 23	.....
Stump (The World)	March 18	July 15	Free.
Sanders (Cling)	March 9	Aug. 4	Cling.
Spottswood	March 25	July 11	Free.
Stonewall (Jackson)	March 23	July 29	Cling.
Sloan (Carolina)	March 23	July 19	Free.
Sylphyde	March 23	July 19	Cling.
Snow	March 23	July 25	Cling.
Susquehanna	March 23	July 28	Free.
Squaw .....	.....	July 22	Free.
Tarbell	March 25	Aug. 8	Free.
Texas	March 9	Aug. 12	Semi-Cling.
Thurber	March 20	July 14	Free.
Tillotson (Early)	March 23	June 24	Semi-Cling.
Tippecanoe	March 26	July 22	Cling.
Topaz	March 18	.....
Tuskena	March 23	July 5	Cling.
Ulatis	March 27	Aug. 11	Free.
Van Buren (Dwarf)	March 25	Aug. 10	Cling.
Victoria	March 9	Aug. 8	Free.
Vorhees No. 1	March 26	July 3	Free.
Vorhees Silver	March 23	July 3	
Walker	March 23	Aug. 25	Free.
Wheatland	March 23	June 29	Free.
Yellow St. John (Fletias)	March 22	June 24	Free.

*These names are revised according to the rules of the American Pomological Society.

2. VARIETIES OF PEACHES FOR DIFFERENT LOCALITIES.

Varieties frequently are affected differently in localities of the same latitude. Perhaps of no other class of fruits is this difference more noted than of the peach. Some experimenters have gone to one extreme and argued from this fact that there is no great scientific importance to be attached to a test of varieties. I am ready to admit that there is much truth in this position when a variety is taken as an isolated individual and conclusions drawn from its behavior in one locality. That there are great and characteristic differences in varieties needs only to be stated that some are late, some early, some sweet, some sour, some stand drouth well, some do not; some are best for shipping, some are best for table use, and some are productive, some are not. Now, when a variety is studied in reference to the class to which it belongs, the work may be of great scientific importance. This is true because it can be much more accurately predicted how a given variety will do when the soil and climate are given, if only the class to which it belongs is known. All varieties belonging to a certain class will do pretty much alike under the same circumstances. For instance, an illustration from the vegetable garden: Cauliflower, which is a variety of cabbage, will not head up well except on low, rich, loamy, damp soil. Similarly, seedlings of the Honey peach bloom early, but have shown themselves to be less susceptible to injury from frost than any other peaches planted in our orchard. There-

fore, all varieties having the Honey blood may be expected to have more or less of this admirable quality.

To obtain a more intelligent opinion as to how a variety may do which is given in the following list, the reader is referred to the part of the bulletin where the different races or types are discussed under the head of classification.

The varieties given below have done well in our orchard, and knowing something about the races to which they belong and how the races do north and south of us, we have made some predictions as to how the varieties will do in latitudes differing from ours.

VARIETIES FOR MIDDLE AND NORTHERN TEXAS, ARRANGED IN THE ORDER OF RIPENING.

Early Varieties.—Alexander, Mamie Ross, Amsden, Miss Lolo, Amelia, Rivers, Tillotson, Yellow St. John and Family Favorite.

Medium Early Varieties.—Spottswood, Elberta, Thurber, Gen. Lee, Cobler and Curtis.

Late Varieties.—Mixon Free, Stonewall Jackson, Columbia, Texas, Bilyeu and Victoria.

VARIETIES FOR MIDDLE AND SOUTHERN TEXAS, ARRANGED IN ORDER OF RIPENING.

Early Varieties.—Alexander (shy bearer), Mamie Ross, Early China, Coleman, Pallas, Mountain, Tillotson and Family Favorite.

Medium Early.—Spottswood, Elberta, Gen. Lee and Cobler.

Late Varieties.—Onderdonk, Stonewall Jackson, Columbia, Texas and Victoria.

For other varieties tested in the "coast country," the reader is referred to page 817.

3. RULES OF NOMENCLATURE.

At the last meeting of the State Horticultural Society, in August, 1896, the president was given authority to appoint a committee on nomenclature. The committee the president afterward appointed consists of R. H. Price, G. Onderdonk and T. V. Munson. In the discussions of the society it was suggested that this committee take as their guide the rules adopted by the American Pomological Society. The committee has done so in revising the names of the peaches reported in the following list. In order that further confusion in names may be prevented, and to scatter the rules referred to broadcast over the State, they are published here:

Rule 1. "The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit."

Rule 2. "The Society reserves the right, in case of long, inappropriate, or otherwise objectionable names, to shorten, modify or wholly change the same, when they shall occur in the discussions or reports; and also to recommend such changes for general adoption."

Rule 3. "The name of a fruit should, preferably, express as far as practicable by a single word, a characteristic of a variety, the name of the originator, or the place of its origin. Under no ordinary circumstances should more than a single word be employed."

Rule 4. "Should the question of priority arise between different names of the same variety of fruit, the circumstances being general, the name first publicly bestowed will be given precedence."

Rule 5. "To entitle a new fruit to the award or commendation of the So-

ciety, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality, or combination of qualities in a higher degree than any previously known variety of its class and season."

Rule 6. "A variety of fruit, having been once exhibited, examined and reported upon, as a new fruit, by a committee of the Society, will not thereafter be recognized as such, so far as subsequent reports are concerned."

In such cases as Crawford Early and Crawford Late, both names must be retained in full in order to distinguish the varieties apart.

4. ORIGIN OF THE PEACH.

Concerning anything of much importance, its origin is of interest to us. Especially is this true when classification and usefulness depend largely upon the native habitat of different types of a certain species. This is true in particular of the peach, which is affected so much by climate that if varieties belonging to certain types are planted out of the zone best suited to the original type, they will prove utter failures. When considered in this light, some knowledge of the origin and classification of the peach becomes of great importance to successful peach culture.

In giving the origin of the peach, I will be confined almost entirely to the book of acknowledged authority on "Origin of Cultivated Plants," by Alphonso de Candolle, volume xlvi of the International Scientific Series:

"The Greeks and Romans received the peach shortly after the beginning of the Christian era. The names, *persica*, *malum persicum*, indicate whence they had it. I need not dwell upon these well-known facts. Several kinds of peach are now cultivated in the north of India, but, what is remarkable, no Sanskrit name is known, whence we may infer that its existence and its cultivation are of no great antiquity in these regions. Roxburgh, who is usually careful to give the modern Indian names, only mentions Arab and Chinese names. Piddington gives no Indian name, and Royle only Persian names. The peach does not succeed, or requires the greatest care to ensure success, in the northeast India. In China, on the contrary, its cultivation dates from the remotest antiquity. A number of superstitious ideas and of legends about the properties of its different varieties exist in that country. These varieties are very numerous, and in particular the singular variety with compressed or flattened fruit, which appears to be further removed than any other from the natural state of the peach; lastly, a simple name, *to*, is given to the common peach.

"From all these facts, I am inclined to believe that the peach is of Chinese, rather than of Western Asiatic, origin. If it had existed in Persia or Armenia from all time, the knowledge and cultivation of so pleasant a fruit would have spread earlier into Asia Minor and Greece. The expedition of Alexander probably was the means of making it known to Theophrastus (332 B. C.), who speaks of it as a Persian fruit. Perhaps this vague idea of the Greeks dates from the retreat of the ten thousand (401 B. C.); but Xenophon does not mention the peach, nor do the Hebrew writings speak of it. The peach has no Sanskrit name, yet the peoples who spoke this language came into India from the northwest; that is to say, from the generally received home of the species. On this hypothesis, how are we to account for the fact that neither the Greeks of the early times of Greece, nor the Hebrews, nor the Sanskrit-speaking peoples, who all radiated from the upper part of the Euphrates valley, or communicated with it, did not cultivate the peach? On the other hand, it is very possible that the stones of a fruit tree cultivated in China from the remotest times should have been carried over the mountains from the center of Asia into Kashmir, Bokhara and Persia. The Chinese had very early discovered this route. The importation would have taken place between the epoch of the Sanskrit emigrations and the relations of the Persians with the Greeks. The cultivation of the peach, once established in Persia, would have easily spread on the one side toward the west, on the other through Cabul toward the north of India, where it is not so very ancient. * * *

"The peach has been found wild in different parts of Asia, but it is always a question whether it is indigenous there or whether it sprang from the dispersion of stones produced by cultivated trees." * * *

"It is difficult, from all these facts, not to admit the Chinese origin of the common peach, as I had formerly inferred from more scanty data.

"Its arrival in Italy at the beginning of the Christian era is now confirmed by the absence of peach stones in the *terra-mare*, or lake dwellings of Parma and Lombardy, and by the representations of the peach tree in the paintings on the walls of the richer houses of Pompeii."

