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Progress in Variety Tests of Barley

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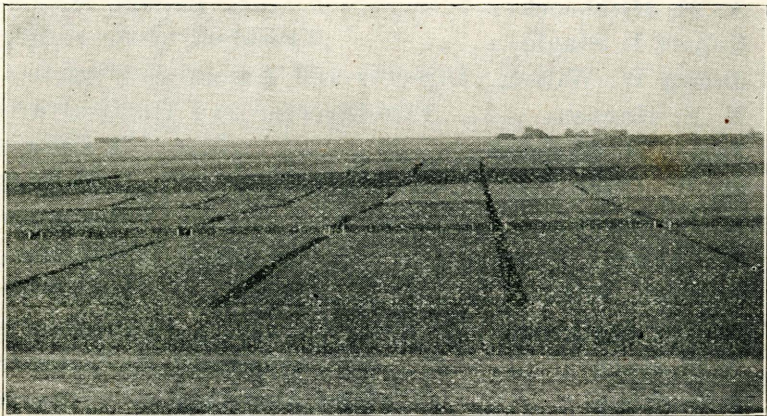
BULLETIN NO. 113

MARCH, 1909

AGRICULTURAL EXPERIMENT STATION

South Dakota State College
of Agriculture and Mechanic Arts

AGRONOMY DEPARTMENT



Progress in Variety Tests of Barley

BROOKINGS, SOUTH DAKOTA

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REPORT OF PROGRESS IN VARIETY TESTS OF BARLEY.

By Clifford Willis, Chief in Agronomy, and
J. V. Bopp, Chief Assistant in Agronomy.

The object of this bulletin is to report the progress of work which has been done in testing different varieties of barley. The variety trials of barley have been made in co-operation with Bureau of Plant Industry United States Department of Agriculture. During this time the work has been very extensive and many varieties have been tested.

In the season of 1908, eighty-seven (87) varieties were grown at this Station. Before taking up the study of the different varieties, it may be of interest to note that the center of distribution has been westward.

We cannot say definitely whether the distribution of barley in this country is due to soil conditions or not. We know that the general direction has been westward for the last fifty years but this can be attributed to the opening and settlement of heretofore unbroken country rather than to an acceptable environment. About the year 1850 the center of barley production was in the state of New York and it may be of interest for the people of South Dakota to know that now it has moved to a point near Sioux Falls.

Barley has been cultivated for a long period of time. It was used chiefly as a food and had it not been for the introduction and wide cultivation of potatoes and the improvement of wheat it would today be used more for food purposes.

Although barley belongs to the same tribe as wheat and rye it has some well marked characteristics. In wheat and rye the spikelets are arranged alternately on each side of the rachis. Wheat has from one to

four and in exceptional instances, five flowers in : spikelet; the spikelet being sessile forms a compact head. Now barley has a head also compact and in general appearance like wheat. The spikelets are, however, only one-flowered. In the six-rowed barley there are three, one-flowered spikelets at each joint of the rachis; while in the two-rowed, there is but a single flowered spikelet at each joint. The two-rowed type is more slender and longer than the head of the six-rowed type.

Barley occupies the fourth rank among the cereals in South Dakota, holding the same place in the United States. According to the crop report for 1908 the standing of the four leading cereals in the state is as follows:

| | Crop | Bushels | Value |
|--|--------|------------|--------------|
| | Corn | 75,584,000 | \$35,624,480 |
| | Wheat | 35,882,000 | 32,292,800 |
| | Oats | 34,281,000 | 14,398,020 |
| | Barley | 24,414,000 | 11,474,580 |

The value per acre of the four crops above named in 1907 according to the Year Book of the Department of Agriculture is: Corn, \$11.73; Wheat, \$9.97; Oats, \$9.63; Barley, \$14.03.

The natural factors and economic conditions of South Dakota, its acceptability as a feed when ground, ought to make barley a valuable crop for the farmer.

THE SEED BED.

We must remember that it requires more than a carefully well selected seed to produce a crop of any grain. Plants need a good home, for what they need in the form of food, aside from the carbon dioxide which they obtain from the air, must be in solution in the soil waters. The soil must be in such a condition so that good communication between the soil and plant is established very soon after the seed germinates.

Of all the cereals, barley responds most readily

to good soil preparation. A poorly prepared soil, therefore, is more certain to affect the yield of barley than either, wheat, oats or corn. Barley is a shallow feeder and the great mass of feeding roots are distributed among the first six or eight inches of soil. It is not sufficient that the land be plowed and harrowed once and the seed sown. What will be the result if a lot of trash is turned under in the spring, the land harrowed once and then the seed forced down several inches? Such indifferent methods place the seed among loosely lying earth and among the rubbish where it is not in intimate contact with the soil particles. The result is—seed is slow to germinate; it comes up irregularly; many plants are weak and lastly, a reduced yield is the result.

After selecting your ground plow in the fall about six inches deep and let it remain so over winter. Take a disc harrow and cultivate as early in the spring as the moisture conditions of the soil will permit. This forms a loose mulch of soil on the surface which prevents the excessive evaporation of water during the windy days of spring. This increases the heat absorptive powers of the soil and makes a better seed bed. Disc again and harrow well before seeding.

Should conditions be such as to prevent fall plowing it should be done as early as possible in the spring. Harrow enough times so that more than the surface is in a good mellow condition and it may even be advisable to pulverize with the disc harrow after the ground is plowed. Do not let the soil dry out and become hard before harrowing and it is a good practice to harrow daily that which has been plowed during the day. Such preparation of seed bed will insure an early start and a good stand and therefore a good crop.

HARVESTING.

In order to have good, plump, mature and bright color in barley it is necessary to exercise discretion and

rare judgment in harvesting the crop. Much depends upon the method of handling whether or not this is accomplished. It is the general practice with most cereals to harvest before the grain is dead ripe. Investigations teach us that grains acquire greater weight until fully mature, but after it is once in the hard dough stage the additional weight gained is slight, while if allowed to ripen fully, the loss by bleaching and shattering will more than out weigh this gain.

The best time to harvest is when the straw is ripe, and the grain is yet in the hard dough stage. The bundles should be shocked promptly and capped so as to permit the full maturation of the grain. Ordinarily it is best not to make the sheaves too large and not place too many in each shock, the usual number being from eight to ten or twelve at most. The best method for capping is to break the straws so that the knot is on the under side, then the short stubble in the butts will be on the top side. Place the first cap with heads towards the west and the top cap the opposite way or with heads towards the east. When caps are placed on in this position in this belt of prevailing westerly winds they will not blow off so easily. The capping will not only keep out the rain but also the heavy dew which discolors barley as much as rain. When handled in this manner, barley is heavier and has a better color, than when cut while straw is yet a trifle green and not quite all of the grain is in the hard dough stage; or when it is fully ripe. *

Because of the long beards barley can hardly be handled advantageously when dead ripe. The sprouting of barley decreases its feeding value and makes it worthless from the brewer's standpoint, therefore it should be either threshed as soon as in fit condition or

* Maryland Bulletin No. 35.

it should be stacked. Occasionally the outer bundles and caps are threshed separately the dark colored grain being used for feeding purposes while the rest is marketed.

PURE SEED.

