U. S. DEPARTMENT OF AGRICULTURAL
WEATHER BUREAU

IN CO-OPERATION WITH THE

Iowa Weather and Crop Service

ANNUAL REPORT FOR 1914

GEO. M. CHAPPEL, Director

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LETTER OF TRANSMITTAL

Des Moines, April 8, 1915.

To His Excellency, George W. Clarke,
Governor of Iowa.

Sir: In compliance with requirements of the law, I have the honor to submit herewith the twenty-fifth annual report of the Iowa Weather and Crop Service for the year 1914. I have the honor also to submit an article pertaining to fungus diseases in Iowa for the year 1914, by Dr. L. H. Pammel, which I respectfully ask to have printed and embodied in this report for future reference.

Very respectfully,
Geo. M. Chappel,
Director.

ANNUAL REPORT 1914

The object and aim of this report is to place before its readers a condensed summary of the monthly and weekly bulletins, issued by the Iowa Weather and Crop Service, in co-operation with the Weather Bureau of the U. S. Department of Agriculture. It is believed that in this form the matter will be especially valuable and convenient for reference and comparison in future years.

Reports have been received regularly each month from 114 co-operative meteorological stations and from the U. S. Weather Bureau stations at Des Moines, Davenport, Dubuque, Charles City, Keokuk and Sioux City, Iowa, and Omaha, Neb. Crop reports were received on the first of June, July, August, September and December, from about 1,400 correspondents, and weather-crop reports were received weekly from April to September, inclusive, from 150 correspondents who are well distributed over the State.

The instrumental equipment at the meteorological stations has been kept up to a high standard, new thermometers, rain gages and instrument shelters being issued to co-operative observers to replace worn out or defective instruments or equipment whenever necessary.

There were distributed during the year 23,000 copies of the Monthly Reports, and 35,000 copies of the Weekly Weather-Crop Bulletins. Four hundred and twenty-five of the Monthly Reports are distributed each month through the Weather Bureau, U. S. Department of Agriculture to scientific institutions in this and foreign countries.

Daily weather forecasts were distributed by telegraph at the expense of the United States Weather Bureau to 76 towns; by mail to 2,636 addresses; by rural free delivery to 909 addresses, and by free telephone to 95,621 subscribers. Arrangements were made to supply all fruit growers, who were prepared to use orchard heaters in case of frost, with timely warnings. This branch of the work is highly appreciated by orchardists and will, we believe, increase within the next few years.

The co-operation with the Horticultural Department, Iowa Experiment Station, was continued during the year with fairly good results.

CLIMATOLOGY OF THE YEAR 1914

BAROMETER (reduced to sea level).—The average pressure of the atmosphere for the year was 30.06 inches. The highest pressure was 30.72 inches at Dubuque on February 24th, and at Keokuk on December 16th; the lowest pressure was 29.29 inches, at Keokuk, on January 8th. The range for the State was 1.43 inches.

TEMPERATURE.—The mean temperature for the State was 49.1°, or 1.7° higher than the normal. The highest annual mean was 53.4°, at Keokuk, Lee County. The lowest annual mean was 44.1°, at Estherville, Emmet County. The highest temperature reported was 109° at Centerville, Appanoose County, on July 12th. The lowest temperature reported was —31°, at Iowa Falls, on December 26th. The range for the State was 140°.

PRECIPITATION.—The average amount of rainfall and melted snow for the year was 31.93 inches, or 0.04 inch less than the normal, and 1.98 inches more than the average for 1913. The greatest amount at any station was 44.11 inches, at Marshalltown, Marshall County, and the least amount was 23.32 inches, at Columbus Junction, Louisa County. The greatest monthly precipitation was 16.24 inches, at Lenox, Taylor County, in September. There was no precipitation at Lake Park, Dickinson County, and at Rock Rapids, Lyon County, in November. The greatest amount in any 24 consecutive hours was 7.78 inches, at Cedar Rapids, Linn County, on September 14th.

SNOWFALL.—The average amount of snowfall was 27.5 inches. The greatest amount reported from any station was 50.7 inches at Northwood, Worth County, and the least amount was 14.9 inches at Monroe, Jasper County. The greatest monthly snowfall was 24.6 inches at Centerville, Appanoose County, in February. Measurable precipitation occurred on an average of 91 days. This is 5 more than for 1913.

WIND.—The prevailing direction of the wind was south. The greatest velocity reported was 68 miles an hour from the northwest at Sioux City, on February 28th.

SUNSHINE AND CLOUDINESS.—The average number of clear days was 166; partly cloudy 102; cloudy 97, as against 182 clear days, 89 partly cloudy, and 94 cloudy days in 1913. More than the normal amount of sunshine was experienced.

MONTHLY SUMMARIES

JANUARY.

A January so pleasant and agreeable as that of 1914 is but rarely experienced in Iowa. The mean temperature averaged 10° higher than usual, the month being the mildest January since 1880; however the latter month averaged about 4° warmer than the current January, and stands as the warmest month of the name in the climatological history of the State.

The mild and open character of the month was a subject of widespread comment and discussion, as were the similar conditions that had obtained during the two preceding months; and reference to the records discloses that the present winter season in the State to date (February 1st) is without exception the mildest of record.

There were no storms during the month that could be classed as at all severe, and the snowfall over much of the State was lighter than usual. The latter did not remain on the ground long, and as a result there was little if any sleighing. The weather conditions of the month were especially favorable for stock, which was out much of the month, thereby effecting a considerable saving in feed. Building operations suffered little interruption because of unfavorable weather conditions.

PRESSURE.—The mean sea-level pressure for the State was 29.97 inches; the highest recorded was 30.68 inches, at Sioux City, on the 12th; the lowest recorded was 29.29 inches, at Keokuk, on the 8th.

TEMPERATURE.—The monthly mean for the State, 105 stations reporting, was 27.8°, or 9.9° higher than the normal. The month was relatively mildest in the western part of the State, where the average temperature was about 11° higher than the normal. The warmest point, as usual, was Keokuk, where the mean temperature averaged 34.0°, and the coldest point was Northwood, a station near the Minnesota line, the average temperature there being 22.2°. In all parts of the State the month was the mildest January since 1880.

Only a few days in the month were colder than usual for the time of year; at Des Moines there were but 3 such days, viz., the 10th, 12th and 25th. The lowest temperature of the month occurred on the morning of the 12th in connection with a sudden cold wave; in the northern part of the State the values were mostly between 5° and 10° below zero, while at many stations in the Southern Section the zero point was not quite reached. The lowest temperature reported was —10°, at Inwood and Lake Park, stations in northwestern Iowa. On several different days in the month the temperatures were in the fifties in all parts of the State, the highest reported being 64°, at Keokuk, on the 28th. No records for high temperature were broken.

HUMIDITY.—The average relative humidity for the State was 81 per cent, the percentages ranging from 83 at Davenport and Dubuque to 78 at Des Moines. The averages were slightly higher than usual.

PRECIPITATION.—The average for the State, 111 stations reporting, was 0.88 inch, or 0.17 inch less than the normal. In general the geographical distribution conformed to the average of past years, the amounts being heaviest in the southeast and lightest in the west. The greatest amount was 2.34 inches, at Fort Madison, and the least amount was 0.27 inch, at Pacific Junction. The former was the only station reporting as much as 2 inches, and 1.74 inches of the total fall at that station occurred on the 28th. The great bulk of the month's precipitation occurred on and after the 18th, and was in the form of snow, except on the 28th.

SNOWFALL.—The average for the State was 5.1 inches, or about 2 inches less than the normal. The amounts ranged from 11.0 inches, at Sioux Center, to a trace at Elliott.

WIND.—Northwesterly winds prevailed, and the movement was less than usual for January. The month was especially free from high winds; the highest velocity reported was 52 miles an hour, from the northwest, at Sioux City, on the 28th. The windiest days were the 1st, 2d, 20th and 29th.

SUNSHINE AND CLOUDINESS.—For the State as a whole the percentage of sunshine received was about the normal amount; but there was a marked deficiency in eastern Iowa; at Dubuque the percentage of the possible amount was 24, or only about half the normal amount. At that point it was the darkest January of record. In Western Iowa the month had an excess of sunshine. The average number of clear days for the State was 11; partly cloudy, 8; cloudy, 12.

MISCELLANEOUS PHENOMENA.—Sleet occurred at some point in the State on the 1st, 6th, 17th, 18th, 28th and 29th; fog was recorded on the 1st, 4th, 5th, 6th, 7th, 8th, 18th, 19th, 26th, 27th and 28th. Lightning and thunder occurred in connection with the storm of the 28th-29th, but this phenomenon was not widespread.

COMPARATIVE DATA FOR THE STATE—JANUARY.

Year	Temperature			Precipitation		
	Mean	Highest	Lowest	Average	Greatest	Least
1890	19.7	61	-27	2.08	3.46	.35
1891	26.0	58	- 4	1.75	3.99	.61
1892	15.3	76	-38	1.09	3.13	.10
1893	9.3	54	-34	.74	3.20	.13
1894	19.3	69	-37	1.09	2.24	.31
1895	13.6	68	-31	.85	2.65	.09
1896	23.4	68	-20	.48	2.10	T
1897	17.2	66	-30	2.01	6.16	.15
1898	23.4	52	-11	1.60	5.32	T
1899	19.8	68	-34	.28	1.15	T
1900	25.6	66	-20	.53	2.47	T
1901	23.7	60	-21	.74	2.34	.04
1902	22.4	63	-31	.88	2.88	.19
1903	23.0	60	-12	.28	1.46	T
1904	14.0	57	-32	1.18	3.68	.02
1905	11.2	56	-30	.91	1.82	.12
1906	24.6	69	-19	1.52	4.71	.28
1907	18.8	68	-22	1.52	5.30	.10
1908	24.9	60	-18	.44	1.50	.06
1909	21.2	72	-25	1.66	3.74	.41
1910	18.1	56	-35	1.57	3.15	.55
1911	20.2	66	-35	.97	3.73	.11
1912	4.2	49	-47	.53	1.90	T
1913	20.9	62	-25	.77	2.05	.04
1914	27.8	64	-10	.88	2.34	.27

T indicates a trace. - indicates temperature below zero.

TEMPERATURE IN IOWA FOR DECEMBER AND JANUARY, 1860-1914.

(Iowa City, Iowa.)

The present unusually moderate winter throughout Iowa has been a matter of general comment, and some data concerning the months of December and January just past may be interesting, especially if compared with records for the same months of former years. We find the months of December, 1913, and January, 1914, unique in the annals of Iowa weather.

Voluntary observations on the weather in the state of Iowa were first begun by Professor T. S. Parvin at Muscatine as early as 1839, and the work continued there for twenty years. In 1860 Professor Parvin began observations at Iowa City and these have been continued without interruption since that time.

On account of the location of Muscatine upon the Mississippi river the mean temperature taken at that station is probably a little above the average temperature at Iowa City; this may be borne in mind when considering data prior to 1860.

The past fifty years have been characterized by one December and one January each of which stands out with a temperature so far above the average as to satisfy even the demands of "the oldest inhabitant." January, 1880, with a mean temperature of 35.2°, and December, 1877, with a temperature of 40.1° are so far above the average for these respective months as to probably be rarely equaled. The absolute maxi-

mum of December, 1877, was 63° or 10° above the mean of the maxima for this month. The abnormal temperature of this particular month was shown by the fact that only on thirteen nights did the thermometer fall to the freezing point.

If we take the month of January as observed at Iowa City beginning with 1860, we find that the mean temperature of the month just passed has been equaled or exceeded only for the corresponding months in 1880, 1891 and 1900, or but four times in fifty years have we had as warm a January. The temperature of December, 1913, has been equaled or exceeded only in the years 1877, 1891, 1892 and 1897. There have been then but five such warm Decembers in fifty years.

Since a warm month in any one year may or may not be preceded or followed by another warm month, it does not follow that an extremely warm December or January means a really mild winter. For example, the January of 1880, as said above, was the warmest ever recorded at this station; yet because the December preceding was decidedly below normal, the result was not a high average for the two months.

When the mean then of December and January is considered, we find that the two months just past have been equaled or exceeded only for the corresponding months in 1877-78 and 1890-91, or as warm a December and January together has occurred but three times in fifty years.

There is but little doubt but that these months in 1857-58 were as warm as the ones just past, yet the observations made at Muscatine can not be compared rigorously with those at Iowa City.

The average deviation from the mean may be taken as a measure of variability. The average deviation, for December, from the mean of 23.6° is, when computed from fifty years' observations at this station, found to be 4.7°; while this deviation in 1913 was 8.6°. The corresponding value for January is 5.9° and for January, 1914, it was 8.0°.

From the standpoint of probability we may expect a December as warm as that of 1913, about once in ten years, while a January like that just past may be expected perhaps once in thirteen years. A warm December with a January following such that a mean temperature equal to that of the past two months is observed, may probably occur once in seventeen years.

If the chance of a warm December and a warm January immediately following were entirely independent of one another, we should then have for the probability of such an occurrence the product of the two independent probabilities, or in this case one-tenth times, one-thirteenth or one divided by one hundred and thirty; while the combination seems to occur with a probability of one-seventeenth; we then must think that a warm December and January are not independent of each other. The data are too limited to be dogmatic in our conclusions yet one seems to be justified in assuming a strong correlation between two successive months,

The following table will make clear the numerical data given in this short sketch:

Years	Mean Temperature December	Years	Mean Temperature January		Mean Temperature for December and January
1877	40.1	*1839	32.2	*1857-58	30.7
1891	33.1	*1858	30.0	1877-78	33.3
1892	32.9	1880	35.2	1890-91	30.9
1897	33.0	1891	28.6	1913-14	29.9
1913	32.9	1900	27.7		
		1914	26.9		

*Observations made at Muscatine.

ARTHUR G. SMITH.

FEBRUARY.

