

TEXAS AGRICULTURAL EXPERIMENT STATION.

BULLETIN No. 32.

SEPTEMBER, 1894.

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- I. Varieties of Plums.
II. Injurious Fungi and Insects.
III. Varieties of Apricots.
IV. Varieties of Japan Persimmons.
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AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS.

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TEXAS AGRICULTURAL EXPERIMENT STATION.

Test of Plums, Apricots and Japan Persimmons

R. H. PRICE, B. S.

SUMMARY OF CONCLUSIONS.

1. Over twenty varieties of plums have originated in Texas. Some of them, belonging to the Chickasaw group, are more productive and more free from injury by insects and fungi than other varieties tested here.

2. The following varieties of the Chickasaw group are recommended for general orchard planting: Caddo Chief, Lone Star, Marianna, Munson, Newman, Paris Belle, Robinson, and Transparent.

3. The Wild Goose group does not seem so well adapted to Texas as the Chickasaw group.

4. The Chickasaw group seems better adapted to Texas than the American group.

5. The European species of plums has almost entirely failed.

6. The Japan plums are of good size and flavor. Very attractive, and would ship well. Many of the varieties need to be sprayed to prevent injury by insects and fungi.

7. The following Japan varieties are promising: Abundance, Burbank, Douglas, Georgeson, Kelsey, and Norman.

8. Marianna as plum stock does not do well for all varieties, especially when they are set on dry upland.

9. Nearly all injurious fungi and insects can be prevented from doing injury to plums by spraying the trees with three ounces of London purple stirred into every twenty-five gallons of Bordeaux mixture. Spraying should begin early, before the bloom all falls off, and be repeated every two weeks till the fruit is half grown.

10. It is often necessary to spray once after the fruit is gathered, to prevent blight defoliating the trees early in the fall.

11. Plums are more fruitful if several varieties which bloom near the same time are set close together in the orchard.

12. The following apricots are the most promising which we have tested: Myer's Early and Royal.

13. Japan Persimmon is a very promising new fruit which seems well adapted to Texas. It grows well when budded upon stock of the native wild persimmon. The most promising varieties tested are Hachiya, Tane-Nashi, and Zengi.

14. This first has a tough skin and a long period of ripening, which enable it to be shipped well.

VARIETIES OF PLUMS.

Over twenty varieties of plums have originated in Texas. Some of them are more productive than any other varieties tested here, and at the same time are almost free from injury by insect enemies and fungus diseases. To secure the hardiness and productiveness of these native seedlings and the large size and good quality of the best Japan plums in one variety offers a most promising field of work to the scientific horticulturist. While we have several of our own seedlings growing, yet our attempts in trying to cross the hardy Chickasaw with the best Japan varieties have so far failed. Luther Burbank of California is doing some good work in this line.

During the past two years considerable work has been devoted to the study of varieties under test and to combatting insects and fungi injurious to this fruit.

The experimental orchard was set during the winter of 1888 and 1889. The trees were set fifteen by fifteen feet apart, upon a rather loose clay loam soil of medium fertility, underlaid by an almost impervious white clay. Surface drainage has been fair. Clean cultivation has been given by using a one-horse turning plow. During the time the orchard has been set two long drouths have severely tested the drouth resisting qualities of all the varieties. Several varieties which had showed weakness during the past two years died during last summer. They were at once investigated, and the facts brought out appear further on this bulletin.

While it is not the object of this bulletin to give elaborate discussion of the reasons for classifying certain varieties in particular groups, still it is believed the classifications used are reliable. At the same time we are aware, as Prof. Bailey stated,* "the native plums constitute probably the hardest knot in American pomology," and it is therefore exceedingly difficult to classify them correctly at the present time.

I. CHICKASAW GROUP (Fig. No. 1).—*Prunus angustifolia*, Marshall;
Prunus chickasaw, Mich.)

This group is described by Bailey as differing from the Wild Goose group (*Prunus hortulana*, Bailey) in "having a more slender, spreading, and zigzag growth, usually smaller size of tree, red twigs; by smaller, lanceolate or oblong-lanceolate very closely serrate shining leaves, which are conduplicate or trough-like in habit; by early small flowers which, upon old wood, are densely clustered on the spurs, and by an early red (rarely yellow) and more or less spotted transparent fruit, the flesh of which is soft, juicy, and more or less stringy and very tightly adherent to the small, broad, roughish stone." The trough-like leaves and zigzag twigs are perhaps the most decided characteristics, and are shown in figure No. 1. This species occurs wild in the State, where it often appears as a thorny bush. Many valuable varieties have come from this species.

*Cornell University, Bull. 38, p. 4.



FIG. No. 1—Newman, Sprays half size. Leaf and stones full size.

African.—The trees have made good growth and are healthy, but have not fruited. “Originated by G. Onderdonk, nursery, Texas, and introduced by him in 1870.” (Bailey.)

Arkansas Lombard.—Medium size, round, light red; skin tough, flesh firm, flavor good when fully ripe; trees productive and hardy, almost free from attacks of insect enemies and fungi.

Beauty.—Medium size, oblong-roundish, light red; skin tough, flesh firm, rather acid; tree low, spreading and thorny; growth rather weak,

only fairly productive; "shot hole" fungus made slight attack upon foliage.

Caddo Chief.—Medium size, round to oblong, red; skin thick, flesh light red, flavor not decided; tree low branching, very productive and hardy, has ripened the earliest fruit. "Wild from Caddo Parish, La." (Bailey.)

Coletta.—Medium size, light red; skin tough, flesh yellow, flavor sweet and pleasant when fully ripe; tree upright in growth and rather thorny, hardy, productive and early; "shot hole" fungus injured foliage badly. "Originated by G. Onderdonk and introduced in 1874." (Bailey.)

Early Red.—Has bloomed but not fruited; growth weak, foliage injured much by a macrosporium fungus. "Originated by Onderdonk and introduced in 1872." (Bailey.)

Jennie Lucas.—Has bloomed but not fruited; trees resemble Transparent in growth; foliage has blighted badly. "Originated and introduced in 1875." (Bailey.)

Lone Star.—Above medium, oblong oval, light red; skin thin and tough, flesh rather soft when fully ripe, flavor sweet and melting; tree hardy and productive, holds foliage late into fall; a desirable early plum. "Originated and introduced by E. W. Kirkpatrick, McKinney, Texas." (Bailey.)

Marianna (Fig. No. 2).—A distinct group is made of this plum by Bailey.* Medium size, roundish, bright red skin rather tough, flesh rather yellow, soft when fully ripe, flavor sweet and desirable; tree rather low and spreading, top very heavy, comparatively free from attack of insect enemies and fungi, very hardy and productive; very much used as stock upon which to bud other varieties, as it grows readily from cuttings; perhaps a seedling of Wild Goose. Originated in Texas and introduced by the late Chas. N. Ely, of Smith Point, Texas.

