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The Sugar Beet of South Dakota

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South Dakota Agricultural College

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SOUTH DAKOTA

AGRICULTURAL COLLEGE
AND
EXPERIMENT STATION
BROOKINGS, S. D.

BULLETIN NO. 27.

NOVEMBER, 1891.

Department of Chemistry.

The Sugar Beet in South Dakota.

DUTCHER & BREED, BROOKINGS.

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Mail for the Station should be addressed to the Director, and that for any special department to the officer in charge.

THE SUGAR BEET IN SOUTH DAKOTA.

JAMES H. SHEPARD, Chemist.

MOTHER BEETS FOR SEED.—At the close of the season last year, a number of sugar beets of the different varieties grown on the college farm were carefully selected and stored in the root cellar. From these beets it was proposed to raise pedigreed seed. Accordingly in the following May 11-14, these beets were subjected one by one to analysis. By means of a common three-fourths inch bit, a diagonal hole was bored from a point as low as possible on the root and extending upward towards the crown. The borings which were obtained were used in the analysis. The auger holes were plugged with moist clay as soon as the boring was completed. Since the purity coefficient for all the beets had previously been found satisfactory and especially so in the case of those beets showing a high per cent. of sugar it was only necessary to determine the sugar content. This was accomplished by the method of Tollens-Rapp-Degener. Under the circumstances this method would give results rather lower than the actual sugar content, since it was found to be rather difficult so to regulate the pressure on the bit as to give equally and sufficiently thin sections or chips. But even under these circumstances which were somewhat unfavorable and which were rendered more so by the long time the beets had been stored before they were analyzed, it was determined to save no beet for planting that should not show 15 per cent. and over of sugar in the beet. It is evident from the manner of conducting the experiment that beets of good keeping quality and at the same time rich in sugar were secured. None of the samples analyzed had wilted.

The first beets analyzed were Dieppe's Klein Wanzlebener. Eight beets were taken with results as tabulated below:

Sta. No.	Wt. Grams	Sugar in Beet
76	669	13.82
77	582	14.91
78	547	14.51
79	470	13.22
80	425	15.70
81	368	17.40
82	322	15.50
83	251	13.95

Of these only Nos. 80, 81 and 82 were planted.

The next variety analyzed was Simon Legrand's White Improved. Of these beets seven were tested with the following results:

Sta. No.	Wt. Grams	Sugar in Beet
84	497	14.11
85	521	15.11
86	429	15.11
87	385	15.11
88	373	11.53
89	312	12.13
90	293	15.61

Station Numbers 85, 86, 87 and 90 were planted.

Six beets, variety, Pajaro Valley, were next analyzed with the following results:

Sta. No.	Wt. Grams	Sugar in Beet
91	1267	9.94
92	651	11.83
93	354	13.52
94	317	14.02
95	304	15.31
96	297	15.51

The last two only were planted.

Florimond Desprez's Richest were then analyzed with the following results:

Sta. No.	Wt. Grams	Sugar in Beet
97	642	11.23
98	531	12.52
99	512	9.54
100	500	10.44
101	462	12.92
102	351	10.92
103	349	10.93

All these beets were rejected as none of them came up to the requirements.

Bulteau Desprez's Richest was the next variety and seven beets were examined with results as follows:

Sta. No.	Wt. Grams	Sugar In Beet
104	976	12.62
105	619	13.92
106	477	15.11
107	386	14.02
108	336	15.61
109	323	14.41
110	384	13.32

Nos. 106 and 108 were planted,

Seven beets of the variety Dieppe's Vilmorin were lastly analyzed with results as follows:

Sta. No.	Wt. Grams	Sugar in Beet
111	327	12.42
112	268	14.91
113	318	Lost
114	312	17.01
115	298	14.71
116	303	16.31
117	316	16.21

Nos. 114, 116 and 117 were planted. On the whole the beets of this variety seemed to be better keepers than any of the preceding.

The mother beets after planting made new tops and threw out flower stalks in great luxuriance. From the small number planted a good yield of seed was obtained. This seed will be planted next May and from the beets raised it is expected that in the following year a sufficient quantity of home grown pedigreed seed will be raised to enable the Station to distribute a fair number of packages for trial. Before leaving this topic it might be well to state that the different varieties of mother beets were planted so far apart that there was no possibility of cross fertilization.

And farther, it will be a good plan for farmers who have had beets of high sugar content (as shown by the analysis this year) to select rather smallish, perfect beets and plant them for seed. Large or deformed beets must not be used for this purpose.

THE SUGAR BEET CROP FOR 1891.

Last spring about one thousand samples of seed were distributed throughout the state. Between seven and eight hundred were sent from this Station. The seed distributed was ob-

tained from various sources, some coming from the Department of Agriculture, and some, variety Desprez, coming from the Oxnard company. In addition to these, various parties throughout the state obtained seed direct from Germany.

In making the report for this season it was deemed best to divide the state into different regions which have somewhat similar climatic conditions. But when the large area of the state is taken into consideration; and when it is remembered that a few local showers just at the right time, or at the wrong time, would greatly influence the growth and development of the sugar beet, it will become evident that even in the regions marked out much variation may be expected.

THE BIG SIOUX VALLEY AND EASTERN REGION embraces all that portion of the state east of the eastern water shed of the James river.

THE JAMES RIVER VALLEY REGION is a well marked district most of which is situated over the artesian basin in South Dakota. This region has many advantages for sugar beet culture.

THE MISSOURI RIVER REGION extends from the western water shed of the James river to the Missouri river. The tier of counties west of the river are but sparsely inhabited toward the northern portion of the state.

THE BLACK HILLS REGION, as is well known, embraces the rich mining regions of western South Dakota. There are many fertile valleys and level plateaus throughout this region where farming is carried on; and it is from these places that the samples of this year have come.

Under each region the report is given by counties. Under the circumstances it was not possible to give averages for each county. It would evidently be unjust to strike averages when some samples were analyzed on trial and found to be immature and afterwards analyzed again. Or again it would not be proper to average a fair sample with a sample that was manifestly not a proper sample at all. Consequently a complete history of each sample is given so far as obtainable. It will be noticed that some of the poorest samples are not from what is now strictly considered to be sugar beet seed.

RESULTS OF THE SEASON'S WORK.—In all two hundred and sixty-three analyses have been made this year. These analyses have been carefully executed by more laborious methods than usually employed. The marc has been determined and the results show that there is a wide variation from the marc usually assumed, five per cent., in more rapid methods. The ash was obtained by incineration with sulphuric acid. One tenth was deducted to allow for excess of weight of sulphates over carbonates. The sugar in the beet was determined by Scheibler's process. And from this factor together with the marc the sugar in the juice was calculated. The Degree Brix was taken with an accurate spindle, applying corrections for variations of temperature. This method was controlled by obtaining the total solids by evaporation with sand. The results were practically identical.

Without attempting to give averages a comparative statement may be made which will be found useful as tending to throw light upon the effect of different methods of cultivation, etc., as effecting the sugar content of the beet.

Of the 263 analyses, 55 show under 10 per cent. sugar in the beet; of these 13 show 10 per cent. and over of sugar in the juice. 84 show between 10 and 12 per cent. sugar in the beet; of these 34 show 12 per cent. and over of sugar in the juice, and are consequently of marketable value; 79 show over 12 per cent. and under 15 per cent. sugar in the beet, of these 41 show over 13 per cent. sugar in the beet; 45 show over 15 per cent. sugar in the beet, and of these 8 show over 17 and 2 show over 18 per cent. sugar in the beet.

METHODS OF CULTIVATION, ETC.—A careful examination of the analyses giving poor returns will clearly exonerate soil and climate from the responsibility of the low per cent. of sugar. It will be found that the poor samples are due to some one of or to a combination of several of the following causes:

1. A bad selection of ground. Low black bottom land was chosen when a higher and lighter soil would have been better.
2. The direct application of barn yard manure. Land should be used that has not been manured for one or two years.

3. Shallow plowing. The land should be plowed at least twelve inches deep. If a subsoil plow is at hand, then ten inches with four inches subsoiling will give better results. The condition of some of the samples received shows the effect of this shallow plowing by the distorted shapes and numerous tap roots of the beets.

4. The seed was planted too late and the beets were harvested too early. The seeds should be sown as soon in May as danger from frost is over, say from the 1st to the 10th. When the season is late as it was this year the beets do not ripen until the very last of October or the first of November. If the beets get a late start in the spring they should be left in the ground as long as possible. They will stand quite a hard frost without injury when standing as they grew. Soaking the seed will hasten germination.

5. The beets were too thin on the ground. Rows varying from 16 inches to eight feet are reported. The rule is, make the rows as close together as possible in soil as rich as that of this state. Also have the beets stand closely together in the row. This prevents the beets from growing too large and gives a better purity coefficient. Probably rows 22 to 24 inches with beets from five to six inches will give the best results obtainable on a commercial scale in our state. The rows well might be only sixteen inches were it not that this would prevent cultivation with horse cultivator. It was not always the farmer's fault that the beets were too thin on the ground, as cutworms destroyed some plots almost completely.

6. Large beets were sent as samples instead of average sized ones as directed. It is a complaint that comes from all parts of the country where sugar beet experiments are now going on that it is hard to get the average farmer to believe that large beets are not best for sugar making. Even where factories are located the same complaint is heard. But it is a well settled fact that LARGE beets and a LOW sugar content always go together. Monstrous beets have been sent to the Station this year in direct violation of instructions.

WORK FOR NEXT YEAR.—The Station Council has decided that the experiments with sugar beets should be continued another

year. Also that four hundred samples of seed should be sent out, and that the necessary funds be apportioned to the Department of Chemistry for carrying on the work.

The work here is so far advanced that nothing further can be gained by haphazard tests in any direction. The work of this season shows that good beets for the purpose of sugar manufacture can be raised with good cultivation, and that poor beets unfit for that purpose can be grown by poor cultivation.

Consequently seed will be sent only to such as will promise to give necessary attention to cultivation. What would be more desirable would be that the distribution should be made to those localities where the people are looking forward to the erection of sugar factories. In such cases, by the active co-operation of a local committee, which could see that proper persons are selected and instructed how to grow the beets, and by instructions that will be sent out from this Station, actual results can be obtained that will compare with those that would be obtained were the factory in operation. The Chemist of this station will be ready at all times to give such aid as may be desired by the grower. Personal visits by him to localities where many samples are placed and the taking of test samples for analysis before the main samples are taken, etc., etc., would be of advantage, so that the reports of next year should not include immature or unfit specimens. All this would insure better results than can be reached any other way.

All correspondence in relation to this work should be addressed to Jas. H. Shepard, Chemist, Brookings, S. D.

The following pages are devoted to a history of the experiments made this year.

THE BIG SIOUX VALLEY AND EASTERN REGION.

MARSHALL COUNTY.

Three samples were received from this county. The beets were large and had grown vigorously. In all twenty-three samples of seed were distributed throughout the county.

Sta. No. 223 came from C. N. Cooper, Britton township. Stable manure was used and beets were hoed. The beets were planted too late and were not thick enough upon the ground; and the manure was also a disadvantage; stand of crop was good.

Sta. No. 276 was from M. L. Babcock, Heckman Township. No fertilizers were used and the beets were both cultivated and hoed. The stand was only 40 per cent. owing to drought. These beets were not thick enough upon the ground.

Sta. No. 287 came from L. O. Harrington, Pleasant Valley township. Well rotted stable manure was used and the beets were hoed. The stand of crop was fair. This was the best sample from Marshall county.

The following tables will show the data given and the analyses of the samples:

Station No.	Variety	Planted	Harvested	Rows	Between Beets	Tons per Acre	Soil
223	Desprez	June 1	Oct. 17	30 in	12 in	24.9	Sandy Loam
276	Desprez	May 21	Oct. 24	24 in	24 in	7.2	Common Prairie
287	Desprez	May 10 15 30	Oct. 26	24 in	6 in	9.3	Black Loam

ANALYSES:

Sta. No.	No. beets analyzed	Av wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
223	6	1224	9.65	10.05	1.51	4.01	14.40	69.09
276	5	943	11.00	11.51	1.59	4.42	16.50	70.00
287	6	884	12.10	12.72	1.80	4.89	18.10	70.00

A blank with report was also received from E. M. Ireland, Newport township, but his sample failed to reach the Station.

He reports a fair stand of crop with a yield of ten tons per acre

ROBERTS COUNTY.

Three samples were received from this county. In all seven samples of seed were sent out to the county from the Station.

Sta. No. 240 was grown by J. T. Stowell of Garfield township. The ground was well manured three years ago and the last crop was cabbage. The ground was plowed 11 inches deep in May, and well harrowed. Beets were cultivated by hand and weeded June 12th to 18th; thinned June 30th and hoed July 30th and Aug. 5. Although the analysis gave good results, nevertheless it is probable that if the beets had been left standing in the ground two weeks longer there would have been a material increase in the per cent. of sugar. Mr. Stowell writes that he has raised sugar beets successfully for the last two years.

Sta. No. 293 came from A. H. Greene, Lake township. He used no fertilizer and cultivated by hand. Frost injured the sample July 24. Stand of crop, 75 per cent.

Sta. No. 321 was grown by W. T. VanDerwarker, Lockwood township. He used no fertilizer and cultivated with hoe.

The following tables complete the reports on these samples:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in row, inches	Tons per acre	Soil
246	Klein Wanzlebener...	May 5	Oct. 16	18	5	10.5	Black loam
293	Desprez	May 20	Oct. 28	16	6	33.0	" "
321	Desprez	May 20	Oct. 15	24	10	38.0	Clay bottom land

ANALYSES:

Sta. No	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
246	6	580	13.80	14.48	1.42	4.72	19.40	74.64
293	3	625	9.60	10.02	1.28	4.23	13.10	76.50
321	3	1330	11.70	12.24	1.62	4.43	14.20	86.20

A letter was received from J. E. Englund who did not send a

sample because the beets were not so large as he thought they should be. He states that they only averaged about twelve ounces each and attributes their small size to dry weather. In all probability had he sent in a mature sample a higher per cent. of sugar would have been obtained than from any other sample from that county. He also reports similar results from a near neighbor.