In regard to the peach being a modification of the almond, which was advocated by Knight and others, De Candolle states, in addition to botanical difference in "size and length of leaves," pointed out by De Caisne, that "geographical botany opposes this hypothesis, for the almond tree has its origin in Western Asia; it was not indigenous in the center of the Asiatic continent, and its introduction into China as a cultivated species was not anterior to the Christian era. The Chinese, however, had already possessed for thousands of years different varieties of the common peach, besides the two wild forms I have just mentioned. The almond and the peach, starting from two such widely separated regions, can hardly be considered as the same species. One was established in China, the other in Syria and in Anatolia."

While it seems that the original peach primarily came from China, we must not infer that varieties from which well defined types have sprung have not originated in Persia and other countries. Mr. P. J. Berkmos, Augusta, Ga., has written me the following bearing on this point:

"That many of our present types of peaches are of Persian origin is beyond doubt. One of my most valued correspondents in Russia, Mr. Jaroslan Niementz, Russian State Councillor, whose official duties call for stated visits to Persia and Bokhara, has frequently sent me peach and apricot stones gathered from seedling trees growing wild in those countries. Last year several of the seedling trees produced from these seeds bore a crop of fruit and afforded me a most interesting opportunity in noting their various characteristics.

"The trees produced from seed labeled *Kiardi* yielded various forms of the *Lemon* cling type; those from seed labeled *Tamara* produced *white freestones*; and from another unnamed lot of seed, white clingstones of the *Heath* type were produced. Thus showing that these types retain in a great measure the powers of reproducing themselves more or less identically. But not one of these seedling peaches was equal in quality to our cultivated varieties of corresponding types. We may infer from this that our best sorts have been obtained through successive generations and substantiate Von Mon's theory that by continually growing the best seeds of the best varieties we may finally reach possible perfection."

5. CLASSIFICATION OF THE PEACH.

The peach has been so modified by climate and crossing of the different types that it is quite a difficult thing to devise a system which will include all varieties, and not be subject to some just criticism. At the same time, it must be admitted that if a system can be devised by which one can distinguish a large number of varieties and predict within a reasonable degree of certainty which types are likely to succeed in a given latitude, such a system would be of great value to the practical grower, as well as to the scientific horticulturist.

There have been several systems devised in the past which are of value in distinguishing varieties, but they are open to more or less objection. The system based upon the presence or absence of glands on the foliage is of considerable value to enable one to distinguish varieties growing in the nursery before they fruit. But we have, however, varieties which bear different glands upon the foliage of the same tree. Seedlings from certain varieties bearing one kind of glands may possess entirely different glands.

Other points upon which systems of classification have been built are color of flesh, adherence or non-adherence of flesh to pit, and size of bloom. While all these points are of value in distinguishing a given variety, still, if a seedling from some varieties possessing these characteristics in a certain form may show them in an entirely different form, even if the parent had used its own pollen to fertilize. This fact is well known and the experiment needs

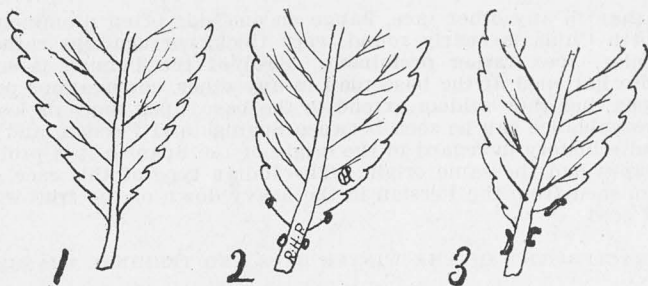


FIG. 11. No. 1, no glands; No. 2, globose glands; No. 3, reniform glands.

only to be tried to prove the fact. As an example, we have Chinese Free which is a seedling of Chinese Cling. We have new types coming from China, Japan and Java, which the above points fail to distinguish with clearness. There are types or races being built up in the southern part of the United States within the memory of man, viz., seedlings of the Honey, which parent came from China about 1854. Another race coming from seedlings of Peen-To, which was imported from Australia by Mr. P. J. Berkman in 1869, but it originally came from China. There is still another distinct race being built up in the southern part of the United States commonly known as Spanish or Indian type. It is very important at this time that the natural botanical characteristics of each race should be written up with clearness, and the kind of climate in which each may be expected to grow successfully be pointed out with reasonable certainty.

During the past four years the peach has been made one of my special studies. Our experimental orchard, which has been bearing during this time, consists of 190 varieties. Both foliage and bloom from these have been collected and mounted for comparison and study. I have also made a study of the peach further south, near the coast, in the large experimental orchard of Mr. G. Onderdonk, of Nursery, Texas, who kindly gave me the benefit of the notes and observations he had made on the peach in that latitude during the past forty years. Mr. P. J. Berkman, president of the American Pomological Society, has kindly sent me the notes he has made on the peach during the past fifty years. Many other prominent horticulturists, both north and south, have been consulted.

From the knowledge gained by my own experience, and from the notes of others, I am prepared to adopt the "Onderdonk Classification of the Peach" as the best. An outline of this classification is published in the report of the United States Department of Agriculture for 1887, page 648. Some of the distinctions made in this classification can not be noticed with decisive clearness a few hundred miles further north, but in the semi-tropical climate of the "coast region" the distinctions are very striking. This at once indicates that different types originated in different degrees of latitude and altitude. These facts are further substantiated by botanical characteristics which I have worked out. We divide the peaches now cultivated in America into five races: (1) *Peen-To*, (2) *South Chinese*, (3) *Spanish or Indian*, (4) *North Chinese*, and (5) *Persian*. By race is meant "a variety so fixed as to reproduce itself with considerable certainty by seed."

CHARACTERISTICS OF THE SEED IN THE DIFFERENT RACES.

The shape, size and corrugations of the seed are so well marked in the more distinct representatives of the different races that one, after a little practice, can distinguish them apart by this means alone. This can readily be seen from the following figure, made from a photograph:

By reference to *Peen-To*, it will be seen that the seed is nearly round, much compressed at the ends, corrugations small, somewhat round. The seed of the Honey is oval, with apex slightly recurved, corrugations slight, prominent flange on one side. Seed of the Spanish is large, oval, nearly flat, apex prominent, corrugations very long and wide, at the base they run more longi-

tudinally than in any other race, flange on one side often prominent. Seed of the North China is nearly round, very thick, corrugations rather slight and irregular, apex rather prominent. Seed of the Persian is somewhat round, more flattened at the base than in any other, corrugations prominent toward apex, but they seldom extend to the base, apex more or less prominent. A resemblance can be seen between Spanish and Persian, and as there is no definite history in regard to the origin of the Spanish it is probable the original types had the same origin. The Indian type of this race can only be distinguished from the Persian in the heavy down of the fruit and corrugations of seed.

CHARACTERISTICS OF THE WINTER BUDS AND TERMINAL BRANCHES.

In all the following figures, showing the winter buds, sections of one and two-year-old wood are given. They are reduced in size and were drawn by Prof. H. Ness, under my direction, as they came from the orchard.

From fig. 13 it will be seen that winter buds of Peen-To (a and b) are small, oblong, rather sharp pointed, and grow close to the limb; branches more small and willow-like than in any other race.

Winter buds of Honey, which represent South Chinese race in c and d, are very prominent, round to oval, two and three buds often occur at the same place, sometimes projected auxiliary buds are produced, occur on the limb to the end, leaving no vacant places; buds are dark red and stand out from the limb at an angle of about 50 degrees; branches not so slender as in Peen-To.

In fig. 14, a and b, winter buds of the Spanish race are represented. Buds are a little larger than those of South China and nearly always occur singly on the new wood. They are oval and project out from the limb at an angle of about 50 degrees. Short naked places occur on the wood. Color of the buds and bark is of a dull grayish color; branches quite slender, but not so much so as in South China.

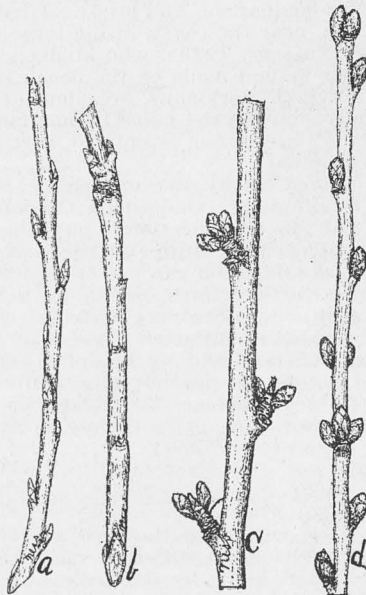


FIG. 13. a, *Peen-To*, one year wood, b, two year wood; c, *Honey*, two year wood, d, one year wood. c and d represent *South China* race. (Original.)

