1. Plants for Dry Western Uplands.
2. Some New Hybrid Plums.

Second Edition March 21, 1914.

ALFALFA AND OTHER SEEDS FROM SIBERIA

Gathered in 1913 by Prof. N. E. Hansen, South Dakota State College of Agriculture and Mechanic Arts, Brookings, S. D.

These seeds were gathered upon my fourth expedition to Siberia on the dry, open steppes near Semipalatinsk, Southern Siberia. This is a region with a total annual precipitation of eight inches, including both rain and snow, and with a temperature range of from 106 degrees in summer to 50 degrees below zero Fahrenheit in winter, often without snow. The expedition was authorized by the South Dakota State Legislature, March, 1913.

1.
Semipalatinsk Alfalfa, 3250 lb. Gathered 1913

As far as I have observed this is the strongest growing form of this species, **Medicago falcata.** In 1908 on my third expedition to Siberia I first found this near Semipalatinsk as plants of erect habit with stems up to five feet eight inches long. Flowers bright yellow. See Bulletin 141 of this station for co-operative tests during the dry seasons of 1911 and 1912.

The Semipalatinsk alfalfa I regard as the strongest and most vigorous of the yellow flowered Siberian alfalfa **(Medicago falcata).** Coming as it does from an 8-inch rainfall climate I regard it as an alfalfa to supplement rather than to supplant the alfalfas now commercially obtainable. In other words, it should be tested mainly wherever the common alfalfas suffer from lack of moisture or from winter killing. Wherever the common alfalfas do well my advice has always been: "Let well enough alone." Letters received from many states show that low bottom land and high dry bench land are two different problems for the alfalfa grower.

Plants of this yellow flowered Siberian alfalfa from the Semipalatinsk region, planted by many farmers on high dry upland in 1911 west of the Missouri river, had proven their ability to stand the severe drought of 1911 and 1912. The plants continued this good record in 1913. These are perhaps three of the driest years in the history of the state. The fact that such plants have yielded from 8 to 10 and even 12 pounds of green forage per plant has given encouragement to many people who would otherwise have left the country. They have faith in the plants themselves.

Planted in rows 2x4 feet or 5,444 plants to the acre, this figures out 8 to 12 tons, dried weight, per acre. You could cut this twice in two and still do very much better than we are doing from buffalo grass. I ask no one to believe any faster than can be demonstrated by field tests.

The fact that this plant is native in an 8 inch rainfall climate with a temperature ranging from 50 degrees below in winter to 106 above in summer gives me confidence in the ultimate outcome.

As to how far north this will go, some encouraging reports have been received from Canada: F. Maclure Sclanders, of Saskatoon, Saskatchewan, Canada, reports it hardy after three years trial and states: "My own experience with Hansen's alfalfa leads me to look upon them as the most important agricultural innovation for very many years."

The ounce package distribution to South Dakota farmers ordered by the Regents of Education, closed February 15. Part of the seed must be reserved for the Alfalfa Stations provided for by the State Legislature.

After Feb. 15, 1914 orders from any one, including persons in other states, will be accepted. For this work James W. Wilson, Director of the South Dakota Agricultural Experiment Station at Brookings, South Dakota, has been appointed Trustee by the Regents of Education and all orders for these seeds and plants should be sent direct to him. This is to pay expenses not covered by the state appropriation.

Price of Semipalatinsk Alfalfa Seed, five dollars per pound, For Associations the seed will be put up in ounce packages without extra charge.

SPECIAL NOTE: Since all these varieties are for experimental purposes, no guarantee of any kind can be given as to the seed. My opinion is that they will be a great help to agriculture on the highest and driest uplands of a number of our western states where no irrigation is possible. In South Dakota I would judge they are for the highest and driest uplands where the conditions as to moisture are less favorable than on the lower lands.

2.

Hansen's Siberian Red Clover.

This lot consists of 142 lbs. seed gathered growing wild near Semipalatinsk. This should arouse wide spread interest at the north wherever trouble has been experienced from winter-killing of the common red clover, which comes to us from the milder climate of western Europe.

Price per packet of ¼ oz. containing about 4150 seeds 50 cts.

NOTE: Since white clover is found wild in this region also, a few seeds may be found mixed with the Red Clover. In such case, save it separate as the Siberian form of White Clover.

3.

Hansen's White Siberian Millet—A large seeded white grained millet of the proso type, grown by the Kirghiz Tartar nomads in the Semipalatinsk region as a grain for their stock, also eaten extensively by the Kirghiz themselves. The corner stone of their agriculture in this 8-inch rainfall climate. The hay is not used except for feeding to horses for a few days in the spring to hasten shedding. The farmers upon our driest uplands in our western states from our Mexican to our Canadian boundary, ought to be able to raise this grain millet in our driest years.