DAY COUNTY.

Twenty seven samples of seeds were sent to this county last spring. Eight samples of beets have been received and four reports without samples have been sent in.

Sta. No. 170 came from Frank Allen, Homer township. No fertilizers were used and the stand was poor and irregular. The seed was sown with a shoe drill. Plowed once and then kept clean with the hoe. The beets were not harvested.

Sta. No. 197 was from Eli Stearns, Homer township. No fertilizer used and one fourth stand of crop reported. The beets were hoed once. The beets were altogether too far apart.

Sta. No. 218 came from Samuel Resseguie, Scotland township. No fertilizer and good stand are reported. The beets were cultivated with horse cultivator.

Sta. No. 227 was from J. D. Martin, Homer township. The beets were hoed once, had no fertilizer and gave one fourth stand.

Sta. No. 265 is from W. R. Lawrence, Farrington township. The beets were not planted in rows but were sown broadcast, consequently they were not cultivated at all.

Sta. No. 269 comes from A. J. Miles, Homer township. He reports a good stand, used no fertilizer, plowed the ground deep and cultivated the beets with a hoe.

Sta. No. 347 was from W. E. Metherell, Homer township. No fertilizer, fair yield and cultivated with hoe.

Sta. No. 210 is an unidentified sample and was analyzed by mistake; it came from Webster.

The following tables complete the reports:

Station No	Variety	Planted	Harvested	Rows— inches	Beets in row— inches	Tons per acre	Soil
170	Desprez	May 21	Oct 15	24	6-24	.....	Sandy Loam
197	Desprez	June	Oct 13	36	20	8	Sandy Loam
218	Desprez	May 18	Oct 15	36	6	12	Black Loam
227	Desprez	May 22	Oct 8	18	8	10	Sandy Loam
265	Vilmorin (?)	May 25	Oct 11	...	...	16	Black Loam
269	.....	Apr. 28	Oct 13	24	6-8	18	Black Loam
347	Desprez	May 16	Oct 15	20	5	28	Black Loam

ANALYSES:

Sta No	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
170	6	784	10.60	11.06	1.27	4.21	15.50	71.35
197	6	995	10.30	10.75	1.90	3.86	15.60	68.91
218	6	738	7.10	7.38	1.58	3.60	12.20	60.50
227	6	981	14.90	15.61	1.39	4.54	18.40	84.29
265	6	701	12.45	13.08	1.08	4.61	16.50	73.21
269	6	501	12.75	13.42	1.69	5.03	18.30	73.33
347	6	612	13.70	14.48	1.81	5.49	19.40	74.64
379	6	315	12.10	12.70	1.16	4.75	16.60	76.51
379	6	485	14.45	15.20	....	....	20.00	76.00

L. W. Lewis of Scotland township, reports a good stand with a yield of about 13.5 tons, but his sample. Sta. No. 379, came too late for complete analysis. W. S. Dart of Independence township reports good stand, but his sample was somehow lost. C. A. Bonner, Homer township, reports that his seed failed to germinate. E. E. Flint of the same township reports his plants destroyed by stock.

GRANT COUNTY.

Eight samples of seed was sent out to this county from the Station, and Henry S. Volkmar of the Grant County Review writes that he distributed two hundred samples. All told, thirteen samples have been analyzed from Grant county.

Sta. No. 140 was grown by E. C. Clark of Alben township. No fertilizers were used and two-thirds stand crop is reported. The beets were cultivated with horse cultivator and hoe.

Sta. No. 153 was raised by Thomas Street of Revillo, Adams township. A fair stand is reported but all told a light crop owing to excessive drought. He does not think that over one and one half inches of rain fell after June 20. The beets were cultivated by horse cultivator and hoed and weeded by hand. The results are not encouraging.

The remaining eleven samples were collected by Mr. Volkmar and forwarded to the Station. He writes: "I distributed 200 samples, but the farmers have either been too busy or too negligent to bring in samples. However, I think what I send you will be sufficient for your purpose." It is a pity that more samples from this county were not forthcoming. Many rank good and some of them are exceptionally fine.

Sta. No. 350 was raised by Frank Robel, Alban township. The land was high rolling prairie. No fertilizers were used. The land had been planted to peas and had grown up to weeds. The weeds were killed and then the beets were sown. The stand was reported good but insufficient data were given whereby the yield per acre could be obtained.

Sta. No. 351 was raised by William Dolly in the city of Milbank. The beets were cultivated with a hoe. No other data are given.

Sta. No. 352 was raised by John C. Reeve, Melrose township. The beets were hoed three times, and the stand was good.

Sta. No. 353 was grown by John Lindberg, Big Stone township. Manure was used and beets were cultivated by hoe.

Sta. No. 354 was grown by Harvey T. Rawson, Melrose township.

Sta. No. 355 was grown by John Martens, Melrose township. The land was plowed the previous fall and again on May 29th, when the seed were immediately sown while the ground was yet moist. The beets were cultivated three times.

Sta. No. 356 was grown by Harvey T. Rawson, Melrose township, on what he calls "fair kind of ground."

Sta. No. 357 was grown by Geo. Jenkins, Grant Centre township. The beets were tilled by means of a cultivator. This is the best sample from the county and as good as any in the

state. More explicit information concerning this sample would have been particularly acceptable.

Sta. No. 358 was grown by F. A. Russell, Alban township.

Sta. No. 360 was grown by N. Bower, Grant Centre township. The land which is described as good corn land with a little sand had been plowed for corn to a depth of about eight inches. The beets were first cultivated with cultivator and afterwards hoed three times. Ground was moist.

Sta. No. 364 was raised by John Tillman, Melrose township. Manure was used and a fine stand was obtained. The beets were well hoed, thinned and kept free from weeds.

The following tables give all the remaining data and complete the report:

Station No.	Variety	Planted	Harvested	Rows—inch s	Beets in row— inches.	Tons per acre.	Soil
140	Desprez	May 15	Oct 15	26	5	12	Low bottom land
153	Desprez	May 15	Oct 10	30	8	3	Black lam
350	German	June 14	Oct 15	15	15	1	Highland loam
351	German	June 1	Nov 10	24	8	14	Black loam
352	Desprez	May 25	Oct 24	15	6	40	Sandy loam
353	German	May 15	Oct 28	18	12	7.5	Fair
354	German	June 12	Oct 25	18	12	19	Low sandy
355	German	May 29	Oct 20	36	4	11	Fair
356	Desprez	June 12	Oct 25	24	6	30	Loam
357	German	May 20	Oct 20	24	16	8.6	Sandy
358	German	May 13	Oct 19	24	16	8.6	Bottom land
360	German	May 18	Oct 28	24	16	8.6	Bottom land
364	German	May 20	Nov 3	24	16	8.6	Bottom land

ANALYSES.

Sta No	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
140	5	684	13.00	13.68	1.06	5.00	17.80	76.85
153	5	524	7.60	7.90	2.07	4.11	12.20	64.75
350	4	642	13.65	14.50	1.52	5.86	22.00	65.90
351	6	470	11.80	12.43	1.50	5.84	18.80	66.00
352	6	382	14.30	15.22	1.62	6.06	21.20	71.79
353	5	610	14.40	15.34	1.69	6.15	21.60	71.02
354	5	590	10.80	11.47	2.00	5.81	17.80	64.42
355	5	620	13.50	14.18	1.53	4.79	18.80	75.42
356	5	760	12.35	13.02	1.90	5.12	18.70	69.60
357	8	244	18.90	20.18	1.38	6.32	22.20	90.88
358	4	730	13.60	14.43	1.88	5.77	22.00	65.60
360	6	621	10.90	11.35	1.58	3.95	16.30	69.62
364	6	475	15.65	16.55	1.88	5.42	21.20	78.05

CODINGTON COUNTY.

Ten samples of seed were distributed in this county and two samples of beets were forwarded for analysis.

Sta. No. 166, variety Desprez, came from John S. Offley, of Henry township. Stable manure was applied and a very poor stand of crop was reported. The beets were too far apart in the rows, but they had good cultivation. They were plowed twice with the shovel plow and hoed twice. He also states that they were dragged twice with open corn drag. This latter is a questionable procedure, unless the drag be so arranged that it will not injure the tender plants. Seed was sown May 16; beets harvested Oct. 16; rows 42 inches apart and beets 6 inches in row. Yield 100 bushels per acre. Soil a black loam.

Sta. No. 361, variety unknown, was grown by Oscar P. Kemp of Watertown. The seed was planted May 10 and the beets were harvested Nov. 14. The rows were 18 inches apart and the beets 12 inches in the row. The stand of crop was fair and the yield twelve and one half tons per acre. No fertilizers were used and the beets were carefully worked with hand cultivator at least twice each week. They were thinned by hand. The poor results shown by the analysis may be due to the fact that the beets were not thick enough on the ground.

The following table shows the analysis.

Sta. No.	No beets analyzed	Av wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degrees Brix	Purity coefficient
166	6	849	10.00	10.35	1.39	3.35	12.60	82.06
361	4	750	7.80	8.13	2.05	4.01	13.40	60.63

DEUEL COUNTY.

Sixteen samples of seed were sent to this county and but one sample of beets was sent in for analysis. Sta. No. 299 was grown by C. H. Lester, Havana township. The beets were planted June 1, and harvested Oct. 29. The rows were 30 inches and beets in row 5 inches. Stand of crop was good and yield per acre seven and one half tons. No fertilizer was used and the soil was prairie loam and had been cropped twelve

years; four years ago it was heavily manured with stable manure after which oats and wheat had been raised. The beets were cultivated and hoed. He writes: "Many of the beets were quite small, while many weighed from three to four pounds. The average weight of 100 average beets was 1.2 lbs. Ground plowed but 6 inches deep in 1890. Many beets grew with divided root, upper part of root quite thick but short. From manner of growth it appears that ground was not plowed deep enough to give room for the roots."

This sample, variety Desprez, averaged 507 grams and gave sugar in beet 11.70; sugar in juice 12.25; ash in juice 1.06; marc 4.48; degree brix 14.80; purity coefficient 82.77.

HAMLIN COUNTY.

Eleven samples of seed were sent to this county and all were distributed in the vicinity of Castlewood. Three of these samples have been heard from. S. D. Haight and T. Melor report that the plants were all destroyed by cut worms. P. E. Higgins lost nearly all by cut worms but managed to save a few by transplanting and these he sent on for analysis. This sample is unique on that account. Sta. No. 280, variety Desprez, is the sample and gave the following results: Av. wt. 513 grams; sugar in beet 9.90; sugar in juice 10.53; ash in juice 1.07, marc 5.96; degree Brix 15.70; purity coefficient 67.07.

BROOKINGS COUNTY.

Eighteen samples of seed were distributed in this county besides those grown at the Station. From the eighteen, three samples of beets were sent in for analysis.

Sta. No. 143 was grown by Z. R. Post of Alton township. No manure was applied this season but the land was previously treated with stable manure. The stand was medium and the beets were cultivated with a horse cultivator.

Sta. No. 211 came from P. D. Davis, Sherman township. Horse manure was used and the stand was good. The beets were once cultivated with a shovel plow and three times hoed.

Sta. Nos. 260, 262, 267 and 268 were grown on the college farm. No fertilizer was used and the stand of crop was 100 per cent. The beets were grown on deep rich bottom land which was plowed ten inches deep and then subsoiled six inches

deeper. The beets were cultivated twice with cultivator and were hoed twice. This soil does not seem well adapted to beet culture when compared with the fine results obtained on the farm last year at which time much higher ground was selected. Some seed was sown on higher ground this year, but for some unknown cause no results were obtained.

Sta. No. 359 was raised by D. R. Sweezy, Bangor township. Barn yard manure was used and a fair stand of crop secured. The ground was plowed deep and the beets were cultivated with a horse cultivator. Crop was light; cut worms destroyed most of the plants so no yield could be given.

Perhaps it might be said that all the samples from Brookings county were raised on too rich ground. Had higher ground without manure been used better results would have ensued.

The following tables complete reports:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in Row— inches	Tons per acre	Soil
143	Desprez	May 19	Oct 10	40	11	8	Black loam
211	Desprez	May 11	Oct 17	24	8	8.5	Sandy loam
260	Klein Wanzlebener.....	May 15	Oct 27	28	9	10.70	Black bottom
262	Vilmorin's Improved.....	May 15	Oct 27	28	9	10.8	Black bottom
267	Desprez	May 15	Oct 27	28	9	14.4	Black bottom
268	German.....	May 15	Oct 27	28	9	11.7	Black bottom
359	Desprez	May 25	Nov 3	26	.....	.....	Black loam

ANALYSES:

Sta. No	No beets analyzed	Av. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
143	6	1294	8.00	8.26	1.50	3.18	13.60	62.30
211	8	315	10.15	10.63	1.25	4.56	14.80	71.82
260	4	648	10.80	11.30	1.01	4.43	15.40	73.37
262	4	589	13.60	14.32	.62	5.07	17.60	81.31
267	4	617	10.30	10.60	.92	4.03	14.30	74.34
268	4	708	11.30	11.78	.94	4.06	14.10	83.55
359	5	639	11.25	11.78	1.83	4.46	17.60	66.90

LAKE COUNTY.

Three samples of seed were distributed in this county but nothing has been heard from any of them.

MOODY COUNTY.

No samples of seed were sent out from the Station to this county but three samples of beets from seed obtained elsewhere, were sent in for analysis.

Sta. No. 168 was raised by James Ashley, River View township. No fertilizers were used and the stand of crop was good. The beets were cultivated with hoe and corn plow.

Sta. Nos. 254 and 255 were grown by James Wilson of Grovena township. The ground was plowed a few days before planting, about eight inches deep. The land has been in cultivation for twelve years. The beets were tended by hoe and the weeds in row pulled by hand. The stand of crop was good.

