Experiments with new orchard fruits, trees, and shrubs

J. L. Budd

Iowa State College

Follow this and additional works at: http://lib.dr.iastate.edu/bulletin

Part of the Agriculture Commons, and the Fruit Science Commons

Recommended Citation
Available at: http://lib.dr.iastate.edu/bulletin/vol2/iss19/2
EXPERIMENTS WITH


J. L. BUDD.

In the spring of 1883 a Bulletin was issued by this Department giving an outline of our experiments with, and investigations of, some of the fruits and ligneous plants of the steppe sections of East Europe and North Central Asia. Since that time we have made several importations of scions and rooted plants from the parts of East Europe where the summer heat is nearly or quite equal to ours, and we have sent out many thousands of plants for trial across the continent on our northern borders. The present notes are a summary of the reports received from our trial stations and of our observations on the College grounds up to date, of a part of the varieties and species which we now have in nursery for distribution in the spring of 1893. But we also have in stock in limited quantity a large number of other varieties and species which have been favorably reported and propagated at other times. We do not graft and bud a full list of our valuable varieties at one time as it would extend our propagating work to a greater extent than our other College duties permit.

APPLES.

SUMMER VARIETIES.

Yellow Transparent. (No. 60 and No. 334.) * * This has become popular across the continent. At the West it blights on certain soils, but usually only on the tips. Fruit is earlier, larger, handsomer and better than the Early Harvest.

Blushed Calville. (22 M.) * * * This at the West will prove more valuable than Yellow Transparent. The tree is much hardier, more nearly free from blight, and the fruit is about as early, as large in size, is handsomely blushed, and it is less perishable and better in quality.

Breskovka. (152 M.) * * * Some later than the above and a very regular and full bearer. Fruit in size, color and shape much like Grimes Golden. Quality best for kitchen use and very good for dessert.

Plodovitka. * * * Very early and profitable at the North.
Voronesh Arkad.  * *  Fruit medium to large, yellow with blush on sunny side.  Flesh fine grained, tender and sweet.

Anisette.  (No. 185.)  * * *  Of the Duchess family and hardier at the North.  An annual and full bearer of fruit like Duchess, but finer in grain, less acid and earlier.  Will prove valuable over a large part of the United States.

Revel Pear.  (No. 379.)  * * *  A heavy bearer of fair sized handsome fruit for home use or market.

Borovinka.  (No. 245.)  * * *  Of the Duchess family.  Fruit almost identical with Duchess, but a better keeper.

Lubsk Queen.  (No. 444.)  * * *  As hardy as Duchess and noted for heavy and continuous bearing.  Fruit large, smooth, with varied shades of red and pink.  Flesh fine grained, sub-acid and very good for so large a fruit.  This is placed with the summer apples because it colors up early and ships well at an early date, but it keeps well at the fruit stands and can be easily kept through September.

Early Sweet.  * *  This is proving very valuable in all parts of the state.  Fruit medium to large, bright yellow, smooth, even and perfect.  Flesh tender and very sweet.  Season here early September.

AUTUMN APPLES.

Revel Borsdorf.  (No. 122.)  * *  An early bearer of very handsome apples of medium size and excellent quality, that take well in market for table and dessert use.  Season here last of September.

Longfield.  (No. 161 and 57 M.)  * *  Tree not hardier than Wealthy, but not so liable to sunscald.  On dry ground will prove very profitable up to the north line of the state.  An annual and full bearer of medium sized yellow fruit, handsomely blushed.  Will be popular as it never fails to bear, is not excelled for cooking and jelly making, and pleases all for dessert use.  After it has borne two or three heavy crops, it should be manured or the heavy crops of fruit will run too small.  Season autumn, but by early picking it will keep nearly as well as Jonathan.

Rosy Repka.  (No. 200.)  * * *  An iron clad tree everywhere.  Fruit large, even sized, handsomely colored, sub-acid, and excellent in quality.  Will be a popular mar-
ket apple. Season autumn, or early winter on the north limit of its possible growth.

_Repka Aport._ (No. 261.) * * * Of the Alexander family. Tree does well up to the north line of the state on dry soil and in unsheltered position. Fruit very large, handsome and good in quality. Season, late fall and early winter.

_Green Crimean._ (No. 399.) * * * On dry ground harder than Wealthy. Fruit large, conical, yellow. Season, late fall and early winter farther North. Most valuable for market and culinary use.

_Hibernal._ (No. 378.) * * * Hardier than Duchess and fully equal in bearing and perfection of tree on varied soils. Fruit large, even sized, handsomely colored and of best quality for culinary use. This will prove a popular market apple for kitchen use during the fall and early winter. It has some value for dessert use when fully matured and the skin, which has a crab-like flavor, is removed.

_Keiv Reinette._ (No. 447.) * * * Hardier than Duchess at the North. Fruit large, smooth, yellow, with crimson splashes, and a rich bloom. Valuable for all uses. Season, late fall and early winter.

_Gipsy Girl._ (56 Vor.) * * * A fine tree in nursery and orchard. Fruit large, smooth and remarkably handsome. A famous train-boy apple in East Europe. Will be prized over a large part of the country. Season, late fall.

_Mallett._ (No. 980.) * * * As imported by the Department of Agriculture this has the name of White Peli-kanoff. The fruit is not white, but is much like Wealthy in size, shape, color and quality. Its true name is Mallett. Though classed with the fall apples it is a remarkable keeper after it becomes tender enough for dessert use. As grown at the North, we have eaten the fruit in good condition in March.

_Large Anis._ (No. 413 Department.) * * * This was imported by the Department of Agriculture under the name of Cross apple. It is an iron clad tree in all respects, a heavy and continuous bearer, and a valuable late fall and early winter apple of good size and excellent quality.

_Antonovka._ * * * This is an iron clad tree and an early and continuous bearer of large yellow apples that will take well in market and prove valuable for home use. Its
fault is tendency to blight on black soils and in sheltered localities, but it is not more subject to blight than the Yellow Transparent. Season, late fall and early winter.

Aport Orient. * * * This is one of the most valuable of the varieties of the Alexander family. Fruit very large, gorgeously colored, and of excellent quality for an apple of its size.

Golden Reinette. * * * This has not proven true to name as received from the Bogdanoff estates, in Russia. It is a member of the Anis family, of fine size and excellent quality. Season, late fall, and early winter North.

Posarts Navaliva. * * * Of the Antonovka family and less subject to blight and a better keeper. Season here, December, and much later on its north limit of growth. Fruit much like the Antonovka, but it averages larger in size and is better in quality.

Kursk Reinette. (20 M.) * * * Of the Longfield family, with the same habit of early and continuous bearing. Fruit more conical than Longfield, of same color, flesh fine grained, tender and sweet. This promises to be very valuable over a large part of the United States.

Sandy Glass. (24 M.) * * Tree not much hardier than Wealthy. Does best on dry soil in unsheltered position. Fruit large, yellow, with blush on sunny side. Flesh fine grained, tender, melting, sub-acid, very good. If picked early will keep into mid-winter here.

Rambour Queen. (No. 502.) * * * Tree a fine grower, but not quite as hardy as Duchess. It succeeds, however, where Wealthy fails. Fruit large to very large, yellow, splashed with rich crimson, remarkably handsome. Flesh fine grained, tender and of excellent quality for so large an apple. Season, late fall.

