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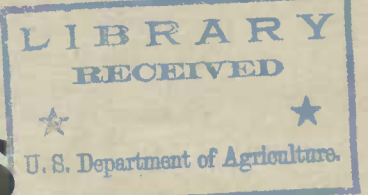
Hansen

INDEXED.

THIS CIRCULAR IS NOW
SUPERSEDED BY CIRCULAR
FOR SPRING 1913.

Spring 1912

Some New Fruits



Originated by N. E. Hansen in the Fruit Breeding Laboratory of the South
Dakota Agricultural Experiment Station

and

Some New Alfalfas

Found in Northern Eurasia by

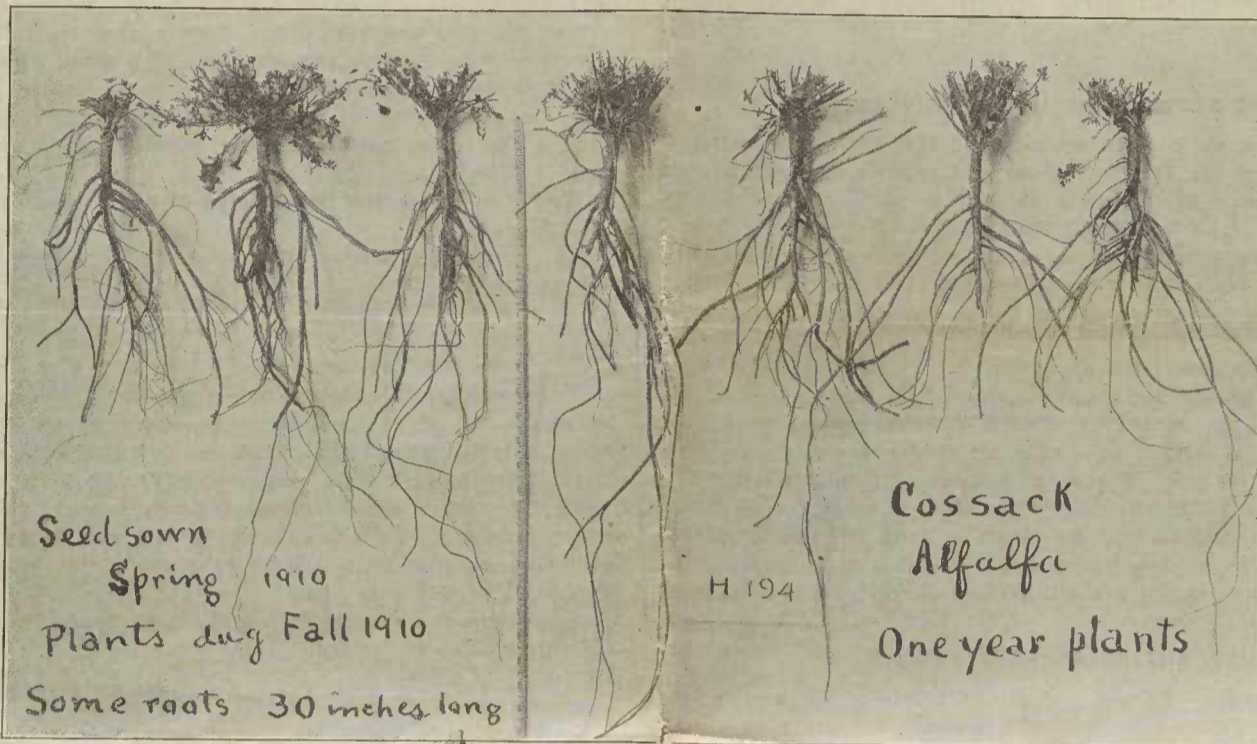
N. E. HANSEN

Hansen

Professor of Horticulture in the South Dakota State College of Agriculture and Mechanic Arts; and Agricultural Explorer for the United States
Department of Agriculture, 1897-8, 1906-7, 1908-9.

In 1911

One
Plant
of
Cossack
Alfalfa
Bore
41,430
Seeds



41,430
Seeds
per
Plant
at
2x4 feet
Means
1029 lbs.
Seed
Per
Acre

My Alfalfa Platform

1. Hardiness against severe cold is a question of Heredity. No perfectly hardy alfalfa has ever been developed in the mild climate of southern Europe or southern Asia.

2. The "acclimatization" of a tender alfalfa is a myth. Acclimatization is a sieve that sifts out less hardy strains, but it does not put into the sieve anything not there in the first place.

3. To develop a hardy strain of alfalfa from a plant coming to us from a mild climate is a ten-thousand-year job. Hence, it is for Nature, not Man, to do such work.

4. We can get our perfectly hardy alfalfa only from climates similar to our own in extremes of winter cold. In other words, *Acclimation* (Nature's work) is possible; *Acclimatization* (Man's work) is impossible.

5. This platform embodies my alfalfa philosophy, formulated after two and one-half years of travel in many lands, on four continents and around the world. It is so radical a philosophy that I do not expect people in general to agree with me, at present. But those disagreeing with these views can not name a single fully hardy variety developed from the old alfalfa.

N. E. HANSEN.

Brookings, South Dakota, February 10, 1912.

SUMMARY

My present belief is: (1) That we can make a perfect success of alfalfa culture in every part of South Dakota; (2) That these new alfalfas will be proof against winter-killing; (3) That some of these alfalfas can be introduced as wild pasture plants on stony, rolling land too rough for cultivation, thus adding greatly to their present carrying capacity for stock.