It is certainly the desire of every grain grower to have pure seed, and generally seed from some outside source, no matter where from, if it is plump and sound, it will satisfy him. It is not enough that seed be heavy, sound and plump in order to be desirable but the great question is, what will it produce? Two samples may be identical as far as outward appearances are concerned yet the one may produce twenty bushels while the other under similar conditions yields forty. It is needless to ask which variety you desire—yet, are you sure of obtaining just the right one when you buy your seed?

Select first of all one of the types, either the two rowed or the six rowed, and confine all your endeavors to the improvement of that variety. The average grain farmer cannot afford to grow several varieties. Be sure your seed is not mixed by seed being brought in with the threshing machine from your neighbor.

There is no need to fear that your seed will run out if the least attempt is made for seed selection. Hand pick enough seed for one or two bushels of seed for an improvement plot and sow this crop for the general field the following year. Select again from your improvement plot and by such a practice the general vigor of the plants is greatly increased.

Select only the largest and plump seed, blow over the light grain with the fanning mill. Heavy seed yielded four bushels more per acre than small plump seed; (a) and a large seed weighing twenty-eight per cent heavier than small seed, gave ten bushels more

(a) Ont. Agr. Col. and Expt. Farms Report 1903, p. 119.

per acre. (b) After cleaning and grading your seed barley the next question is, how much will grow? Is it strong in vitality and has it vigorous germs? It pays to make a germination test so as to be able to sow the correct amount of seed per acre. This test can be easily made by taking one hundred grains from the seed lot and planting them in sand or mellow soil and placing the tray in a warm place. The per cent showing strong germination can then be easily determined.

Now there is one more requisite which if neglected may reduce the yield. How much of my barley is going to be affected by smut? Yes, but you say, I have no smut on my farm. Truly so, but do you know whether your neighbor has none also? Please remember that the spores may be brought to your farm in the threshing machine and as a result your seed is badly affected. Better guard against infection by formalin treatment. See South Dakota Bulletin No. 110.

All these things, careful selection and improvement; grading, testing vitality, and guarding against smut, each small and seemingly insignificant in itself go to influence the final result.

USES OF BARLEY.

Within recent years, barley has been used more extensively as a feed for domestic animals than ever before. The statistics for the last few years show that the production of barley has been more than 150,000,000 bushels annually. Some of this finds its way to foreign markets, some goes to the manufacturer for the finished product known as pearl barley, some is used for malt but the largest portion is used for feed for domestic animals. The United Kingdom receives most of our exports and we must remember that it is the common feeding stuff of the old world. In this country its

use as stock food is chiefly confined to California and other western states yet its popularity is spreading rapidly eastward.

There seems to be a specific place for barley as a feed in the Northern Great Plains for barley can and may fully occupy the position which corn occupies in the corn belt. Like the three cereals it is fairly high in nourishing constituents.

DIGESTIBLE NUTRIENTS IN COMMON FEEDS.

| Name of Feed | Dry Matter in 100 Lbs. | Digestible Nutrients in 100 Lbs | | |
|--------------|---------------------------|---------------------------------|--------------------|--------------------|
| | | Protein | Carbo- hydrates | Ether Ex- tract |
| Corn | 89.4 | 7.8 | 66.7 | 4.3 |
| Barley | 89.1 | 8.7 | 65.6 | 1.6 |
| Oats | 89.0 | 9.2 | 47.3 | 4.2 |
| Wheat | 89.5 | 10.2 | 69.2 | 1.7 |
| Alfalfa Hay | 91.6 | 11.0 | 39.2 | 1.2 |

The above table taken from Henry's, "Feeds and Feeding" shows that barley is very similar in chemical composition with the other cereals. It is slightly higher in protein content than corn but contains much less fat. Prof. Shepperd of the North Dakota Experiment Station expresses himself as believing that barley is the grain which will fill the place of corn in that State.

In a feeding test with range lambs at this Station it took about 7 per cent more barley than corn to make a pound of gain; (a) while with a similar test with pigs at the Wisconsin Station it required 8 per cent more barley to make the same gain. (b) However, "Barley, judging from European standards leads the cereals in the quality of pork produced." As consumers grow more critical, the pig feeder may profit by using it as a feed. Considering the fact that the greater portion of South Dakota is essentially not a corn state and that barley flourishes over the entire state and furthermore

(a) South Dakota Bulletin 86.

(b) Wisconsin Report 1890.

considering that alfalfa does well in the state, this should induce the farmer to grow it for feeding purposes.

RAINFALL—BROOKINGS STATION.

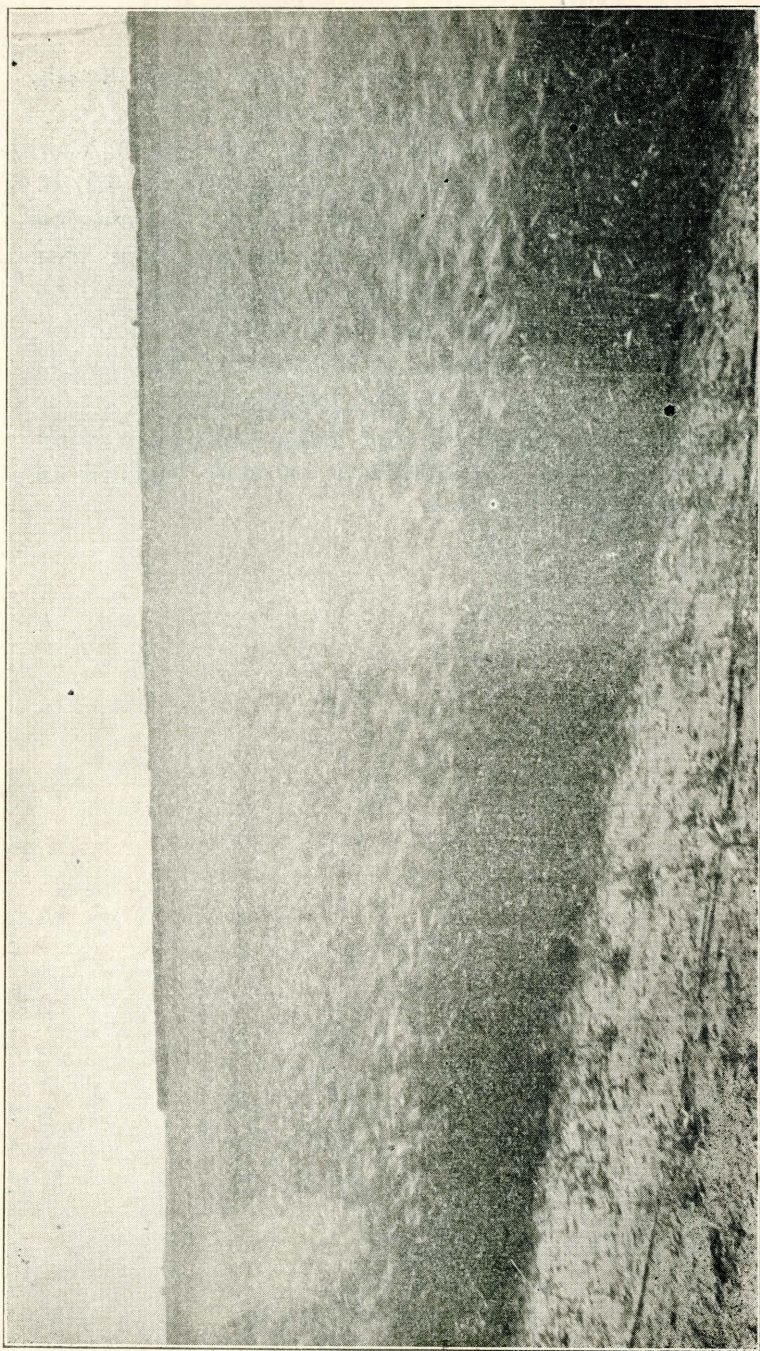
| Year | January | February | March | April | May | June |
|------|---------|----------|-------|-------|------|------|
| 1899 | 0.25 | 0.21 | 0.40 | 3.38 | 3.36 | 5.42 |
| 1900 | 0.02 | 0.20 | 2.09 | 1.68 | 1.23 | 1.62 |
| 1901 | 0.09 | 0.28 | 0.50 | 1.40 | 1.80 | 4.51 |
| 1902 | 0.50 | 0.26 | 0.67 | 1.60 | 2.66 | 3.17 |
| 1903 | 0.10 | 0.31 | 1.87 | 1.00 | 4.53 | 4.16 |
| 1904 | 0.04 | 0.15 | 0.25 | 1.78 | 1.82 | 4.30 |
| 1905 | 0.22 | 1.00 | 0.68 | 1.01 | 6.14 | 6.09 |
| 1906 | 0.17 | 0.02 | 0.58 | 1.40 | 3.51 | 4.89 |
| 1907 | 1.06 | 0.28 | 0.55 | 1.17 | 2.36 | 5.65 |
| 1908 | 0.20 | 1.80 | 1.16 | 2.10 | 6.46 | 6.35 |