Silken Leaf. (No. 327.) * * * This is one of the hardiest of the Hibernal family. A great and continuous bearer of smooth, handsome apples, specially valuable for culinary use. Season, late fall, and mid-winter at the North.

Pointed Pšpka. (No. 361.) * * * A true iron clad and perfect tree on varied soils. Fruit large, conical, coming to a point at the narrow basin, yellow, covered with stripes and splashes of crimson, with much bloom. Flesh fine
grained, sub-acid and very good. Season here, late fall, and late winter on its north limit of growth.

Bergamot. (No. 424.) * * * This is of the Antonovka family and is classed as a winter apple by J. B. Mitchell, of Cresco, and other northern growers. The fruit is later with us than Antonovka or Posarts Nalivia, but does not keep later than December with ordinary care. A remarkable bearer and perfect tree in every way. Fruit large, even in size, bright yellow and good in quality for any use.

Harry Kaump. * * This originated in Wisconsin and is now very popular in Sac and other counties in Northern Iowa. An early and continuous bearer. Fruit medium, green with show of color on sunny side, flesh fine grained, mildly acid and fine in quality for dessert use. Season, late fall and early winter.

WINTER APPLES.

Aport Voronesh. * * * We introduced the Aport of Central Russia from several points. It has been sent out as Aport, 23 M., 4 Vor., and 12 Orel. We have kept these importations separate, but they all appear to be identical. Fruit large, smooth, yellow, with much red in broken stripes and splashes. Flesh yellowish white, slightly coarse, sub-acid, aromatic, quality very good for any use. Mid-winter here, and will keep through winter at the north.

Arabskoe. (No. 257.) * * On dry soil this is much hardier than Wealthy at the North. Fruit large and much like Blue Pearmain. Quality much better than Willow. Mid-winter here, and much later north.

Bogdanoff. * * Tree nearly as hardy as Duchess on dry soil at the North. Fruit large, smooth, finely colored, with much bloom. Flesh fine grained, tender, sub-acid and nearly best in quality. Season, late winter.

Bogdanoff White. * * Of the same family as 24 M. Fruit large, yellowish white, fine grained, tender, and excellent in quality. Season here, early winter.

Sklanka Bogdanoff. * * * This is an iron clad tree on dry soils, and an early and continuous bearer. Fruit medium in size, yellow, conical, quality better than Baldwin. Season mid-winter, and very late on its north limit of growth.
Volga Cross. * * * A perfect tree on varied soils. Fruit of size of Rhode Island Greening and a much better keeper. Quality better than Baldwin.

Cross. (15 M. and No. 413.) * * * This is the true Cross apple of Central Russia. In close sheltered positions on black soils, it is subject to blight, but like the Yellow Transparent, it blights only on points of growth. On dry soils and in airy positions it will prove very valuable, as it is a heavy and continuous bearer. Fruit medium to large, oblate, ribbed, yellow, with red and crimson stripes. Flesh firm, sub-acid, very good. Season here, mid-winter, and it will keep as grown in North Iowa until spring.

Marmalade. (88 Vor.) * * * A perfect tree on varied soils. Fruit large, yellow, blushed on sunny side. It is especially valuable for jellies, marmalades and other culinary uses requiring much grape sugar. Season here, mid-winter.

Ostrakoff. (4 M.) * * * This is harder than Duchess and less subject to blight. An early, heavy and continuous bearer, and needs manuring to keep up size of fruit after it has borne heavy crops. Fruit medium to large, even in size, yellow. Flesh firm, sub-acid and fine in quality. Midwinter here, and will keep until May on its north limit of growth.

Ledenets. (30 M.) * * * An iron clad tree, succeeding best on dry soils without shelter at the north and west. A heavy and continuous bearer. Fruit medium to large, oblate, yellow, with blush on sunny side. Flesh fine grained, sub-acid, very good. Season, mid-winter here, and very late on its north limit of growth.

Lead. (3 M.) * * * This also does best on dry soils without shelter. Fruit large, oblate, conical, yellow, with red on sunny side, acid and most valuable for cooking, but when ripe it is better for dessert use than Willow or Ben Davis. Mid-winter here, and much later north.

Royal Table. (5 M.) * * * Also needs dry soil and open exposure. An early and continuous bearer. Fruit medium to large, conical, ribbed, yellow, with red on sunny side. Flesh white, fine grained, sub-acid, nearly best in quality. Mid-winter here, and late winter at the North.
Aport. (No. 252.) * * This was sent us by Dr. Regel as the true Winter Aport. It is not identical with the Aport Voronesh above noted. It is proving to be an early and continuous bearer and promises to be very valuable. Fruit medium to large, oblate, yellow, with splashes and stripes of red and crimson. Flesh fine grained, sub-acid, nearly best in quality.

Borsdorfi. (No. 356.) * * This is the best bearer of the Russian Borsdorfi family and the hardiest and best tree. Fruit small, russeted and best in quality. Season, all winter.

Repka Malenka. (No. 410.) * * On dry soil this is hardier than Wealthy. Fruit medium in size, yellow, with crimson splashes and broken stripes. Quality, very good. Season, late winter.

Regel. (No. 169.) * * * This was received by the College from Dr. Regel, of St. Petersburg, under the name of Green Sweet. But a mistake was evidently made as this is not sweet, has a fine color and is a late keeping winter apple. It much resembles Repka Malenka in shape and color, but it is larger in size and of better quality. In season and flavor it is much like Rawle's Janet.

Zuzoff's Winter. (No. 585.) * * In the Bulletin of 1890 we did not credit this as a very hardy variety. Our recent reports show it to be as hardy as Wealthy and less subject to blight. It is an annual bearer on account of its very late period of blossoming in the spring. Fruit large to very large, beautifully colored, fine grained, tender, mildly acid and nearly equal to Northern Spy in quality. Season about that of Grimes Golden. In tree it is not hardier than Wealthy and it should be top-worked in trying positions in North Iowa.

Romna. (No. 599 and 11 M.) * * * This succeeds best on dry soil where its roots run very deep. Fruit medium in size, conical, smooth, handsomely colored. Flesh white, firm, quite acid and best for cooking, but when matured it is much better for dessert use than Willow or Missouri Pippin or other coarse sorts found in our markets. Season, mid winter here, and late winter north of 43d parallel.

Voronesh Rosy. (No. 1277.) * * The stars only indicate this to be as hardy as Wealthy, yet it stands better at the North, as it is less liable to sun-scald and to injury of its forks.
It will prove a very valuable variety for top-working no
Hibernal, north of the 44th parallel. Fruit large, even
sized, yellow, with rosy red and bloom on sunny side, and
often over the whole surface. Flesh fine grained, tender,
sub-acid and nearly best for dessert use. Season at Ames,
February.

**Grandmother.** (No. 469, 6 M, 84 Vor.) * * As im-
ported by the Department (No. 469) it is not true to name.
It is hardier than Wealthy and an early bearer. Fruit
medium in size, oblate, ribbed, yellow, with fine red and crim-
son on sunny side. Stem thick and strong. Flesh firm and
quality nearly best. Season, mid-winter at Ames, and late
winter on high divides in North Iowa.