Please remember: Land that can raise good alfalfa is worth one hundred dollars, and more, per acre. Is it not worth while making a strenuous effort to get our alfalfa culture on a safe foundation? With all loss from periodical and partial winter-killing eliminated, raising alfalfa seed can be made an important industry, since the plant seeds better in regions like the western Dakotas than in those of great rainfall.

The State Legislature, March 3, 1911, appropriated One Thousand Dollars each year for two years, to test these Hardy Alfalfas in every County of the State, under the auspices of the South Dakota Agricultural Experiment Station. Since no federal funds are available for such work, a state appropriation is necessary.

REPORT OF PROGRESS IN 1911.

In March, 1911, I offered to send 10 hardy alfalfa plants free to the first ten applicants in each county. This offer was spread widely throughout the state by courtesy of the newspapers and I received some eight hundred letters. Applicants were required to describe the character of the soil and to state whether they wished the plants for hay or pasture. The supply of plants did not nearly prove equal to the demand, especially the hay alfalfas, and many counties exceeded their quota. All unfilled ap-

plications, together with those received too late, were placed on the waiting list for the spring of 1912.

The letters generally expressed the great need of a hardier type of alfalfa than the one now under general cultivation, as they reported widespread and severe losses of the common alfalfa. This was getting the truth direct from the people instead of articles unduly optimistic, based on limited trials in especially favorable locations. It is my impression that many alfalfa fields which are reported hardy have really been winter-killed in large measure, but that the older plants have been succeeded by the crop of volunteer plants. But this is not the foundation we wish for our alfalfa industry. We must have fields in which no plants whatever winter-kill, plants which are as hardy as any of the native grasses.

The old or common alfalfa is originally from the hot climate region from India to the Mediterranean Sea. In regions where it is perfectly hardy, my advice is, in general, "Let well enough alone." But even then, some alfalfa is needed that will stand heavy pasturing.

In spite of the dry season of 1911, excellent progress was made at the South Dakota Experiment Station at Brookings in raising seed of these Russian and Siberian Alfalfas which I brought over in 1906 and 1908 as Agricultural Explorer sent by Hon. James Wilson, Secretary of Agriculture. The Cossack, Chernob, Obb, Siberia, and many others seeded heavily. One plant of the Chernob alfalfa bearing 25,000 seeds was exhibited at the State Fair at Huron, September, 1911. But within the past few days, in checking up the season's selection work, we find this has been largely exceeded by other plants. One plant, the Cossack, yielded 31,935 seeds; one plant of the Chernob yielded 37,175. Our champion for the season was one plant of the Cossack alfalfa, which yielded three ounces of seed; this means about

41,430 SEEDS ON ONE PLANT.

This plant has plenty of room in good garden soil, on high dry upland prairie; but even if such plants were set in rows 4 feet apart, and 2 feet apart in the rows, this means in round numbers: 1029 lbs. seed per acre, worth at present prices over Two Hundred Dollars. And 100 acres of such plants at 2x4 feet would yield over 100,000 lbs. of seed, enough to transfer our alfalfa industry from an uncertain to a permanent foundation.

A Brief History

In 1906 in the course of my third trip to Russia and second trip through Siberia sent by Hon. James Wilson, Secretary of Agriculture as Agricultural Explorer for the United States Department of Agriculture, I learned that three species of alfalfa grew wild in Siberia, and brought seed of one of them to the United States for the first time. The other two species were obtained on my third trip to Siberia in 1908-9. All three bear yellow flowers. My own estimate of these new alfalfas is that they will extend the alfalfa belt on this continent as far north as we wish to farm. Also that they will be needed mainly in regions where our common alfalfa, native of the mild region between India and the Mediterranean Sea, is subject to winter-killing.

My preliminary report "The Wild Alfalfas and Clovers of Siberia, with a Perspective View of the Alfalfas of the World," was published May 28, 1909, as Bulletin 150, Bureau of Plant Industry, United States Department of Agriculture. A copy may be obtained by sending Money Order or Cash,

ten cents to the Superintendent of Documents, Government Printing Office, Washington, D. C.

So far seed from the 1906 trip has not been available in sufficient quantity for the Experiment Stations, let alone the multitude of private planters eager to test them. My correspondence indicates the intense and widespread interest in the alfalfa question, but farmers must be patient until the relative value can be determined and seed of the best ones raised for distribution.

Seeds will not be available in quantity until the legislature grants sufficient funds for the work at the central station and sub-stations, preliminary to the work of farmers and seedmen.

THE FEEDING VALUE OF ALFALFA.

The great value of alfalfa as a feed for stock is not always fully realized. Our present western ranges are over-stocked and the pressure of population makes it necessary to get more returns from the land. The following quotation from the 1904 Yearbook of the U. S. Department of Agriculture should be remembered:

"The carrying capacity of Alfalfa is, in round numbers, from 3-5 to 1 animal to the acre, while the usual carrying capacity of the native grasses is 1 animal to 8 1-4 acres."

EIGHT MEMBERS OF THE ALFALFA FAMILY.

1. MEDICAGO SATIVA—The Common Alfalfa, Southern Asia.
2. MEDICAGO SATIVA TURKESTANICA—Turkestan Alfalfa.
3. MEDICAGO FALCATA—Europe and Asia.
4. MEDICAGO MEDIA—Hybrid of *M. sativa* and *falcata*.
5. MEDICAGO PLATYCARPA—Central Siberia.
6. MEDICAGO RUTHENICA—Mongolia and Eastern Siberia.
7. MEDICAGO GLUTINOSA—Highlands of Armenia, not yet introduced.
8. MEDICAGO ARBOREA—Tree Alfalfa of Southern Italy and Greece (10 to 12 feet).