| Year | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|------|------|------|-------|------|------|------|--------|
| 1899 | 0.73 | 3.25 | 0.17 | 2.21 | 0.42 | 0.43 | 20.23 |
| 1900 | 4.94 | 4.00 | 4.97 | 2.72 | 0.45 | 0.64 | 24.56 |
| 1901 | 1.66 | 2.94 | 5.09 | 0.74 | 0.60 | 0.15 | 19.76 |
| 1902 | 2.75 | 5.30 | 0.26 | 1.18 | 0.96 | 2.52 | 21.83 |
| 1903 | 3.30 | 4.25 | 2.73 | 1.85 | 0.10 | 0.45 | 24.65 |
| 1904 | 1.91 | 0.93 | 0.93 | 3.15 | 0.02 | 0.20 | 15.48 |
| 1905 | 0.98 | 4.54 | 2.16 | 1.50 | 2.45 | T | 26.77 |
| 1906 | 1.86 | 4.28 | 5.13 | 3.01 | 0.89 | 0.52 | 26.26 |
| 1907 | 3.77 | 1.41 | 1.28 | 0.96 | 0.10 | 1.12 | 20.21 |
| 1908 | 4.69 | 2.37 | 3.89 | 1.43 | 1.30 | 0.42 | 32.47 |

The Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C., says in Circular number five (5):— Barley Culture in the Northern Great Plains area, "The results of these tests are strikingly in favor of the two-rowed barleys. Minnesota No. 6 which has stood the highest in many barley trials at the Minnesota Agricultural Experiment Station, is a pedigree variety of many years' standing, developed from the Manchuria." Swan Neck No. 187, Chevalier No. 10584, Chevalier No. 35 and Hanna No. 24 are pedigreed barleys introduced from Sweden through Mr. D. G. Fairchild, Agricultural Explorer of the

Bureau of Plant Industry, which gives proof of the value of producing pure types of barley.

Hanna No. 24, although fifth in the list of two-rowed barleys and Minnesota No. 6 second in the list of six-rowed barleys, have been widely introduced through-out the state. Kitzing No. 189 in a four year average, yielded 45.13 bushels while Hanna No. 24 in a five year average, yielded only 40.66 bushels. A difference of 4.57 bushels in favor of Kitzing No. 189. Odessa No. 182 in a five year average, yielded 43.91 bushels, while Minnesota No. 6, in the same period, yielded only 40.54 bushels. A difference of 3.37 bushels in favor of Odessa No. 182.



MINNESOTA NO. 6.

VARIETY TEST OF BARLEY—1906.