February, 1914, will compare favorably, as to weather conditions, with months of that name in past years. The average temperature was considerably below the normal, and there was an excess of wind movement, but the precipitation was less than usual; and, with the exception of the evening of the last day of the month, there was no general winter storm that could be classed as severe. As a result, there was much less than the average amount of trouble and inconvenience from drifting snow. In fact railroads, telephone and telegraph companies and stock feeders probably have never experienced a more favorable winter than this, so far as the weather is concerned. The month was the coldest February since 1905, but the deficiency of temperature was due to almost continuous moderately cold weather rather than to any extremely low temperatures or to any long continued cold spells. Nor were there any unusually warm periods. There were two cold waves of importance. The first occurred on the 7th-8th, and the second spread over the state on the afternoon and night of the last day of the month. The first was not severe, although it gave the coldest weather of the month and winter on the 8th. The one on the 28th was attended by winds of gale force and rapidly falling temperature. It proved to be one of the severest blows Iowa has experienced in recent years, and was the only general blizzard of the winter.

Ice of good thickness and quality was secured throughout the State, and the harvest was generally finished by the 20th.

Fall sown grains were covered by a mantle of snow during the coldest weather and were reported to be in good condition at the close of the month.

PRESSURE.—The mean sea-level pressure for the State was 30.24 inches; the highest recorded was 30.72 inches at Dubuque, on the 24th; the lowest recorded was 29.61 inches at Davenport on the 6th.

TEMPERATURE.—The monthly mean temperature for the State, 109 stations reporting, was 16.8°, or 3.7° lower than the normal. February was

the coldest month of the winter, and the coldest February since 1905. It was 11.0° colder than January, 1914, and 1.1° lower than the normal for January. The highest temperature reported was 59° at Pella on the 28th, and the lowest was —29° at Inwood in the extreme northwestern corner of the State, on the 7th.

Over the northern counties the temperature was below freezing all of the time from the 4th to the 25th, inclusive, except on the 21st, when it was one or two degrees above that point. The 7th and 8th were generally the coldest days, but the monthly minimum at some stations was recorded on the 16th, 18th or 24th, and the lowest temperatures were recorded in the extreme western counties; the values in the extreme southwestern corner of the State being considerably lower than they were in the north-central, or northeastern counties. The most noticeable feature in regard to the temperature of the month was the sudden change from warm to cold that occurred during the last day of the month. During the forenoon of the 28th, in the western, and the afternoon in the eastern half of the State, the temperature was near or above 50°, but with the approach of the cold wave from the northwest the temperature fell rapidly during the afternoon and night, and the readings were only a few degrees above zero in the eastern part of the state on the following morning.

HUMIDITY.—The average relative humidity for the State was 79 per cent, or about 2 per cent more than the normal. The average at 7 a. m. was 83 per cent and at 7 p. m. 74 per cent. The percentages at the several stations were as follows: Charles City, 84; Davenport, 82; Des Moines, 77; Dubuque, 83; Sioux City, 78; Omaha, Neb., 69 per cent.

PRECIPITATION.—The average for the State, 114 stations reporting, was 0.87 inch, or 0.28 inch less than the normal. As in January the greatest precipitation was over the southeastern counties. The greatest amount was 1.99 inches at Keosauqua, and the least amount was 0.32 inch at Britt. Practically all of the precipitation came in the form of snow, which was fairly well distributed throughout the month. Light snow flurries were frequent, but the only general storms occurred on the 6th-7th, 12th, 15th, 20th, and 22d, during which most of the precipitation fell, the greatest amounts being recorded on the 6th.

SNOWFALL.—The average for the State was 9.2 inches, or 1.9 inches more than the average for the past 22 years. The greatest amount reported was 24.6 inches at Centerville, and the least was 2.5 inches at Britt.

WIND.—Northwesterly winds prevailed, the total movement being considerably more than the normal for February. High winds prevailed on several days, culminating in a severe gale on the 28th when considerable damage was done to plate glass windows, trees, telegraph and telephone poles, and buildings in various parts of the State. The highest velocity reported was 68 miles an hour, from the northwest, at Sioux City on the 28th.

SUNSHINE AND CLOUDINESS.—The duration of sunshine was somewhat less than usual, the percentage of the possible amount being 53 at Charles City; 57 at Davenport; 58 at Des Moines; 47 at Dubuque; 60 at Keokuk; and 55 at Sioux City. The average number of clear days for the State was 10; partly cloudy, 9; cloudy, 9. During the past 24 years the average number of clear days in February is 11; partly cloudy, 8; cloudy, 9.

MISCELLANEOUS.—Dense fog occurred quite widely on the 17th, 21st and 27th; sleet was reported from several points on the 2d, 18th, 22d and 26th; lightning was observed at Mason City on the 21st, and bright sun dogs were visible at Albia on the 1st.

COMPARATIVE DATA FOR THE STATE—FEBRUARY.

Year	Temperature			Precipitation		
	Mean	Highest	Lowest	Average	Greatest	Least
1890	26.0	67	-24	.88	2.18	.11
1891	19.4	70	-31	1.16	2.41	.55
1892	28.1	68	-20	1.20	2.18	.12
1893	16.4	60	-28	1.39	2.91	.06
1894	19.7	60	-19	.89	2.41	T
1895	16.4	73	-33	.49	1.34	.02
1896	27.4	78	-13	.71	2.40	.04
1897	24.7	61	-24	.89	1.81	.22
1898	24.2	62	-18	1.20	3.65	.10
1899	12.2	75	-40	.80	4.32	.12
1900	14.8	60	-27	1.30	4.57	.18
1901	17.5	49	-21	1.01	3.00	.12
1902	17.6	62	-21	.73	2.39	.02
1903	19.8	56	-21	1.18	3.25	.30
1904	14.8	70	-26	.41	1.99	T
1905	12.8	69	-41	1.57	2.97	.44
1906	23.6	66	-32	1.29	2.91	.20
1907	25.0	65	-31	.71	1.95	.06
1908	24.3	59	-16	1.69	3.95	.23
1909	26.2	62	-26	1.54	4.72	.30
1910	17.8	58	-21	.46	2.09	T
1911	27.3	71	-13	2.76	5.46	.50
1912	18.1	57	-30	1.21	3.25	.04
1913	20.2	70	-24	.82	2.39	.07
1914	16.8	59	-29	.87	1.99	.32

T indicates a trace. - indicates temperature below zero.

MARCH.

March, 1914, in Iowa was not an unusual month; in fact the climatological conditions were rather typical. The chief features were the cold wave at the beginning of the month, the warm springlike weather two weeks later, and the cloudy, showery period during the closing days. Both the mean temperature and average precipitation were near the normal, while the snowfall was light, averaging less than two inches.

The cold wave already referred to was the culmination of the severe wind storm that passed over the state on February 28th; it caused the coldest weather of the month in all parts of the state, except a small area in the extreme southwestern portion. On the morning of the 1st the temperature in northern Iowa ranged from zero to 5° below, and in the central and southern sections, from zero to 10° above. A five-day period of warm pleasant weather began on the 12th; the day temperatures at this time were unusually high for so early in the season, reaching

70° even in northern Iowa. At Dubuque the maximum temperature of the 15th (70°) is the highest recorded at that station during the first 15 days of March in the last 20 years. Many evidences of spring were noted at this time; grass began to grow, insects were seen, and the general appearance of migratory birds took place. Most of the ice in rivers and streams disappeared during this period. Some field work on farms was accomplished, and a little gardening was done. Growth of vegetation was checked by a return to cool weather on the 17th. The closing days of the month were marked by cloudy, damp, showery weather; at this time occurred the first rains of the season, and thundershowers were numerous. The moisture was of great benefit, but retarded outdoor work.

PRESSURE.—The mean sea-level pressure for the State was 30.11 inches; the highest recorded was 30.64 inches, at Sioux City, on the 11th; the lowest recorded was 29.42 inches, at Omaha, Neb., on the 24th.

TEMPERATURE.—The monthly mean for the State, 108 stations reporting, was 34.7°, or 1.4° higher than the normal. The month was milder than usual over the entire state, the excess of mean temperature being greatest in northwestern Iowa, where it was between 2° and 3°. Keokuk, with a mean temperature of 39.0°, was the warmest point, and Northwood, a station in Worth county, with a mean of 29.6°, the coldest point. The lowest monthly temperatures at the various stations occurred on the 1st, except in three cases, the lowest temperature reported being —5°, at Estherville, Emmet county, and at Northwood, Worth county. All the monthly highest temperatures, except that at Keokuk, occurred some time during the warm spell at the middle of the month; the highest temperature reported was 78°, at Lamoni, on the 15th.

HUMIDITY.—The mean relative humidity for the State was 74 per cent, or practically the normal figure. The average at 7 a. m. was 80 per cent; at 7 p. m., 67 per cent. The monthly averages at the several stations were as follows: Charles City, 82; Davenport, 77; Des Moines, 71; Dubuque, 76; Keokuk, 76; Sioux City, 70; Omaha, Neb., 70.

PRECIPITATION.—The average for the State, 116 stations reporting, was 1.69 inches, or 0.08 inch less than the normal. In northern Iowa there was an average deficiency of two-fifths of an inch, but in central and southern Iowa a slight excess prevailed. The greatest amounts occurred in the extreme eastern part of the state and over a small area in the southwest, where more than 3 inches were reported. The greatest amount was 3.84 inches, at Clinton. The northwestern part of the state was driest, less than an inch occurring in several counties. Lake Park reported the least amount, 0.28 inch. There were 3 fairly well defined precipitation periods. The first covered the 5th-10th; the second, the 17th-21st; and the last, the closing week. Practically all the precipitation of the first two periods was in the form of snow, while that of the last period was rain. A large percentage of the month's total amount occurred in the last period. Thunder showers were quite numerous at this time, and in a few cases rain fell at an excessively heavy rate. At Davenport on the night of the 28th, 0.75 inch occurred in 20 minutes. The average number of rainy days was 7.

SNOWFALL.—The average for the State was 1.8 inches, or 3.2 inches less than the normal. The greatest amount reported was 18.0 inches, at Northwood, while a few stations had only traces.

WIND.—Northwesterly winds prevailed, and the movement was less than usual for one of the windiest months of the year. The windiest days were the 6th, 17th and 24th. The highest velocity reported was 42 miles an hour, at Sioux City, on the 17th.

SUNSHINE AND CLOUDINESS.—About the normal amount of sunshine prevailed for the state as a whole. The percentages at the various stations were as follows: Charles City, 54; Davenport, 57; Des Moines, 64; Dubuque, 55; Keokuk, 51; Sioux City, 54; Omaha, Neb., 55. The average number of clear days was 12; partly cloudy, 8; cloudy, 11.

MISCELLANEOUS.—Sleet was reported on the 4th, 5th, 6th, 17th and 26th; fog occurred on the last four days; and thunder was heard from the 23d to the 31st, inclusive, except on the 30th.

COMPARATIVE DATA FOR THE STATE—MARCH.

Year	Temperature			Precipitation		
	Mean	Highest	Lowest	Average	Greatest	Least
1890	28.0	75	-24	1.57	3.67	.32
1891	26.8	66	-19	2.60	4.58	1.33
1892	31.9	48	- 6	2.22	4.58	.57
1893	31.8	84	- 8	2.14	4.40	.64
1894	41.0	84	- 5	2.03	4.52	.26
1895	34.4	94	-11	0.83	2.60	.22
1896	30.9	81	-12	1.10	3.99	.16
1897	32.0	72	-22	2.39	6.16	.29
1898	37.5	72	- 2	1.94	6.21	.33
1899	23.0	75	-16	1.62	5.90	.37
1900	30.7	81	-13	2.06	5.15	.45
1901	34.2	76	- 8	2.64	5.25	.70
1902	39.1	79	-12	1.45	4.33	.13
1903	38.8	82	6	1.38	3.90	.15
1904	34.8	78	3	2.18	4.57	.50
1905	41.5	84	1	2.04	3.70	.39
1906	27.1	65	-14	2.34	4.55	.58
1907	40.6	92	- 7	1.35	5.05	.23
1908	37.9	85	- 8	1.58	3.74	.45
1909	32.5	71	-15	1.53	5.00	.28
1910	48.9	92	-10	0.17	1.32	.00
1911	39.4	83	2	0.08	4.84	T
1912	24.9	70	-19	2.01	5.25	.60
1913	31.9	78	-23	2.48	5.88	.74
1914	34.7	78	- 5	1.69	3.84	.28

T indicates a trace. — Indicates temperature below zero.

APRIL.

For the State, as a whole, the climatic conditions of the month closely approximate the normals for April. While there were periods when the departures from the normal were quite marked, the averages for the month vary but little from the normals. There was a deficiency of only 0.1° in temperature and 0.34 inch in precipitation. The first twelve days were cold and mostly cloudy, but there was not much precipitation during

that period. In fact the month was considerably drier than usual until the 24th, although there were many light showers on the 1st, from the 4th to the 6th, 10th, 15th, and 18th to 19th, but from the 24th to the 28th rainfall was general and at many stations heavy. Nearly all of the precipitation came in the form of showers, but light snow flurries occurred in all parts of the State on the 4th, 5th, 10th or 19th. Much warmer weather prevailed generally during the latter half of the month, and from the 15th to 17th and 25th to 27th it was unusually warm. The month, as a whole, was favorable for all out-door pursuits. The bulk of the small grain was sown by the 18th, and by the end of the month it was up and showed a good stand. Potatoes were planted and a large area was prepared for corn. Fruit trees were in blossom in the southern counties, and shade and forest trees were becoming green in all parts of the State. Owing to a great amount of fall plowing and the favorable conditions prevailing this spring, farm work is farther advanced than usual at the close of April.