RAISING ALFALFA IN HILLS FOR SEED.

The alfalfa seed brought over in my 1906 and 1908 tours was scattered widely in small lots from the Mexican border to Alaska. I have endeavored to give good garden care to the seeds allotted to this department. By this is meant to treat them rather as individual plants, either by transplanting them from flats or after one season's growth, and growing these plants in hills with a view to securing the largest amount of seed. It should be remembered that some of the most valuable of these many varieties of alfalfas were raised from a single spoonful of seed, so that progress has necessarily been slow.

My experience in transplanting and raising alfalfa plants in hills the past five seasons leads me to believe that there is something worthy of our study in this method of raising plants for seed purposes. I hope to experiment further in this line. When the number of plants is small, the plant is not cut but the entire strength of the plant is saved for seed production, and the seed is stripped from the plants by hand. Of course, raising alfalfa for hay is a different proposition altogether, but somewhat thinner seeding than is customary at present will perhaps be of advantage at least in dry regions.

TRANSPLANTING ALFALFA PLANTS

The past three seasons I have raised alfalfa plants by sowing seed in rows with a garden drill and cultivated with a wheel-hoe, much the same as for carrots and beets. The plants make a strong growth and are either plowed up late in the fall and heeled-in outdoors with manure over the earth, or in earth in the storage cellar. Such plants are desirable for transplanting three to four feet apart each way in good garden soil and should be given thorough cultivation. This will encourage free production of seed. Transplanting alfalfa plants is nothing new as it has long been practiced in parts of India and South America.

The roots, when too long for planting straight down the way they grew, may be shortened with a sharp knife. This is better than doubling up the roots to fit the hole. Many of these plants grow roots 24 to 36 inches long from seed sown in the spring close together in garden drills. Set plants as deep as they grew last year, or a trifle deeper, but not shallower. Save seed carefully as it ripens. Do not cut early if at all the first season. Better leave alone till they get established.

SEEDS AND PLANTS FOR 1912.

The past season the blister beetles, grasshoppers and severe drouth all combined to destroy most of the crop of young alfalfa plants, so that the amount available for spring 1912 is only a small fraction of the number expected. So that, allowing for last spring's waiting list and unfilled orders from last spring, and the experiments already planned in various parts of the state, I have no plants to offer, except the North Sweden and the Orenburg. These experiments include tests on the highest points in the Black Hills, and on stony rough pasture lands elsewhere, too rough for cultivation.

In view of the great interest in the subject, it appears better to offer seed in a limited way for the spring of 1912, rather than to wait another year to raise more plants. A packet containing 100 seeds of any one of the following varieties, except Cossack, will be sent for \$1.00 each packet. The surplus of the Cossack alfalfa seed will be offered as a premium for membership by the South Dakota State Horticultural Society, in packets of 100 seeds each. Your soil may not need inoculation with the alfalfa bacteria, but to make sure, a little package of strongly inoculated soil will be sent with each order, with full instructions. These seeds are for careful people who will give them good cultivation and plenty of room in rich garden soil, so as to raise an abundance of seed.

Nine Alfalfas, Pure-bred and Hybrid

Nine varieties are offered for spring 1912; viz: One of the Turkestan alfalfa (*Medicago sativa turkestanica*) group; three of the Sand Lucern (*Medicago media*) group; five of the yellow-flowered *Medicago falcata* of eastern European Russia and Siberia. Further experiments will determine which is the best of these types of alfalfa for each section.

Medicago falcata ranges much further north in Asia while *Medicago media* is a natural hybrid which occurs where the ranges of the yellow and blue flowered alfalfas overlap. The crossing occurs freely where the two grow near together. These hybrid or mule alfalfas are distinguished by wonderful vigor of growth, and their quick recovery after cutting; also the seed does not shatter prematurely. *Medicago falcata* ranges much further north in Asia and is, no doubt hardier, but the seed is inclined to shatter too early; this, however, will no doubt soon be bred out by selection. The plants vary greatly in habit, some as being tall and erect in habit as any plants of the common blue-flowered alfalfa *Medicago sativa*; while others are of low semi-trailing habit. The latter may prove valuable for

steep slopes and mountain pastures, while those of erect habit will, of course, be best for mowing. Russian experience shows that *Medicago falcata* as found native in eastern Russia and Siberia stands grazing much better than the common alfalfa; in my opinion, this Siberian type of *Medicago falcata* will be a valuable addition to our native ranges. Plants can be set at the start by means of cheap hand transplanters, and thus our roughest hill lands, now of little value, can probably soon be vastly increased in carrying capacity as pasture.

ALFALFA FOR HAY AND FOR PASTURE

Four of these, the Cossack, Chernob, North Sweden, and Select Turkestan, retain the seed tightly in the pod, making it easy to save the seed. The other five in which the seed shells as soon as ripe through a long season, will probably do well as addition to our wild pastures, since some of the seed is more apt to find moist soil for prompt germination than if it all ripened at the same time.

WHY NAMES INSTEAD OF NUMBERS

Words are usually retained in memory easier than figures, hence I have given the new alfalfas names instead of numbers. The present plan of giving each state its own agronomy accession numbers makes it very difficult to follow up new introductions. In time, however, the agronomists will, no doubt, adopt rules of priority in nomenclature as stringent as those of the American Pomological Society. The present lack of rules in agronomy nomenclature causes confusion, as it inflicts local bookkeeping on national problems.

HANSEN'S CHERNO ALFALFA.