Per packet of ¼ oz. about 2300 seeds, 50c.

4.

Lavathera Thuringiaca—A tall growing perennial flower from the Semipalatinsk steppes. Height 6 to 7 feet. Branching habit. Flowers pink, somewhat of the style of single Mallows or Hollyhocks..

Packet of 100 seeds, 25c.

5.

Blue Larkspur—From Semipalatinsk. Flowers a beautiful dark blue. A hardy perennial, height up to 7 feet.

Packet of 100 seeds, 25c.

6.

Hansen's Turkestan Radish—All Sold.

7.

Siberian Esparsette. Also from the Semipalatinsk region. This Siberian form of esparsette an erect-growing legume should be tested where the French esparsette is not hardy.

Per packet of 200 seeds—50 cts.

8.

Melilotus dentatus. A tall yellow flowered sweet clover from the Semipalatinsk region. Seeds very large, stems red tinted. Preliminary feeding tests at the Imperial Agricultural College at Moscow, Russia, indicate that cattle prefer it to the common sweet clover.

Per packet of 200 seeds, 50 cts.

9.

Hansen's Mongolian Wheat—Very large kernels, cultivated by the Kirghiz nomads southwest of Semipalatinsk.

Seeds all sold.

10.

Phleum Boehmeri—The Siberian representative of timothy. Found on the highest and driest hill sides near Semipalatinsk.

Per packet 1-10 oz., 25c.

11.

Melilotus albus—White flowers.

Per packet of 100 seeds, 25c.

12.

Melilotus officinalis—Yellow flowers.

Per packet of 100 seeds, 25c.

13.

Lathyrus tuberosus—Pink flowers.

Per packet of 100 seeds, 25c.

14.

Vicia sp—Blue flowers.

Per packet of 100 seeds, 25c.

15.

Vicia sp—Yellow flowers.

Per packet of 100 seeds, 25c.

16.

Lasiogrostis splendens—Chee grass. A giant grass growing up to 16 feet or more on pure alkali soils on the dry steppes at Semipalatinsk. Eaten by stock when young; older stems used for matting.

½ ounce, 50c.

PLANTS OF COSSACK ALFALFA

For description see bulletin 141, page 80. These plants were raised at the South Dakota Experiment Station at Brookings, 1913, and are now stored in earth in cellar, ready for shipment. The most of them will be used for transplanting work at the alfalfa stations.

Price of Cossack alfalfa plants one year old, by mail postpaid, one dollar per hundred. By express at expense of purchaser four dollars per thousand.

TWO RUSSIAN ALFALFAS

From my trip of 1906 I brought four of these natural hybrid alfalfas. In 1910 I named two of them the Cossack and Cherno. Both descended from single plants on the steppes of Voronezh province of southern Russia, land of the Don Cossacks. For description see page 80, Bulletin 141.

The original plant of Cossack, S. P. I. 20714, as found wild in the dry steppes, had blue flowers on one branch, yellow on another, and sometimes both colors on the same branch.

The original plant of Cherno, S. P. I. 20716, as found growing wild, was described as a beautiful plant, very hardy, very productive and with black green flowers.

These two varieties do not come true to color; in fact, they vary widely, 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. Both Cossack and Cherno are distinguished for their vigor of growth, individual cultivated plants running as high as 500 stems to the plant. In fact 500 stems to the plant is becoming our minimum standard in selection work. In both Cossack and Cherno the aftermath is rapid and the seed is held tight in the pods until spring—although of course it should be harvested at the usual time, when ripe. Owing to the great variation in the color of the flowers of these alfalfas, securing the right seed will be a matter of good faith on the part of the grower.

In the spring 1913 plants of Cossack and Cherno were transplanted at a number of places in the state and at the alfalfa seed stations authorized by the State Legislature. The seed offered was raised on upland soil, without irrigation, at Lemmon, Perkins Co., Mobridge, Walworth Co., Isabel, Dewey Co., Faith, Meade Co., Pierre, Hughes Co., Sansarc and Kadoka, Stanley Co. The price has been fixed by the Regents of Education at $5 per pound.

The Cossack and Cherno I regard as the strongest and best of the hybrid alfalfas, both of strong growth, many with 500 stems to the plant, and heavy seeders.

CROSSING ALFALFA

All these three alfalfas cross readily with common alfalfas and the result, as far far as I have noted, is a strong plant of superior qualities. While these hybrid alfalfas are splendid plants, their maintenance and distribution will be a matter of good faith since the plants vary so widely in color of flower. The crossing of alfalfas is under investigation as incident to my work at the alfalfa stations authorized by the State Legislature of South Dakota. Much progress has already been made by the United States Department of Agriculture in crossing alfalfas by hand pollination.

