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The Western Sand Cherry

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South Dakota Agricultural College

EXPERIMENT STATION



The Teton Sioux Indian "Ah-oon-ye-ya-pa"

THE WESTERN SAND CHERRY

BY N. E. HANSEN

DEPARTMENT OF HORTICULTURE

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Any farmer of the state can have the Bulletins of this Station free upon application to the Director.

THE WESTERN SAND CHERRY

N. E. Hansen, Horticulturist

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SUMMARY OF SAND CHERRY EXPERIMENTS AT THE SOUTH DAKOTA STATION

The work of improving the Western Sand Cherry (*Prunus Besseyi*) was taken up at this Station to meet the demand for a hardy cherry or a satisfactory substitute for it. After fruiting many thousands of seedlings, it appears reasonable to believe that in this species we have a bush cherry that can be raised to advantage upon the most exposed prairies.

The following preliminary notes and conclusions may be of interest:

1. The Western Sand Cherry is an exceedingly variable species in size and quality of fruit. All are acceptable for culinary use and the fruit is much used by prairie settlers as well as by the Indians.
2. Over one hundred varieties have been selected and are now under propagation for preliminary trial. Some of

these bear fruit from three-fourths to seven-eighths of an inch in diameter and of quality acceptable for eating out of hand.

3. It hybridizes readily with several other members of the genus. The fruiting of our numerous hybrids with Japanese plums, native plums, *Prunus Simoni*, peaches, nectarines, cherries and other species is awaited with interest. Some of these hybrids are combinations of at least three species.

4. Seedlings fruit well the third year, and under favorable circumstances the second year from seed. When worked on strong native plum (*Prunus Americana*) stocks, fruit is borne in abundance upon shoots one year old from the bud or graft.

5. The species responds readily to cultivation. The principle "Excess of food causes variation," upon which the work is mainly based, holds true in this case. The third generation is decidedly more variable than the first. Some seed of the fourth generation was planted this spring.

6. The fruit averages larger when Sand Cherries are budded on native plum stocks. It will soon be determined if seedlings from such fruits average better than seedlings raised on own roots. It also appears probable that when grown on native plum stocks Sand Cherries bear better on heavy soils than when on own roots. The plants are remarkably productive when young or on young shoots, but for older plants some system of renewal pruning may be advisable.

7. This species deserves special attention as a dwarf stock for peaches, apricots, Japanese and native plums. Tame cherries unite with difficulty. The past three seasons peaches of normal size have been raised at this Station from trees on Sand Cherry stocks. These were trees grown in pots, tubs and boxes, wintered in a cool cellar and fruited under glass. For orchard purposes plum trees on this stock must not be high-stemmed, as they get top-heavy and lop over when bearing a heavy crop of fruit. If used at all, it must be as a bush with several stems. The trees are not dwarfed in

nursery. Evidently the trees should be headed back annually, at least until in heavy bearing, to keep them properly dwarfed. The fruit is fully up to standard in size and quality.

HISTORICAL NOTES

This Bulletin is intended to be a preliminary report and announcement of progress and not a complete monograph. The story of the work at this Station is told mainly by the twenty cuts illustrating these pages. But as the Western Sand Cherry is a new fruit just passing from its native prairie home over the fence into the cultivated garden, it will be of interest to give some of the main facts in the history of its development. No claim is made as to completeness. An effort, however, has been made to give the salient points.

BOTANICAL CONSIDERATIONS

Dr. N. L. Britton gives the following descriptions of the eastern and western Sand Cherry.* For the convenience of the general reader the metric system measurements are rendered into their approximate English equivalents.

"*Prunus pumila* L. Sand Cherry. Dwarf Cherry. (I. F. f. 2017.) Much branched from the base, sometimes bushy, eight inches to six and one-half feet high. Leaves mostly oblanceolate or spatulate, acute or acutish, narrowed at the base, serrate, especially toward the apex, usually pale beneath and deep green above, glabrous or very nearly so on both sides when mature; flowers one-third to one-half inch broad, appearing with the leaves in sessile lateral umbels; drupe one-third to one-half inch in diameter, dark red or nearly black when mature without bloom; flesh thin, acid. On sandy or gravelly shore, New Brunswick to Manitoba, New Jersey and Michigan. April-May. Fruit ripe in August.

*Manual of the Flora of the Northern States and Canada. Nathaniel Lord Britton, August, 1901. P. 525.

Prunus Besseyi Bailey. Western Sand Cherry. Bessey's Cherry. (I. F. f. 2019.) A shrub, one to four feet high, the branches spreading or prostrate. Leaves elliptic, oblong or oval, the teeth appressed, the apex and base mostly acute; flowers in sessile umbels, expanding with the leaves, one-third to one-half inch broad; fruit one-half to two-thirds inch in diameter, on stout pedicels; bitterish and astringent, black, mottled or yellowish. Prairies, Manitoba and Minnesota to Kansas and Utah. April-May."

In 1894 Professor Bailey separated the western from the eastern Sand Cherry and named it *Prunus Besseyi*, distinguishing the two as follows:*

"**Prunus Besseyi**; distinguished from *P. pumila* by the following characters: Spreading or diffuse bush, the branches not strict, forming a symmetrical shrub three or four feet high, or sometimes prostrate and the highest shoots rising only eighteen inches; leaves spreading in habit, elliptic or elliptic-oblong, much broader and thicker than in *P. pumila*, with more oppressed teeth, rounded or abruptly contracted above, the petiole short and stout; stipules on strong shoots * * * very prominent, green and leaf-like, often longer than the petiole, serrate; fruit nearly twice larger than that of *P. pumila*, on shorter and thicker peduncles, often bitterish and astringent (sour in *P. pumila*), but in some forms palatable, black, mottled or yellowish. The spreading bushy habit of the plant contrasts well with the strict and willowy growth of *P. pumila*."

FROM THE ORNAMENTAL STANDPOINT

In June, 1901, in Bulletin 72 of the South Dakota Station, now out of print, the present writer discussed the ornamental value of these two Sand Cherries as follows:

Prunus Besseyi, Bailey. Eight plants received from Arnold Arboretum and planted spring of 1899 are now three feet high and are full of fruit this year. This is the western

*Cornell University—Agricultural Experiment Station, Bulletin No. 70, L. H. Bailey, August, 1894, page 261.

Sand Cherry found native from Kansas to Manitoba and west to Utah and Colorado. We have grown many thousand seedlings of this species, as received from northern Nebraska and various parts of the Dakotas, with a view to improving the fruit in size and quality, and the results, so far, give us reason to believe that we will soon have varieties worthy of general cultivation. Meanwhile the plant is very worthy of cultivation as an ornamental shrub. The "Improved Rocky Mountain Cherries" are Colorado seedlings of this species. Plants received from Valentine, Nebraska, near the South Dakota line, and set spring of 1897 in a row three to four feet apart, now form a hedge four feet high, nine feet across and twenty-five feet long. The abundant white blossoms appear in early May, and are followed by black fruit about one-half inch in diameter, ripening late in July to early in August. None of these are, however, equal in quality to our second generation seedlings from the same source, some of which bore fruit for the first time this year, the seed having been saved from the best of 5,000 seedlings fruited on the Station grounds in 1898 and planted in spring 1899. The handsome glossy foliage and white flowers give this plant decided value as an ornamental shrub, and for this can be planted in hedge row or among other shrubs, but for the purpose of raising the largest amount of fruit, it would probably be best to set the plants further apart, four by six feet. At present one of our main lines of work is the improving of our native Sand Cherry. The many points of difference from the eastern form would seem to entitle it to specific rank, *P. Besseyi*. Bailey's Cyclopaedia refers it to *P. pumila*, var., *Besseyi*, Waugh, with the statement: "In its extreme form this plant looks to be distinct, but it seems to intergrade imperceptibly into *P. pumila*."

Prunus pumila, Linn. Sand Cherry, Dwarf Cherry. Native of North America from New Brunswick south to Virginia, west to Minnesota and Kansas. Six specimens marked "from near Lake Michigan" received from Arnold Arboretum and planted in the spring of 1899, are now four to six feet high and some are bearing fruit, but the plants winter-kill

severely. Five plants marked "New England variety" are three feet high and hardy, are bearing fruit this year, but it is small and very inferior. For South Dakota it is evident that the western Sand Cherry is more desirable than the eastern Sand Cherry.

THE EARLIEST RECORD

Professor Bailey has given us an interesting account* of the early history of the western Sand Cherry. It appears that: "Dr. C. C. Parry collected it in eastern Colorado in 1867, and apparently the same was found somewhere in the Rocky Mountains, presumably in Colorado, in 1888, by S. M. Tracy. It was collected even so long ago as 1839 by Geyer, in Nicollet's famous expedition, being found on 'arid sandy hillsides of the upper Missouri.'" * * * The horticultural history of the plant seems to begin with A. S. Fuller's 'Small Fruit Culturist,' 1867. Mr. Fuller collected the true Eastern Sand Cherry upon Hat Island, in Lake Huron, in 1846. Concerning the Western Sand Cherry Mr. Fuller writes: "A few years ago, through the kindness of Professor George Thurber, I received some cherry seed from Utah Territory." The resulting seedlings were different from those found on Hat Island.

AN EARLY PROPHECY

Mr. Fuller then makes the following prophecy, which now after a lapse of nearly forty years, we hope has been fulfilled: "I do not consider this cherry of any particular value as it is found in its normal condition, but if we could obtain an improved variety of a similar growth, and as hardy and productive, it would certainly be a great acquisition. There is no reason why this should not be accomplished, for, as I have said, it is nearly related to our cultivated varieties, and a hybrid can, and probably will be, produced between them."

The seed sown in 1889 in the following article by Professor Bessey is now bearing abundant fruit:*

*The Evolution of Our Native Fruits, L. H. Bailey, 1898, p. 233-248.

*American Pomological Society Report, 1889, p. 160.

A PROMISING NEW FRUIT FROM THE PLAINS

Charles E. Bessey, Lincoln, Nebraska

“Upon the plains of Nebraska, one of the small native shrubs which has attracted attention on account of its promising fruits, is what has been known as the Sand Cherry. Scientifically it is the *Prunus pumila* of the botanists, and a member of the natural order **Rosaceae**, and of the family **Amygdaleae**. Its affinities are with the cherries and the plums, native of this country and Europe.

“In Nebraska it occurs upon sandy soils north of the Platte River, beginning at about seventy-five or one hundred miles from the Missouri River, and extending thence westward and southward to the Colorado line. It appears to prefer the sandier soils, hence its popular name, and over the great area I have outlined wherever the soil is sufficiently sandy it occurs in abundance. In these portions of the country the inhabitants have for a long time been in the habit of collecting and using the fruit, and in some cases attempts have been made to bring the shrubs under cultivation.

“The fruits are true cherries, occurring usually in pairs or threes (rarely singly) on last year's wood. The cherries are about one-half an inch in diameter, and when ripe are of a deep purple-black color. In shape they vary from flattened spherical (oblate spherical) to spherical, and even bluntly conical. At the base they are slightly indented, and the apex is usually marked by a slight indentation also. The stalk is slender, and from one-half to three-fourths of an inch in length. The stone or pit is slightly elongated, but little compressed, rounded on one margin, and bluntly angled on the other.

“The fruits have a colored flesh, which possesses in many cases a considerable astringency, but in nearly every clump of bushes one may always find some which have but little, if any astringency. I have frequently eaten the fresh cherries while rambling over the plains, and have often found specimens which were fully as palatable as many of the cultivated cherries.

"The shrub grows to a height of from one to two feet, or rarely more. Its leaves are of firm texture, oblanceolate in shape, with slightly serrated margins. Their under surfaces are whitish, and they are borne upon short petioles, and stand alternately upon the stems. Under cultivation the shrubs are much thriftier, and the leaves are larger.

"From the fact that in a wild state these cherries are so large, and in many cases so palatable, I am led to hope that by cultivation they may be made to yield us a new fruit for our gardens in some portions of the northern states, especially in sandy soils. I am, moreover, encouraged in this hope by the fact that experiments upon a small scale, made by persons living in the regions where the Sand Cherry grows, have given results which indicate that it is readily affected by cultivation.