McPherson.—Rather small, round, golden yellow; skin brittle, flesh yellow, adheres to seed, quality only fair, unless fully ripe is rather acid; tree low and bushy, thorny, fairly productive, and hardy.

Munson.—Above medium size, oblong, pale red; skin thin and rather tough, flesh light yellow, flavor slightly acid, very pleasant and melting; tree rather drooping, very hardy and productive, holds its foliage late into the fall; so far has not been attacked by insects nor fungi; all points considered it is the most desirable plum for orchard planting that has yet fruited. Bailey has named another plum Munson, but since this plum was named by Onderdonk some time before Bailey named his, the name Munson is continued. Originated and introduced by Onderdonk in 1888.

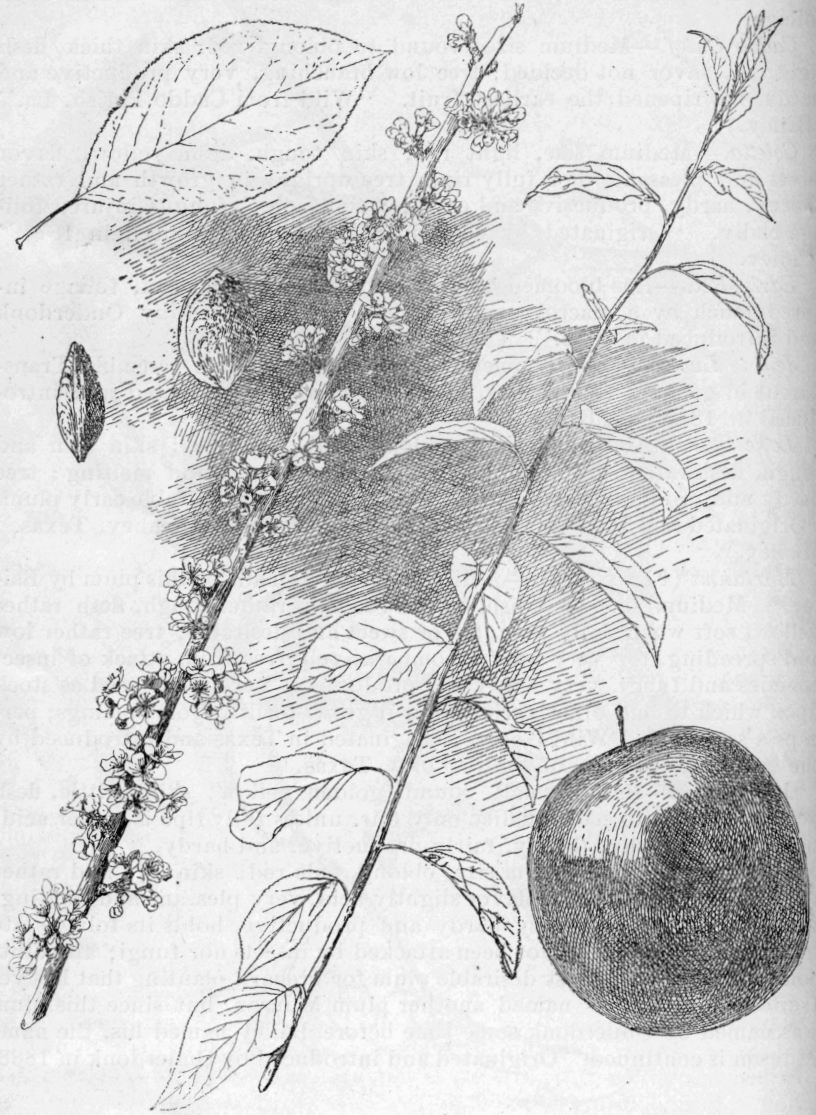


FIG. No. 2.—*Marianna*. Sprays half size. Fruit and seeds full size.

Newman (Fig. No. 3.)—Medium size, round, deep yellow, tinged with red; skin tough, flesh firm, flavor sweet and pleasant when fully ripe; tree vigorous and productive, with drooping branches, foliage hangs on well late into fall; one of best second early plums. “Introduced from Kentucky by W. F. Heikes.” (Bailey.)

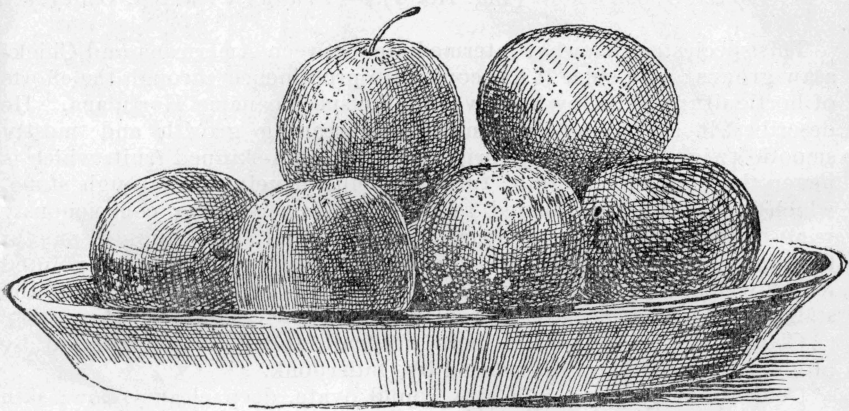


FIG. No. 3.—*Newman*. Natural Size.

Ohio Prolific.—Has not fruited; healthy.

Paris Belle.—Medium size, round-oval, light red; skin thin, flesh yellow and firm, flavor slightly sweet and pleasant; tree rather small and drooping, blooms late, very hardy and productive, very little affected by insects and fungi, holds foliage on well. Valuable late plum. Originated at Paris, Texas.

Pottawattamie.—Bloomed but did not fruit; now dead.

Robinson.—Medium size, round, splashed with red; skin rather tender, flesh yellow and firm, flavor rather acid; tree low and shrubby, hardy and fairly productive, one of best late plums. "Seedling grown by Mr. Pickett, Putman county, Indiana. J. H. Robinson called attention to it in 1879." (Bailey.)

Transparent.—Medium size, round to oblong, light yellow, almost transparent; skin thin and tough, flesh rather soft and melting, flavor sweet and desirable—makes a pleasing contrast when placed among a plate of red plums; tree rather low and upright in growth, productive and hardy, ripens fruit early. The rust (*Puccinia pruni-spinosae*) affects foliage unless it is sprayed; perhaps same as Yellow Transparent, which originated in Northern Texas and was introduced by J. L. Freeman. (Bailey.)

Tudor.—Above medium size, oblong, light red; skin very thin, flavor rather acid unless fully ripe; tree fairly vigorous and productive, "shot hole" fungus injures foliage unless it is sprayed; heteropterous insect punctured fruit considerably and caused it to be knotty. A note concerning the insect appears in latter part of the bulletin.