PRESSURE.—The mean sea-level pressure for the State was 30.00 inches. The highest recorded was 30.53 inches, at Charles City, on the 30th; the lowest, 29.44 inches, at Sioux City, on the 17th, and at Charles City on the 18th.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 107 stations, was 48.6°, or 0.1° below the normal. This is the nearest approach to the normal for April ever before recorded since state-wide observations began in 1890. The first half of the month was considerably below the normal, and readings below the freezing point were recorded in all parts of the State on numerous dates. The 8th and 9th were, however, the coldest days except in the extreme northwestern counties where the lowest readings were recorded on the 4th or 5th. The lowest temperature reported was 11° at Lake Park on the 8th. Higher temperatures prevailed during the latter half of the month, and the readings from the 15th to the 17th and from the 24th to the 27th were decidedly above the average; the maximum occurring at most stations on the 16th, 17th or 26th. The highest temperature reported was 88° at four stations. Another cool wave spread over the State during the last three days of the month, which resulted in freezing temperatures in Palo Alto and Pocahontas counties on the 30th.

HUMIDITY.—The average relative humidity for the State at 7 a. m. was 76 per cent, and at 7 p. m. 58 per cent. The mean for the month was 67 per cent, or slightly more than the normal. The greatest monthly mean was 76 per cent at Charles City, and the least 64 per cent at Dubuque.

PRECIPITATION.—The average for the State, 115 stations reporting, was 2.52 inches, or 0.34 inch less than the normal. Geographically the distribution was quite uniform, the average amounts for the northern, central and southern districts being 2.64, 2.60 and 2.32 inches, respectively. The greatest amounts were recorded in Greene and Carroll counties, where the rainfall was heavy on the 27th and 28th. The distribution during the month was uneven. In fact, the first and second decades were unusually

dry, there being only light showers prior to the 24th. The bulk of the precipitation came on the 26th, 27th or 28th, during which time the showers were copious to heavy and were quite general. There were no damaging downpours. The average number of days with 0.01 inch or more was 8.

SNOWFALL.—The average for the State was 0.3 inch, or 1.6 inches less than the normal. This is, with five exceptions, the least amount recorded in April since 1892.

WIND.—The prevailing direction of the wind was from the northwest. There were no wind storms of importance, but brisk to high winds prevailed on the 17th and 18th which caused considerable inconvenience in seeding small grain by causing dust storms over plowed fields. The highest velocity recorded was 52 miles per hour, from the northwest, at Sioux City, on the 10th. High winds also prevailed on the 27th.

SUNSHINE AND CLOUDINESS.—For the State, as a whole, the percentage of sunshine received was somewhat below the normal; but there was a deficiency of 19 per cent at Charles City and 7 per cent at Sioux City, indicating more cloudiness over the northern than there was over the southern part of the state. The average number of clear days was 10; partly cloudy, 8; cloudy, 12.

MISCELLANEOUS PHENOMENA.—Sleet occurred in Fremont and Cerro Gordo counties on the 5th, and in Plymouth county on the 19th. Hail occurred in Cerro Gordo county on the 10th; in Cerro Gordo, Dallas, Union, and Wayne counties on the 18th; in Warren county on the 19th; Cass county on the 24th; and in Palo Alto, Kossuth and Hancock counties on the 26th. Thunderstorms were quite general on the 17th, 18th, 23rd, 24th, 26th, and 27th, and in a few localities on the 1st, 6th, 15th, and 28th.

RIVERS.—The rivers in this section did not change materially during the first three weeks of the month, and were low for the season during that period. Owing to moderately heavy rains, they rose steadily during the last week and in all cases the highest stage of the month was recorded on the 30th.

COMPARATIVE DATA FOR THE STATE—APRIL.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	51.8	+3.1	88	2	1.80	—1.06	4.46	0.38	------	6	14	9	7
1891	50.6	+1.9	93	13	2.15	—0.71	5.06	0.59	------	8	14	7	9
1892	45.4	—3.3	88	14	4.75	+1.89	8.38	2.43	5.7	9	8	9	13
1893	45.5	—3.2	96	15	4.21	+1.35	8.51	1.24	6.0	10	8	9	13
1894	51.7	+3.0	93	12	3.07	+0.21	6.91	0.55	0.2	9	11	11	8
1895	54.2	+5.5	98	8	2.62	—0.24	5.88	0.28	2.1	5	14	8	8
1896	54.5	+5.8	94	10	5.02	+2.16	9.67	2.35	4.5	11	11	10	9
1897	47.9	—0.8	89	19	5.35	+2.49	9.86	2.22	T	11	9	9	12
1898	48.1	—0.6	91	14	2.56	—0.30	4.82	0.27	T	8	13	9	8
1899	48.9	+0.2	89	1	2.40	—0.46	5.76	0.56	2.0	7	12	11	7
1900	52.2	+3.5	89	19	2.67	—0.21	6.62	0.43	0.9	6	12	9	9
1901	49.9	+1.2	92	15	1.79	—1.07	3.47	0.66	2.0	5	14	8	8
1902	48.2	—0.5	96	9	1.71	—1.15	4.15	0.40	T	5	14	11	5
1903	49.8	+1.1	86	17	2.98	+0.12	6.00	0.74	0.8	9	11	9	10
1904	44.1	—4.6	86	13	3.63	+0.77	8.97	1.52	1.4	7	15	6	9
1905	47.5	—1.2	90	10	3.03	+0.17	5.49	0.63	1.2	8	12	8	10
1906	52.5	+3.8	94	22	2.42	—0.44	5.55	0.53	0.6	8	14	9	7
1907	41.5	—7.2	80	10	1.32	—1.54	3.22	0.24	2.7	6	12	8	10
1908	50.5	+1.8	91	8	2.24	—0.62	4.59	0.67	0.3	8	14	8	8
1909	43.8	—4.9	86	14	4.58	+1.72	9.43	0.83	3.1	12	9	9	12
1910	52.5	+3.8	99	15	1.48	—1.38	4.86	0.10	3.0	7	14	7	9
1911	46.7	—2.0	86	3	3.09	+0.23	6.04	1.33	3.6	9	11	8	11
1912	49.9	+1.2	84	20	2.66	—0.20	5.66	0.78	1.1	8	13	8	9
1913	50.2	+1.5	88	16	3.28	+0.42	7.43	1.12	2.7	9	15	5	10
1914	48.6	—0.1	88	11	2.52	—0.34	5.03	0.37	0.3	8	10	8	12

MAY.

The month was characterized by cool weather during the first and moderately warm weather during the latter half, and by numerous torrential rains, although there was a decided deficiency of rainfall for the State, as a whole. The month was, however, unusually favorable for all out-door operations, and farm work progressed rapidly. The bulk of the corn was planted by the 23d, and by the close of the month much of it has been cultivated once and some of it twice. Frost was quite general over the northern two-thirds of the State, between the 12th and 14th, but no damage was done except to tender garden truck. Destructive wind squalls occurred in many localities on the 3d, and on the night of the 10th-11th, which blew down wind-mills, silos and small buildings, and caused the death of one man near Camanche on the 3d. Most of the wind squalls attended severe electrical storms, and were accompanied by excessive rainfall and, in some cases, by hail. The heavy rains caused considerable damage by floods and soil erosion, and the hail was destructive to fruits, garden truck, meadows and green houses. The lack of moisture in the southern counties was detrimental to all crops except corn, which was in fine condition and growing rapidly at the close of the month.

PRESSURE.—The mean sea-level pressure for the State was 30.06 inches. The highest recorded was 30.46 inches, at Dubuque, on the 15th; the lowest, 29.54 inches, at Sioux City, on the 3d.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 111 stations, was 62.2°, or 1.7° above the normal. This has been exceeded but five times during the past 25 years. The first 17 days were unusually cool, and light frost and freezing temperatures occurred on several dates in many localities. The 2d, 8th, 12th, 13th and 15th were the coldest days; the lowest reading, 25° being recorded on the 13th at Washta. After the 17th the temperature was above the normal most of the time, and the excess for the month was made up during this period. The highest temperature was recorded at most stations on the 26th; the highest reading being 96° at Cedar Rapids.

HUMIDITY.—The average relative humidity for the State, at 7 a. m. was 74 per cent, and at 7 p. m. 54 per cent. The mean for the month was 64 per cent, or about 4 per cent less than the normal. The greatest monthly mean was 73 per cent at Charles City, and the least, 60 per cent at Davenport.

The average for the State, 118 stations reporting, was 3.31 inches, or 1.26 inches less than the normal. By sections the averages were as follows: Northern, 4.44 inches, or 0.04 inch less than the normal; Central, 3.52 inches, or 1.07 inches less than the normal; Southern, 1.96 inches, or 2.68 inches less than the normal. All of the rain came in the form of local showers, many of them being excessive. At Des Moines, on the 10th-11th, 2.58 inches fell in 3 hours and 19 minutes; on the 10th 1.22 inches fell in 24 minutes; on the 11th 1.20 inches fell in 18 minutes; and on the 23d, 1.31 inches fell in 29 minutes.

PRECIPITATION.—The rainfall was light over the southern three tiers of counties, except over small areas in Jefferson and Madison counties, where heavy local showers occurred which did more harm than good. Over nine counties extending from Montgomery and Page eastward to Lucas and Decatur the rainfall was decidedly deficient, and within that area all crops, except corn, suffered from the lack of moisture. A few flakes of snow fell at Algona and Britt on the 7th. Measurable precipitation occurred on an average of 10 days.

WIND.—The prevailing direction of the wind was from the south. The highest velocity recorded was 50 miles per hour, from the north, at Sioux City, on the 23d. Wind squalls occurred on several dates, and were destructive in many localities. The squalls accompanied severe electrical storms and were attended in many cases by hail.

SUNSHINE AND CLOUDINESS.—The average duration of sunshine was about 71 per cent, or about 8 per cent more than the normal. The average number of clear days was 14; partly cloudy, 11; cloudy, 6.

Thunderstorms occurred on the 3d, 4th, 6th, 9th, 10th, 11th, 20th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th and 31st.

Hail occurred on the 3d, 7th, 10th and 11th.

RIVERS.—There has been no "Spring Rise" in the rivers of this section this year, but there has been a fair boating stage throughout the month.

COMPARATIVE DATA FOR THE STATE—MAY.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	57.7	— 2.8	90	26	3.56	—1.01	6.44	1.61	------	9	10	13	8
1891	58.3	— 2.2	94	21	3.18	—1.39	7.10	1.46	------	8	14	9	8
1892	54.0	— 6.5	88	29	8.77	+4.20	12.64	4.87	T	16	5	9	17
1893	56.6	— 3.9	96	26	3.45	—1.12	5.82	1.65	0	9	13	9	9
1894	61.1	+ 0.6	96	22	1.87	—2.70	4.77	0.33	0	6	17	10	4
1895	61.7	+ 1.2	104	24	3.19	—1.38	5.79	0.84	0	9	11	12	8
1896	65.5	+ 5.0	100	34	6.69	+2.12	11.79	3.40	0	12	11	12	8
1897	58.5	— 2.0	96	20	1.92	—2.65	3.59	0.21	0	5	16	10	5
1898	59.6	— 0.9	92	26	4.67	+0.10	7.82	2.22	0	12	9	10	12
1899	60.2	— 0.3	90	27	6.23	+1.66	11.47	3.09	0	13	9	12	10
1900	63.2	+ 2.7	98	22	3.31	—1.26	6.98	0.96	0	8	14	10	7
1901	60.7	+ 0.2	95	28	2.35	—2.22	4.57	0.72	0	7	16	9	6
1902	63.8	+ 3.3	97	25	5.39	+0.82	18.04	0.87	0	13	10	12	9
1903	61.6	+ 1.1	91	24	8.55	+3.98	15.45	2.88	0	16	9	12	10
1904	59.6	— 0.9	93	27	3.78	—0.79	8.15	1.50	0	8	13	10	8
1905	58.3	— 2.2	88	28	5.95	+1.38	10.83	2.57	0	14	12	11	8
1906	60.8	+ 0.3	95	24	3.54	—1.03	10.72	0.89	0	11	13	10	8
1907	53.5	— 7.0	96	14	3.48	—1.09	7.68	0.71	1.0	10	11	10	10
1908	59.4	— 1.1	93	13	8.34	+3.77	14.33	1.33	0	15	9	11	11
1909	57.9	— 2.6	97	18	4.34	—0.23	7.85	1.86	0.1	9	12	12	7
1910	55.4	— 5.1	89	18	3.41	—1.16	6.91	1.29	T	10	15	7	9
1911	64.9	+ 4.4	98	23	3.76	—0.81	8.73	0.42	0.7	9	16	9	6
1912	62.7	+ 2.2	97	29	3.33	—1.24	6.41	0.72	0	10	14	11	6
1913	59.4	— 1.1	102	30	6.24	+1.67	10.25	3.14	0	13	11	8	12
1914	62.2	+ 1.7	98	25	3.31	—1.26	6.90	0.30	T	10	14	11	6

JUNE.

From the viewpoint of the agriculturist, June was an exceptionally favorable month over the larger part of the State. There were, however, some objectionable features of a local character, such as damaging wind squalls, electrical storms, excessive rainfall, drouth, and in a few places hailstorms. The temperature was all that could be desired for crop growth, but the rainfall was unevenly distributed. Over the northern and central districts there was an excess of precipitation, amounting to 2.51 and 1.76 inches respectively, while in the southern counties there was a deficiency of .71 inch. The rain came in the form of showers and many of them were attended by thunderstorms, during which lightning caused considerable damage to buildings. The heavy and excessive rains in the northern part of the State delayed the cultivation of corn and flooded the bottom lands, while in the southern districts, grass, small grain, and early potatoes were suffering from lack of moisture. But for the state as a whole crops, and especially corn, probably never were in better condition at the close of June than they were this year. Corn made remarkably rapid growth, and at the close of the month the bulk of the crop was laid by, with fields in excellent condition.