"In closing, I need only say that the Sand Cherry of the plains, while apparently the same botanically as the *Prunus pumila* of the east, possesses such well marked differences, that I am inclined to regard it as at least a good geographical variety. It is from the western form only that I hope we may derive a new fruit."

In 1895 Professor Bessey again discussed the subject as follows:*

"No native fruit appears more promising than this. Even in a wild state it is very prolific, and when fully ripe it is edible in the uncooked state. The astringency which is present in the unripe fruits almost or entirely disappears at maturity. Plants appear to differ a good deal in the amount of astringency, as well as in the size and shape of the cherries which they bear. In many parts of the state the Sand Cherry has been transplanted to the garden or orchard. Wherever this has been done the results have been encouraging. The plants become larger, and the cherries are larger and more abundant. They root freely from layers, and hence are propagated with the greatest ease. My studies of this interesting native cherry, supplemented by the testimony of num-

*Report of Nebraska State Horticultural Society 1895, p. 168.

erous observers in all parts of the state where it grows, lead me to the conclusion that we have here a fruit which needs only a few years of cultivation and selection to yield us a most valuable addition to our small-fruit gardens. It has recently attracted the attention of cultivators in the states eastward as a promising stock upon which to graft or bud some of the more tender varieties of the cultivated cherries of the old world."

In July, 1891, Professor Charles A. Keffer discussed the Sand Cherry as follows:*

"SAND CHERRY

"The Sand Cherry (*Prunus punila* L.) is a native of the Dakotas. It is found throughout the valleys of the James and Missouri rivers. It grows readily from the seed, and can be propagated from root cuttings. It is a rapid grower, and begins to fruit the third year from the seed. It is the most dwarf of all the cherries, growing in the form of a bush, like the currant; and seldom attaining a height of more than four feet. It branches freely and when in full flower, in the month of May, it is an ornamental object. The flowers are produced in clusters of two or three from every bud on the one year old branches. They appear with the leaves, the blossoms completely hiding the young leaves from sight. In size they are like the bloom of the wild plum, in all other respects resembling closely the flowers of the cultivated cherry. They differ from the other forms of wild cherry (*P. serotina* and *P. virginiana*) in the flower cluster, the latter having their flowers in drooping racemes.

"Plants of Sand Cherry set three years ago bore heavily last year and again this year. Careful testing of the fruit of different plants shows a great variety in the quality, and suggests possibilities of improvement in the species.

"Fruit begins to ripen the first week in August. The cherries on most of the bushes were ripe by August 20th,

*South Dakota Experiment Station, Bulletin 26, Charles A. Keffer, July, 1891, p. 10-11.

and some few will last into September, showing a season of from four to six weeks in a seedling plantation.

"Classifying roughly according to the fruit, we find yellow and black fruited sorts. The yellow fruited sorts, as a class, are earlier than the blacks, and of rather better flavor. They are greenish yellow when fully ripe, and vary in size, the largest being about the size of a medium Early Richmond cherry. In quality they differ greatly; on a few bushes the fruit is almost free from the crude 'puckery' flavor common to all wild cherries, but the majority are no better than choke cherries. The stone is as large or larger than in Early Richmond, and the pulp is very watery, having little substance. The skin is rather tough and varies greatly in thickness and astringency in different plants. Cherries selected for size and flavor were cooked, the fruit of several different plants being cooked separately, the pits being removed in all cases before cooking. The best gave an insipid sauce, having little of the character of the cultivated form of the cherry, and yet good enough to be relished where no other fruit can be had. A jelly of inferior quality, of a light yellowish green color, was made from the juice pressed from the fruit before cooking. Jam made from the fruit was less palatable than the stewed cherries. As the fruit is very juicy the jam consisted almost entirely of the skins.

"The dark colored sorts range from dark red to deep black, and in size, quality and season vary as much as do the light colored kinds. Seeds have been saved from the best of all the bushes, and their action under cultivation will be observed.

"An effort was made last spring to fertilize a number of flowers of Sand Cherry with pollen of the Vladimer, a Russian form of Professor Budd's importation, but owing to cold, cloudy weather at the time the work was unsuccessful.

"While of little value when the quality of the fruit is considered, it would seem that these dwarf cherries should give rise to a race especially adapted to the northwest. They have withstood all the dry weather of the past three years without injury, and they have been covered with bloom for two seasons, though unprotected during the winter. Their flower

clusters and fruits show a close relationship to our cultivated forms, and hence crossing with the latter should be feasible. In this way varieties having qualities superior to the natives may be secured. The quality of the fruit is too poor to justify the extensive cultivation of the Sand Cherry, but even in its present form it deserves a place in every Dakota farmer's garden, just as the wild plum deserves a larger place in every Dakota orchard."

Professor Samuel B. Green of the Minnesota Experiment Station in September, 1891,* gave his experience with the Sand Cherry: "We have some single plants that spread five feet, while others close by will not get to half that size. We have fruit varying in color from quite light red to almost black, and in form from round oblate to oval. The largest fruit we have is oval with three fourths ($\frac{3}{4}$) inch and five-eighths ($\frac{5}{8}$) diameters, while one other is round and eleven-sixteenths (11-16) of an inch in diameter; that is nearly as large as the Early Richmond cherry.

"Quality—The quality varies greatly, some being a mild, not disagreeable sub-acid, others insipid, and still others very astringent. It is found in large quantities in parts of the Dakotas and western Minnesota. When cooked it makes a nice sauce.

"Ripening—The period of ripening varies from July 24th to August 15th. A peculiarity of the plant is that all the fruit on any plant is ripe at nearly the same time and can all be gathered at one picking.

"Conditions Under Which It Grows Best—In eastern Minnesota it is generally found fruiting most heavily on dry gravelly ridges and along railroad cuts and embankments. In western Minnesota and the Dakotas it grows and fruits very heavily in the richest as well as the poorest soil. In the richest soil in eastern Minnesota it grows and blossoms freely, but the blossoms generally fall off, leaving but little fruit, while on very poor soil there it is very sure to fruit heavily each year. In our trials it generally fruits best on

*Minnesota Experiment Station, Bulletin No. 18, p. 127.

very dry soil, and yet we have some plants from South Dakota that fruit heavily in the rich soil of our nursery."

Professor Green writes (1894)* that he has "raised probably five thousand seedlings in the last four years, and has seen many seedlings on the grounds of the Jewell Nursery Co., at Lake City, Minn. Among these I have seen many that produce very good fruit, but I have not yet selected the one which I shall propagate. I have attempted quite a number of hybrids between it and *Prunus Americana*, but have so far failed to get one that I felt sure represented both species."

PROFESSOR BUDD BEGINS THE WORK

The most extended series of experiments in improving the Western Sand Cherry by selection was begun in 1892 by Professor J. L. Budd at the Iowa Experiment Station. In this work the present writer was privileged to assist. Part of a plantation of several thousand Sand Cherry seedlings raised to test their value as a stock for plums, was left to bear fruit and was gone over in 1894 and 1895 at fruiting time. This seed came originally from northwestern Nebraska. The remarkable variability of the fruit in size and quality was noted and several plants marked for propagation. This work was continued at the South Dakota Station in the spring of 1896 and many thousands of seedlings have been fruited here since that time.

In 1903 the total number of Sand Cherry seedlings raised at this Station was 47,397; of this number 31,897 were selected for fruiting and to use as stocks. Of this number 14,097 are made up of many small lots, mostly from varieties selected for budding.

In a paper on "The Breeding of Native Northwestern Fruits," before the Minnesota State Horticultural Society, December, 1900, the present writer mentioned this work as follows: The most promising of new types of fruit is the Sand Cherry (*Prunus Besseyi*). Some Dakota plants were already on the Station grounds. Over five thousand more

*The Evolution of Our Native Fruits, L. H. Bailey, 1898, p. 243.

plants, grown at Marcus, Iowa, by M. E. Hinkley, now editor of the Fruitman, from seed he had gathered in northern Nebraska, at Valentine, near the South Dakota line, were obtained from Mr. Hinkley in the spring of 1896 and 1897, and seeds saved from the best plants as they fruited in 1898 and 1899. Of the over 14,000 seedlings raised from these plants, 8,400 have been reserved for fruiting. The plants show the most wonderful variety in size and flavor. Some of the plants found in this first plantation, most of which was grubbed up this fall, bear fruit of large size and with but little astringency. But little, in fact, remains to make this a choice table fruit, and it certainly makes a good fruit for culinary use.

THE FIRST RECOGNITION

The first public display of these selected Sand Cherries was made at the biennial meeting of the American Pomological Society at Boston, Massachusetts, September 10-12, 1903. They were not entered for any medal. Professor John Craig, secretary of the society, writes as follows under date of September 18, 1903:

"I beg to notify you that the exhibit of twenty glass bottles of Improved South Dakota Sand Cherries you made at the recent meeting of the American Pomological Society at Boston, was recognized by making honorable mention of it in the report of the committee of the society. This report will appear in the proceedings of the society, and there your exhibit will be duly and permanently recorded."

Out of the over one hundred varieties which have been selected at this Station, only two have been named and distributed for trial elsewhere. These are Sioux and Tomahawk, first sent out in the fall of 1902 and spring of 1903. The others still remain under numbers and letters, as shown in Plates 4 and 5. In the spring of 1903 many plants of several of these, all budded on native plum root, were sent out for limited trial in many places. When deemed worthy, some of these may be given names. In this it is my intention to give names suggesting their native Indian habitat.

A SEARCH FOR SAND CHERRIES ON THE RANGE*

One of the main lines of the plant-breeding experiments in the Horticultural Department at Brookings is the improvement of the native Sand Cherry. As found in the mountains of Colorado this species has been introduced by a Colorado nurseryman under the name of the Rocky Mountain Cherry, but as observed in cultivation these do not average better than our native Dakota form of the species, (*Prunus Besseyi*). There are many thousands of seedlings of Sand Cherry now growing on the college grounds, and many choice varieties have been selected. Some seventy-five are now in propagation, but only a few will be sent out for trial this fall to propagators. From the third generation seedlings raised this year it is hoped that still better varieties will be obtained. By the present methods a generation is obtained every three years, as they fruit freely the third year from the pit. Among those that bore last year and this year, varieties were found with fruit fully three-fourths of an inch in diameter and of good quality. The native wildness is not yet fully eliminated, although for culinary use they are very acceptable, and when fully ripe are by no means to be despised as a table fruit to eat out of hand. The present stock is mainly from Valentine, on the northern edge of Nebraska near the Rosebud reservation of South Dakota, with small lots from various Dakota points. All have proved perfectly hardy here.

With a view to securing specimens from the gumbo clay lands along the Cheyenne River, northwest of Pierre, the writer took a 250 mile trip in a livery rig the latter part of July and the first week of August. The start was made from Pierre Tuesday afternoon, July 29th, and the first of the sand cherries were found in quantity at Leslie, some seventy miles northwest of Pierre, on the Cheyenne River. For the benefit of new readers, it should be explained that south of the river is open to the white settlers, while north of the river is a large reservation for the Teton Sioux Indians. On both

*From an article by N. E. Hansen, Brookings, S. D., in *Dakota Farmer*, October 15, 1902.

SOME SIOUX SAND CHERRIES
THE TAMING OF A TETON--TOLD IN TWENTY TABLETS



PLATE 2—Illustrating productiveness of the Sand Cherry. The plants as a rule fruit very abundantly, especially when young. With age productiveness appears to diminish, and it appears probable that a system of renewal pruning will be advisable, the plants bearing very heavy crops on the younger shoots. Plants do better on poor dry, sandy soil, while on very rich, low land some complain of lack of productiveness, the plants going to wood more than to fruit.