Wooten.—Medium size, roundish, light red; skin rather tough, flesh yellow and rather soft, flavor sweet and pleasant; curculio injured 25 per cent of fruit; tree fairly vigorous and very productive, foliage injured badly in fall by blight. "Found wild in Central Texas and introduced by A. M. Ramsey." (Bailey.)

II. WILD GOOSE GROUP (Fig. No. 4).—(*Prunus hortulana*, Bailey.)

This species is somewhat intermediate between Americana and Chickasaw groups; and since it has come into prominence through the efforts of horticulturists, Bailey has given it the specific name Hortulana. He describes it as having "strong wide-spreading growth and mostly smooth twigs, a firm, juicy, bright-colored, thin-skinned fruit, which is never flattened, a clinging, turgid, comparatively small rough stone, which is sometimes prolonged at the ends but is never conspicuously wing-margined, and by comparatively thin and firm shining, smooth, flat, more or less peach-like, ovate-lanceolate or ovate long-pointed leaves which are mostly closely and obtusely glandular-serrate, and the stalks of which are usually glandular."*

Clara.—Has bloomed but bore no fruit, foliage badly affected by blight; originated and introduced by Onderdonk.

Golden Beauty.—Medium size, round ovate, deep clear yellow; skin tough, flesh firm and of good quality; tree dies back at top and is inclined to be weak, productive, blooms very late. "Introduced by Onderdonk in 1874." (Bailey.)

Indian Chief.—Medium size, round, red; skin tough, flesh rather soft, flavor good; tree productive, but short lived.

Kanawha.—Small, round, red; skin tough, flesh firm, flavor rather acid; tree productive but weak in growth; now dead.

Mason.—Has not fruited.

Miner.—Has bloomed but not fruited. Bailey makes a distinct group of it and classifies it as "*Prunus hortulana* var. *mineri*."†

Wayland.—Medium to large, round, light red; skin and flesh tough; would ship and sell well but is a poor table plum; tree has been productive but weak; is now dead.

Wild Goose.—Medium size, oval, light purplish red; skin tough, flesh rather soft, flavor very fair; tree not very productive, much affected by blight, foliage does not hang on well in the fall.

III. AMERICAN GROUP (*Prunus americana*, Marshall).

This group is described by Bailey as being "strong growing varieties, which have come from the Northwest, and which are characterized by a firm, meaty, usually compressed, dull-colored late fruit, with thick and usually very tough, glaucous skin, and large more or less flattened stone, which is often nearly or quite free, and by large obovate, thick, veiny, jagged, dull leaves."‡

Deep Creek.—Medium size, round, light red; skin tough, flesh yellow, flavor good; tree drooping, productive, weak in growth, fruit affected some by "brown rot;" "introduced by Abner Allen." (Bailey.)

De Soto.—Very weak, did not fruit, dead. "Found wild at De Soto, Wis.; introduced by Elisha Hale, Lansing, Ia." (Bailey.)

Forest Garden.—Did not fruit, dead. "Introduced by H. C. Raymond of Forest Garden nurseries, Council Bluffs, Ia." (Bailey.)

*Cornell University, Bull. 38, p. 16.

†Cornell University, Bull. 38, p. 23.

‡Cornell University, Bull. 38, p. 5.



FIG. No. 4.—Wild Goose. Sprays half size, stones full size.

Quaker.—Has not fruited, foliage injured some by blight. “Discovered wild by Joseph Bundy, Springville, Ia.” (Bailey.)

Weaver.—Large, round-oblong “mottled red;” skin tough, flesh rather firm, flavor very good; tree very productive but has been much

affected by blight. The most desirable plum of the American group which has fruited here, needs to be sprayed to save the foliage; ripens fruit middle of July.

IV. EUROPEAN SPECIES (*Prunus domestica*).

The prunes and damsons are representatives of this group and are very easily distinguished. So far not one in the test has borne fruit here. At other places where I have seen this group bear fruit, the curculio was a very serious enemy. It did much more injury to this group than to the Chickasaw, growing near by.

Bradshaw.—Has not fruited, hardy.

Clyman.—Has not fruited, affected by some blight.

Damson.—Has not fruited, healthy.

Reine Claude de Boval.—Has not fruited, dead.

Richland.—Has not fruited, very weak.

Ruff's Choice.—Has not fruited, foliage affected some by blight.

Summer Prune.—Has not fruited, dead.

Texas Guage.—Has not fruited, dead.

Washington.—Has not fruited, healthy.

V. JAPAN GROUP (Fig. No. 5).—(*Prunus triflora*, Rox.)

Great confusion has existed among nurserymen and growers concerning nomenclature of varieties and botanical position of this new class of plums, which has during the past few years been imported from Japan. Dr. J. T. Whitaker, of Tyler, Texas, and myself were placed on a committee of nomenclature concerning these plums by the State Horticultural Society, during its annual meeting in July, 1893. Shortly afterwards forms for taking notes upon were sent to Dr. Whitaker, who reported upon several which were not in our list, as shown further on. Prof. Bailey, who has devoted much study to this group, has classified them all as coming from *Prunus triflora*.* He states that "a plum found in the botanic gardens at Calcutta about seventy years ago by Roxburgh, and by him named *Prunus triflora*, seemed the most likely parent." He also states that "Prof. Georgeson, who had spent some years in Japan in a critical study of its products, definitely referred these plums to *Prunus triflora* of Roxburgh." Specimens in the Kew Herbarium, England, partly collected by Roxburgh, and others, from the Ava Hills of Northwest India, Prof. Bailey states, nearly all our knowledge of *Prunus triflora* seems to rest upon. The following description is by Bailey: "Trees of strong growth, with widely spreading, long forked branches, which are light colored and marked with corky elevations, the young growth not pubescent, the buds three or more at the joint, and the leaf-scars often small; flowers two to three from each bud, generally rather small and short-stalked and sometimes not opening wide, leaves firm but rather thin in feeling, and not pubescent nor rough-nettled below, although the whitish veins are pronounced, very smooth and often somewhat shiny above, commonly long-obovate or sometimes nearly elliptic in outline, and the point usually prominent, the edges marked with fine, close serratures;

*Cornell University, Bull. 62, pp. 5, 6 and 8.

fruit globular or more often conical, and with a deep depression at base, and a very prominent suture, the flesh clinging to or free from the smooth or tightly pitted scarcely winged pit."

