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Second report on the sand cherry as a stock.

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In Bulletin No. 22 appeared the first report of an experiment with the Sand Cherry (_Prunus pumila_) as a stock for the plum and cherry, and it should be read in connection with the following, which gives the result of the second year's experience. 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 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.

In the notes on size of trees allowance should be made for the extreme drouth of 1894. A more favorable season would have shown larger growth.

RESULTS OF CROWN-GRAFTING.

PLUM.

WYANT. Native (_Prunus Americana_). Of 290 side-grafts, 120 grew or 41 per cent. These made an average growth of 18 inches the first year, and at the end of the second year averaged 45 inches in height, strong, stocky, well branched trees.
POTTAWATTAMIE. Native (*Prunus Chicasa*). Of 194 side-grafts, 63 grew or 32 per cent. These made an average growth of 18 inches the first year, and at the end of the second year averaged 42 inches in height, strong, stocky, much branched trees. Some on wild plum (*Prunus Americana*) stocks planted at the same time averaged 48 inches and were somewhat stockier.

**EARY RED.** Russian. Of 390 whip-grafts, 190 grew or 48.7 per cent. Of 427 side-grafts, 293 grew or 68.6 per cent. These 483 trees made an average growth of 12 inches, much branched, the first season. At the end of the second season they averaged 33 inches in height, much branched, mostly slender and not at all stocky.

**LONG BLUE** (No. 20 Vor). Russian. Of 75 side-grafts, 50 grew or 66.6 per cent. These made an average growth of 10 inches, branched, the first year and attained the same average size as Early Red the second year. Evidently the European plums are dwarfed in the nursery more than the native plums are by the sand cherry stock.

**OGON.** Japanese. Of 79 whip-grafts, 31 grew or 39 per cent. Average height the first year, about 12 inches. Of 79 side-grafts, 43 grew, or 54 per cent. Average height the first year, about 16 inches, branched. These all averaged 36 inches in height at the close of the second season, all stocky, thrifty, well branched trees.

**CHERRY.**

**BEESARABIAN.** Of 335 side-grafts, only three grew, which made an average growth of 12 inches, branched, the first year. At the end of the second season one measured 24 inches, branched. The other two were lost amid numerous sprouts from the stock.

**STRAUSS WEICHSEL.** Of 262 side-grafts, only one grew and measured 11 inches the first year. At the end of the second season it measured 15 inches, branched.

**LUTOVKA.** Of 152 side-grafts, only one grew and measured 16 inches the first year. At the end of the second season it measured 26 inches, branched.

**BRUSSELER BRAUNE.** Of 255 side-grafts, all failed. The numerous sprouts are bearing a good crop of fruit.

**RESULTS OF BUDDING.**

**PLUMS.**

**EARLY RED.** Russian. 130 buds were inserted July 15 to 18, 1893. Result when dug in fall of 1894, 62 trees from 16 to 67 inches in height, average 33.29 inches, much branched.

**RICHLAND.** European. 143 buds inserted July 17. Result when
dug, 90 trees averaging 32 inches in height, branched. More sprouts appear from stocks budded with European than from those budded with native or Japan plums.

**Leipsic** (No. 113 Riga). Russian. 47 buds inserted July 22. Result, 40 trees ranging from 15 to 53 inches in height, average 32.43 inches, strongly branched.

**Minnesota.** A Swedish variety from Minnesota. 81 buds inserted July 18. Result, 50 trees from 15 to 77 inches in height, average 42.84 inches. This is a very strong, erect growing variety, not much branched.

**Trabesche.** Russian. 30 buds inserted July 22. Result 18 trees, from 22 to 45 inches in height, well branched. Average 32.94 inches.

**Ungarish Prune.** Russian. 247 buds inserted July 17. Result, 175 trees from 10 to 51 inches in height, average 31.22 inches, well branched.

**Botankin.** Japanese. 183 buds inserted July 17. Result, 159 trees from 25 to 69 inches in height, average 40 inches, very strongly branched.

**Burbank.** Japanese. 164 buds inserted July 20. Result, 145 trees averaging 4 feet in height, very strongly branched. Trees inclined to branch too near the ground, probably caused by the pinching back of the young shoot to prevent blowing off. These two Japanese plums appear well adapted to the sand cherry stock; the buds take readily and most of them make a strong stocky tree of saleable size in one season.

**Wyant.** Native (*Prunus Americana*). 487 buds inserted July 19. Result, 408 trees averaging 40 inches. These are strong, stocky, well branched trees mostly of saleable size.

**August Budding.**

Some of the sprouts that came up from the stocks where the root graft failed were budded about the middle of August with several varieties. The sprouts were mostly very slender. The variety succeeding best was Milton, a *Chicasa* plum, of which 37 trees were dug measuring from 24 to 47 inches, averaging 34.16 inches, mostly whips.

**Cherries.**

**Bessarabian.** 194 buds inserted July 21, 1893. Result, at end of season the following year, 3 trees, 24, 27 and 33 inches, average 28 inches, mostly branched.

**Sklanka.** 262 buds inserted July 21. Result, 5 trees from 27 to 32 inches, average 29.6 inches, mostly branched.
Shubianca (6 M). 247 buds inserted July 22 and 24. Result, three trees; 1 measuring 25 inches, branched; 1 measuring 25 inches, a whip; and one measuring 36 inches, stocky and well branched. These trees were left standing in nursery and the last mentioned tree was full of blossoms last spring (1895), several of which developed fruit.

Early Morello (No. 23 Orel). 146 buds inserted July 24. Result, 3 trees measuring 28, 30 and 35 inches respectively, only the largest one branched.

Yellow Glass. A sweet cherry. 54 buds inserted July 22. All failed.

All the stocks where the bud failed threw up numerous sprouts in 1894 and are now bearing a heavy crop of fruit (1895). Many of the sprouts from stocks where the graft failed are also bearing fruit. Some bore in 1894. This is of interest as our plants from Colorado have failed to fruit at any age although grown on the College grounds for twelve years.

Sand Cherry on Native Plum.

The Pennock or Rocky Mountain Sand Cherry was budded in 1893, on native plum (Prunus Americana) on sprouts from the root where the graft had failed. The budding was a good stand and when dug in the fall of 1894, 108 plants were counted, averaging 33 inches in height. The plants were strong, compact, much branched bushes and would have been larger if budded earlier in the usual way on stocks planted out for that purpose.

Mr. C. W. H. Heideman's experience in Minnesota is that the Sand Cherry fruits abundantly when on the native plum stock, while it is unproductive when on its own roots.

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

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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.