The following tables give the remainder of report:

Station No.	Variety	Planted	Harvested	Rows—Inches	Beets in row. Inches	Tons per acre	Soil
168	Desprez	May 6	Oct 15	36	8	32.0	Sandy clay
254	Vilmorin	June 2	Oct 20	24	8	20.7	Sandy loam.
255	Klein Wanzlebener.	do	do	24	8	18.7	do

ANALYSES:

Sta. No	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degrec Brix	Purity coefficient
168	6	961	11.40	11.86	1.26	3.89	15.20	78.02
254	2	571	12.80	13.61	1.08	5.92	17.00	80.00
255	2	508	10.90	11.59	1.20	5.97	16.50	70.24

MINNEHAHA COUNTY.

Eight samples of seed were sent to this county and five samples of beets were returned.

Sta. No. 167 was grown by Wm. Connolly of Wall Lake township. No fertilizer was used and cut worms killed some of the plants. He estimates the yield at about ten tons per acre. Beets were cultivated with hoe.

Sta. No. 122 came from John Engebretson of Palisade township. Manure was used and cut worms did some damage. The stand and yield could not be given.

Sta. No. 173 came from Chas. Olander, Split Rock township. No fertilizer and a full stand of crop are reported. The land had been in cultivation for twenty years and had been in timothy for the past three years. The beets were hoed four times and weeded once by hand.

Sta. No. 266 was grown by O. Olson of Valley Springs. The ground had been manured the previous year with stable manure. It was plowed ten inches deep just before the planting which was done by hand. The beets were cultivated with corn plow and with hoe.

Sta. No. 363 was grown by E. J. South of Sioux Falls township. No fertilizer was used and a poor stand of crop was reported. The land is low black loam but not wet. It had been in garden several years but last year it was in corn. The beets were hoed twice and twice cultivated with horse corn cultivator.

The following tables complete the report:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in row— inches	Tons per acre	Soil
123	Klein Wanzlebener.....	May 11	Oct 1	30	7	.....	Black loam.
167	Desprez	June 20	Oct 14	18	8	10.0	do
173	do	May 13	Oct 13	36	8	30.5	Black alluvial.
266	Vilmorin	May 12	Oct 14	36	.....	10.7	Sandy loam.
363	Desprez	May 30	Oct 20	46	.....	.....	Low black loam.

ANALYSES:

Sta. No.	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
123	6	466	12.10	12.57	1.03	4.64	17.20	73.08
167	5	674	12.20	12.67	1.40	4.62	17.30	73.33
173	6	969	9.50	9.90	1.19	4.04	14.80	68.24
266	4	962	10.90	11.41	1.89	4.44	16.00	71.31
363	6	714	11.30	11.89	1.64	4.98	16.80	70.79

MCCOOK COUNTY.

Nine packages of seed were distributed in this county and four samples of beets have been returned.

Sta. No. 204 was grown by Oliver Gibbs, Jr., of Ramsey. Well rotted manure was used and beets were hoed and kept

clean. The cut worms destroyed so many of the plants that the stand was thin and uneven.

Sta. No. 264 came from L. W. Robbins, Benton township. No fertilizer was used. The ground had been prepared for corn and the seed were sown quite thick in marks made by a corn cultivator. The seed was covered by dragging lengthwise of the row, and although a fine rain fell that night not one seed in fifty germinated. Beets were cultivated and hoed.

Sta. No. 297 and 298 were sent by W. T. Pierce, Pearl township. No fertilizer was used and the stand was poor. The ground was plowed the preceding fall and again in May to a depth of 7 inches. Beets were hoed and weeded. Sta. No. 298 proved to be some variety of mangel.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested.	Rows — inches	Beets in row — inches.	Tons per acre.	Soil
204	Desprez	May 15	Oct 16	24	.....	.....	Sandy loam.
264	Vilmorin	June 1	Oct 22	36	.....	.....	Gravelly loam.
297	Klein Wanzlebener	May 15	Oct 15	30	36	6.3	Black loam.
298	Mangelwurtzel	do	do	20	36	7.5	do

ANALYSES:

Sta. No.	No. beets analyzed	Av. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
204	4	1183	10.00	10.43	1.32	4.10	14.60	71.74
264	6	797	12.10	12.69	1.11	4.68	16.20	78.83
297	6	669	9.20	9.46	.69	3.77	13.00	72.77
298	4	1271	4.75	4.91	1.26	3.28	10.20	48.14

TURNER COUNTY.

One package of seed was sent to this county, but two samples of beets were sent in.

Sta. No. 341 came from John M. Downer, township 97, R. 55. Only about one hundred seeds germinated. These plants were hoed and carefully tended. Seed sown May 22; beets harvested Oct. 19. The average weight of the six beets analyzed was 644

grams; sugar in beet 11.50; sugar in juice 12.16; ash in juice 1.78; degree Brix 18.60; purity coefficient 65.37.

Sta. No. 236 was raised by Dr. S. B. Tenney, Marion township. No fertilizer was used this year but last year the land was lightly manured. The seed, Desprez, were sown May 25, and beets were harvested October 19. The soil was sandy loam. The ground was plowed and the seed dropped by hand and covered one and one half inches deep. The rows were 20 inches apart and the beets stood 8 inches in the row. Hoed with a garden hoe. The season was dry and the beets were a long time coming up. The average weight was 395 grams; sugar in beet 13.40; sugar in juice 14.01; ash in juice 1.03; marc 4.36; degree Brix 16.80; purity coefficient 83.40.

LINCOLN COUNTY.

Two samples were sent to this county but neither of them have been heard from.

In general there has been but little interest in the whole region and better cultivation, deeper plowing, better selection of soil of which there is a great variety to choose from, and narrower rows with beets standing thickly in the row would bring much better results. Of course the reader will be able to find the exceptional cases in which these remarks are not applicable.

THE JAMES RIVER VALLEY REGION.

BROWN COUNTY.

Sixty-six samples of seeds were distributed in this county by the Station. In addition to these about two hundred samples were distributed by others interested. Especial interest has been taken in this work by S. W. Narregang, Secretary of the Beet Sugar Factory Committee of Aberdeen. Of the forty-six samples received for analysis, Mr. Narregang sent twenty-six. These samples are found in the first twenty six samples described.

Sta. Nos. 145, 326, 152, 327, 159 and 328 were grown by John A. Lovelace, Carlisle township. These six samples represent three varieties, one sample of each was harvested Oct. 12, and from the results obtained it was thought that the beets were yet immature. Accordingly a second sample of each was harvested Nov. 3 and sent in for analysis. The first two numbers are for the two samples of the Desprez variety. The second two are for the Klein Wanzlebener and the last two are for the Vilmorin varieties. No fertilizer was used and a full stand was obtained. The beets were hoed June 20 and 29; hoed and ridged July 10 and hoed July 20. The ground was stirred to a depth of two inches at each hoeing. June was fine growing weather and likewise most of July with some hard rains.

August 7th, hail cut the tops all to pieces; tops all died, but new ones started and grew finely thereafter.

Sta. Nos. 189, 307 and 372 were grown by Samuel Fulker, who harvested all his beets before they were ripe. The last sample was buried in the ground until Nov. 5, in order to see if more sugar would be elaborated. The ground has been in wheat for seven years, the last use being for a garden. The beets were hoed June 25, thinned July 1 and hoed July 5. June, fair rains; July, dry and cool; August and September the same; weather unfavorable for beets. Had these samples been allowed to mature they should have shown excellent results.

Sta. Nos. 219 and 371 were raised by Casper Kronschnable, 12-127-63; the first having been harvested early and the last a couple of weeks later. The land had been in cultivation eight years, mostly in potatoes and flax. Last crop flax. Beets hoed once and cultivated twice. No extra pains taken. Land plowed only seven inches deep. Weather in May wet, in June dry, August hot and dry, September at first dry, latter part rains.

Sta. No. 179 was raised by N. Rein, 33-124-63. Land had been cultivated eight years in garden and corn; last crop wheat. Plowed in April, 8 inches deep and thoroughly pulverized and dragged. Seed sown with garden drill 2 inches deep. Beets cultivated every two weeks; thinned June 1. May dry; June fair, rains; July dry and cool; August and September dry and cool and season generally unfavorable.

Sta. No. 184 was grown by M. J. Sackreiter, S. W. 29-129-62. Ground manured in 1890; plowed 10 inches deep; pulverized and seed were sown by horse drill; hoed twice and thinned. May dry; June fair, rains; remainder of season dry and all the season cool and unfavorable.

Sta. No. 188 was grown by George Vetter, 10-124-65. No fertilizer. Land plowed eight inches deep; disc harrowed just before planting; seed sown by hand; hoed twice and cultivated twice. May very dry; June, one pretty fair rain; July, one good rain. The season here was very dry, wheat yielding but 2.5 to 4 bushel per acre. The beets had but one good rain after they were up.

Sta. No. 110 was grown by J. F. Kinna, S. E. 33-125-64. Land cultivated ten years, mostly in garden; last four years in cabbage. No fertilizers used. Plowed in spring twelve inches deep. Seed sown by hand. Beets hoed twice and cultivated once.

Sta. No. 217 was raised by C. C. Matteson, Westport. The beets were hoed twice and cultivated once. Weather was at first wet and then dry. Tops of beets destroyed by hail July 12.

Sta. No. 272 was raised by J. E. Hickenbotham, 5-122-63. Land in cultivation eight years mostly in garden; last crop potatoes; plowed 9 inches deep; seed planted with garden drill; cultivated six times with drag; hoed twice; thinned and cultivated once with cultivator. May dry; June fair, rains; remainder of season dry; unfavorable.

Sta. No. 273 was grown by A. J. Ford, 6-126-64. Land in cultivation seven years; mostly wheat; plowed 7 inches deep and seed sown by hand; beets cultivated twice, hoed once and thinned. No fertilizer used. May dry; June fair, rain; July, August and September dry and cool; October, rain and cool. Season unfavorable.

Sta. No. 311 was grown by H. C. Coburn, 17-127-61. Land cultivated six years; last crop potatoes. Ground plowed 9 inches deep, and seed planted by hand one half inch deep. Hoed three times. No fertilizer ever used on land. Fair rains in June; remainder of season dry and cool; unfavorable.

Sta. No. 312 was grown by R. Christian, 1-122-64. Land in cultivation nine years. Last crop corn. Ground plowed 6 inches deep. Seed planted with garden seeder one and one half inches deep. Beets harrowed once, cultivated twice and thinned twice, June and September fair rains; remainder of season dry and cool. Unfavorable. No fertilizer used.

Sta. No. 325 was grown by Willie Fritsche, 34-123-63. Land in cultivation ten years, mostly in potatoes; last crop barley. Ground plowed 10 inches deep and seed sowed by hand two inches deep. Beets hoed three times. No fertilizer. June

and September fair rains and remainder of season dry; hot in August.

Sta. No. 343 was grown by A. McLane, 12-124-67. Ground plowed 8 inches deep and seed sown by hand one inch deep. Beets cultivated twice and thinned to 10 inches in the row. Weather same as last sample.

Sta. No. 344 was grown by Daniel Kight, 6-124-64. Land in cultivation six years. Plowed in fall 6 inches deep and cultivated before seeding. Seed planted by hand one inch deep. Beets hoed three times and thinned. Weather same as last.

Sta. Nos. 149 and 308 were grown by C. T. Richmond, 26-121-64. He sent the first sample to the Station direct and Mr. Narregang sent in the second sample later. Land in cultivation nine years, mostly in carrot and beets. Plowed nine inches deep and seed sown by hand 2 inches deep. Beets hoed four times. Fair rains in June; remainder of season dry and unfavorable. No fertilizer used.

Sta. Nos. 324, and 335 to 339 were grown by C. J. Edson. 2-123-64. All but the first two numbers were sent direct by Mr. Edson; the first two were sent by Narregang. Land was plowed the preceding October and again in May. Beets were hoed three times and thinned. Fair rains June and September; the rest of the season was dry.

In general concerning the work in Brown county Mr. Narregang writes: "I am sorry some of the beets show such a low rate of sugar; but the tonnage is excellent. Owing to the fact that our farmers got their beets planted so far apart and the soil is so productive, they have grown too large and bulky. And again the samples they bring in I find are among the very largest beets which they have. We are well satisfied with the growth of the sugar beet and believe that just as soon as our people understand what to do and how to do it we will have no trouble in raising all the beets we want for a factory."

Sta. Nos. 119 and 135 were grown by L. Freeman, Bath township. No fertilizer was used. The beets were planted between rows of potatoes and were cultivated and hoed twice. The samples were taken before they were ripe.

Sta. No. 124 was grown by J. K. Russel, Westport, who says the beets were raised according to instructions. This sample was immature.

Sta. No. 155 was grown by E. Churchill, Henry township. No fertilizer was used and the stand was very good. The beets were cultivated by hand hoe. Owing to the drouth in this immediate vicinity crops were almost a total failure. Corn and cabbage in the same plot with the beets were not worth gathering.

Sta. No. 158 was grown by W. F. Crockard, Claremont township. No fertilizer was used and the stand of crop was fair. Beets were cultivated with hoe.

Sta. No. 177 was grown by Jas. Leak, Claremont. No fertilizer was used and stand was poor. Beets were cultivated with cultivator and hoe. The season was unfavorable. The beets were injured badly by wind when small; also by hail July 20 and Aug. 4th, the leaves all being destroyed.

Sta. No. 192 was grown by Joseph Stearns, Claremont township. No fertilizer was used and the stand was poor. Ground was plowed 12 inches deep and beets were cultivated once and hoed once.

Sta. No. 215 was grown by John Wade, Claremont. In 1889 land was manured with a light covering of hen manure and was planted to corn last year. Stand of crop was medium. Beets were cultivated with hoe and kept perfectly clean from weeds.