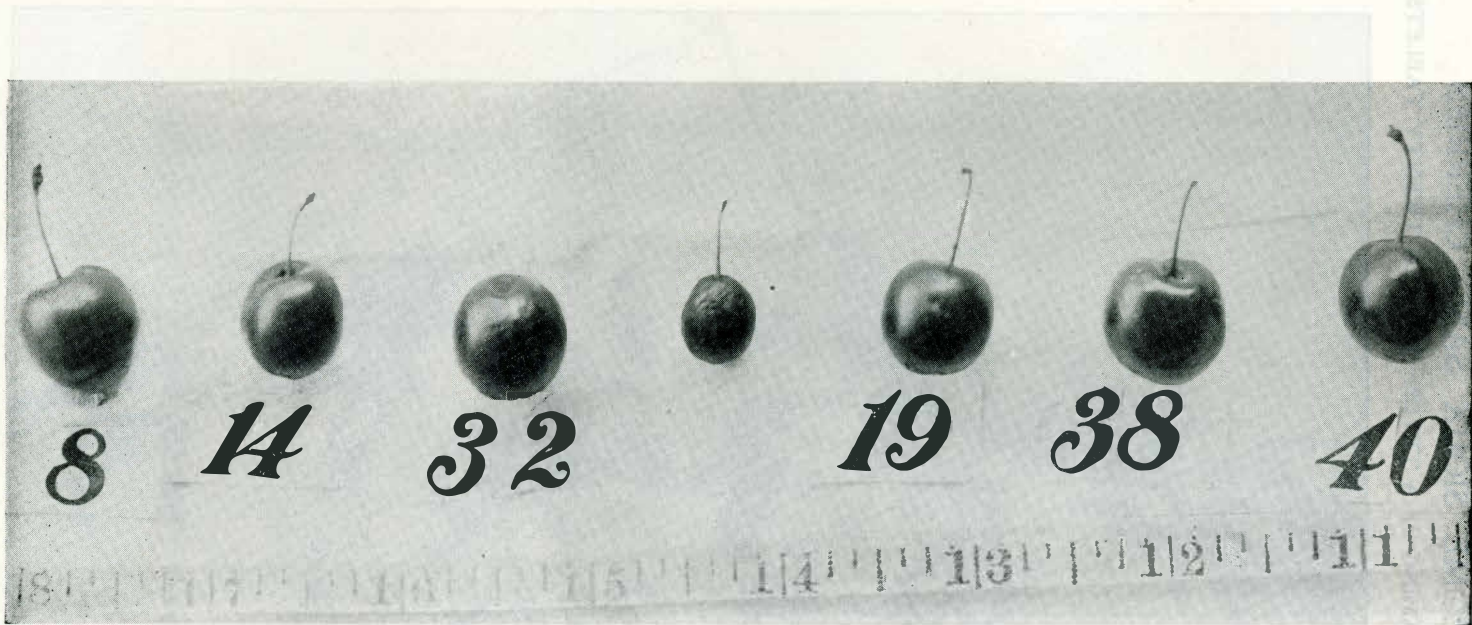


PLATE 3—This shows the range of variation in the first generation of five thousand Sand Cherry seedlings.

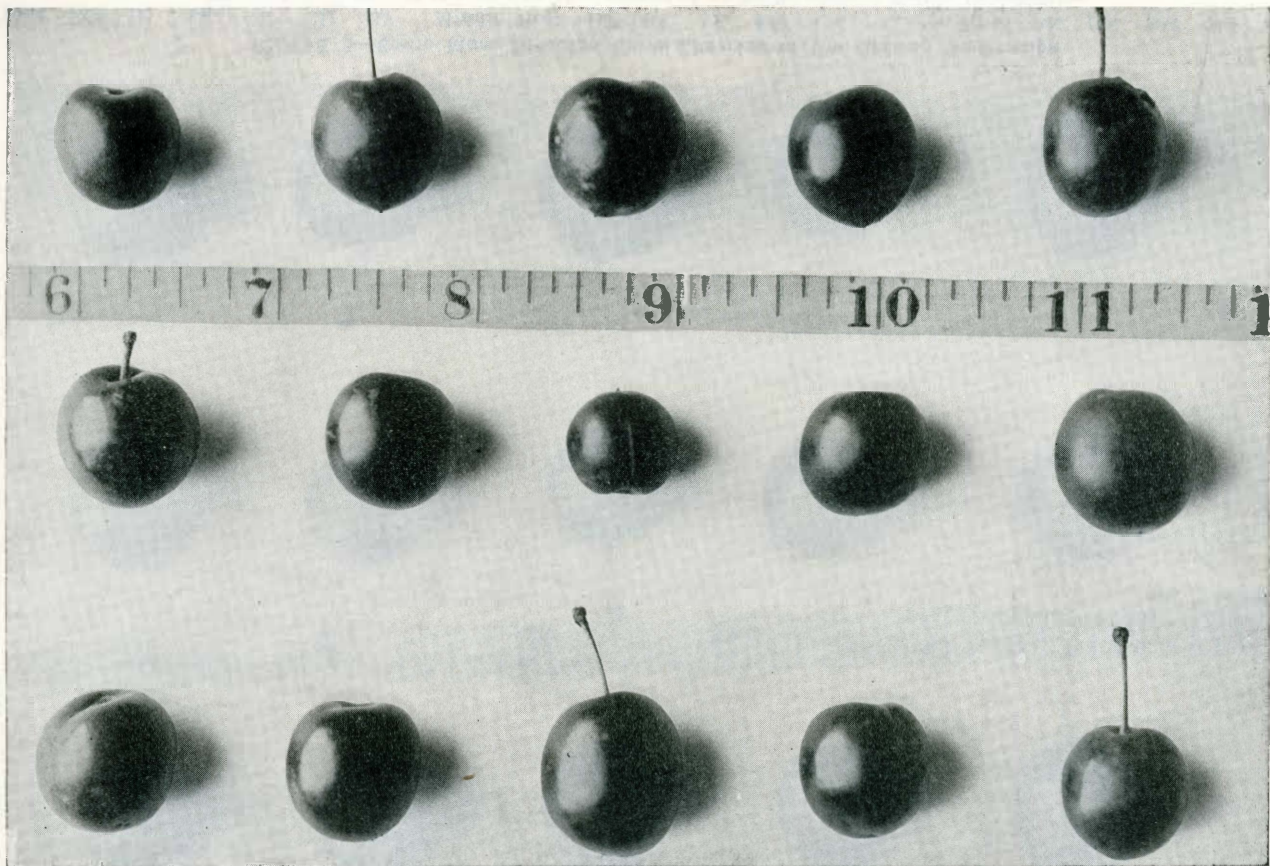


PLATE 4—Some Selected Sand Cherries of the Second Generation

Upper Row—CO CM CS CC BR Middle Row—CL AO BP BM CT Lower Row—CQ CP BX CR W

The flavor is considered of more importance than size, but the endeavor is to combine both in one seedling. Some are from three-fourths to seven-eighths of an inch in diameter.

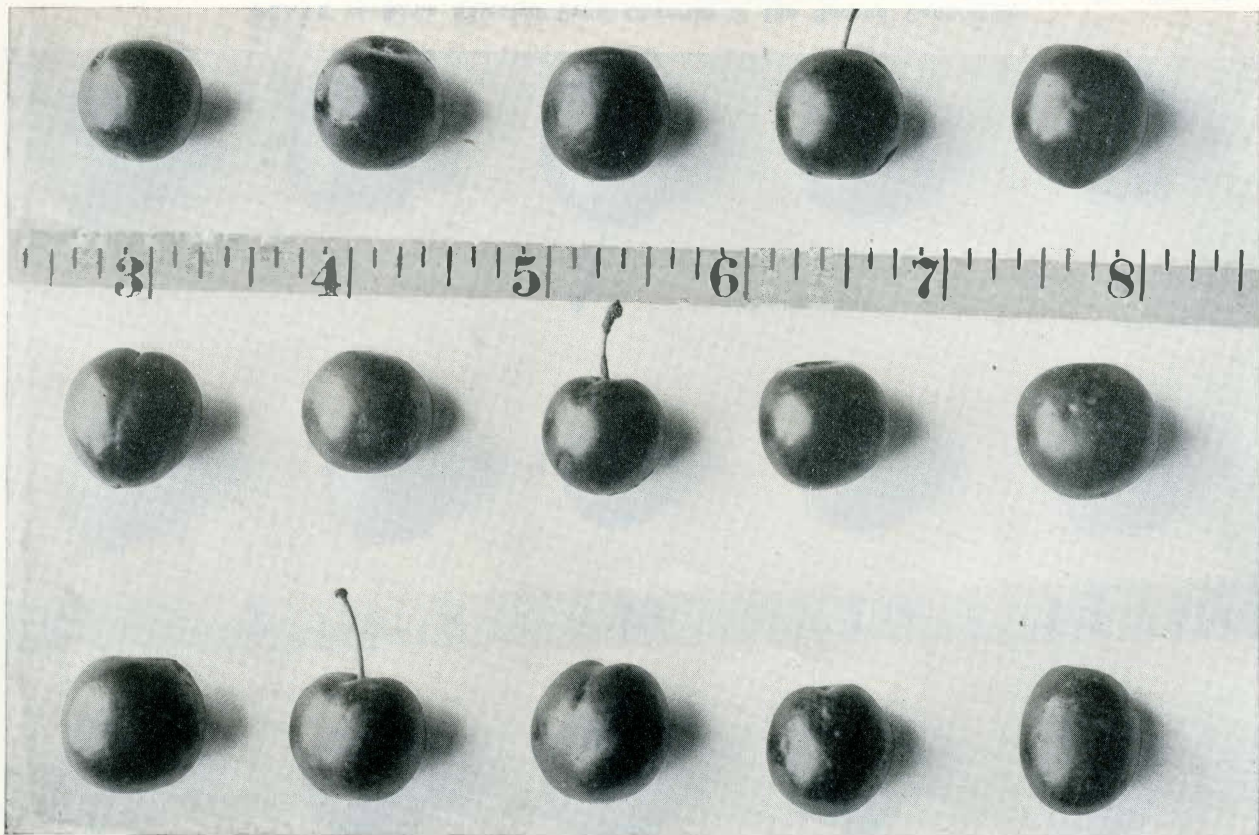


PLATE 5—Some More Selected Sand Cherries of the Second Generation

Upper Row—F AR CE CD BV Middle Row—BT BV AE AW CK Lower Row—BN CN BW BS BA

The relative size of the pits is also regarded as an important factor in selection.



PLATE 6—Illustrating productiveness of the Sand Cherry when budded on native plum stock.

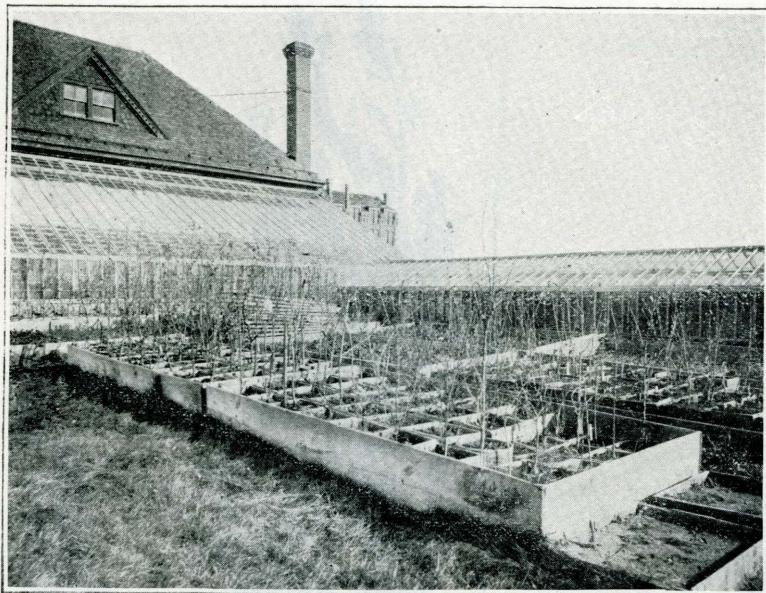


PLATE 7—The beginning of the fruit-breeding work with potted plants at the South Dakota Experiment Station. (Photograph Nov. 2, 1899.)