The following is quoted from the report of Hon. James Wilson, Secretary of Agriculture, for 1912: "Siberian Alfalfas (page 121)."

"During the past year marked advance has been made in the work with the hardy and drouth-resistant alfalfas introduced from Europe and Asia. The crossing of the yellow-flowered form with the common species has resulted in some very promising hybrids adapted to use both as hay and for grazing in the Great Plains region. The value of the new alfalfa for hybridizing can scarcely be overestimated."

FREEZING ALFALFA SEED

As explained in Bulletin 141, page 75, Siberian alfalfa seed in its native home is exposed to severe freezing over winter, since it grows wild on the open steppe and must maintain itself against all other plants. The one ounce of alfalfa seed when received should be kept as cool as possible. If kept in a warm room it tends to dry out too much before sowing. A better stand can be obtained by mixing the seed with a little wet sand and bury for winter freezing in the garden, then sowing seed and sand together in early spring. If to be sown with drill, it will not hurt the seed to let it freeze up solid in a pan of water and spread out to dry before sowing. At least 25 per cent increase in germination will result from freezing. If the seed is sown in the fall, of course the seed will receive sufficient freezing. It is easy for you to test the matter yourself by freezing a small portion and sowing an equal portion without freezing.

CARE OF SEED THE FIRST YEAR

One ounce of alfalfa seed is not much yet it contains about 14,500 seeds. I would advise sowing the seed out doors as early as possible in well prepared soil sowing thinly in drills about one-half inch deep, or at any rate not over one inch deep. If you have a garden seed drill, set it to feed as for celery, or a little wider open than for celery. If the seed comes too thick, the extra plants may be dug in the fall and buried over winter in plow furrows, or they may be transplanted at once into their permanent place.

FIRST OR SECOND CUTTING

The roots must be given a chance to develop. The material for this is made in the leaves first. Hence do not cut the first year. Give good cultivation, this will encourage the formation of seed.

The best seed will usually come on the first cutting. The yellow flowered Siberian alfalfa, being intended for the highest and driest uplands without irrigation, cannot be expected to give more than one good cutting each season.

TRANSPLANTING

My machine transplanting of one year old roots explained in Bulletin 141, I am not ready to recommend to the farmer until all the details are worked out. However, some very encouraging results have been obtained from transplanting by farmers and at the alfalfa stations, both for seed and hay. A few thousand plants may readily be set by plowing a furrow, or with a spade. One plant of Semipalatinsk alfalfa transplanted in 1911 on the high dry gumbo at Sansarc, 45 miles northwest of Ft. Pierre yielded 8 pounds green fodder from one plant cut May 17, 1913. Yields of 5 to 6 pounds are not uncommon from transplanted plants. So there is something in transplanting worth further investigation. I wish no one to believe it faster than can be shown by field demonstrations. At all events it is a quick method of raising pure seed of new varieties.

In 1913 at this station 350,000 Cossack and Cherno alfalfa plants were grown from three and one-half pounds of seed on a little over one acre of land (exactly 1.13 acres). This would set 72 acres at 3x3 feet or 4860 plants per acre.

The longer I work at the problem of alfalfa for dry western uplands, the more I become convinced that transplanting one year plants into cultivated rows with suitable machinery is a safer and surer method than sowing the seed in cultivated rows, as the plants have one year's start and can stand more hardship the first year. But it must be some hardy variety like those mentioned in this list of plants which often have 500 stems the second year. Experience shows that transplants succeed where seed fails.

NEW PLUMS

The new hybrid plums offered in this list were offered first as scions in the spring of 1912. For description and cuts see the price list for that year which will be sent free on application. This is the first time the College offers trees of these new varieties, and they must be closed out to make room for my other work in breeding hardy fruits. This department does not conduct a commercial nursery. My policy is to offer each kind as fast as originated, leaving the main work of propagation to commercial nurseries. The price list is sent on the same day to all who have ordered trees during the preceding four years. 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.

The nurserymen pay the same price as the farmers for these new plums. Since there are no restrictions any one can propagate them as fast as they wish. In the following pedigrees the female plant is named first:

Tokata—Chinese apricot plum (Prunus Simoni). DeSoto plum (native).

Kahinta—Apple plum (Japanese). Terry (native).

Oziya—Red June (Japanese). DeSoto (native).

Teton—Native of Walworth county, South Dakota.

Cikana—Dakota Sand Cherry. Gold plum (hybrid Japanese).

Price of any of these five varieties; two trees for $1.00.

SPECIAL OFFER

Set of the above five varieties, three trees of each, total fifteen trees $6. Only 40 complete sets of this kind are available. On late orders I must vary the assortment unless directed to the contrary by the purchaser. These trees are all one year old, budded on native plum roots.

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 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 the 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,
Experiment Station,
Brookings, South Dakota.

February 9, 1914