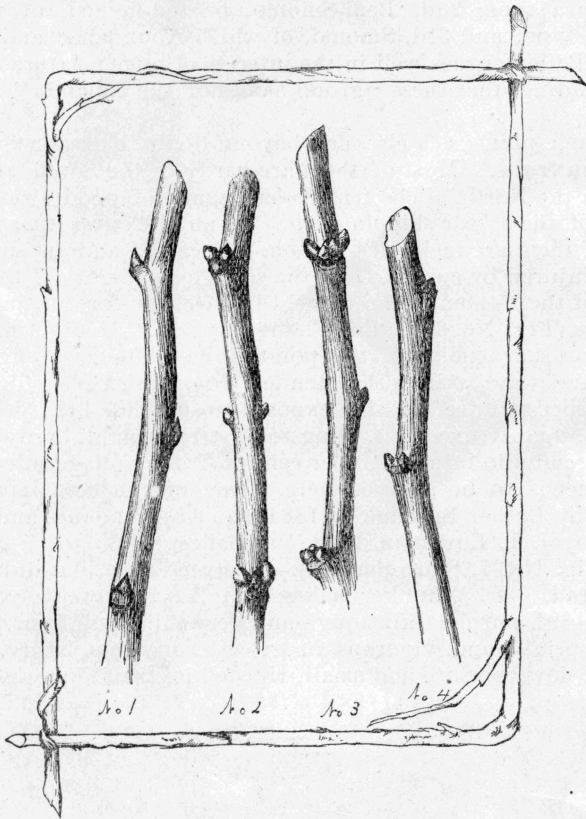


FIG. No. 5. Winter buds of three species of plums.—No. 1, *Prunus domestica*; Nos. 2 and 3, *Prunus triflora*; No. 4 *Prunus hortulana*.

While I do not agree with Prof. Bailey entirely in classifying all these varieties as *Prunus triflora*, yet it seems that it is the best that can be done till all have been fruited and studied more. Mr. P. J. Berkman, in a recent letter to me states, "Whilst we class most of the Japan plums under the species *Prunus japonica*, we still divide this into three distinct groups. *Prunus triflora* is no doubt the parent of some of the Japan varieties, but I am satisfied from the inflorescence of many varieties, like Ogon and others, that they belong to a distinct type, which may, no doubt, be *Prunus japonica*. Possibly these have been crossed and thus produce many forms. I do not, therefore, think that all came from one source; there is too much difference in their growth, foliage and inflorescence to warrant a common origin. Whilst my friend Bailey is no doubt correct in his classification from the observations taken in northern sections, our climate here has considerable influence upon habits of va-

rious varieties, which would bring them nearer to the same influence of their native country, hence, as Bailey says, all knowledge of *Prunus triflora* seems to rest upon botanical specimens from Kew Herbarium." The three groups Mr. Berkman refers to are: 1st, Hattankio, of which the Kelsey is a type; 2nd, Beni-Smomo, or red-fleshed, of which the Satsuma is a type; and 3rd, Smomo, of which Abundance and Burbank are types. Bailey argues well in the interest of nomenclature and a better understanding, that these "group names of the Japanese" should be discarded.

The Japanese plums as a class are, beyond doubt, a great acquisition to our American fruits. Most of them are hardy in the South, and several are hardy in the North. The fruit is handsome, of good size and quality. Most of them bear shipping well. As an objection it may be stated that some of them are inclined to bloom too early, and in some places the fruit is injured by curculio and the foliage by blight. I think, however, both of these enemies can be held in check by careful spraying.

Abundance (Fig. No. 6, Yellow-Fleshed Botan).—Medium size, roundish, sometimes sharp pointed, the point often oblique, a slight suture extends all the way; skin rather tender, color greenish yellow to rich yellow, splashed with red on side exposed to sun, flesh firm, yellow, very juicy, sweet, quality excellent, clingstone; tree upright, hardy and fairly productive; curculio injured 10 per cent of fruit; foliage affected some by blight, needs to be sprayed here. One of the best Japan plums. "Imported by Luther Burbank in 1884, named Abundance and put upon the market by J. T. Lovett in 1888." (Bailey.)

Berger (Fig. No. 7, Shiro Smomo).—Bloomed here, but did not fruit; trees now dead. Dr. Whitaker makes the following report: "Size under medium, reddish purple; skin tough and very thin, flesh firm, quality the best; tree upright and vigorous in growth, medium hardy, bloomed March 10th, flowers white and small, ripened its fruit June 1st."

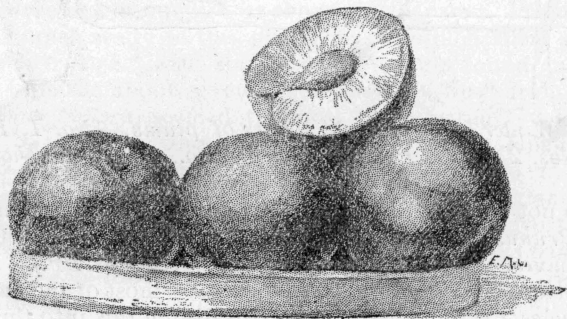


FIG. No. 7. *Berger*. Full Size.

Berkman (Fig. No. 8, White-Fleshed Botan, Sweet Botan, Botan).—This plum has not been in our test, but the following description by Bailey is given to distinguish it from Abundance: "Medium, broadly and obtusely conical and somewhat angular in cross-section; deep blood-red if ripened in the sun; flesh very sweet, moderately juicy, excellent