| VARIETY | Access No. | Rate of Seeding | Maturity | | | | Resistance | | | Yield | |
|---------------------|------------|-----------------|-----------|-----------|----------|------------------|---------------|---------------|-----------------|-------------|--------------|
| | | | Date Sown | Date Ripe | No. Days | Height in Inches | Per Cent Smut | Per Cent Rust | Per Cent Lodged | Wt. per Bu. | Bu. per Acre |
| | | | | | | | | | | | |
| Chevalier | 35 | 2 Bu. | 4-19 | 8-3 | 106 | 40 | 92 | 95 | 12 | 49.5 | 50.3 |
| " | 200 | " | 4-19 | 8-6 | 109 | 40 | 98 | 95 | 20 | 48.5 | 49.0 |
| " | 10584 | " | 4-20 | 8-6 | 108 | 38 | 98 | 95 | 10 | 50.5 | 48.8 |
| Primus | 10586 | " | " | 8-3 | 105 | 44 | 98 | 95 | 5 | 52.0 | 37.3 |
| Princess | 10583 | " | " | 8-8 | 110 | 38 | 100 | 95 | 2 | 49.0 | 41.1 |
| Brasserie | 384 | " | 4-19 | 8-1 | 104 | 40 | 100 | 95 | 8 | 46.5 | 55.0 |
| Gold Melon | 48 | " | 4-20 | 8-1 | 10 | 42 | 100 | 95 | " | 43.5 | 37.0 |
| Senbaku | 46 | " | 4-19 | 8-6 | 107 | 40 | 100 | 98 | 2 | 47.5 | 51.4 |
| Bavarian | 158 | " | 4-20 | 7-31 | 102 | 38 | 85 | 95 | 5 | 48.5 | 40.2 |
| " | 159 | " | " | 8-8 | 110 | 38 | 98 | 95 | 5 | 49.0 | 36.8 |
| " | 160 | " | " | " | " | " | " | " | 5 | " | 36.3 |
| " | 208 | " | " | 8-3 | 105 | " | " | " | 5 | 43.0 | 39.0 |
| Striegum | 47 | " | " | " | 105 | 36 | 92 | 95 | 5 | 49.0 | 43.1 |
| Hanna | 26 | " | 4-19 | 8-2 | 105 | 36 | 90 | 95 | 2 | 50.0 | 46.4 |
| " | 30 | " | " | 8-1 | 104 | 42 | 88 | 95 | 8 | 51.0 | 44.0 |
| " | 203 | " | " | " | 36 | 90 | 95 | 5 | 48 | 49.0 | 49.0 |
| " | 24 | " | " | 8-2 | 105 | 32 | 95 | 95 | 2 | 47.5 | 46.4 |
| " | 416 | " | 4-20 | 7-31 | 102 | 40 | 100 | 95 | 10 | 45.5 | 55.3 |
| Hannchen | 10585 | " | 4-19 | " | 103 | 36 | 98 | 95 | 10 | 49.0 | 49.4 |
| Bohemian | 27 | " | " | 8-1 | 104 | 38 | 92 | 95 | 5 | 58.5 | " |
| " | 204 | " | " | 8-6 | 109 | 38 | 98 | 95 | 10 | 51.0 | 48.0 |
| Common | 184 | " | 4-18 | 7-26 | 99 | 40 | 88 | 95 | 2 | 50.0 | 42.5 |
| Hullless | 22 | 6 Pk. | " | 7-28 | 101 | 40 | 99 | 100 | 10 | 59.5 | 25.3 |
| " | 234 | " | 4-19 | " | 100 | 38 | 100 | 100 | 10 | 59.0 | 26.2 |
| Little BlueHullless | 335 | " | " | 8-1 | 104 | 34 | 100 | 95 | 5 | 51.5 | 30.9 |
| Moravian | 343 | 2 Bu. | " | 7-31 | 103 | 40 | 98 | 95 | 5 | 49.5 | 54.3 |
| Lower Frankish | 207 | " | " | 8-4 | 107 | 42 | 98 | 95 | 10 | 49.5 | 50.4 |
| Swan Neck | 187 | " | " | 7-30 | 102 | 40 | 98 | 95 | 8 | 48.9 | 49.1 |
| Bolton | 177 | " | " | " | 102 | 42 | 98 | 90 | 2 | 48.5 | 35.6 |
| Surprise | 171 | " | " | 7-31 | 103 | 38 | 98 | 92 | 5 | 47.0 | 41.4 |
| Manchuria | 170 | " | 4-18 | 7-28 | 101 | 46 | 98 | 95 | 2 | 47.5 | 45.8 |
| " | 329 | " | 4-19 | 8-1 | 104 | 36 | 100 | 95 | 5 | 44.0 | 46.2 |
| Summit | 174 | " | 4-18 | 7-28 | 101 | 38 | 98 | 95 | 2 | 49.5 | 41.7 |
| Prize Prolific | 169 | " | 4-19 | 8-6 | 109 | 34 | 98 | 95 | 8 | 45.0 | 41.7 |
| Kitzing | 189 | " | " | 8-1 | 104 | 38 | 95 | 95 | 5 | 48.5 | 53.8 |
| " | 201 | " | " | 8-3 | 106 | 38 | 95 | 95 | 10 | 48.5 | 44.6 |
| " | 167 | " | " | " | " | " | " | " | " | 48.0 | 43.5 |
| Odessa | 182 | " | 4-18 | 7-28 | 101 | 42 | 98 | 95 | 2 | 48.5 | 50.5 |
| Gold Foil | 162 | " | 4-19 | 8-6 | 109 | 38 | 98 | 95 | 8 | 48.0 | 43.3 |
| Minnesota | 6 | " | 4-18 | 7-28 | 101 | 42 | 95 | 95 | 2 | 48.0 | 41.0 |
| Grecian | 336 | " | 4-19 | 7-30 | 102 | 38 | 100 | 98 | 5 | 47.5 | 47.3 |
| Newton | 172 | " | " | 8-6 | 109 | 40 | 98 | 95 | 5 | 57.0 | 35.4 |
| Highland Chief | 209 | " | " | 8-5 | 108 | 40 | 98 | 95 | 20 | 48.5 | 42.3 |
| Hanna | 33 | " | " | 8-2 | 105 | 38 | 95 | 95 | 5 | 49.0 | 36.8 |
| " | 34 | " | " | 8-3 | 106 | 36 | 92 | 95 | 5 | 48.0 | 41.7 |
| Horn | 31 | " | " | " | 38 | 92 | 95 | 8 | 49.0 | 41.4 | |
| Chevalier | 156 | " | " | 8-6 | 109 | 38 | 98 | 95 | 15 | 46.5 | 36.8 |
| Princess | 193 | " | 4-20 | 8-9 | 111 | 36 | 98 | 95 | 5 | 49.0 | 37.5 |
| Sangatsko | 78 | " | 4-18 | 7-21 | 94 | 34 | 100 | 95 | 2 | 60.0 | 31.2 |
| Bohemian | 32 | " | 4-19 | 8-3 | 106 | 36 | 90 | 95 | 5 | 49.5 | 44.4 |

VARIETY TEST OF BARLEY—1907.

| VARIETY | Access. No. | Maturity | | | | | Per Cent Lodged | Yield | |
|---------------------|-------------|-----------------|-----------|-----------|----------|------------------|-----------------|-------------|--------------|
| | | Rate of Seeding | Date Sown | Date Ripe | No. Days | Height in Inches | | Wt. per Bu. | Bu. per Acre |
| Chevalier | 35 | 2 Bu. | 5-9 | 8-13 | 96 | 34 | 35 | 41.5 | 22.5 |
| " | 200 | " | " | Green | " | 32 | 25 | 41.5 | 20.0 |
| " | 10584 | " | " | " | " | 15 | " | " | 20.8 |
| Primus | 10586 | " | " | 8-15 | 98 | 34 | 10 | 43.5 | 14.2 |
| Princess | 10583 | " | " | Green | " | 32 | 35 | 38.5 | 12.9 |
| Brasserie | 384 | " | " | 8-12 | 95 | 50 | 50 | 42. | 23.3 |
| Gold Melon | 48 | " | " | 8-14 | 97 | 34 | 10 | 44.5 | 25.6 |
| Senbaku | 46 | " | " | " | " | 30 | 5 | 49 | 19.2 |
| Bavarian | 158 | " | " | 8-9 | 92 | " | " | 42. | 21. |
| " | 159 | " | " | Green | " | " | " | " | 14.6 |
| " | 160 | " | " | " | " | " | 20 | 40. | 12.9 |
| " | 208 | " | " | 8-14 | 97 | 32 | 20 | 40.5 | 17.3 |
| Striogum | 47 | " | " | " | " | 30 | 60 | 42.5 | 20.8 |
| Hanna | 26 | " | " | 8-11 | 94 | 32 | 35 | 41.5 | 21.3 |
| " | 30 | " | " | 8-9 | 92 | 34 | 40 | 41. | 20.2 |
| " | 203 | " | " | 8-11 | 94 | 50 | 25 | 42.5 | 23.3 |
| " | 24 | " | " | " | " | 32 | " | 41.5 | 19.2 |
| " | 416 | " | " | " | " | 36 | " | 42.5 | 24. |
| Hannchen | 10585 | " | " | " | " | 30 | 35 | 41.5 | 22.7 |
| Bohemian | 27 | " | " | 8-12 | 95 | 28 | 10 | 43. | 22.1 |
| " | 204 | " | " | 8-15 | 98 | 32 | 60 | 43.5 | 16.3 |
| Common | 184 | " | " | 8-7 | 90 | " | 40 | 45. | 31.7 |
| Hulless | 22 | 6 Pk. | " | 8-5 | 88 | 30 | 90 | 44. | 12. |
| " | 234 | " | " | " | " | " | " | 48. | 11.2 |
| Little Blue Hulless | 335 | " | " | 8-11 | 94 | " | 25 | 51 | 9.5 |
| Sangatsuko | 78 | 2 Bu. | " | 8-4 | 87 | " | 95 | 56.5 | 21.3 |
| Moravian | 343 | " | " | 8-13 | 96 | 32 | 15 | 42. | 24.4 |
| Lower Frankish | 207 | " | " | 8-14 | 97 | " | 75 | " | 10.6 |
| Swan Neck | 187 | " | " | 8-11 | 94 | " | 35 | " | 23.8 |
| Bolton | 177 | " | " | 8-8 | 91 | 34 | 20 | 43. | 23.3 |
| Surprise | 171 | " | " | 8-9 | 92 | 30 | 5 | 44. | 16.5 |
| Manchuria | 170 | " | " | 8-8 | 91 | 34 | 15 | 45. | 33.1 |
| " | 329 | " | " | 8-11 | 94 | 36 | 80 | 49. | 23.8 |
| Summit | 174 | " | " | " | " | 32 | 60 | 44. | 22.3 |
| Prize Prolific | 169 | " | " | Green | " | " | 50 | 40. | 14. |
| Kitzing | 189 | " | " | 8-13 | 96 | " | 80 | 44.5 | 22.9 |
| " | 201 | " | " | 8-14 | 97 | " | 60 | 43. | 21. |
| " | 167 | " | " | " | " | " | 75 | 41.5 | 19.2 |
| Odessa | 182 | " | " | 8-8 | 91 | 30 | 15 | 43. | 32.1 |
| Gold Foil | 162 | " | " | 8-14 | 97 | 32 | 70 | 40.5 | 21.7 |
| Minnesota | 6 | " | " | 8-8 | 91 | 34 | " | 46. | 34.6 |
| Grecian | 336 | " | " | " | " | 28 | 85 | 42. | 31. |
| Nepal | 321 | " | " | 8-5 | 88 | 30 | 50 | 48.5 | 9.7 |