**Swinsovka.** (No. 277.) * * * The Department No.
277 is labeled Vargul, but is not true to name. The
Swinsovka is of the Lead apple family, but is not identical
with 3 M. Fruit medium to large, green, with yellow on
sunny side. Flesh fine grained, firm, sub-acid, juicy and
excellent for dessert use. Season, mid-winter at Ames, and
late winter north.

**Red Queen.** (No. 316.) * * As hardy as Wealthy and
doing remarkably well on dry soils up to the 43d parallel.
Will prove most valuable at the north top-worked on
Hibernal. Fruit medium to large, smooth, even sized,
colored late in season. At the North, it is usually picked
before it is much colored. Flesh firm, fine-grained, sub-acid
and better than Ben Davis in quality. Season, late winter.
Like the Cross apple, this should only be planted on dry
soils and in unsheltered positions.

**Boiken.** * * A variety imported from Transylvania.
It is now a favorite variety in Eastern France. The tree
seems to be as hardy as Wealthy, and is an early and continu-
ous bearer. Fruit medium to large, yellow, with handsome
carmine stripes and splashes. Flesh snow white, fine grained,
sub-acid and best in quality. Season, late winter. Will be
very valuable for top-working at the North.

**Citron.** * About as hardy as Roman Stem. Fruit large,
yellow, finely colored, quality best. Season, late winter.
Will prove most valuable for top-working.

**Battulen** * Also from Transylvania, and is much grown
in Europe from cuttings. It is a poor grower in nursery and
should be top-worked. Fruit large, peculiarly handsome; flesh white, fine-grained and best in quality. Season, late winter.

_Winsted Pippin._ * * This originated in Minnesota. E. R. Heisz, of Nora Springs, in North Iowa, says it is nearly as hardy as Duchess. On the College grounds it has proved a perfect tree and a good bearer. Fruit medium to large, mildly acid, fairly well colored, and much better than Willow in quality. Season, late winter.

_Burlington._ * An Iowa seedling, about as hardy as Roman Stem. Fruit medium, fine-grained, sub-acid and nearly best in quality. Season, mid-winter.

**THE CRAB APPLES.**

In the past we have propagated and sent out for trial some of the most promising varieties and hybrids of the Siberian crabs. But at this time we have decided that their place is taken by such varieties of the Russian apples as the Longfield, Marble, Recumbent and other sorts.

The Longfield, for instance, is superior to any of the crabs for jelly, marmalade, pies, sauce, etc. It is also a better bearer and its fruit has a value for dessert use. The only crab we now pronounce valuable is the one known as Virginia crab, which is only valuable as a stock for top-working, but it is not as valuable for this use as the members of the Hibernal family.

We have recommended the Boone crab, but with farther experience we find that it is a shy bearer and its foliage and fruits have been attacked by scab to a ruinous extent.

**GENERAL NOTES.**

It will be urged by friends who have had considerable experience in growing and fruiting the East European fruits that we have omitted some of the varieties they have found most valuable, and included a number with which they have not been wholly satisfied on account of blight or some other cause.

But it must be kept in mind that this is a report on the varieties and species we will distribute at this time, and that varied soils, elevations and exposures bring us varying reports. The notes as now given are a summary of the behavior on our own grounds and on the grounds of a large proportion of our reporters over an immense area of our country.

In the autumn list we have included a number of varieties which are proving mid-winter apples on their north limit of growth, such as Longfield, Rosy Repka, Repka Aport, Hibernal, Mallett, Large Anis, Posarts Nalivia, Silken Leaf, Pointed Pipka, Bergamot and Harry Kaump.
We cannot too strongly impress the importance of planting apple trees on the highest and driest land available, and furnishing no protection on the north and west. If the elevation is not more than ten feet above the general level of the adjacent lands, it is a great advantage in furnishing air drainage, equalizing the temperature in summer and lessening danger from frosts in the blossoming period.

Another benefit resulting from the selection of dry soil is that it permits deeper setting, which is a protection to the tender roots we are compelled to use in root-grafting.

If compelled to set the family orchard on low, black colored soil, get our selection of best varieties for such soil, set the trees shallow and ridge up for drainage and root protection.

We send out low headed trees, and our advice is to keep them low. In setting, lean the trees at a strong angle toward the one o'clock sun. They will have an awkward appearance at first, but they will soon become erect.

The best crop for a young orchard is buckwheat. Plow the ground very shallow about the middle of June and seed at once. The buckwheat keeps the ground loose, porous and relatively moist, permitting the roots to come up near the surface where the most of the nitrogenous plant food is found. The buckwheat can be cut, or allowed to rot on the ground. Bank the trees in the fall to protect the crowns and to prevent damage by mice. To guard against rabbits, wash the stems with thin whitewash, thickened with copperas and sulphur. If washed off by rains, renew the wash as often as necessary.

In the above lists, three stars (* * *) indicate the variety to be hardier on suitable soils than the Duchess; two stars (* *) indicate the variety to be hardier than Wealthy, except as noted in special cases. One star (*) indicates the variety to be as hardy as Roman Stem except as noted in special cases.

PEARS.

Prior to 1882 the writer, in common with all experienced orchardists, believed that pear growing would never prove profitable west of Lake Michigan, except at a few favored points.

The varieties from Southwest Europe and their American seedlings had failed with us as completely as had the grapes, strawberries, raspberries, etc., from that equable climate. Hence, we were astonished to find healthy pear orchards loaded with fruit in the parts of East Europe where our native Black Locust winter-kills as the common peach does with us. We were still more surprised to find the pear used as a street tree on the Volga, where the Duchess apple will not endure the winters, and where, with scanty snowfalls, the thermometer often goes down fifty or more degrees below
We at once decided that some of these varieties were worthy of trial. The present notes are confined to the varieties which have fruited in our state and have shown the fewest defects of tree and foliage. All of the varieties from South Central Russia have proven as hardy as the Duchess apple in tree, but many of them are far more subject to blight, except when planted on ridges in wholly unsheltered positions.

*Bessemannka.* (No. 508 and 3 M.) On dry soils, where it can be planted deeply to protect the tender roots on which we are compelled to graft all our varieties, this is doing well up to the 44th parallel. Fruit medium in size, Bergamot shaped, and is nearly or quite seedless. Flesh tender, juicy, sub-acid, almost buttery, and very satisfactory for dessert use. Season last of August.

*Limber Twig.* (No. 513 and 14 M.) Much like the above in hardiness and habits of growth. Fruit larger than Bessemannka and about the same in quality and season.

*Gakovsky.* (No. 347.) This variety can be grown on dry soil at the far North. The fruit in our climate is not as large as we reported in 1890, and it is not as firm in flesh as was reported. It proves to have fair quality for dessert use and is very valuable for cooking. Season, September.

*Autumn Bergamot.* (No. 122.) A very vigorous grower in orchard and nursery, and has done better on common prairie soils than the above noted varieties. Fruit small to medium in size, nearly sweet, very juicy and would be called good in quality in pear growing regions.

*Kurskaya.* (No. 392.) A very hardy tree and has been very free from blight on all soils. Fruit medium in size, Bergamot shaped and excellent in quality. This has fruited very freely even during the past peculiar season.

