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TEXAS AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 16,

JUNE, 1891.

WORK IN HORTICULTURE

Drainage Experiments:

IRISH POTATOES,
CABBAGE,
STRAWBERRIES.

Russian Fruits and Ornamental Trees.

List of Fruits on Trial.

Forest Trees Successful to Date.

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS.

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GEO. W. CURTIS, DIRECTOR.
College Station, Brazos Co. Tex.

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TEXAS AGRICULTURAL EXPERIMENT STATION.

WORK IN HORTICULTURE.

(S. A. BEACH, B. S. A.)

DRAINAGE EXPERIMENTS.

A series of drainage experiments was inaugurated last fall intended to cover several years, the object being to compare crops produced on drained and undrained land; also to compare the merits of deep and shallow drainage on soil underlaid at a depth varying from ten inches to two feet with hard tenacious clay.

For this purpose equal areas of drained and undrained soil otherwise similar were prepared alike, planted to the same cropand given exactly similar cultivation.

A comparison is made of time of ripening, quality and quantity of yield.

The first year's work is not yet complete but it is believed a report of the progress of this experiment will be of interest especially to gardeners, fruit growers and others who believe in intensive rather than extensive cultivation.

The ground selected for this experiment has a uniform slope to the north of about 5 inches to the rod, at the foot of which is the main drain of 3 inch tile. The soil is rather heavy clay loam under laid with hard pan at a depth varying from 10 inches to two feet. From the main drain laterals were extended up the slope for a distance of twenty rods. These laterals were placed a rod apart and at varying depth. The first three were laid four feet deep. The next two were laid twenty inches deep. The next two were laid two and a half feet deep.

For cost of tiling at different depths see table.

During the present season this land was occupied by Irish potatoes, strawberries and cabbage.

TABLE SHOWING COST OF DRAINAGE:

Depth 2 1-2 feet:		
To digging 40 rods	$18.50	
To cost of tile	18.48	
To laying tile	2.00	
To covering tile	5.50	$44.78
Average cost per rod 2 1-2 feet deep		$ 1.12
Depth 20 inches:		
To digging 40 rods	$10.00	
To cost of tile	18.48	
To laying tile	2.00	
To covering tile	4.78	$35.26
Average cost per rod 20 inches deep		$ 0.88
Depth 4 feet:		
To digging 60 rods	$85.95	
To cost of tile	27.72	
To laying tile	3.00	
To covering tile	13.92	$130.59
Average cost per rod 4 feet deep		$ 2.17

Irish Potatoes.

The variety selected for this test was the Early Rose with which a certain area of tile drained land was planted and the remaining

part of the same lot of potatoes was planted in an undrained field of similar soil. The two pieces of land were previously manured alike and were given the same care and cultivation.

In the undrained field on May 31 an area was selected equal to the area planted on the tiled land and the potatoes were dug. The yield was 3.75 bushels. Three days later the potatoes on the tiled land were dug. The yield was 10.25 bushels. The apparent increase in yield from tile drainage thus being over 170 per-cent. There was also great superiority in size, appearance and quality of the yield on the drained land.

Cabbage.

The experiment with this vegetable was conducted in a manner entirely similar to that with the Irish potato and gave even more marked results. Similar soil on tiled and untiled land was selected, manured the same and set to the same varieties of Early cabbage. The heads began to mature on the tiled plat about a month earlier than on the untiled plat. In fact at present writing (June 15) it is difficult to find enough matured heads to make a comparison of average weight. Six have, however, been gathered. Their average weight is 1.58 pounds. The tiled plat has matured 342 heads, having an average weight of 2.42 pounds, thus showing a remarkable advantage in time of ripening and increase in size of cabbage on the tiled ground.

Strawberries.

One great drawback with strawberry culture in many parts of the state is the difficulty experienced in getting the plants to withstand summer heat and drouth. Especially is this found the case at the Experiment Station. An experiment with strawberries therefore has been planned as follows:

1st. To find whether the plants stand the summer better on tiled or untiled ground.

2nd. To find whether the plants stand the summer best mulched with cotton seed hulls or straw or with the surface of the soil kept friable by clean cultivation.

3rd. A variety test of a few prominent varieties.

