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Raspberries, Blackberries and Dewberries

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SOUTH DAKOTA
Agricultural Experiment Station
South Dakota State College of Agriculture and
Mechanic Arts
BROOKINGS, SOUTH DAKOTA



"The Survival of the Fittest."

RASPBERRIES, BLACKBERRIES
AND
DEWBERRIES

DEPARTMENT OF HORTICULTURE

WILL A. BEACH PRINTING CO.
Sioux Falls, S. D.

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RASPBERRIES, BLACKBERRIES and DEWBERRIES

N. E. Hansen.

Charles Haralson.

The need of hardier varieties of raspberries for the prairie Northwest is well known. Briefly stated, in an immense region ranging from Wisconsin westward to the Rocky Mountains, north of the line passing through northern Illinois, Iowa and Nebraska, our present standard varieties of raspberries must, for the best results, be laid down and covered with earth for winter protection. From the farmer's standpoint, at least, this is expensive and unsatisfactory. The following photographs will give an idea of the work in raspberry-breeding at this Station which was undertaken in order to meet this great need.

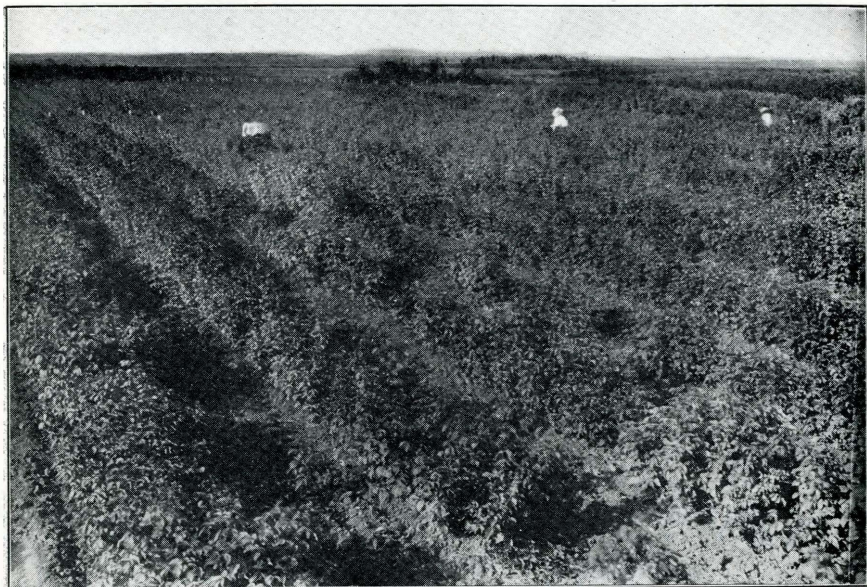


Plate No. 2.—Plantation of seedling raspberries July 18th, 1905, at the South Dakota Experiment Station. The frontispiece shows the same field four days afterwards, the inferior seedlings having been removed.



Plate No. 3.—The Sunbeam Raspberry (South Dakota No. 6). This appeared as a sunbeam when the outlook for hardy raspberries was dark. The first of our thousands of raspberry seedlings to be named. A hybrid of Shaffer with a wild red raspberry from Cavalier county, North Dakota, near the Manitoba line. Plant vigorous, productive, purple-caned, but sprouts freely; foliage distinct, fruit on style of Shaffer but smaller, worthy of trial where raspberries winter-kill, as it has endured 41 degrees below zero without protection. The prairie Northwest must have a raspberry that is hardy without winter protection. First sent out spring of 1906. A promising forerunner of some larger-fruited varieties selected from among the thousands of seedlings now on hand.



Plate No. 4.—A seedling of a wild red raspberry from Arcola, Saskatchewan, Canada, showing the dwarf habit of the plant. The dwarf canes are a characteristic of raspberries from the far north.

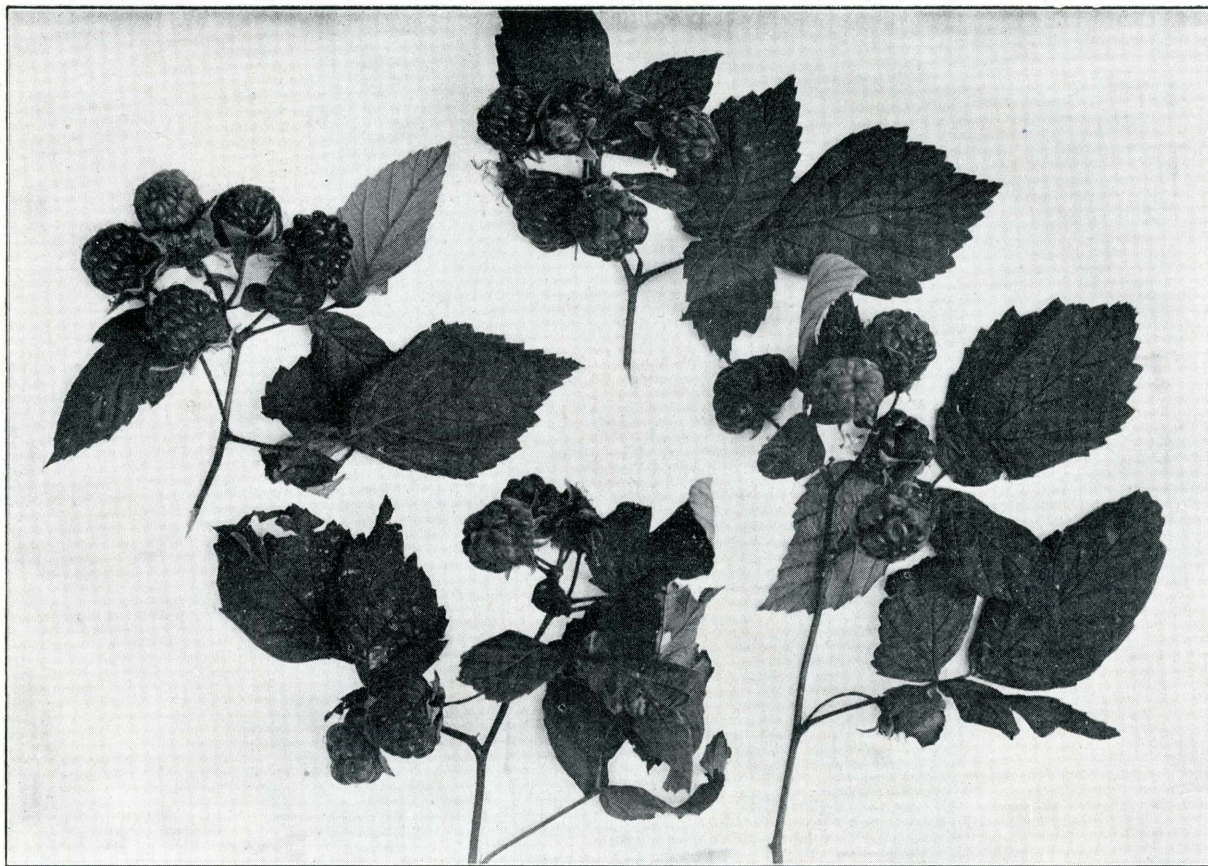


Plate No. 5—A seedling of a wild Raspberry from Crookston, in the Red River valley of northwestern Minnesota.

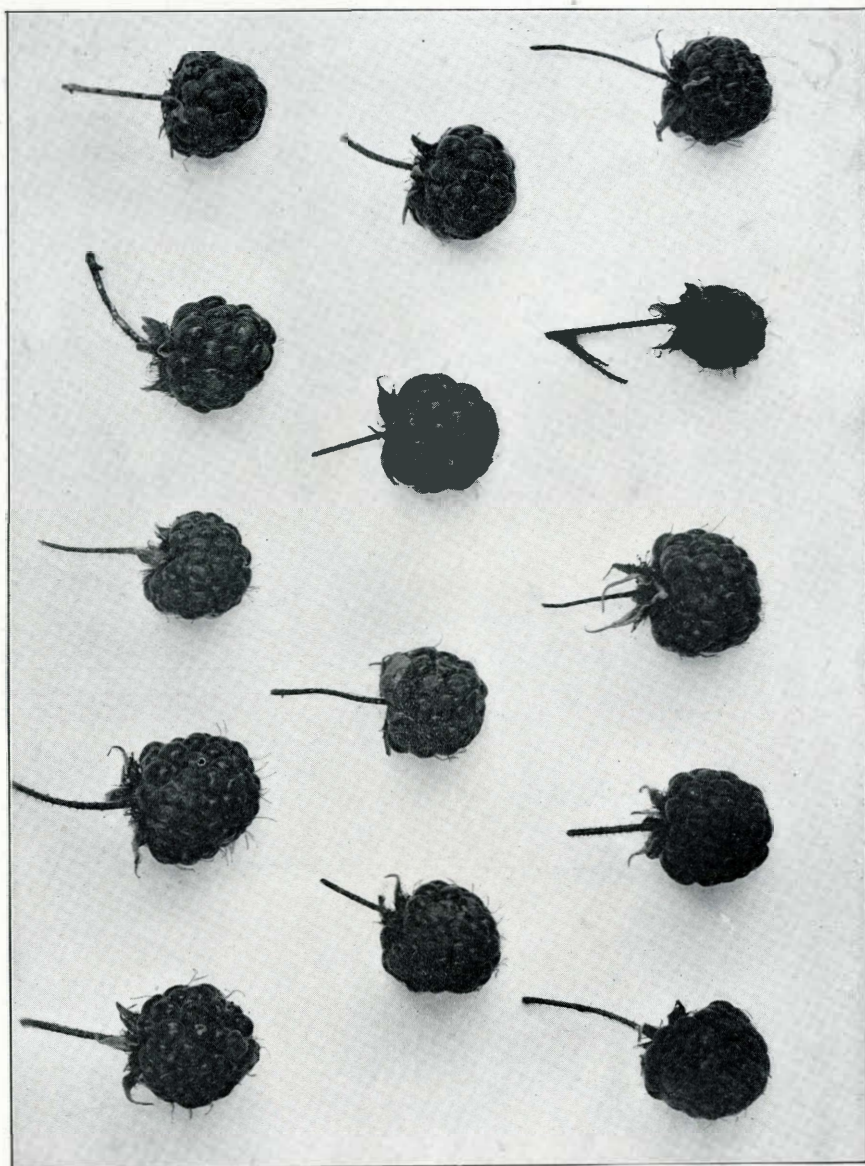


Plate No. 6. - Seedling Raspberries. Read downward.