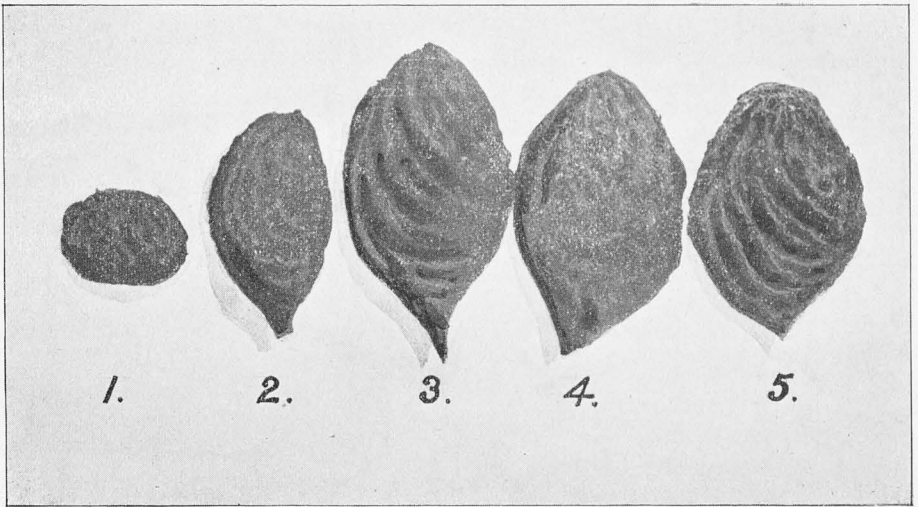


FIG. 12. (1) *Peen-To*, (2) *South Chinese (Honey)*, (3) *Spanish or Indian (Texas)*, (4) *North Chinese (Chinese Cling)*, (5) *Persian (Old Mixon Free)*. (Original.)

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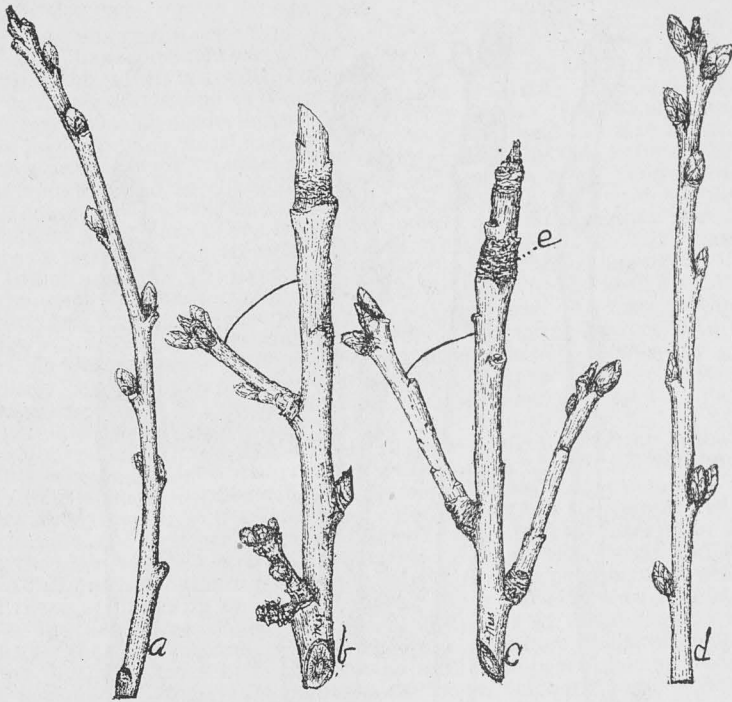


FIG. 14. a, one year wood, b, two year wood. a and b represent Spanish race, Texas variety. c, two year wood, d, one year wood. c and d represent North China race, Chinese Cling variety. (Original.)

At c and d are shown winter buds of North China race. Buds are slightly larger than those of Spanish and are a little more pointed. This far south, they occur very sparingly over the bearing wood and many latent buds occur near the tips. The buds stand out at an angle of about 45 degrees. Branches are short, thick and stubby, and many come out below the tips, which die back here, as shown at c. Bark, dark grayish color.

In fig. 15 are shown winter buds of a standard and a dwarf Persian peach. The buds are about the size of those of North China race, but are a little more oblong. They come out at an angle of about 35 degrees. The most striking features in the wood of this race are the long naked places and the blunt tips. The bearing wood is nearly always dark red, foreshadowing the color of the peach.

DESCRIPTION OF THE FIVE DIFFERENT RACES AS THEY ARE AFFECTED BY CLIMATIC INFLUENCES.

I. PEEN-TO (*Prunus platycarpa*, Decaisne): Tree rather large, vigorous, branches willow-like, come out at an angle of about 40 degrees; flowers large, come out frequently in January in the States bordering on the Gulf, blooms at low temperature and very irregularly; leaves narrow and long and inclined to hang on nearly all winter; fruit much flattened; skin white, and mottled with carmine; flesh white; flavor sweet, with a peculiar slight almond twang. It is adapted to the northern part of the citrus belt, in which climate it ripens from 1st of May to June. It has a tendency to sport. Mr. P. J. Berkman writes me that "our Australian correspondent, when sending us the seed, stated that both round and oblong, free and cling, varieties would be produced from seed. This peculiarity has given a new race of peaches to Florida and other sub-tropical countries, where the Persian types were unsuccessful, and extended their season of maturity from April until July."



FIG. 15. a and b, winter buds of the Persian race, Mountain Rose variety. c and d, slight variation in the Persian race; variety, Van Buren Golden Dwarf. (Original.)

This peach and its offspring thrive in a more southern climate than any others.

II. SOUTH CHINA RACE (the parent of this race is the Honey, *Purnus persica*, B. & H.): Tree is a medium-sized grower in this climate; branches come out at an angle of about 50 degrees and curve upward; less willow-like than Peen-To; blooms always large and very profuse; the bloom will resist more cold without injury than any class tested here; has borne continuous crops during the past four years, while sudden and severe spring freezes occurred. Mr. Onderdonk informs me he has had continuous crops for twelve years.

Foliage is small, slightly conduplicate, distributed all along on the limb, color dark green, hangs on late in the fall; requires short season of rest; fruit rather small, somewhat oval in shape, slightly flattened, suture very deep at basin, but does not extend more than one-third the way; the apex is long and recurved; flavor is a peculiar honey sweet. Supposed to have originated in Southern China, from which the seed of the Honey came. This race is adapted to more southern climates than any other except the Peen-To. The Honey seedlings are very valuable for the southern part of the Gulf States.

III. THE SPANISH RACE: Tree very large, except in the Indian type, which evidently has considerable Persian blood, judging from the color of the young wood, which is reddish, the naked places on the bearing wood and the corrugations and shape of the stone; limbs are large, long and spreading; branches low and droop down, except in the Indian type; blooms nearly always large; foliage small and nearly always flat; hangs on late in fall; stays green during severe drouths; turns slightly yellow in fall before falling off; fruit very decided in character, very late, nearly always yellow, except in the Indian type, which is yellowish, streaked with red, or deep blood red just under skin; very heavy down; frequently affected by black spot fungus. A heavy bearer and sure croper in its native zone. Seems to have come from the Indian type brought over from Spain and distributed among the Indians by the early Spanish settlers. Perhaps it is owing to successive seedlings in more favorable climate that the type is now varying. All over the Southern States one hears the expression that seedlings are surer bearers than budded fruit, and there seems to be some truth in this belief, because by growing seedlings continuously varieties will adapt themselves to climate. This Spanish race is an example almost within the memory of man. Adapted to isothermal lines north of which the South China flourishes.

IV. NORTH CHINA RACE: The original Chinese Cling tree, which is the parent of this race, is almost a dwarf here. It dies back at the tips and has borne but few peaches. Further south, at Nursery, Texas, it is a complete failure. Bears only three or four fruit a year. Seedlings from the parent are among the largest and best peaches for Middle Texas. Blooms later than Persian and the flowers are nearly always large. Foliage very large and flat; toward fall, in the Southern States, the foliage turns a peculiar dull pea green, and these seedlings in an orchard among other varieties can be picked out easily by the foliage alone. The green, dull color of the foliage in the fall indicates the color the fruit will be when ripe. Foliage hangs on well during drouth, but sheds off a little early in the fall. The parent comes from China and is supposed to have come from the more northern part. Adapted to zones north of those suited to the Spanish race.

V. THE PERSIAN RACE: Tree medium size to large; limbs short and thick, with long naked places; bark usually rich purplish red on young wood; bloom large and small, owing to variety; foliage crimped and conduplicate, has purplish tinge before falling, foreshadowing the color of the fruit; foliage falls off early; trees require a long period of rest. This indicates that this race had a Northern origin. It now forms the bulk of Northern orchards. Fruit usually the most highly colored and of the best flavor. In this class we sometimes find a variety with the fruit somewhat yellow, but the flavor of such fruit is not so good. It is almost useless to plant this race in the southern part of the Gulf States. New varieties are being introduced from other races of great promise for this region. This race is supposed to have developed in Persia.

ORNAMENTAL VARIETIES.

Ornamental varieties are so different from the others in their fruiting habits that it is difficult to classify them. A separate division is made of them. The following are some of the varieties: Orleans Dwarf, Golden-Leaved Pyramidal, Pink Double Flowering, White Double Flowering, and Willow-Leaved.

RELATION OF THE DIFFERENT RACES SHOWN BY DIAGRAM, AS THEY ARE ADAPTED TO CLIMATE.