For the purpose of making these tests strawberries were set in the fall of 1890 as follows:

A			B	
Tile drained 2 1-2 feet deep. Clean cultivation all summer.	Tile drained 2 1-2 feet deep. Mulched during summer.	Not drained. Mulched during summer.	Not drained. Mulched during summer.	Not drained. Clean cultivation all summer.
I	II	III	IV	V

The land was divided lengthwise into five equal strips, numbered I, II, III, IV and V. I and II have a tile drain 2 1-2 feet deep extending through the middle. III, IV and V are undrained; I and V are given clean cultivation throughout the whole season. II, III and IV are mulched during summer. A and B are paths three feet wide separating the mulched plats from those given clean culture. No. III is used only to separate the undrained plats from the influence of the tile drain in II and is not included in a report of results. In rows running lengthwise of the plats were set equal numbers of each of the following varieties, viz: Cloud, Michael's Early, Parker Earle, Charleston and Jessie.

So far as growth of plants is concerned during the period from time of setting last November to date, Michaels' Early stands first on the list in multiplication of plants and vigor of foliage, Charleston second, Cloud third. These three varieties have formed matted rows nearly or quite complete. The Jessie and Parker Earle have formed few new plants and have not done so well in this regard as I have seen them do at other places, but though few in number, the plants are nevertheless in vigorous condition. All plants have been kept from fruiting this spring in order that more abundant growth might be secured and that they might begin the summer in the most favorable condition.

METHOD OF SETTING STRAWBERRIES.

The following description of the very successful and expeditious method used is taken from notes prepared about February 1st, 1891, and since published in public press:

"About 3500 plants were set. Of these 500 were received in good condition and 'heeled in' till the ground was prepared. The other 3000 were not received in good condition, the roots being quite dry and the leaves wilted.

Believing that strawberry plants should not be wet while out of the ground, except just before resetting, but that they should be kept constantly moist, we placed these plants on moist earth, covered them with damp moss (sphagnum), which was kept moist constantly, and placed a shade of boards over them to keep off the heat of the sun and to protect then from drying winds. In three or four days the plants had revived and showed little white points of new growth on the roots.

The ground was ploughed about six inches deep and well harrowed about the middle of October. The plants were intended to be set about the middle of November, but because the ground was dry the set'ing was delayed a fewdays in the hope that prospective rain would give more favorable condition for the work. In this we were disappointed, and about the 20th of November the plants were set. Some expressed the opinion that unless it should rain within three or four days, or a week at most, the plants would surely die. Yet although the ground remained very dry for a month, nearly every plant is alive and growing, notwithstanding much of the labor was done by students almost or wholly unaccustomed to this kind of work.

The ground was mellowed by running the subsoil plow twelve to

fifteen inches deep once in a row. The plants were taken to the field covered with damp moss and burlap. Three or four bunches were placed in a bucket one-third full of water. The one who made the holes used a common spade; this he set deep in the mellow earth and by a jerk of a handle backward and forward, made an opening in the soil about five inches deep, into which was placed a plant fresh from the bucket. The wet roots were carefully dropped so as to allow them to hang at full length in the earth. The spade was then withdrawn and set deeply just in front of the plant, so that an another jerk of the handle pressed the dirt firmly against the lower part of the roots; the process was completed by pressing the soil firmly around the crown of the plant, being careful not to cover the crown.

It is not claimed that this is the only way to set strawberries, but it is thought to be a good way because:

1. It keeps the plant moist all the time the roots are out of the ground, their natural reservoir of moisture.

2. The wet roots drop as deep as possible into the soil, and therefore are not dependent for moisture upon one or two inches of surface soil.

3. The wet root hairs come into immediate contact with the finest particles of soil, and through them begin at once to absorb moisture from the earth.

4. The pressure of earth firmly against the roots by use both of the spade and the foot, checks rapid evaporation from the soil next the plant.

5. The subsoil plow loosens the soil deeply, so that the work can be done more easily and rapidly.

6. The work can be done in this manner very quickly and efficiently with comparative ease. The workmen keeping the body nearly erect, are thus allowed freedom of motion and find the work less tiresome on that account."

NOTES ON INTRODUCTION OF RUSSIAN FRUITS AND ORNANENTAL TREES.

In a state containing so wide an extent of newly developed and undeveloped territory as does Texas, one very important line of horticultural investigation is that of the adaptability of fruits, shrubs and ornamental trees to its various conditions of soil and climate. Not all varieties successful in Eastern States prove equally successful here. In the work of testing new varieties or old varieties under new conditions every grade of success is experienced from most gratifying results to complete failure.