*Victorina.* (No. 361 and 106 Vor.) This, by mistake, has been sent out largely as No. 391. It is a very hardy tree and free from blight on soils suitable in any climate for pear growing. Fruit medium size, pyriform, fine grained, tender, and very good in quality when ripened in the house. Season, early September.

*Early Bergamot.* (No. 418 and 103 Vor.) A fine healthy tree, much hardier than the Wealthy apple. An early sum-
mer variety, larger in size and better in quality than the old Summer Bergamot grown in Wisconsin previous to our recent test winters.

*Flat Bergamot.* (No. 396.) About like the above in hardiness of tree and quality of fruit, but its fruit matures early in September.

*Winter Pear.* (9 M.) We have very favorable reports of this variety as to hardiness of tree and freedom from blight. Fruit larger than the Bessemaninka, as good in quality and three weeks later in season.

*Dula.* (4 M.) The foliage of this variety indicates close relationship with the Snow pears of Mongolia. Fruit Bergamot shaped and most valuable for culinary use. Season, September.

*Saccharine.* (12 M.) This appears to be identical with the Zuckerbirn (Sugar pear) of Northeast Germany. It appears to be hardier than the Wealthy apple and has shown no trace of blight on the College grounds. Fruit Bergamot shaped, tender, juicy, nearly melting and sweet. Season, early September.

*Lemon.* (No. 516 and 7 M.) A very hardy tree, which Dr. Shroeder says is most valuable for culinary use. I have not seen the fruit as yet when fully ripe.

*Mongolian Snow Pear.* This is hardier in tree than Flemish Beauty and its leaves are always clean, handsome and perfect. On dry soil it will prove valuable up to the 42d parallel. It is a regular bearer, even such unfavorable seasons as that of 1892. Fruit above medium in size, and when ripened in the house it is much better in quality than Kieffer, Le Conte or any of the Chinese pears we have tested grown in the South. It should be ripened in the house and can be kept until late in autumn.

*Golden Russet.* We suspect this to be identical with the Golden Russet pear of Japan, recently figured and reported upon very favorably in eastern journals. But of this we are not certain, as our trees were received from Northwest China. It is an early and continuous bearer of peculiar flattened russeted fruit, maturing in autumn, and may be kept into early winter. This is not an iron clad at Ames, but if injured at its points of growth during severe winters, it starts vigorous
shoots from below and continues its usual habit of free bearing. Valuable for culinary use.

GENERAL NOTES.

As a rule in all countries the pear thrives best on rather high and dry soil, and in our state it has succeeded best on prairie ridges, knolls and bluffs wholly unsheltered at the north and west. Plant on a ridge, even if not more than ten feet above the general level. With us the main trouble is from blight with the iron clad varieties, which is not often seen when planted on dry ground in wholly unsheltered positions.

We are compelled to use the seedlings of the French pears in grafting, which in our climate are apt to be injured in open winters unless the trees are planted deeply. On dry ground plant fully six inches deeper than they stood in nursery. In nine cases out of ten, these deeply planted trees will throw out roots from the scion within two years after planting.

We send out and plant for our own use trees only one or two years old from the graft. Even in Michigan the veteran grower, T. T. Lyon, loses no opportunity for urging the planting of what he calls "maiden trees," i.e., one year old trees. These small trees are more certain to make a good growth the first season, and will make larger and better trees four years after planting than older trees planted at the same time. Again the little trees will permit very low heading and the shaping of the top so as to have a central ascending stem without forking branches.

CHERRIES.

In the summer of 1882 the writer had a fine opportunity for studying the European cherries from the valley of the Moselle, in France, eastward to North Central Asia. In the spring of 1883 we imported one year old trees of the varieties which we decided to be the most promising for trial in the prairie states and in the far North. These little trees were set out in the orchard on the College grounds and have had hard usage. They have been exposed to the recent trying summers and winters that have killed our trees, young and old, of the grade of hardiness of Early Richmond, Montmorency and English Morello. Since their first year of growth they have also been mercilessly cut for scions in autumn and buds in summer, which we need not say is a serious damage to any stone fruits.

A better opportunity for determining the relative hardiness of trees and perfection of foliage has not been given in the history of our prairie horticulture.

After this severe ordeal on the College grounds and the extended tests on the grounds of experimenters over the
North and West, we are now pleased to report that many of the varieties appear to be as hardy as our native plums.

These East European varieties are also hardier in fruit, bud and blossom than any of our old varieties.

We are also pleased to report that the fruit has fully realized our European estimates as to the quality, color and size after the trees come into heavy bearing. But the first fruits on young trees are small on account of being robbed by the rapid growth of the young wood. In the following list, the varieties are given very nearly in the order of maturing their fruit.

_Early Morello._ (23 Orel.) * * * A neat round topped tree, with firm thick leaves. An early and regular bearer. Fruit much like Early Richmond in size and color, but the pit is smaller, the flesh firmer, has more grape sugar, and it is a little earlier in season. Juice uncolored.

_June Morello._ * * A neat round topped variety of the eastern Griotte race. Fruit much like the Richmond in size, color and season, but firmer in flesh and much better in quality for dessert use or canning. Juice uncolored.

_Griotte precoce._ * * Much like the above in size, color and quality of fruit, but ten days later in season. Uncolored juice.

_Boquet Morello._ * * Another variety of the same family, still later in season and with much grape sugar. Uncolored juice.

_King’s Morello._ * * This belongs to a class of the Griottes, with stronger growth. Fruit round, truncate at both ends, flesh white, soft, juicy, pit very small. Juice slightly colored when fully ripe.

_Griotte du Nord._ * * Of the same class as the above. A good tree, with fine foliage. Fruit large, nearly black when fully ripe. Flesh firm and of fine quality. Uncolored juice.

_Sklanka._ * * * A handsome round topped tree, with pendent habit and the best of foliage. This does well on low, black soil, where most varieties of cherries fail, but it succeeds still better on higher, drier land. Fruit large, yellow, with red on sunny side. Flesh firm, juicy and very
Orel Sweet. (26 Orel.) * * This is the hardiest of the strictly sweet cherries of East Europe. It is twenty per cent. harder than the Early Richmond, with good foliage. Fruit medium in size, black, very small pit. Flesh firm, rich and decidedly sweet. Juice colored.

Strauss Weichsel. * * * A strong, vigorous tree, with good foliage. Fruit large, nearly black when ripe. Flesh firm, juicy, refreshing, mildly sub-acid. Uncolored juice.

Bessarabian. (No. 62.) * * * Our reports on this variety continue to be very favorable on all soils, and in about all locations over a great area of the Northwest. Fruit large, dark red, firm fleshed and of excellent quality for any use. Juice uncolored.

Frauendorfer Weichsel. * * * A strong growing tree, with weeping habit and fine foliage. Fruit large, dark red, truncate. Flesh tender, juicy, sub-acid. This variety is criticised at first, as the first fruits are small and poor, on account of the rapid growth of the new wood. Juice uncolored.

Cerise de Ostheim. * * * A round topped tree, with plendulous habit. It is the best variety of the Ostheim family. Fruit medium in size and nearly black when ripe. Pit small, flesh firm and is tender, juicy and very rich in grape sugar. This also is condemned when the trees are bearing their first fruits. Juice highly colored.