VARIETY TEST OF BARLEY—1908.

| VARIETY | Accession No | Maturity | | | | | Resistance | | | % Lodged | Bu. per Acre |
|-----------------------|--------------|-----------------|-----------|-----------|----------|------------------|------------|--------|------|----------|--------------|
| | | Date of Seeding | Date Sown | Date Ripe | No. Days | Height in Inches | % Smut | % Rust | | | |
| | | | | | | | | Stem | Leaf | | |
| Chevalier | 35 | 2 Bu. | 4-30 | 8-4 | 96 | 38 | 100 | 85 | 90 | 40 | 32.7 |
| Chevalier | 200 | " | " | " | 96 | 38 | 100 | 85 | 90 | 40 | 23.17 |
| Chevalier | 10584 | " | " | " | 96 | 38 | 100 | 85 | 90 | 60 | 26.47 |
| Primus | 10586 | " | " | " | 96 | 40 | 100 | 85 | 90 | 2 | 22.94 |
| Princess | 10583 | " | " | 8-10 | 102 | 30 | 100 | 80 | 80 | 5 | 19.75 |
| Brasseria | 384 | " | " | 8-5 | 97 | 34 | 100 | 85 | 85 | .. | 20.25 |
| Gold Melon | 48 | " | " | 8-6 | 98 | 37 | 100 | 90 | 85 | .. | 17.77 |
| Senbaku | 46 | " | " | 8-6 | 98 | 34 | 100 | 90 | 90 | .. | 18.0 |
| Bavarian | 158 | " | " | 8-4 | 96 | 36 | 100 | 90 | 90 | 5 | 12.94 |
| " | 159 | " | " | 8-5 | 97 | 36 | 100 | 90 | 80 | .. | 14.74 |
| " | 160 | " | " | 8-5 | 97 | 30 | 100 | 75 | 90 | .. | 8.47 |
| " | 208 | " | " | 8-5 | 97 | 34 | 100 | 85 | 90 | .. | 11.88 |
| Striegum | 47 | " | " | 8-4 | 96 | 37 | 100 | 85 | 90 | .. | 16.35 |
| Hanna | 26 | " | " | 8-5 | 97 | 36 | 100 | 85 | 90 | .. | 17.94 |
| " | 30 | " | " | 8-5 | 97 | 37 | 100 | 90 | 90 | .. | 25.88 |
| " | 203 | " | " | 8-5 | 97 | 36 | 100 | 90 | 90 | .. | 17.29 |
| " | 24 | " | 4-20 | 7-31 | 102 | 33 | 100 | 95 | 90 | .. | 30.12 |
| " | 416 | " | " | 7-31 | 102 | 36 | 100 | 95 | 90 | 10 | 31.34 |
| Hannchen | 10585 | " | 4-30 | 8-5 | 97 | 35 | 100 | 90 | 85 | 5 | 17.95 |
| Bohemian | 27 | " | " | 8-5 | 97 | 35 | 100 | 90 | 90 | 2 | 21.25 |
| " | 204 | " | " | 8-5 | 97 | 38 | 100 | 80 | 90 | 5 | 19.88 |
| Common | 184 | " | " | 7-29 | 90 | 38 | 95 | 90 | 90 | .. | 27.44 |
| Hulless | 22 | 6 Pk. | " | 8-5 | 97 | 30 | 95 | 100 | 95 | .. | 22.75 |
| " | 234 | " | " | 8-4 | 96 | 26 | 100 | 100 | 95 | .. | 11.87 |
| Little Blue Hulless.. | 335 | " | " | 8-5 | 97 | 30 | 100 | 90 | 80 | .. | 11.87 |
| Sangatsvko | 78 | 2 Bu. | " | 8-4 | 96 | 34 | 100 | 95 | 98 | 2 | 15.64 |
| Lower Frankish | 207 | " | " | 8-4 | 96 | 32 | 100 | 90 | 95 | 20 | 23.52 |
| Swan Neck | 187 | " | " | 8-4 | 96 | 39 | 100 | 95 | 95 | .. | 30.62 |
| Bolton | 177 | " | " | 8-4 | 96 | 38 | 100 | 95 | 95 | .. | 21.53 |
| Surprise | 171 | " | " | 8-4 | 96 | 34 | 98 | 100 | 95 | .. | 22.23 |
| Manchuria | 170 | " | " | 7-29 | 90 | 36 | 100 | 98 | 90 | .. | 35.33 |
| " | 329 | " | " | 7-31 | 92 | 37 | 100 | 95 | 90 | .. | 30.77 |
| Summit | 174 | " | " | 7-31 | 92 | 32 | 100 | 95 | 90 | .. | 22.44 |
| Prize Prolific | 169 | " | " | 8-5 | 97 | 35 | 98 | 90 | 85 | .. | 16.58 |
| Kitzing | 189 | " | " | 8-5 | 97 | 34 | 100 | 90 | 90 | .. | 49.12 |
| " | 201 | " | " | 8-5 | 97 | 34 | 100 | 90 | 90 | .. | 15.88 |
| " | 167 | " | " | 8-5 | 97 | 34 | 100 | 90 | 85 | .. | 16.00 |
| Odessa | 182 | " | " | 7-29 | 90 | 38 | 95 | 95 | 90 | .. | 30.58 |
| Gold Foil | 162 | " | " | 8-5 | 97 | 34 | 100 | 90 | 80 | .. | 17.00 |
| Minnesota | 6 | " | " | 7-29 | 90 | 36 | 100 | 90 | 90 | .. | 28.84 |
| Greclan | 336 | " | " | 7-29 | 90 | 32 | 98 | 90 | 90 | .. | 31.22 |
| Moravian | 343 | " | " | 8-4 | 96 | 38 | 100 | 90 | 95 | 20 | 28.10 |