There are notable and praisworthy instances in older parts of the state of enthusiastic horticulturists who for years have carried on such experiments at private expense and a great deal of it. Others have more recently begun similar work and it is now pursued with commendable zeal throughout Texas.. It is to be hoped that these pioneers in Texas horticulture will make the Horticultural Department of the Experiment Station a center to which they will report the success, and what is equally important but less apt to be reported the failure of these experiments, and also make it a center for the collection, propagation and distribution of untried sorts. Only by

such co-operation can this line of station work be made most valuable to the state.

The largest list of varieties untried in Texas which the Station received this year year came from the noted collection of East European and Asiatic trees and shrubs at the Iowa Agricultural College. Several years ago Prof. J. L. Budd of that college took an extended trip over the plains of East Europe for the purpose of studying the horticulture of that region with reference to introducing into the western part of the great central plain of the United States and especially Iowa, the best varieties from a region possessing marked similarity to ours both in soils and climatic conditions and where the cultivation of orchard fruits has been known for many hundred years.

Many things thus introduced from the home of the Duchess of Oldenburg apple and Boleana poplar have proven remarkably successful in many parts of the Northwest. It is believed that among these varieties of apple, plum, pear and cherry will be found some kinds especially adapted to Northwestern Texas. A list of varieties thus introduced is here given together with notes on those which promised to succeed here, taken from Prof. Budd's descriptions published in bulletins and reports of the Iowa station and college. It is desired to at once propagate for distribution to anyone in the state who will agree to test them carefully and report results to the Station. Applications for them should be made to the Station Horticulturist who will make known the conditions of distribution.

List of Apples.

Antonovka	26 m.	Longfield	161
Arabka	257	Pointed Pipka	361
Bergamot	424	Red Queen	316
Borovinka	245	Red Transparent	333
Borsdorf	402	Revel Pear	379
Cinnamon	50 vor.	Round Borsdorf	356
Cross	413	Royal Table	5 m.
Gipsy Girl	56 vor.	Romna	599
Golden Reinette	51 vor.	Sklanka	
Good Peasant	387	Stripe	367
Grand Sultan		Skrisch	15 m.
Great Mogul	54 m.	Striped Winter	33 m. and 6 Orel
Grandmother	469	Thaler	342
Green Crimean	399	Vargulek	12 m.
Herren	87 m.	Voronesh Marmalade	88 vor.
Hibernal	378	Yellow Transparent	334
Jungfern			347
Juicy Burr	544		382
Kiev Reinette	447		392
Koursk Anis	984		8 m.
Koursk Reinette	20 m.		28 m.
Landsburg (Landsberger Reinette)			7 Orel

NOTE:—The numbers here given correspond to the importation numbers used by Prof. Budd. "M" refers to the Moscow list; Vor to the Voronesh list.

Notes on some of the above List:

No. 245. BOROVINKA, (*Borovinka*).—Much like Duchess in form, size and color, but fully a month later. It is finer in flesh, less acid, and a much better eating apple than Duchess. An early and full bearer, and tree a true iron-clad. Will prove valuable, I think, over a wide area of the northwest.

No. 402. BORSDORF (*Borsdorfer*).—Has small, firm leaf, and is a slow grower, but a fine tree in orchard; supposed to be an East German apple, but it proves

fully as hardy as Wealthy. The only complaint received is that the fruit is too small; but Dr. Hoskins says that manuring will bring it up to medium size. It is fine in color, good in quality, and a good keeper.

No. 51 *vor.* GOLDEN REINETTE.—We send this out as Golden Reinette. Medium to large, golden in color, fine grained, juicy, sub-acid; almost best in quality. Dr. Fischer, of Veronesh, says: "The best winter apple of South Russia." Tree seems hardier than Wealthy.

No. 399. GREEN CRIMEAN,(*Krimskaya selonka*).—This is not a true Russian, and not hardier than Fameuse. Fruit large, and only valuable for cooking.

No. 20 *m.* KOURSK REINETTE.—Medium, yellow, irregular, flat; dessert; grown south. Keeps till spring.

LANDSBURG OR LANDSBERGER REINETTE.—Medium to large. conical, yellow, shining, with crimson on one side. Flesh, yellowish, delicate, melting, sub-acid, best. Early winter in south half of Iowa. Does well on rich, low, prairies in Silesia. A fair grower in nursery and seems as hardy as Fameuse.