Left Row. No. 11, a seedling of Wilmot, South Dakota, No. 1 wild. No. 12, a seedling of Wilmot, South Dakota, No. 2, wild. No. 13, a seedling of Wilmot, South Dakota, No. 2, wild. No. 14, a seedling of Wilmot, South Dakota, No. 4, wild. No. 15, a seedling of Wilmot, South Dakota, No. 4, wild.

Middle Row. No. 7, No. 8, No. 9, No. 10, all seedlings of Wilmot, South Dakota No. 1, wild.

Right Row. No. 1, No. 2, No. 3, No. 5, No. 6, all seedlings of Wilmot, South Dakota No. 1, wild.

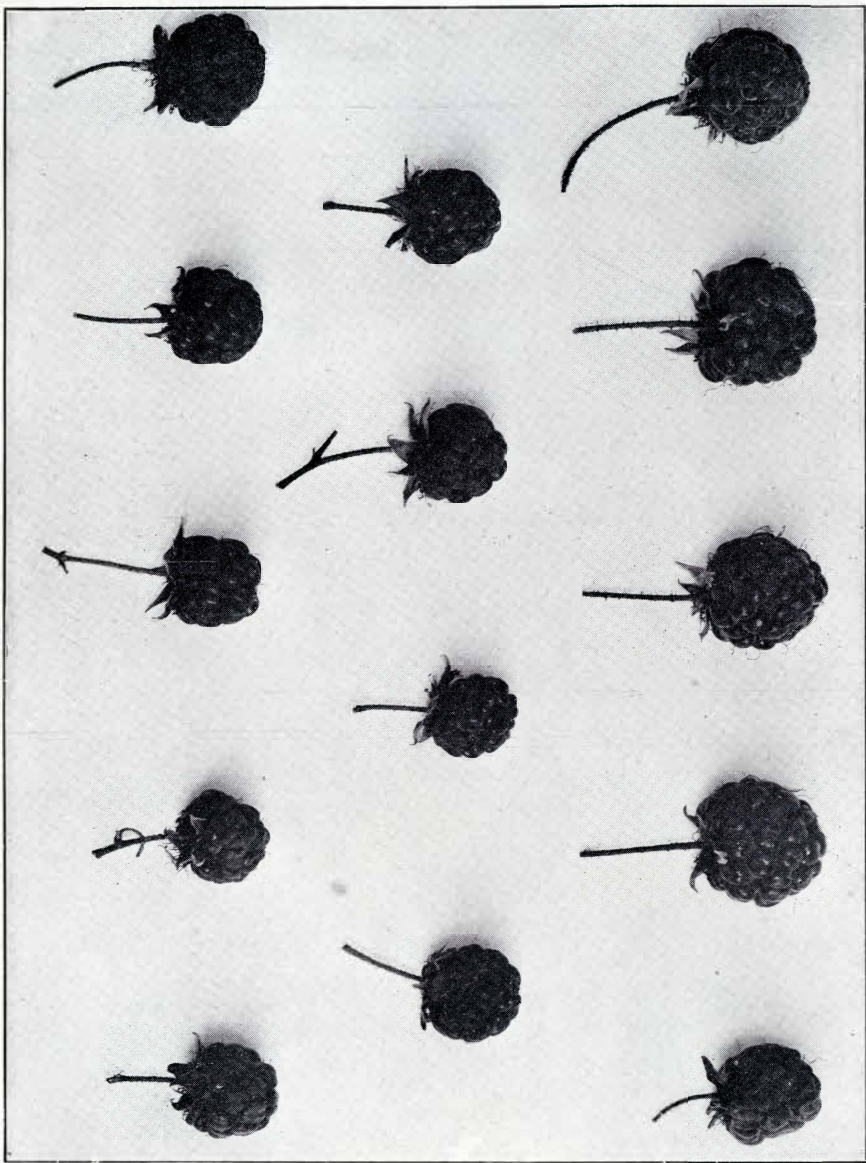


Plate No. 7.—Seedling Raspberries. Read downward.

Left Row, No. 25, No. 26, No. 27, No. 28, No. 29, all seedlings of Crookston, Minnesota, wild.

Middle Row. No. 21, No. 22, No. 23. No. 24, all seedlings of Crookston, Minnesota, wild.

Right Row. No. 16, No. 17, No. 18, No. 19, all seedlings of Wilmot, South Dakota, No. 4, wild. No. 20, a seedling of Wilmot, South Dakota, No. 3, wild.

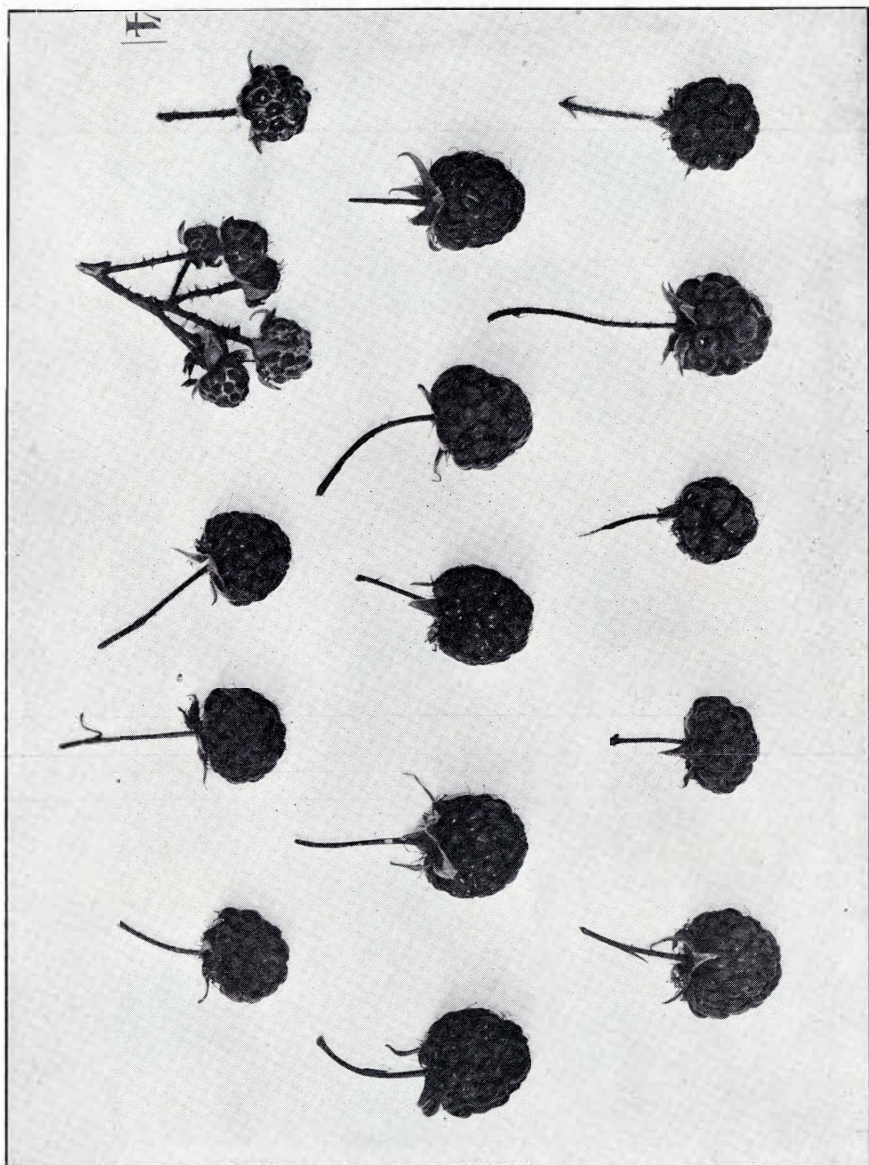


Plate No. 8—Seedling Raspberries. Read downward.

Left Row. No. 40, A seedling of Wilmot, South Dakota, No. 7, wild; No. 41, a seedling of Wilmot, South Dakota, No. 7, wild. No. 42, a seedling of Wilmot, South Dakota, No. 9, wild; No. 43, a seedling of Wilmot, South Dakota, No. 9, wild. No. 44, a seedling of Wilmot, South Dakota, No. 9, wild.