This is my No. 196 of the 1906 trip (S. P. I. 20716). A Sand Lucern or hybrid alfalfa (*Medicago media*) descended originally from a single plant found wild on the steppes of the Voronezh province, southeastern Russia, land of the Don Cossacks. The flowers are called black-green, but are really a very dark purple changing to a rich green with dark purple veins; plant of strong, very upright growth, a heavy seeder here the past three years. In my opinion this hybrid condition of the plant should be continued and the colors not isolated by selection as it appears to add extra vigor.

Chernob refers to the dark-colored flowers, being the Russian word for "black."

Of course, as a matter of experiment, I am isolating single plants of both Chernob and Cossack.

HANSEN'S COSSACK ALFALFA

This is my No. 194 of my trip (S. P. I. No. 20714). A Sand Lucern (*Medicago media*), a hybrid alfalfa from the Voronezh or Voronezh province of the Don river region of southeastern Russia. This spontaneous or natural hybrid of *M. falcata* and *M. sativa* will sometimes have blue flowers on one branch, yellow on another, sometimes both colors on the same branch; a heavy seeder the past three years. This stock descended originally from a single plant growing wild and in my opinion this hybrid condition should be continued and the colors not isolated by selection as it appears to add extra vigor.

This province is in the black soil region where Indian corn, sugar beets and watermelons are raised.

THE COSSACK AND CHERNO FOR HAY

In a preceding paragraph it was noted that one plant of the Cossack bore 41,430 seeds in 1911. Here it is decidedly stronger in growth than the Turkestan, and appears hardier, although it will probably not go far north as the pure yellow-flowered Siberian alfalfas.

I believe that the Cossack and Chernob will be two of the best hay alfalfas for South Dakota. In color of flower they vary very greatly, scarcely any two plants alike, ranging from the deepest violet purple through red purple, old rose, lilac, green, tan, deep yellow, light yellow, even into clear white. The prevailing colors are as already described.

HANSEN'S NORTH SWEDEN ALFALFA.

This is my No. 51 of the 1906 trip. (Seed and Plant Introduction No. 20571). From twenty-year old fields near Ultuna, about sixty degrees north latitude Sweden. A Sand Lucern of hybrid alfalfa (*Medicago media*), a natural hybrid of the blue-flowered *M. sativa* and the yellow-flowered *M. falcata*, bearing yellow and blue flowers; plant of vigorous upright habit. Judging from its origin it will probably do best in moist cold regions and be resistant to cold rather than drouth. The rainfall in 1908-09 was above normal and the plants seeded heavily. In the dry seasons of 1910-11 the plants seeded well but the plants were not as vigorous as the Cossack and Chernob, especially the past very dry season, 1911. My opinion is that this plant should go farther east and especially northeast; from northern Minnesota east to the Atlantic Ocean, and perhaps far southeast or on our northern Pacific slope, where the rainfall is greater.

We have both one and two year plants available. Price of plants, packed ready for shipment, one year old, \$1.20 per 50, \$2.00 per 100; two year old, \$1.50 per 50, \$2.50 per 100.

HANSEN'S SELECT TURKESTAN ALFALFA

This is *Medicago sativa turkestanica*, No. 191 of my 1906 trip (S. P. I. 20711), originally developed from seed of a single plant found at Tashkend, the capital of Russian Turkestan. This plant is remarkable for its erect and vigorous growth. At Moscow it was found very hardy and productive, a beautiful plant, where the French lucern, by which is meant the ordinary cultivated alfalfa of southern Europe, winter-killed. This variety will be appreciated wherever the Turkestan alfalfa is found fully hardy.

HANSEN'S ORENBURG ALFALFA

This is my No. 261 of my third tour to Siberia, 1908. This is *Medicago falcata*, grown from seed gathered for me from plants growing wild in the dry steppe region at Orenburg, Orenburg province, on the extreme eastern border of European Russia. Summer heat of 98 degrees above, and winter cold of 33 degrees below zero Fahrenheit, are not uncommon. The annual rainfall at Orenburg is a little less than 16 inches; in this region the yield of hay from this wild yellow-flowered alfalfa is reported at 300 Russian "pood" per dessiatine, which equals two tons per acre, and the yield of seed 26 pood per dessiatine, or 348 pounds per acre.

We have some two-year-old plants from seed sown thickly in garden drills in the spring of 1910 and not transplanted. We find there is a small proportion of blue-flowered plants in this lot, both the blue and yellow-flowered alfalfas being found in this region, but they can easily be separated; the blue-flowered would then naturally be of the Turkestan alfalfa group.

Price for these two-year-old plants packed ready for shipment, \$1.50 per 50, \$2.50 per 100.

HANSEN'S SAMARA ALFALFA

This is my No. 201 of the 1906 trip (S. P. I. 20721); of tall erect growth with beautiful yellow flowers *M. falcata*. From the dry steppes of Samara province in the Volga river region of eastern Russia. This may range further south than the Omsk and Obb Siberia strains, but should be found drouth-resistant and sufficiently hardy for South Dakota.

HANSEN'S OMSK 1908 SIBERIA ALFALFA

Hansen's Omsk Siberia Alfalfa (1908 seed). This was grown from seed gathered from wild plants near Omsk, Akmolinsk province, western Siberia (S. P. I. 24453) in my 1908 trip to Siberia, hence is really the same as my No. 199 of my 1906 trip (S. P. I. 20719) *Medicago falcata*, gathered in the same place. The plants hold their own perfectly with other native plants in the compact prairie or steppe sod. Omsk is in latitude fifty-five degrees. A plant of vigorous habit with bright yellow flowers. The plant varies somewhat in erectness of habit so that there is room for improvement by selection.