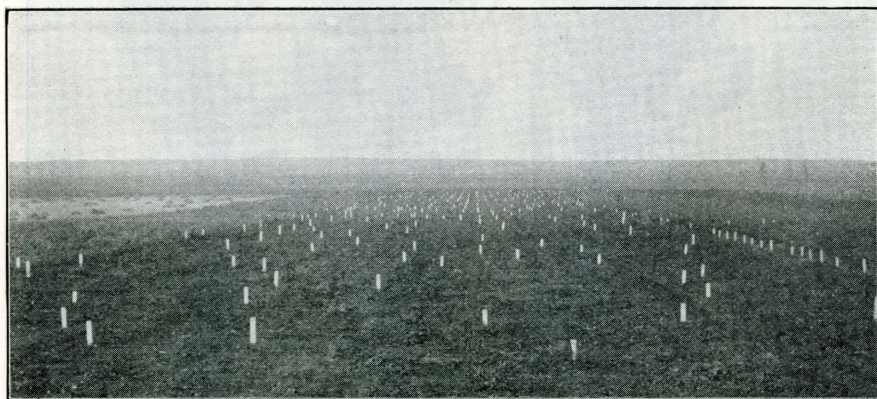


PLATE 8—Part of the fruit-breeding nursery in 1903 at this Station. In all over one-quarter of a million fruit seedlings were under observation, and the number is being steadily increased.



PLATE 9—Hybridizing Sand Cherries with plums under glass.

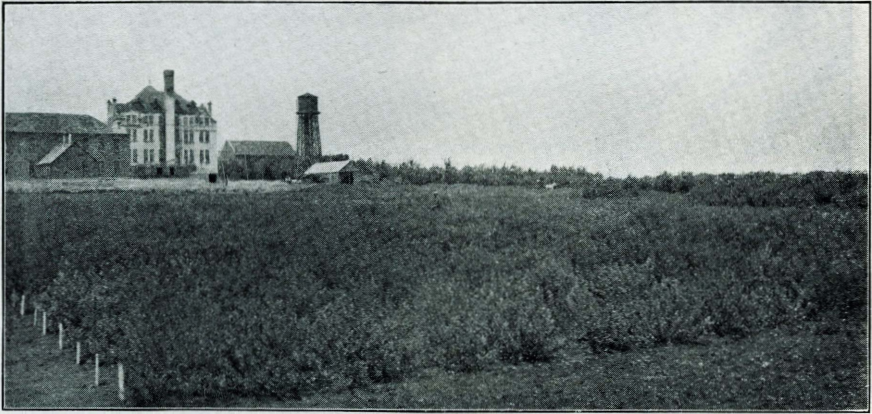


PLATE 10—A plantation of several thousand Sand Cherries from which the best have been selected for propagation. This entire plantation of second generation plants is now ready for the tree digger, as illustrated in the next cut.

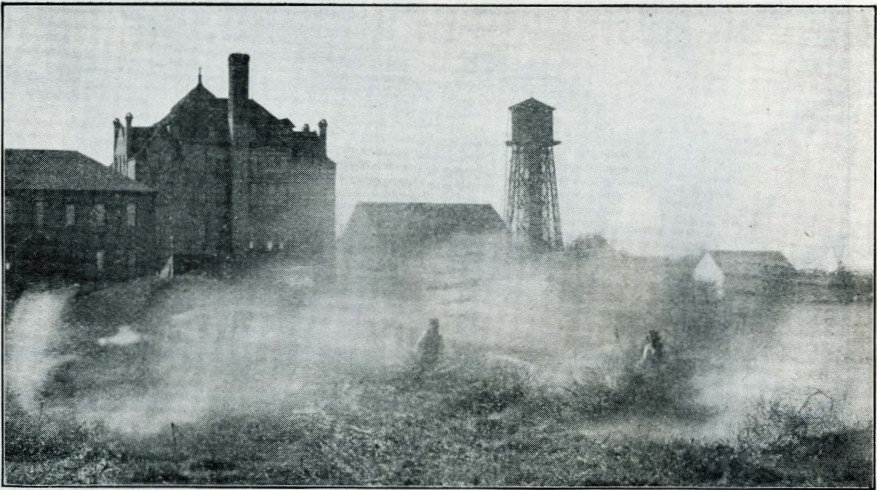


PLATE 11—The selected Sand Cherries are propagated by budding on native plum roots. The discarded plants are taken out with a tree-digger and destroyed by fire, as illustrated above. Many thousands of Sand Cherry plants are thus destroyed in the course of this work of rigid selection.



PLAT 12—The Compass Cherry. This is probably the first hybrid between the Sand Cherry and the plum, and was originated by H. Knudson of Springfield, Minnesota. It is a hybrid between the Sand Cherry as found at Bismarck, North Dakota, with the Miner plum. At Brookings I have raised over 499 seedlings of the Compass, some of which are promising. The Compass is intermediate in season between the latest Sand Cherries and the earliest plums. In the market it would be called a small plum instead of a cherry. The flavor is sprightly and pleasant and the tree is immensely productive, as is indicated by the above cut. In Minnesota it has come into favor with planters, and is well worthy of a place in the home garden. It is neither plum nor sand cherry, but in a class by itself.



PLATE 13—One year shoots of native plums crown-grafted on Sand Cherry roots in nursery row. If not pinched back many of the shoots will attain a height of over six feet.

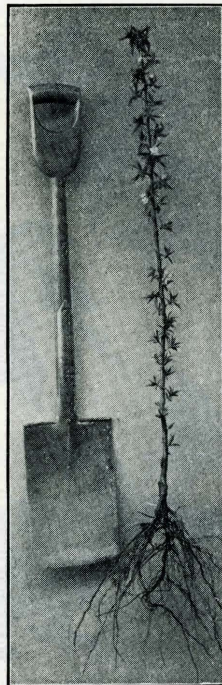


PLATE 14—A one year shoot of native plum on Sand Cherry roots, showing the strong tendency to early blossoming.

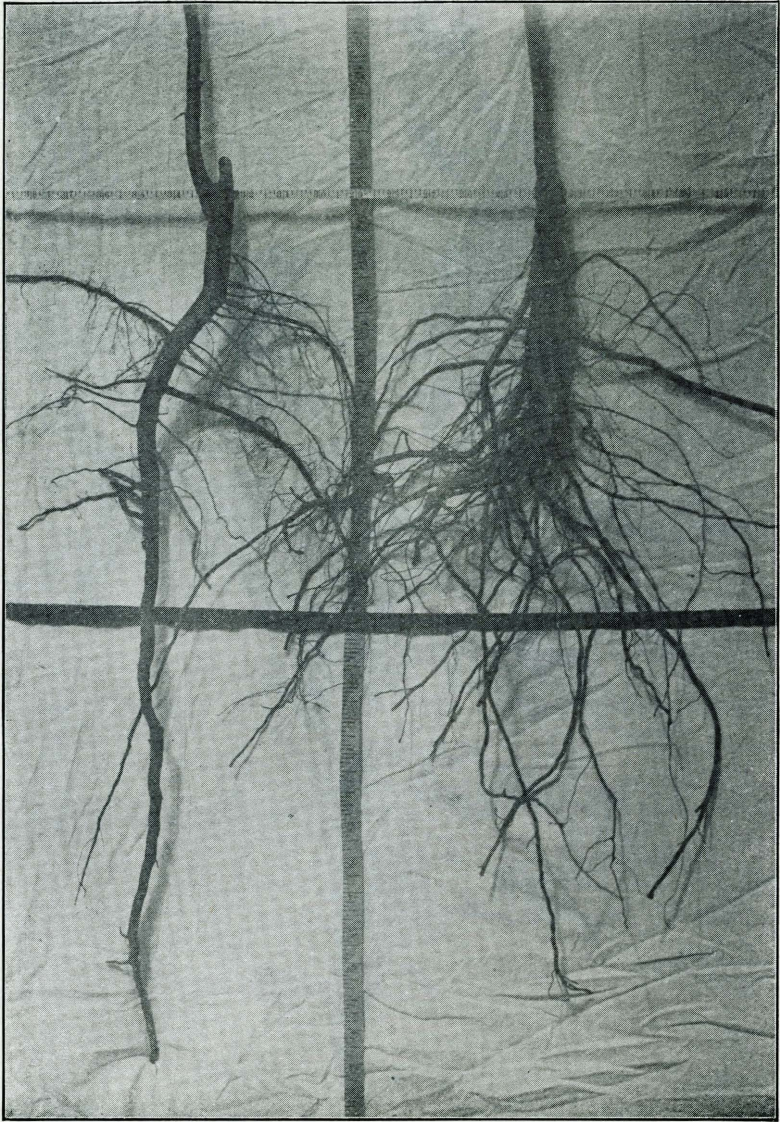


PLATE 15—Native plum on native plum stock at left; on Sand Cherry stock at right.



PLATE 16—The Red June, a Japanese plum, fruiting heavily on Sand Cherry stock.



PLATE 17—The Gold, another variety of Japanese plum, fruiting heavily on Sand Cherry stock. The trees are dwarf and set fruit buds very freely.



PLATE 18—The Bokhara No. 3 peach in blossom as a dwarf tree on Sand Cherry roots. Owing to transplanting the tree did not set fruit the same year (1900), but fruited early the following season.



PLATE 19—The Bokhara No. 3 peach bearing fruit on Sand Cherry roots.



PLATE 20—A sample of Bokhara No. 3 peach raised on Sand Cherry stock, from the tree shown in Plate 19. This crop of 16 peaches is probably the first ever raised on this stock. The tree is not well shaped, as it had been frozen down twice in succession outdoors to within two or three buds of the stock, in the vain endeavor to raise fruit outdoors. The first winter the tree was laid down and covered with earth, with manure over the earth. The second winter with bean vines, covered with earth and manure. Peach trees on Sand Cherry roots are bent over easily, and the suggestion is herewith made that the Sand Cherry will be worthy trying as a stock for the peach further south, where it is only necessary to bend the tree over and cover with litter as a slight winter protection.

sides of the river sand cherries were found in quantity on the gumbo points of the bluffs on either side of the river. They do not thrive in sod, but prefer loose soil. The bushes are knee high or less, but this appears to be mainly because they have not a fair chance, for occasional bushes are found that are somewhat taller. * * *

In company with an old gray-headed Indian, Mr. Stand Straddle, some fine cherries were found on steep gumbo bluffs north of the Cheyenne, some fifteen miles west of Leslie. It is not the coolest employment to be picking sand cherries on a very steep southern slope of slippery gumbo hills with the temperature over 100 degrees in the shade, with no shade except at a considerable distance away. However, we persevered and hope to raise several thousand sand cherries from the seed obtained. The Indians have a way of pounding choke cherries and sand cherries with a heavy stone, to which a handle is attached with leather strips. With this large hammer the fruits are pounded, pits and all, and mixed with meat and dried, also made into soups. * * *

The Teton Sioux name for the sand cherry is Ah-oon-ye-yapa, meaning "with the wind." The meaning in the picturesque Indian language appears to be that when picked with the wind the cherries are sour, and if picked against the wind they are sweet. This is a very quaint explanation of the wonderful variety in quality and flavor as well as size to be found among these sand cherry bushes. Forging the river a little farther up we cut across the county to the Pierre Black Hills trail, striking it at Pineau Springs, 95 miles west of Pierre and 65 miles east of Rapid City. Our good luck did not follow us here, as the Pineau Hills were destitute of sand cherries this year. On the few small bushes that were found, the fruit had been taken by late frosts. The return trip was uneventful, and Pierre was reached Wednesday noon, August 6th. * * *

SOUTH DAKOTA EXPERIENCE

The following is the gist of a discussion at the annual meeting of the South Dakota State Horticultural Society at Sioux Falls, January 23, 1902, reported by the present writer as secretary:*

E. D. Cowles: The Rocky Mountain Dwarf cherries as sold in the nurseries is simply the ordinary sand cherry of Colorado, and are not quite as good as we dig up right here in the sand hills near Vermillion.