PRESSURE.—The mean sea level pressure for the State was 29.93 inches. The highest recorded was 30.34 inches, at Dubuque, on the 16th; the lowest, 29.49 inches at Sioux City, on the 4th.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 108 stations, was 72.2°, or 3.1° higher than the normal. The highest monthly mean was 77.6° at Leon; the lowest was 67.2° at Elma and Estherville. The highest temperature reported in the State, was 101° at Burlington on the 9th and 26th and at Centerville on the 9th, and the lowest was 40° at Alton on the 2d and at Monroe on the 17th. The temperature was quite uniform throughout the month, which will account for the unusually rapid growth of vegetation.

HUMIDITY.—The average relative humidity for the State at 7 a. m. was 76 per cent, and at 7 p. m., 59 per cent. The mean for the month was 68 per cent, or about 2 per cent less than the normal. The highest monthly mean was 70 per cent, at Dubuque, and the lowest, 65 per cent, at Des Moines.

PRECIPITATION.—The average for the State, 116 stations reporting, was 5.57 inches, or 1.19 inches more than the normal. By sections the averages were as follows: Northern, 6.94 inches, or 2.51 inches more than the normal; Central, 6.08 inches, or 1.76 inches more than the normal; Southern, 3.68 inches, or 0.71 inch less than the normal. The greatest amount reported from any station was 13.24 inches at Osage, and the least 1.17 inches at Bonaparte. The greatest amount in any 24 consecutive hours, 6.31 inches, occurred at Osage. During 12 hours and 13 minutes, 4.33 inches fell at Davenport on the 4th-5th.

The rainfall was well distributed throughout the month, except in many localities over the southern counties, where but little rain fell during the latter half of the month. Measurable precipitation occurred on an average of 13 days.

WIND.—The prevailing direction of the wind was from the south. The highest velocity recorded was 67 miles an hour, from the south, at Sioux City, on the 23d. As in May, wind squalls were frequent, and damaging in many localities.

SUNSHINE AND CLOUDINESS.—The average duration of sunshine was about 70 per cent, or about 5 per cent more than the normal. The average number of clear days was 12; partly cloudy 14; cloudy 4.

MISCELLANEOUS PHENOMENA.—Thunderstorms occurred at some place in the state on every day of the month, except the 2d, 16th, and 29th, and hail fell on the 4th, 5th, 6th, 10th, 12th, 14th, 21st, 22d, 24th, 25th and 26th.

RIVERS.—Owing to heavy rains in northern Iowa, Minnesota, Wisconsin, and the Dakotas, there was a moderately high stage of water in all rivers, but no damaging floods occurred except in some of the smaller streams in the northern part of the State, where bottom lands were flooded and crops were more or less damaged.

COMPARATIVE DATA FOR THE STATE—JUNE.

YEAR	Temperature				Precipitation				Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1900	72.7	+3.6	106	44	7.76	+3.38	16.53	1.57	11	12	10	8
1901	69.1	0.0	99	37	5.39	+1.01	19.88	1.68	11	8	10	12
1902	69.2	+0.1	102	42	5.19	+0.81	14.16	0.67	10	12	11	7
1903	71.2	+2.1	100	40	3.91	—0.47	7.56	1.36	8	15	11	4
1904	73.2	+4.1	104	34	2.67	—1.71	6.20	0.57	7	16	10	4
1905	69.7	+0.6	102	34	4.32	—0.06	9.26	0.98	10	11	11	8
1906	69.1	0.0	100	40	3.11	—1.27	7.89	0.81	9	12	13	5
1907	69.1	0.0	103	29	3.81	—0.57	9.38	1.03	10	10	12	8
1908	71.4	+2.3	99	42	4.72	+0.34	12.48	1.90	9	13	10	7
1909	70.7	+1.6	100	42	5.04	+0.66	11.99	1.10	10	12	13	5
1910	69.7	+0.6	102	38	3.98	—0.40	12.35	0.67	5	17	10	3
1911	72.3	+3.2	106	30	3.71	—0.67	7.84	1.05	9	15	11	4
1912	65.2	—3.9	97	32	7.16	+2.78	16.04	1.46	14	8	11	11
1913	64.6	—4.5	96	30	2.86	—1.52	6.04	0.75	10	13	10	7
1914	67.1	—2.0	94	35	3.45	—0.93	8.35	0.44	7	13	10	7
1905	69.9	+0.8	100	36	5.53	+1.15	14.89	1.80	10	12	11	7
1906	67.9	—1.2	99	37	3.92	—0.46	8.27	1.48	8	15	10	5
1907	66.5	—2.6	98	36	5.35	+0.97	9.33	2.07	11	14	9	7
1908	67.1	—2.0	94	35	5.66	+1.28	11.88	1.77	13	12	10	8
1909	69.1	0.0	96	40	6.41	+2.03	13.30	2.80	13	12	10	8
1910	69.5	+0.4	105	33	1.99	—2.39	5.51	0.05	7	18	7	5
1911	75.7	+6.6	108	36	1.82	—2.56	6.28	0.06	5	20	8	2
1912	66.2	—2.9	101	34	2.74	—1.64	5.71	0.78	7	15	9	6
1913	71.5	+2.4	102	33	3.31	—1.07	8.95	0.74	7	19	8	3
1914	72.2	+3.1	101	40	5.57	+1.19	13.24	1.17	13	12	14	4

JULY.

The month goes on record as one notable for heat and dryness. With the single exception of the memorable July of 1901, it was the warmest July in the 25 years' climatological history of the State. Moreover, with the exception noted, August, 1900, is the only other month of record warmer than the one under discussion. There has been less precipitation in other summer months than in July this year, but the total number of such months (June, July and August considered) is but 10 in a 25 years' record.

The heat was less endurable than usual owing to the light winds that prevailed, the month being one of the least windy Julies of record. But few severe storms occurred, the most important being those of the 16th and 27th. The former was the more widespread, and much damage was done to corn and grain. However, the beneficial effects of the accompanying rainfall far exceeded the loss by wind and hail.

A saving factor in the drouthy conditions of the month was that the rainfall came at opportune times, vegetation deriving the maximum possible benefits. The great staple corn was in such excellent shape at the close of June that it withstood the unfavorable weather remarkably well, but considerable deterioration took place in southern counties as the month progressed. The weather conditions were good for haying and the harvesting of small grains, and by the close of the month this

work had been practically completed. At the same time threshing was well advanced. The soil was too dry for plowing, and pastures were cut short by the drouth, especially in southern counties. In some places stock had to go on feed. Reports of wells going dry came from several sections.

PRESSURE.—The mean sea level pressure for the State was 29.98 inches. The highest recorded was 30.27 inches, at Dubuque, on the 29th; the lowest was 29.56 inches, at Des Moines, on the 16th.

TEMPERATURE.—The monthly mean for the State, 107 stations reporting, was 76.6°, or 2.5° higher than the normal. An excess of temperature prevailed at all stations, but the departures were greatest in southern sections. Burlington, with a mean temperature of 80.6° was the warmest point in the State, and Elma, with a mean of 72.4°, the coolest.

Most of the highest monthly temperatures at the individual stations occurred on the 11th, 12th or 27th. In general these values were slightly above 100° over the southern half of the State, and slightly below 100° over the northern half. The highest temperature reported was 109°, at Centerville, on the 12th. The next highest was 106°, at Bedford, on the 27th. The weather was coolest at the beginning and close of the month, and on or about the 18th. About 90 per cent of the lowest monthly temperatures at the various stations occurred at the last mentioned time. The lowest reported was 43°, at Washta, on the 3d, and at Mason City, on the 18th.

HUMIDITY.—The average relative humidity for the State at 7 a. m. was 77 per cent, and at 7 p. m., 53 per cent. The mean for the month was 65 per cent, or about 3 per cent less than the normal. The highest monthly mean was 72 per cent, at Charles City, and the lowest, 62 per cent, at Davenport.

PRECIPITATION.—The average for the State, 114 stations reporting, was 2.27 inches, or 1.69 inches less than the normal. Only 4 other Julies since 1889 have been drier. The precipitation was deficient over 90 per cent of the State, but the Central Section was driest. There were two chief areas where there was an excess of moisture, one covering most of Pocahontas, Calhoun, Sac and Crawford counties, the other, Mahaska, Monroe, Wapello, Wayne, Appanoose and Davis counties. The greatest amount reported was 6.50 inches, at Oskaloosa, and the least, 0.44 inch, at Davenport. In point of time the precipitation of the month was exceptionally well distributed. The 6th, 12th, 16th, 24th and 30th were the dates of most general occurrence. There was an average of 5 rainy days for each station, this being 3 fewer than the normal.

WIND.—The prevailing direction of the wind was from the south. The highest velocity recorded was 35 miles an hour, from the north, at Sioux City, on the 16th. The velocities were among the lightest of record for July.

SUNSHINE AND CLOUDINESS.—The average percentage of the possible amount of sunshine was 81, or about 9 per cent more than the normal. The average number of clear days was 20; partly cloudy, 8; cloudy, 3.

MISCELLANEOUS PHENOMENA.—Thunder was heard at some place in the State on every day of the month, except the 2d, 8th, 14th, 19th and 20th, and hail fell on the 15th and 16th.

RIVERS.—As the result of heavy rains in Minnesota and Wisconsin in June, the Mississippi River rose rapidly during the first half of the month, reaching a stage of 14.4 feet at Dubuque on the 12th, and 10.6 feet at Davenport on the 13th. With three exceptions the stage at Dubuque was the highest in July in 40 years. Steadily falling stages prevailed at Dubuque after the 12th, and at Davenport after the 15th.

COMPARATIVE DATA FOR THE STATE—JULY.

YEAR	Temperature				Precipitation				Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	75.6	+1.5	110	45	1.98	—1.98	5.00	0.37	3	18	8	5
1891	68.5	—5.6	99	41	4.22	+0.26	8.20	1.67	8	13	13	5
1892	73.0	—1.1	104	38	5.29	+1.33	12.86	1.71	9	16	10	5
1893	75.0	+0.9	102	47	3.33	—0.63	8.84	1.49	7	19	10	2
1894	76.4	+2.3	103	39	0.63	—3.33	3.50	T	3	22	8	1
1895	72.1	—2.0	104	35	3.40	—0.56	10.10	0.45	7	15	12	4
1896	73.6	—0.5	104	42	6.90	+2.94	12.67	1.61	9	14	11	6
1897	75.6	+1.5	106	42	3.26	—0.70	7.60	1.01	6	18	10	3
1898	73.4	—0.7	102	42	2.98	—0.98	12.88	0.55	7	19	9	3
1899	73.1	—1.0	101	38	3.07	—0.89	8.66	0.42	7	16	10	5
1900	73.4	—0.7	102	37	6.15	+2.19	18.45	1.80	9	16	10	5
1901	82.4	+8.3	113	46	2.34	—1.62	5.97	0.27	5	21	9	1
1902	73.1	—1.0	99	41	8.67	+4.71	13.57	4.82	13	14	10	7
1903	72.9	—1.2	100	40	4.83	+0.87	12.72	0.94	9	17	9	5
1904	70.6	—3.5	100	38	4.41	+0.45	11.97	1.28	10	16	9	6
1905	70.6	—3.5	102	40	2.91	—1.05	7.08	0.69	9	14	10	7
1906	70.9	—3.2	102	42	3.04	—0.92	7.05	0.26	8	18	10	3
1907	73.7	—0.4	102	41	7.27	+3.31	13.66	3.97	13	16	11	4
1908	73.0	—1.1	100	42	3.66	—0.30	9.21	0.70	8	16	10	5
1909	72.3	—1.8	102	46	4.77	+0.81	12.20	1.20	10	15	8	8
1910	74.5	+0.4	108	43	1.86	—2.10	5.69	0.12	7	19	8	4
1911	75.5	+1.4	111	38	2.27	—1.69	6.62	0.08	7	18	10	3
1912	74.6	+0.5	103	38	3.71	—0.25	7.56	1.17	10	17	10	4
1913	76.1	+2.0	108	45	1.82	—2.14	6.23	T	5	21	8	2
1914	76.6	+2.5	109	43	2.27	—1.69	6.50	0.44	5	20	8	3
Normals	74.1		104	41	3.96		9.39	1.08	8	17	10	4

AUGUST.

The hot and dry weather that prevailed during July continued until the 18th of August, culminating on the 16th, 17th and 18th with high temperatures and hot, dry winds. From the 19th to the close of the month more favorable conditions obtained. The temperature was generally moderate and showers were more frequent. The 16th and 17th were among the worst days ever experienced in Iowa. The temperature was near or above 100 degrees, with wind velocities ranging from 25 to 36 miles per hour, bright sunshine and extremely low humidity. All vegetation, especially over the southern half of the state, suffered greatly by these adverse conditions, and corn probably never deteriorated more in 48 hours than it did on those two days. While August will go on record as a dry month, and great damage was done by the drouth, yet rain fell at some point in the state on every day of the month. The showers were, however, widely scattered and of but slight benefit, except in a few localities of small area, until near the close of the month. Copious and quite general showers occurred on the 23d, 27th and 31st, which afforded great relief to vegetation, and put the ground in condition for plowing.

The month closed with severe local wind, rain and electric storms in many localities. Wind did much damage to trees and buildings, and wind and rain seriously injured the corn crop.

PRESSURE.—The mean sea level pressure for the state was 29.96 inches. The highest recorded was 30.37 inches, at Sioux City, on the 26th; the lowest was 29.58 inches, at Sioux City, on the 17th.

TEMPERATURE.—The monthly mean for the state, 113 stations reporting, was 73.7°, or 19° above the normal. The highest monthly mean was 78.1° at Leon; the lowest, 68.5°, at Estherville. The highest temperature reported in the state was 103° at Lamoni, on the 18th and the lowest was 40° at Elma, on the 14th, and Spencer on the 25th. The coolest days were the 14th, 26th, 27th and 28th, and the highest temperatures were recorded on the 8th, 16th, 17th and 22d.