George Glass. * * This variety was introduced into Marshall County, Iowa, from North Germany. It has fine foliage and is proving a good bearer. Fruit large, firm and well stocked with grape sugar. Uncolored juice.

Double Natte. * * This variety was mixed when received. At first we sent out some trees of a spurious variety that has no value. Fruit large and nearly black when ripe. Flesh dark red, firm, and of high quality for canning. Juice highly colored.

Lithauer Weichsel. * * Much grown in Southwest Russia for drying and the making of cherry wine. A strong vigorous tree. Fruit medium in size, with very small pit.
Flesh quite acid, but with much grape sugar. Only valuable for canning. Highly colored juice.

*Lutovka.* * * A strong growing tree, with fine foliage. Fruit very large, dark red. Flesh white, firm, pure flavored. Uncolored juice.

24 *Orel.* * * The name of this variety is not known as the invoice was lost. It is much like the Lutovka in all respects and may prove to be identical. Uncolored juice.

*Vladimir.* (25 *Orel.*) * * * A medium sized tree that promises to be very valuable. Fruit as large as Montmorency, black when ripe. Flesh firm, juicy, refreshing, and nearly sweet. Highly colored juice.

*Brusseler Braune.* * * A larger grower than Richmond, with good foliage. It does not succeed well on low, black soil, but is a remarkable bearer on dry upland. Fruit large, nearly black when fully ripe. Flesh firm, juicy and fine flavored. Mildly sub-acid when fully ripe. Juice highly colored.

27 *Orel.* * * The name of this variety was also lost. It appears to be almost identical with Brusseler Braune, yet we have more favorable reports in regard to hardiness of tree at the North than we have of the latter variety.

*Orel.* * * * This is a dwarf growing variety of the Vladimir family. It bears good crops when the plants are not more than four feet in height. Fruit large, black, and quite acid. Will be very valuable for the far North. Colored juice.

*Shubianca* (6 M.) * * * * Another dwarf variety of the Vladimir family. Fruit much like the Orel, but some later in season. Colored juice.

*Shadow Morello.* * * * This is a dwarf variety, remarkable for its heavy and continued bearing. Fruit large and nearly black when ripe. When first colored red, the fruit has a bitter flavor. At this stage of development it is excellent for canning, and when black and fully mature it is excellent for dessert use. Highly colored juice.

*Spate Morello.* * * * Another variety of the same dwarf family of Griottes. Also a remarkable bearer. Fruit much like the above, but some later in season. Highly colored juice.
Large Long Late. * * Still another variety of the same dwarf family. It is known in North Silesia as Double Shadow Morello. Fuit much like the above, but some later in season. Highly colored juice.

SOME VARIETIES FOR SOUTH IOWA.

While all the varieties above noted except, perhaps, Orel and Shubianca, will prove valuable in South Iowa, the following varieties of high quality will have special value on dry upland soils south of the 42d parallel.

Heart Shaped Weichsel. This is an evident cross between the sweet cherries of the East and the Dukes. It is admitted as a lawn troe in North Germany, on account of its symmetric habit of growth and handsome striped leaves. Fruit large, heart shaped, purplish black when fully ripe. Flesh firm, juicy, refreshing and almost sweet. Uncolored juice.

Red Oranien. Of the Red Duke family, with fine foliage. It blossoms late, and promises to be a good bearer. Fruit large, dark red and in quality much like the above.

Bunte Morello. This is not a Morello, though grown in North Silesia under this name. A vigorous grower, fully as hardy as Early Richmond. Fruit large, heart-shaped, purplish red, and sweet. The success of this variety hinges on planting on high grounds, as its blossoms come out quite early in the spring.

Yellow Glass. A variety introduced from North Silesia. A fine grower, with perfect leaf. Fruit very large and bright yellow in color. Flesh firm, fine grained, juicy and sweet. This promises to be very valuable. It fruited on the College grounds even the past unfavorable year.

Vilne Sweet. From Vilne in Southwest Russia. Fruit large, firm fleshed and sweet. This variety should be tested by all who have good cherry soil in the South district, as the tree promises to be a good bearer and the fruit would be called of excellent quality in California.

GENERAL NOTES.

1. Dry ridge soil with porous subsoil is most favorable for cherry growing. On such soil the trees should be set four to six inches deeper than they stood in the nursery. By deep setting, roots will be thrown out from the scion or from a point above the bud in two or three years.
Indeed, the Russian and North German varieties often emit roots from the scion the first year after setting the root-grafts in nursery. Another benefit resulting from deep setting is protection of the tender roots we are obliged to use in propagation.

2. Even in West Europe, low cordon and bush training of the cherry is becoming common among commercial growers. In East Europe in sections remote from the ocean, all stone fruits are headed very low. In the Volga region the cherry is grown in bush form, with several stems like the currant and gooseberry. Experience has also favored very low stems of the stone fruits in the prairie states. With high stems all varieties are liable to sun-scald and stem injury. Fortunately many of the Russian varieties favor the shading of stems by their pendent habit of growth. But even with these it is best to have very low stems.

3. We send out one year old cherry trees exclusively. Many who receive them, we find, set them in nursery rows with a view of planting them in orchard when they attain proper size. This is wrong, as they should be planted at once where they are to stand permanently. It will be found that the one year old cherry tree set in orchard will be larger, thriftier, better shaped and more fruitful, than the three year old tree set at the same time.

4. Root-grafting the cherry is far better for the planter than those propagated by budding. The root-grafts are set down in nursery to the top bud of the scion, thus placing the tender root considerably below the surface and favoring the emission of roots from the scion. When set still deeper in the orchard, such trees are not liable to root-killing.

5. Observations in Europe and in this country favor the belief that alternating varieties in the cherry and plum orchard favors regular and continued bearing. A variety that proves a poor bearer when depending on its own pollen supply, is often regularly fruitful when intermingled with other sorts. In our climate, if the weather during the blossoming period is hot and windy, a variety may mature and waste its pollen before the stigmas are ready to receive it. With such varieties, the pollen of adjacent sorts may perform the needed work with the aid of insects and the wind.

6. In planting a cherry orchard, we have much to favor the belief that planting the trees quite thickly in the rows running north and south, is an advantage; giving a wider space than usual between the rows to let in the sun at mid-day, and to favor free circulation of air. Orchards planted with trees only ten feet apart in the rows and with a space between the rows of twenty-four feet, have fruited more regularly than those planted in the usual way.

7. In the above list, the varieties marked with three stars (* * *) are hardy enough to be grown on dry soil up to the 44th parallel. Some of them, such as Orel, Shubianca, Vladimir, and possibly Bessarabian, will succeed on hardy roots far north of that line. The hardy root for the far North is the native Pin Cherry or Red Wild Cherry (Prunus Pensylvanica) on which all cherries make a good union by either budding or grafting.
The varieties marked with two stars (* *) are hardier on dry soil than any variety of the old list, and may be safely planted up to the 43d parallel.

8. The name "Amarelle," previously used, means Morello. Hence the change in some of the names.

PLUMS.

NATIVE VARIETIES.