VARIETY TEST OF BARLEY—Years Grown—In Order of Yield.

| VARIETY | Acces. No. | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 | 1908 | No. of Yrs. | Av. Yield |
|---------------------|---------------|-------|------|------|------|------|------|-------|----------------|--------------|
| Kitzing | 189 | | | | 54.7 | 53.8 | 22.9 | 49.12 | 4 | 45.13 |
| Odessa | 182 | | | 61.2 | 45.2 | 50.5 | 32.1 | 30.58 | 5 | 43.91 |
| Swan Neck | 187 | | | 69.0 | 45.0 | 49.1 | 23.8 | 40.62 | 5 | 43.50 |
| Chevalier | 10584 | | | 50.0 | 60.0 | 48.8 | 20.8 | 26.47 | 5 | 41.21 |
| “ | 35 | 31.25 | Hail | 42.9 | 64.2 | 50.3 | 22.5 | 32.70 | 6 | 40.94 |
| Hanna | 24 | | | 47.0 | 60.6 | 46.4 | 19.2 | 30.12 | 5 | 40.66 |
| Minnesota | 6 | | | 49.3 | 49.0 | 41.0 | 34.6 | 28.84 | 5 | 40.54 |
| Hannchen | 10585 | | | 50.0 | 57.7 | 49.4 | 22.7 | 17.95 | 5 | 39.55 |
| Chevalier | 200 | | | 49.4 | 54.6 | 49.0 | 20.0 | 23.17 | 5 | 39.23 |
| Moravian | 343 | | | 9.75 | 50.1 | 54.3 | 24.4 | 18.10 | 4 | 39.22 |
| Surprise | 171 | | | | 35.2 | 41.4 | 16.5 | 22.23 | 4 | 38.80 |
| Hanna | 203 | 45.0 | Hail | 47.0 | 48.3 | 49.0 | 23.3 | 17.29 | 6 | 38.31 |
| Manchuria | 170 | | | 48.1 | 29.1 | 45.8 | 33.1 | 35.33 | 5 | 38.28 |
| Common | 184 | | | 45.5 | 44.0 | 42.5 | 31.7 | 27.44 | 5 | 38.22 |
| Lower Frankish | 207 | | | 57.3 | 47.5 | 50.4 | 10.6 | 23.52 | 5 | 37.86 |
| Hanna | 416 | | | | | 55.4 | 24.0 | 31.34 | 3 | 36.91 |
| Grecian | 366 | | | | 38.4 | 47.3 | 31.0 | 31.22 | 5 | 36.68 |
| Hanna | 26 | | | 42.9 | 54.8 | 46.4 | 21.3 | 17.94 | 5 | 36.66 |
| Kitzing | 167 | | | | 34.4 | 43.5 | 19.2 | 49.12 | 4 | 36.55 |
| Bohemian | 27 | 35.6 | Hail | 45.4 | 32.7 | 49.5 | 22.1 | 21.25 | 6 | 36.09 |
| Hanna | 30 | | | 45.0 | 43.5 | 44.0 | 20.2 | 25.88 | 5 | 35.71 |
| Gold Melon | 48 | 26.0 | Hail | 45.8 | 46.3 | 37.0 | 25.6 | 17.77 | 6 | 34.98 |
| Bavarian | 159 | | | 59.9 | 48.9 | 36.8 | 14.6 | 14.74 | 5 | 34.98 |
| Princess | 10583 | | | 50.4 | 50.8 | 41.1 | 12.3 | 19.75 | 5 | 34.87 |
| Kitzing | 201 | | | 44.2 | 46.3 | 44.6 | 21.0 | 15.88 | 5 | 34.49 |
| Senbaku | 46 | | | | 47.2 | 51.4 | 19.2 | 18.00 | 4 | 33.95 |
| Summit | 174 | | | | 44.3 | 42.3 | 23.3 | 22.44 | 4 | 33.08 |
| Princess | 10586 | | | 42.1 | 45.8 | 37.3 | 14.2 | 22.94 | 5 | 32.46 |
| Bolton | 177 | | | | 45.6 | 35.6 | 23.3 | 21.53 | 4 | 31.50 |
| Gold Foil | 162 | | | | 43.5 | 43.3 | 21.7 | 17.00 | 4 | 31.37 |
| Striegum | 47 | 22.3 | Hail | 42.5 | 30.0 | 43.1 | 20.8 | 16.35 | 6 | 29.17 |
| Prize Prolific | 169 | | | | 39.8 | 41.7 | 14.0 | 16.58 | 4 | 28.02 |
| Sangatsuko | 78 | 22.0 | Hail | 27.9 | 32.9 | 31.2 | 21.3 | 15.64 | 6 | 26.82 |
| Bavarian | 160 | | | | 49.2 | 36.3 | 12.9 | 8.47 | 4 | 26.71 |
| Hulless | 22 | | | 29.0 | 41.3 | 25.3 | 12.0 | 22.75 | 5 | 26.07 |
| Hulless | 234 | | | | 42.3 | 26.2 | 11.2 | 11.87 | 4 | 22.89 |
| Little Blue Hulless | 335 | | | | 36.8 | 30.9 | 9.5 | 11.87 | 4 | 22.19 |

YIELD PER ACRE FOR EACH YEAR GROWN—(Two-Rowed.)

| VARIETY | Acces. No. | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 | 1908 | No of Yrs. | Av. Yield |
|----------------------|---------------|-------|------|------|------|------|------|-------|---------------|--------------|
| Kitzing | 189 | | | | 54.7 | 53.8 | 22.9 | 49.12 | 4 | 45.13 |
| Swan Neck | 187 | | | 69.0 | 45.0 | 49.1 | 23.8 | 30.62 | 5 | 43.5 |
| Chevalier | 10584 | | | 50.0 | 60.0 | 48.8 | 20.8 | 26.47 | 5 | 41.21 |
| " | 35 | 31.25 | Hail | 42.9 | 64.2 | 50.3 | 22.5 | 32.70 | 6 | 40.94 |
| Hanna | 24 | | | 47.0 | 60.6 | 46.4 | 19.2 | 30.12 | 5 | 40.66 |
| Hannchen | 10585 | | | 50.0 | 57.0 | 49.4 | 22.7 | 17.95 | 5 | 39.55 |
| Chevalier | 200 | | | 49.4 | 54.6 | 49.0 | 20.0 | 23.17 | 5 | 39.23 |
| Hanna | 203 | 45.0 | Hail | 47.0 | 48.3 | 49.0 | 23.3 | 17.29 | 6 | 38.31 |
| Lower Frankish | 207 | | | 57.0 | 47.5 | 50.4 | 10.6 | 23.52 | 5 | 37.86 |
| Hanna | 416 | | | | | 55.4 | 24.0 | 31.34 | 3 | 36.91 |
| Hanna | 26 | | | 42.9 | 54.8 | 46.4 | 21.3 | 17.94 | 5 | 36.66 |
| Kitzing | 167 | | | | 34.4 | 43.5 | 19.2 | 49.12 | 4 | 36.55 |
| Bohemian | 27 | 35.6 | Hail | 45.4 | 42.7 | 49.5 | 22.1 | 21.25 | 6 | 36.09 |
| Hanna | 30 | | | 45.0 | 43.5 | 44.0 | 20.2 | 25.88 | 5 | 35.71 |
| Gold Melon | 48 | 26.0 | Hail | 45.8 | 46.3 | 37.0 | 25.6 | 17.77 | 6 | 34.98 |
| Bavarian | 159 | | | 59.9 | 48.9 | 36.8 | 14.6 | 14.74 | 5 | 34.98 |
| Princess | 10583 | | | 50.4 | 50.8 | 41.1 | 12.3 | 19.75 | 5 | 34.87 |
| Kitzing | 201 | | | 44.2 | 46.3 | 44.6 | 21.0 | 15.88 | 5 | 34.39 |
| Striegum | 47 | 22.3 | Hail | 42.5 | 30.0 | 43.1 | 20.8 | 16.35 | 6 | 29.17 |
| Bavarian | 169 | | | | 49.2 | 36.3 | 12.9 | 8.47 | 4 | 26.71 |