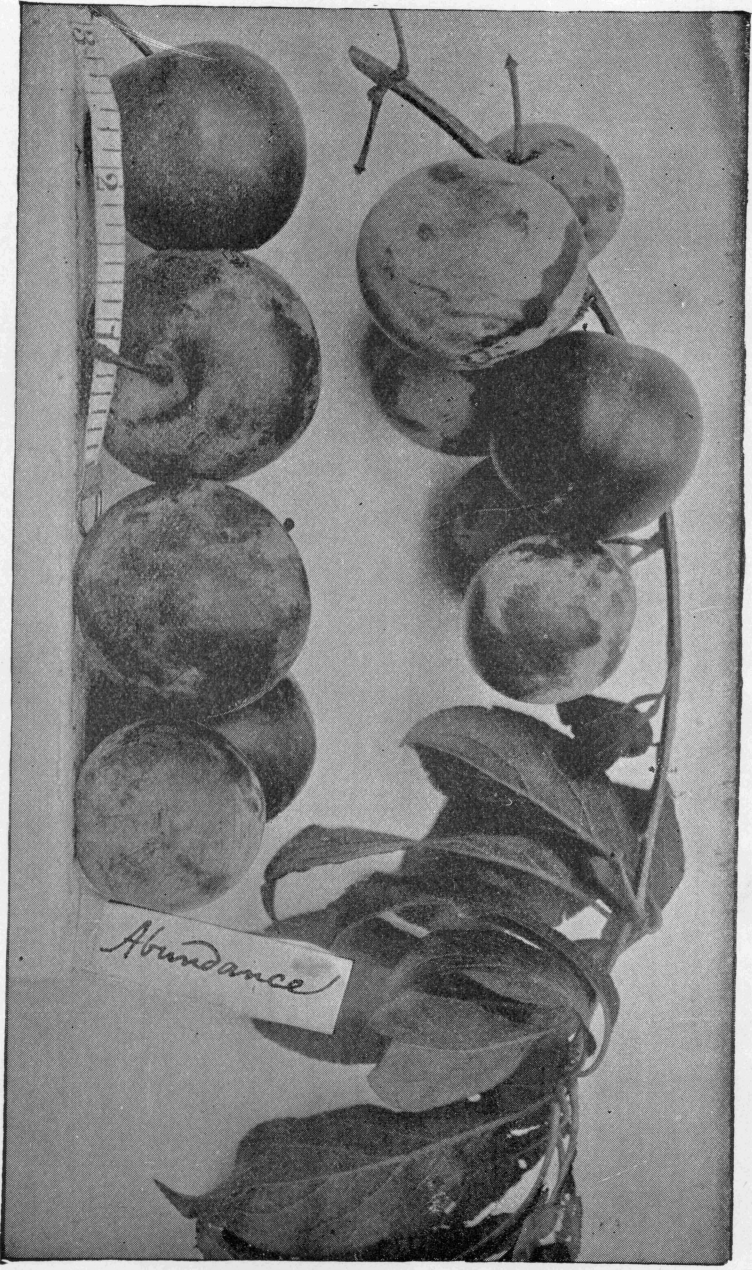


FIG. NO. 6. *Abundance.*

in quality, cling or semi-cling; ripens with Abundance or just ahead of it. One of the best. Introduced by Luther Burbank in 1887 from imported stock."



FIG. No. 8. *Berkmans (Sweet Botan.)*

Burbank (Fig. No. 9).—The following report is made by Dr. Whitaker: "Fruit large to very large, roundish, oblique point, yellow splashed with red; skin tough, flesh firm, flavor sub-acid—the best; tree open spreading, vigorous and productive, ripens fruit June 15th to 20th. One of the most reliable for general orchardists." Perhaps Burbank No. 2 of Bailey.

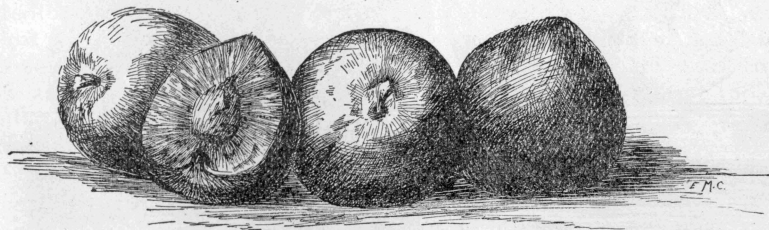


FIG. No. 9. *Burbank. Half size.*

Chabot.—Has not fruited here, foliage affected by blight. Described by Bailey* as "medium to large, oblong-conical; pink-red in color with many very fine gold dots; flesh yellow and juicy, rather acid, of good

*Cornell University, Bull. 62, p. 22.

quality, cling; medium to late in season; very productive. Imported from Japan by Chabot, of Berkeley, California."

Douglas (Munson of Bailey, Hytankayo of Whitaker).—At the request of Dr. Whitaker I name this variety Douglas, as it will prevent confusion, since there is another plum introduced by Onderdonk named Munson previously, and because this name is more American. I have tested the fruit, but the variety is not in our orchard, therefore the following notes made by Dr. Whitaker are given: "Size rather large, conical, yellow, with purple tinge; skin tough, flesh firm, flavor very good; tree upright, vigorous grower, hardy and very productive. Nearly free from attacks of insects and fungi." Imported and introduced by Dr. Whitaker.

Engre.—The following notes were taken by Dr. Whitaker: "Fruit medium size, round with pointed apex, purplish red with many white dots, flesh firm, flavor best of any other variety known to me; tree slightly straggling, very productive and hardy, very little injury by fungi, ripens fruit June 1st."

Georgeson (Hattankin No. 1).—Medium size, oblong and occasionally conical, golden yellow; skin rather tender, flesh rather firm, good flavor when fully ripe; tree vigorous and trop spreading, very productive. Fruit was affected some by brown rot and considerable injury was done by curculio; foliage inclined to blight, needs to be sprayed. The main difference between this variety and Kerr, which it closely resembles, is that the fruit is larger and is seldom pointed. "Imported by H. H. Berger & Co. of California, named for Prof. C. C. Georgeson, Manhattan, Kansas." (Bailey.)

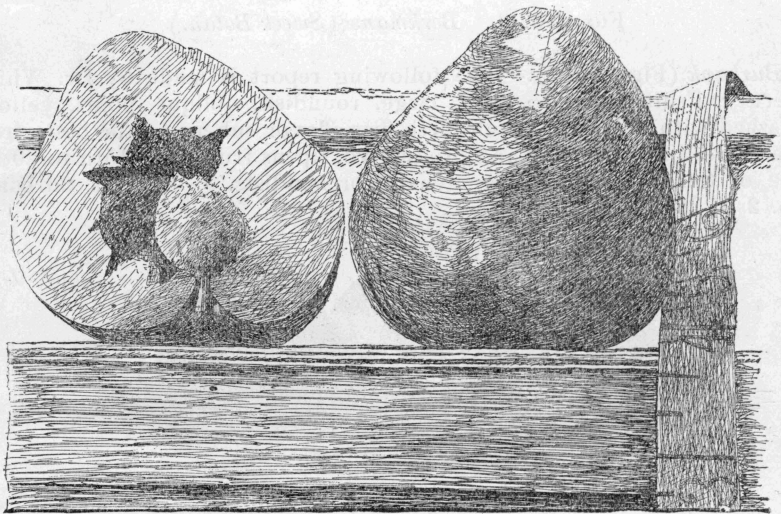


FIG. No. 10. *Kelsey*. Three-fourths natural size.

Kelsey (Fig. No. 10).—Very large, long, pointed, conical in shape, yellow, tinged and splashed with red, skin rather tender, flesh firm, more or less hollow, slightly clinging to the stone at base end, flavor very

good when fully ripe; tree upright, vigorous and productive. Curculio attacked it severely and brown rot affected it considerably; the foliage also is subject to blight. It is a valuable plum, but needs to be sprayed here. "First Japanese plum introduced into this country; named in memory of late John Kelsey, Berkeley, California." (Bailey.)

Kerr (Fig. No. 11, *Hattankin* No. 2).—Medium size, conical, with decided point, green shading into yellow; skin tough, flesh rather soft, cling, flavor very fair when fully ripe; tree upright in growth, leaves vary much in size on same tree, healthy. "Imported by Forest & Burgess, Riverside, California. Named for J. W. Kerr, Denton, Maryland." (Bailey.)