Sta. No. 233 was grown by W. F. Hohensee, of Brainard township. No fertilizer and very good stand of crop. Beets cultivated with hoe.

Sta. No. 237 was grown by Nelson Washburn of Westport. Land used for garden for six years. Plowed eight inches deep. Seed sown with garden drill and beets cultivated with the same machine, using different fixtures. No fertilizer used. Weather very dry until May 30, then wet and good growing weather until August when it was hot and dry till the middle of September, when it rained after which the weather continued favor-

able. This sample should have been left in the ground at least two weeks longer.

Sta. No. 241 was grown by M. L. Inscho, Carlisle township. The beets were planted according to directions but the cut worms destroyed all but about two hundred of the young plants. These grew finely. The beets were plowed twice and hoed twice and weeded by hand.

Sta. Nos. 277 and 309 were raised by Mrs. H. B. Miller, Detroit township. No fertilizer was used and a good stand was obtained. Beets were cultivated with cultivator and hoe. The first sample was such a poor one, that Mrs. Miller was requested to send a second, harvested later.

Sta. No. 291 was sent by W. O. Chase, Osceola township. No fertilizer and good stand of crop. The soil was prairie loam with a mixture of gray soil which is found in flat lands in this section. Beets cultivated with hoe and horse cultivator.

Sta. No. 294 was grown by C. O. Case, Bath township. No fertilizer and medium stand. Land in cultivation seven years, chiefly in garden vegetables; plowed 6 inches deep and beets hoed and cultivated when necessary. The reason of poor stand was cut worms and dry weather.

Sta. No. 300 was grown by C. R. Kimball, Ordway township. No fertilizer and good stand of crop. Soil was rather poor owing to poor cultivation previously. Land plowed 6 inches deep and beets hoed and cultivated and thinned.

Sta. No. 301 came from W. W. DeLa, Shelby township. The beets were planted in a basin and the heavy rains just after they came up drowned a large portion of the young plants.

Sta. No. 306 was raised by Charles L. Smith, Detroit township. Land used six years for a garden. Plowed 10 inches deep and beets hoed four times. Weather was dry till middle of May and plentiful rains fell in June. Fine growing weather in July and August was hot and dry. Heavy rains in September.

Sta. No. 320 came from E. T. Scott of Frederick. Land rather poor; in cultivation nine years. Beets plowed once

with double shovel plow and hoed once. Cut worms spoiled the experiment.

W. T. Wing of Bath, Edward Johnson, of Frederick, W. H. Albright of Detroit and W. A. Harris of Frederick report that cut worms prevented them from carrying out the work properly.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested	Rows—inch Beets in row— inches.	Tons per ac.	Soil
145	Desprez	May 20	Oct 12	22 8	16.8	Black sandy loam.
326	do	do	Nov 3	22 8	16.8	do
152	Klein Wanzlebener	May 15	Oct 12	22	20.6	do
327	do	do	Nov 3	22	20.6	do
159	Vilmorin Improved	do	Oct 12	22	9.8	do
328	do	do	Nov 3	22	9.8	do
169	Vilmorin	Jun 15	Oct 9	18	21.2	do
307	do	do	do	18 8	21.2	do
372	do	do	do	18	21.2	do
219	do	May 15	Oct 16	30	.....	Sandy loam.
391	do	do	Nov 1	30	.....	do
179	do	April 29	Oct 14	18	6.8	Black sandy loam.
184	do	May 25	Oct 16	18	28.1	do
188	Klein Wanzlebener	May 11	Oct 16	24	6.8	do
190	Vilmorin	May 12	Oct 16	18	57.5	do
217	do	May 20	Oct 21	20	13.5	do
272	do	May 8	Oct 24	18	17.0	do
273	do	May 20	Oct 20	24	21.8	do
311	Klein Wanzlebener	May 8	Oct 15	21	17.6	do
312	Vilmorin	May 15	Oct 31	18	32.7	do
325	Klein Wanzlebener	May 8	Oct 19	18	65.3	Black loam.
343	Vilmorin	May 20	Oct 12	36	49.5	do
344	Klein Wanzlebener	May 2	Oct 23	15	26.2	do
149	Desprez	May 15	Oct 16	24 8	32.5	do
308	do	do	Oct 18	24 8	2.5	do
329	Vilmorin	May 12	Nov 4	18	26.1	do
338	do	do	do	18	26.1	do
324	Klein Wanzlebener	do	do	18	14.4	do
335	do	do	do	18	14.4	do
336	Seed from Philadelphia	do	do	18	26.5	do
337	Sugar Refinery	do	do	18	18.4	do
339	White French	do	do	18	30.5	do
119	French Red Top	do	do	18	4.4	do
135	Desprez	May 14	Sept 26	36 6	4.4	do
135	do	do	do	36 6	4.4	do
124	do	May 10	Oct 12	24 6	.....	.....
155	do	May 20	Oct 13	32 8	24.5	Upland loam
158	do	May 12	Oct 13	27 8	28.9	Black, light loam.
177	do	May 15	Oct 14	30 8	20.0	Black sandy loam.
192	do	May 22	Oct 14	48 8-48	2.7	Sandy loam.
215	do	May 16	Oct 18	24 16	20.0	Black loam.
233	do	May 20	Oct 17	18 6	63.9	do
237	Klein Wanzlebener	May 11	Oct 17	20	11.6	do
241	Desprez	May 19	Oct 13	24	.....	Gravelly loam.
277	do	May 30	Oct 20	18 4	.....	Black loam.
309	do	do	Nov. 4	18 4	.....	do
291	do	May 15	Oct 10	20 8	17.0	Light loam
294	do	May 13	Oct 26	24 10	22.0	Black loam.
300	do	May 15	Oct 21	24	25.0	do
301	do	May 11	Oct 22	36	.....	do
306	do	May 15	Oct 28	16	.....	do
320	do	May 28	Oct 20	.....	.....	do

ANALYSES.

Sta. No	No beets analyzed	Ave. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
145	3	562	12.80	13.52	1.56	4.57	18.20	74.06
146	2	392	14.80	15.72	.81	5.85	19.10	80.61
152	3	744	13.20	13.89	1.33	4.25	17.80	78.93
327	3	414	12.00	12.6	1.24	5.19	17.50	72.28
159	3	389	14.00	15.34	.96	5.51	18.80	81.60
328	2	535	16.20	17.05	.89	6.10	20.10	80.12
189	4	623	7.30	7.58	1.44	3.65	12.70	59.68
307	4	275	9.00	9.68	1.18	6.97	16.00	60.05
372	9	221	10.10	10.63	1.34	5.00	15.50	68.59
219	3	1484	11.40	11.92	1.49	4.39	16.20	73.58
391	5	391	15.45	16.20	1.33	5.27	20.00	81.02
179	4	771	10.10	10.61	1.58	4.82	16.60	63.92
184	3	1181	10.0	10.67	1.32	4.44	15.20	70.20
188	5	636	8.80	9.18	1.12	4.15	14.60	62.88
190	6	517	10.90	11.43	1.20	4.62	15.70	72.80
217	2	673	10.30	10.80	1.34	4.62	14.40	75.00
272	4	505	9.20	9.61	1.02	4.34	13.50	71.18
27	6	581	11.50	12.08	1.49	4.82	16.30	73.50
311	3	1058	12.50	13.06	1.22	4.35	17.50	74.62
312	6	331	12.50	13.16	1.13	5.01	16.70	78.80
325	4	344	14.70	15.53	1.32	5.34	19.40	84.00
343	9	173	15.50	16.65	1.19	6.89	21.00	79.30
344	5	234	17.50	18.66	1.03	6.23	21.20	88.01
149	6	687	12.10	12.2	1.49	4.06	18.00	76.66
308	6	422	14.00	14.55	1.24	5.20	17.10	85.05
329	4	299	16.40	17.55	1.11	6.55	20.90	80.00
338	3	259	14.30	15.20	1.06	5.91	18.60	81.18
324	4	338	14.60	15.63	1.09	6.63	19.50	80.00
335	3	262	12.20	12.98	1.39	6.13	16.50	78.66
336	1	350	13.40	14.32	1.37	6.41	17.70	80.90
337	1	537	13.20	14.06	1.31	6.12	18.20	76.70
339	1	442	15.40	16.24	1.26	5.15	19.10	85.02
119	6	377	12.00	12.64	1.67	5.11	18.20	69.40
135	6	400	11.80	12.41	1.65	4.96	18.00	68.95
124	6	406	9.30	9.73	1.24	4.16	14.80	65.74
155	6	951	11.40	11.94	1.24	4.55	16.00	74.63
158	6	912	10.70	11.17	1.48	4.25	15.00	74.47
177	6	851	9.70	10.13	1.31	4.25	11.70	68.81
192	3	2027	7.20	7.49	1.48	3.87	13.00	57.61
215	6	587	12.30	12.93	1.57	4.86	17.80	72.64
233	6	1000	11.30	11.69	1.43	4.17	15.80	73.98
237	8	333	10.60	11.01	1.40	4.52	16.20	67.97
241	6	615	10.30	10.82	1.44	4.78	15.40	70.26
277	1	1360	10.75	11.47	1.94	6.28	18.30	62.13
309	5	821	11.50	12.09	1.36	4.93	16.10	74.47
241	5	726	11.60	12.15	1.68	4.57	16.70	72.75
294	6	921	13.00	13.69	1.58	4.32	15.60	87.75
300	6	567	15.60	16.12	1.50	5.70	18.20	83.03
301	3	1035	8.40	8.81	1.24	4.47	13.20	66.74
306	2	564	11.40	12.28	1.67	7.18	18.30	67.11
320	3	1036	9.50	9.86	1.74	3.71	14.20	61.44

MCIPHERSON COUNTY.

Seven samples were distributed in this county and four packages of beets have been sent in for analysis. All these samples have an average of over 13 per cent sugar in the beet.

Sta. No. 232 was grown by Ira P. Clark of Leola. He made preparation to irrigate the beets but there was little need of

water. The land had been in use for growing vegetables for about six years. The seed was sown with hand drill and cultivated with the attachments for same. A good stand was obtained.

Sta. No. 247 was grown by John Weber, Weber township. No fertilizer was used and the stand was good. This sample gives the lowest results in sugar which is probably due to the great distance apart to which the beets were thinned. A hoe was used to cultivate the beets.

Sta. No. 278 was grown by J. G. Oulson, Washington township. No fertilizer and a good stand. Land cultivated 7 years; plowed 12 inches deep. Beets hoed, cultivated, thinned and weeds kept out clean all summer. In fact the instructions had been followed faithfully and the good results obtained are sufficiently apparent.

Sta. No. 295 was grown by J. O. A. Bennett of Leola. No fertilizer was used and a very good stand was obtained. Beets were hoed three times. This was a fine sample.

A report also came from L. A. Rice, Hillsview township who also had good success, but his sample failed to reach the Station.

The following tables complete the report:

Station No.	Variety	Planted	Harvested	Rows — inches	Beets in row — inches	Tons per acre	Soil
232	Desprez	May 10	Oct 78	18	....	21.8	Sandy loam.
247	...do	May 18	Oct 15	18	18	16.9	do
278	...do	May 11	Oct 24	24	8	14.9	Prairie loam.
295	...do	May 15	Oct 19	20	10	20.4	Black prairie.

ANALYSES:

Sta. No.	No. beets analyzed.	Av. wt. grams	Sugar in beets	Sugar in juice.	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
232	3	491	13.40	14.02	1.70	4.45	18.40	76.20
247	5	791	12.10	12.66	1.27	4.45	16.00	79.13
278	6	435	13.90	14.68	1.05	5.34	18.20	80.66
295	6	551	14.00	14.78	1.14	5.35	16.60	82.23

EDMUNDS COUNTY.

Thirty one samples of seed were distributed in this county and eight samples of beets were sent in for analysis. Two farmers reported failures. A. L. Crane, Roscoe, reports his sample destroyed by stock and A. I. Wall, Vermont City, says his beets were too small to send owing to drought.

Sta. No. 178 was grown by C. W. Huntley, Huntley township. No fertilizer was used. Cut worms destroyed so many that the beets were too thin on the ground and data could not be obtained. Beets were cultivated twice and hoed twice.

Sta. No. 191 was grown by S. Bakkegard, Modena township. No fertilizer was used and the stand of crop was good. Beets were kept clean from weeds but were not hoed. He states that the seed did not germinate till after May 30 when a good rain fell. They would have done better had they been hoed.

Sta. No. 208 was grown by W. H. H. Dickinson, Vermont township. No fertilizer used and crop light owing to dry weather. Beets cultivated by hand and it was well done.

Sta. Nos. 216, 220, 222 and 230 were grown by Mr. W. K. Pratt, Glen township. Nos. 220, 230 and 216 were harvested Oct. 13; and 222 Oct. 19 after a hard freeze. 230 was raised in a "Gumbo" patch. 220 is average size and No. 216 is large size. He writes "I have grown these beets as nearly as possible as a large field would be worked. The land has been cropped six times and has been worked to a depth of six inches. It was prepared for beets by plowing 10 inches this spring. After waiting three or four days I cultivated it up fine and then dragged down fine. Marked the ground and sowed the seed by hand. The seed was soaked before planting and it came up well. Cut worms were bad". The land is a low clay. No fertilizer used. Cultivated and hoed as needed. The four samples were analyzed just as sent.

Sta. No. 239 was grown by John Bergman, Fountain township. No fertilizer used and the beets were cultivated with hoe.

Sta. No. 257 was grown by R. Barrows, Rosette township. Manure from cow stable and hen house was used and stand was very good. The land was high ground, plowed 7 inches deep

at planting time. Was manured last year and last crop was sugar beets.

Sta. No. 274 was grown by Lester Crane, Sangamon township. A little barn yard manure was used. The land has been in cultivation three years and beets were cultivated and hoed.

Sta. No. 319 was raised by G. H. Osborn, Fountain township. No fertilizer and very poor stand of crop. Beets were hoed once and cultivated twice.