No. 361. POINTED PIPKA, (*Pipka Ostronkonetchnaya*).—A fine tree in all respects. Fruit medium to large, conical, skin greenish yellow, with show of red striping in the sun; cavity deep russeted, basin very shallow and corrugated. A tendency to ridge is shown in the largest specimens. Flesh rather fine, juicy, and better than the Willow. Season late winter here, and will keep until June farther north. This very valuable apple was sent us by Dr. Regel, who obtained the scions from one of the central provinces in the black soil region of Russia. Erroneously it was first sent out as the *Astrachan Pippin.*

No. 599. ROMNA, (*Romenskoe*).—This is one of the strongest growers in our collection and seems as hardy as a willow. Judging from its season, as we saw it in Central Russia, the fruit should keep through winter in the north half of Iowa. Fruit medium in size, round, yellow, with dark red in the sun.

No. 15 *m.* SKRISCH.—(We call it cross apple).—This is not identical with 413 from D.. Regel, but the variety of the family which we saw in Tula and Central Russia. Medium in size, yellowish, fine grained, juicy, sub-acid; very good. A true winter apple here (Iowa).

No. 342. THALER, (*Charlottenthaler golba*).—Much like the Yellow Transparent, but thought to be in North Iowa a better tree. With us it is larger than the latter and a trifle later. A valuable very early apple, that will be popular over a wide area.

No. 339. YELLOW TRANSPARENT.—This is now widely known. It is earlier than Early Harvest and much like it in appearance and quality

List of Peaches.

Bokaria	No. 1	North China	No. 1
Bokaria	No. 2	North China	No. 2

List of Pears.

Bessemianka	3 m. and 508	Limbertwig	14 m. and 513
Chinese de Engery		Long Stem	345
Early Bergamot	103 (vor.) and 418	Winter Pear	m. 9
Flat Bergamot	396		391
Lemon	7 m. and 516		

Notes on some of the above List.

BESSEMIANKA. (*No. 508 and 3 m.*)

This is grown on a great variety of soils in Russia,and it does well here [Iowa] on about all soils except the black muck, upon which even the small fruits will not do well.

On dry soils, where it can be planted deeply to protect the tender seedling roots on which we are compelled to graft all our varieties, it is doing well up to the 44th parallel.

The fruit is medium in size, Bergamot shaped, and nearly or quite seedless. The flesh is tender, juicy, mildly sub-acid, almost buttery, and satisfactory for dessert use. Season September.

The tree is a rapid upright grower, with bright green foliage always free from rust or mildew. So far it has not proven more subject to blight than the Duchess apple.

WINTER PEAR. (*9m.*)

We have favorable reports so far from all sources as to the hardiness of the tree and its freedom from blight. As we saw and tested the fruit in central Russia it was in season the last days of September. Fruit larger than Bessemianka and quite as good in quality.

LEMON. (*516 and 7 m.*)

A very hardy tree which Dr. Shroeder says is best for cooking. I have not seen the fruit except in a green state.

List of Plums.

Arab No 2.
Communia.
Dame Aubert.
Hungarian.
Leipzig.
Long Blue.
Long Red
Merunka.
Moldorka.
Ungarish.
Wyzerka.
Yellow.

EARLY RED (*No. 3.*) This was sent out quite extensively eight years ago marked "Mixed Arab." The sorts mixed were Early Red, White Nicholas, and Black Arab—now called Black Prune. But it has since proven that nearly all the trees thus sent out were Early Red, which is our No. 3 from St. Petersburg. The tree has proven hardy as far as our native plums can be grown, and an early bearer of purplish red fruit as large as the Lombard, better in quality, and two weeks earlier. It also has proven more nearly free from the attacks of the curculio and gouger than any native variety.

MOLDAVKA. This is a south Rusian variety that stands, if grown with a low stem, up to the 43d parallel. It comes into bearing early and the fruit is nearly as large, handsome, and good, as the Bradshaw.

LONG RED (*Orel 19*). A very hardy tree with perfect foliage. Fruit medium to large, oblong, purplish red in color, and of fair quality for dessert use. Its use will be mainly for kitchen purposes for which it is not excelled.

LONG BLUE (*Orel 20*). This is a true iron clad. The triple buds of the two-year-old wood are much like those of the Miner or Forest Rose. A bountiful bearer of showy blue plums with much bloom. Fair for dessert use and best for cooking.

YELLOW (*Vor*). This was selected by Dr. Fischer of Voronesh in central Russia as one of the hardiest sorts for dessert use. Fruit large, nearly round, freestone, and nearly best in quality for any use.

List of Cherries.