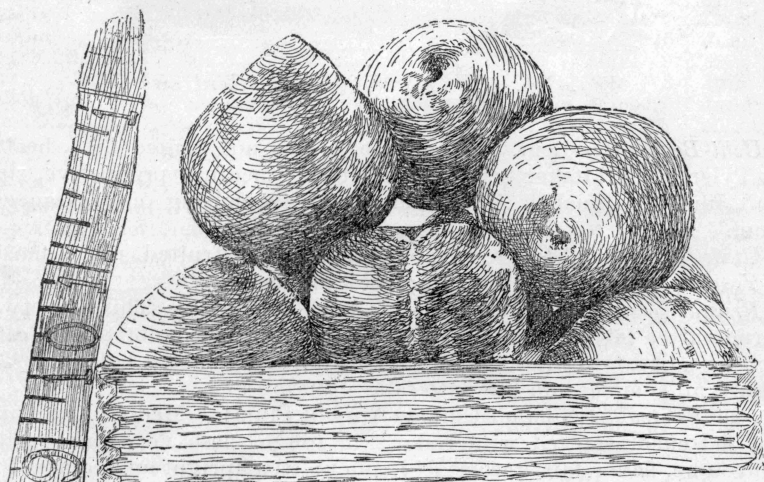


FIG. No. 11. *Kerr*. Half size.

Long Fruit.—Has not fruited here; foliage much affected by blight.

Maru (Masu. Massu).—The following report is by Dr. Whitaker: "Medium size, round, purplish red with blue bloom; skin thick, flesh yellow and coarse grained, quality medium, not so good as Burbank; tree compact, upright grower and fairly productive, bloomed March 15th, and ripens fruit last of June." "Imported by Burbank in 1885." (Bailey.)

Normand (Fig. No. 12. Normand Yellow. Normand's Japan).—The following report is by Dr. Whitaker: "Large, roundish to conical, light yellow with white dots; skin thin and tough, flesh firm, flavor good, sub-acid; tree open head, vigorous and productive, not affected by insects nor fungi." The fruit resembles Ogon some in size and color, but I consider the quality much better. "Imported by J. L. Normand, Marksville, La." (Bailey.)

Ogon.—Has not fruited here; subject to blight.

Satsuma.—Has not fruited here; foliage blights. Dr. Whitaker reports that it is very productive and hardy at Tyler. "Fruit medium size, conical, dark red; flavor very good, ripens July 20th."

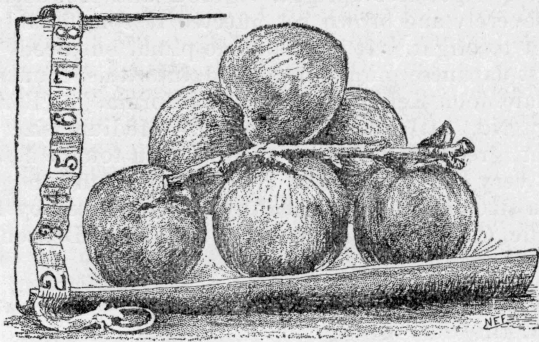


FIG. No. 12. *Normand*. One-third size.

Uchi-Beni (Ura-Beni. Honsmomo).—Has not fruited here, healthy. At Tyler Dr. Whitaker reports that it is “medium productive, ripens fruit June 5th, quality good, very small; promising only as an early plum.”

Utah Hybrid.—This is a dwarf cherry; has not fruited, not promising.

Yosebe.—Has not fruited here; trees now dead.

Prunus pissardii (Persian Purple-Leaved Plum).—This variety has borne only a few plums, which were small, crimson colored and of inferior quality. Desirable as an ornamental tree, since it holds its purple foliage all summer and late into fall.

Prunus simonii (Simon’s Chinese Apricot Plum).—Medium size, roundish, flattened, spotted with red; skin tough, flesh very firm, yellow, clingstone, flavor fair, rather acid, juicy; tree upright and compact top, foliage resembles that of peach; very hardy and fairly productive, not affected by fungi nor insects. “Introduced 20 years ago from China by Eugene Simon.” (Berkmans.)

UNCLASSIFIED LIST.

Bastle.—Has not fruited; very weak.

Gen. Hand.—Has not fruited, but is healthy.

Piram.—Small, round, light yellow, thin, brittle and tender; flesh soft, deep yellow, flavor sweet; tree hardy and fairly productive; perhaps a Chickasaw. “Seedling of Goliad county, and 20 years ago was named after Piram Hall.” (Onderdonk.)

Queen of Arkansas.—Has not fruited here.

Ruff’s Spanish.—Bloomed March 10th, but has borne no fruit. Perhaps a Chickasaw.

Saffold.—Bloomed March 2nd, but has borne no fruit; foliage affected some by blight.

Wilmeth Late.—Has not fruited; very weak. “Brought from Alabama 45 years ago.” (Onderdonk.)

Virgata.—Bloomed in January, but has borne no fruit; tree has some value as a shrub.

THE FOLLOWING TABLE SHOWS DATES OF BLOOMING AND RIPENING—THERE WERE NO NOTES TO MAKE WHERE BLANKS OCCUR.

Name of Variety.	Date of blooming.	Date of ripening.
Abundance (Yellow Fleshed Botan.)	Mar. 16	July 1
African		
Arkansas Lombard	Mar. 17	June 12
Bastle		
Berkmans (White-Fleshed Botan, Sweet Botan, Botan)		
*Berger (Shiro Smomo)	Mar. 8	June 10
Bradshaw		
*Burbank	Mar. 15	June 15
Caddo Chief	Mar. 9	May 19
Clara	Mar. 6	June 20
Chabot	Mar. 20	June 23
Clyman	Mar. 27	
Coletta	Mar. 14	June 1
Deep Creek	Mar. 4	June 27
De Soto		
Douglas (Munson, Hytankayo)	Mar. 10	July 10
Early Red	Mar. 6	
*Engre	Mar. 10	July 1
Forest Garden		
Golden Beauty	Mar. 27	July 6
Georgeson (Hattankin No. 1)	Mar. 24	June 15
Indian Chief	Mar. 12	July 27
Jennie Lucas	Mar. 17	
Kanawha	Mar. 26	July 26
Kelsey	Mar. 2	July 12
Kerr (Hattankin No. 2)	Mar. 22	June 7
Lone Star	Mar. 4	May 19
Long Fruit		
Marianna	Mar. 2	June 1
*Maru (Masu, Massu)	Mar. 15	June 30
Mason		
McPherson	Mar. 10	May 16
Munson	Mar. 2	May 19
Miner	Mar. 26	
Newman	Mar. 10	June 27
*Norman (Normand's Japan)	Mar. 15	July 2
Ohio Prolific (set '93)		
Ogon		
Paris Belle	April 1	July 21
Piram	Mar. 10	May 19
Pottawattamie	Mar. 24	
Prunus pissardii	Mar. 4	
Prunus somonii	Mar. 15	June 1
Quaker		
Red Japan (set '92)		
Reine Claude De Bavay		
Richland		
Robinson	Mar. 28	June 27
Ruff's Choice		
Ruff's Spanish	Mar. 12	
*Satsuma	Mar. 10	July 20
Saffold	Mar. 6	June 2
Summer Prune		
Texas Guage		
Transparent	Mar. 5	May 19

* Bloomed and fruited at Tyler, Texas.