HUMIDITY.—The average relative humidity for the state at 7 a. m. was 78 per cent, and at 7 p. m., 53 per cent. The mean for the month was 66 per cent, or about 6 per cent less than the normal. The highest monthly mean was 76 per cent at Charles City, and the lowest, 61 per cent at Des Moines.

PRECIPITATION.—The average for the state, 121 stations reporting, was 2.19 inches, or 1.49 inches less than the normal. By sections the averages were as follows: Northern, 2.40 inches, or 1.08 inches less than the normal; Central, 1.82 inches, or 1.95 inches less than the normal; Southern, 2.35 inches, or 1.43 inches less than the normal. The greatest amount reported from any station was 4.90 inches at Lake Park, and the least, 0.42 inch at Webster City. The greatest amount in any 24 consecutive hours, 4.30 inches, occurred at Tipton, on the 19th. At Dubuque, on the 31st, 1.03 inches fell in 15 minutes. While rain fell at some place in the state on every day of the month, the showers were generally light, widely scattered and of but little benefit until the 23d, when they were quite general and copious. They were also quite general on the 27th and 31st. Measurable precipitation occurred on an average of 7 days, which equals the normal.

WIND.—The prevailing direction of the wind was from the south. The highest velocity recorded was 52 miles an hour, from the northwest, at Sioux City on the 4th.

SUNSHINE AND CLOUDINESS.—The average percentage of the possible amount of sunshine was 73 per cent, or 4 per cent more than the normal. The average number of clear days was 17; partly cloudy, 10; cloudy, 4.

MISCELLANEOUS PHENOMENA.—Thunderstorms occurred at some place in the state on every day of the month, except the 1st, 3d and 14th, and hail fell on the 5th, 18th, 19th and 31st.

RIVERS.—The Mississippi river from Dubuque to below LaCrosse fell during the first 10 days of the month, and then remained nearly stationary until the close. The average stage was about 4.0 feet, which was sufficient for navigation. Practically all creeks and small streams were dry until near the close of the month.

COMPARATIVE DATA FOR THE STATE—AUGUST.

YEAR	Temperature				Precipitation				Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	68.4	—3.4	102	36	3.41	—0.27	6.44	1.02	8	15	10	6
1891	69.1	—2.7	106	34	4.24	+0.56	13.02	1.23	8	13	12	6
1892	71.4	—0.4	102	40	2.24	—1.34	4.69	0.65	5	18	9	4
1893	69.4	—2.4	101	30	2.32	—1.26	6.22	0.40	5	19	9	3
1894	74.6	+2.8	108	38	1.58	—2.10	4.53	T	4	21	8	2
1895	71.9	+0.1	103	37	4.43	+0.75	10.63	0.67	7	17	9	5
1896	71.7	—0.1	104	34	3.52	—0.16	12.25	0.86	8	15	11	5
1897	68.9	—2.9	104	35	1.86	—1.82	4.98	0.47	6	15	11	5
1898	71.2	—0.6	103	40	3.44	—0.24	10.55	0.58	6	17	9	5
1899	74.4	+2.6	100	41	3.68	0.00	10.45	1.12	7	17	10	4
1900	77.4	+5.6	103	44	4.65	+0.97	10.43	1.26	6	18	10	3
1901	73.8	+2.0	105	40	1.29	—2.39	4.46	T	5	20	9	2
1902	69.1	—2.7	98	37	6.58	+2.90	15.47	1.57	11	11	11	9
1903	69.1	—2.7	101	41	6.64	+2.96	17.74	2.55	11	12	10	9
1904	69.1	—2.7	97	35	3.43	—0.25	6.75	0.66	7	17	8	6
1905	74.3	+2.5	104	44	4.05	+0.37	8.47	1.04	9	16	9	6
1906	74.1	+2.3	101	33	3.95	+0.27	10.51	0.92	9	17	9	5
1907	71.1	—0.7	99	37	4.33	+0.65	9.67	1.05	9	17	9	5
1908	70.0	—1.8	101	38	4.77	+1.09	10.55	1.35	9	17	9	5
1909	76.1	+4.3	103	33	1.81	—1.87	8.21	T	5	21	8	2
1910	71.9	+0.1	104	36	3.88	+0.20	11.22	0.37	8	15	10	6
1911	71.7	—0.1	107	34	3.32	—0.36	9.47	0.44	9	16	10	5
1912	71.0	—0.8	101	40	3.78	+0.10	7.90	0.89	10	15	10	6
1913	76.6	+4.8	108	40	2.68	—1.00	7.13	0.08	6	17	10	4
1914	73.7	+1.9	103	40	2.19	—1.49	4.90	0.42	7	17	10	4
Normals	71.8	-------	103	37	3.68	--------	9.07	0.78	7	16	10	5

SEPTEMBER.

September, 1914, will go on record as the wettest month of that name in the history of the state, and, with one exception, July, 1902, it was the wettest month of record since state-wide observations began in 1890. Showers were frequent between the 1st and 24th, and in many localities the rainfall was heavy to excessive; the greatest monthly amount being 16.24 inches at Lenox, and the greatest amount in 24 consecutive hours was 7.78 inches at Cedar Rapids. Notwithstanding the fact that rain fell at some place in the state on every day between the 1st and 24th, inclusive, except the 3d and 19th, there was an excess of sunshine and an absence of damaging frosts; and the month, as a whole, was pleasant and highly favorable for agricultural interests. There was, however,

considerable damage done in some localities by wind squalls and excessively heavy rainfall. The long, severe drought of July and August was thoroughly broken and at the close of the month the pastures were as green as in May or June; much fall plowing had been done under favorable conditions; the water supply was replenished, and a large acreage of winter wheat had been seeded.

PRESSURE.—The mean sea level pressure for the State was 30.07 inches. The highest recorded was 30.44 inches, at Dubuque, on the 9th; the lowest was 29.59 inches, at Omaha, Neb., on the 13th.

TEMPERATURE.—The monthly mean for the State, 103 stations reporting, was 64.5°, or 1.1° above the normal. By sections the mean temperatures were as follows: Northern, 63.1°, or 1.3° above normal; Central, 64.5°, or 1.0° above normal; Southern, 65.9°, or 0.9° above the normal. The highest monthly mean was 67.8°, at Northboro, and the lowest monthly mean was 59.8° at Estherville. The highest temperature reported in the State was 99°, at Clarinda and Northboro, on the 5th, and the lowest was 30°, at Washta, on the 30th.

HUMIDITY.—The average relative humidity for the State at 7 a. m. was 85.8 per cent, and at 7 p. m., 67.2 per cent. The mean for the month was 76.5 per cent, or about 3 per cent more than the normal. The highest monthly mean was 84 per cent at Charles City, and the lowest, 73.3 per cent, at Omaha, Neb.

PRECIPITATION.—The average for the State, 111 stations reporting, was 7.88 inches, or 4.52 inches more than the normal. By sections the averages were as follows: Northern, 5.84 inches, or 2.79 inches more than the normal; Central, 8.38 inches, or 4.92 inches more than the normal; Southern, 9.41 inches, or 5.85 inches more than the normal. The greatest amount reported from any station was 16.24 inches, at Lenox, Taylor county, and the least, 2.48 inches, at Lake Park, Dickinson county. The greatest amount in any 24 consecutive hours, 7.78 inches, occurred at Cedar Rapids, Linn county, on the 14th. At Des Moines, on the 16th, .18 inch fell in 5 minutes; .58 inch in 10 minutes; .81 inch in 15 minutes; .95 inch in 20 minutes; 1.02 inches in 25 minutes; 1.21 inches in 35 minutes; 1.56 inches in 40 minutes; 1.68 inches in 45 minutes; 1.80 inches in 50 minutes; 1.98 inches in one hour; 2.37 inches in one hour and 20 minutes, and 3.24 inches fell in one hour and 40 minutes. This was one of the heaviest rainfalls of record but does not quite equal the record for the station. On June 24, 1879, 3.00 inches of rain fell in one hour, and on July 14-15, 1907, 3.22 inches fell in one hour and 30 minutes. Measurable precipitation occurred on an average of 10 days.

WIND.—The prevailing direction of the wind was from the south. The greatest velocity recorded was at the rate of 43 miles per hour from the southwest, at Sioux City, on the 13th.

SUNSHINE AND CLOUDINESS.—The average percentage of the possible amount of sunshine was 68 per cent, or about 5 per cent more than the normal. The average number of clear days was 16; partly cloudy, 7; cloudy, 7.

MISCELLANEOUS PHENOMENA.—Thunderstorms occurred at some place in the State on the 1st, 2d, 4th, 5th, 7th, 8th, 9th, 10th, 12th, 13th, 14th, 15th, 16th, 17th, 20th, 21st, 22d and 23d. Hail fell at Waukee on the 1st; at Mason City, Nora Springs, Marshalltown, Whitten and Indianola on the 5th, and at Olin and Lenox on the 6th.

RIVERS.—The Mississippi River, from Dubuque to La Crosse, Wis., remained nearly stationary during the first fifteen days of the month and rose slowly during the latter half of the month. The lower Des Moines River began to rise rapidly on the 15th, reaching the flood stage at Ottumwa, on the 17th, and falling again after the 20th. Some unprotected lowlands in the vicinity of Keokuk were flooded, but no material damage resulted. At Davenport, the lowest stage of the Mississippi River, 3.1 feet, occurred on the 1st, and the highest stage, 7.1 feet, was recorded on the 16th.

COMPARATIVE DATA FOR THE STATE—SEPTEMBER.

YEAR	Temperature				Precipitation				Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	59.3	—4.1	96	23	2.97	—0.39	4.85	1.36	7	13	10	7
1891	67.3	+3.9	104	28	1.33	—2.06	3.60	0.13	4	20	7	3
1892	64.7	+1.3	99	29	1.53	—1.83	4.15	0.16	4	16	8	6
1893	64.7	+1.3	102	18	2.34	—1.02	5.49	0.74	4	20	6	4
1894	65.1	+1.7	100	26	3.57	+0.21	7.43	0.67	8	15	10	5
1895	66.8	+3.4	103	22	3.03	—0.33	7.43	0.85	5	18	8	4
1896	58.5	—4.9	95	22	4.09	+0.73	9.96	1.82	10	11	9	10
1897	70.9	+7.5	106	26	2.04	—1.32	5.88	0.00	4	23	5	2
1898	65.3	+1.9	99	29	2.69	—0.67	8.45	0.41	7	16	9	5
1899	62.5	—0.9	104	15	0.93	—2.43	4.32	T	4	16	9	5
1900	64.4	+1.0	99	26	4.98	+1.62	8.82	2.48	9	15	8	7
1901	63.3	—0.1	102	26	4.77	+1.41	13.62	1.71	9	13	9	8
1902	59.1	—4.3	88	23	4.35	+0.99	10.41	1.65	9	15	6	9
1903	60.8	—2.6	94	28	3.81	+0.45	8.79	1.42	10	14	6	10
1904	64.0	+0.6	94	30	2.78	—0.58	8.33	0.09	7	13	8	9
1905	65.8	+2.4	96	36	3.81	+0.45	13.18	0.50	8	14	8	8
1906	67.2	+3.8	100	27	4.16	+0.80	11.10	0.64	8	16	8	6
1907	62.8	—0.6	98	25	2.75	—1.61	6.06	1.38	8	15	9	6
1908	67.9	+4.5	98	20	1.20	—2.16	3.46	0.25	3	21	6	3
1909	62.4	—1.0	94	30	3.58	+0.22	7.34	1.39	9	14	8	8
1910	63.2	—0.2	99	30	3.59	+0.23	7.43	1.18	9	14	7	9
1911	65.8	+2.4	103	32	5.12	+1.76	13.73	1.19	10	11	9	10
1912	62.1	—1.3	104	24	3.98	+0.62	10.12	0.28	11	12	8	10
1913	64.5	+1.1	107	19	3.31	—0.05	7.44	0.45	9	15	8	7
1914	64.5	+1.1	99	30	7.88	+4.52	16.24	2.48	10	16	7	7
Normals	63.4	------	99	26	3.36	--------	8.31	0.93	7	15	8	7

OCTOBER.

With the exception of frequent and general showers between the 5th and 14th, and light, scattered showers on the 22d and 23d, the weather was unusually mild and pleasant and favorable for farm and construction work. Showery weather was general from the 5th to the 14th, with some heavy local falls on the 6th, 7th, and 8th; but from the 15th to the close

of the month the weather was ideal, with high temperatures prevailing most of the time. The first cool wave of the season spread over the State between the 24th and 27th, causing the first killing frost in all sections, except in the extreme northern corner of the State, where killing frost occurred on the 15th. Light snow flurries, the first of the season, occurred in the eastern counties on the 26th.

The abundance of moisture in the soil, the lateness of the first occurrence of killing frost, and the pleasant weather during the latter half of the month were ideal for farm work. All crops were matured under favorable conditions, and much of the corn crop was harvested. Pastures, meadows and fall sown grains were in excellent condition.

PRESSURE.—The mean sea level pressure for the State was 34.04 inches. The highest record was 30.52 inches at Sioux City, on the 24th, and the lowest was 20.65 inches, at Sioux City, on the 4th.

TEMPERATURE.—The monthly mean for the State, 108 stations reporting, was 55.9°, or 5.1° above the normal, and only 8.6° below the average for September. By sections the mean temperatures were as follows: Northern, 55.0°, or 6.0° above the normal; Central, 55.9°, or 5.0° above the normal; Southern, 56.8°, or 4.2° above the normal. Such a slight variation in the mean temperature of the several districts is unusual. The highest monthly mean was 58.8° at Keokuk, and the lowest monthly mean was 53.6°, at Rock Rapids. The highest temperature reported in the State was 88° at Lenox, on the 1st, and the lowest was 14°, at Washta, on the 27th.

HUMIDITY.—The average relative humidity for the State at 7 a. m. was 88.0 per cent, and at 7 p. m. it was 71.4 per cent. The mean for the month was 79.7 per cent, or about 7 per cent more than the normal. The highest monthly mean was 88 per cent at Charles City, and the lowest, 76 per cent, at Sioux City.