The subjoined tables complete the reports:

Station No.	Variety	Planted	Harvested.	Rows — inches	Beets in row — inches.	Tons per acre.	Soil
178	Desprez	May 12	Oct 15	40	10	.....	Sandy loam.
191	do	May 16	Oct 16	16	6	32.7	Black loam.
308	do	May 20	Oct 16	20	6	13.0	Dark loam.
216	do	May 22	Oct 13	28	7	9.0	Low clay.
320	do	do	do	28	7	9.0	do
222	do	do	Oct 19	28	7	9.0	do
230	do	do	Oct 13	28	7	9.0	"Gumbo."
239	Vilmorin	May 18	Oct 18	30	18	9.0	Black loam.
257	Desprez	May 12	Oct 15	46	8	10.0	do
274	do	May 15	Oct 21	24	6	21.0	do
319	do	May 11	Oct 12	30	.....	3.0	.....

ANALYSES:

Sta. No.	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
□ 178	6	862	8.50	8.80	1.26	3.81	13.70	64.45
191	6	1014	8.05	8.34	1.35	3.69	13.60	61.32
308	6	1143	11.30	11.84	1.25	4.54	16.40	72.20
216	6	678	10.00	10.42	1.11	4.08	14.40	72.36
320	4	694	10.50	10.99	1.39	4.44	16.50	66.61
222	4	995	9.40	9.85	1.46	4.18	14.40	68.13
230	4	697	9.30	9.72	1.37	4.33	15.00	64.80
239	6	616	12.60	13.26	1.36	5.01	17.60	75.34
257	3	656	10.80	11.40	1.96	5.23	17.20	66.28
274	6	506	11.20	11.81	1.42	5.17	15.70	75.86
319	3	899	12.80	13.49	1.64	5.09	16.70	80.78

FAULK COUNTY.

Fourteen samples of seed were sent to this county and eight samples of beets were sent in for analysis.

Sta. No. 133 was grown by E. J. Tuttle of Burkmere. No fertilizer was used and the beets were hoed and cultivated.

Sta. No. 146 was grown by A. C. Voss, 119, R. 70. The beets were raised on old land, flax stubble. The stand was good but the yield could be increased by better cultivation. The beets were hoed.

Sta. No. 169 was raised by L. L. Turpin, Union township. No fertilizer was used and the beets cultivated with a cultivator and hoe.

Sta. Nos. 201 and 202 were raised by Dr. S. S. Wentworth, township 120. No fertilizer was used and the stand of crop was fair. The beets were cultivated with hand cultivator and kept entirely free from weeds. The second sample is a rose colored variety, seed not imported.

Sta. No. 231 was raised by W. S. Thorn, Oakland township. No fertilizer was used and stand of crop was fair. Beets cultivated with two horse cultivator once a week up to harvest. Ground plowed very deep.

Sta. No. 292 was raised by Charles Hunter of Seneca. The seed was sown by hand and no fertilizer was used.

Sta. No. 313 was grown by Edwin Wright, Seneca township. Land in cultivation five years. Land is sloping and was manured previous year, stand fair. Land plowed eight inches deep, seed planted by hand one inch deep. Beets hoed twice and cultivated twice.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested	Rows — inches	Beets in row — inches	Tons per acre	Soil
133	Desprez	May 20	Oct 10	48	5	9	Black loam.
146	.....do	May 8	Oct 13	24	8	11	.....
169	.....do	June 1	Oct 15	36	18	.....	Black sandy.
201	.....do	May 4	Oct 16	48	8	25	Bl'k loam with sand.
202	Champion	do	do	48	8	30	do
231	Desprez	May 11	Oct 15	42	5	5	Black rich loam.
292	French White	May 13	Oct 21	24	6	25	Sandy loam.
313	Desprez.	May 15	Oct 15	24	....	16	.....

ANALYSES:

Sta. No.	No. beets analyzed.	Av. wt. grams	Sugar in beets	Sugar in juice.	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
133	6	335	14.50	15.28	1.38	5.13	20.40	74.90
146	6	644	9.00	9.40	1.24	4.25	15.60	60.25
169	6	907	11.00	11.57	1.17	4.59	15.20	75.80
201	6	1222	8.80	9.14	1.64	3.65	13.40	68.21
202	6	1328	9.30	9.61	1.46	3.21	14.10	68.15
231	6	536	12.60	13.26	1.38	5.30	17.20	77.09
292	6	775	10.10	10.43	1.25	3.20	14.10	74.00
313	2	561	12.50	13.15	1.15	5.72	17.00	85.60

SPINK COUNTY.

Thirty five samples of seed were distributed throughout this county and twelve samples of beets have been returned.

Sta. No. 125 was grown by Michael Connor, Lake township. No fertilizer was used and stand of crop was poor owing to dry weather. Beets were cultivated and hoed as often as necessary to keep clean.

Sta. No. 161 was raised by Thomas Lambert of Ashton. No fertilizer and beets were worked with garden drill.

Sta. No. 165 was grown by C. F. Richard, Crandon township. No fertilizer was used and beets were hoed.

Sta. No. 176 was raised by Freeman Young, Athol township. No fertilizer used and half crop secured. Beets cultivated with hoe and shovel plow.

Sta. No. 206 was grown by Henry Wilson, Frankfort township. No fertilizer was used and stand fair. Last crop on land potatoes. Beets hoed. He writes "Cut worms destroyed

fully half of crop and seriously retarded growth of rest; and just previous to digging the beets, found that the moles were eating them."

Sta. No. 244 was grown by W. F. Bruell of Redfield. Beets were cultivated and hoed. "Dry weather caused the beets to grow small, the specimens sent being the best (probably he means the largest); the remainder are much smaller." Had the directions for sampling been observed the analysis would have shown better results.

Sta. No. 249 was grown by Messrs. John and C. B. Ward of Ashton. The beets did not start till after May 30. Season dry. No fertilizer, medium stand. Beets plowed and hoed.

Sta. No. 296 was raised by R. Bingham, Lodi township. No fertilizer was used and one fourth stand was obtained. "The beets did not do very well owing to cut worms and dry weather; they are quite small. In some rows there were no beets for three rods and then again they are all right." The analysis shows that small beets are best for the sugar maker.

Sta. Nos. 345 and 346 were sent by Julius Liebig of Frankfort. They were fine samples. No fertilizers were used. Potato ground, no rain from June on. Beets cultivated by hoe.

Sta. No. 370 was grown by Robert C. Kimmel, Beotia township. Beets were cultivated four times and a good stand was secured.

Sta. No. 373 was grown by Geo. W. Garrett, Lake township. No fertilizer was used and a good stand. Beets cultivated with small cultivator.

The following tables complete the reports:

Station No	Variety	Planted	Harvested	Rows—inch s	Beets to row— inches.	Tons per acre	Soil
125	Desprez	May 1	Oct 12	24	9	12	Dark loam.
161	do	May 18	Oct 12	18	8	15	Black loam.
165	do	May 14	Oct 15	18	10	11	Brown loam.
176	do	May 15	Oct 17	48	8	4	Upland prairie.
206	do	May 20	Oct 15	24	6	2	Upland.
244	do	May 11	Oct 10	36	6	10	Rich black.
249	do	May 6	Oct 17	24	10	13.2	Black loam.
296	do	May 20	Oct 20	36	5	5	do
345	German	May 18	Oct 26	18	6	16.6	Black prairie loam.
346	French	May 18	Oct 26	18	6	17	do
370	Desprez	May 15	Oct 25	24	8	7	Light black loam.
373	do	May 10	Oct 10	36	8	5	Clay subsoil.

ANALYSES.

Sta. No.	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
125	6	853	9.70	10.06	1.65	3.60	15.20	66.25
161	6	1427	7.50	7.85	1.40	4.50	15.80	50.00
165	6	675	10.50	10.98	1.56	4.42	16.60	66.14
176	6	628	11.60	12.15	1.30	4.64	16.80	72.32
206	6	263	12.05	12.77	1.47	5.69	15.20	84.01
244	6	750	10.50	11.03	1.44	4.84	14.30	77.13
249	6	484	11.00	11.59	1.27	5.13	16.20	71.54
296	6	423	15.65	16.53	1.18	5.30	21.20	77.97
345	3	417	16.00	16.96	1.35	5.70	21.20	80.00
346	3	399	17.80	18.85	1.14	5.56	22.20	84.91
370	6	162	16.10	17.38	1.53	7.39	22.20	78.64
373	4	884	11.40	11.92	1.55	4.32	16.10	74.01

CLARK COUNTY.

Twenty four packages of the seed were distributed throughout this county and three samples of beets have been returned.

Sta. No. 185 came from A. Grover, Lake township. Land plowed in May 8 inches deep. Seed planted with a garden drill four inches deep, and they did not germinate for three weeks. Cut worms destroyed half the young plants.

Sta. No. 221 was grown by John Vercoe, Blaine township. No fertilizer was used and a very even stand of beets was obtained. Land cultivated 4 years; last crop wheat. Planted and cultivated with a garden drill, hoed twice and thinned.

Sta. No. 224 was grown by D. L. Talcott, Warren township. "The seed germinated all right but the cut worms took nearly

all the young plants. We have had an unusually dry season and I did not plant the seed until June 3, on account of its being so dry. May 30 we got a good rain, the only one of the season. I only harvested two bushels but they were very nice."

Station No.	Variety	Planted	Harvested	Rows— Beets in Row— inches	Tons per acre	Soil
185	Desprez	May 20	Oct 23	42	5.0	Sandy loam.
221	do	May 15	Oct 11	24	10.6	Rich black loam.
224	do	June 3	Oct 17	36	.....	Black sandy loam.

ANALYSES:

Sta. No	No beets analyzed	Av. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
185	14	193	12.00	12.63	1.31	5.00	16.80	75.18
221	6	519	14.00	14.74	1.61	5.02	16.30	90.43
224	6	578	11.00	11.49	1.58	4.24	15.80	72.09

HAND COUNTY.

Six samples of seeds were distributed in this county and three packages of beets have been returned. Beside these, two have reported failures. Mrs. D. E. Flower of Clyde lost the crop through the interference of the drab potato bug and dry weather. C. C. Campbell of Dean lost his plants by cut worms.

Sta. No. 120 was grown by Micheal Lemmon, Greenleaf township. He reports the crop poor owing to dry weather, cut worms, and hail on the 15th of July which killed all the tops. No fertilizer was used and beets were plowed five times and hoed.

Sta. No. 131 was grown by Oliver Pash, St. Lawrence township. No fertilizer. Land was new, simply broke and then backset deeper. Land close to creek bottom. Harrowed and planked till quite smooth before planting. Beets hoed twice and thinned.

This is the first sample reported from raw prairie land and the analysis shows it to be a fine sample. It would have been

better had the sample stood three or four weeks longer before harvesting.

Sta. No. 154 was grown by A. C. Justice, Burdette township. No fertilizer was used. The cut worms spoiled the crop in spite of the fact that the worms were twice hand picked. Only a dozen plants survived.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in row, inches	Tons, per acre	Soil
120	Desprez.	May 10	Oct 10	46	6	.....	Rich upland.
131	....do	May 29	Sep 22	18	6	7.5	Rich sandy loam.
154	....do	May 19	Oct 15	30	....	.....	Li't clay & sandy l'm

ANALYSIS:

Sta. No.	No. beets analyzed.	Av. wt. grams.	Sugar in beets.	Sugar in juice.	Ash in juice.	Marc.	Degree Brix.	Purity coefficient.
120	6	428	10.80	11.23	1.52	3.83	15.80	71.00
131	6	266	17.80	18.88	1.29	5.74	22.40	84.73
154	6	540	8.20	8.57	1.39	3.77	12.00	71.42

BEADLE COUNTY.

Fifty four samples of seed were distributed in this county and twenty eight samples have been analyzed.

Sta. Nos. 199 and 261 were grown by A. W. Wilmarth, township 110-62. The land is upland and was plowed 8 inches deep, harrowed and rolled. The seed was sown by hand drill. Beets were cultivated once, hoed once and thinned. No fertilizer was used and stand of crop was good. First sample was large beets and second sample average size.

Sta. No. 198 was also grown by Mr. Wilmarth but upon low river bottom land and the ground was plowed 12 inches deep. Same cultivation as preceding samples. Stand good and no fertilizer.

The four following samples were collected by Mr. Wilmarth and sent in for analysis.

Sta. No. 314 was grown by C. W. Barringer, township 110-62. This sample was irrigated with artesian water and the stand was good. Land was plowed 12 inches deep. Beets were hoed, thinned and weeded.

Sta. No. 315 was grown by J. A. Colcord, township 110-62. No fertilizer was used and the stand was good. Land plowed in April 12 inches deep. Beets were hoed, thinned and weeded.

Sta. No. 316 was grown by A. B. Melville township 110-61. Data same as in previous sample.

Sta. No. 270 was grown by C. W. Witmar of Broadland. No data could be obtained.

Sta. Nos. 365, 366, 367, and 369 were grown by N. T. Smith, Huron township. No fertilizer was used. The first and last grown on river bottom land and the stand was good. The other two were grown on upland and the stand was fair. The beets were cultivated and hoed.

Sta. No. 126 came from F. Campbell Clyde township. Good stand and no fertilizer. Beets plowed and hoed.

Sta. No. 121 was grown by C. A. Blake, Whiteside township. No fertilizer was used and good stand.

Sta. No. 129 was grown by B. E. McIlvaine, Clyde township. A mixture of stable and hen manure was used and the beets were cultivated with a corn cultivator.

Sta. No. 130 was raised by P. A. Bullock, Sand Creek township. No fertilizer was used and stand was fair. Land plowed deep last fall and again just before planting. Hoed crops have been on ground for last two years. Beets received about the same cultivation as corn. Cultivated three times and hoed twice. Two large beets weighing seven or eight pounds each were sent beside the sample.

Sta. No. 143 was raised by Mrs. A. A. Frank, Hartland township. No fertilizer and three fourths stand of crop was reported. Beets cultivated and hoed.