Name of Variety.	Date of blooming.	Date of ripening.
Tudor	Feb. 24	May 20
*Uchi-Beni (Ura Beni, Honsmomo).....	Mar. 10	June 5
Utah Hybrid.....		
Washington		
Wayland	Mar. 26	July 25
Weaver.....	Mar. 20	July 18
Wild Goose.....	Mar. 16
Wilmeth Late (set '93)		
Wooten.....	Mar. 23	June 15
Yellow Transparent	Mar. 9	May 17
Yosebe		
Virgata.....	Jan. 3

* Bloomed and fruited at Tyler, Texas.

MARIANNA AS PLUM STOCK.

Cuttings of the Marianna plum grow readily and make a convenient and cheap stock for the nurseryman to bud upon. Trees budded upon this stock usually make a fine, thrifty growth the first two or three years before the tops grow so large. Indiscriminate use of this stock seems to be fraught with serious results. While it seems well adapted to some varieties, I am convinced, however, that other varieties are short lived when budded upon this stock. One main fault with the stock seems to be that the roots spread out too near the surface and do not go down into the subsoil deep enough to draw moisture to sustain the tree when reaching maturity. The peach is often used for stock, but it is open to objection also. It is frequently attacked by borers, and does not do well in low damp soils. There is room for considerable experimental work on this subject, which will take some time to arrive at definite conclusions.

Several prominent Southern nurserymen were written to for their opinions of the Marianna for plum stock, and their replies are given below:

"I have tried both peach and Marianna plums for stock for plums, and so far the Marianna appears much better, and I think there is nothing else that would excel it. The peach fails from the borer and from the least seapiness in soil at any season of the year, while the plum does not suffer from these causes."—T. V. MUNSON.

"As to the Marianna for stock for plums, I know of nothing that equals it for this region. I think it will prove equally good for apricots, but it is not a good stock for peach."—G. ONDERDONK.

"Marianna is good for plums, but not for peach."—E. W. KIRKPATRICK.

"We have found the Marianna to be the best stock for budding Japan plums upon."—P. J. BERKMANS.

"I do not recommend the Marianna as a stock. My experience has been that while the trees on Marianna make a fine growth for a few years, the tree will be short lived. I consider peach stock the best."—W. WATSON.

"Marianna as a stock is not satisfactory. It yields to the attacks of root galls. I am using the *Prunus americana* and like it very much. I think seedlings from Hytankayo, Burbank and Satsuma will give us the best stock known to the nursery world."—J. T. WHITAKER.

The following plums which were budded upon Marianna stock have died during the past two years. No doubt drouth and fungi were partly the cause, but non-affinity between the stock and scion, which was plainly shown by the improper union in nearly all cases after the trees were split open, was undoubtedly the main cause: Bastle, Berger, Botan, Caddo Chief, Clyman, DeSoto, Forest Garden, Indian Chief, Miner, Ogon, Pottawattomie, Queen of Arkansas, Ruff's Choice, Texas Guage, Wayland, Weaver, Wooten and Yosebe. The following which were budded upon peach have also died: Kanawha, Reine Claude, and Wild Goose.

COMBATting INJURIOUS INSECTS AND FUNGI.

During the past two years we have used in spraying three ounces of London purple stirred into twenty-five gallons of Bordeaux mixture to prevent this fruit from being injured by insects and fungi. Selected trees in the orchard from all varieties were sprayed three times, during intervals of two weeks, beginning when the bloom had commenced to fall off from the young plums. After the fruit had ripened, samples were taken into the laboratory to be analyzed, to see if any poison could be detected. None was found. Three weeks elapsed since the last spraying, during which time several hard rains had fallen. Should there be any desire to remove the last trace of the mixture which might remain when the fruit ripens, it can be easily removed by immersing the fruit in water containing some vinegar. Full instructions for making Bordeaux mixture are given in Bulletin No. 23. The fruit and foliage of the sprayed trees were, without exception, much healthier, and freer from injury by insects and fungi. In some instances, where the trees were not sprayed, so much as 90 per cent of the fruit was injured by curculio.

PLUM CURCULIO (Fig. No. 13. *Conotrachelus nenuphar*).—This is a small, dark brown weevil, with slight projections on its back. The female cuts the skin of the young plums in a semicircular shape, and deposits the egg under the cut skin. The egg soon hatches, and the young larva bores into the plum, causing it to ripen prematurely and unevenly.

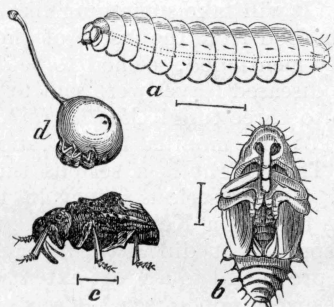


FIG. No. 13. *Plum curculio*; a, larva; b, pupa; c, beetle, magnified; d, natural size.

During the past summer we used an instrument known as "Tree Protector," bought of the Downs Tree Protector Company, Boston, Mass., to trap this insect. It is simply a cupped-shaped arrangement with a

hole in the bottom through which the tree passes. This instrument is placed around the trunk of the tree to prevent insects crawling up. Kerosene oil is placed in the upturned border of the bottom to catch and kill them on their return to the ground. Two curculio were caught in the trap. Several were also found upon the fruit, which evidently had flown and lighted there, as they could not have climbed up the tree. The trap is therefore not satisfactory. Curculio fly from tree to tree, as well as climb up the trunks. The jarring method was also used. A cloth was spread under the trees early in the morning while the curculio were not active, and as high as eight were caught under a single tree, 2nd of last April. Every third day the trees were gone over this way till the plums were half grown. This method will prevent the injury if kept up persistently, but the spraying method is considered cheaper and more beneficial, taking into consideration the effects of the Bordeaux upon fungous diseases also. It is often necessary, after the fruit is gathered, to spray once or twice to prevent blight. Spraying, to be most effective, should be done in time and in a thorough manner.