HANSEN'S OBB SIBERIA ALFALFA

This is *Medicago falcata* gathered in my 1908 trip (S. P. I. 24452) on the open steppes near Obb on the Obb or Obi river of the Tomsk province, central Siberia. In hardiness and general characteristics it is much like the Omsk Siberia strain.

HANSEN'S SEMIPALATINSK ALFALFA

Plants grown from seed gathered from wild plants in the dry steppes of the Semipalatinsk region, Akmolinsk province, southwestern Siberia. Plants are mostly of the tall growing type much the same as the lot I gathered in 1908 on the Irtysh river about ten miles north of Semipalatinsk, (S. P. I. 24455), from plants of erect habit, with stems some of which were five feet eight inches long. Flowers bright yellow. This is *Medicago falcata* from a region with very cold winters and dry-hot summers.

ALFALFAS FOR EXPERIMENT STATIONS ONLY

A few seeds can be spared for Experiment Stations only of several other strains of alfalfa from Siberia, including semi-erect and trailing forms which will be desirable for trial only on steep slopes and for pasturing, at the same price per packet of 100 seeds.

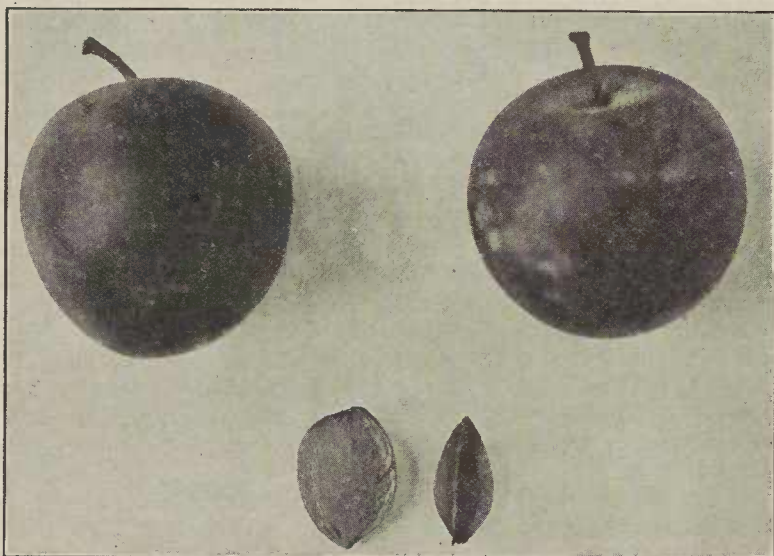
Hansen's Samara Perennial Clover

This is more for Experiment Stations than for private planters until better tested. This is No. 34 of the 1906 tour, (S. P. I. 20654), *Trifolium alpestre* Crantz; according to other authorities *Trifolium medium* L. The exact botanical status of the plant remains to be determined. A wild clover from the Samara province of the Volga river region of eastern European Russia, allied to the red clover, but the leaf is different, and color of heads is of many shades of red, running into purple. A drouth-resistant, tap-rooted, perennial clover, native in the dry steppes of extreme eastern Russia, recommended for cultivation by the Russian authorities as being immensely superior in hardiness and drouth-resistance to the red clover of western Europe, which extended tests show to be very decidedly lacking in hardiness. A good seeder at this station and plants started in the spring of 1907 are still productive after five season's growth, so it must be a true perennial.

In common with so many of the wild legumes when first brought into cultivation the seed may contain many "hard" seeds hindering prompt germination. It may be well just before sowing to run the seed through a seed-scratching machine, such as now used by some European seedsmen, according to the method first introduced by Dr. Nilsson of Svalof, Sweden. For a few seeds a fair substitute for this is mixing the seed with sharp sand in a bag and pounding the bag against a board.

Price of seed per 1-2 ounce, \$1.00.

Some New Fruits



TOKATA PLUM.

Offered for the first time. Tokata is the Sioux Indian for "go forward." Female parent is the large, firm-fleshed, fragrant apricot plum of China, (*Prunus Simoni*), popular in the orchards of California; male parent, De Soto, a well known native plum (*Prunus Americana*) from southwestern Wisconsin.

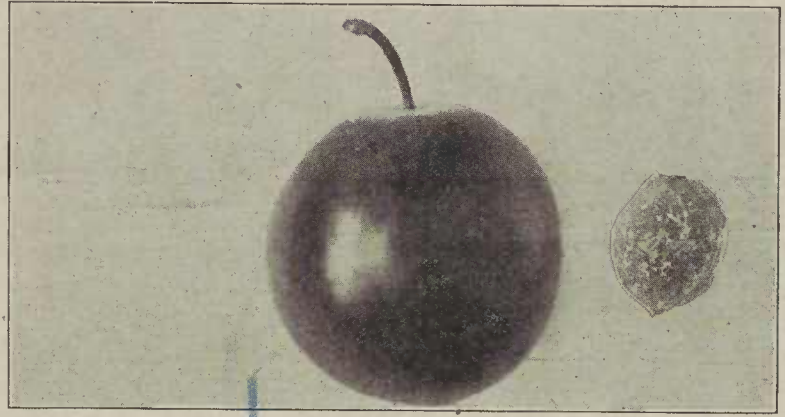
The four varieties sent out from this Department: Hanska, Inkpa, Kaga, Toka, show that the firm flesh and rich fragrance of the apricot of China can be combined successfully with the native northwestern plum, *Prunus Americana*. In a way, the Tokata is a reciprocal hybrid of these two species, since the native plum in this case is the male instead of the female parent.