Abbess de Oignies.
Amarelle Bouquet.
Amarelle Bunt.
Bessarabian.
Brusseler Braune.
Cerise de Ostheim.
Double Natte.
French Weichsel.
Galopin
George Glass.
Griotte du Nord.
Griotte Precoce.
Juniat Amarelle.
Kings Amarelle.
Koeper.
Lutorka.
Morello Fouhe.
Red Muscateller.
Schatten Amarelle.
Sklanka.
Spate Amarelle.
Strauss Weichsel.
23 Orel.
24 Orel.
27 Orel.
108 Riga.

Notes on the above List.

ABBESSE DE OIGNIES. Of the Red Duke family grown in East Europe on favorable soils in North Silesia, and Southeast Russia. In no case have we known the leaves injured by rust our mildew. Even the present unfavorable seasons the foliage of our budded trees is perfect. Fruit large, round, dark red. When ripe mildly sub-acid.

AMARELLE BUNT. Another variety of the Red Dukes much prized in North Silesia for dessert use and cooking. A fine grower in orchard and nursery and far hardier tree on our grounds than Richmond or English Morello; mainly I

think on account of its more perfect foliage. The fruit is highly prized in the markets of Warsaw, Poland.

SPATE AMARELLE. Much grown for dessert and culinary use in East Poland and North Silesia, where it is noted for its regular and bountiful crops. Tree smaller than English Morello with pendulous habit.

Our trees from five to six feet in height were bending with the weight of the fruit this season.

Fruit medium to large. Color dark purple when ripe. Flesh and juice colored.

When first colored red the fruit has a bitter taste. At this stage of growth it is excellent for canning, and when fully matured it is desirable for dessert use. Season about the 20th of July.

BRUSSELER BRAUNE. A variety much prized on the sandy plains of East Poland. A larger grower than Richmond, with good foliage. Fruit large, nearly round, purplish red in color, juice slightly red, flavor pure and quite acid. As it contains much grape sugar it is valuable for canning and drying. Later I think than English Morello.

LUTOVKA. A fine round topped grower with strong shoots and good foliage. Much grown in Poland, North Silesia and South Russia, for making "Kirschwasser." Fruit large, yellowish red when ripe, flavor pure and sprightly; season late. Will be valuable for dessert and culinary use.

List of Trees and Shrubs.

Populus fastigiata.
Populus bereolensis.
Salix rosmarinifolia.
Salix laurifolia.
Acer ginnala.
Eleagnus angustifolia.
Tamarix Amurensis.
Caragana Redowsky.
Polish privet.
Russian privet.

Notes on above List.

POPULUS BEREOLENSIS. Has large thick leaves with handsome wavy edges. It is said to be the most valuable of the family for timber, as it polishes smoothly as butternut.

ELEAGNUS ANGUSTIFOLIA. A medium sized tree with silvery shoots and foliage. Its flowers are not excelled in delicacy of fragrance and the silvery fruits are oramental in late summer.

SALIX ROSMARINIFOLIA. A shrub Willow for ornamental planting. To those who believe that no shrub Willow can be graceful and pretty I will say this is an exception. In the northwest it will be specially prized. It is not the Rosemary leaved Willow of the eastern nurseries which will not endure our summers or winters. Top-worked on *Salix aurea* it makes a fine pendulous tree of small size for the lawn.

SALIX LAURIFOLIA. This is not identical with the Laurel Leaved Willow of some eastern nurseries. It makes a tree of medium size with finely rounded top, and laurel like, shining leaves that few will recognize as those of a Willow. This is very much liked where it has been introduced.

TAMARIX AMURENSIS. The ordinary Tamarix of the eastern nurseries is not hardy in the west, but the still more beautiful species from the valley of the Amur is perfect up to the 32d parallel and almost a perpetual bloomer.

LIST OF FRUITS ON TRIAL.

Since the publication of the list of peaches in the Station orchard in Bulletin No. 8, Dec. 1889, many changes in the list have been made. It is thought advisable to publish at this time a revised list of peaches and also apples, cherries and plums in the Station orchards.

Peaches.

Amsden.
Annie Wylie.
Albert Sidney.
Alice Haupt.
Alexander
Hyne's Surprise.
Infant Wonder.
Jack Ross.
Jennie Worthen.
June Rose.