Six Rowed.)

| | | | | | | | | | | |
|-----------------------|-----|----|------|------|------|------|------|-------|---|-------|
| Odessa | 182 | | | 61.2 | 45.2 | 50.5 | 32.1 | 30.58 | 5 | 43.91 |
| Minnesota | 6 | | | 43.3 | 49.0 | 41.0 | 34.6 | 28.84 | 5 | 40.54 |
| Manchuria | 170 | | | 48.1 | 29.1 | 45.8 | 33.1 | 35.33 | 5 | 38.28 |
| Common | 184 | | | 45.5 | 44.0 | 42.5 | 31.7 | 27.44 | 5 | 38.22 |
| Grecian | 336 | | | | 38.4 | 47.3 | 31.0 | 31.22 | 4 | 36.98 |
| Sangatsuko | 78 | 22 | Hail | 27.9 | 32.9 | 31.2 | 21.3 | 15.64 | 6 | 26.82 |
| Hulless | 22 | | | 29.0 | 41.3 | 25.3 | 12.0 | 22.75 | 5 | 26.07 |
| Hulless | 234 | | | | 42.3 | 26.2 | 11.2 | 11.87 | 4 | 22.89 |
| Little Blue Hulless.. | 335 | | | | 36.8 | 30.9 | 9.5 | 11.87 | 5 | 22.19 |

TABLE SHOWING COMPARATIVE YIELD OF VARIETIES OF BARLEY.

| VARIETY | Acces. Number | Av. Yield | No. Yrs. | |
|---------------------|------------------|-----------|----------|-------|
| Kitzing | 189 | 45.13 | 4 | ===== |
| Odessa | 182 | 43.91 | 5 | ===== |
| Swan Neck | 187 | 43.50 | 5 | ===== |
| Chevalier | 10584 | 41.21 | 5 | ===== |
| " | 35 | 40.94 | 6 | ===== |
| Hanna | 24 | 40.66 | 5 | ===== |
| Minnesota | 6 | 40.54 | 5 | ===== |
| Hannchen | 10585 | 39.55 | 5 | ===== |
| Chevalier | 200 | 39.23 | 5 | ===== |
| Moravian | 343 | 39.22 | 4 | ===== |
| Surprise | 171 | 38.80 | 4 | ===== |
| Hanna | 203 | 38.31 | 6 | ===== |
| Manchuria | 170 | 38.28 | 5 | ===== |
| Common | 184 | 38.22 | 5 | ===== |
| Lower Frankish | 207 | 37.86 | 5 | ===== |
| Hanna | 416 | 36.91 | 3 | ===== |
| Grecian | 366 | 36.68 | 5 | ===== |
| Hanna | 26 | 36.66 | 5 | ===== |
| Kitzing | 167 | 36.55 | 4 | ===== |
| Bohemian | 27 | 36.09 | 6 | ===== |
| Hanna | 30 | 35.71 | 5 | ===== |
| Gold Melon | 48 | 34.98 | 6 | ===== |
| Bavarian | 159 | 34.98 | 5 | ===== |
| Princess | 10583 | 34.87 | 5 | ===== |
| Kitzing | 201 | 34.39 | 5 | ===== |
| Senbaku | 46 | 33.95 | 4 | ===== |
| Summit | 174 | 33.08 | 4 | ===== |
| Princess | 10586 | 32.46 | 5 | ===== |
| Bolton | 177 | 31.50 | 4 | ===== |
| Gold Foil | 162 | 31.37 | 4 | ===== |
| Striegum | 47 | 29.17 | 6 | ===== |
| Prize Prolific | 169 | 28.02 | 4 | ===== |
| Sangatsuko | 78 | 26.82 | 6 | ===== |
| Bavarian | 169 | 26.71 | 4 | ===== |
| Hulless | 22 | 26.07 | 5 | ===== |
| " | 234 | 22.89 | 4 | ===== |
| Little Blue Hulless | 335 | 22.19 | 5 | ===== |

Dates of Killing Frosts.—(4 Year Average)

NORTHEAST SECTION.

| Station | County | Last in Spring | 1st in Autumn |
|---------------|-----------|----------------|---------------|
| Aberdeen | Brown | May 17 | September 30 |
| Bowdle | Edmunds | May 23 | September 22 |
| Clark | Clark | May 21 | October 1 |
| Clear Lake | Deuel | May 15 | September 30 |
| Ipswich | Edmunds | May 24 | September 29 |
| Kidder | Marshall | May 21 | September 26 |
| Milbank | Grant | May 13 | September 28 |
| Watertown | Codington | May 21 | September 30 |
| Average Dates | | May 19 | September 28 |

MIDDLE EASTERN SECTION

| | | | |
|---------------|-----------|--------|--------------|
| Brookings | Brookings | May 18 | September 30 |
| Faulkton | Faulk | May 14 | October 2 |
| Flandreau | Moody | May 13 | September 30 |
| Forestburg | Sanborn | May 15 | September 28 |
| Howard | Miner | May 16 | October 1 |
| Howell | Hand | May 9 | October 1 |
| Huron | Beadle | May 8 | October 1 |
| La Delle | Spink | May 14 | September 30 |
| Melette | Spink | May 20 | September 23 |
| Redfield | Spink | May 18 | October 2 |
| Wentworth | Lake | May 26 | October 2 |
| Average Dates | | May 16 | September 30 |

SOUTHEASTERN SECTION

| | | | |
|---------------|-------------|----------|--------------|
| Academy | Charles Mix | May 7 | October 12 |
| Alexandria | Hanson | May 11 | October 10 |
| Armour | Douglas | May 15 | September 23 |
| Canton | Lincoln | May 17 | October 2 |
| Greenwood | Charles Mix | April 29 | October 14 |
| Mitchell | Davison | May 11 | October 10 |
| Sioux Falls | Minnehaha | May 14 | October 2 |
| Yankton | Yankton | April 27 | October 14 |
| Average Dates | | May 9 | October 7 |

MISSOURI VALLEY SECTION

| | | | |
|---------------|--------|--------|--------------|
| Chamberlain | Brule | May 14 | October 10 |
| Higmore | Hyde | May 20 | September 30 |
| Kimball | Brule | May 13 | October 2 |
| Pierre | Hughes | May 3 | October 4 |
| Stephan | Hyde | May 14 | September 30 |
| Average Dates | | May 13 | October 3 |