PRECIPITATION.—The average for the State, 116 stations reporting, was 3.23 inches, or 0.77 inch more than the normal. By sections the averages were as follows: Northern, 3.55 inches, or 1.21 inches more than the normal; Central, 3.14 inches, or 0.65 inch more than the normal; Southern, 3.00 inches, or 0.46 inch more than the normal. The greatest amount reported from any station was 6.64 inches, at Corning, and the least, 0.74 inch, at Le Mars. The greatest amount in any 24 consecutive hours, 4.63 inches, occurred at Corning, on the 8th. Showers occurred at some place in the State every day between the 5th and the 14th, with some heavy local falls on the 6th, 7th and 8th. The first snow of the season fell in Scott county on the 26th. Measurable precipitation occurred on an average of 9 days.

WIND.—The prevailing direction of the wind was from the South. The greatest velocity recorded was at the rate of 42 miles per hour from the South, at Sioux City, on the 3d.

SUNSHINE AND CLOUDINESS.—The average percentage of the possible amount of sunshine was 59 per cent, or about 10 per cent less than the normal. The average number of clear days was 16; partly cloudy, 6; cloudy, 9.

MISCELLANEOUS PHENOMENA.—Thunderstorms occurred at some place in the State on every day from the 5th to the 13th, inclusive, and in a few localities on the 22d. The first killing frost occurred in the extreme northwestern corner of the State on the 15th, but the first general killing frost did not occur until the 25th or 27th.

RIVERS.—The Mississippi River fell slowly from Dubuque to La Crosse, averaging about 5.0 feet.

COMPARATIVE DATA FOR THE STATE—OCTOBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	49.2	—1.6	86	16	3.48	+1.02	6.82	1.59	------	7	11	11	9
1891	50.0	—0.8	92	19	2.77	+0.31	6.53	0.85	------	6	18	7	6
1892	54.5	+3.7	96	14	1.55	—0.91	2.58	0.00	0.0	4	21	6	4
1893	52.4	+1.6	94	10	1.28	—1.18	4.56	0.02	0.0	4	16	9	6
1894	51.7	+0.9	90	20	2.67	+0.21	5.25	0.03	0.2	8	14	8	9
1895	46.0	—4.8	88	4	0.47	—1.99	1.38	0.00	T	2	19	8	4
1896	47.9	—2.9	88	12	3.13	+0.67	5.05	1.51	T	5	18	6	7
1897	56.8	+6.0	97	12	1.14	—1.32	3.30	0.03	0.0	4	17	8	6
1898	47.5	—3.3	88	17	3.56	+1.10	5.75	1.27	3.6	8	7	9	15
1899	56.7	+5.9	95	17	1.73	—0.73	4.64	0.15	0.0	5	17	8	6
1900	59.3	+8.5	90	21	3.91	+1.45	8.00	1.20	0.0	7	16	7	8
1901	54.2	+3.4	88	20	1.98	—0.48	4.23	0.45	T	6	17	7	7
1902	53.5	+2.7	83	20	2.54	+0.08	6.66	0.28	T	5	16	8	7
1903	52.2	+1.4	90	16	1.95	—0.51	4.50	0.32	0.0	5	19	6	6
1904	53.1	+2.3	96	16	1.67	—0.79	4.43	0.14	T	6	15	8	8
1905	49.2	—1.6	95	16	3.40	+0.94	5.36	1.20	1.6	8	16	6	9
1906	50.5	—0.3	87	7	1.96	—0.50	4.25	0.50	0.1	6	14	7	10
1907	50.4	—0.4	85	10	1.50	—0.96	3.71	0.30	0.0	5	20	5	6
1908	51.1	+0.3	89	17	3.38	+0.92	8.83	0.58	2.6	8	16	6	9
1909	49.7	—1.1	97	10	2.22	—0.24	4.70	0.48	T	6	16	6	9
1910	55.2	+4.4	93	10	0.77	—1.69	1.73	T	0.1	4	21	4	6
1911	48.7	—2.1	87	14	3.34	+0.88	7.03	0.73	0.6	10	12	8	11
1912	52 2	+1.4	92	16	2.98	+0.52	5.77	1.03	T	6	21	3	7
1913	49.2	—1.6	89	-2	3.03	+0.57	7.29	0.35	1.2	9	15	8	8
1914	55.9	+5.1	88	14	3.23	+0.77	6.64	0.74	T	9	16	6	9
Normals	50.8	-------	90	14	2.46	-------	5.16	0.55	0.4	6	16	7	8

T indicates an amount too small to measure.

NOVEMBER.

Seldom in the past in Iowa has November been so pleasant and agreeable as was the month under discussion. The weather was remarkably mild, dry and sunshiny, resembling in these respects the memorable November of 1904.

The weather was ideal for outdoor work, and in many sections every day was a working day. Corn gathering progressed with but little interruption, and by the close of the month a large percentage of the crop had been cribbed. The general absence of precipitation caused dusty roads in some parts of the State, but the lack of moisture did not materially shorten pasturage for stock, which was out all the month. During the closing week haze and smoke were present, especially in southern

Iowa, and it is believed these conditions were due to the forest fires that prevailed in Arkansas and contiguous territory.

PRESSURE.—The mean pressure (reduced to sea-level) for the State was 30.10 inches; the highest recorded was 30.62 inches, at Sioux City, on the 19th; the lowest recorded was 29.68 inches, at the same station, on the 14th.

TEMPERATURE.—The monthly mean for the State, 108 stations reporting, was 41.0°, or 6.0° higher than the normal. Only four months of the same name in the last 25 years have been warmer. As compared with the normal the temperature averaged highest in the northwestern part of the State, and lowest in the northeastern, but the difference between the greatest and least departure was not large. The highest monthly mean temperature was 46.2°, at Northboro, Page county, and the lowest was 35.4°, at Estherville, Emmet county. The outstanding feature of the temperature conditions was the sudden and severe cold wave of the 18th-19th. Over large areas the temperature on the 19th was the lowest of record for so early in the season, the readings ranging from 6°, at Keokuk, to —4° at several stations in northern Iowa. In most cases the monthly highest temperatures at the various stations occurred on the 2d, 3d or 6th, the readings being above 70° except over the extreme northeast part of the State. The highest reported was 80°, at 3 stations. At Des Moines the maximum of 76° on the 2d equaled the highest previous November temperature at that station. The weather of Thanksgiving Day (26) deserves special mention, the day having been remarkably mild and pleasant.

HUMIDITY.—The mean relative humidity for the State at 7 a. m. was 76 per cent, and 7 p. m. it was 60 per cent. The mean for the month was 68 per cent, or about 6 per cent lower than the normal. The highest monthly mean was 81 per cent, at Charles City, and the lowest, 60 per cent, at Sioux City.

PRECIPITATION.—With the single exception of November, 1904, the current month was the driest November in the last 25 years. The average precipitation for the State was but 0.22 inch, or 1.29 inches less than the normal. No station had as much as one inch, while at 13 stations only traces occurred. Moreover, at Lake Park, Dickinson county, there was no precipitation whatever.

The great bulk of the month's supply of moisture came in three periods, viz., those of the 7th-8th, 14th-15th and 29th-30th. The last named period was the most important, being one of general, light, misty rains. The average number of days with 0.01 inch or more precipitation was 2.

SNOWFALL.—Some snow fell over much of the State, but only 10 stations reported measurable amounts. The greatest fall was 0.5 inch, at Bedford and Northboro, stations in extreme southwestern Iowa. With the exception of November, 1912, the current November is the only one on record having an average snowfall of only a trace.

WIND.—The prevailing direction of the wind was from the northwest. The highest velocity was at the rate of 39 miles an hour from the northwest, at Sioux City on the 18th. The month was not so windy as usual.

SUNSHINE AND CLOUDINESS.—The mean percentage of the possible amount of sunshine was 68, or about 14 per cent higher than the normal. The average number of clear days was 19; partly cloudy, 6; cloudy, 5.

MISCELLANEOUS PHENOMENA.—Thunder was heard at a few stations, most of them in northeastern Iowa, on the 2d; at Creston, on the 14th, and in extreme eastern Iowa on the 24th.

COMPARATIVE DATA FOR THE STATE—NOVEMBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	38.6	+3.6	78	— 2	1.46	—0.05	3.55	0.71	------	3	15	8	7
1891	30.5	—4.5	84	—24	1.70	+0.19	3.64	0.06	------	7	10	8	12
1892	33.3	—1.7	70	— 3	1.10	—0.41	3.16	0.05	1.8	4	11	8	11
1893	34.0	—1.0	86	—13	1.17	—0.34	2.56	0.05	4.6	4	16	8	6
1894	32.7	—2.3	72	— 5	0.92	—0.59	2.42	T	0.4	4	9	11	10
1895	34.3	—0.7	86	—12	1.51	0.00	3.01	0.45	4.9	6	9	8	13
1896	29.6	—5.4	82	—15	1.83	+0.32	4.51	0.16	2.9	6	9	8	13
1897	34.3	—0.7	81	—19	0.66	—0.85	2.24	T	1.2	5	12	8	10
1898	32.2	—2.8	78	—17	1.50	—0.01	3.61	0.33	8.7	6	14	8	8
1899	43.9	+8.9	86	8	1.20	—0.31	2.97	0.13	0.5	5	12	8	10
1900	33.5	—1.5	79	— 6	1.06	—0.45	3.35	T	3.7	6	12	7	11
1901	35.8	+0.8	77	2	0.86	—0.65	2.30	0.20	2.6	3	18	6	6
1902	41.2	+6.2	79	4	2.13	+0.62	4.19	0.16	1.8	7	9	7	14
1903	34.2	—0.8	76	— 5	0.52	—0.99	1.74	T	1.1	3	13	8	9
1904	41.0	+6.0	80	4	0.15	—1.36	0.50	0.00	0.5	1	20	6	4
1905	38.4	+3.4	70	—12	2.84	+1.33	5.30	0.90	0.6	5	16	7	7
1906	35.4	+0.4	76	— 5	2.03	+0.52	3.86	0.35	4.4	8	9	7	14
1907	36.7	+1.7	68	— 4	1.03	—0.48	2.27	0.05	0.9	4	17	6	7
1908	39.3	+4.3	80	5	1.56	+0.05	3.31	0.21	1.4	5	14	7	9
1909	42.4	+7.4	84	— 3	5.39	+3.88	11.48	2.07	6.8	10	10	7	13
1910	33.4	—1.6	76	5	0.34	—1.17	1.03	T	0.7	3	13	9	8
1911	29.9	—5.1	79	— 8	1.42	—0.09	4.99	0.11	1.6	6	11	8	11
1912	40.1	+5.1	77	6	0.98	—0.53	2.38	0.00	T	2	18	8	4
1913	44.1	+9.1	78	10	1.18	—0.33	3.49	0.20	0.4	6	11	7	12
1914	41.0	+6.0	80	—4	0.22	—1.29	0.95	0.00	T	2	19	6	5
Normals	35.0	-------	78	— 5	1.51	-------	3.31	0.25	2.2	5	13	8	9

T indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.

DECEMBER.

December, 1914, will go on record as a pleasant and agreeable winter month, notwithstanding the fact that it was, with one exception, the coldest December of record, and that there was more cloudiness, more snow and a greater number of days with measurable precipitation than usual. These adverse conditions were, however, counterbalanced by the fact that the wind movement was extremely light, so there was no drifting of snow or blizzardy conditions. Snow flurries were frequent after the 7th, and the temperature was unusually low during the second and third decades of the month. In some localities the 26th was the coldest December day since December 31, 1863.

All fall sown grains, grass and alfalfa were well protected by a thick mantle of snow during the periods of low temperature. Sleighing was excellent over the greater part of the state after the 18th.

PRESSURE.—The mean sea level pressure for the state was 30.25 inches. The highest recorded was 30.72 inches, at Keokuk on the 16th, and the lowest was 29.53 inches, at Davenport and Keokuk, on the 29th.

TEMPERATURE.—The monthly mean for the state, 109 stations reporting, was 15.7°, or 8.2° below the normal, and with one exception was the coldest December of record. By sections, the mean temperatures were as follows: Northern, 12.7°, or 8.5° below the normal; Central, 16.2°, or 7.9° below the normal; Southern, 18.2°, or 8.2° below the normal. The highest temperature reported in the state was 63° at Bloomfield, on the 1st, and the lowest was —31° at Iowa Falls, on the 26th. The temperature averaged lower, and lower readings were recorded, over the eastern and northeastern counties than over the western and southwestern counties. At Iowa City, the 26th, with a temperature of —22°, was the coldest December day recorded since December 31, 1863, when the temperature was 23° below zero.

HUMIDITY.—The mean relative humidity for the state at 7 a. m. was 87 per cent, and at 7 p. m. it was 83 per cent. The mean for the month was 85 per cent, or 6 per cent more than the normal. The highest monthly mean was 90 per cent at Charles City, and the lowest 82 per cent at Des Moines, Dubuque and Keokuk. The high percentage of humidity at the 7 p. m. observations, as compared with the average for 7 a. m., is remarkable.

PRECIPITATION.—The average for the state, 116 stations reporting, was 1.30 inches, or 0.08 inch more than the normal. By sections the averages were as follows: Northern, 1.09 inches, or 0.02 inch more than the normal; Central, 1.43 inches, or 0.18 inch more than the normal; Southern, 1.38 inches, or 0.03 inch more than the normal. The greatest amount reported from any station was 2.24 inches, at Tipton, and the least, 0.57 inch, at Le Mars. The greatest amount in any 24 consecutive hours, 1.03 inches, occurred at Washington, on the 28th-29th. All of the precipitation after the 7th came in the form of snow, and, while the amounts were not great, the flurries were frequent. The average number of days with 0.01 inch or more of precipitation was 9, which is 4 more than the average for December, and has not been equalled or exceeded in any December of record, except in 1909, when there were 11 days.