Some of our native varieties can only be called "new" in the sense that they are not generally known over the West, though many of them have been prized locally during the past quarter of a century. We are now distributing the following varieties:

De Soto. This is more generally known than any of our native sorts, and is generally popular. It does not stand drought well, hence it should not be planted on dry ridges. Fruit larger than Miner and much better in quality for any use.

Wolf. Fully equal to the De Soto as a bearer, and the fruit is larger in size. In quality, however, it does not quite equal the De Soto for dessert use or canning. Its fruit in a very dry season is much superior to the De Soto.

Wyant. Known locally on the Cedar River, near Janesville, Iowa, for many years, but only recently sent out for trial to other points. A bountiful bearer of fruit as large as De Soto, free stone, and the best in quality for dessert use, uncooked, with cream and sugar, that we have tested. Taking all things into consideration, we regard this the most valuable of the native varieties.

Rollingstone. A heavy and continuous bearer when the tree attains some size and age. Fruit round, firm fleshed and valuable for dessert use. For cooking, it is not superior to the De Soto.

Cheney. This has been prized for many years near La Crosse, Wisconsin. Fruit averages larger than that of any of the preceding sorts. Flesh firm, free from astringency and valuable for market or dessert use. We have not yet tested it for cooking. The two past years this variety has been seriously attacked by the fungus known as Plum Pocket. If this continues, it will seriously lessen its value.
Hawkeye. This has not been tested to any great extent outside of the home grounds of H. A. Terry, at Crescent, Iowa. Fruit as large as Cheney and excellent in quality. Very promising for trial.

Chippewa. A dwarf variety from Chippewa Falls, Wisconsin. It often bears when only two feet in height, and the crops of fair sized fruit it carries when only four or five feet in height is surprising.

Pottawattamie. An annual and early bearer of medium sized, bright red fruit of excellent quality for any use. It will not prove hardy north of the 42d parallel, except in favored spots.

Forest Rose. Much like the above in hardiness and quality of fruit, but will sell better on account of larger size. It has proven an excellent bearer at Ames and at many other points south of the 42d parallel.

Maquoketa. This was found on the Maquoketa River in Eastern Iowa. Fruit larger than Miner and better in quality for dessert use or cooking.

The three last named are varieties of the Chicasa species and at present they appear to be the hardiest in tree and the most regular in bearing: of the Chickasaw family yet tested.

Other Native Plums. We are sending out in a small way some other fine native plums for trial, which have been locally prized. Some of these in the near future may take the place of a part of those noted at this time.

EAST EUROPEAN VARIETIES.

The varieties introduced from Southwest Europe and their American seedlings, which have been grown with greater or less profit in the states east of the lakes, have wholly failed on the College grounds at Ames. The varieties noted at his time were selected by the writer on the steppes of East Europe in 1882, with the exception of the three last named in the list, which have come to us as strays from the same source. The opinions here expressed in regard to their value, are founded on our home experience with trees badly injured by scion-cutting; and on the reports from our trial stations scattered over the Northwest and cold North.

Early Red. 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 nearly all the trees thus sent out have proven to be Early Red, which is our No. 3 from St. Petersburg. The tree has proven hardy as far north as any of the native plums we have noted, and an early bearer of purplish red fruit nearly as large as Lombard, better in quality and two weeks earlier. It has also proven nearly free from the attacks of the curculio and plum gouger.

*Moldavka.* This is a South Russian variety, which has proven hardy up to the 44th parallel. Fruit large, oblong oval, free stone and bright yellow in color. Very good in quality for any use. Will be very valuable at the North, as the fruit ripens in August. Among the sprouts first received were two or three spurious ones, bearing large blue fruits. These were mixed with those first sent out under this name.

*Voronesh Yellow.* This was selected by Dr. Fischer, of the Voronesh Agricultural College, as one of the hardiest and best varieties for dessert use. Fruit large, bright yellow in color, free stone and nearly best in quality for any use. Season, August.

*Leipzig.* (113 Riga.) This will prove most valuable in the south half of the state, yet on dry soil it may be grown up to the 43d parallel. Fruit very large, blue, with much bloom and much superior to Lombard in quality.

*Dame Aubert.* This is a favorite variety over the black soil sections of South Russia. Fruit medium in size, bright yellow in color, free stone and excellent in quality. Season, August.

*Hungarian Prune.* A very hardy tree and an early and continuous bearer. Fruit of medium size, prune shaped, blue and free stone. So far, this variety has been less injured by curculio and plum gouger than any other variety on the grounds.

*Ungarish Prune.* A low spreading tree, that has proven hardy on dry ground up to the 43d parallel. Fruit medium in size, with a deep suture, dark blue, with much bloom, is prune shaped, a perfect free stone and of high quality when fully ripe. But if tested when it first colors, is very sour. When fully ripe it has the flavor and quality of the Italian prunelles.
Hungarian No. 1. This was mixed with the sprouts of the Hungarian Prune above noted and has proven very valuable. Fruit medium in size, prune shaped, bright yellow, free stone, and fine in quality.

Black Prune No. 1. This is a true prune of excellent quality. Fruit medium in size and when ripe excellent in quality for dessert use or cooking. Though sweet to the taste when eaten as picked from the tree, it develops much acid in cooking.

Beer Plum. This also belongs to the prune family and has proven a remarkable bearer. Like the Black Prune, it is nearly sweet when fully ripe, but develops enough acidity when cooked for delicious sauce.

Wyzerka. We have many favorable reports in regard to this variety from the central and southern districts. The fruit is large, blue, with much bloom, and is of good quality.

Long Red. (Orel 19.) A very hardy tree, with perfect foliage. Fruit medium in size, oblong, purplish red and mainly valuable for culinary purposes. Yet when fully ripe it is good for dessert use.

Long Blue. (Orel 20.) This is a true iron clad and a bountiful bearer of showy blue plums, with much bloom. Fair in quality for dessert use and best for cooking.

Minnesota. This was introduced into Minnesota from Sweden. It is a strong growing tree, with fine foliage, and so far has proven a perfect ironclad. We have not yet tested the fruit, but it is said to be large, dark blue in color, a perfect free stone, and one of the best in quality of the plums grown in Northern Sweden. It is very promising for trial.

Communia. This is a stray from East Europe, introduced by the Communia Colony, of Northeast Iowa. A fine grower, with large, perfect foliage, and is an early and continuous bearer of quite large blue fruit, with deep suture and much bloom, which is excellent in quality for any use. On dry soil it will prove quite hardy up to the north line of the state.

Richland. This has been long known in parts of Pennsylvania and is now popular in parts of Indiana. Beyond doubt, it was originally introduced from East Europe. It is perfectly hardy at Ames, and a good bearer of medium sized, copper colored fruit of excellent quality.
Prunus Simoni. This is now quite widely known as Simon's Plum. It is included with the plums, yet it appears to be a cross between the peach and plum. Fruit large to very large, red in color and is shaped much like a smooth tomato. Its fault is in the way of too early blossoming in the spring. It will pay to grow this fine fruit by laying down in winter as recommended for the peach on a future page. This tree is not fully hardy at Ames without winter protection.

Shense Apricot. This is also classed with the plums, as it bears best when planted with them. It is a true apricot, grown from a pit received by the College from a missionary in Northwest China. In Nebraska it is grown under the name of Acme, but this is a misnomer. It is a fine grower with perfect foliage, and with low stems will prove hardy on dry soil up to the 42d parallel. The fruit is much better in size, appearance and quality than any of the Russian apricots.