A. Norby: The Rocky Mountain Dwarf cherries as sent out by nurserymen are all seedlings, and hence no two are alike in size and quality. I find they do not average as well as our common South Dakota sand cherries.

E. D. Cowles: I have the sand cherry from four different sources, including the sand hills of Nebraska and Clay county, South Dakota. In one part of my grounds where it is only about four feet to water, they blossom and blight and are unproductive, while on a gravel knoll they do well and bear heavily.

G. H. Whiting: At Rapid City in the Black Hills the sand cherry creeps over the surface on dry knolls. They cover the ground and are full of fruit. In the sand hills of western Nebraska I ate sauce made from the native sand cherry and know of nothing that suits me better as to quality. As put up by the prairie settlers the sauce is very rich and of excellent quality.

H. P. Robie: I have seen large areas covered with sand cherry bushes eighteen inches in height on the open prairie at Valentine in Nebraska, near the South Dakota line. The fruit dries on the ground after falling off instead of decaying. Poor soils suits them best.

E. D. Cowles: At Pierre, Nebraska, the best sand cherries are picked where the land is plowed in June. The young sprouts come up and the next year these sprouts bear full of fruit.

*Dakota Farmer, July 1, 1902.

G. H. Whiting: Sand cherries take well in market, at least they sold well at Esmond, as people find they make good sauce. East of Rapid City in the Black Hills on a stony, gravelly soil, the sand cherries do well.

E. D. Cowles: On a tract of land near Pierce, Nebraska, so poor and sandy that it will not even raise a mortgage, sand cherries are at home and are very productive. My advice would be to put sand cherry bushes on the highest, dryest land on the farm.

N. E. Hansen: At the Agricultural College we are raising sand cherries by the thousand on open, rather high prairie, and find them very productive. All indications are favorable to the belief that the Dakota sand cherry will find a place in every Dakota garden strictly on its merits as a fruit plant. It appears to be very susceptible to improvement under cultivation, and next year some of our selected varieties will be ready for distribution.

MINNESOTA EXPERIENCE

In 1895 Clarence Wedge, Albert Lea, Minn., reports:*

"A Select Sand Cherry—We have again fruited the Nebraska type of the native Sand Cherry and are more than ever impressed with the present and prospective value of the fruit. Where professional skill or a favorable climate admits the growth of standard fruit, there may be little room for this rustler from the arid plains, but on the average western farm home, where the strawberry bed is considered a luxury, the apple orchard an uncertain quantity, and the grape and cherry are known only by hearsay, we think the selected varieties of this wonderful productive little bush would make a most acceptable addition to the short list of cultivated fruits.

"At our own place, where all the fruits that can be grown in our climate are enjoyed almost without limit, we find the better strains of the sand cherry very much relished by most of the family. The bushes that bear the large globular

*Northwestern Agriculturist, September 1, 1895.

cherries appear to be the most free from that astringency that is the principal objection to the fruit.

“We have found among our plants one that bears a fruit full larger than the Richmond cherry, almost or quite free from astringency. It has a small pit and a fair amount of acidity; withal a wonderfully early and prolific bearer. We shall propagate from this selected bush as rapidly as possible and feel certain that it will be prized by the average planter of our section; at any rate it is sure to please him in the matter of early bearing, as it seldom fails to bear the second year from planting.”

NEBRASKA EXPERIENCE

Professor R. A. Emerson of the Nebraska Experiment Station writes:*

“The characters of the sand cherry which make it desirable for parts of Nebraska are its hardiness, late blossoming, productiveness and drouth-resistance. In its native habitat in the sand hills the sand cherry grows from a few inches to two feet in height. As grown at the experiment station, on rather low, rich soil, the bushes often reach a height of five to six feet the third year from seed.

“Both in the sand hills and as grown at the experiment station, the plants are very productive, often being bent to the ground with a load of fruit. The fruit varies greatly in size, shape and quality. Not only does the fruit vary in size, but the pits of some of the largest fruits that are found, averaging three-quarters of an inch in diameter, are no larger than some of the fruit which are a little over half as large.

“The great drawback to the sand cherry is the quality of the fruit. The average sand cherry has a very astringent or puckery taste, which does not disappear when the fruit is cooked. This quality is especially noticeable in fruits which are not thoroughly ripe. Among numerous seedlings it is not uncommon to find individuals which show very little of this disagreeable flavor, but when such an individual is found

**Twentieth Century Farmer*, August 12, 1903.

the fruit is apt to lack flavor entirely, being very insipid to the taste. It is only very rarely that a plant is found to produce fruit without astringency and at the same time with an agreeable flavor. It is this latter fact that accounts for the very few selections that were made from something like 1,000 seedlings at the experiment station.

"Whether seedlings reproduce the good qualities of the parent plants has not yet been determined. The idea in growing seedlings from selected plants is to improve upon rather than merely retain the qualities of the parent. The latter can be done by any of the common methods of propagation by which the sand cherry is increased, such as budding, grafting, root cuttings, stem cuttings, layerage, etc.

"The writer is not yet prepared to recommend even the improved sand cherries for general culture in the eastern part of the state, but it seems to him that some of the better kinds might be grown with profit farther north and west, where other sorts of fruit are grown with difficulty. In eastern Nebraska, especially in moist seasons, the sand cherry is very susceptible to brown rot. This disease, of course, can be held in check by the use of Bordeaux mixture, but it is doubtful if the sand cherry is good enough to make it pay to spray for diseases in eastern Nebraska. In the drier atmosphere of western Nebraska little trouble would be experienced from this disease. * * *

"From the writer's experience with the sand cherry at the experiment station, he is of the opinion that at least in the heavier soils the sand cherry, if grown at all, will have to be pruned on a renewal system, something after the manner of currant pruning. Where sand cherries are grown in bush form with a definite trunk, they make pretty shrubs, but the extremities of the limbs are apt to die after three or four years, or, if they do not, the fruit becomes smaller as the bush becomes older. If, on the other hand, three or four sprouts are started from the roots, so that the oldest one of these can be removed each year and a new one allowed to grow from near the ground to take its place, it is probable that better results will be secured. In the sand hills the

writer has not noticed this tendency for the older branches to die. It is noteworthy, however, that in many locations in the sand hills, especially near blowouts, the older branches are often covered with the drifts of sand and the new tops are formed above—virtually a renewal of the top.”

FOR THE OPEN PRAIRIE

Alex Alin of Fullerton, North Dakota, under date of October 30, 1902, writes as follows:

“Since I got a few bushes of the common Sand Cherry in 1899, I have given my neighbors quite a start also. The Sand Cherry is the first fruit I advise a new beginner to try here, for if he fails with that he had better give up fruit raising.”

The above is a fair sample of many letters received concerning the Sand Cherry on the open prairies of the Dakotas, showing that this is pre-eminently a pioneer fruit.

THE IMPROVED DWARF ROCKY MOUNTAIN CHERRY

Chas. E. Pennock, nurseryman and fruit-grower, Fort Collins, Colorado, first introduced to commerce the Sand Cherry as found native in Colorado, under the name of The Improved Dwarf Rocky Mountain Cherry. The introduction was made in 1893, and the following is quoted from Mr. Pennock's original circular: “This wonderful fruit was first noticed by me, in the summer of 1878, on the banks of the Cache la Poudre River, in the mountains of Larimer county, Colorado. It struck me then as being the most valuable wild fruit I had ever seen. I knew that Colorado was noted, and justly so, for the flavor and quality of her native fruits, and here was one that surpassed, in every respect, all the others. I spoke of it at the time to several gardeners and fruit-growers, among whom was Mr. W. C. Hart, and whose testimony is given on the following page of this circular.

“When I settled on my present fruit farm in 1881, I at once secured a start of it and have been growing and im-

proving it ever since, and each year my admiration of it has increased."

As fruited in many places the Dwarf Rocky Mountain cherries appeared to be seedlings only, which do not average any better than the average run of unselected Dakota Sand Cherry seedlings.

After its general introduction this fruit suffered the fate of most novelties by being praised far beyond its merits, in being sold at exorbitant prices, and in the substitution of other fruits upon delivery to the purchaser. The case is well stated in the following horticultural editorial reply:*

Cherries—G. W. H., Minn. 1. Will you please advise me if the Rocky Mountain Cherry is hardy in Minnesota? 2. Is the fruit desirable? 3. Would you advise me to buy and set them out in preference to the Early Richmond or some other cherry trees? I understand they are very small and never attain the size of an ordinary cherry tree. The agents from the * * * * * are pushing them for all they are worth, representing the fruit as large as the Early Richmond. Is there a home nursery there, and are they reliable? Was told a few days since that they had no nursery, but shipped in stock from southern firms. Please advise me and oblige, if those cherries are what they claim; we want them, but want to know first." Ans. by Mr. Harris: "1. As far as we know, the Dwarf Rocky Mountain Cherry is reasonably hardy in Minnesota, but on our soil in south-eastern Minnesota has been seriously attacked with fungus growths, such as mildew, twig blight, fruit rot and "pockets." We do not know of their producing but one fair crop of fruit in five years. 2. As far as our observation extends and an experience with several hundred plants, we have not seen a plant producing fruit that would appear to have any commercial value. A few plants have produced fruit nearly as large as the Early Richmond cherry and quite palatable, while others were so acrid as to be scarcely edible. It is an interesting plant for experimenting with and is doubtless ca-

*Farm, Stock and Home, August 1, 1899.

pable of being developed into a most valuable fruit, especially for growing in arid regions, and on poor soils where better fruit cannot be produced. But this work had best be left for the experiment stations. 3. We would not advise you to buy and set them out as a substitute for or in preference to Early Richmond or any other of the pie cherries. Neither would we advise you to purchase or plant them for any purpose unless you have seen a desirable variety of them growing and fruiting and grown and offered by a reliable man. The larger portion of the plants sold by agents are seedlings * * * and not likely to produce fruit of any particular merit * * *."

SAND CHERRY HYBRIDS

A number of hybrids between the Western Sand Cherry and other species of the same genus are now in existence. Some of these have been introduced; many more are under trial and will be distributed if deemed promising.

The first of these appears to be the "Utah Hybrid Cherry," which is named *Prunus Utahensis* in Europe. Professor Bailey has determined this by botanical evidence to be a hybrid of the Western Sand Cherry with the sand plum, a dwarf species native of Kansas and the Southwest. This originated as a natural hybrid in the garden of "J. E. Johnson, now deceased, at Wood River, Nebraska, on or near the Platte River, probably sometime in the sixties." Mr. Johnson, soon afterwards removing to Utah, introduced this variety as the Utah Hybrid. This plant has never won much favor, as it lacks in size and quality of fruit. This is not surprising in view of the fact that neither parent is remarkable for these characteristics.

The next hybrid which attracted attention is the Compass cherry, which was originated in the spring of 1891 by H. Knudson, Springfield, Minnesota, by crossing the Sand Cherry from near Bismarck, North Dakota, with the Miner plum. The Sand Cherry was the female parent. The resulting seedling fruited in 1894. This hybrid plant has proven to

be an early and abundant bearer of small plum-like fruit of pleasant, sprightly flavor, and is worthy of a place in the home garden. It is on the trial fruit list of the Minnesota and South Dakota state horticultural societies. (See Plate 12 for further description.) There was a decided controversy over the introduction of this variety, which it is not necessary to publish here. It is alleged that an amateur attempted to introduce the Compass as his own from scions obtained from Mr. Knudson, who vigorously protested; a lawsuit followed, which established the originator's claim.

The 499 seedlings of the Compass raised at the South Dakota Experiment Station in 1901 began to fruit in 1903; some appear quite promising. There is a wonderful diversity in the character of the foliage. Many of the seedlings show leaves much like those of the native plums, owing perhaps to the fact that the six Compass trees in the Station orchard are surrounded by choice native plums. On the other hand, some of the seedlings show little or no trace of the plum parentage and revert back to the Sand Cherry in almost every point.