Middle Row. No. 35, No. 36, No. 37, No. 38, No. 39, all seedlings of Rapid City, South Dakota, wild.

Right Row. No. 30, No. 31, No. 32, No. 33, all seedlings of Crookston, Minnesota, wild. No. 34, a seedling of Rapid City, South Dakota, wild.

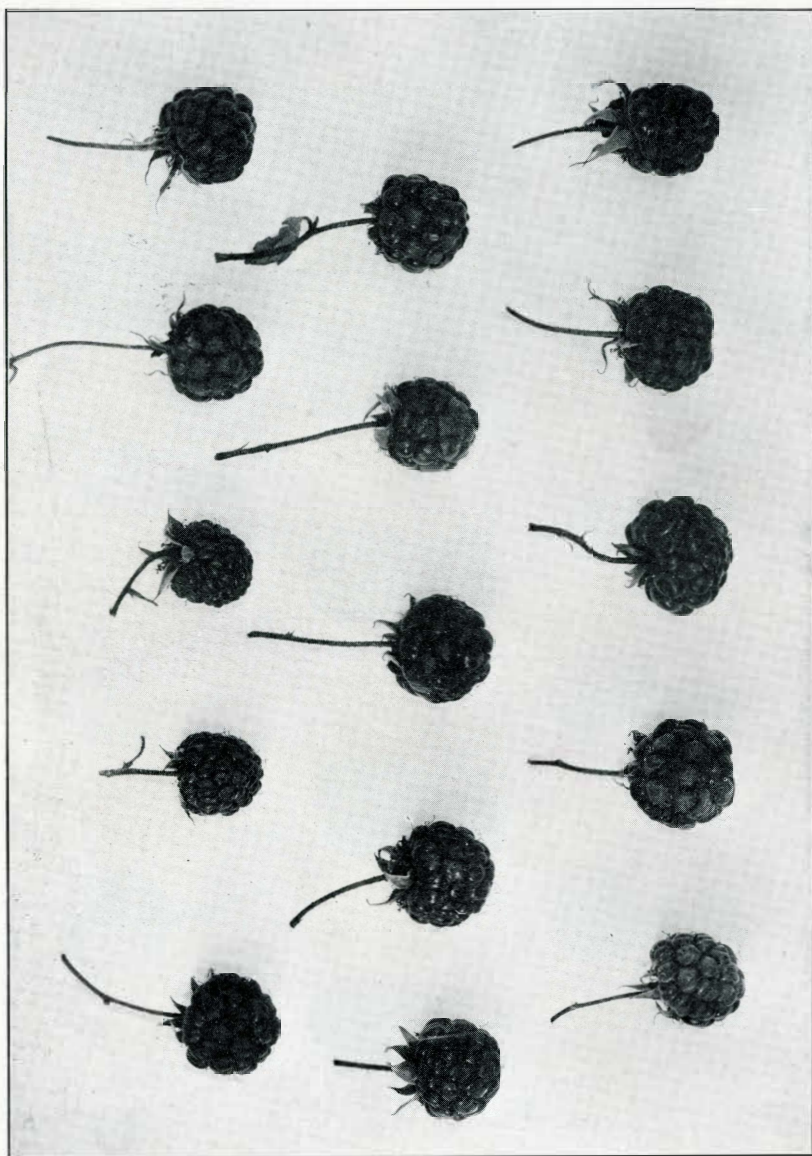


Plate No. 9--Seedling Raspberries Read downward.

Left Row. No. 55, No. 56, No. 57, all Wilmot, South Dakota, wild. No. 58, a seedling of Wilmot, South Dakota, No. 8, wild. No. 59, a seedling of Wilmot, South Dakota, No. 8, wild.

Middle Row. No. 50, No. 51, No. 52, No. 53, No. 54, all seedlings of Wilmot, South Dakota, wild.

Right Row. No. 45, No. 46, No. 47, No. 48, No. 49, all seedlings of Wilmot, South Dakota, wild.

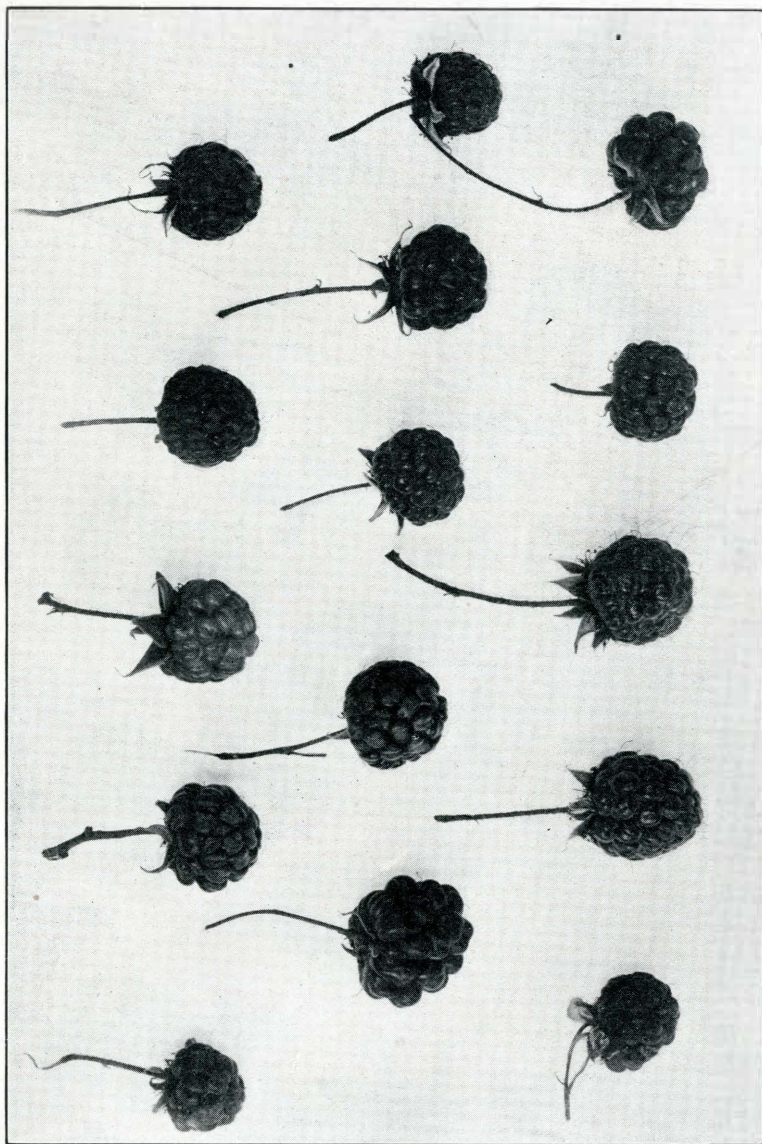


Plate No. 10—Seedling Raspberries. Read downward.

Left Row No. 74, No. 73, No. 72, No. 71, all hybrids, Cavalier, North Dakota, wild x Shaffer; No. 70, a hybrid, Cavalier, North Dakota, wild x Loudon.

Middle Row. No. 69, No. 68, No. 67, No. 66, No. 65, all hybrids, Cavalier, North Dakota, wild x Loudon.

Right Row. No. 64, No. 63, hybrids, Cavalier, North Dakota, wild x Loudon; No. 62, No. 61, No. 60, all seedlings of Wilmot, South Dakota, No. 8, wild;

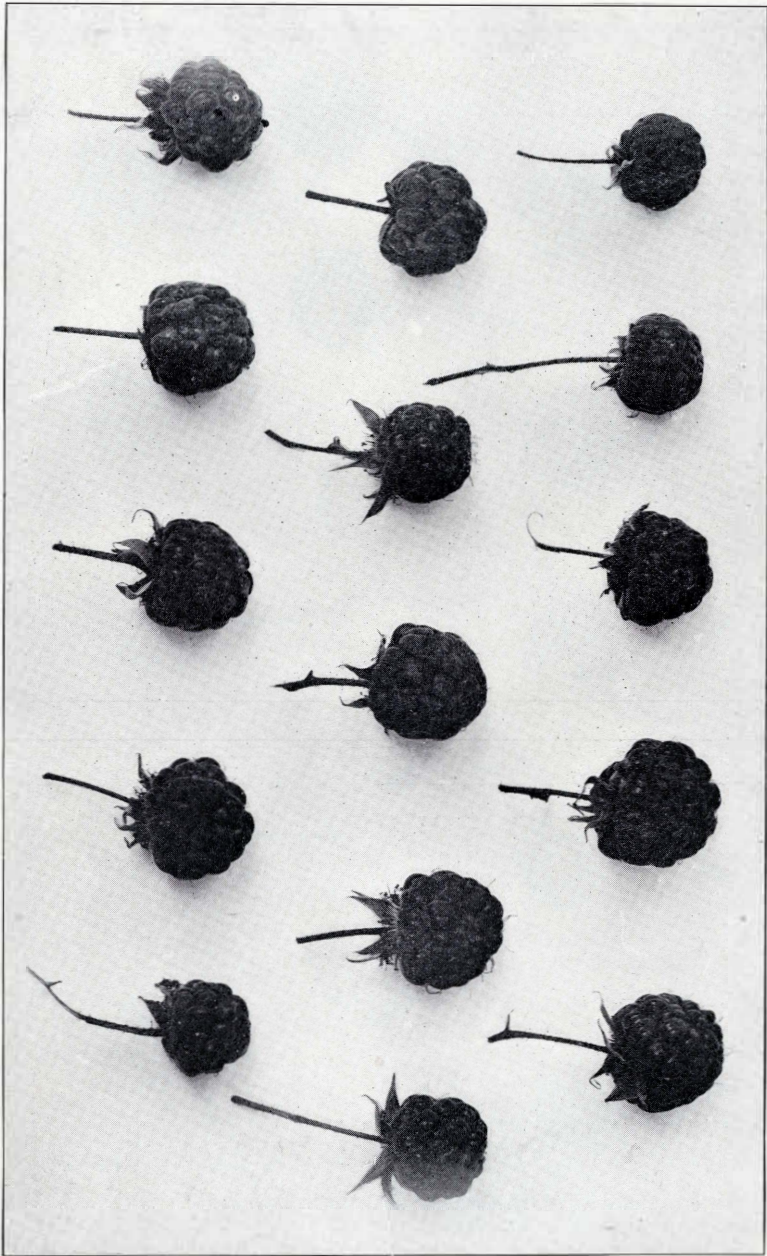


Plate No. 11 - Seedling Raspberries. Read downward.