The fruit is regular in form, roundish, slightly oval, with apex flat. In 1911 the size was 1 3-8 x 1 7-16 inches in diameter. The skin is of a rich dark orange red, slightly mottled with numerous orange dots suffused in the skin covered with light lilac bloom. The flesh is of a rich orange red color, very firm and with the rich *Simoni* flavor when fresh from the tree. Pit free. When cooked a few minutes in sugar syrup the sauce has the rich Chinese apricot flavor, which is superior to any of the native plums and to the ordinary California plums as we receive them in this market. Tree of good upright habit.

As to how far north this variety can be grown remains to be deter-

mined by experiment, but it can scarcely be expected to go outside of the natural successful range of the DeSoto plum.

No nursery trees available for spring but can spare 100 feet of scions. Price, 2 feet for \$1.00. Can spare twelve bearing trees, six feet in height, thinned out from nursery row, cut back for scions. Price each tree, \$5.00.



KAHINTA PLUM.

Offered for the first time. Kahinta is the Sioux Indian name for "sweep." Female parent: the Apple plum, a Japanese variety originated by Luther Burbank of California; male parent, the Terry, a native plum (*Prunus Americana*), originated by the late H. A. Terry of Crescent, Iowa.

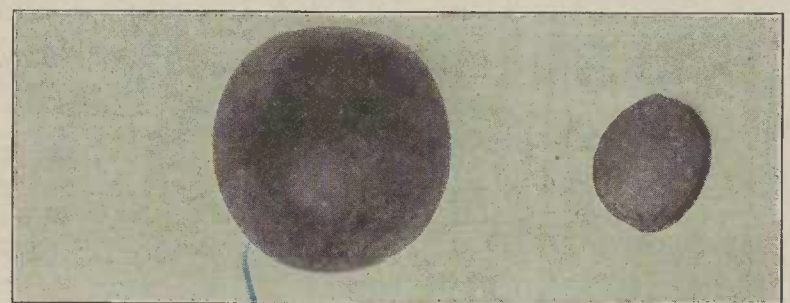
I have several seedlings of this pedigree, all with fruit of excellent quality, approximating that of the peach in excellence.

Fruit 1 1-2 inches in diameter, dark red, roundish, slightly oval, very heavy, the heaviest plum on the ground the past very dry season, weight being about one ounce. Fruit freestone, skin thin, no acidity; flesh firm, yellow, sweet. A few scions only, available this year. Price, 2 feet for \$1.00.



OZIYA PLUM.

Offered for the first time. Oziya is the Sioux Indian name for "to refresh." Female parent, Red June, a large early Japanese plum; male parent, DeSoto, a well known native plum from southwestern Wisconsin. Oziya was our earliest large plum in 1911, remarkable for its large size and very bright red color; flesh light yellow and of excellent quality. The original tree and the few trees propagated from it bore heavily the past season, the best specimens measured 1 5-8 inches in diameter. This plum should be of value for market as an extra early plum. I am satisfied that the Oziya, since it has a true plum pit, is a true hybrid of the Japanese plum and the native plum, whereas the Skuya, which I supposed to be of the same pedigree, after further study appears to be a sand cherry hybrid, as noted in Bulletin 130. Oziya plum jam is really remarkable for its bright cherry color and superb flavor, the skin cooks soft and disappears entirely and there is no trace of the native plum acidity. A few scions only, available this year. Price, 2 feet for \$1.00.



TETON PLUM.

For many years I have been endeavoring to collect pits and scions of pure wild plums in various parts of South Dakota, both by correspondence and personal field work. My best success in this line was in 1904 in exploring along the Missouri near Campbell, in Campbell county. This tree was found in a small plum thicket a short distance from the Missouri River. The fruit was 1 3-8 inches in diameter, color a good clear red; flesh of good quality. Later in the season I returned to cut scions from three of the trees in this thicket. These trees bore heavily the past season. One of them I have named Teton in honor of the Indian tribe living in that vicinity. This plum is practically a freestone; the skin is thick but cooks readily. It is the best representative of the pure native plum of this state that I have found up to date. Offered for the first time.

Only a few scions available this year. Price, three feet for \$1.00.

CIKANA PLUM-SAND-CHERRY.

Offered for the first time. Cikana is the Sioux Indian name for "small." Of the same pedigree as Opata but much later in season. This pedigree is: Female parent, the Dakota sand cherry (*Prunus Besseyi*); male parent, the Gold plum, a very large hybrid Japanese variety originated by Luther Burbank and for which Three Thousand Dollars was paid when first introduced.

Fruit a glossy black, round, one inch in diameter; skin very thin, free from acidity; flesh green, slightly red at pit, very pleasant; quality very good for the table. The Cikana would make a good substitute for the black California cherry when cooked. When cooked with pits in it cooks soft in about half an hour and the black skin gives the sauce a beautiful rich red color. The flavor is milder than that of Ezaptan. A few scions only, available this year. Price 2 feet for \$1.00.

CHAMPA SAND CHERRY.