In the following diagram, made by Mr. G. Onderdonk, the different races are shown as they are adapted to different isothermal lines; it is admitted, however, that this arrangement is arbitrary and will vary some with seasons and local conditions:

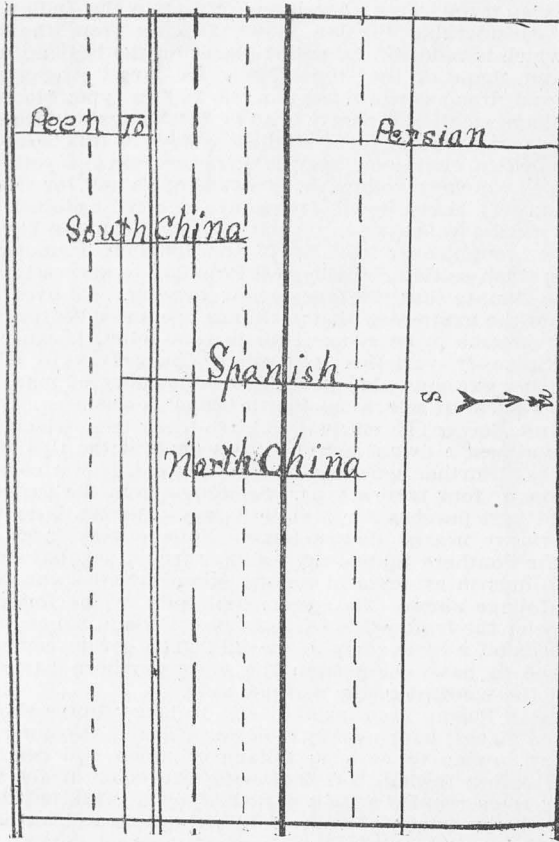


FIG. 16. The races as they are adapted to different isothermal lines. (Onderdonk.)

6. HINTS ON ORCHARD SETTING AND MANAGEMENT.

For ordinary purposes, some peaches may be grown on most any soil. They grow best on a sandy loam, underlaid by a clay. Some of the best peach soil in the State consists of white, sandy loam, underlaid by red clay. The peaches which grow upon it are highly colored and of fine flavor. The soil should be well drained. If low, heavy soil is used, it can be much improved by throwing it up in ridges as wide as the rows are to be one or two years before planting.

THE SITE FOR THE PEACH ORCHARD.

There is scarcely a farm upon which some part of the land is better adapted for peaches than the other. High, rolling lands are usually better than low, level ones. A hill-side with northern exposure is better, because the trees are more backward in the spring and, consequently, frequently escape injury from late spring frosts.

PREPARATION OF THE SOIL.

The soil should be prepared as well for peach trees as for most any other crop. After the soil has been well prepared, there is not much danger losing any trees from drouth. If the trees are set in a sod, they will make a poor,

weakly growth the first year, and if the sod is not broken they will bear a few small peaches in five or six years, and finally die in a few more years without paying the owner. The owner will then be ready to claim that "peach growing does not pay." In the "coast country," where there is sub-irrigation and the soil frequently contains a considerable per cent of sand, peaches have borne fair crops without much cultivation. As a general rule, it may be stated that it will pay to prepare the soil well before setting and give it good cultivation while the trees are growing, just the same as it does for any other crop.

SELECTING THE TREES.

The largest tree is not the best one. One-year-old nursery stock usually gives the best satisfaction. The trunks should be clean and healthy, with no scale or other insects on them. Roots should be clean and abundant, with no knots on them. The roots should be examined closely for any malformations, and all such rejected. Carelessness in this particular may cause the whole orchard to be lost in a few years by the ravages of insects or fungus diseases. It is best to buy trees of a nurseryman whose reputation is known to be good. There are several of them in the State. It will pay to buy the best trees, even if the cost is a little greater. There is one mistake that is frequently made in the State, and that is stripping the leaves off young trees before they have matured their wood. Nurserymen tell me they have to do it, because the demand is made upon them to send the trees early. Trees should be ordered direct from the nursery early in the season with the distinct understanding that they are to be left in the nursery rows till about all the foliage is shed.

If the trees come before they can be set in the orchard, they should be taken at once to some well-drained place and carefully healed in. Loose dirt should be thrown over the roots 18 inches deep and be pressed down among the roots carefully. Carelessness in this respect may cause many trees to be lost, others to be weakened and the nurseryman's reputation to suffer.

HOW TO SET THE TREES.

If the trees are set in straight rows, the owner is much more apt to take better care of them, and will delight in calling his neighbor's attention to the orchard. One of the simplest ways to do this is by stretching a common garden line across the field and measuring on it with a rod the desired distance the trees are to be set and then drive a small stake at each place for a tree. The holes should be about two feet wide and about 18 inches deep. The top dirt should be thrown by itself, to go around the roots first. The same garden line may be stretched across the holes in the opposite direction and the trees be set by it. If the eye be used carefully, the rows may be set fairly straight by this simple method. Set the trees when the ground is in good working order and press fine dirt around the roots firmly.

In this extreme southern climate I have obtained better results by setting in November and December than I have by setting in the spring. The dirt becomes firm around the trees and young rootlets start out during the first warm days. A good safe distance to set the trees is 20x20 feet apart and it will take 108 trees per acre.

PRUNING THE YOUNG TREE BEFORE IT IS SET.

There is a wide difference of opinion as to how much of the top and roots of the young tree should be cut off before it is set. The young tree grew in the nursery in a crowded condition, so that the top is usually in a switch-like form and about half the roots were left in the ground when the young tree was dug, so that the crown would start too high if left unpruned, and there is considerable difference in the balance between the roots and the top. Then, again, the roots are usually mangled and torn in the process of digging. These facts make some pruning necessary, both of the top and of the roots.

The extreme view in pruning is advocated by Mr. H. M. Stringfellow, of Galveston, Texas. His theory, which has been widely advertised of late, is given here in his own words:

"Hold the top of the tree down, and cut all roots back to about an inch, sloping the cuts so that when the tree is set the cut surface is downward. Experience has shown that the roots are generally emitted perpendicularly to the plane, or surface, of the cut. This final pruning should be done shortly before planting, so as to present a fresh surface for the callous to form on. If trees are to be kept some time, or shipped by a nurseryman, about two inches of root should be left, the planter to cut back as directed when the tree is set. About a foot of the top should be left; more or less makes no difference. If the tree is well staked, three feet may be left without diminishing the growth much. I have had six-foot trees, well staked, to grow finely, but to avoid staking and to secure a new, straight body, it is best to cut back short. Let all shoots grow until a foot or so long, when the straightest and best ones should be left and all others rubbed off."

The advantages claimed by Mr. Stringfellow are also given here:

1. "An enormous saving to the nurseryman in digging his stock, which now must be taken with roots a foot or more long."

2. "An equally great saving in packing. Instead of great bales of tops, roots, moss, bagging and rope, and the labor of putting up the same, or large boxes containing thousands of pounds of the same useless dead-weight, a thousand root and top-pruned trees could be packed in a medium-sized light box, with a layer of wet moss in the bottom to maintain a moist atmosphere, and shipped with perfect safety around the world."

3. "The saving to the buyer will be even greater. * * * It would be hard to estimate how many hundreds of thousands of dollars are annually paid by planters to railroads, in charges, on worse than useless tops, roots and packing."

4. "Thousands of dollars will be saved in the planting. Instead of large holes, and spreading out of roots, working in the soil by hand, etc., as now practiced, the planter will prepare his ground, stretch a strong line, with tags tied at right intervals, make a small hole with a dibble a couple of inches in diameter, stick the trees down the proper distance, and when a row is done turn back and tramp thoroughly. This is very important."

5. "Another most important advantage is that by this method we reduce to a minimum the danger of spreading all kinds of disease and insect pests, such as eel-worm, root tumor, scales, root lice, etc. These are mostly found on the tops or long roots."

6. "It enables the planter to set extra large trees, which the nurseryman now has to throw away, and thus obtain fruit much sooner."

If all these claims could be realized, a "new era" in tree planting would certainly come to the horticulturist, but, reasoning from *my* own experience, I wish to give a word of caution here, *go slowly before experimenting*. There are so many conditions which bear upon results, such as different soils and climates, that general conclusions drawn from meager experiments are apt to be misleading to one, or some, part of the State.