Sta. No. 160 was grown by M. Gray, Clyde township. Good stand and no fertilizer are reported. Beets are cultivated with hoe and cultivator.

Sta. No. 203 was raised by E. W. Crouch, Iowa township. No fertilizer and one fourth stand are given. Land in cultivation seven years, chiefly in corn and potatoes. Last crop corn. The land has a gentle slope and lies about six feet above the river bottom. Plowed in May 8 inches deep, harrowed and seed planted with hand corn planter in hills two inches deep and 12 inches apart. Beets cultivated twice and hoed once. The seed came up well but a heavy rain, June 15, covered up and washed out about three-fourths of the plants leaving the hills six feet apart. Did not thin out any and took sample from crowded hill. Single plants growing alone weighed seven to eight pounds.

Sta. No. 226 was grown by J. W. Smith, Wessington township. Barn yard manure was used and cut worms spoiled the experiment. Beets were hoed.

Sta. No. 234 was raised by Charles May, Valley township. Well rotted barn yard manure was used and stand was good. Cultivated three times and hoed once.

Sta. No. 248 was grown by Holden Cook, 109-63. Good stand and no fertilizer are reported. The beets were not cultivated at all, except that a few weeds around the plants were pulled out. Land had four crops on it and was clean and nice, plowed deep in the spring.

Sta. No. 263 was grown by Noyes Appleman, Cavour township. No fertilizer was used and cut worms spoiled the experiment.

Sta. No. 275 was grown by J. C. Hatfield, Iowa township. No fertilizer was used and beets were cultivated same as corn,

Sta. No. 282 comes from Edward Lynch, Banner township. Cut worms destroyed all the plants except a few straggling ones in different parts of the plat.

Sta. No. 284 was grown by J H Miller on the Hitchcock farm. No fertilizer and a good stand are reported. Beets were cultivated and hoed.

Sta. No. 318 was grown by W. R. Thurston, Clifton township. Beets were not thinned, but were hoed and weeded by hand.

Sta. No. 323 comes from Wilfred Baker, Wolsey. All conditions were favorable. But cut worms destroyed the symmetry of the stand. Weather wet during the first part and dry during the last of the season. Beets hoed three times.

Sta. No. 334 was grown by W. E. Mexon, Lake Byron township. Beets grown on river bottom with barn yard manure and stand not very good. In mangels the year before. Beets cultivated twice, hoed twice and weeded by hand. Would have been better without the manure.

W. F. Van Horn, Dearborn township reports failure from drought, and George Frank of Garfield township lost his beets by cut worms.

The following tables finish the reports:

Station No.	Variety	Planted	Harvested	Rows— Beets in row— inches	Tons per acre	Soil
199	Mette.....	May 15	Oct 24	18 6	17 8	Upland sandy loam.
261	do.....	do	do	18 6	17 8	do
198	Klein Wanzlebener.....	do	Oct 21	18 6	22.9	River bot'm b'k loam
314	Mette.....	Apr 30	Nov 1	16 6	46.5	Black sandy loam.
315	do.....	May 10	Oct 30	16 6	26.0	do
316	Klein Wanzlebener.....	May 12	Nov 1	18 6	34.0	do
270	.....	.....	.....	.....	.....	.....
365	Klein Wanzlebener.....	May 20	Nov 5	18 6	56 5	Deep bl'k river bot'm
366	Mette.....	May 19	Oct 30	18 7	17.5	Upland prairie.
367	Klein Wanzlebener.....	May 15	Nov 4	16 6	32.6	do
369	Mette.....	May 16	Nov 2	18 6	72.9	Deep bl'k river bot'm
121	Desprez.....	June 6	Oct 12	15 6	14.4	Sandy loam.
126	do.....	May 15	Oct 10	24 10	36.0	Black loam.
129	do.....	May 14	Oct 12	44 8	.....	Sandy loam.
130	do.....	May 20	Oct 6	36 16	10.0	Bl'ck, very little sand
148	do.....	May 17	Oct 8	44 6	6.0	Black sandy loam.
160	do.....	May 18	Oct 15	20 6	8.0	Sandy loam.
203	do.....	May 28	Oct 19	44 12	8.8	lay loam.
226	do.....	June 18	Oct 12	.....	.....	Black loam.
234	do.....	May 15	Oct 15	24 6	15.0	do
248	do.....	May 1	Oct 12	18 4	42.0	Black sandy loam.
263	do.....	May 25	Oct 17	36 11	.....	Black sandy loam.
275	do.....	May 12	Oct 15	44 8	24.0	Sandy loam.
282	do.....	May 4	Oct 28	24 8	.....	.....
284	Mette.....	May 21	Oct 26	20 8	34.3	Black loam, 2ft. deep
318	Desprez.....	May 8	Nov 5	20 4	36.0	River bot'm b'k loam
323	do.....	May 25	Oct 16	18 11	.....	.....
334	do.....	May 20	Oct 25	24 11	48.5	Black loam.

ANALYSES:

Sta. No.	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
199	6	367	15.30	16.02	1.42	4.48	18.80	85.21
261	6	289	18.50	19.58	.70	5.54	21.20	92.36
198	6	745	10.50	10.85	1.53	4.12	15.40	71.10
314	6	609	16.10	16.90	1.30	4.74	19.90	84.92
315	6	305	14.80	15.44	1.42	4.12	19.20	80.42
316	6	583	13.00	13.58	1.45	4.33	19.00	71.47
270	6	418	8.00	8.36	1.30	4.26	12.70	65.82
365	2	746	12.70	13.30	1.78	4.49	18.60	71.49
366	2	558	15.20	16.14	1.51	5.84	21.00	76.86
367	2	355	12.50	13.27	1.47	5.83	18.40	72.14
369	3	431	15.20	16.02	.79	5.09	20.40	78.53
121	6	654	10.20	10.78	1.35	3.56	15.00	71.86
126	6	1472	10.90	11.30	.96	3.55	15.20	74.34
129	6	2020	7.30	7.52	1.57	3.11	11.10	67.74
130	6	880	8.70	9.02	1.57	3.66	13.80	65.36
143	6	1043	9.10	9.48	1.61	3.97	14.00	67.71
160	6	2008	11.20	11.76	1.25	4.73	16.40	71.46
203	6	994	9.60	10.00	1.25	4.04	14.10	70.92
226	6	208	12.60	13.40	1.51	5.96	16.00	83.75
234	3	1514	11.50	12.04	1.19	4.20	16.10	74.78
248	3	558	9.60	9.97	1.44	3.75	14.40	69.24
263	6	737	9.75	10.18	1.27	4.27	14.60	68.69
275	3	1278	9.10	9.45	1.47	3.73	14.50	65.10
282	6	460	11.40	12.07	1.63	5.52	17.30	69.76
284	3	835	13.65	14.17	1.27	4.39	17.30	81.90
318	3	1274	12.70	13.60	1.60	6.67	16.00	85.00
323	6	407	13.40	14.14	1.67	5.23	19.60	72.14
334	6	1050	9.70	10.26	1.85	5.45	15.00	68.40

KINGSBURY COUNTY,

Thirteen samples of seed were sent to this county and five packages of beets have been returned.

Sta. No. 136 was grown by W. A. Palmer, Denver township. No fertilizer was used and one half stand of crop was secured. Land plowed 8 inches; seed planted by hand; beets hoed, cultivated and thinned.

Sta. No. 156 was raised by Walter Thornber, Iroquois township. A good stand is reported. Land in cultivation 4 years; plowed deep in April and rolled. Beets cultivated, hoed and thinned. On account of drouth in early part of season the beets are not so good as they ought to be.

Sta. No. 174 was raised by R. Glendenning, Esmond township. No fertilizer and ninety five per cent stand are reported. Beets cultivated, hoed and thinned. Seed did not germinate until June 10. A hail storm on the 12 of August shattered the leaves badly and broke the stalks.

Sta. No. 180 was raised by D. M. Maxson, Esmond township. No fertilizer and very poor stand of crop are reported. Beets hoed once and cultivated three times. The ground was in corn last year was plowed in May, 8 inches deep and thoroughly dragged. The seed was sown with a drill, but the dry spell coming on only a few of the seed germinated until after June 1 and then the cut worms took them. After the shower at that time the balance of the seed came up but the worms were ravenously hungry and took all but about five per cent which was still farther reduced by dry hot winds that followed.

Sta. No. 186 came from F. W. Collins of De Smet. Land was in cultivation two years in potatoes and received a light coating of stable manure last year. Plowed in fall and again in spring 6 inches deep. Harrowed and planted seed by hand. Beets cultivated with hoe entirely. Weather dry with occasional rains.

The following tables finish the reports:

Station No.	Variety.	Planted.	Harvested.	Rows— Beets in row— inches.	Tons per acre	Soil.
136	Dee-prez	May 4	Oct 6	40 8	13.0	Black loam.
156	do	May 21	Oct 15	24 6	19.6	Sandy loam.
174	do	May 13	Oct 13	36 12	8.5	Black loam.
180	do	May 13	Oct 14	36		do
186	Klein Wanzlebener	May 7	Oct 17	16 10	21.8	do

ANALYSES:

Sta. No.	No beets analyzed.	Av wt grams.	Sugar in beet.	Sugar in juice.	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
136	6	1035	11.30	11.84	1.38	4.58	16.80	70.49
156	6	951	12.00	12.53	1.22	4.23	16.60	75.48
174	6	673	10.40	10.87	1.33	4.32	16.40	65.66
180	6	716	9.60	10.02	1.39	4.23	15.03	66.80
186	2	922	12.60	13.26	1.14	5.04	18.00	73.67

JERAULD COUNTY.

Eleven samples of seed were distributed to this county and three samples of beets were returned. C. M. Yegge of Alpena

reports his beets destroyed by cut worms.

August Bachmor, Crow Lake township sent in a sample (Sta. No. 378) after the laboratory was closed and it did not receive a complete analysis. In his case also the cut worms were very troublesome and the crop was practically destroyed. No. beets analyzed 6; av. wt. 250 grams; sugar in beet 14.25; sugar in juice 15.00; degree Brix 21.40; purity coefficient 70.00

Sta. No. 193 was grown by C. W. Parker, Blaine township. He had only one fourth stand on account of cut worms. In some places the beets were all gone for several feet and a short distance in the row would be all right. Av. wt. 701 grams; sugar in beet 10.80; sugar in juice 11.29; Ash 1.40; Marc 4.33; degree Brix 16.60; purity coefficient 68.01.

Sta. No. 256 was grown by W. C. Gordon, Franklin township. The beets were cultivated and hoed. The land was sandy loam. Beets 10 inches in row and rows 36 inches. Yield 8 tons per acre. Av. wt. 1161 grams; sugar in beet 11.70; sugar in juice 12.24; Ash 1.21; Marc 4.44; degree Brix 16.50; purity coefficient 74.18.

SANBORN COUNTY.

Nineteen samples of seed were distributed in this county and five samples of beets have been returned. C. D. Smith, Jackson township reports the loss of his beets by cut worms.

Sta. No. 138 was grown by Charles Ashton, Oneida township. No fertilizer and good stand of crop are reported. Beets were cultivated twice, hoed once and thinned.

Sta. No. 171 was grown by B.F. Wright, Warren township. Barn yare manure was used and only one fourth stand was secured owing to cut worms. Beets were plowed once and hoed three times.

Sta. No. 235 was grown by Hiram Phillips, Logan township. Barn yard manure was used and seven eighths stand was obtained. Beets were hoed twice, cultivated twice and thinned.

Sta. No. 332 was grown by S. F. Benson, Logan township. Barn yard manure was used and cut worms destroyed nine tenths of the crop.

These tables finish the reports:

Station No.	Variety.	Planted.	Harvested.	Rows— inches	Beets in rows— inches.	Tons per acre.	Soil.
138	Desprez	May 8	Oct 12	36	8	10.4	Dark loam.
171	do	May 20	Oct 15	36	8	22.0	Clay mixed.
235	do	do	Oct 12	20	8	22.0	Sandy loam.
332	do	June 10	Oct 27	24	10	.....	Sandy.

ANALYSES:

Sta. No	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
138	6	1225	12.80	13.38	1.50	4.35	18.00	63.22
171	7	764	9.20	9.61	1.45	4.43	13.70	70.07
235	6	1121	9.20	9.54	1.57	3.58	14.00	68.14
332	3	733	10.70	11.15	1.26	4.03	15.10	73.84

MINER COUNTY.

Five packages of seed were sent to this county and three samples of beets were returned. O. E. Clark of Roswell reports that cut worms destroyed his beets.

Sta. No. 163 was grown by M. Doty, Miner township. No fertilizer was used and nine tenths stand was obtained. The beets were cultivated and hoed.

Sta. No. 175 and 242 were grown by J. W. Briggs, Beaver township. No fertilizer was used this year, well rotted barn yard manure used last year. Seed planted with garden drill and beets hoed twice. Land was irrigated last winter from flowing well.

Sta. No. 209 was raised by George Basford, Miner township. Stable manure used and fair stand of crop reported. The seed was planted May 11 and the plants did not appear for over six weeks. Perhaps had he soaked the seed they would have come quicker.

The remainder of the reports follow:

Station No.	Variety.	Planted.	Harvested.	Rows— feet in rows— inches.	Tons per acre	Soil	
163	Desprez.....	May 8	Oct 14	30	10	21.5	Gray sandy loam
242	Desprez.....	May 16	Oct 15	20	12	39.6	Black sandy loam
175	Desprez.....	do	do	20	12	do	Black sandy loam
209	Desprez.....	May 11	Oct 14	30	8	3	Black

ANALYSIS:

Sta. No	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
163	6	1161	12.60	13.15	1.17	4.29	15.60	84.30
242	6	1 983	10.20	13.13	1.54	4.87	17.80	73.20
175	3	626	12.50	10.63	1.43	4.05	14.10	75.39
209	6	1052	11.55	11.83	1.42	4.03	16.00	73.94

AURORA COUNTY.