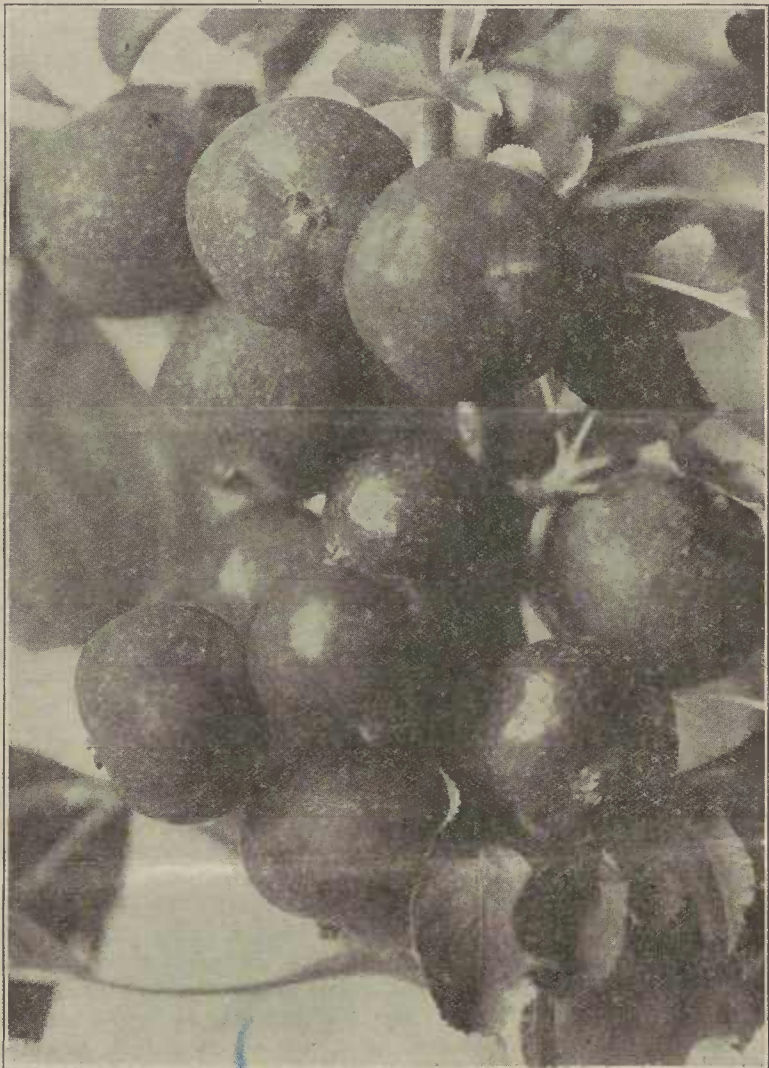
Offered for the first time. Champa is the Sioux Indian name for "cherry." A seedling of the Sioux, one of our pure sand cherry seedlings. The bush is of strong upright growth for a sand cherry, the original plant is about 5 feet.

In quality for table or culinary use, the Sioux seems to be the best out of the many thousands of sand cherry seedlings grown at this station. But the Champa exceeds the Sioux somewhat in size and appears to be the largest sand cherry to date. Color, glossy black; pit small, long rather than round. These pure sand cherries should be gotten on own roots as soon as possible by layering, as budding is expensive. Some of those who have the Sioux and Tomahawk sand cherries are doing this. A unique method, which was introduced by C. W. Gurney of Yankton, S. D., is by "high buds;" that is, budding two or three feet from the ground on native plum stock, thus giving a neat round-headed plant, very fruitful and ornamental for the home garden.

Available stock of the Champa for this spring: 230 plants, 12 to 18 inches, mostly branched, budded on native plum seedlings. Price, 2 plants for 50c.

These plants should be set a little deeper than they stood in the nursery, making it easier to make layers.

Sand cherries are for dry climates and dry soils, in moist soils and climates they mildew and are unproductive. The drier the soil the better the sand cherry seems to like it, the more the sand cherry is at home. Hence, it deserves a place in the small fruit garden of the western settler.



AMUR CRAB-APPLE.

Offered for the first time. Raised from seed of the selected Siberian crab known as *Pyrus baccata cerasifera*. *Cerasifera* means cherry-bearing, referring to the bright cherry-like color of the fruit. The word Amur refers to the Amur River region, the original home of the pure Siberian crab, *Pyrus baccata* in eastern Siberia.

There is a great demand on the market for a medium-sized crab-apple, not too large in size, free from blight, and equal in color to the Transcendent. The Amur is my first attempt in this line after raising thousands of crab apple seedlings. This is offered as an improvement on the Transcendent crab, not in size but in color, being an intense bright red with a light bloom, a beautiful fruit. The jelly of the Amur is a bright ruby red, that of the Transcendent light pink; the Transcendent sauce cooks yellow, that of the Amur a pleasing bright red.

If the tree proves as productive and free from blight elsewhere as at this station Amur will be worthy of trial. The upright habit of the tree and the bright glowing color of the abundant fruit makes the tree very pleasing from an ornamental standpoint, even should the fruit be ranked too small to compete with the larger crabs. A few scions only available this year. Price, 50c per foot.

THE APPLE.

Special attention is now being paid to the apple, as the most important problem of all is a hardy winter apple. After fruiting a multitude of apple seedlings and after wide travel in many lands, I believe the future is full of hope in this line and that the longed-for apple is on the way and almost here.

After raising fully 10,000 apple seedlings along various lines of pedigree, I have yet no apple to offer as a candidate for the winter apple which is so much desired by several million people in the prairie northwest, but have a lot of seedlings coming along new lines of pedigree. The evolution of this apple will probably be a step-by-step process, rather than a single stride.

OHTA RASPBERRY.

Offered for the first time. Ohta is the Sioux Indian for "much" or "many." This was first noted in 1906 in our plantation of 6,000 hybrid seedling raspberries. Female parent, a wild red raspberry from Cavalier county in northeastern North Dakota; male parent, the Minnetonka Ironclad, a red raspberry originated by F. J. Empenger, Maple Plain, Minn., who writes under date of June 25, 1907: "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."