So far as I have been able to learn, Mr. Stringfellow's experiments have been conducted exclusively in the "coast country," where there is water near the surface and much of the soil is of a loamy nature. As an instance of how I came near being misled, I will mention the experiments we carried on here in root-pruning of the peach during 1894. Six Mamie Ross peach trees were pruned according to Stringfellow, six moderately pruned, and six unpruned, were set out in January, 1894, on a heavy, wet soil. The six trees which were severely pruned made more growth than the others the first year. Unfortunately, nearly all the trees died on this heavy soil the following year. At the same time, we had also set 100 Mamie Ross trees on rather dry upland. These trees were also severely root and top-pruned. Every tree grew and is living now. Some bore fruit last summer. There are two main differences I notice between these 100 trees and others set on the same soil. They have been very much dwarfed. The tops, in most cases, have started very close to the ground and some are one-sided and very irregular. Taken as a whole, I see no other objection to these trees now except that they are dwarfed. An average tree is shown in the following figure, made from a photograph at the end of the third summer:

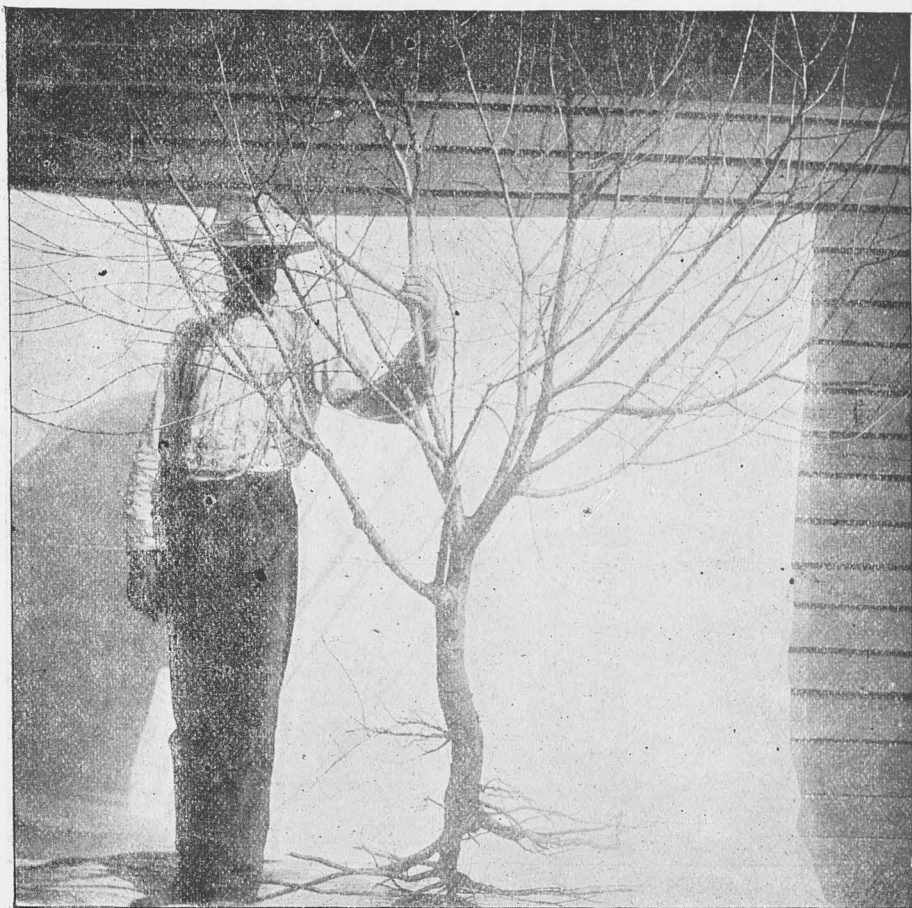


FIG. 17. A three year old Mamie Ross peach tree which was severely top and root pruned when set out. Grown on a well drained clay loam soil of medium fertility. Good cultivation was given. (Original.)

During the spring of 1896 we again set out trees which were pruned according to the "Stringfellow method," and others which were moderately pruned. The trees consist of peach, apple, pear and plum. The soil is a clay loam of medium fertility. It has good surface drainage and has been well cultivated. The past season has been very dry and has proved to be a severe test upon the life of the trees. Scarcely any rain fell from the 13th of May till the 16th of September. Old settlers state it was the severest drouth we have had for 30 years.

During the latter part of August, two of the average trees which had been severely root and top pruned and two of the average of moderately pruned were taken up, the leaves were stripped off and I photographed them. When the trees were planted out they were seedling trees of about one size. Those which were moderately pruned have made the best growth so far in every instance.



FIG. 18. *Seedling peach trees which were transplanted during the spring of 1896 and have made a summer's growth during very dry weather. Nos. 1 and 2 severely top and root pruned. Nos. 3 and 4 moderately pruned. (Original.)*

Without drawing positive and definite conclusions, it seems evident, so far as this soil and climate are concerned, that severe top and root pruning are not advisable. After sending the photographs to Mr. Stringfellow, he informs me that all the roots should have been cut close to the main one, except those at the bottom, and the trees should have been set on hard, unplowed ground. There is no question about the fact that much of the tops and roots of trees could be safely cut off before they are shipped, and much expense be saved in packing and paying freight. One serious objection to trees being too closely pruned before they are shipped is that in rather careless packing they are apt to dry out too much. If the ends of moderately long roots are dry, they can be cut off at the proper distance and still be green enough to grow. If closely root-pruned trees, or any other kind of live trees, were packed in a very "tight box in humid atmosphere" and shipped "around the world," they would undoubtedly mildew and decay. This has happened with me frequently in ordinary packing and shipping less than a thousand miles.

This far south, we have obtained the best results by pruning the top of the young tree down to about 18 or 20 inches and trimming all the roots off to

within six inches of the trunk, with the exception mentioned. On a soil with sub-irrigation, no doubt the results might be different.

Two-year-old trees should not be cut quite so low, because the latent buds on the trunk may refuse to grow and sprouts will be thrown up irregularly from the roots and thus make an undesirable tree. The character of growth of forest trees is an index to the climate and forms a true guide by which to start the crown of orchard trees. In this part of the State, the oak trees are low, with short, thick tops. The trunk is fairly well shaded. Orchard trees should be likewise. There are other advantages in favor of a low top. The fruit can be gathered easily, frequently without a ladder; the branches being diffuse are not so apt to be broken by heavy bearing, and the trunk being shaded is protected greatly from "sun scald." After watching trees for sever-



FIG. 19. *Young tree properly cut back.*

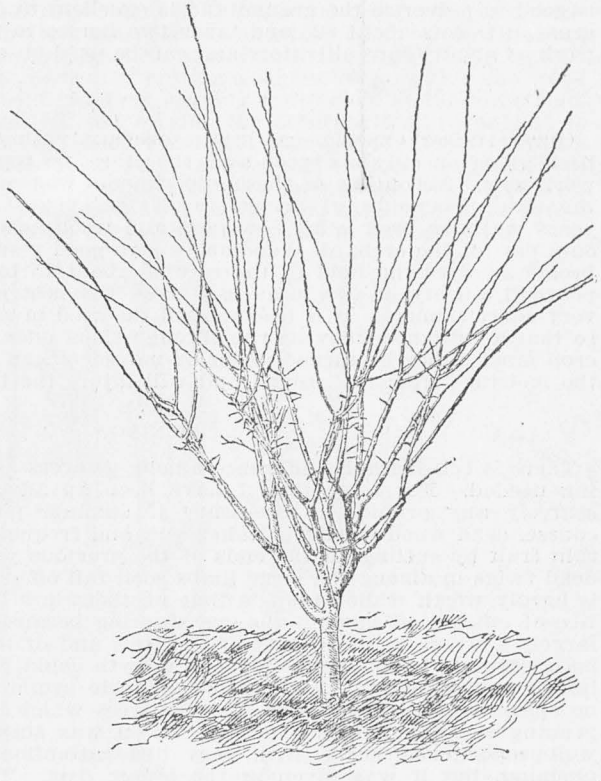


FIG. 20. *Young tree with top properly formed.*

al years, which were injured from what is commonly called "sun scald," I am convinced that it is a misnomer. I have noticed that every time our trees have been injured in this way it was in the spring, when a freeze occurred after the sap had started. The sun would shine on one side of the frozen trunk and cause the cells of the wood to burst. In one or two months the bark would crack up the tree eight or ten inches and expose a deadened area. This injury did not occur only after a freeze, no matter how hot the sun shone. If straw be wrapped around the trunks, or planks be set in front of them after such a freeze, so that the sun would not strike the frozen trunks direct and they would thaw out gradually, the injury could be averted. But the cheapest method is to start the crown low and let each tree shade its own trunk.

CULTIVATION OF THE ORCHARD.

It is an undisputed fact that cultivation helps to conserve the moisture in the soil. In addition to this, it helps to make plant food available and partially takes the place of fertilizers. We have orchard trees which are now standing in a drouth of three months and are strong and vigorous, and have not ceased to grow, but the soil has been well cultivated. Cultivation should begin before drouth sets in. However beneficial cultivation may be, still there are many trees injured by it. The bark is rubbed off the limbs and the roots are cut by running the plow deep near the trunk. This is due to careless labor and improper implements. One of the very best implements I have found for general orchard cultivation is the spading disk harrow. It is good to pulverize the ground and is excellent to destroy young weeds and grass. It costs about \$25 and takes two horses to pull it, but it will do the work of about four cultivators and can be used on other farm lands.

FERTILIZERS.