Eighteen samples of seed were sent to this county and twelve samples of beets have been returned. One sample, Sta. No. 381, from C. L. Mott came too late for complete analysis.

Sta. No. 144 came from John Hage, Belford township. No fertilizer and fair stand of crop. Beets cultivated with culti. vator and hoe.

Sta. No. 147 was grown by G. F. Merkle, Belford township. No fertilizer and half stand of crop. Ground plowed 8 inches deep, hoed the beets four times and cultivated them three times.

Sta. Nos. 225 and 229 were raised by A. H. Hall, White Lake township. No fertilizer was used and a fair stand of the first and a good stand of the second are given. This is the fifth crop from this plat of land; plowed 8 inches deep, dragged and rolled before planting. Planted with a hand drill, hoed the beets twice, cultivated twice and thinned.

Sta. No. 243 was grown by George E. Babcock, Centre township. The cut worms destroyed all but a few of the beets. Those left were kept clean from weeds.

Sta. No. 245 was grown by Herman Steffen, Belford township. Rotten manure was used and two thirds stand was obtained. Ground was very light drying out easy, on the top of a hill; plowed 14 inches deep and beets hoed twice. Cut worms destroyed part of the plants.

Sta. No. 302 was grown by Milton G. Swatman, Palentine township. A poor stand. For some reason nearly all the seed failed to grow. Perhaps they were planted too deep. After waiting for more of the seeds to grow until the ground got weedy plowed the field up with stirring plow, throwing the plow around those that had grown.

Sta. No. 348 was grown by J. B. Wheaton, Bristol township. Ground used for a garden for seven years and had always been plowed deep. No fertilizer and good stand.

Sta. Nos. 375, 376 and 377 were grown by D. G. Townsend, Plankinton township. No fertilizer was used and stand was not very even. Land plowed in the spring 8 to 12 inches deep, dragged and rolled and seed planted by hand and covered with team and plank. Cultivated three times, hoed and thinned.

These tables close the reports:

Station No.	Variety	Planted	Harvested	Rows — inches	Beets in row — inches	Tons per acre	Soil
144	Desprez	May 18	Oct 10	36	7	5.0	Black loam
147	do	May 12	Oct 12	32	8	32.6	Light loam
225	White French	May 7	Oct 19	36	8	17.3	Black loam.
229	Desprez	do	do	36	8	17.3	.....
243	Klein Wanzlebener	June 27	Oct 19	18	18	20.0	Prairie loam.
245	Desprez	May 20	Oct 15	22	7	20.0	Very light.
302	do	May 23	Oct 28	24	8	18.0	Black loam
348	do	June 15	Oct 30	36	8	5.0	Bottom land.
375	German	May 14	Oct 29	24	10	14.0	Black, 12 to 18 in. d'p
376	French	do	do	24	10	20.0	do
377	Improved White	do	do	24	10	20.0	do

ANALYSES:

Sta. No.	No beets analyzed.	Av. wt. grams.	Sugar in beet.	Sugar in juice.	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
144	5	1173	12.20	12.69	1.91	3.89	17.60	71.53
147	5	558	14.90	15.61	.92	4.64	18.30	82.02
225	3	1396	9.20	9.50	1.48	3.11	13.70	69.34
229	5	694	11.50	11.96	1.66	3.85	17.10	69.94
243	2	982	10.30	10.69	1.34	3.69	14.20	75.28
245	5	552	12.70	13.34	1.89	4.83	20.30	65.71
302	5	620	11.70	12.30	1.44	4.89	16.60	74.10
348	3	866	12.10	12.67	1.55	4.64	18.20	70.00
375	3	940	16.54	17.10	1.83	3.26	21.70	78.80
376	3	884	14.38	15.90	1.80	3.27	20.30	76.81
377	3	900	12.97	13.30	1.83	2.50	18.20	73.08
381	5	760	15.01	15.80	.....	.....	20.40	77.45

DOUGLASS COUNTY.

Three samples of seed were sent to this county and one sample of beets has been sent in.

Sta. No. 228 was grown by N. R. Wetlaufer, Independence township. The seed was planted May 21 and beets were harvested Oct. 19. Rows were 30 and beets 6 inches apart. No fertilizer and a good stand. The land was black prairie loam plowed 10 inches deep in May. Harrowed five times and planted seed by hand. Beets cultivated five times, hoed once and weeded. Land in use five years. The beets, variety, Desprez, average 639 grams; sugar in beet 11.80; sugar in juice 12.37; ash in juice 1.12; marc 4.61 degree Brix 17.00; purity coefficient 72.76; yield per acre 56 tons.

HANSON COUNTY.

Ten samples of seed were distributed and three samples of beets were returned.

Sta. No. 187 was grown by L. L. Brande, Edgerton township. The beets were planted May 15 and harvested Oct. 13. The rows were 36 inches and the beets 6 to 8 inches. The stand of crop was poor. Beets were hoed and plowed. Land a sandy loam.

Sta. No. 250 was raised by Joseph Lunn, Pleasant township. The beets were planted May 16 and harvested Oct. 12. The poor stand was caused by dry weather at planting time and cut worms at thinning out time. Attempted to transplant the beets but those tried never made any growth to speak of.

Sta. No. 285 was grown by Thomas Scholfield, Hanson township. Beets were planted May 12 and harvested Oct. 20. A little hog manure was mixed with the soil. The seeds were planted thickly and came up very nicely, but the worms took nearly all of them shortly after they came up. He only raised 100 beets and they were scattered over one and one half rods of ground. Av. wt of the one hundred raised 3.4 pounds.

The following analysis complete the report.

Sta. No.	No. beets analyzed.	Av. wt. grams	Sugar in beet.	Sugar in juice.	Ash in juice	Marc.	Degree Brix.	Purity coefficient.	Variety.
187	6	374	9.60	10.07	1.06	4.65	15.40	65.39	Desprez
250	6	1361	9.20	9.53	1.47	3.46	14.20	67.11	do
285	3	1145	14.30	15.01	1.50	4.73	17.90	82.85	do

DAVISON COUNTY.

Eleven samples of seed were given out in this county and five samples of beets were returned. A. W. Hubbard of Mitchell lost his crop. Stock ate the beets in September.

Sta. No. 172 was grown by J. C. Clapham, Blendon township. No fertilizer and three fourths stand. Land plowed 12 inches deep and beets cultivated by hand.

Sta. No. 205 came from George Calkins, Badger township. No. fertilizer was used and stand, good. Beets cultivated and hoed

Sta. No. 214 was grown by John Abraham, Beulah township. Barn yard manure was used and not very good stand was obtained. Beets were hoed.

Sta. 251 came from Gottfried Wilde, Baker township. No fertilizer and a very good stand are reported. Ground plowed deep in Autumn and beets hoed and kept free from weeds. The cut worms took most of the beets. Beets cultivated as in Germany.

Sta. No. 258 came from Ben. B. Perley, Badger township. The crop was mostly destroyed by cut worms.

These tables finish the reports.

Station No.	Variety	Planted	Harvested	Rows— Beets in row	inches	Tons per acre	Soil
172	Desprez	May 12	Oct 15	24	6	10.0	Black loam.
205	do	June 8	Oct 15	26	7	19.0	do
214	do	June 1	Oct 15	36	7	6.2	Black sandy loam.
251	do	April 29	Oct 5	24	.....	.....	.....
258	do	May 18	Oct 23	48	.....	.....	Black sandy loam.

ANALYSES:

Sta. No.	No. beets analyzed.	Av. wt., grams	Sugar in beets	Sugar in juice,	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
172	6	1141	10.00	10.42	1.04	4.04	14.20	73.38
205	6	531	15.10	15.76	.97	4.19	18.20	86.59
214	6	261	14.50	15.21	1.03	4.71	19.00	80.53
251	6	818	13.85	14.40	1.19	4.67	18.10	79.56
258	2	210	13.80	14.49	.84	4.73	17.00	85.24

HUTCHINSON COUNTY.

Ten samples of seed were distributed and four samples of beets were returned from this county.

Sta. No. 151 came from Nathan Osborn, Liberty township. No fertilizer and good stand. Land plowed 12 inches deep and beets plowed once and hoed twice.

Sta. No. 200 came from C. Stickel, township 67. No fertilizer and a good stand. Beets cultivated.

Sta. No. 286 came from John Fish, Township 99 R. 60. No fertilizer and a fair stand of crop are reported. Beets cultivated once and hoed twice.

Sta. No. 362 came from John A. Brown, Township 98. No fertilizer and a good stand are given. Beets cultivated and hoed.

The following tables complete the reports:

Station No.	Variety.	Planted.	Harvested.	Rows— inches	Beets in row— inches.	Tons per acre	Soil.
151	Desprez	May 15	Oct 12	36	4	43.6	Deep black loam.
200	do	May 5	Oct 7	36	6	10.0	do
286	do	May 6	Oct 15	28	8	.....	Black loam.
352	do	June 1	Oct 15	18	4	62.0	Good but dry.

ANALYSIS:

Sta. No.	No. beets analyzed.	Av. wt. grams.	Sugar in beets.	Sugar in juice.	Ash in juice.	Marc.	Degree Brix.	Purity coefficient.
151	6	1206	8.50	8.81	1.91	3.52	14.40	54.36
200	3	1267	10.20	10.61	1.76	3.90	15.50	68.45
266	6	1154	8.30	8.68	1.50	4.03	13.10	66.26
352	6	600	13.00	13.54	1.32	3.99	16.50	82.06

In general there has been a great interest in this work throughout the James River Valley and especially so in certain centres that are looking forward to beet sugar factories. Some very good results have been obtained and when better cultivation is learned and practiced good results will be the rule and not the exception.

THE MISSOURI VALLEY REGION.

CAMPBELL COUNTY.

Two samples of seed were sent to this county and both farmers receiving them returned samples of beets.

Sta. No. 281 was grown by James Reid, Auburn township. No fertilizer was used this year, last year barn yard manure for potatoes. Stand was good. Plowed ground 8 inches deep, made furrows with shovel plow and sowed seed by hand. Beets cultivated and hoed. "The drills were broad and in many places the beets grew in a mass, one jammed against an other. Some of the beets are creased on account of coming in contact with one another. I do not want any more sugar beets to experiment with. I am doubtful if they will pay here either for sugar or for cattle food. Labor is too high priced and corn is cheaper for stock. I raised a few beets for a sugar factory in San Francisco, Cal. last year. They showed 16 per cent of sugar. I have also raised beets other years and there is no longer any question about their growing here and of good quality. When the heat and drought in July affected wheat quite seriously, the sugar beets grew right along. We had some heavy rains this fall that may have affected the quality."

Sta. Nos. 330 and 331 were grown by Myron T. Wolverton, Franklin township. No fertilizers were used and the stand was fair. The first was grown on low ground and the second on ground two feet higher, and drier. The beets were cultivated once and hoed once. The beets grown on higher ground were rather better for sugar making owing to a higher purity coefficient and lower ash.

The following tables complete the report:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in row— inches	Tons per acre	Soil
281	Desprez	May ..	Oct 17	30	12	12	High moder'ly fertile
330	.....do	May 10	Oct 21	20	10	15	Black loam.
331	.....do	do	do	20	10	15	.....do

ANALYSIS:

Sta. No.	No. beets analyzed.	Av. wt. grams.	Sugar in beets.	Sugar in juice.	Ash in juice.	Marc.	Degree Brix.	Purity coefficient.
331	6	529	14.10	14.82	1.37	4.88	18.10	81.87
330	6	620	15.20	16.06	1.33	5.30	19.80	86.12
331	6	737	15.20	15.86	1.19	4.80	18.00	88.11

WALWORTH COUNTY.

But one sample of seed was sent to Walworth county, and the recipient, A. Johnson reports that the long legged potato bugs destroyed the plants.

POTTER COUNTY.

Seventeen samples of seed were distributed to this county and eight samples of beets were returned. A. E. Beaudoin of Lebanon reports a failure for unknown reasons.

Sta. No. 137 was grown by S. G. Manful, Lowell township. No fertilizer used and a good stand of crop. Beets cultivated with common corn plow and hoed once. "I find them excellent for stock. Sheep and pigs do well on them. They are easy to cultivate and I want to raise one or two acres next year. I can raise 2,500 bushels per acre with little trouble."

Sta. Nos. 123, 150 and 162 were grown by James Naylor, Jr., Artichoke township. Barn yard manure was used and stand was fair. Land plowed 10 inches deep. Beets cultivated once and heeded three times.

Sta. No. 164 was raised by Chas. O'Neill, Logan township. No fertilizer and a good stand. Land cultivated five years; last crop flax. Beets cultivated once and hoed once. "They will

more than pay me for my labor for feeding to my stock."

Sta. No. 194 was grown by W. E. Scanlon, Lucas township. No fertilizer and thin stand. Beets cultivated twice and hoed once.

Sta. No. 196 was raised by J. B. Roberts, of Potter. No fertilizer and very poor stand. Beets cultivated and hoed.

Sta. No. 259 was grown by Wm. H. Spencer, Artichoke township. An inch of sheep manure was used and stand of crop was good. Ground plowed deep in the spring and beets were cultivated twice and hoed three times.

The following tables finish the reports:

Station No	Variety	Planted	Harvested	Rows—inch s Beets in row — inches.	Tons per acre	Soil
137	Desprez	May 15	Oct 4	44 9	45	Bunch grass, clay and
123	do	May 8	Oct 9	20 2	10	Sandy loam. [sand.
150	German	do	do	20 2	10	do
162	White Globe	do	do	20 2	8	do
164	Desprez	May 10	Oct 14	36 6	9	Black sandy loam.
194	do	May 15	Oct 13	36 6	6	Bunch gr ss b'k lo'm
196	do	May 25	Oct 17	36 ..	..	..
259	do	May 13	Oct 17	36 9	2	Yellow bunch grass.