Left Row. No. 84, No. 85, No. 86, No. 87, No. 88, all seedlings of Wilmot, South Dakota, wild.

Middle Row. No. 79, No. 80, No. 81, No. 82, No. 83, all seedlings of Wilmot, South Dakota, wild.

Right Row. Sunbeam. Sunbeam (late specimens). No. 75, a hybrid, Cavalier, North Dakota, wild x Shaffer; No. 77, No. 78, seedlings of Wilmot, South Dakota, wild.

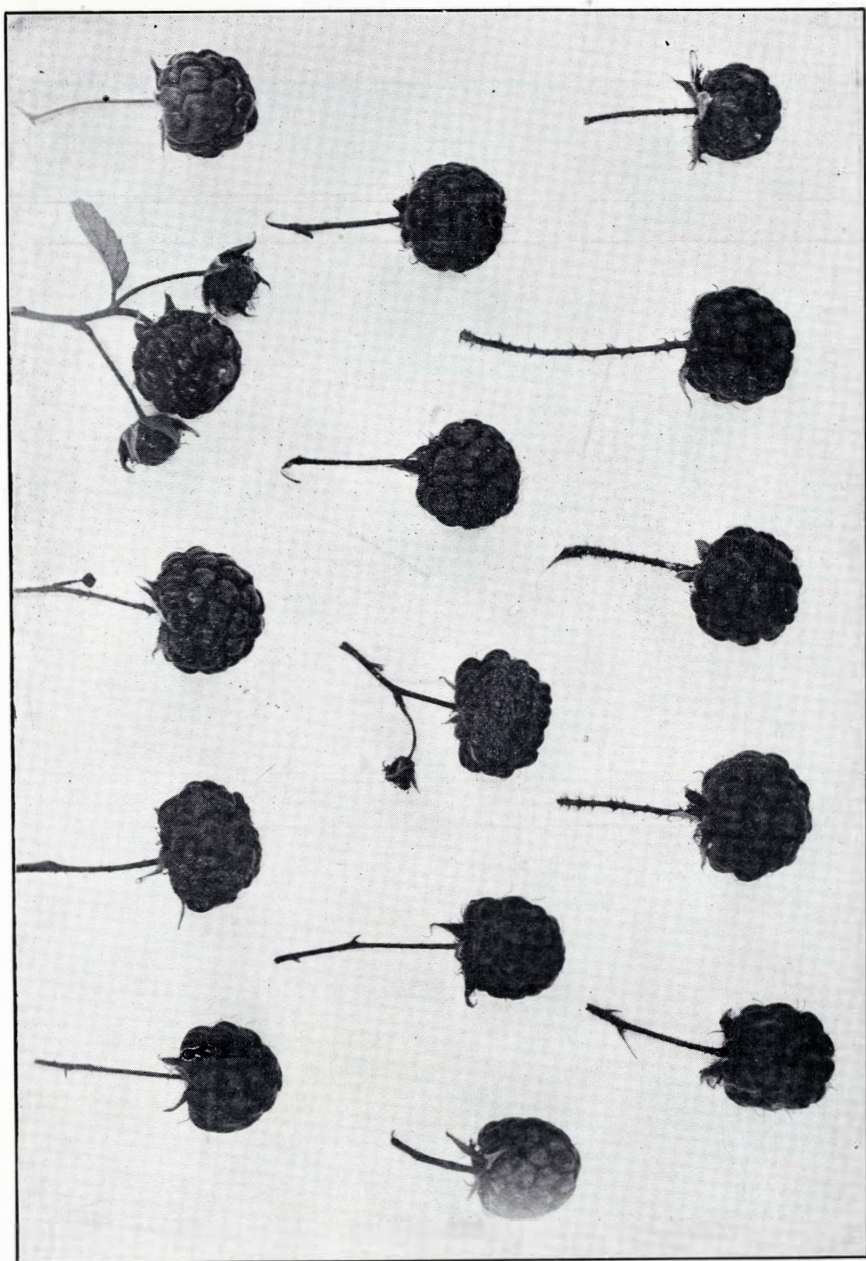


Plate No. 12—Seedling Raspberries. Read downward.

Left Row. No. 99, a hybrid, Cavalier, North Dakota, wild x Columbia; No. 100, No. 101, seedlings of Minnetonka Ironclad; No. 102, No. 103, seedlings of Cavalier, North Dakota, wild.

Middle Row. No. 94, a seedling of Shipper's Pride; No. 95, No. 96, No. 97, No. 98, all hybrids, Cavalier, North Dakota, wild x Columbia.

Right Row. No. 89, No. 90, No. 91, No. 92, all seedlings of Wilmot, South Dakota, wild; No. 93, a seedling of Shipper's Pride.

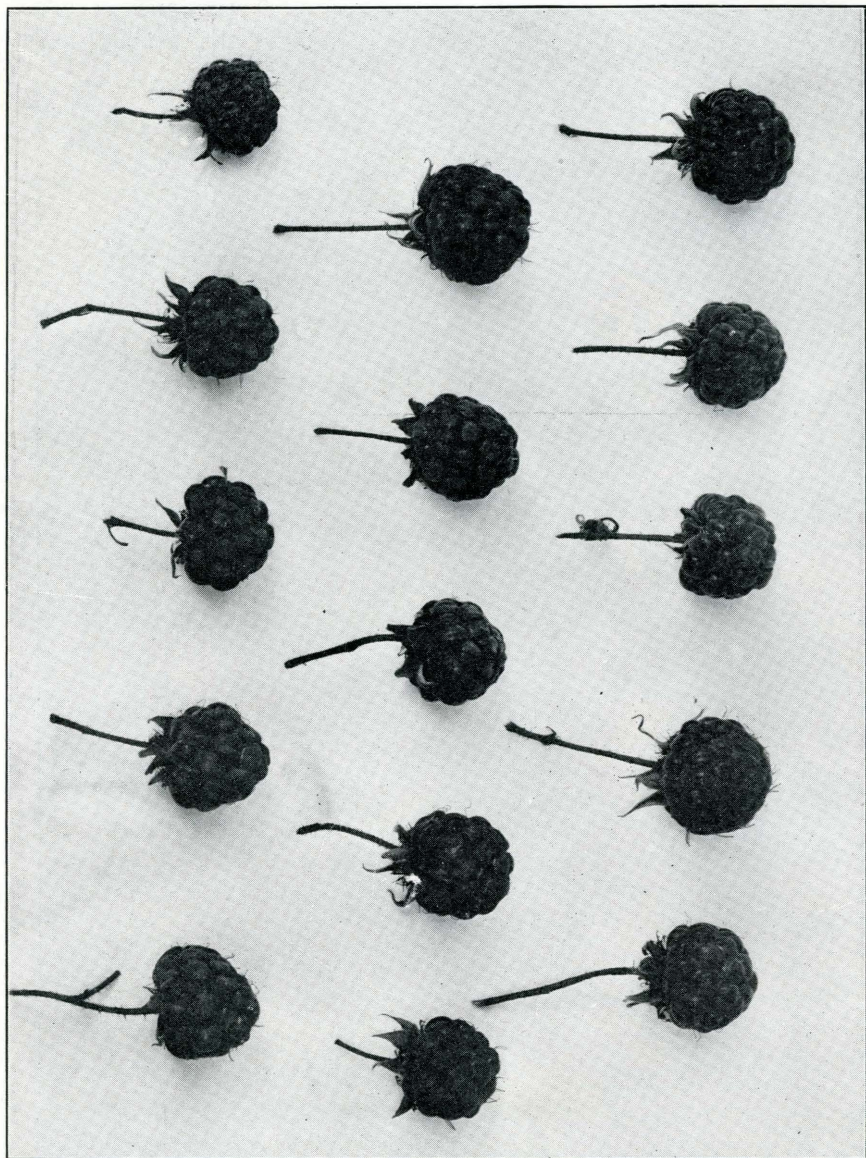


Plate No. 13—Seedling Raspberries. Read downward.

Left Row. No. 115, No. 116, No. 117, No. 118, No. 119, all seedlings of Saskatoon, Saskatchewan, Canada, wild.

Middle Row. No. 110, No. 111, No. 112, No. 113, 114, all seedlings of Cavalier, North Dakota, wild.