Amelia.
Barnes.
Barnard.
Baldwin's Late.
Beatrice.
Beers Smock.
Bernice.
Bequett Cling.
Bequett Free.
Bexar.
Bilyeu's Late Oct.
Bishop's Early.
Black Freestone.
Blood Cling.
Bonanza.
Bonito.
Bronough Cling.
Butler's Cling.
Bokaria No. 1.
Bokaria No. 2.
Calaways.
Carpenters Cling.
Chinese Blood.
Chinese Cling.
Christiana.
Climax.
Coleman.
Cobler's Indian.
Columbia.
Comet.
Conkling.
Countess.
Cowan's Late.
Crawford's Late.
Crinsom Beauty.
Crocket's Late White.
Crother's.
Dowling's June.
Druid Hill.
Duff's Cling.
Early China.
Early Louise.
Early Rivers.
Early Tillotson.
Eaton's Golden.
Eldred.
Elmira.
English.
Esther Doom.
Falcon.
Family Favorite.
Foster.
Ford's No. 1.
Ford's No. 2.
Ford's No. 3.
Gaylord.
Galveston.
Gem Cling.
Gen. Grant.
Gen. Lee.
Gen. Tavlor.
George IV.
Glendale Beauty.
Good's Oct.
Gov. Briggs.
Juno.
Knight's Cling.
Lady Ingold.
Lady Palmerston.
Lady Paskam.
La Reine.
Langworthy.
Leatherburg's Late.
Lemon Cling.
Leopard.
Lilard's Oct.
Lord Palmerston.
Lonoke.
Libscombe Prize.
Lulu.
Mamie Ross.
Miner.
Minnie.
Mitchell.
Miss Lolo.
Morris White.
Mountain Rose.
Mrs. Brett.
Muskogee.
Nelson's Cling.
North China No. 1.
North China No. 2.
Old Mixon Free.
Old Mixon Cling.
Onderdonk.
Orange Cling.
Ormon.
Oriole.
Pallas.
Pansy.
Peen-to.
Piquett's Late.
Price's Free.
Princess of Wales.
Reeve's Favorite.
Ren.
Rosedale Sept.
Red River.
Raisin Cl.
Ringgold Cl.
Rupley's Cl.
Rose.
Reagan.
Scott.
Schumacher.
Scruggs.
Smock.
Salway.
Sea Eagle.
Stump-the-world.
Sander's Cl.
Spottswood Cl.
Stonewall Jackson.
Sloan's Carolina.
Sylphide.
Snow.
Squaw.
Susquehanna.
Topaz.
Troth's Early.

Golden Drop.
Guadalupe.
Hale's Early.
Haupt's Aug.
Haupt's Extra.
Haupt's.
Haupt's No. 14.
Haupt's Oct.
Hance's Golden Rareripe.
Henrietta.
Heath Cling.
Honey.
Howell's Cling.
Tippecanoe.
Texas.
Tarbell.
Thurber.
Tuskena Cling.
Ulatis.
Van Buren's Golden Dwarf.
Victoria.
Voorheis No. 1.
Voorheis Silver.
Yellow Aug.
Yellow St. John.
Wheatland.

Walker.

Total number ..... 167.

Plums.

African.
Ark. Lombard.
Bungourme.
Botan.
Beaty.
Bradshaw.
Bashtti Am.
Chabot.
Cheney.
Clara.
Clyman.
Caddo Chief.
Coletta.
Deep Creek.
Damson.
De Soto.
Early Red.
El paso.
Forest Garden.
Gen. Hand.
Golden Beauty.
Hattankin No. 1.
Hattankin No. 2.
Hall's New Golden.
Indian Chief.
Jennie Lucas.
Kanawha.
Kelsey.
Long-fruited.
Lone Star.
Mason.
Marianna.
Munson.
Miner.
McPherson.
Newman.
Ogon.
Pottawattomie.
Prunus Pissardii.
Paris Belle.
Piram.
Prunus Simonii.
Petite.
Queen of Arkansas.
Richland.
Robinson.
Ruff's Spanish.
Ruff's Choice.
Reine Claude de Bavay.
Saffold.
Satsuma.
Shiro-smomo.
Summer Prune.
Tudor.
Texas Gage.
Transparent.
Ura Beni.
Utah Hybrid.
Virgata.
Washington.
Weaver.
Wayland.
Wild Goose.
Wooten.
Wolf.
Wyant.
Yellow Transparent.
Yosobe.

Total number ..... 68.

Cherries.