The Ohta raspberry is hardy and very productive. Fruit a beautiful red, fairly firm, of good quality. The canes have red-tinted leaves at the tips. As fruited here the Ohta appears sufficiently large for commercial purposes and the bright red color makes the fruit very attractive. The berries run about sixteen to the ounce, with only fair cultivation on open exposed upland prairie. The plants are hardy without winter protection. Price, 10 plants for \$2.00.

LAKE BAIKAL SIBERIAN BIRD CHERRY.

This is *Prunus Padus* as found wild in the Lake Baikal region of Eastern Siberia. An interesting ornamental tree with large leaves; the fruit is used very extensively by the peasants for culinary purposes, but is not much of an improvement on our western choke cherry, although less astringent. A few 3 year old seedling trees, once transplanted, grown from fruit I obtained in Siberia in 1908, price each 50c.

A New Hybrid Rose

TETONKAHA ROSE.

Offered for the first time. Tetonkaha is the west lake of the chain of lakes known as Lake Oakwood, about eighteen miles northwest of this station. Tetonkaha was an Indian maiden who lost her life many years ago in this vicinity as the penalty for saving her white lover and his people from an Indian massacre.

The Tetonkaha Rose is a seedling of the wild prairie rose from the banks of this lake, crossed with pollen of a hybrid of the Siberian *Rosa rugosa*, so that it is a combination of at least three species. In the 100 seedlings obtained from this cross, 74 are double and 26 single. All identical in color, a deep pink, and all fragrant. It is now time to transplant these plants and they have formed many root sprouts. The blossoms on the 74 double-flowered plants are practically identical and the stock offered consists of these sprouts from the original seedlings. The flowers are fully 3 inches in diameter; the bush is perfectly hardy, flowering abundantly in June; about 18 to 25 petals, deep rich pink; very fragrant; appears desirable for dwarf hedges or as an ornamental shrub. The habit is more upright and the flowers are less concealed by the foliage than in the pure *Rosa rugosa*. Plants 50c each.

INTRODUCTION.

The object of these experiments is to originate better and hardier fruits for the prairie Northwest than any now known. To be compelled to protect fruit trees and plans is Horticulture on Crutches and hence to be avoided if possible.

This department does not conduct a commercial nursery. The plants sent out are either originated here as the result of fruit-breeding experiments, or imported from Russia, Siberia or other northern regions of Europe and Asia. My policy is to offer each kind only until well introduced, leaving the main work of propagation to the commercial nurseries. The varieties sent out have all done well here; their value elsewhere can only be determined by actual trial. A careful record is kept here of each lot sent out, and it is expected that each planter will do the same and report in due season when requested.

Those interested in experimental horticulture for the prairie Northwest should order early, as the stock is limited. On late orders please specify if selection of varieties is left to me.

In the spring of 1911 I sent out my entire stock of nursery trees of the choice new hybrid plums described in Bulletin 130 of this station. A copy of this will be sent free upon application. These new hybrid stone fruits bore heavily the past season at this station. Numerous reports have been received of their good behavior elsewhere. A bulletin giving this experience will be sent to applicants as soon as issued. The general experience is very favorable and indicates that the varieties favorably mentioned in bulletin 130 will be extensively raised for home use and market over a wide area of the prairie northwest, including both Dakotas, Minnesota and further south and north.

The experiments in breeding hardy fruits at this station are now second to none in extent. A new fruit-breeding laboratory, granted by the Legislature in 1909, includes an area of 40x115 feet under glass, which greatly facilitates the work. The number of lots of hybridized seeds the last two seasons now number some twelve hundred.

The varieties offered in this list are some of the successes; the failures are represented by the ashes of many huge bonfires.

Owing to the failure of the native plum crop we ran out of plum seedlings for budding, so that this year we have scarcely any plum trees to offer. This season some splendid plums fruited for the first time, which are deemed eminently worthy of propagation elsewhere, but it will take two years to work up a stock so that no trees can be ready for distribution before the spring of 1914. However, the best varieties of new plums described in Bulletin 130 are now being propagated extensively by the leading nurserymen of the northwest. This is as it should be, the work of this department is to do the inventing of new fruits, so to speak, with the expectation that the commercial nurserymen will do the manufacturing. However, realizing that propagation is the only real test of a plum, a few scions are offered of five new varieties of plums. They are intended only for expert propagators as in the hands of amateurs scions usually give disappointment only.

The scions will be cut only as ordered. All orders should be in before March 25th.

Native Plum Pits: We are often asked for native plum seedlings to use as stocks for budding and grafting. We have none to offer, but can spare some native plum pits, (cleaned now and stratified in sand), at the rate of 2 quarts for \$1.00.

Native Sand Cherry Pits: Mixed pits from our experimental plantation of the Sioux Indian sand cherries (*Prunus Besseyi*), cleaned and stratified in sand, ready for planting. Price 1 pint for \$1.00.

Special Note—To give these Sioux Indian names their native melody, pronounce the vowel A with the long Italian A, as in "arm."

TERMS, CASH WITH ORDER.

Positively no credit given except to Government Experiment Stations. Add 25 cents to orders for less than \$3.00 to pay for moss and packing. Stock is shipped by express carefully packed in moss.

No Orders Booked Until Paid For.

No Plants Sold in Less Than the Quantities Specified.

The money received from the sale of plants makes it possible to carry on the fruit-breeding work on a larger scale than would otherwise be possible. A work of tremendous magnitude and importance is being done with very limited means; this charge helps to cover cost of propagation and also serves to keep the stock out of the hands of the careless planter who is not really interested in the work.

Do not send local checks. Remit by Bank Draft, Postoffice or Express Money Order. Address
N. E. HANSEN,
February 10, 1912. Experiment Station, Brookings, South Dakota.