SNOWFALL.—The average for the state was 11.1 inches, or almost twice the normal amount. The greatest monthly amount was 20.2 inches at Waterloo, and the least 5.2 inches at New Hampton.

WIND.—The prevailing direction of the wind was from the northwest. The highest velocity was at the rate of 40 miles an hour from the northwest, at Sioux City, on the 29th.

SUNSHINE AND CLOUDINESS.—The average percentage of the possible amount of sunshine was 39 per cent, or about 10 per cent less than the normal. The average number of clear days was 10; partly cloudy, 6; cloudy, 15.

MISCELLANEOUS PHENOMENA.—Sleet fell at Belmond and Pella on the 28th and at Clinton on the 29th. At the latter place many telephone wires were down "From heavy, wet snow." Rivers were frozen over between the 10th and 16th and by the end of the month the ice was 8 to 12 inches thick. The ice harvest began on the 28th at many places in the state.

COMPARATIVE DATA FOR THE STATE—DECEMBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	29.1	+5.2	72	—18	0.45	—0.77	1.40	0.00	------	3	17	7	7
1891	32.3	+8.4	72	—14	2.41	+1.19	4.50	1.21	------	6	14	9	8
1892	18.9	—5.0	68	—29	1.65	+0.43	3.04	0.20	10.9	8	9	8	14
1893	22.0	—1.9	70	—21	1.31	+0.09	2.80	0.46	7.6	7	10	9	12
1894	30.1	+6.2	73	—17	0.95	—0.27	1.75	0.25	1.3	3	15	6	10
1895	25.4	+1.5	63	—16	1.63	+0.41	5.74	0.00	4.1	5	11	9	11
1896	30.8	+6.9	70	—10	0.65	—0.57	1.79	T	1.6	4	10	8	13
1897	18.0	—5.9	60	—25	1.65	+0.43	3.22	0.61	15.9	6	11	7	13
1898	18.1	—5.8	60	—25	0.48	—0.74	1.70	T	3.9	3	15	8	8
1899	22.6	—1.3	75	—19	1.61	+0.39	4.28	0.10	4.3	5	12	9	10
1900	26.9	+3.0	63	—10	0.45	—0.77	2.70	T	2.4	4	13	6	12
1901	20.5	—3.4	64	—31	0.93	—0.29	2.75	0.05	5.4	6	10	9	12
1902	20.1	—3.8	59	—20	2.23	+1.01	5.51	0.67	12.9	8	9	6	16
1903	19.6	—4.3	58	—27	0.41	—0.81	1.96	T	3.7	4	11	9	11
1904	23.4	—0.5	67	—19	1.44	+0.22	3.68	0.06	12.3	5	12	7	12
1905	27.0	+3.1	62	—11	0.52	—0.70	1.69	T	4.2	3	19	6	6
1906	25.7	+1.8	65	— 9	1.43	+0.21	2.81	0.37	1.4	6	11	7	13
1907	28.8	+4.9	62	— 9	1.00	—0.22	2.28	0.05	4.7	5	10	7	14
1908	27.2	+3.3	67	—17	0.57	—0.65	2.07	0.05	3.8	3	15	8	8
1909	15.1	—8.8	60	—26	2.18	+0.96	6.10	0.89	13.7	11	10	5	16
1910	23.4	—0.5	57	—14	0.37	—0.85	1.39	0.01	3.0	3	15	7	9
1911	27.9	+4.0	60	—24	2.57	+1.35	4.43	0.62	12.6	7	13	6	12
1912	29.2	+5.3	64	—13	0.74	—0.48	1.75	0.10	1.1	3	18	7	6
1913	32.0	+8.1	65	—13	1.02	—0.20	4.73	0.00	1.3	4	15	5	11
1914	15.7	—8.2	63	—31	1.30	+0.80	2.24	0.57	11.1	9	10	6	15
Normals	23.9	------	65	—19	1.22	------	3.05	0.25	6.2	5	13	7	11

T indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.

MONTHLY STATE DATA FOR 1914.

MONTH	Temperature				Precipitation				Number of Days				Prevailing direction of wind
	Mean	Departure from normal	Highest	Lowest	Average	Departure from normal	Greatest	Least	1 in. or more of precip'n	Clear	Partly cloudy	Clody	
January	27.8	+9.9	64	—10	0.88	—0.17	2.34	0.27	5	11	8	12	nw
February	16.8	—3.7	59	—29	0.87	—0.28	1.99	0.32	6	10	9	9	nw
March	34.7	+1.4	78	— 5	1.69	—0.08	3.84	0.28	7	12	8	11	nw
April	48.6	—0.1	88	11	2.52	—0.34	5.03	0.37	8	10	8	12	nw
May	62.2	+1.7	98	25	3.31	—1.26	6.90	0.30	10	14	11	6	s
June	72.2	+3.1	101	40	5.57	+1.19	13.24	1.17	13	12	14	4	s
July	76.6	+2.5	109	43	2.27	—1.69	6.50	0.44	5	20	8	3	s
August	73.7	+1.9	103	40	2.19	—1.49	4.90	0.42	7	17	10	4	s
September	64.5	+1.1	99	30	7.88	+4.52	16.24	2.48	10	15	8	7	s
October	55.9	+5.1	88	14	3.23	+0.77	6.64	0.74	9	16	6	9	s
November	41.0	+6.0	80	— 4	0.22	—1.29	0.95	0.00	2	19	6	5	nw
December	15.7	—8.2	63	—31	1.30	+0.08	2.24	0.57	9	10	6	15	nw
Annual	49.1	+1.7	109	—31	31.98	—0.04	16.24	0.00	91	166	102	97	s

COMPARATIVE DATA FOR THE STATE—ANNUAL.

Year	Temperature					Precipitation in inches			
	Mean annual	Highest	Date	Lowest	Date	Annual	Greatest annual	Least annual	Av. snowfall
1890	48.0	110	July 13	—27	January 22	31.30	45.74	16.00	------
1891	47.3	106	August 9	—31	February 4	32.90	49.05	23.48	------
1892	46.6	104	July 11	—38	January 19	36.58	48.77	24.78	34.2
1893	45.7	102	July* 13	—36	January 14	27.59	33.27	19.19	37.2
1894	49.7	109	July 26	—37	January 25	21.94	29.81	15.65	19.2
1895	47.2	104	May 28	—33	February 1	26.77	35.25	18.57	26.0
1896	48.6	104	July 3	—20	January 4	37.23	51.60	28.68	22.6
1897	47.8	106	July* 23	—30	January 25	26.98	36.18	20.21	38.8
1898	47.7	103	August 20	—25	December 31	31.34	55.47	19.51	40.3
1899	47.3	104	September 6	—40	February 11	28.68	42.06	21.79	23.4
1900	49.3	103	August 3	—27	February 15	35.05	47.33	25.05	25.8
1901	49.0	113	July 22	—31	December 15	24.41	37.69	16.35	38.5
1902	47.7	98	July 30	—31	January 27	43.82	58.80	20.14	28.0
1903	47.2	101	August 24	—27	December 13	35.39	50.53	26.41	19.4
1904	46.3	100	July 17	—32	January 27	28.51	38.92	19.34	29.2
1905	47.2	104	August 11	—41	February 2*	36.56	52.26	24.66	38.3
1906	48.4	102	July 21	—32	February 10	31.60	44.34	20.63	32.8
1907	47.4	102	July 5	—31	February 5	31.61	43.90	19.98	24.0
1908	49.5	101	August 3	—18	January 29	35.26	49.98	24.11	22.7
1909	47.4	103	August* 15	—26	February* 15	40.01	53.48	27.20	49.0
1910	48.6	108	July 16	—35	January 7	19.87	27.99	12.11	23.4
1911	49.5	111	July* 3	—35	January 3	31.37	46.77	19.74	35.3
1912	46.4	104	September 8	—47	January 12	28.89	33.13	15.25	29.5
1913	49.7	108	July 16*	—25	January 8	29.95	45.18	20.31	25.4
1914	49.1	109	July 12	—31	December 26	31.98	44.11	28.30	27.5

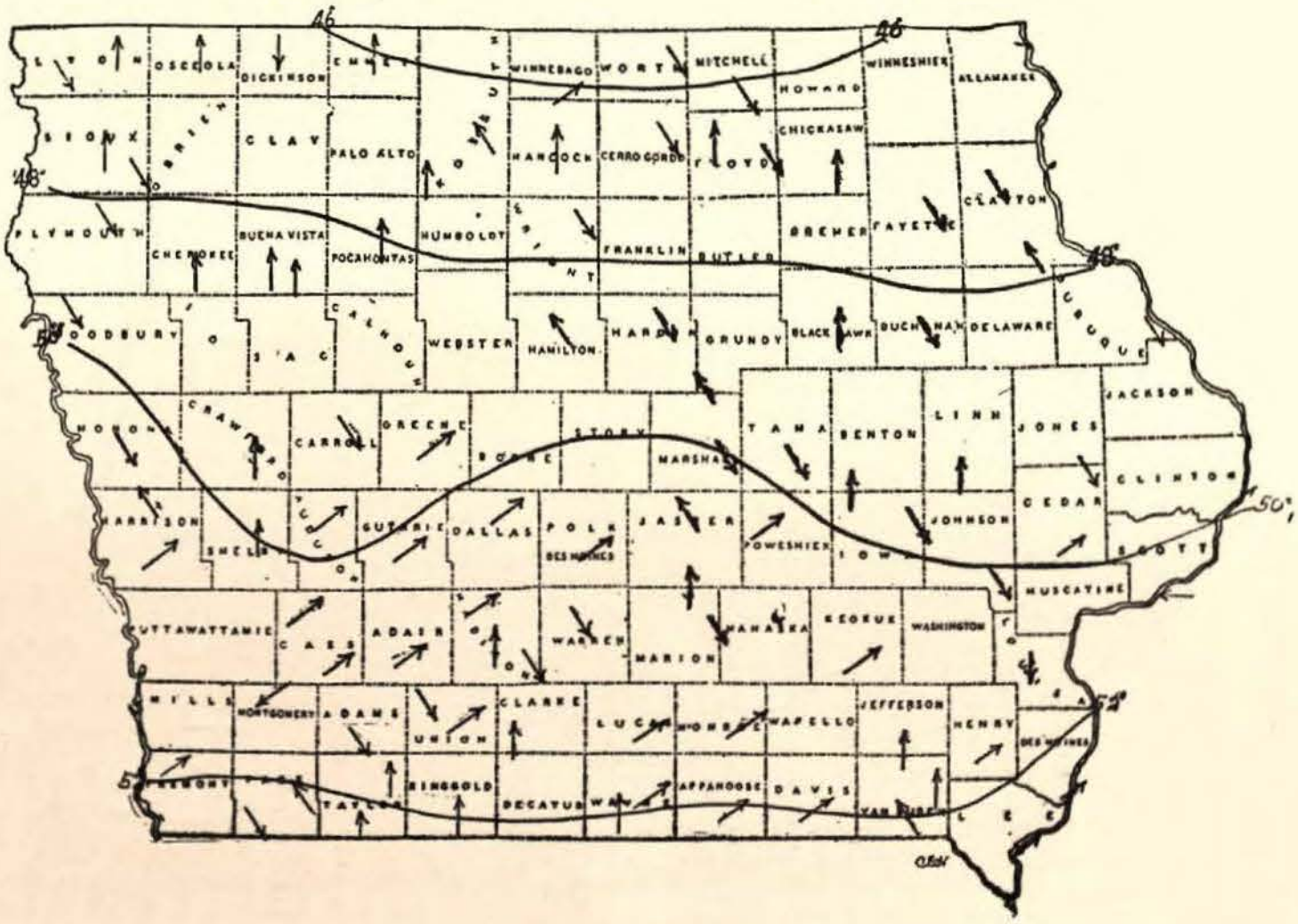
*And other dates.