Abbess de Oigines.
Amarelle Bouquet.
Amarelle Bunt.
Bessarabian.
Black Heart.
Brusseler Braune.
Cerise de Ostheim.
Double Natte.
French Weichsel.
Galopin.
George Glass.
Koeper.
Lutovka.
Montmorency.
Montmorency extraordinaire.
Morello Fouhe.
Olivet.
Red Muscateller.
Schatten Amarelle.
Sklanka.
Spate Amarelle.
Strauss Weichsel.

Gov. Wood.
Griotte du Nord.
Griotte Precoce.
Juniat Amarelle.
Kings Amarelle.
Weir No. 44.
23 Orel.
24 Orel.
27 Orel.
108 Riga.

Total number 32

Apples.

Antonovka.
Arabka.
Arkansas Black.
Baldwin.
Ben Davis.
Bergamot.
Black Warrior.
Bledsoe.
Belle Pippin.
Borovinka.
Borsdorf.
Bradfords Best.
Buckingham.
Cannon Pearmain.
Carter's Blue.
Cinnamon.
Collasaga.
Cooper's Early.
Cross.
Duchess of Oldenburg.
Early Harvest.
Elgin Pippin.
Fall Pippin.
Fall Stripe.
Fannie.
Forest.
Gano.
Gipsy Girl.
Golden Pippin.
Golden Reinette.
Good Peasant.
Grandmother.
Grand Sultan.
Great Mogul.
Green Crimean.
Gravenstein.
Hall's Red.
Haley's Eureka.
Herren.
Hibernal.
Hominy.
Jeffries.
Jonathan.
Juicy Burr.
Jungfern.
Kentucky Red.
Key's Winter.
Kiev Reinette.
Kinnard's Choice.
Koursk Anis.
Koursk Reinette.
Landsburg.
Lawver.
Lincoln.
Longfield.
Loy.
Maiden Blush.
Maverack's Sweet.
Missouri Pippin.
Mrs. Bryan.
Nashville Mammouth.
Nickajack.
Ortley.
Pointed Pipka.
Rambo.
Red Beitigheimer.
Red June.
Red May.
Red Queen.
Red Transparent.
Red Winter Pearmain.
Revel Pear.
Romanite.
Romna.
Rome Beauty.
Round Borsdorf.
Royal Red.
Royal Table.
Shannon.
Shirley.
Shockley.
Sklanka.
Skrisch.
Smith's Cider.
Southern Limbertwig.
Steubenraugh.
Steward.
Stevenson's Red.
Stripe.
Striped Winter.
Summer Pearmain.
Summer Queen.
Summer Rose.
Sweet Bough.
Sweet Dixon.
Texas Red.
Thaler.
Twenty Ounce.
Vargulek.
Voronesh Marmalade.
Wealthy.
White Winter Pearmain.
Winesap.
Yellow Bellflower.
Yellow Horse.
Yellow Transparent.
Yopp's Favorite.
347.
382.
392.
8 m.
28 m. and 7 Orel.

Total number ..... 113.

LIST OF FOREST TREES SUCCESSFUL TO DATE.

[NOTE.—The following list prepared by Mr. G. E. Eberspacher at the request of the Director to accompany the report by Prof. S. A. Beach on preceding pages of this Bulletin, represents those trees and shrubs which have successfully passed two years and are now in good healthy condition. Very many others have been planted the present year, but the list given includes only those, as already stated, which have made a healthy, vigorous growth for more than two years since planting. THE DIRECTOR.]

Forest and Shade Trees.