Our fertilizer experiments in the orchard with chemical fertilizers have been going on only one year and, therefore, no report can be made on this work now. An outline of these experiments was read before the meeting of the State Horticultural Society, at Tyler, August 9th, 1896. For several years we have been using cow peas and wood ashes with favorable results on a part of the orchard. Wood ashes give good results and should be spread broadcast over the land at the rate of about 15 tons per acre. The whip-poorwill variety of cow peas has given the best satisfaction, owing to its very short runners. It is best to drill the seed in rows about 2½ feet apart, so that a cultivator may be run through them once. If a drouth comes, the crop must either be turned under or moved off, as it will take out much of the moisture from the ground and will injure the trees.

PRUNING.

There is considerable difference among growers as to the amount of pruning needed. For some time I have been an advocate of the theory that scarcely any pruning is necessary if summer pinching is followed. Of course, dead wood should be taken out, and frequently it is the best way to thin fruit by cutting off the ends of the previous year's growth. The small dead twigs in among the large limbs soon fall off of their own accord and it is hardly worth while to waste time on them in a large orchard. The practice of cutting off large limbs every spring because the shears are sharp is largely a waste of the energy of the tree, and of the man. If the tree had been properly summer pinched, the growth could have been easily directed in the proper direction, and the head made symmetrical and beautiful and no energy of the tree wasted. I have trees which have never had a pair of pruning shears on them after the crown was started, and have developed well-proportioned heads with very little attention being paid to summer pinching, but it was given at the *proper time*. The limbs should not all branch from the trunk at one place, because they are more liable to split off, but they should be somewhat distributed, like the limbs shown in Fig. No. 20.

THINNING THE FRUIT ON THE TREE.

It is almost the universal practice in the State not to thin the fruit. At the same time, the grower is ready to admit that if half, or more, of the peaches had been taken off the heavy-bearing varieties, the others remaining would have grown almost twice as large and been worth much more in the market. The trees which overbear are exhausted in producing so many pits, and soon die out. A tree which is allowed to overbear one year is not apt to bear a full crop the next year. As a rule, peaches should not be closer on the limb than four or five inches. Thinning should not be done until after the pit has hardened some, because many drop during this process.

7. A METHOD OF DORMANT BUDDING.

In closing this part of the bulletin, I wish to give a description of a method by which budding may be done when the bark does not slip and the sap is almost dormant.

Dry weather frequently comes on during the season for budding in this State, and if one waits for the bark to slip the work is very much delayed. Another advantage which may be claimed for this method is that budding may be done here in the winter. On the 10th of January, 1894, fifty trees were budded out in the open ground and all grew and made trees except one, which was accidentally destroyed. Some of these trees bore fruit last summer. We have published short accounts of this method before and two nurserymen informed me at the last meeting of the State Horticultural Society that they were using the method in their nurseries successfully. The method as used at the Station here consists of cutting a slip of bark, with some wood attached, down the tree about one inch, leaving it attached at the lower end. About half this slip is then cut off, leaving the other half still attached to the tree. Cut off a bud, leaving some wood also attached to it, to prevent injury, and then carefully place it between the slip and tree, so that it will fit nicely, and the cambium of the bud and tree come in contact. Tie tight with some good material, such as raffia. In five or six days the bud will be found to have knit firmly. Treat them then as those budded in the usual way.

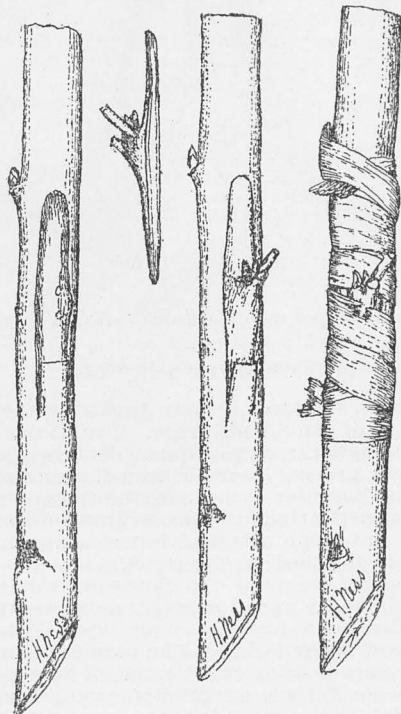


FIG. 21. *A method of dormant budding.*

The method as described here was discovered by the assistant in the Department of Horticulture, Prof. H. Ness, and has been tested here in several ways upon our grounds, but we find that a modification of the method was long since used by a German, H. Jaeger, court gardener to the Grand Duke of Sachsen-Weimar. The following translation from his book, *Die Baum-schule*, page 115, gives his account of it:

"This has been described as something new, but has long since been known, though seldom used. * * * According to my own experience, as well as that of others, it succeeds with certainty in cold frames and in hot-houses, or by the use of bell jars. The operation consists in cutting a bud with the usual amount of wood from the scion, then removing a corresponding slice of wood and bark from the stock and putting the first, closely fitting, in the place of the second, then tie well and cover the wound with soft grafting wax, leaving the bud free."

8. FUNGOUS DISEASES AND INJURIOUS INSECTS.

Peach yellows, which is so bad in many States north and east of Texas, does not occur in the State, so far as I know. Not a single case has been reported to me.

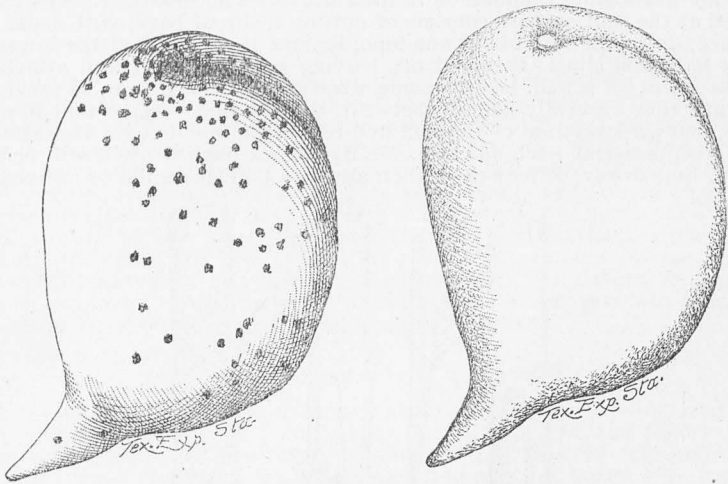


FIG. 22. No. 1, not sprayed with Bordeaux; No. 2, sprayed. (Original.)

BLACK SPOT OF THE PEACH.

Black spot is, perhaps, the most serious disease in the State upon late varieties, especially those of the Spanish race. The damage is due to a fungus by the name of *Cladosporium carpophilum*. It first appears on the peach when about two-thirds grown, in small, round, black spots or patches. If the weather continues damp for some time, the fungus will soon spread over the entire upper surface. During dry seasons it is not so bad, as might be expected. The side of the peach attacked becomes dry and wrinkled. Sometimes cracks appear in the flesh to the stone.

During the past season we tried the Bordeaux mixture for this fungus. The varieties upon which the experiments were made were Early China and Mamie Ross. The first spraying was made April 13th, when the peaches were the size of the end of the thumb. The next spraying was put off rather late on account of there not being much rain. It was made May 24th. The next spraying was made June 8, at which time the beneficial effects of the Bordeaux could be plainly seen. At the last spraying, three ounces of Paris green was put into 25 gallons of Bordeaux for curculio. The result of this arsenical compound was that the foliage was partially injured, as might have been expected, because it is well known that the peach is very susceptible to injury from the arsenical compounds. Could see no appreciable benefit in preventing injury from curculio. The beneficial results in preventing the spread of the black spot fungus were very decided. Photographed peaches, sprayed and unsprayed, are shown in Fig. No. 22. The Bordeaux

was made according to our regular formula, which we have used for a number of years, viz., two pounds of copper sulphate, dissolved in 25 gallons of water, and then two and a half pounds of unslaked lime mixed with it. The mixture is strained through some coarse cloth before being put into the spraying machine. A fresh mixture is always used.

PEACH CURL.

The peach curl has been reported to me a few times, but it does not occur in our orchards. This disease is also due to a fungus. It distorts the foliage in the spring and causes it to fall off. It is claimed that this fungus can be prevented by spraying. It is a good idea to cut the affected parts off and burn them.

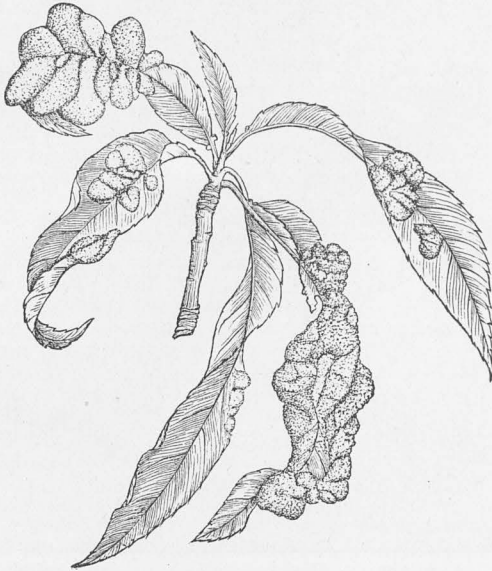


FIG. 23. *Peach curl* (*Taphrina deformans*).