Right Row. No. 105, No. 106, No. 107, No. 108, No. 109, all seedlings of Cavalier, North Dakota, wild.

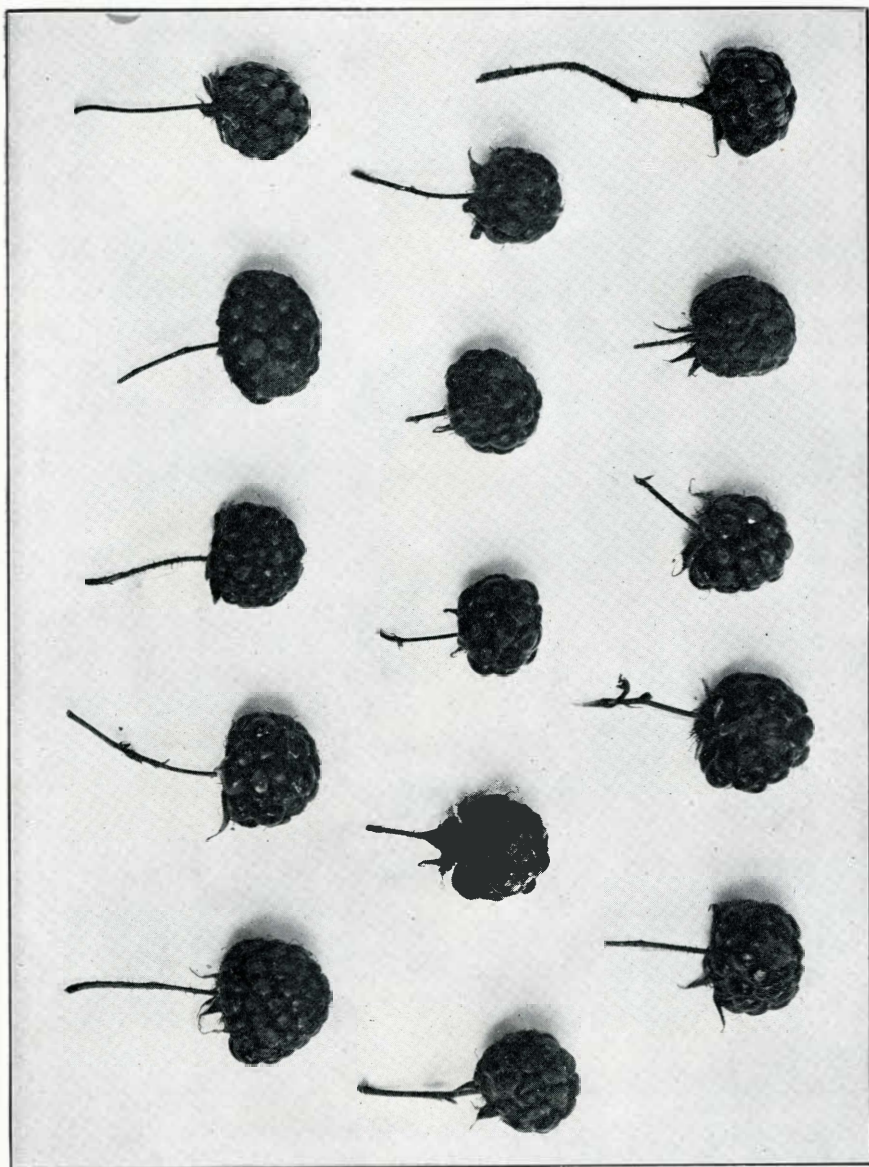


Plate No. 14.—Seedling Raspberries. Read Downward.

Left Row. No. 130, No. 131, No. 132, No. 133, No. 134,

Middle Row. No. 125, No. 126, No. 127, No. 128, No. 129.

Right Row. No. 120, No. 121, No. 122, No. 123, No. 124.

All the above are seedlings of wild raspberries from Saskatoon, Saskatchewan, Canada.

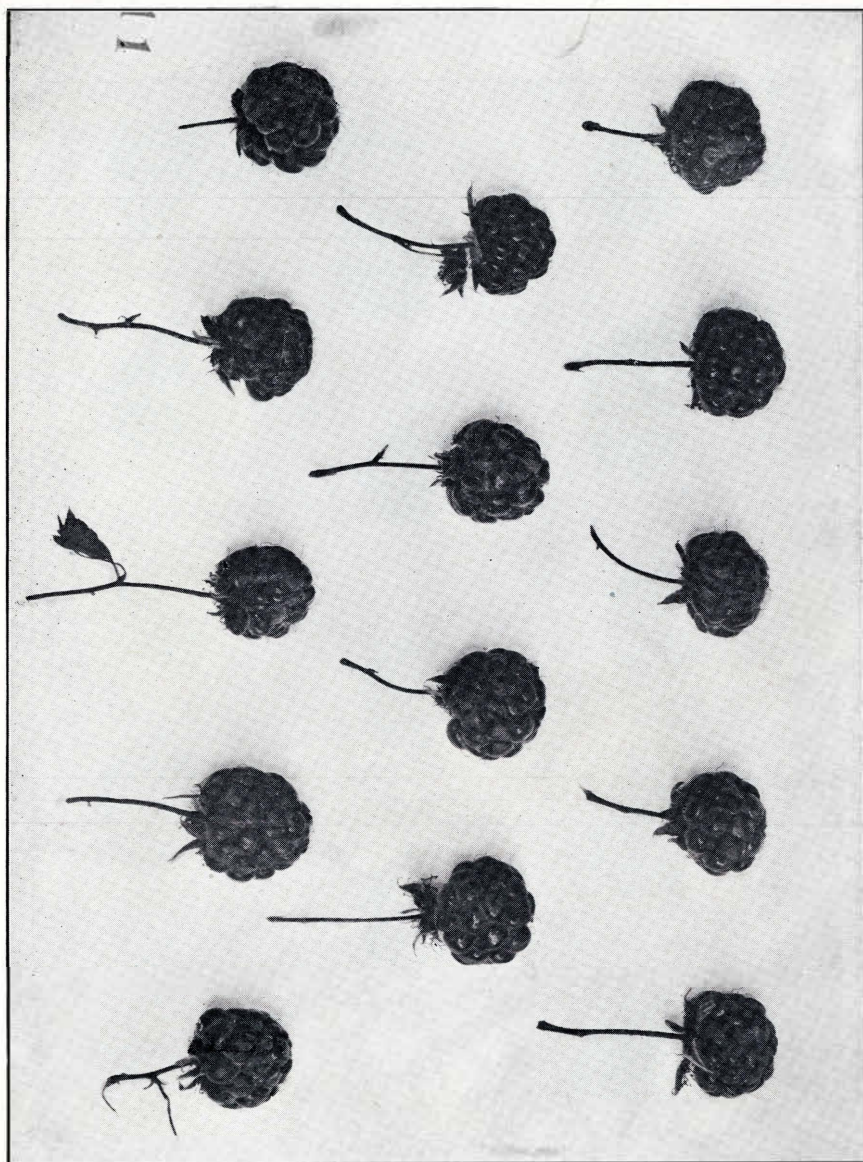


Plate No. 15.—Seedling Raspberries. Read downward.

Left Row. No. 144, No. 145, No. 146, No. 147, No. 148, all seedlings of Arcola, Saskatchewan, Canada, wild.

Middle Row. No. 140, No. 141, No. 142, No. 143, all seedlings of Arcola, Saskatchewan, Canada, wild.

Right Row. No. 135, a seedling of Saskatchewan, Canada, wild. No. 136, 137, 138, 139, all seedlings of Arcola, Saskatchewan, Canada, wild.

Breeding Hardy Raspberries for the Northwest.

(Address by N. E. Hansen, South Dakota Experiment Station, before the American Breeders' Association, Lincoln, Nebraska, Jan. 19, 1906.)

1. That hardier varieties of the raspberry are needed is evident from the fact that all of the present standard sorts are not hardy over a large area of the prairie Northwest.

2. Some of these old varieties are grown under winter protection, the canes being laid down in the fall and covered with earth. This method is expensive and the work is distasteful to the busy prairie farmer, who likes fruit but cannot find time for such extra work as laying down raspberry canes.

3. These tender varieties were developed in large measure from the native raspberries of the eastern states: (1) by selection from large numbers of seedlings under cultivation; (2) by crossing with the cultivated raspberries of Europe; (3) by the finding of choice-fruited plants found growing wild, thus taking advantage of Nature's efforts in this line.

4. The seedlings having much of the European species in their make-up usually proved tender under cultivation, even in the milder climate of the east. But neither these, nor those of pure eastern native ancestry, proved sufficiently hardy in the prairie Northwest.

5. This is another instance of DeCandolle's law that wild woody plants have not advanced one hundred miles north of their natural limits within historic times. But as raspberries of the same species are found indigenous far northwestward, it is quite evident that Nature has accomplished the task of adapting the raspberry to a colder and drier climate. But how many thousand years has she taken to do this work?

6. The great task remains for us to breed a hardy race of raspberries from our native northwestern form of the species. This must be done: (1) by selection from thousands of pure native seedlings under cultivation, the endeavor being to raise as many generations under as high cultivation as possible, until varieties are obtained combining perfect hardiness and productiveness of plant with large size and

good quality of berry; (2) by crossing with the best tame and native varieties of America, Europe and Asia.