COMMON NAME.	SCIENTIFIC NAME.
Ash, Am. White	Fraxinus Americana, L.
Ash, Green	F. Viridis, Mx.
Beech, Purple-leaved	Fagus svlvatica, L.
Birch, Black	Betula nigra, L.
Box Elder	Negundo aceroides, Mch.
Cherry, Evergreen, or Wild Peach	Cerasus Caroliniensis.
Cottonwood	Populus monilifera, Ait.
China Tree	Melia Azedarach, L.
China Tree, Umbrella	Melia Azedarach, var. umbraculiformis.
Chestnut, Am. Sweet	Castanea vesca, var. Americana, Mx.
Catalpa	Catalpa bignonoides, Walt.
Cucumber Tree	Magnolia acuminata, L.
Elm, English	Ulmus campestris, L.
Elm, Scotch	Ulmus montana, L.
Elm. Am. White	Ulmus Americana, L.
Hackberry	Celtis occidentalis.
Japan Varnish Tree	Sterculia platanifolia, L.
Laurel, Spice	Laurus nobilis.
Laurel, English	L. Laurocerasus.
Laurel	L. Bertinnii.
Laurel	L. Caucasica.
Locust. Honey	Gleditschia triacanthos, L.
Locust, Black	Robinia pseudacacia, L.
Maple, Sugar	Acer saccharinum, Wang.
Maple, Silver or Soft	A. dasycarpum, Ehr.
Maple, Purple-leaved	A. sp.
Mulberry	Morus multicaulis.
Mulberry, Russian	M. Tartarica.
Poplar, Balsam	Populus balsamifera, L.
Poplar, Silver	P. alba, L.
Poplar, Gray or White	P. canescens.
Poplar, Italian Pyramidal	P. sp.
Sycamore	Platanus occidentalis, L.
Sweet Gum	Liquidambar styraciflua, L.
Tulip Tree	Liriodendron tulipifera.
Tamarisk	Tamarix gallica.
Willow, Weeping	S. Babylonica, L.
Willow, Rosemary-leaved	S. petiolaris, Smith.
Willow, Laurel-leaved	S. sp.
Willow, Batavia	S. sp.
Walnut, Black	Juglans nigra, L.
Walnut, English	J. regia.

Coniferæ.

COMMON NAME.	SCIENTIFIC NAME.
Arbor Vitæ—Chinese	Biota orientalis, Don.
Elegant	B. orientalis, var. elegantissima, Rol.
Golden, 2 varieties	B. orientalis, var. aurea.
Weeping (filiformis pendula)	B. pendula, Endl.
Caucasian	Thuja occidentalis, var. densa, Gordon.
Hovey's	T. occidentalis, var. Hoveyi.
Intermedia	T. occidentalis, var. compacta, R. Smith.
Silver	T. occidentalis, var. argentea, Car.
Vervaene's	T. occidentalis, var. Vervaeneana.

Giant	T. gigantea, Nutt.
Siberian	T. Tartarica, Lodd.
Japan	Cupressus Nutkaensis, Hook.
Japan, variegated	C. Nutkaensis, var. variegata.
Cedar, Deodar	C. deodara, Loudon.
Cedar, Red	Juniperus Virginiana, L.
Cypress, Japan	Retinospora plumosa.
Cypress, Golden Japan	Retinospora plumosa, var. aurea.
Juniper, English	Juniperus communis, L.
Juniper, Irish	Juniperus communis. var. Hibernica, Lodd.
Juniper, Scaly-leaved	J. squamata, Don.
Juniper, Silver	J. sp.
Juniper, Golden Variegated	J. sp.
Maidenhair Tree or Gingko	Salisburia adiantifolia, Smith.
Pine, Scotch	Pinus sylvestris, L.
Pine, white	P. strobus, L.

Shrubs and Small Trees.

COMMON NAME	SCIENTIFIC NAME.
Ash-berry, Holly leaved	Mahonia aquifolia, Nutt
Althea, 19 varieties	Althea frutex.
Burning Bush, 8 varieties	Euonymus Japonicus
Sage tree	Budleya Lindleana.
Box tree, 4 varieties	Buxus sempervirens, L.
Deutzia, 6 varieties,	Deutzia crenata
Flowering willow	Chilopsis linearis
Gold-dust tree	Aucuba Japonica
Hercules Club	Aralia spinosa
Hydrangea, 5 varieties	Hydrangea Japonica H. hortensis, L., etc.
Honeysuckle, Upright, 4 varieties	Chamæcerasus crysantha
Holly English	Ilex aquifolia
Japan Quince, white red and pink var.	Pyrus Japonica
Jasmine	Jasminum fruticians, L.
Lilac, white and purple	Syringa vulgaris, var. alba L.
Mock Orange or Syringa, 8 varieties	Philadelphus grandiflorus, Wild.
Osmanthus, 3 varieties	Osmanthus aquifolia
Privet, Amoor river	Ligustrum amorense.
Privet, California	L. Californiacum.
Privet common	L. Vulgare, L.
Privet, 3 other varieties	L. robustum. L. volutum. L. variegata argentea
Sweet-scented Shrub	Calycanthus floridus, L.
Spindle or Strawberry tree	Euonymus Europæus, L.
St. Johnswort	Hypericum kalmianum, L.
Spiræa, 2 varieties	S. Douglasii S. trilobata.
Sage or Chaste Tree	Vitex agnus-castus, L.
Waxberry	Symphoricarpus racemosus, Mx.
Weigelia. 18 varieties	Diervilla Japonica.