ROOT TUMOR OR ROOT GALL.

The very large, irregularly lobed and somewhat corky tumor which usually occurs on the peach, and several other trees, near where the roots begin is a serious thing in the State. No scientist, so far as I know, has ever been able to discover any insect, fungus or bacterium which is the primary cause of this material enlargement.

The tumors occur both on small and on large trees. Sometimes they are found on the smaller roots down in the ground. The disease is found in Europe and the German writers claim it is due to mechanical injuries done to the roots. This seems to me most probable, but there are several who claim that if healthy trees are set on infected land they will soon become diseased. It is also claimed that the disease can be transmitted by budding. Others claim it can not be. Our buds from infected trees failed to take and therefore, we can not now make a positive statement about this point. We have taken a tumor off of a large tree in our orchard and carefully sprayed Bordeaux around the roots. The tree seems now to be recovering, and bore its first fruit during the past season, but from our results so far we can not recommend the treatment as a positive remedy. This one being the only affected tree found in the orchard, has prevented other experiments. At any rate, one should be very careful to reject all such trees at setting time and all affected parts should be burned. The disease deserves more study than

we have had time to give it. We have done considerable work in microscopic examinations, but, like others, have been unable to find anything. After the tumors become old, various insects may be found around them, but they do not seem to have any direct connection with the disease. We are glad to



FIG. 24. *Root tumor.*

know that the Department of Vegetable Pathology, at Washington, is now working on the disease. Recently we had specimens forwarded there from an infected orchard. Owing to the widespread interest manifested in this malformation on fruit trees, it may be well to give here the results of an intelligent practical horticulturist, who has been studying it a number of years and carried on experiments to see if it could be transmitted by budding or grafting. At my request, Mr. Yates has kindly written out the results of his experience and observation, which I will give here in full:

SOME REMARKS ON ROOT OR STEM TUMORS BY W. A. YATES,
BRENHAM, TEXAS.

"While the different forms of root-knot are now pretty thoroughly understood, having been classified and described by scientific investigators, there still remains a dissention of opinion regarding the cause of the root or stem-tumor, now so prevalent in many of the nurseries and orchards in the South and West.

"The writer having been familiar with the above form of knot for a number of years past, and during that time conducted certain experiments, with the object of discovering, if possible, the origin or these abnormal growths, will briefly give the result of observation and experiment made in this connection.

"Acquaintance with these tumors was first formed in the propagating bed

of a greenhouse, where frequently the usual callous formations of the cuttings would, instead of throwing out roots, continue to develop until an abnormal size; upon partially cutting away these callous growths, however, and re-planting the cuttings, roots would be thrown out without any recurrence of the kind. Afterward, upon finding similar growths on the roots and stems of fruit and other trees, and under the impression that, perhaps, these tumors were communicable, experiments to determine this point were commenced by budding, grafting and inoculating unaffected from affected trees, but, although these experiments were carefully conducted for several years, no tumors were ever reproduced on the unaffected trees by these means.

"It was while experimenting in this way that the writer, being exceptionally well situated for extensive observation, first noticed that wherever the free circulation of sap in young trees had been checked or impeded, either from some mechanical cause or adverse weather conditions, it was no uncommon thing to see some of these tumors commence to form, which, during the spring and early summer months, would grow with great rapidity; wet seasons and naturally moist ground apparently favoring their more rapid development. Continued investigation along this line finally forced the conviction that tumor was primarily caused either by impeded circulation of sap and consequent disorganization of the sap vessel and surrounding tissues, a lack of working harmony between root and branch, or a disparity in the absorption of moisture by the roots and its transpiration by the foliage with a like result.

"While there are many mechanical causes of impeded or arrested circulation of sap, such as the bending of stem or roots in transplanting or by other means, and abrasions or wounds of any kind made beneath the ground surface, perhaps the most prolific mechanical cause of tumor is budding and grafting; after which operation there often exists a lack of complete harmony between root and branch, as when plum is worked on peach, pear on quince, or apple on paradise stock. The act of budding in itself may not be performed without checking in some measure the free flow of sap, added to which, in the case of the peach especially, is the difference during early spring in the relative sap conditions of the stock and the variety inserted thereon. The former generally being in an active state of growth, while the latter much longer remains dormant; as a consequence, therefore, the sap vessels of the stock must for some time remain in a more or less congested condition, resulting not infrequently in eruption of the cells and the formation of callous growths, by the sap being forced out of its regular channels.

"These growths are also frequently the result of grafting when there exists any disparity between size of stock and scion, causing improper union; or when, as above stated, growth commences in the stock and the flow of sap is checked or impeded by the dormant condition of the scion; in these cases, the tumor may generally be found at or near the point of mechanical operation.

"In the case of the apple, it not infrequently happens when the tumors occur immediately below the ground surface, they commence to throw out a bunch of somewhat fleshy fibrous roots, upon doing which the tumors cease to develop in size, and apparently devote all their energies to root forming. Occasionally roots thrown out from these tumors may be found both on the peach, plum and pear, but these instances are of rare occurrence. The writer has also frequently found tumors on grape vines and persimmons affected with root-rot (*Ozonium auriconium*) at the point where the elaborated sap had been checked in its descent by the ascending root-rot fungus.

"An unseasonable loss of foliage, causing inequality between absorption and transpiration, and thereby congestion and rupture of the sap cells in the lower portion of the tree, is a prolific source of tumor. Vineyardists in California well know that a spring freeze is not infrequently followed by the so-called "black knot" on their vines, which knot is but another name for tumor.

"Generally speaking, tumors first commence to form in the early spring months, and during the first season of their existence remain a healthy, irregularly formed mass of callous matter; many of them, however, owing to their abnormal formation, become diseased the second year, and after thoroughly decaying become loose and fall away from the tree; others continue to appropriate the sap of the affected tree until of enormous size, when the host succumbs to this fatal drain of the life-giving fluid.

"If discovered in time, the tumors may be permanently removed by careful cutting, covering the wounds thus made with grafting wax. Fruit trees, owing to the various mechanical operations they undergo, are more subject to tumor than other trees; although the writer can name many species of shades, shrubs and evergreens on which he has seen at one time or other some form of root or stem-tumor."

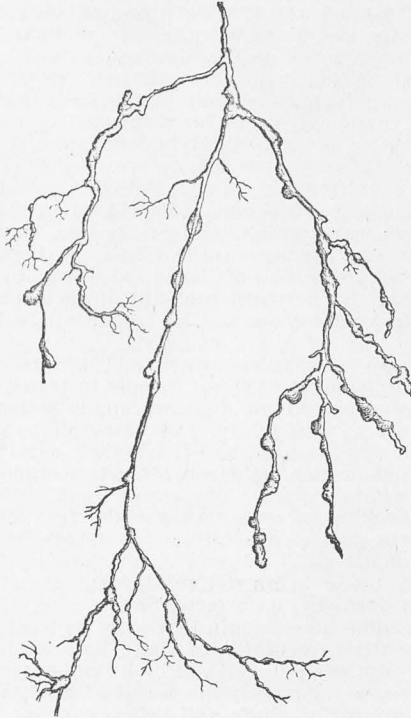


FIG. 25. *Root knots due to nematodes.*

ROOT KNOTS.

Root-knot is quite a different thing from root-tumor, with which it has been confounded by some orchardists of the State. This disease is due to a small "eel-worm" or nematode. The knots due to this cause usually occur on the small roots somewhat in beed-like strands and are much smaller than root-tumors. The little worms can easily be found in them with a microscope.

These knots have sometimes been also confounded with root nodules, which occur on leguminous plants. Sometimes root-knots are also found on leguminous plants. The microscope easily then settles the point. The nodules are filled with bacteria, which are beneficial to the plant, while root-knots are filled with worms, which are injurious.

THE CURCULIO.

The curculio has been decidedly the most injurious insect of the peach here. A short description of the insect, together with our experiments in preventing the injury done to plums, was given in Bulletin No. 32. The insect injures the peach also, but not quite so bad as it does the plum.

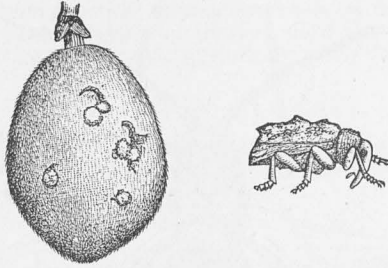


FIG. 26. *The Curculio (Conotrachelus nenuphar)*. The peach showing injury when the eggs are first deposited is natural size. The insect is much enlarged.

While we have had very fair success in spraying plums for this insect with the arsenical compound, our success in spraying peaches does not encourage us to recommend it. As before stated, the peach is very susceptible to injury from the use of these poisons, and the quantity used must be very small, probably one pound to 200 gallons of water, and then some lime must be mixed with it. We prefer the jarring method for the peach. If the insects are jarred down into sheets early in the morning, they do not fly readily and may easily be caught and killed. The trees can be jarred for something less than 5 cents per tree. When the "wormy" fruit fall to the ground, it is a good idea to turn hogs in to eat it up and greatly prevent the insect next year.