BLACK HILLS SECTION

| | | | |
|---------------|------------|--------|--------------|
| Fort Meade | Meade | May 14 | September 28 |
| Oelriches | Fall River | May 17 | September 30 |
| Spearsfish | Lawrence | May 12 | October 1 |
| Average Dates | | May 14 | September 30 |

KILLING FROSTS

| Stations | Last in Spring | First in Autumn |
|--------------|----------------|-----------------|
| Aberdeen | May 27 | September 25 |
| Academy | May 15 | October 11 |
| Alexandria | May 26 | September 27 |
| Armour | June 4 | September 28 |
| Ashcroft | May 27 | September 14 |
| Bowdle | May 27 | September 25 |
| Brookings | May 27 | September 25 |
| Canton | May 27 | September 26 |
| Castlewood | May 27 | September 25 |
| Centerville | May 27 | September 28 |
| Chamberlain | May 27 | September 28 |
| Cherry Creek | May 16 | September 10 |
| Clark | May 27 | September 28 |
| Clear Lake | May 27 | September 25 |
| De Smet | May 27 | September 28 |
| Elk Point | May 27 | |
| Fairfax | May 27 | |
| Farmingdale | | September 10 |
| Faulkton | May 27 | September 28 |
| Flandreau | May 27 | September 25 |
| Forestburg | May 27 | September 28 |
| Ft. Meade | May 27 | September 29 |
| Frederick | May 27 | September 28 |
| Gann Valley | May 27 | September 28 |
| Greenwood | May 3 | October 12 |
| Hermosa | May 14 | October 8 |
| Highmore | May 27 | September 28 |
| Howard | May 27 | September 24 |
| Howell | May 3 | September 28 |
| Huron | May 20 | September 28 |
| Ipswich | May 27 | September 23 |
| Kennebec | May 8 | September 28 |
| Kidder | May 27 | September 8 |
| Kimball | May 20 | September 28 |
| La Delle | May 27 | September 25 |
| Little Eagle | June 5 | |
| Marion | May 20 | September 27 |
| Mellette | May 27 | September 28 |
| Menno | May 27 | September 28 |
| Milbank | May 27 | September 25 |
| Mitchell | May 27 | September 28 |
| Montrose | May 27 | September 9 |
| Mound iCty | June 5 | September 28 |
| Oelrichs | May 30 | September 29 |
| Orman | May 16 | September 29 |
| Pierre | May 3 | October 11 |
| Pine Ridge | May 27 | |
| Plankinton | May 27 | |
| Rapid City | May 14 | |
| Redfield | May 27 | September 28 |
| Rosebud | | September 10 |
| Rosylvn | May 27 | September 30 |
| Selby | | September 28 |

KILLING FROST—(Continued)

| Stations | Last in Spring | First in Autumn |
|----------------------|----------------|---------------------|
| Sioux Falls | May 27 | September 28 |
| Spearfish | May 27 | September 29 |
| Stephan | May 27 | September 28 |
| Vermillion | May 26 | October 11 |
| Watertown | May 21 | September 24 |
| Wentworth | May 27 | September 28 |
| Wessington Spgs | May 20 | September 28 |
| White Horse | June 5 | |
| Wolsey | May 27 | September 28 |
| Yankton | May 7 | October 12 |
| Average Dates | May .24 | September 27 |

COMPARATIVE ANNUAL DATA FOR SOUTH DAKOTA

| YEAR | Temperature | | |
|------|-------------|---------|--------|
| | Mean | Highest | Lowest |
| 1890 | 44.5 | 107 | -31 |
| 1891 | 44.3 | 112 | -34 |
| 1892 | 43.2 | 110 | -40 |
| 1893 | 42.5 | 110 | -44 |
| 1894 | 45.9 | 113 | -39 |
| 1895 | 44.0 | 112 | -46 |
| 1896 | 44.0 | 109 | -32 |
| 1897 | 43.5 | 109 | -35 |
| 1898 | 45.0 | 113 | -29 |
| 1899 | 43.3 | 111 | -47 |
| 1900 | 47.1 | 115 | -32 |
| 1901 | 46.2 | 115 | -42 |
| 1902 | 48.9 | 111 | -35 |
| 1903 | 44.2 | 110 | -39 |
| 1904 | 44.1 | 110 | -39 |
| 1905 | 44.6 | 108 | -48 |
| 1906 | 45.0 | 107 | -37 |
| 1907 | 43.6 | 107 | -37 |

RAINFALL.

State:—Average rainfall for the state is 20.05 inches. The least rainfall for the last eighteen years was in 1894 when the precipitation was 15.24 inches, the next being 16.37 inches in the year 1898. The year 1891 had a rainfall of 17.59 inches; 1893, 17.25 inches, 1895, 17.38 inches. The greatest rainfall during this period was in 1906, 26.09 inches; the next was in 1905, 24.83 inches.

North Eastern Section:—Rainfall of the State. The word rainfall, includes both rain and snow. The average for both state and sections has been obtained from observations made since 1890 and extending over a period of eighteen (18) years. The average rainfall for this section is 20.55 inches. The lowest rainfall was in the year 1891, being 14.50 inches; the next being 15.84 inches in 1890. The greatest rainfall for this section was in 1906, being 28.28 inches; the next was 28.20 inches in 1905; while in 1892 there was an average of 26.59 inches.

Middle Eastern Section:—This section of the state has an average rainfall of 20.66 inches. The lowest rainfall was in the year 1894, being 13.46 inches; the next being 17.13 inches in 1895. The greatest rainfall for this section occurred in 1905, being 27.74 inches; the next was 26.86 inches in 1906, while there was 25.15 in 1892.

Southeastern Section:— This part of the state has an average rainfall of 24.13 inches. The lowest rainfall was in the year 1894, being 14.52 inches; the next being 18.31 inches in the year 1890. The greatest rainfall for this section occurred in 1906, being 32.14 inches; the next was 29.21 inches in 1905; while there was 25.69 inches in 1897.

Missouri Valley Section:—This section has an average rainfall of 16.32 inches. The lowest rainfall was in the year 1894, being 11.14 inches; the next being 12.09 in 1893. The greatest rainfall for this section occurred in 1906, being 24.52 inches; the next was 22.08 inches in 1901, while there was 22.00 inches in 1896.

Black Hills Section:—This part of the state has an average rainfall of 18.61 inches. The lowest rainfall was in the year 1898, being 12.69 inches; the next being 13.00 in 1896; while in 1900 there was 13.72 inches. The greatest rainfall for this section occurred in 1905; being 22.37 inches; the next was 21.70 inches in 1891; while there was 21.30 inches in 1892.

WINDS.

The climate of the State is that peculiar to the great part of the Northwest. As a rule it is very healthful though subject to great extremes of temperature. The highest recorded temperature is one hundred and fifteen (115) degrees—in the years 1900 and 1901. The lowest recorded temperature is forty-eight (48) degrees—in the year 1905. The mean temperature for the entire state is forty-four and thirty hundredths (44.30) degrees. The cold is not so noticeable because of the dryness of the air. The summers are very pleasant, although short, with very warm days but cool nights. A very important factor in the climate of South Dakota is the strong wind which is very frequent in all seasons of the year. They usually blow from the southeast and south during the spring and summer months. During the three months of September, October and November the winds have no general direction and are quite variable. During December, January, February and March the winds usually blow from the north and northwest.