7. The present writer's efforts in this line at the South Dakota Experiment Station began ten years ago and are just beginning to show good results. From many parts of the Dakotas, Minnesota, Manitoba and Assiniboia, the native raspberries have been gathered; and many thousands of seedlings raised under high cultivation, both pure-bred and hybrids with other raspberries from three continents. Not all of these have fruited but of those that have fruited a goodly number have been selected as worthy of propagation. One especially is promising at this writing, the "Sunbeam," appearing as the lone survivor to cheer us when the outlook was dark for hardy raspberries. It is the first of our thousands of raspberry seedlings to be named and is a hybrid of Shaffer's Colossal with a wild red raspberry from Cavalier county, North Dakota, near the Manitoba line. The plant is vigorous, productive, purple-caned, but sprouts freely; foliage distinct; fruit on style of Shaffer but smaller; worthy of trial at the north where raspberries winter-kill, as it has endured 41 degrees below zero without protection.

8. The essential demand of a seedling raspberry or of any other of the quarter of a million fruit seedlings raised at this Station is that it must endure the winters unprotected without injury (this means at times—40° F.) with the ground bare, and be productive of fruit of fair size and quality.

9. It is my constant endeavor to breed a cosmopolitan race, not merely one adapted to a narrow range. This cross-breeding of many races may produce this.

10. If twenty thousand seedlings will produce this desired plant, well and good. If two hundred thousand seedlings are necessary, it will be the writer's best endeavor to raise that number. The history of horticulture shows that in large numbers lies rapid progress. And time-saving is an important factor in this rapid age. From the ashes of millions of seedlings will arise, Phoenix-like, the new creations which will dominate our future prairie pomology.

Breeding Raspberries at the South Dakota Station.

The foregoing photographs will indicate some of the results obtained in the work of improving the native raspberries of the Northwest. Many varieties of cultivated raspberries have been tested at this Station in the endeavor to find one sufficiently hardy to endure the winters without laying down in the fall and covering with earth for winter protection. This method is commonly practiced in the raspberry-growing sections of Wisconsin, Minnesota and northern Iowa and the Dakotas; and even manure is added as a mulch over the earth in order to afford further protection. This is too expensive and troublesome for the busy prairie farmer, who farms on an extensive scale. Besides, it is horticulture upon crutches, and hence to be avoided if possible. Some of the varieties were entirely killed, root and branch, even when protected. Other varieties killed to the ground; as the canes are biennial, that is, come up the first year and bear fruit the second year; this meant that there was no fruit obtained.

In order to understand the variety test of raspberries, it is best to discuss briefly their classification.

Classification of Raspberries.

The American Red Raspberry—The wild red raspberry (*Rubus strigosus*, Michx.) is found native according to Dr. Britton "from Newfoundland and Labrador to Manitoba and British Columbia, south in the Alleghanies to North Carolina, and in the Rocky Mountains to New Mexico. Ascends to 5500 feet in North Carolina." The wild red raspberry bears red fruit of tender texture and excellent quality which varies greatly in size and quantity; the plant sprouts freely from the roots so that where hardy they must be kept down by cultivation the same as weeds, otherwise the plants take full possession of the soil. The commercial method is to cultivate them in rows so that they can be cultivated and the superfluous sprouts kept down. The eastern form of the species has been brought under cultivation as will be seen in the following list.

The Black Raspberry—(*Rubus occidentalis*, L.). The black-cap or black raspberry ranges from Quebec and Ontario south to Georgia and Missouri. Ascends to 3000 feet in Virginia. The fruit is purple black in color and the plant propagates by "tips," the ends of the canes taking root as soon as they bend over and touch the ground. It is said to have been brought first under cultivation by Nicholas Longworth of Ohio, who transplanted a desirable wild ever-bearing variety to his garden in 1832. The native red raspberry is probably of still earlier cultivation, but great advances have been made in recent years with both species.

The Purple Cane Raspberry—(*Rubus neglectus*, Peck). These include a group of raspberries intermediate between the black and red raspberries. They are found native from New England to Pennsylvania and are considered to be hybrids of the two preceding species, the red and the black raspberries. The fruit is dark red or purple but the plant propagates from tips; hence the plant may be said to have something of the color of one parent and the habit of plant of the other.

The European Raspberry—(*Rubus Idæus*, L.). The cultivated raspberry of Europe found native over the greater part of Europe and Asia. The varieties introduced have not as a class proven hardy in the United States and have been largely superseded by varieties originated from native American species.

Miscellaneous Varieties. This includes some members of the raspberry family introduced from various parts of the world.

Variety Test of Raspberries at this Station.

This plantation was started mainly in the spring of 1899; other varieties were added from time to time. Any variety proving tender was discarded. In the following list the origin of the cultivated brambles, which include the raspberries, blackberries and dewberries, is given mainly on the authority of Prof. F. W. Card in "Bush Fruits."


7 **Arcola, Saskatchewan, wild.** *Red.* The wild red raspberry of the Northwest Territory, Canada, as found wild

near Arcola, Saskatchewan, proved perfectly hardy at this Station without winter protection. The plants are dwarf in habit and the fruit varies greatly in size and quality. For the fruit of a number of seedlings of this wild raspberry see Plates No. 14 and 15. A very dwarf lot of seedlings, much like those from Saskatoon, but some are promising in size and quality of fruit; see Nos. 136 to 148 inclusive.

Brandywine. *Red.* Supposed origin: found near Brandywine Creek at Wilmington, Delaware. Not hardy, killing to the ground at this Station.

Cardinal. *Purple-cane.* Originated on the grounds of A. H. Griesa at Lawrence, Kansas, 1888; probably a seedling of the Shaffer. Not sufficiently hardy at this Station.

Caroline. *Purple-cane.* Originated with S. P. Carpenter, New York, and considered to be a seedling of Brinckle's Orange crossed with Golden-cap. This would make it a hybrid of the European raspberry with the wild purple-cane raspberry of the eastern United States. Fruit of good size and flavor but the canes kill to the ground at this Station.

 **Cavalier, North Dakota, wild.** *Red.* This wild red raspberry was obtained from Cavalier county, North Dakota, near the Manitoba line. It has proven perfectly hardy without any winter protection of any kind at this Station ever since its planting in the spring of 1898. The plant is of strong growth and sprouts freely; the fruit is of good quality. Out of many seedlings raised, Nos. 102 to 114 inclusive were saved, which are promising as to size of fruit but mostly dwarfed in habit, about two and a half feet.

Champlain. *Red.* A chance seedling found in the garden of Mr. Macomber of Grand Isle county, Vermont, and introduced in 1892. A choice variety of the European type. Winter-killed at this Station.

Chinese Raspberries. (*Rubus xanthocarpus*, Bur. et Franch.) This is a trailing raspberry, the vines of which die off every fall after the ripening of the fruit. The fruit is ovate, bright yellow, large, fragrant, sweet; quality good. This new species was discovered in 1885 by the celebrated Russian traveler, Grigorii Nikolajewitsch Potanin, in the Chinese province Kansu (latitude about 40°). Plants grown

from seed sent by Potanin to the Imperial Botanic Gardens of St Petersburg fruited for the first time in July, 1891. Stock of this new raspberry was secured by the Horticulturist of this Station while in Russia in 1897-8 as Agricultural Explorer for the United States Department of Agriculture. This plant bears large fruit but has proven worthless on the open prairie at Brookings. The fruit is very sparingly produced and the plants are not sufficiently hardy in open exposure. In southeastern Minnesota this plant has done better and fruit has been exhibited at the State Fair. It appears to be more of a plant for covering waste slopes where it can take complete possession and not for the open prairie.

Columbian. *Purple-cane.* Supposed origin: a seedling of the Cuthbert grown near the Gregg, on the grounds of J. T. Thompson, Oneida, New York. A variety of the Shaffer type of the purple-caned raspberries. Fruit of large size, a little later than the Shaffer. At this Station the canes kill back too much to be of any value.

Conrath. *Black-cap.* A chance seedling found in 1886 by C. H. Woodruff, near path of Gregg, at Ann Arbor, Michigan. Winter-killed at this Station.

7 **Crookston, Minnesota, wild.** *Red.* The wild red raspberry of the Red River Valley, as found native near Crookston, northwestern Minnesota, has proven perfectly hardy at this Station without winter protection, and is of much stronger growth than the wild raspberry of Saskatchewan. We now have a number of promising seedlings of it in bearing. See Plates No. 7, 8. For seedlings see Nos. 21-33 inclusive, all of strong growth, fully five feet high.

Cuthbert. *Red.* Probably the most popular of all the old varieties of the American type. A chance seedling found about 1865 by Thomas Cuthbert in his garden at Riverdale, New York City. A choice variety but killing to the ground every year so that no fruit of consequence was obtained at this Station.

Fullmer's Colorado. *Red.* A variety received from a grower in Colorado. The canes kill back too much to be desirable.

➤ **Fullerton, North Dakota, wild. Red.** The wild red raspberry from near Fullerton, North Dakota, proved perfectly hardy without winter protection at this Station and we have many seedlings now in bearing and more are coming on.

Gault. Black-cap. "Found by W. C. Gault, of Ashland county, Ohio, growing by the roadside near his place in 1887." Kills to the ground so that no fruit is produced at this Station.

Gregg. Black-cap. Found growing wild in a ravine on the Gregg farm, Ohio county, Indiana, in 1866. Kills to the ground so that no fruit is produced at this Station.