GENERAL NOTES.

1. Where possible select a north slope with rich soil for the plum orchard. If shelter is given, let it be on the east side, as protection from east storms during the blooming period appears to be an advantage.

2. In practice in our state the best results have been reached by planting rather thickly in the rows running north and south, and giving more room the other way for letting in the sun between the rows, and air circulation. Trees planted ten feet apart in the rows, with space between the rows of twenty-four feet, have given the best results.

3. The alternating of varieties in the rows, with a view to more perfect fertilization of the blossoms, is also an advantage. With some varieties the mingling of varieties is absolutely essential, and I believe it to be an advantage in all cases.

4. The need of very low tops is quite as apparent as with the cherry. I know of no variety of the native or foreign plums that will prove long lived and fruitful with a high exposed stem. If it does not develop the fatal gumming on the south side, the main growth of wood of stem and top will soon be on the north side.

5. It never pays to market plums in rough tubs, baskets or boxes, as is so often practiced. The commercial crates and boxes are now too cheap to be dispensed with in shipping any of the stone fruits.

PEACHES.

In 1885 it was stated in Bulletin that we had sent out for trial some varieties of the peach from Northwest China and Bokara. As then noted, they have proven much hardier than any of the varieties hitherto tried in the West, and we are now pleased to report that several of them have been well
loaded with peaches of good size and quality at many points in the south half of Iowa during the past four years. In tree these peaches are about as hardy as the Early Richmond, but like this cherry, they are not as hardy in fruit, bud and blost som as we could wish. Even with these hardy varieties it will pay best to lay them down in winter. If properly grown it is easier to lay down an acre of peach trees than an acre of blackberries. Our peach trees one year old from bud, are from four to six feet in height. These are planted in orchard and are given good care. In the fall they will average fully six feet in height. Trim them up late in the fall to a single cane and lay them down flat on the surface of the earth, and cover with straw or old prairie hay with enough earth to hold the covering in place. About the 20th of April, remove the covering, but permitting the stem to lie prostrate. When growth begins to start, turn up the extreme top and tie to a stake. Keep off all shoots from the prostrate stem and encourage upward growth of the erect portion. In the fall before the ground freezes cut the tree loose from the stake and press it down to the earth to the right or left and cover as before. The spring of the stem will permit the laying down of the trees with very little pressure.

The prostrate stem will soon take root if left in contact with the earth. To avoid this place stones or billets of wood under it.

The accompanying diagram will show clearly the mode of procedure.

The hardy peaches are more valuable for laying down than the common varieties, for the reason that they ripen their wood perfectly in the autumn. If unripe wood is covered the
fruit buds are usually rotted or fatally injured during the winter.

**DWARF JUNEBERIES.**

During the past ten years we have been experimenting with several varieties of the Dwarf Juneberry. The Osage, Greene County, Williams and Alpina have borne the best crops of the largest and best fruits, hence we are sending them out for trial. When grown in a small way, the fruit is mainly taken by the birds, but, as with cherries, when grown by the acre the quantity taken by the birds is scarcely missed. In size and quality these Juneberries compare favorably with the large bush huckleberry.

**PROTECTION FROM BIRDS.**

In this connection a note on the protection of juneberries, cherries and other fruits from birds, will have some interest. In this country this subject has been much neglected, and so far as I know we have no manufactory of suitable netting for this purpose in the United States. But in Europe such netting is used for hundreds of purposes by gardeners and fruit growers. The netting used has meshes close enough to exclude birds and is made from strong linen twine soaked in tanning liquid to make it very durable. Neighborhoods wishing to import this twine can order it from George Robinson, Rye, Sussex, England. It will cost, laid down in Iowa, about three cents per yard, and, with good care when not in use, will last twenty years or more.

To favor the covering of many plants of the Juneberry or cherry trees, it is well to select varieties ripening in succession. As an instance, in an orchard of one hundred and fifty cherry trees, the whole can be covered with thirty tree covers if five varieties are planted, putting out thirty trees of each variety ripening in constant succession, as noted in our cherry list.

With Juneberries, we will have the same succession with the varieties above noted.

**SMALL FRUITS.**

Our small fruit growers are wide awake in the work of testing and sending out, at moderate prices, the best of the
grapes, strawberries, raspberries, and blackberries. Hence, we do not propagate any of them for distribution, yet we test all promising new varieties, with a view to reporting upon their prospective value.

**TREES FOR SHELTER BELTS AND TIMBER.**

The need of quick-growing trees on the storm-swept prairies of the Northwest, has long been apparent. The cottonwood and white willow have been extensively planted, but on high, dry prairies, they have failed on account of leaf rust and other troubles. To meet this want, the College introduced, in 1882, some of the quick-growing poplars and willows of East Europe, which are more valuable for fuel and timber than any of our quick-growing trees. Of the species which have been given extended trial, the following are proving satisfactory, where the native trees of our river and creek bottoms fail wholly or in part:

*White Poplar.* (Populus alba.) This is the true White Poplar of East Europe and is far more valuable than the Gray Poplar (Abele) which has been known as a great sprouter. It is upright in habit, a very rapid grower, and is peculiar and beautiful in foliage. Its timber is close grained and valuable for many uses, including house finishing.

*Silver White Poplar.* (Populus alba argentea.) Standing singly this is spreading in habit, but it is upright in groves. A very rapid grower, with timber quite as valuable as the above. This beautiful silvery leaved tree will grow where all native trees fail in the dry parts of the West and Northwest.

*Asiatic Poplar.* (Populus Certinensis.) This is a very rapid grower, where even the Box Elder fails. Its leaves are large and thick, with wavy ledges, and furnish a fine shade. Its timber is closer grained than any of our native soft woods, and it does not warp, shrink or crack after it has become dried. It is much used for house finishing, flooring, joists, etc., in the far East.

*Petrovsk Poplar.* (Populus Petrovsky.) A variety of the above originated near Moscow. In East Europe, it is much used as a shade tree on large lawns and on the road sides. It is also largely used in timber plantations. It thrives on the dry ridges of the Northwest where our native trees fail,
**Red Willow.**  (Salix fragilis.) This is the famous Red Willow of East Europe and Asia, used for tanning the Russian glove leather, and upper leather; and for about all the purposes for which we use White Pine Loudon says of it: "The Redwood Willow produces timber superior to that of any other tree willow." A very rapid, upright grower, with handsome silvery foliage.

**Golden Willow.**  (Salix aurea.) This is wholly distinct from our common Golden Willow. In 1885 it was placed with the ornamental willows. This will prove very valuable for shelter belts and timber.

**Pointed-leaved Willow.**  (Salix acutifolia.) This has no comparative value as a timber tree, except on very dry soils where other trees fail. It is known in the far East as the Desert Willow, and is peculiar in having palisade cells on both sides of the leaves, like our native Compass plant. Hence, it will thrive with very little water at the roots.

**GENERAL NOTES.**

1. The two first noted above do not grow readily from cuttings of the young wood, but will grow very readily from root cuttings.  
2. The other poplars and willows named grow as readily from cuttings of the young wood as any of our native poplars and willows.