A heteropterous insect, resembling in shape the common squash bug, did much injury to several varieties by puncturing the fruit with its long beak and causing the plums to be knotty. Some of the insects were sent to Prof. L. O. Howard, who pronounced them to be the "Leaf-footed" bug (*Leptoglossus phyllopus*). He stated further, "according to Hubbard, the normal food of this bug in the South is a large thistle, upon the heads of which young and old may be found clustering and sucking the juices of the plant. The young bugs are seldom found away from the thistle, but the adults are strong flyers and enter the orange groves, sucking the opening buds and tender shoots, and also attacking the ripening fruit. It is probably a similar perversion of habit which leads them to attack your plums. I should not, however, advise you to eradicate the thistle, as an undesirable change of habit may result, and it will be worth while to have a certain proportion as a trap crop upon which the bugs may at any time be caught and destroyed." I have not yet noticed it upon the thistle, nor has it been reported to me from other parts of the State. The preparations used upon the orchard have had no effect upon this insect, apparently. It will take something like kerosene emulsion to destroy it, as it takes its food from the inside of the plum.

The blight, previously mentioned, seemed to be due to more than one fungus. Specimens of diseased leaves were sent to Prof. Galloway, who thought the injury due to three fungi, *Monilia linhartinia*, *Cladosporium* and *macrosporium* fungi. The monilia fungus appearing first and the other two following. This blight is a serious thing here, and unless spraying is done early it does serious injury in the fall. Brown rot (*Monilia fructigena*) was bad upon Kelsey and a few other varieties, but where the trees were sprayed it did little injury. Shot hole fungus (*Septoria cerasina*) was prevented to a great extent where the trees were sprayed; where the trees were not sprayed it was a serious disease upon a few varieties.

IMPOTENT VARIETIES.

Some native varieties of plums appear not to fertilize themselves, and consequently do not bear well unless fertilized by some other variety. I have known the Wild Goose to be unproductive when planted by itself.

Miner is also said to be unproductive alone. It is, therefore, better to plant mixed orchards, which are more apt to be productive. Rows of different varieties which bloom near the same time should be set near each other, so that plenty of fertile pollen may be furnished.

Cuts 1 to 12 are used by courtesy of Cornell University. Cut No. 13 was obtained of Dr. Riley.

VARIETIES OF APRICOTS.

The apricots were planted at the same time, upon the same soil, and the same distance apart as the plums. "There are three species of apricots: the purple (*Prunus dasycarpa*), the Chinese or Japanese (*Prunus mume*), and the common and Russian apricots (*Prunus Armeniaca*).* None of the purple class have been in our tests.

I. *PRUNUS MUME* (Chinese or Japanese Apricot).—The fruit of this class is rather small, greenish yellow, with a rather hard and dry flesh, which adheres firmly to the stone. The leaves are generally narrower and longer pointed than those of the common apricot. The fruit is of inferior quality, being too acid to be of high flavor.

Bungoume (Hubbard Apricot).—Roundish, somewhat flattened, large; skin yellow, flesh yellow, rather soft when fully ripe, very acid; very early, not productive. Bloomed February 9th, ripened May 15th.

Gold Dust.—The following report is by Dr. Whitaker: "Roundish, large; skin tough and smooth, reddish yellow; flesh yellow and firm, flavor very fair; medium productive. Bloomed March 10th, ripened May 10th."

Hanahoume.—Reported by Dr. Whitaker. "Roundish, medium size; skin thin and tough, reddish yellow; flesh white, slightly mealy, flavor under medium; very early. Bloomed Feb. 13th, ripened May 1st."

Koume.—Reported by Dr. Whitaker. "Roundish, size under medium; skin yellow, tough; flesh yellow, slightly mealy, quality poor; very early."

II. *PRUNUS ARMENIACA* (Common Apricot).—The fruit of this group is usually sweet and of good quality; fruit reddish or yellow, and flesh free. Bailey states that "this fruit is native of Northern China, Mongolia and Mandshuria, but cultivated from the earliest times, and once thought to have come from Asia Minor, whence the specific name, *Armeniaca* or *Armenian*.

"These Russian apricots were introduced into this country by the Mennonites, who settled in the West. They were grown in the country so long ago as 1876, and probably earlier."†

Alexander.—Has not fruited; healthy.

Alexis.—Bloomed March 13th, but did not fruit.

Eureka.—Bloomed March 14th, but has not fruited.

Jackson.—Has not fruited.

*Cornell University, Bull. 71, p. 278.

†Cornell University, Bull. 71, p. 284.

Moorpark.—This variety, which bears at some other places in the State, has not fruited here; healthy.

Myer's Early.—Small, roundish, light yellow shading to red on side exposed to sun; skin tough, deep yellow and rather soft, quality fair; medium productive. Bloomed March 3d, ripened May 16th.

Nicholas.—Has not fruited.

Royal.—Good size, oblong, light yellow splashed with red; skin tough, flesh yellow, rather firm and mealy, flavor excellent—the best which has yet fruited. Bloomed March 15th, ripened May 19th.

Russian No. 1.—Bloomed March 10th, but has not fruited.

Russian No. 2.—Has borne a few apricots which were of good quality, resembling very much Eureka. Bloomed March 11th, ripened May 17th.

JAPAN PERSIMMON (*Diospyros Kaki*.)

This new Japanese fruit seems well adapted to the South. The fruit ripens in the fall when most other fruits are gone. Its very tough skin and long period of ripening enable it to be shipped almost as well as the orange. Seed of the native wild persimmon germinate readily and afford good stock upon which to bud this fruit.

The varieties were set during the winter of 1889. The soil is the same as that upon which the plums and apricots grew. So far no fungus nor insect enemy has injured the fruit or trees, save a borer which killed a few of our young budded stock.

Daidai.—Medium size, conical, lemon color; skin tough, flesh yellow and soft when fully ripe, flavor sweetish, rather insipid; tree low, very productive and hardy, ripened fruit September 25th.

Dutch Medlar.—Has not fruited.

Hachiya.—Large, oblong, slightly conical, greenish yellow at base, shading into reddish yellow at apex; skin tough, flesh soft, flavor excellent, sweet; tree prolific and hardy, ripens fruit September 8th. Decidedly the best variety which has yet fruited.

Hiyakume.—Small, round, color lemon; skin tough, flesh firm, flavor poor; medium hardy and productive, ripened fruit September 30th.

Kurokume.—Has not fruited.

Masugata.—Has not fruited.

Meno.—Has not fruited.

Tane-Nashi.—Roundish, medium size, dull yellow; skin tough, thick and netted, flesh soft when fully ripe, flavor sweet and melting; tree prolific, ripens fruit September 17th. A desirable variety.

Yedo-Ichi.—Has not fruited.

Zengi.—Medium size, round with flat base, orange color; skin thick, flesh soft, yellow, dark granular around seed, flavor sweet, melting; tree hardy and prolific, ripens fruit September 14th.

Credit is due Mr. H. Ness for helping take the field notes.