In 1898 the Pennock, a supposed hybrid between the Sand Cherry and Moore's Arctic plum, was described and introduced by Charles E. Pennock of Colorado. As fruited at the South Dakota Experiment Station in 1903 the fruit is something like that of the Compass, being remarkable neither for size nor quality. Both the Compass and the Pennock would be called small plums by the average purchaser of fruit. They are to be regarded more as stepping stones to something better, and as something to impart hardiness and drouth-resistance to larger fruits.

The "What-is-It," recently introduced by J. W. Kerr of Denton, Maryland, was produced by Theodore Williams of Benson, Nebraska, and is considered to be a hybrid of the Western Sand Cherry and the Wild Goose plum. Mr. Williams has produced many hybrids between the Sand Cherry and various plums, which are being given preliminary trial previous to introduction.

Professor R. A. Emerson* reports unfavorably on all these plum-sand cherry hybrids, so far as observed, for Nebraska, especially as to quality: "A few hybrids between the Sand Cherry and unknown varieties of plum have been produced at the Nebraska Experiment Station, and seedlings of these hybrids are now being grown. * * * Mr. Williams has a number of second generation hybrids, that is, seedlings of these sand cherry-plum hybrids, which produce good fruit, but those which I have seen are so much like plums that they should be classed with them, and, so far as I have learned, have no particular advantages over plums."

The hybridization of the Sand Cherry with the plums generally is difficult, owing to the difference in time of blossoming; that is, if it is desired to use the Sand Cherry as the male parent. The very latest plum blossoms are very often gone before those of the Sand Cherry are open. At the Iowa Station in 1891-95 much work in this line was done under Professor Budd's direction by the present writer, but without success, owing to the difference in blossoming, late frosts and other causes. At Brookings outdoor crossing was also tried, but found even more uncertain. A change in methods was deemed essential, especially after studying dwarf fruit trees in some of the leading horticultural centers in Europe in 1894 and 1897. Luther Burbank of California, the greatest living breeder of fruits and flowers, has a mild climate in which to work. For Dakota a California climate must be created during the mating season of fruit trees and plants. The result is given in the following paragraph:

NEW SOUTH DAKOTA HYBRIDS

At the South Dakota Experiment Station during the past three years the hybridization of the Western Sand Cherry has been attempted on a large scale. Hundreds of combinations have been tried and the number of blossoms operated upon runs up well into the thousands. The work has been done under glass, as shown in Plate No. 9. Crosses have been made with the native, European and Japanese plums,

*Twentieth Century Farmer, August 12, 1903.

with the Chinese *Prunus Simoni* and other apricots, with the peach and nectarine, with the sour and sweet cherries, and with several other relatives of the plums and cherries. It would be premature at this writing to make definite announcements of the hybrid plants obtained until they bear fruit. But as near as can be judged from the character of the foliage of the one and two year plants, and the seedlings now appearing in the seed flats, plants have been obtained of most if not all the above combinations. Evidently the Western Sand Cherry is a plastic creation whose fixity of type is easily broken up by crossing with other species. Some of the plants obtained are combinations of at least three species.

THE SAND CHERRY AS A STOCK FOR STONE FRUITS

In 1895 Professor J. L. Budd of the Iowa Experiment Station began the first experiment on a large scale with the Sand Cherry as a stock. In this work the present writer was privileged to assist. This work is summarized as follows:

"The stocks were grown in 1892 from seed gathered in northwest Nebraska. In the fall of 1892 the largest of the seedlings were taken up for crown-grafting during the winter, leaving the others for budding. The grafts were planted in the spring of 1893, and the budding was done during July of the same year. The trees of suitable size were taken up late in the fall of 1894, the grafts having had two seasons' growth, and the buds one season's growth. All the trees had a very strong root system, consisting mainly of a dense cluster of long cylindrical roots from immediately beneath the crown, no special tap-root being formed. The color was a fine shade of carmine. This red color is a marked characteristic of the Sand Cherry root.

"The trees were put in cellar in the fall of 1894 and planted out in permanent position the following spring. Some were

*Iowa Experiment Station Bulletin 28, p. 229-232. J. L. Budd. N. E. Hansen.

planted on the College grounds and the others sent out for trial to various points throughout the northwest. While heeled in on the packing grounds many of the one and two year old Japan and native (Wyant) plums blossomed."

Summary

"1. The experience of two years with the Sand Cherry indicates that it is a promising stock for the Japanese and native plums. Budding gives larger, smoother, stockier trees in nursery than grafting. The European plums are more dwarfed than by native plum stocks, and will probably bear younger than on plum stocks if not permitted to root from the scion.

"2. The cultivated cherries do not appear to unite readily with the Sand Cherry either by budding or grafting. Yet it may be that we have not worked them at the proper time.

"3. The Sand Cherry stock hastens the blossoming of the Japanese and native plums. Scattered experience in Utah, Georgia, Iowa and elsewhere indicates that the cultivated plums bear earlier on this stock than on plum stocks.

"4. The early and heavy bearing of the Sand Cherry from northwest Nebraska has special interest, as plants on the College grounds from Colorado have blossomed freely during the past twelve years, but have rarely borne a specimen of fruit. All our stocks on which the buds and grafts failed are bending under their loads of fruit when two years old."

Under date of June 1, 1904, Professor A. T. Erwin of the Iowa Experiment Station reports as follows concerning some of the trees resulting from the above experiments* which were planted on the grounds of the Iowa Experiment Station:

"Replying to your recent favor regarding the Sand Cherry as a stock for the plum, I will state that my observations regarding it have been made on the Station grounds here and of the Hawkeye, Wyant and Domestica varieties. The stock

*Iowa Experiment Station, Bulletins Nos. 22 and 28. J. L. Budd, N. E. Hansen.

has had a most marked influence on the stature of the plants. The most of them are not more than half size for plants of their age.

“As a dwarf stock, particularly for trees grown on city lots, I think the Sand Cherry might be of value. For the general orchard tree, it dwarfs the scion too severely. The Sand Cherry forms a better union, I think, with the Americana varieties than with those of the Domestica type. In the latter case the trees seem to form an enlargement at the crown, and the Sand Cherry roots sprout heavily about the base. Most of our European varieties grafted on the Sand Cherry have not made a durable union.”

Under date of June 10th Professor Erwin writes: “Replying to your recent favor, I would state that I have seen no evidence of the plum trees becoming top-heavy where worked upon the Sand Cherry stock. They have been so dwarfed as to preclude any possibility of this kind, I think. I have just been through the orchard and find that a number of the Domesticas on this stock are dying out, suggesting an uncongenial union and a short-lived tree.”

THE WESTERN SAND CHERRY AS A STOCK FOR NATIVE PLUMS

In 1896 the experiment begun by Professor Budd at the Iowa station with the Sand Cherry as a stock was taken up at the South Dakota station by the present writer. The following table gives the growth obtained the first year in nursery:

CONCLUSION

It will be seen from the above table that the growth obtained from the native plums on Sand Cherry stocks compares favorably with that usually obtained in nursery propagation in this section with native plums on native plum stocks. Since this time no detailed measurements have been made of the numerous varieties of stone fruits grafted on this stock. It has been definitely determined that for winter grafting indoors the Sand Cherry is superior to the native plum. A larger per cent succeed and as strong growth is obtained in nursery. Native, Japanese and European plums, apricots, peaches and nectarines all take readily by budding or grafting. The sour and sweet cherries are worked only with great difficulty. These tender fruits are worked on Sand Cherry roots simply for plant-breeding experiments, the trees being put in pots, tubs and boxes at one or two years of age to be wintered in cellar and fruited under glass. Many hardy native plums budded on Sand Cherry stocks have been planted in the orchard of this Station. The trees become dwarfed and bear fruit early and abundantly. The fruit is fully up to the standard in size and quality. But some trees grown with a rather tall stem sag or lop over under the heavy load of the fruit. If used at all such trees are more for the small amateur garden, rather than for commercial purposes. Such trees should be raised in bush form with very low stems, and some attention should be paid to heading back the top in the early years of growth.

For indoor root-grafting a side-graft at the collar, with wedge-shaped scion containing three buds, is better than whip-grafting, such as is commonly used for the apple.

In this work of winter root-grafting plums on Sand Cherry stocks, long scions have been used in some cases and the graft set as deeply as possible clear up to the top bud. This has favored the emission of roots from the scion and the plum tree has thus in many cases grown its own roots and become independent of the Sand Cherry root. At this writing the indications point strongly to this method as being one of

value from the standpoint of the commercial nurseryman. The northern propagator of plum trees is hampered as to budding by the short and often dry season in August, and in grafting by the rush of other work the following spring just before the buds swell, which is the only time for outdoor grafting. It is well known to commercial nurserymen that the native plum (*Prunus Americana*) has not been an easy stock to handle in indoor grafting in the winter. Piece-root grafting as is practiced with the apple is not practicable and usually fails with the plum. The buds of both scion and stock must be kept dormant up to the time of planting in spring. Crown-grafting on whole roots done by inserting a wedge-shaped scion in a slit at the collar, commonly known as side-grafting, will give a fair stand if great care be taken. But it is an easy matter to make a mistake in the nursery by trimming up one of the numerous sprouts from the wild root instead of the shoot from the scion owing to the great similarity in foliage between the two. When these plum grafts on plum roots are dug at one or two years of age it will be found that the root system is rather meager and that there is a strong tendency from the formation of a tap root with no side branches. This makes a tree that is not well received by the average customer upon delivery.

On the other hand, the root system thrown out by the Sand Cherry root is very vigorous and abundant. It is better adapted to dry soils than the plum. Hence in dry seasons this advantage will be especially manifest. The greatest need of some easy method of indoor propagation of the native plum during the long winter season when labor is available makes it advisable to give the Sand Cherry a thorough trial for this purpose. A plum scion of five or six inches in length should be crown-grafted on whole Sand Cherry root. The point of union and the exposed tip of the scion should be covered with alcoholic plastic or other grafting wax and care taken to keep both stock and scion dormant until planting out time. Instead of alcoholic plastic* the point of union may

*Grafting Wax—For all outdoor grafting and for covering cut surfaces, the following is a good wax; it is called alcoholic plastic: One

be covered with a narrow strip of paper covered on one side with the wax made for the thread used in winding grafts, consisting of two pounds resin, one pound beeswax and one pound beef tallow. In order to facilitate the setting of grafts as deeply as possible, the Sand Cherry roots should be cut back severely. In any event the graft should be set down clear to the top bud so as to favor emission of roots from the scion, and when the trees are set in orchards the trees should be set several inches deeper.

IN FOUR OTHER STATES

Some Sand Cherry seedlings from South Dakota were tested by Professor F. A. Waugh, then of the Vermont Experiment Station, in 1901 as a stock for plums in comparison with Americana, with Miner, Marianna and peach. In this experiment the trees on Sand Cherry stock, instead of being dwarfed in nursery, gave the tallest, largest and heaviest trees in almost every case. *The character of the roots of these trees is given as follows:*

“Sand Cherry Stocks—We have used these only one year, but have found them to give remarkably fine root systems. A strong, straight tap root is usually formed, and the secondary roots set out from this in large numbers and on all sides, usually tending downwards at an angle of 40 to 50 degrees with the axis of the stock. There is nearly always a heavy mass of fine fibrous roots. The union with scions of most varieties is good, although usually marked with considerable swelling.”

In this same report is given the following table showing the heights and diameters of Stoddard (*Americana*), Chabot

pound of white resin, one ounce beef tallow, one tablespoonful of turpentine, five or six ounces of alcohol. Melt resin and tallow slowly, take from fire, and when a little cooled by stirring, add the turpentine, stirring constantly. When still cooler, add alcohol. If the plastic becomes too thick to work well, add more alcohol. For outdoor grafting the plastic is kept slightly warm in a small tin pan set on the top of a cone-shaped tin box with a lamp inside, thus forming a portable heater. The wax should not be warmer than can be applied with the finger.

*Vermont Experiment Station Report 1902, p. 257.