**ORNAMENTAL TREES.**

**Bolle's Poplar.**  (Populus Bolleana.) On dry soil this very handsome tree, with upright habit, silvery bark and cut leaves, with the brightest shade of green above and a silvery pubescence below, is proving very valuable. It is propagated like the white poplars from root-cuttings.

**Laurel-leaved Willow.**  (Salix laurifolia.) This is not identical with the Laurel-leaved Willow of some eastern nurseries. It is a neat round topped tree of medium size, with laurel-like, shining leaves that few will recognize as those of a willow. It is specially valuable for certain positions in the back ground of lawns and for ornamental wind-breaks.

**Napoleon Willow.**  (Salix Napoleonis.) Grown from cuttings, this is almost a trailer, but top-worked six feet from the ground on Salix aurea it forms the finest weeping willow I have seen in the West, and one that is perfectly hardy anywhere. Its foliage has a peculiar bluish green tinge which is very pleasing.
**Silver-leaved Willow.** (Salix alba argentea.) A silvery leaved form of the White Willow from East Europe. In contrast with the Laurel-leaved Willow, it has a very pleasing expression.

**Rosemary-leaved Willow.** (Salix rosemarinifolia.) This is not the Rosemary Willow of eastern nurseries, which will not endure our summers or winters. It is a shrub variety from central Asia, with narrow, fern-like, dark green leaves, which are decidedly ornamental. Top-worked on *Salix aurea* it makes a beautiful pendulous tree of small size for the lawn.

**Wild Olive.** (Elaeagnus angustifolia.) A medium sized tree, with silvery shoots and leaves. It is remarkably similar in leaf and habit to the olive trees of California. Its flowers are not excelled in delicacy of fragrance, and its silvery fruits are ornamental in autumn.

**Prunus Maacki.** A small sized tree, with spreading top and dense green foliage that is fully expanded earlier in spring than any tree in our collection, native or foreign. In East Europe it is known as the May Day Tree, around which the party gathers to crown the May Queen. Its pure white blossoms are in long racemes and are useful in forming the first handsome bouquets for the parlor vase.

**Bird Cherry.** (Prunus padus.) The variety of this handsome small tree that we propagate is weeping in habit. Its racemes of pure white flowers are handsome and fragrant in early spring, and are followed by an abundant crop of dark purple fruit, of which the birds are very fond.

**Acer ginnala.** A dwarf variety of the Maple, with cut leaves, which assume all the colors of the rainbow in autumn. It is a small tree, for the lawn, very closely allied to the Japan Maples, which are becoming very popular in the eastern states.

**Alnus incana.** This form of the Alder is a native of East Europe, and thrives well on dry upland soil, unlike the Alders of West Europe. It is a round topped, handsome tree, with silvery foliage.

**ORNAMENTAL SHRUBS.**

**Amur Tamarix.** (Tamarix Amurensis.) The ordinary Tamarix, so popular on eastern lawns, is not hardy at the West. But the still more beautiful species, from the valley
of the Amur, is perfect, up to the 43d parallel, and when properly pruned, it is almost a perpetual bloomer. Like the hardy Hydrangea, this handsome shrub must be annually cut back at its points of growth, to preserve symmetry of form and free blossoming.

**Viburnum lantana.** The rare beauty of foliage, flowers and fruit of this member of the Snowball family, places it well at the head of the list of hardy varieties.

**Russian Snowball.** This is a variety of the common Snowball, found in Central Russia. The bush is smaller and more pendent in habit than the common variety, but the flower trusses are larger and handsomer.

**Mock Orange.** As the best varieties of the Mock Orange (Philadelphus) are not common in Iowa, we are propagating the best of them, and send out two fine varieties imported from East Europe. The flowers of some of the species are pure white, fully two inches in diameter and very fragrant. All of them are hardy in any part of the state.

**Amur Barberry.** (Berberis Amurensis.) This is a much larger grower than our common species. Grown as single specimens on the lawn, it forms a large, spreading bush fifteen to eighteen feet in height. It is free from the attacks of the cluster cup fungus, and is the most valuable species for stock barriers, or, if properly pruned, for ornamental hedges. Its immense load of dark purple fruit is decidedly ornamental, and is useful for the making of healthful marmalades and jellies.

**Chinese Barberry.** (Berberis Thunbergii.) This is a low growing species, with thick, rounded leaves, which change into varied shades of red and purple in autumn. Its load of bright red fruit hangs on well into winter. This is a favorite species in the eastern states, and we are pleased to report it perfectly hardy, and still more beautiful at the West. Very valuable as single specimens and for low division hedges on the lawn.

We have also a dozen or more other varieties and species of the barberry from East Europe and North Asia, which have much interest, most of which are free from cluster cup fungus.
Privet. (Ligustrum vulgare.) The West European Privet so much prized in the eastern and southern states, is not hardy in Iowa, but the still more beautiful varieties from Poland and Central Russia are proving hardy in all parts of the state. These have pure white and very fragrant blossoms, resembling those of the lilac, and are loaded in autumn with dark colored berries.

Lonicera splendens. This species of the Bush Honeysuckle is much handsomer in form of bush, in foliage, in blossom and in berries, than the common species.

Lonicera Xylosteum. A species of Bush Honeysuckle, with large dark green leaves and pendent habit. In form and expression it is the handsomest of its family, and its large dark red berries are as large as small cherries, and hang on late in autumn.

Lonicera Alberti. A trailing species, with partially upright center. Each year the central part extends upward with all the lateral branches trailing downward to the earth. On the lawn it attracts much attention when in flower and through the growing season.

We have about a dozen other varieties and species of the Bush Honeysuckles, all of which are interesting in a shrub collection.

Climbing Honeysuckles. We have three species of Climbing Honeysuckles from East Europe, which are proving perfectly hardy in our climate, and are very handsome in foliage, blossoms and berries. These are decided acquisitions, as the eastern varieties are mostly tender with us.

Rosa rugosa. The varieties of this unique and beautiful species we send out were imported by the College from Russia and North Central Asia. In habit, flower buds, flowers and foliage they are handsomer than the varieties introduced from Japan. We propagate single red and white varieties, and one red variety which is half double in flower.

Spiraeas. We distribute all the hardy varieties and species common in the East, such as S. triloba, S. Van Houttei, S. Douglasii and S. Nobleana; and also some hardy varieties of S. callosa and other species from East Europe.
GENERAL NOTE.

We have on the College grounds very many desirable flowering shrubs, many of them introduced by the College from the most trying positions of the Eastern Continent. Many of these not noted in the above list are propagated in a small way for sending out to our trial stations.

COLLEGE NURSERY.

The impression seems common that our limited nursery grounds are commercial in character. Very often we receive orders for the common varieties of fruits, shrubs, etc., grown in our nurseries. Our real purposes are:

1. To familiarize students with the modes and methods of propagation and culture.

2. To furnish object lessons as to variations in leaf, bud and habit of growth of varieties and species.

3. To test and send out for trial the hardiest known and most promising varieties of the apple, pear, cherry, plum, prune, apricot, peach, forest trees, ornamental trees, shrubs, etc.

4. To send trees for trial only to those who agree to preserve the names and numbers, and in due time to report the relative value of each for general culture.