ANALYSES:

Sta. No.	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
137	3	1306	8.80	9.10	1.58	3.38	13.40	67.16
123	5	598	13.10	13.66	1.62	4.23	19.00	71.90
150	2	397	12.30	12.88	1.52	4.65	18.40	70.00
162	5	303	16.50	10.98	1.37	4.41	16.00	68.63
164	5	741	11.50	12.16	1.24	4.30	17.80	67.20
194	6	821	12.15	12.69	1.25	4.29	17.00	74.43
196	6	1268	9.00	9.34	1.58	3.82	14.00	66.48
259	6	682	12.80	13.46	1.38	4.90	17.30	77.80

SULLY COUNTY.

Nineteen samples of seed were sent to this county and five samples of beets have been returned. Miss Minnie Hock of Clifton, and Geo. G. Howard of Elk township lost their plants by drought. John A. Buck of Pearl township lost his beets by

hail on the third of July. F. E. Fagnar, Ojoboko, sent a sample. Sta. No. 380 too late for complete analysis.

Sta. No. 128 was grown by J. R. Knapp, Morton township. No fertilizer used. Beets hoed and kept clean from weeds. This sample was not ripe when harvested.

Sta. No. 132 was grown by Mrs. W. H. Reed, Norfolk township. A medium stand of crop. She writes: "This is my first attempt. I planted May 8 and did first thinning June 15th. The beets grew nicely during the first two months, every seed seeming to come up. July 4th, dry weather set in and we had no more rain to speak of. They grew very slowly after the dry weather began. They were planted on oats ground, plowed deep, the soil being mellow and of rather sandy nature. I am confident that deep plowing is necessary in all cases with a reasonable amount of moisture. We had frost the latter part of August killing all kinds of vines. I could improve the growth at another trial. I have always heard they were not good for cooking, but I find them as palatable as the red beet."

Sta. No. 283 was raised by Nathan Porter, Hartford township. No fertilizer used and a good stand. Beets cultivated once and kept perfectly clean from weeds with hoe.

Sta. No. 349 was grown by G. F. Burtch, Onida township. No fertilizer used and although plenty of rain fell the seed germinated unevenly. The leaves were cut by hail twice. He intended to irrigate the beets but it was not necessary. The splendid results shown by the analysis show what a hardy plant the sugar beet is.

These tables complete the reports:

Station No.	Variety.	Planted.	Harvested.	Rows— Beets in row— inches.	Tons per acre	Soil.	
128	Desprez	May 4	Sept 25	20	6	9	Black loam.
132	do	May 8	Sept 25	46	8	24	Sandy.
283	do	May 20	Oct 13	36	6	28	Black
349	do	May 14	Oct 17	26	12	24	Black Sandy loam.

ANALYSES:

Sta. No	No beets analyzed	Av. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
128	6	327	13.19	13.78	1.80	4.97	10.00	72.52
132	8	146	13.40	14.14	.97	5.24	18.20	77.60
283	6	497	11.40	11.95	1.37	4.62	15.90	75.16
349	3	1089	17.00	17.90	1.55	5.57	20.80	86.05
380	6	510	14.25	15.00	.....	.....	18.30	82.00

HYDE COUNTY.

Fourteen samples of seed were sent to this county and one package of beets were returned. Sta. No. 340, variety Desprez was grown by John Shearer, Highmore township. He reports a poor stand on account of cut worms, land in cultivation seven years and last crop millet. The av. wt. was 287 grams; sugar in beet, 16.45; sugar in juice, 17.29; ash in juice 1.19; marc 4.89; degree Brix 19.80 and purity coefficient 86.82.

The beets were planted in rows 24 inches apart and the beets thinned to 6 to 8 inches. But the cut worms spoiled the experiment. The analysis shows that very rich beets might be grown. He also sowed some seed forty two inches apart but they grew too large.

HUGHES COUNTY.

Eleven samples of seed were sent to this county and four packages of beets were returned. A. G. Swanson of Dry Run township and George Chadwick of Harold assign dry weather as the reason for the failure of their beets.

Sta. No. 139 was raised by J. P. Youngberg, Logan township. No fertilizer used and stand poor. Ground broken in 1890, Beets cultivated and hoed.

Sta. No. 207 was grown by Mrs. A. H. Whaley, Harrold. The beets were irrigated with artesian water. Cultivated with hoe. Probably the beets were kept growing too long. No water should have been supplied after Sept. 1. The rows were ridged up and water from the artesian ditch was let in. They grew very large. There were no small ones.

Sta. No. 271 was grown by D. A. Arnold of Blunt. Ground plowed deep; beets hoed three times and kept clean from weeds. Seed did not germinate well; too dry. Quite dry all through the season.

Sta. No. 322 was raised by E. R. McQueen, Harrold township. Manured last year with barn yard manure. Beets were hoed.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested	Rows— inches.	Beets in Row— inches	Tons per acre	Soil
139	Desprez		Oct 13				Black loam.
207	Vilmorin's Improved	May 25	Oct 10	24	9	36	Sandy loam
271		May 10	Oct 12	24			Dark sandy loam.
322	Desprez	May 1	Oct 15	12	8	29	Dark clayey soil.

ANALYSES:

Sta. No.	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
139	6	582	11.20	11.75	1.59	4.69	16.20	72.22
207	3	1143	8.70	9.07	1.71	4.11	14.40	62.99
271	6	674	12.20	12.86	1.34	5.13	16.50	77.95
322	4	819	11.80	12.41	1.62	4.19	16.90	78.25

BUFFALO COUNTY.

Ten packages of seed were distributed to this county and five samples of beets were returned. H. Klindt of Grant township lost his plants by cut worms. Alfred J. Woledge of Gann Valley raised a good crop but neglected to send a sample.

Sta. No. 134 was grown by Mrs. Z. A. Johnstone, Eden township. Ashes and refuse were used as fertilizers and a good stand of crop was obtained. The beets were hoed.

Sta. No. 157 was grown by Wm. K. Brown, 107-68. Manure was used last two years previous and an uneven stand is reported owing to cut worms. Beets were cultivated and weeded by hand.

Sta. Nos. 303 and 304 were grown by Wm. Cruson, Eden township. No fertilizer and sixty per cent stand are reported. Beets were cultivated with hoe.

Sta. No. 317 came from John B. Smith, Elmira township. No fertilizer and good stand. Beets cultivated twice and hoed twice. Kept clean from weeds.

These tables complete the report:

Station No	Variety	Planted	Harvested	Rows— inches	Beets in row— inches	Tons per acre	Soil
134	Desprez	May 10	Oct 8	18	6	53	Black loam.
157	do	May 12	.....	48	.....	.....	Best prairie.
303	do	May 15	Oct 19	24	3	12	B't'm land with sand
304	Vilmorin	do	do	24	3	15	do
317	Desprez	June 12	Oct 14	42	7	4	Black prairie loam.

ANALYSES:

Sta. No	No beets analyzed	Av. wt grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
134	6	450	16.30	17.11	1.60	4.76	21.80	78.48
157	6	787	10.10	10.54	1.55	4.21	15.40	68.44
303	6	662	13.50	14.06	1.35	4.00	16.80	83.69
304	6	905	16.20	17.05	1.22	4.99	18.60	91.67
317	6	354	17.20	18.34	1.67	6.80	21.80	84.13

BRULE COUNTY.

Eleven samples of seed were distributed in this county and five samples of beets have been sent in. F. H. Griswold, Smith township lost his beets by cut worms.

Sta. No. 183 was grown by Simon Morgan, Pleasant Grove township. "The soil was not in good condition as I plowed it last fall for a fire break and the ground was too dry. Beets hoed three times. Was not prepared this year but will do better next year."

Sta. Nos. 252 and 253 came from J. C. Victoria, Smith township. No fertilizer and good stand. Plowed May 13; harrowed twice hoed and thinned one week after plants appeared, then cultivated twice after that.

Sta. No. 141 came from Charles Schwiesow, 105-70. No fertilizer and light crop. Beets cultivated twice and hoed once.

Sta. No. 142 was grown by Patrick Rigney, Red Lake township. No fertilizer and beets cultivated with horse cultivator.

The following tables finish the reports:

Station No.	Variety	Planted	Harvested	Rows—Inches	Beets in Row—Inches	Tons per acre	Soil
141	Desprez	May 8	Oct 9	44	12	22	High land heavy soil.
142	do	May 16	Oct 8	30	8	26	Clayev.
252	do	May 14	Oct 14	30	12	14	Deep black sand.
253	French Yellow	do	do	30	12	29	do
183	Desprez	May 18	Oct 12	24	6	32	.....

ANALYSES.

Sta. No.	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
141	5	1992	9.80	10.18	1.54	3.75	15.00	67.86
142	6	950	10.00	10.42	1.77	4.02	16.20	70.49
183	6	750	13.80	14.45	1.32	4.50	18.60	77.69
252	6	1150	10.10	10.50	1.16	3.81	14.40	72.91
253	1	1737	9.60	9.98	1.10	3.83	13.30	75.04

CHARLES MIX.

Three samples of seed were sent to Charles Mix county and one sample of beets were sent in. Sta. No. 333, Dieppe's Klein Wanzlebener, was grown by J. C. Samuel, Castalia township. Seed planted June 1 and beets harvested Oct 27; rows 42 inches apart and beets six inches in the row. The stand of crop was good and the yield 33 tons per acre. No fertilizer; clay soil; cultivation same as corn except one hoeing and thinning. Av. wt. 1240 grams; sugar in beet 14.00; sugar in juice 14.65; ash in juice 1.63; marc 4.43; degree Brix 16.90; purity coefficient 86.68; 3 beets analysed.

BON HOMME COUNTY.

Thirty two samples of seed were sent to this county and three samples of beets were returned.

Sta. No. 182 was grown by Joseph Horkey, 96. A good stand of beets which were hoed twice.

Sta. No. 279 was grown J. Jiricek, 95. Beets hoed twice.

Sta. No. 289 was grown by Charles C. Reynolds, 95 R. 59. No fertilizer and one third stand. Hoed once and plowed once with corn plow.

The following tables complete the reports:

Station No.	Variety	Planted	Harvested	Row—inch s Beets in row— inches.	Tons per acre	Soil
182	Desprez	May 15	Oct 6	24	12	Heavy dark clay.
279	do	May 5	Oct 7	20	9	.....
289	do	May 10	Oct 22	42	.....	Upland, second crop

ANALYSES:

Sta. No.	No beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
182	4	1721	8.60	8.91	1.59	3.53	13.40	66.49
279	5	924	13.30	13.98	1.24	4.87	18.30	76.50
289	3	996	11.50	11.94	1.21	3.81	14.60	81.80

YANKTON COUNTY.

Three samples of seed were sent to this county and one sample of beets was returned.

Sta. No. 310, Desprez, was grown by James Connell, 93. The seed was planted May 15; harvested Oct. 16; rows 24 inches; beets 6 inches in row; good stand; yield per acre 30 tons; Barn yard manure applied; light sandy loam in cultivation 20 years; last crop corn; beets cultivated twice and hoed twice. 4 beets analyzed; av. wt. 1001 grams; sugar in beet 11.40; sugar in juice 12.08; ash 1.12; marc 5.69; degree Brix 13.80; purity coefficient 87.53.

CLAY COUNTY.

Five samples of seed were sent to this county and two packages of beets were returned.

Sta. No. 181 was grown by Thomas Jordan, Fairview township. No fertilizer was used. Beets planted on old ground which had been cultivated 30 years. Has never been fertilized. The beets were hoed once and cultivated once. "The beets were planted in a far corner of the lot and were forgotten. They did not come up till late in June and I did not think they would amount to much and so did not tend them as they should have been. Later in the season it rained too much."

Sta No. 305 came from J Hvestendahl, Prairie Centre township. No fertilizer was used. Land in use three years. Last crop potatoes. Beets cultivated and weeded by hand.

The remainder of the reports are given below:

Station No.	Variety	Planted	Harvested	Rows— inches	Beets in row, inches	Tons per acre	Soil
181	Klein Wanzlebener.....	May 27	Oct 16	46	*	.....	Sandy loam.
305	Desprez.....	May 14	Oct 20	....	8	.....	Sandy and blue

*Too thick.

ANALYSES:

Sta. No.	No. beets analyzed.	Av. wt. grams	Sugar in beets	Sugar in juice,	Ash in juice.	Marc	Degree Brix.	Purity coefficient.
181	6	1721	10.70	11.12	1.30	3.79	14.50	76.69
305	4	1101	10.10	10.58	1.21	5.56	15.50	68.26

UNION COUNTY.

Two samples of beets were received from this county. G Nilson, Virginia township, reports his beets planted late and destroyed by cut worms.

Sta. No. 240 was raised by O. Whitney in Sioux Valley township. Beets were planted May 10 and harvested Oct. 6. Soil black loam; beets hoed; variety, Desprez.

Sta. No 290 was grown by A. P. Johnson, Sioux Valley township No fertilizer and very thin stand Black loam, quite rich; beets cultivated same as corn but were thinned.

The analyses follow:

ANALYSES:

Sta. No	No. beets analyzed	Av. wt. grams	Sugar in beet	Sugar in juice	Ash in juice	Marc	Degree Brix	Purity coefficient
240	6	778	10.50	10.94	1.32	3.99	15.50	70.58
290	3	1072	13.30	13.89	.86	5.02	16.60	83.70

GREGORY COUNTY.

One sample of beets came from Gregory county west of the the Missouri river.

Sta No 238 was grown by D. H. Gaughen of Huson Beets planted May 21; harvested Oct 15. Rows 24 inches; beets in row 8 inches Stand good; yield 12 tons; no fertilizer; soil black sandy; beets hoed and plowed. Variety, Desprez. 6 beets analyzed, av wt. 768 grams; sugar in beet 15.10; sugar in juice 15.80; ash in juice 1.05; marc 4.47; degree Brix 19.80; purity coefficient, 79.80.

The results are in general good for this region.