(*triflora*), Milton (*hortulana*) and Newman (*angustifolia*) plums on the following roots at the end of the first year in the nursery:

KINDS OF STOCK	Average Height feet	Average Diameter inches
Americana, from seeds.....	2.41	0.31
Miner, from root cuttings.....	2.78	0.34
Marianna, from cuttings.....	3.31	0.35
Peach, from seed.....	3.25	0.32
Sand Cherry, from seed.....	3.59	0.40

Professor R. A. Emerson reports on this subject as follows:*

“At the Nebraska Experiment Station the Sand Cherry has been used as a stock for the following: Lombard, Peter’s Yellow Gage, Voronish Yellow, Moldavka, Abundance, Cheney, Wolf, Pottawattamie and Wild Goose plums, Gibb apricot and Hale’s Early peach. In all these cases the buds set well and the trees grew well during the first year. In case of Lombard, the union was imperfect, the trees having broken off at the union of the stock and scion during the second year in the nursery. In the case of the other European plums, Peter’s Yellow Gage, Voronish Yellow and Moldavka, the union does not seem to be satisfactory, though few of the trees have broken off. The American and Japanese plums and also the peach and apricot have grown well on Sand Cherry roots, as can be seen from the exhibit. It will be noticed that the points of union between the stock and the scion are more or less swollen. *

* * The buds of Early Richmond and English Morello cherries were set in Sand Cherry stocks at the same time the plum buds were set. These cherry buds seem to set, but none of them grew.”

At the Minnesota State Horticultural Society meeting in December, 1899, Martin Penning of Sleepy Eye, Minnesota, originator of the Surprise plum, informed the present writer that he had over twenty trees of Wolf plum on Sand Cherry

**Twentieth Century Farmer*, August 12, 1903.

roots set four years; also that they had borne a fine crop in 1899, and had not been dwarfed so far either in fruit or tree. Under date of May 26th, 1904, Mr. Penning reports his further experience with these trees as follows:

“My plums grafted on Sand Cherry are about all dead. They grew well for about five to six years and bore heavy crops of fine plums. The root is not strong enough to support a heavy top. I do not recommend the Sand Cherry root for the plum; they are too short lived.”

AN ADVERSE REPORT

The following note from an experimenter at Osage, Iowa, appeared in the *Minnesota Horticulturist*, January, 1899:

“The Sand Cherry a Poor Stock—‘Some six or seven years ago we grafted plum on Sand Cherry. The scions used were Wyant, Rockford, Wolf and DeSoto. Some of these trees fruited in 1897 and all of them fruited in 1898. The fruit we found to be of inferior size and quality, in fact about worthless. We advise caution in using Sand Cherry as a stock for plum.’”

The above mentioned trees were subsequently found to be not on Sand Cherry roots; it was simply an error in observation. In the orchard of the South Dakota Experiment Station the plums raised on Sand Cherry stock are fully equal in size and quality to those on native plum stock.

In reply to my inquiry, M. J. Wragg, Waukee, Iowa, writes under date of January 23, 1901:

“In regard to the Sand Cherry as a stock for plums, have come to the conclusion that it has no point of merit over the native plum; and I am certain that it is not a whit hardier. I have said that it made a splendid stock for the budding of many of our Chickasaw varieties.”

SOME STATION TREES ELSEWHERE

Several varieties of native plums, budded or grafted on Sand Cherry stocks at this Station, were sent out in the spring

of 1900 for trial elsewhere. The following reports have been received up to date:

Report No. 1

Four Odegard plums on Sand Cherry stocks were sent to Professor C. B. Waldron of the North Dakota Experiment Station, who, under date of May 28, 1904, reports as follows:

"In response to your inquiry of May 26th, I will say that I have just returned from our plum orchard, where I made a special examination of the Odegard plums which you refer to. These passed the winter in very good shape and are blossoming freely. The Wolf plum alongside received a pretty hard jolt during the winter and I doubt if it survives. The same can be said of the Aitkin and two or three others. The trees that you mention are planted in a very exposed place and have been given unnecessarily severe treatment, aside from the fact that they have been well cared for in the way of cultivation, etc. Last year these trees fruited and we secured a couple of jars of fruit very attractive in appearance and large size, something over an inch and five-eighths in diameter.

"As we have no Odegard plums growing on Americana stock, of course we have no basis of comparison between them and Sand Cherry for that particular variety of plum. I will say, however, that the other varieties growing on Americana stock are not looking nearly as well as this variety growing upon the Sand Cherry stock."

Report No. 2

Three Odegard and two Rollingstone plum on Sand Cherry stocks; and four Valentine, Nebraska, Sand Cherry seedlings were sent to O. M. Lord, Minnesota City, southeastern Minnesota, who, under date of May 30, 1904, reports as follows:

"In answer to yours of the 24th, the Odegard died. The Rollingstone grew very well, but has had no plums till this year. The trees are set very full and will probably give a good crop. I have not succeeded with the Sand Cherry. The trees you sent at first are all dead. Those sent last are alive,

but look as if they could not stand it. We have had no plums here for the last two years, but there is promise of a fair crop now."

Report No. 3

Two Odegard plum on Sand Cherry stocks were sent to H. L. Felter, Washta, Cherokee county, Iowa, who under date of May 28, 1904, reports as follows:

"These trees were set on good valley land and have received good cultivation each year; have grown well and will now caliber a little over two inches in the stem.

"Have not had plums from them, but they are now rather lightly set with fruit, and I hope to report later as to the fruit."

Report No. 4

Four Odegard plum on Sand Cherry stocks were sent to E. D. Cowles of Vermillion, South Dakota, who under date of June 6, 1904, reports as follows:

"In regard to Odegard plums on Sand Cherry roots, shipped me four years ago, I also bought four trees on native plum roots same spring; growth nearly equal and very strong; neither have blossomed; present height about nine to ten feet. All lived; three of the Sand Cherries have made beds of Sand Cherries about four feet across, which are in full bloom. One Sand Cherry root did not sprout. Trees were set not over two inches deeper than in nursery.

"I find in our soil, shallow set trees bloom best."

Report No. 5

Twelve Rollingsstone plums and two Odegard plums on Sand Cherry stocks were sent to W. T. Stobbs of Wessington, South Dakota. Under date of May 30, 1904, Mr. Stobbs reports as follows:

"In reply to your letter of May 26th, will say that the plums on Sand Cherry roots are all living. Have not sprouted as plums on their own roots do. But they have not made the growth that plums on their own roots have. I do not

think that a Sand Cherry root is large enough to support a tree as large as a plum. They have not yet fruited."

Report No. 6

Three Odegard plum on Sand Cherry stocks were sent to L. S. Kaump of Hitchcock, South Dakota, who under date of June 5, 1904, reports as follows:

"In regard to the plums you sent me grafted on Sand Cherry roots are a success one way and in another I think a failure. The three you sent me are Odegard. They are too top heavy for such light roots. They have grown very thrifty and are full of fruit this season, but the wind whips them all around, more so than any other tree that I have in my whole orchard. Now I would advise if you graft on Sand Cherry roots, use plums that have light tops; do not use such trees as the Forest Garden or Odegard. I have a plum tree here that I think would be a good one to graft. The tree grows low down; is a very early bearer; the fruit is almost like the Forest Garden, only a trifle smaller. I bought the parent tree in a bunch of Forest Garden. I always put the two together for sale, these are so near alike, only one grows tall and the other low down."

TAME CHERRIES ON SAND CHERRY STOCK

While it is difficult to make tame cherries unite in budding or grafting with the Sand Cherry, it is not impossible. A two-year-old tree of Early Richmond cherry grown on this stock by G. Miller, Anita, Iowa, was received at this Station in the spring of 1903 and planted in a tree-tub. This year this tree, although dwarfed considerably, bore a good crop of fruit.

THE SAND CHERRY AS A STOCK FOR THE PEACH

So far as the writer has found any record, the first experiments in in this line were begun at the Iowa Experiment Station in the winter of 1892-3.*

*Iowa Experiment Station, Bulletin No. 22, p. 853. J. L. Budd, N. E. Hansen.

The Bokhara peach was root-grafted on Sand Cherry. The method was side-grafting in a slit at the collar on whole roots, using a wedge-shaped scion. Of fifty-six grafts but one grew. The height attained the first season was ten inches.

It is well known to nurserymen that owing to the hard wood grafting the peach is not nearly so successful as budding. Hence the commercial propagation of the peach is by budding rather than by grafting. In subsequent experiments at the South Dakota Station budding has been practiced much more than grafting.

In August, 1897, under the directions sent by the present writer while on a tour of agricultural exploration in Russia for the United States Department of Agriculture, buds of Bokhara No. 3 peach were ordered from a nursery at Atlantic, Iowa, and inserted in Sand Cherry stocks. It was thought the Sand Cherry would dwarf the peach top sufficiently to permit the trees being bent down readily for winter protection. The buds made a strong growth in 1898. These shoots were laid down and covered with earth in the winter of 1898-9, which will be long remembered for its severity. In spite of the winter protection, with manure over the earth, the peach top killed back to within two or three buds of the point of union. In 1899 these surviving buds made a vigorous growth and were laid down and covered with a heavy mulch of bean vines with earth over the mulch. These shoots likewise killed back during the winter of 1899-1900 to within a few buds of the point of union. To prevent further mishaps some of the trees were potted in tubs and boxes, and have since been wintered in cellar. A few were left outside and made a strong growth in 1900 and in the fall were left standing surrounded by wire netting and protected by a pile of coarse stable manure outside of the netting. These trees budded out early the spring of 1901, but having been girdled by mice which had crawled through a hole in the netting, were dug up and destroyed. Since then the experiments have been wholly with peach trees grown in tubs and boxes.

At the present writing it appears that the Western Sand Cherry is well worth trial as a peach stock further south,

where such heavy winter protection need not be given. It is certain that the peach on Sand Cherry is dwarfed in size in dry seasons, especially when headed back as they should be; that the peach will fruit early on this stock; also that the fruit is fully up to standard in size and quality. The Sand Cherry is especially recommended to those who grow peaches for orchard house purposes, and there may be a field for dwarf peaches in the peach-growing regions of the south for the home garden, especially on city lots.

In 1896 Professor E. S. Goff of the Wisconsin Experiment Station reported as follows on the Sand Cherry as a dwarf stock for the peach:*

"The chief hope for peach growing in climates where the flower buds are habitually killed in winter, lies in securing a stock that will dwarf the tree sufficiently to render winter protection practicable. For some years past I have been endeavoring to find such a stock. My first hope lay in the dwarf flowering almond, *Prunus Japonica*(?), but with this I failed to secure a union with buds of the peach. I would not say that the peach cannot be successfully budded on this stock, but repeated efforts here in Wisconsin resulted in failure. I inserted a total of several hundred buds in four different trees without securing a union in a single instance. Budding in our dry and warm summer weather is much more difficult than in the eastern states, and it is possible that the peach may be budded on the flowering almond in a climate more favorable for budding.

"I next tried a form of the Sand Cherry grown from pits procured in western Iowa. This shrub is quite dwarf, attaining a height of only two or three feet. Professor Bailey pronounces it *Prunus Besseyi*, the same species to which the so-called Improved Dwarf Rocky Mountain Cherry belongs. With this stock I have been more successful. I inserted a few buds in it in 1893, and while I had less expectation of success than with the flowering almond, I succeeded much better. The peach grew vigorously on this stock, and by the

*Garden and Forest, November 4, 1896, p. 448.

second year had attained a height of about five feet. The past season, although the best growing season we have had for some years, the peach trees on this stock have scarcely increased in height. They have branched rather thickly, and at present are well filled with flower buds, from which I infer that they will probably not grow larger than they now are. At this height the trees are readily protected by digging away sufficient earth from the roots, so that the trunk may be bent down readily, when the whole is covered with earth. The trees blossomed the past spring and set some fruit, though the fruit failed to mature.

"I am also trying *Prunus subcordata* and a dwarf form of *P. maritima*, but with what success remains to be seen."