Kansas. Black-cap. Originated on the farm of A. H. Griesa, as a chance seedling at Lawrence, Kansas, in 1884. Killed to the ground at Brookings so that very little fruit was obtained and the plants were discarded.

Key Prolific. (Johnston's Sweet). *Black-cap.* Found in the Ozark Mountains of Arkansas and grown in Iowa since about 1881. Winter-killed at this Station.

Lotta. (Brackett's No. 101). *Black-cap.* Originated on the farm of G. C. Brackett at Lawrence, Kansas. Winter-killed at this Station.

Loudon. Red. Originated a few years ago by Frank W. Loudon of Janesville, Wisconsin, being a seedling of the Turner crossed with Cuthbert. At this Station this has borne a fair crop occasionally without winter protection but usually kills back so far that very little or no fruit is produced. It is doing much better in the Black Hills section as determined by Prof. F. L. Cook of Spearfish.

Marlboro. Red. A popular early variety originated by A. J. Caywood about twenty-five years ago at Marlboro, New York. Its characteristics indicate that it is a pure seedling of the red raspberry of the eastern United States, although said to be partly of English parentage. Kills back to the ground at this Station so that no fruit of consequence is produced. Hon. Wyman Elliot of Minneapolis, Minnesota, under date of May 14th, 1906, writes: "I find on inquiring there has been very much injury done to the Marlboro red and some other kinds of raspberries. Also the

strawberries are very much injured with only vitality enough to make a few blossoms and in many instances killed outright. We need hardier stock in small fruits and I am pleased that you have started in the right direction to give us hardy stock."

Mayberry. (Japan Golden Mayberry). A seedling of *Rubus microphyllus*, a small-leaved raspberry from Japan crossed with Cuthbert raspberry. Originated in California by Luther Burbank. This killed to the ground in the winter of 1899-1900 and later was killed root and branch. It is hoped that the large, choice fruit will make it valuable for mild climates.

Miller. *Red.* Supposed origin: found near Brandywine Creek at Wilmington, Delaware. Winter-killed at this Station.

7 **Minnetonka Ironclad.** *Red.* F. J. Empenger, Maple Plain, Minnesota, under date of June 25th, 1907, writes: "The name of the Minnesota Seedling or Fairy was changed to the Minnetonka Ironclad. The origin of the Minnetonka Ironclad is that Turner, Cuthbert and wild raspberries were planted together and when in full bloom I used a branch of the wild on Turner and Cuthbert; and then I used the Turner on the wild and Cuthbert, and then the Cuthbert on Turner and wild. I used seed from all three and mixed it. From this seed I produced the Minnetonka Ironclad. This was about 1890."

Mr. Empenger writes under date of April 6th, 1903: "We had many plants come up but only the Minnetonka was hardy enough to suit us. I still grow on a small scale four of the varieties raised from the single lot of seed but they are of very little value."

This has done well at the South Dakota Station, being much hardier than the Loudon or any other cultivated varieties. Height about three and one-half feet, branching freely the second year. The plant suckers very freely, sprouts being found eight to ten feet from the mother plant the second year. Berry of fair size and firmness and of very good quality.

Nemaha. *Black cap.* Found growing wild along the bluffs of the Missouri river in Nemaha county, Nebraska, by Ex-Governor Furnas. Introduced about 1883. This is a popular variety in southeastern Nebraska and other regions of the west and is usually regarded as an improvement on the Gregg in flavor and hardiness. At this Station the canes killed back to the ground so that there was very little or no fruit produced.

Ohio. *Black-cap.* This appears to have originated from the native raspberry of Ohio about forty-five years ago and is the chief variety planted for drying purposes. Killed to the ground at Brookings so that very little fruit was produced.

Older. *Black-cap.* A chance seedling found in 1872 in the garden of Mr. Older, Independence, Iowa. This has proven to be the hardiest of the black-caps as tested at this Station and has borne some fruit but has killed to the ground so that it has demonstrated its sufficient lack of hardiness for profit.

Orange. (Brinckle's Orange). *Red.* The standard of excellence in quality in raspberries. Originated by Dr. W. D. Brinckle of Philadelphia in 1845. Roe considers it a hybrid between the European raspberry and the native species of that section. It was raised from the seed of an English variety. Winter-killed at this Station. Experience elsewhere shows it to be very tender in the Northwest, not enduring even mild winters.

Rapid City, South Dakota, wild. *Red.* This is the wild red raspberry from the Black Hills region of South Dakota. The fruit varies considerably in size on the seedlings but all are of good quality. The plants have not proven as hardy at this Station as the wild red raspberry from the Red River Valley near Crookston in northwestern Minnesota. For seedlings see Nos. 34--39 inclusive. These are promising as to size of fruit but the canes have not always endured the winters without freezing back.

Redfield. *Red.* Found on the farm of D. W. Humphrew, near Redfield, Iowa. Distributed in 1894. Not sufficiently hardy at this Station.

Saskatoon, Saskatchewan, wild. Red. The wild red raspberry of Assiniboia (Saskatchewan), Canada, as found wild near Saskatoon, proved perfectly hardy without winter protection at this Station. It is much the same as the wild raspberry from Arcola in the same province. For cuts of a number of promising seedlings of this raspberry see Plates No. 13, 14, 15. The seedlings are a very dwarf lot running about two and a half feet but promising as to size and quality of fruit. See Nos. 115 to 135 inclusive.

Shaffer. (Shaffer's Colossal). *Purple-cane.* The most popular of the purple-caned raspberries. Originated in the garden of George Shaffer, Monroe county, New York, about 1871. This has been very popular over a wide area east and west owing to its vigorous, upright growth, large fruit and productiveness. Excellent for canning and drying. It is of rich flavor and excellent in quality. Its main fault is its dark color, which is too dark to be attractive, unless picked rather early while yet red, and before it has fully developed its rich quality. This variety was injured too much at Brookings to be of any value but it may have a worthy descendant in the Sunbeam of which it is the male parent, the female parent being a wild red raspberry from Cavalier county, North Dakota, near the Manitoba line.

Shipper's Pride. *Red.* Introduced by Empenger Bros., Maple Plain, Minnesota. F. J. Empenger writes under date of February 20th, 1901: "We got one single plant mixed with a lot of plants from New Jersey and we raised all our plants from this one plant. I call this the Shipper's Pride. We have raised this berry for eleven years. The introducer finds it hardy without winter protection. At the South Dakota Station the plant appears hardy but the berry is rather small and too soft for market. The bush is of dwarf habit about two and a half feet in height so that the plants are somewhat overshadowed by other varieties in adjacent rows. Out of a lot of seedlings of this variety raised at this Station, many winter-killed and only two were saved. See Nos. 93 and 94, Plate No. 12.

Strawberry-Raspberry. This is a rose-leaved raspberry. (*Rubus rosæfolius*, Smith; *Rubus sorbifolius*, Maxim.)

A low plant, one or two feet in height; it sprouts freely, forming dense masses of foliage. It is a native of Japan China and the East Indies. It is not a cross of the strawberry and raspberry as was claimed when first introduced. The fruit is very large, often fully an inch in diameter, but with so large a receptacle that there is not much flesh, and the berries have too large a cavity when picked. There has been considerable controversy and discussion concerning this plant among nurserymen, nearly all now condemning it as worthless. At Brookings it winter-killed, and the fruit was rather small and tasteless. It has dropped out of the catalogues except perhaps as a curiosity. Part of the discrepancy in the opinion appears to come from the fact that it varies from seed. A fruit-grower near Minneapolis is raising it to some extent for preserves, which are of pleasant flavor and of rich dark red color.


Sunbeam. (SOUTH DAKOTA No. 6). *Hybrid.* This is the first of our 7000 raspberry seedlings to receive a name. (See frontispiece and Plate No. 11.) In 1905 it was the tallest growing variety in the plantation of wild and hybrid seedlings. It is a seedling of the wild raspberry from Cavalier county, North Dakota near the Manitoba line, fertilized with pollen of Shaffer. This has proven perfectly hardy without winter protection at this Station, and was first distributed in the spring of 1906. The plant is very productive and sprouts as freely as any of its wild ancestors; the fruit, however, follows the male parent in color. The fruit is medium in size, of good quality but may prove too soft for market purposes. A large number of seedlings have already been raised of this variety and we are using it largely in crossing experiments hoping that the fruit may improve in market quality as to firmness and size of fruit. Our experience with this variety is too limited to venture any definite prophecy as to its ultimate value.

Thompson Early Prolific. *Red.* Sent out about 1888 from Rio Vista, Virginia. A choice variety of rich flavor and color. Not sufficiently hardy at this Station.

Turner. *Red.* Originated many years ago by Prof. J. B. Turner of Jacksonville, Illinois. This has been the

standard of hardiness in the old varieties and one of the best known. It will endure ordinary winters, but the test winters are too much for it. In Dakota it did well until the dry years of the early '90s. If any of the old varieties should be planted the Turner should be one of the first. M. F. Merchant, Ellendale, North Dakota, under date of April 24th, 1907, writes: "Strawberries came through in good condition but Turner and Early King raspberries killed to the ground."

Wilmot, South Dakota, wild. *Black-cap.* The wild black-cap raspberry found near Wilmot, Roberts county, northeastern corner of South Dakota, has not proved especially promising under cultivation. Although hardy in their native woods the fruit canes have not proven sufficiently hardy in open exposure. We have saved two seedlings of it, Nos. 40 and 41. All the plants are very thorny.