BROWN OR BLACK ROOT APHIDES (LICE).

Lice sometimes occur upon the roots and cause the trees to have a stunted, sickly appearance.

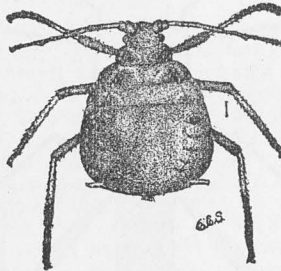


FIG. 27. *Black peach aphid (Aphis persicae-niger)*. The common wingless form.

If the trees are suspected of being infested, an examination of the roots should be made, and, if the insects are found, heavy applications of tobacco dust dug into the ground is said to be very good.

If the insect appears above ground on the twigs, kerosene emulsion should be sprayed on them.

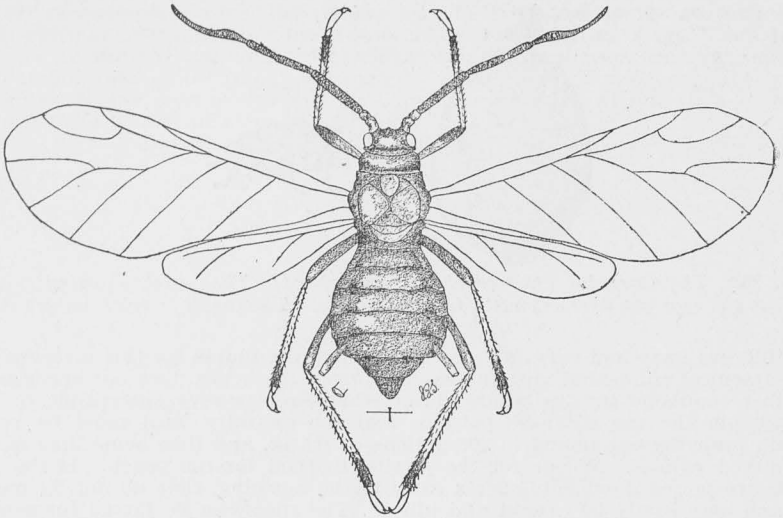


FIG. 28. *Black peach aphid (Aphis persicæ-niger). The winged form.*

LEAF-FOOTED BUG.

This insect was discovered in our experimental plum orchard injuring the fruit during the summer of 1893. Later it appeared on the peaches.

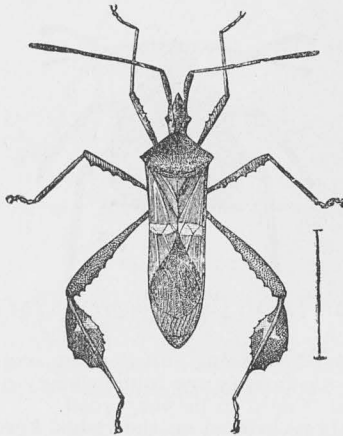


FIG. 29. *Leaf-footed bug (Leptoglossus phyllopus).*

The insect thrusts its long beak into the fruit and sucks the juice. At the places where the fruit is punctured it becomes hard and knotty, frequently gum oozes out. In size, shape and color it somewhat resembles the common squash bug. The main prominent differences are a distinct white band across the body about midway and the peculiar flat, leaf-like hind pair of legs. Its peculiar flat hind pair of legs would indicate that the insect might be somewhat aquatic in its habits. Its full life history is not known. After the fruit had gone here, I noticed it feeding upon a late crop of tomatoes in September. The young were also found upon the plants at the same time. In November the adult bugs were found by the side of a large pond of water.

The insect has been reported to me from several parts of the State and indications at present are that it may increase. I have no good remedy to offer for this insect. The jarring method used for the curculio will drive them from the trees and may frighten many away from the orchard.

THE PEACH TREE BORER.

In some parts of the State considerable damage has been reported from the borer. In our orchards here not one has been found.

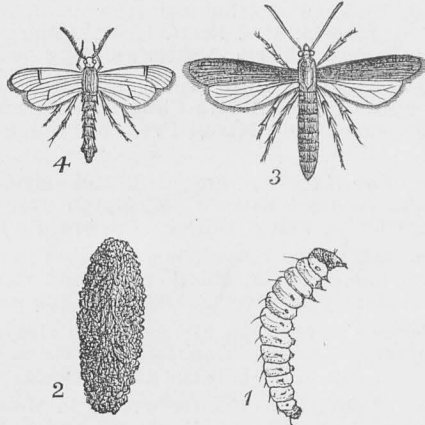


FIG. 30. *Peach tree borer (Sannina exitiosa)*. No. 1, larva; No. 2, pupa; No. 3, female; No. 4, male.

A great many remedies and labor-saving devices have been recommended for this insect. The old way, which is sure, but hard work, is to cut them out with a knife or thrust a small wire into the holes they have cut and kill them. A very satisfactory wash I have used and recommended to several growers in the State, who have also reported good results, consists in painting the trunk of the tree one or two inches below the surface of the ground up to about 18 inches, with the ordinary white lead paint, into which had been stirred a little Paris Green—enough to slightly color it. Many jack rabbits have been reported to me as being poisoned by this paint. The dirt should, of course, be raked away from around the tree before the paint is put on, and then afterward be raked back. All borers which may be in the tree should first be hunted out. A very small amount of Paris Green should be used, about one tablespoonful to 10 pounds of paint. In two years the trees should be repainted. The cost for each tree to paint once is about 1½ cents.

9. VARIETIES RECOMMENDED BY NURSERYMEN AND FRUIT GROWERS IN DIFFERENT PARTS OF THE STATE.

The following letter, which explains itself, was sent last September (1896) to different horticulturists of the State. Their replies are printed below, beginning with those from South Texas:

"Will you please send me a list of six peaches which do best in your section of the State (1) for table use, and (2) for shipping? Arrange them in the order of ripening, beginning with the earliest. If you can not recommend as many as six, cut the number down. Return this letter as soon as you can, as we wish to print your reply in a bulletin now prepared on the peach."

Wm. Watson, Brenham: Six best grown in Washington county: Japan Blood, Mamie Ross, Mountain Rose, Gen. Lee, Alice Haupt and Stonewall Jackson. The same number are recommended for shipping.

G. Onderdonk, Nursery: For table use grown in Victoria county: Early China, Pallas, Onderdonk, Cobler, Galveston and Guadalupe. For shipping: Pallas, Onderdonk, Cobler, Texas, Guadalupe and Orman.

H. M. Stringfellow, Galveston: For table use grown in Galveston county: Waldo, Angel, Imperial, Chinese Free, Family Favorite and Pallas. (No list for shipping.)

F. T. Ramsey, Austin: For table use grown in Travis county: Alexander, Rivers, Family Favorite, Lee, Elberta and Carpenter. For shipping: Sneed, Alexander, Mamie Ross, Elberta, Chillon and Carpenter.

J. W. Stubenrauch, Mcxia: For table use grown in Limestone county: Carman, Mountain Rose, Elberta, Mrs. Brett, Heath Cling and Levy. For shipping: Carman, Gov. Briggs, Elberta, Matthews Cling, Salvay and Levy.

J. M. Howell, Dallas: For table use grown in Dallas county: Sneed, Mamie Ross, Gen. Lee, Old Mixon Free, Routh Cling, Elberta and Howell Cling. For shipping: The same, except Old Mixon Free, for which Old Mixon Cling is substituted.

C. Falkner, Waco: For table use grown in McLennan county: Alexander, Mamie Ross, Amelia, Jackson, Elberta and Mixon Free. For shipping: Mamie Ross, Jackson, Chinese Cling, Elberta, Crawford's Late and Heath.

E. W. Kirkpatrick, McKinney: For table use grown in Collin county: Alexander, Rogers, Gen. Lee, Elberta, Heath Cling and Caruth. For shipping: Sneed, Mamie Ross, Gen. Lee, Elberta, Chinese Cling and Heath.

John S. Kerr, Sherman: For table use grown in Grayson county: Alexander, Mamie Ross, Family Favorite, Gen. Lee, Elberta and Caruth's Late. For shipping: Mamie Ross, Gen. Lee, Elberta and Ringgold Cling.

Irvine & Thompson, Bowie: For table use grown in Montague county: Tillotson, Joe Johnson, Gen. Lee, Elberta, Henrietta and Salway. For shipping: Alexander, Mamie Ross, Gen. Lee, Elberta, Henrietta and Salway.

T. V. Munson, Denison: For table use grown in Grayson county: Yellow St. John, June Rose, Mrs. Brett, Elberta, Raisin Cling, Eldred, etc. For shipping: Triumph, Mamie Ross, Bishop, Family Favorite, Elberta, Beckett Free and Salway.

P. W. Hunt, Fort Worth: For table use grown in Northwest Texas: Alexander, Hale's Early, Elberta, Old Mixon Cling, Stump the World and Summer Snow. For shipping: Mamie Ross, St. John, Elberta, Gen. Lee, Old Mixon Cling and Stump the World.