PROPAGATION OF THE SAND CHERRY

It is essential that Sand Cherries be propagated easily, so as to be sold at a moderate price. A Sand Cherry bush is not to be compared to a tree or tame cherry. The Sand Cherry is to be classed with the small fruits, not with the orchard fruits. The amount of fruit that can reasonably be expected from the Sand Cherry bush does not warrant any more than a low price for the original plant itself. In some cases the Sand Cherry plants have been sold at fifty cents each, and they were simply one year seedlings at that. Such prices do not at all warrant any one in setting out a plantation. In price Sand Cherries should rank rather with the currants and raspberries. Sand Cherries should be sold by the hundred rather than by the dozen, and planted close together, so that cultivation can be done with an ordinary cultivator. If set 3 by 6 feet they will be easier to handle than 4 by 4 feet. The grass should be kept out, as it is essential that the soil be kept mellow.

The best method of propagating our selected varieties of the Sand Cherry is still to be determined. In time it is to be hoped that these selected varieties will be bred true to seed the same as tomatoes or beets. At present these selected varieties are being budded on native plum stocks and set in a

plantation by themselves. The main object of this is to obtain better seedlings from the seed picked from these plants, both parents being choice varieties. It may be found also that if a plantation is all of one variety that the tendency to reversion to the original small fruited condition will be lessened; in other words, that the seedlings may in a few years be made to breed approximately true to seed. Some method like this is needed, as several hundred plants would not be too many for a good sized family on the prairie. In the seedling Sand Cherry plantations we have noticed that the lower limbs when covered with earth emit roots very readily. It will doubtless be found that these choice Sand Cherry budded on plum stocks can be planted rather deeply; and that own-rooted plants can be obtained as readily as from the gooseberry by bending the limbs down in a trench and covering with earth in the early summer, in the usual method of nursery layering.

At this Station the raising of Sand Cherries from seed has been found to be a very easy matter. The method is the same as pursued in raising plum seedlings: As soon as picked the fruit should be spread out in a thin layer and allowed to remain until they get a little soft. The seed should be washed clean, which is done by putting it into a pail with a little water and pounding carefully with a tamper or a short piece of scantling. As soon as the pits are washed clean, spread out in the sun to dry slightly for a day or two, and then mix with moist sand in a small box, such as soap or crackers come in. The sand and seeds are in alternate layers, the idea being to keep the seeds separated from one another to avoid moulding. The box should have holes bored in the bottom for free drainage. Care must be exercised to keep the seeds only moderately moist until cold weather comes. This is usually done by putting the box in a cool, airy cellar. If the sand is kept too wet or too dry good results will not follow. If the box is buried outside as soon as seeds are clean, the seeds are apt to dry out in the dry weather sometimes experienced before winter sets in. This may be prevented by a mulch of old straw or stable litter during the dry spell. This

is the best plan if the box in the cellar is apt to be neglected and the sand become too dry. It is very essential that the seeds do not dry out before planting, and still they must not be in water all the time, as that would water-soak them. Before the ground freezes the box should be buried two inches below the surface of the ground out of doors in a well drained spot in the garden and allowed to freeze all winter. If snow comes too early in the fall, shovel it away, so that seeds will be sure to freeze very hard. Be sure also to have the sand quite wet just previous to freezing-up time in the fall. As early in the spring as possible the seeds should be planted. Get the land in good condition by plowing and harrowing. If possible, use fall plowed land. Make the rows three or four feet apart and plant the seed two or three inches apart in the row. Plum pits can be planted four inches deep, Sand Cherries two to three inches. In a small way this can be done by opening up a shallow furrow with a hoe and stepping on the seeds, and then fill up the furrow with a hoe or by dragging the feet in walking. With large lots of seeds a horse marker set at four feet with rather sharp runners is the most convenient implement. In case the seedlings are to be taken up at the end of the first year the pits can be sown a little closer in the drill. In weeding, nursery hooks made something on the style of a pitchfork with the tines bent in the middle at right angles to the handle are very convenient implements for loosening the soil in the line of the row. The rest of the cultivation can be done by wheel hoes, common hoes and by the ordinary field cultivator. In the latter case the shields should be set so as not to smother the young seedlings with earth.

In case the spring is a very wet one so that it is impossible to get the seeds planted early, the sand should be stirred every day after it thaws to prevent the seeds in the bottom of the box from germinating sooner than those nearer the top, but if possible the seeds should be planted before there is any show of their germinating. If good care be given, the young plants will make a strong, vigorous growth and can be planted in their permanent positions the following spring.

Over winter it is best to have them buried to prevent injury from field mice and rabbits, and not because of any lack of hardiness. A tree-digger is the best implement for taking up the young plants in the fall, but an ordinary walking plow will do for one year old plants, especially if the plow is set to run as deeply as possible and an active man is on hand to press down the plow beam. If dug with a plow it is best to use nursery hooks or potato hooks to remove the plants from the loose earth. Where space in the storage cellar is scarce, a very convenient and cheap method of heeling-in (burying) plants is in long trenches made by plowing out deep furrows, and if necessary plowing back in the same furrow, thus making a deep dead-furrow. The plants are now placed close together sloping in trenches and covered entirely with loose earth, the aim being to have the top of the plants about even with the surface of the soil. Sometimes the weather is rather dry and hence the leaves are slow in falling. In that case we do not stop to strip them, but simply heel them in as quickly as possible, and the leaves are soon removed by the moist earth. As soon as winter sets in a good mulch of stable litter is applied on top of the earth to prevent alternate thawing and freezing and drying out during the winter.

It is quite possible to raise Sand Cherry seedlings to fair size even when sown quite thickly in rows, but the average size will be less than where sown thinly. Hence rather thin seeding is preferable. After a plantation is once started and seed readily obtainable Sand Cherry seedlings can be raised very cheaply; in fact, in my opinion, nurserymen will find them easier to raise, one year with another, than native plum seedlings. Sand Cherry seedlings are better adapted to dry land and drouthy seasons than those of native plum, which prefer moister land. Dry seasons suit the Sand Cherry; long continued wet weather favors mildew. It should be remembered that the Sand Cherry is "a child of the sun" and eminently adapted to semi-arid conditions of soil and climate.

Professor Samuel B. Green gives his experience in Sand

Cherry propagation as follows:*

“Propagation—It grows freely from seed, which should be sown as soon as ripe and not be allowed to get dry. Seedlings vary much, and selected plants should be grown in other ways. They fruit in about three years from seed. In many sections the wild plants may be dug and transplanted to the garden. Plants may be increased by layers, suckers and from root cuttings, and by budding and grafting on the Sand Cherry or the native plum. The easiest way to increase them is by cutting the roots around the plants but eight inches away from the main stem some time when the plant is dormant, and all the cut surfaces will sprout and form new plants. If the roots are cut into pieces about six inches long, and these treated like willow cuttings, they will grow nearly as readily. When budded on the plum peculiar looking, interesting trees are formed, which are quite fruitful. The plum may also be worked on the Sand Cherry and it forms a good union, but the roots are so very flexible that the trees are liable to blow over unless the union is set very deep. The common cherry does not take freely on it. At present only seedlings are offered by nurserymen, there having been no named kinds introduced.” •

THE SAND CHERRY ON NATIVE PLUM STOCKS

To avoid the possibility of any mixture in nursery all the selected Sand Cherries at this Station have been budded on native plum stock. If any sprouts appear from below the bud they are easily detected, owing to the wide difference in foliage, whereas if budded on Sand Cherry stock trouble would be caused by sprouts being too near that of the scion in character of foliage. One other reason has been the decided increase in the vigor and productiveness of the plants on black prairie soils. The main start of our Sand Cherries has been those native to sandy soils, and lack of fruitfulness has resulted in some cases when planted on rich, heavy soils, the plants going to wood rather than to fruit. In the vigor

*Amateur Fruit Growing, Samuel B. Green, December 1893, p. 67.

and size of plant there is also a marked improvement when the Sand Cherry is worked on native plum stock, the plum root being specially adapted to rich soil. The fruit is also increased in size somewhat.

One of our selected Sand Cherries, No. 97, was budded on Americana plum stock in August, 1899. The buds made a strong growth the following season. The next season they were left standing in nursery row and fruited heavily on these shoots one year old from the bud. On five of these the fruit was counted; the total number was 576. This first crop was in 1901. The past two years these bushes have fruited abundantly.

Several other varieties budded on native plum stock at the same time have also proved productive, although not as much so as No. 97. One of these has been almost wholly free from mildew, both as one year plants in nursery and as fruiting in permanent plantation. Several other seedlings have been selected because of their freedom from mildew, which is one of the faults of the Sand Cherry, especially in wet seasons. In 1903 the very rainy season appeared especially favorable to mildew, plum pocket and a twig blight affecting the tips of the young shoots. In raising many thousands of seedlings the selection is now very rigid and includes the elimination of all plants showing susceptibility to fungus troubles of any sort. The "No-mildew" series, as they are termed at present, are of decided value from an ornamental point of view, owing to the beautiful shining foliage, especially in the latter part of the summer, when mildew is most prevalent. Whether the seedlings can be bred immune to plum pocket and other fungus troubles also, remains to be determined. Some seed of the fourth generation was planted this spring (1904).

These experiments confirm the earlier experiments in this line.

In October, 1897, C. W. H. Heidemann at New Ulm, Minnesota, reported as follows: "For the purpose of determining the affinity between our native plums and the Sand Cherry (*Prunus pumila*), I inserted buds of the latter on plum stocks.

On my grounds the Sand Cherry had blossomed profusely, but bore no fruit. But on the plum stock it bears heavily. On this stock the growth of the Sand Cherry is stronger and the leaves are larger."

Professor J. L. Budd, in commenting on this note in the Iowa State Register, wrote: "The experience has been verified by parties in Iowa * * * those worked on the native plum bear profusely, when those on their roots do not. The Black Hills variety also bears well when worked on the plum, but rarely holds its fruit as a seedling on common prairie soil. Top-worked it makes a very pretty small round-topped tree for the lawn."

In 1896 Professor John Craig reported the following experiments:*

"While plums or cherries have not taken readily, either budded or grafted, on Sand Cherry stocks, yet when the conditions are reversed and the native plum (*Prunus Americana*, L.) is used as the stock, a ready and permanent union has been effected. Scions of a selected type of Sand Cherry, which were inserted into two year old seedling plum stock—about a foot from the ground—in the spring of 1894, bore a good crop of fruit this year, and made, in addition, a very satisfactory growth. The remarkable thing about the fruit was that it was distinctly better in quality and considerably larger than that borne the same season upon the original parent plant, although the fruit of this latter was fully up to normal size. I am unable to say that we may confidently look for a continuation of this improved size and quality, nor that the union between scion and stock will be permanent. At present this seems to offer a field for interesting and profitable experiment."

PRESENT VALUE

I. The Western Sand Cherry is a native northwestern prairie fruit worthy of being tamed and transferred to the small fruit garden.

*Report Central Experimental Farm, Ottawa, Canada, 1896, p. 124.

2. It is yet in the early stages of development; too much must not be expected at first.

3. Even unselected seedlings are not to be despised in the drier regions of the prairie northwest, where the small fruits of the eastern states are usually a failure.

4. At least one of its hybrids is worthy of a place in the home garden; the Compass may be considered a forerunner of a new race of fruits.

5. Propagators will find the Sand Cherry worthy of attention as a stock in winter root-grafting of the native plum.

6. For orchard houses and amateur plantations it can be used to advantage as a dwarf stock for plums, peaches, apricots and some other stone fruits.

7. It is worthy of a place on the list of desirable low ornamental shrubs for the foreground in clumps of larger growing species.

A PREDICTION

The foregoing pages are a record of exploration into a new field--the log of a voyage on an uncharted sea. The following forecast is offered, which the reader must regard as subject to modification whenever additional experience makes it necessary:

1. The Western Sand Cherry will be found of great value in the commercial propagation of some of the stone fruits.

2. From the Western Sand Cherry will be developed by selection a race of bush fruits with fruit equal to California cherries in size and of quality acceptable for table use.

3. From the Western Sand Cherry will be developed a race of hybrid fruits of a new type by hybridizing with choicer fruits; these "new creations" will be hardy and fruitful on the most exposed prairies.

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