 **Wilmot, South Dakota, wild.** *Red.* The wild red raspberry of the northeastern corner of South Dakota, as found wild near Wilmot, Roberts county, has proven hardy and of considerable promise under cultivation. No winter protection has been given. We now have selected a number of varieties which are seedlings of selected Wilmot seedlings. In the preceding plates, Nos. 1 to 11 inclusive, are all seedlings of Wilmot No. 1, a uniform lot of tall-growing, productive, vigorous plants. Numbers 12 and 13 are seedlings of Wilmot No. 2. Numbers 14 to 19 inclusive are seedlings of Wilmot No. 4. No. 20 is a seedling of Wilmot No. 3. Nos. 42 to 44 inclusive are seedlings of Wilmot No. 9; these plants are of very vigorous growth, fairly productive, quality not high. Numbers 45 to 57 inclusive, are a productive lot of seedlings from Wilmot seedlings. Numbers 58 to 62 inclusive, are seedlings of Wilmot No. 8. The fruit of some is of fair size but the bush is rather dwarf in habit. Numbers 77 to 92 inclusive comprise a very uniform lot of large-fruited plants from selected Wilmot wild raspberry. The plants vary in size and vigor

Windom, Minnesota, wild. *Black-cap.* The wild black-cap raspberry of Cottonwood county, southwestern Minnesota, as found wild many years ago near Windom has not proven sufficiently promising or hardy in open exposure at this Station.

Winona. *Black-cap.* A variety from Ohio introduced in 1890. At this Station the canes killed back too much, so that very little fruit was produced.

Hybrid Raspberries Produced at the South Dakota Station.

The production of hybrid raspberry seedlings is being carried on on a somewhat extended scale at this Station. About seven thousand raspberry seedlings have been produced so far in the course of the experiments, in addition to many thousands that have not yet fruited. In 1906, 325 seedlings, almost all hybrids, were selected from a large plantation of seedling raspberries. They have been planted for further trial in a new plantation. Among them are a number of varieties which are very large in size and very productive. The absence of the Horticulturist on a six month's trip last fall through Siberia and around the world as Agricultural Explorer for the United States Department of Agriculture, from June 27th, 1906, to January 2nd, 1907, prevented any detailed observations of this interesting lot of seedlings. In the foregoing plates will be found several seedlings already fruited; none are figured that have not proven hardy without protection.

LOT A. Cavalier wild, crossed with pollen of Loudon. Nos. 63 to 70, inclusive. On some of these the fruit is large and promising. The plants are rather dwarfed, running as low as two and a half feet. Some of the discarded seedlings were very poor plants with nearly all the fruiting canes killed.

LOT B. Cavalier, North Dakota, wild, crossed with pollen of the Shaffer. An uneven lot of seedlings in height and hardiness; many have the brown purple-tinted young leaves of the Sunbeam, (South Dakota No. 6.). See seedlings Nos. 71 to 76 inclusive.

LOT C. Cavalier county, North Dakota, wild, crossed with pollen of Columbia. These rather lack in hardiness as a whole. However, Nos. 95 to 99 inclusive, were saved for further trial. The plants are mostly of dwarfish habit, three feet in height.

Blackberries and Dewberries.

The European blackberry or bramble (*Rubus fruticosus*) is not equal in flavor and quality to that of our native American blackberries, which have attained a high degree of perfection considering the short period since between 1850 and 1860, under which it has been in cultivation. The Ameri-

can blackberries include several groups of plants, mainly eastern and southern in range. The common or Ohio blackberry (*Rubus nigrobaccus*, Bailey; *R. villosus*, authors, not Ait.), is native throughout the eastern United States and ranging far north into Canada. This species is divided into several groups* by Professor Bailey and these have produced many cultivated varieties. None of them as far as tested have proven to be of any value for South Dakota. The dewberries include a group of plants closely allied to the blackberries; in fact they may be regarded as a creeping or trailing blackberry, but there are important points of difference, among which is the method of propagation. Dewberries propagate from the tips of the young shoots taking root, while the blackberries propagate by suckers. In quality the dewberries are usually considered superior to the blackberries. The species are mainly southern and eastern in range and none of the cultivated varieties have proven of any value for this state.

The cultivated dewberries belong mainly to the species (*Rubus Canadensis*, L.) which is found, according to Dr. Britton from "Newfoundland and Ontario to Lake Superior, south to Virginia, Louisiana and the Indian Territory."

In addition to the above there are some varieties which appear to be hybrids of the blackberry and dewberry. It will be a difficult matter to secure a hardy blackberry or a hardy dewberry owing to the lack of hardy northwestern native plants from which to make a beginning. The following notes will give our experience at this Station:

Blackberries.

Ancient Briton. A variety which is said to have come from England to Wisconsin, perhaps fifty years ago. The reports as to its origin are conflicting. Killed back to the ground at this Station. At Sparta and other places in Wisconsin, it is raised in large quantities, the canes being laid down and covered with earth for winter protection.

Early Harvest. A variety found growing wild in Illinois. Winter-killed at this Station.

Eldorado. An accidental seedling from Eldorado, Ohio; introduced about 1882. Winter-killed at this Station.

Erie. An accidental seedling found in 1876 at Tallmage, Ohio. Winter-killed at this Station.

*L. H. Bailey, Evolution of Our Native Fruits.

*Fred W. Card, Bush-Fruits.

Kittatinny. Found at Hope, New Jersey, near the Kittatinny Mountains, and introduced about 1865. This winter-killed too much to be of any value at this Station.

Lovett. Introduced from New Jersey. Winter-killed at this Station.

Rathbun. A variety sent out by A. F. Rathbun of New York. Winter-killed at this Station.

Snyder. The most popular of all blackberries for commercial purposes. Originated as a chance seedling, on or near the farm of Henry Snyder, near La Porte, Indiana, about 1861. Not sufficiently hardy at this Station.

Stone's Hardy. An old variety from Illinois. The canes winter-kill too much at Brookings to be of any value.

Taylor. (Taylor's Prolific). Introduced by Mr. Taylor, Henry county, Indiana, about 1867. One of the choicest in quality of all blackberries. Winter-killed at this Station.

Western Triumph. A chance seedling found in 1858 upon the open prairie, by Mr. Biddle, in Lake county, Illinois. This variety fruited sparingly; the canes were of vigorous growth but killed back too much to be of any value.

Wilson. (Wilson's Early). Discovered in 1854 by John Wilson, of New Jersey. Killed to the ground at this Station.

Dewberries.

Lucretia. This most popular of all the dewberries was found by a soldier of the Civil War near Beverly, West Virginia. At this Station it has proven tender and unproductive.

Mayes. Also called Mayes Hybrid or Austin's Improved. This was found growing wild in Texas, on the farm of John Mayes, about 1880. Winter-killed at this Station.

Windom. Introduced before 1887 by Dewain Cook, Cottonwood county, Minnesota. Exact origin unknown. Mr. Cook states that his neighbor, J. Q. Pickett grew them as early as 1870 and it is thought that he brought them from near the Mississippi river bluffs in Iowa. Not sufficiently hardy and productive at this Station.

Brambles in the Black Hills.*

The horticultural conditions in certain parts of the Black Hills, in the southwest part of this state, are different from those found on the open prairie. Hence it will be of interest to quote the experience of Prof. F. L. Cook of Spearfish.*

*South Dakota State Horticultural Society report, January 1906, p. 122.

"Blackberries, black-cap raspberries, and the hybrid raspberries of the Columbian type, can, on the average, be made to produce no more than half a crop, and are therefore unprofitable commercially. * * *

"It has been my aim to test for this region every promising variety of red raspberries also. A few of the sorts tried are the Loudon, Philadelphia, Turner, Queen of the Market (Cuthbert), Shipper's Pride, Miller, Thwack, Marlboro, Brandywine and Thompson's Prolific. Two of these varieties, Loudon and Marlboro, have for a series of years proven more than twice as productive as any others, and are therefore emphatically the sorts to grow in the Black Hills, until something better is found. The Marlboro is about a week earlier, so the two make a good complement. * * *

"Those who wish to grow black and purple-cap raspberries and blackberries, in spite of the fact that they do poorly in this altitude, will find the Cumberland, Eureka and Kansas black-caps, the Cardinal and Columbian purple-caps, the Ancient Briton and Snyder blackberries good varieties. In midsummer, as soon as new canes reach a height of about eighteen inches, they should be headed back. In the spring it is a good thing to cut back severely. They require the same winter protection as red raspberries.

"Dewberries are productive, but only an expert will be able to make them pay for market."

Summary.

1. Extended experiments upon the open prairies of the Northwest show that it is useless to expect anything of value from the cultivated varieties of brambles (raspberries, blackberries and dewberries) which are all native to the milder climate of the eastern and southern states.

2. It is evidently necessary that we cultivate and improve our native form of these fruits.

3. It remains to be determined whether this will be done by raising the pure wild seedlings of our native species or whether the hardy varieties will come from hybrids of the present cultivated brambles of the southern and eastern United States or of Europe and Asia. At the South Dakota Experiment Station seven thousand seedlings have been raised and fruited in an effort to solve the problem along both lines; and as many more seedlings are coming on from seed sown this spring.