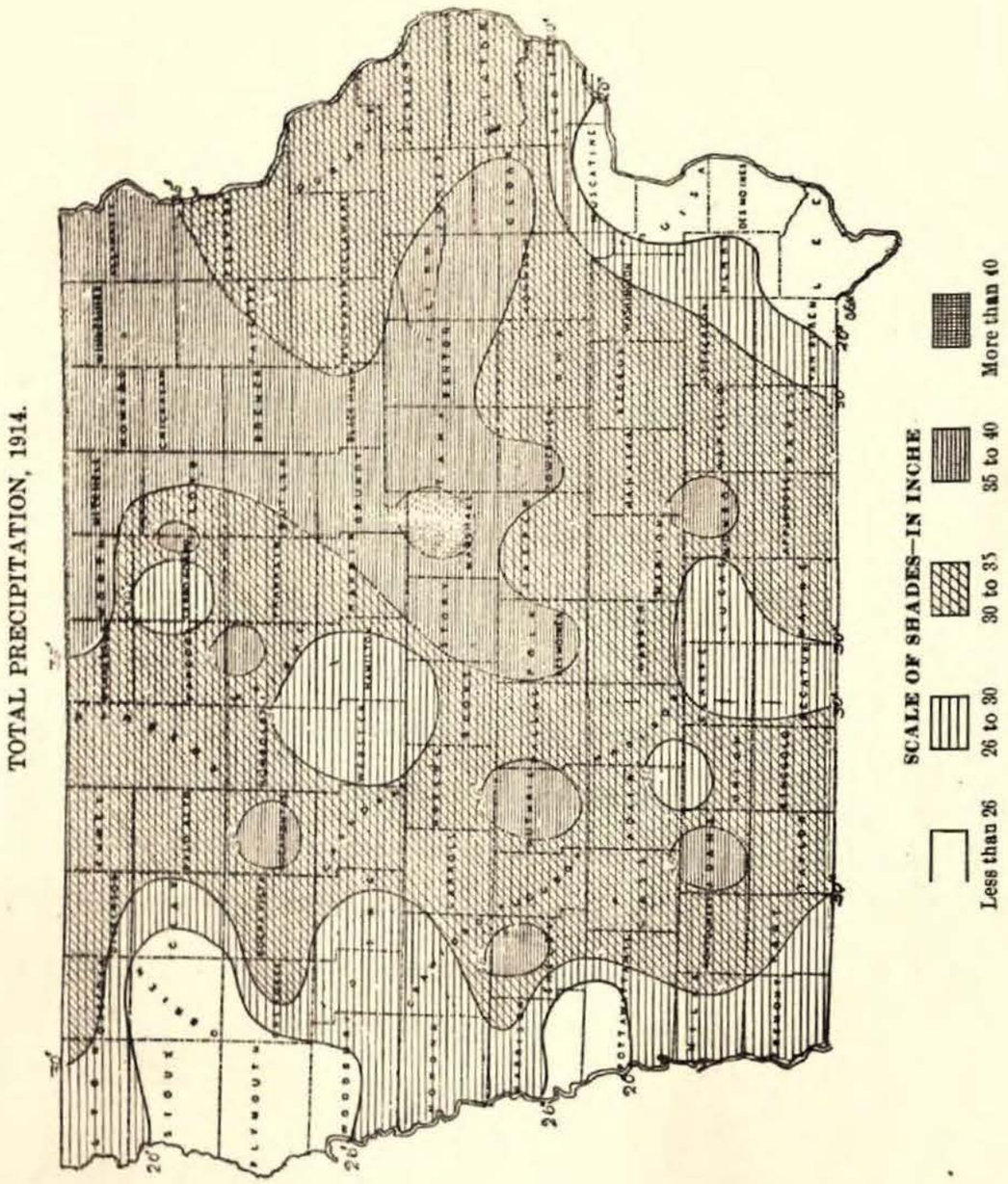
DATES OF KILLING FROSTS, 1914

STATIONS	Killing Frosts	
	Last in spring	First in autumn
Northern Section		
Algona	April 20†	Oct. 25
Allison	----------	Oct. 25
Alta	May 12†	Oct. 25
Alta (near)	----------	Oct. 25
Alton	May 13†	Oct. 25
Belmond	April 20	Oct. 25
Britt	April 20†	Oct. 25
Charles City	April 20	Oct. 25
Decorah	May 16	Oct. 25
Elkader	May 17†	Oct. 25
Elma	May 15†	----------
Estherville	April 20†	Oct. 25
Fayette	April 20†	Oct. 27
Forest City	April 21†	Oct. 25
Humboldt	May 15	Oct. 25
Inwood	April 20†	Oct. 15
Lake Park	May 13	Oct. 25
Lansing	April 20†	----------
Le Mars	April 20†	Oct. 25
Mason City	April 20	Oct. 25
New Hampton	April 20†	Oct. 25†
Nora Springs	April 20	Oct. 25
Northwood	April 20†	Oct. 25
Osage	April 20†	Oct. 25
Pocahontas	May 15	Oct. 25
Postville	April 20†	Oct. 25
Rock Rapids	May 13†	Oct. 14†
Sanborn	April 20	Oct. 25
Sibley	May 13†	Oct. 25
Sioux Center	April 20†	Oct. 25
Spencer	May 13†	Oct. 25
Storm Lake	April 20	Oct. 27
Washta	May 13	Oct. 25
Waverly	May 15†	Oct. 25
West Bend	April 20	Oct. 25
Central Section		
Amana	April 20†	Oct. 27
Ames	----------	Oct. 25
Audubon	April 20†	Oct. 25
Baxter	April 20	Oct. 27
Belle Plaine	April 20	Oct. 25
Boone	----------	Oct. 25
Carroll	April 20†	Oct. 27
Cedar Rapids	April 20†	Oct. 25
Clinton	April 20†	Oct. 25
Davenport	April 20†	Oct. 27
Delaware	April 20†	Oct. 27
Denison	May 13	Oct. 25
Des Moines	April 20†	Oct. 25
Dubuque	April 20	Oct. 27
Fort Dodge	April 20†	Oct. 25
Grinnell	April 20†	Oct. 27
Grundy Center	April 20†	Oct. 25
Guthrie Center	April 20†	Oct. 25
Harlan	May 13	Oct. 25
Independence	April 20†	Oct. 25
Iowa City	April 12	Oct. 25
Iowa Falls	April 20†	Oct. 25
Jefferson	April 20†	Oct. 25
Little Sioux	May 14	Oct. 27
Logan	May 13†	Oct. 25
Maquoketa	April 20†	Oct. 25
Marshalltown	April 20†	Oct. 25
Monroe	April 20†	Oct. 25
Odebolt	April 20†	Oct. 25
Olin	April 20†	Oct. 25
Onawa	April 9	Oct. 25
Perry	April 20†	Oct. 25
Sac City	April 20†	Oct. 25
Sioux City	April 20	Oct. 25
Tipton	April 20†	Oct. 27
Toledo	April 20†	Oct. 25
Waterloo	April 20†	Oct. 25
Waukee	April 20	Oct. 25
Webster City	May 13†	Oct. 25†
Whitten	April 20†	Oct. 25
Southern Section		
Afton	April 20†	Oct. 27
Albia	April 20†	Oct. 27
Allerton	April 20†	Oct. 27
Atlantic	April 20†	Oct. 25
Bedford	May 13	Oct. 27
Bloomfield	April 20†	Oct. 27
Bonaparte	April 20†	Oct. 27
Burlington	April 20†	Oct. 27
Centerville	April 20†	Oct. 25
Chariton	April 20†	Oct. 27
Clarinda	April 20	Oct. 27
Columbus Junction	May 13†	Oct. 27
Corning	April 20†	Oct. 27
Corydon	May 14†	----------
Council Bluffs	April 20†	Oct. 25
Creston	April 20†	Oct. 25
Earlham	May 13	Oct. 25†
Elliott	May 1†	Oct. 27
Fairfield	----------	Oct. 25
Fort Madison	April 20†	Oct. 27
Greenfield	April 20	Oct. 25
Indianola	April 12	Oct. 27
Keokuk	April 20†	Oct. 27
Keosauqua	April 20†	Oct. 27
Knoxville	----------	Oct. 27
Lamoni	April 20†	Oct. 27
Lenox	April 20	Oct. 27
Leon	April 20†	Oct. 27
Mt. Ayr.	April 20†	Oct. 27
Mt. Pleasant	April 20†	Oct. 25
Murray	April 20†	Oct. 27
Northboro	April 20	Oct. 27
Oskaloosa	April 20†	Oct. 27†
Ottumwa	April 20†	Oct. 27
Pella	April 20†	Oct. 27
St. Charles	April 20†	Oct. 25
Sigourney	May 1	Oct. 27
Stockport	May 13	Oct. 27
Thurman	April 20†	Oct. 27
Washington	April 20†	Oct. 27
Winterset	April 11†	Oct. 27
Omaha, Neb.		

†Date of last temperature of 32° or lower in spring, first temperature of 32° or lower in autumn, as the case may be, when frost was not reported.

MEAN ANNUAL ISOTHERMS AND PREVAILING WINDS, 1914.





CLIMATE AND CROP REVIEW

Season 1914

WEATHER AND CROP REVIEW BY MONTHS.

The year 1914 opened with the warmest January and ended with the second coldest December of record. All of the months of the year, except February, April and December, were warmer than usual, and the summer months, like those of 1913, were unusually warm. In regard to precipitation, the records show that the State received nearly the normal amount, there being a deficiency of only 0.04 inch. This, however, does not indicate the conditions that prevailed during most of the year, and especially during the crop months. There was a deficiency of precipitation every month from January to August, inclusive, except in June, and the southern part of the State suffered from one of the worst droughts of record. At the end of August, there was an accumulated deficiency of precipitation of 4.12 inches. This was overcome by excessive rains in September and the excess was further increased by frequent showers during the first half of October, but dry weather during the latter half of October and all of November caused a slight deficiency for the year. The hot, dry weather during July and August greatly reduced the yield of corn, especially in the southern counties, where the effects of the drought were even worse than in 1913.

SYNOPSIS BY MONTHS.

The generally mild and pleasant weather that prevailed during November and December, 1913, continued most of the time during January, 1914, making it the warmest month of that name since 1880, and the warmest winter season, November to January, inclusive, of record. The average temperature was 10° above the normal, and there were no storms of consequence. A moderate cold wave passed over the State on the 12th; the temperature ranging from a little above zero in the southern part of the State to 5° and 10° below zero in the northern section. The snowfall was lighter than usual and did not remain on the ground long. Live stock was out most of the month, thereby affecting a considerable saving in feed. Building operations suffered little interruption because of unfavorable weather conditions.

February was considerably colder than usual, but the precipitation was less than the normal. There was, however, an excess of wind movement, but there were no general winter storms that should be classed as severe until the night of the last day of the month. As a result, there was much less than the average amount of trouble and inconvenience from drifting snow. In fact, railroads, telephone and telegraph companies and stock feeders probably have never experienced a more favorable winter. There

were two cold waves. The first occurred on the 7th-8th, and the second spread over the State on the afternoon and night of the 28th. The first was not severe, although it gave the coldest weather of the month and winter on the 8th. The one on the 28th was attended by winds of gale force and rapidly falling temperature. It proved to be one of the severest blows Iowa has experienced in recent years, and was the only general blizzard of the winter. Ice of good thickness and quality was secured, and the harvest was generally finished by the 20th. Fall sown grains were protected by snow during the coldest weather and were in good condition at the close of the month.

The conditions during March were quite typical. The chief features were the cold wave at the beginning of the month, the warm spring-like weather two weeks later, and the cloudy, snowy period during the closing days. Both the mean temperature and average precipitation were near the normal, while the snowfall was light, averaging less than two inches. A five day period of warm, pleasant weather began on the 12th; the day temperatures at this time were unusually high for so early in the season, reaching 70° even in northern Iowa. Most of the ice in streams and rivers disappeared during this period, vegetation began to grow, and some field work was done. The return of cool weather on the 17th checked the growth of vegetation.

The mean temperature and average precipitation for April were very close to the normals, there being a deficiency of only 0.1° in temperature and 0.34 inch in precipitation. The month was considerably drier than usual until the 24th, but from that date to the 28th, the rainfall was general and, at many stations, heavy. The month, as a whole, was favorable for all out-door pursuits. The bulk of the small grain was sown by the 18th. Potatoes were planted and a large area was prepared for corn. Fruit trees were in blossom in the southern counties, and shade trees were becoming green in all parts of the State.

May was characterized by cool weather during the first and moderately warm weather during the latter half of the month, and by numerous torrential local rains, although there was a deficiency of rainfall for the State, as a whole. Frost was quite general over the northern two-thirds of the State between the 12th and 14th, but no damage was done except to tender garden truck. Destructive wind squalls occurred in many localities on the 3d, and on the night of the 10th-11th. Most of the wind squalls attended severe electrical storms, and were accompanied by excessive rainfall and, in some cases, by hail. The heavy rains caused considerable damage by floods and soil erosion, and the hail was destructive to fruits, garden truck, meadows and greenhouses. A deficiency of moisture in the southern counties was detrimental to all crops except corn.

June was an exceptionally favorable month over the larger part of the State, but there was some objectionable features of local character, such as damaging wind squalls, electrical storms, excessive rainfall, drought and, in a few places, hailstorms. Over the northern and central districts there was an excess of precipitation, amounting to 2.51 and 1.76 inches, respectively; while in the southern counties there was a deficiency of .71 inch. The heavy rains in the northern part of the State delayed the

cultivation of corn and flooded the bottom lands, while in the southern districts grass, small grain and early potatoes were suffering from lack of moisture. Corn made remarkably rapid growth, and at the close of the month the bulk of the crop was laid by with fields in excellent condition.

July was notable for heat and dryness. With the exception of July, 1901, it was the warmest month of that name in 25 years. But few severe storms occurred, the most important being those of the 16th and 27th. The former was more widespread, and much damage was done to corn and grain. Corn was in such excellent condition at the close of June that it withstood the drought remarkably well, but considerable deterioration took place in southern counties as the month progressed. Haying and harvesting were practically completed under favorable conditions. Pastures were cut short by the drought, especially in southern counties, and in some places stock had to go on feed.

The hot and dry weather that prevailed during July continued until the 18th of August, culminating on the 16th, 17th and 18th with high temperatures and hot, dry winds. From the 19th to the close of the month the temperature was generally moderate and showers were more frequent. The 16th and 17th were among the worst days ever experienced in Iowa. The temperature was near or above 100 degrees, with wind velocities ranging from 25 to 36 miles per hour, bright sunshine and extremely low humidity. All vegetation, especially over the southern half of the state, suffered greatly by these adverse conditions. While August will go on record as a dry month, and great damage was done by the drought, yet rain fell at some point in the State on every day of the month. The showers were, however, widely scattered and of but slight benefit, except in a few localities of small area, until near the close of the month. Copious and quite general showers occurred on the 23d, 27th and 31st, which afforded great relief to vegetation, and put the ground in condition for plowing. The month closed with severe local wind, rain and electrical storms in many localities. Wind damaged trees and buildings, and wind and rain seriously injured the corn crop.

September was the wettest month of that name in the history of the State, and, with one exception—July, 1902—it was the wettest month of record since state-wide observations began in 1890. Showers were frequent between the 1st and 24th, and in many localities the rainfall was heavy to excessive, the greatest monthly amount being 16.24 inches at Lenox, and the greatest amount in 24 consecutive hours was 7.78 inches at Cedar Rapids. The long, severe drought of July and August was thoroughly broken, and at the close of the month pastures were as green as in May or June. Much fall plowing was done and a large acreage of winter wheat had been seeded.

With the exception of frequent and general showers between the 5th and 14th of October, and light scattered showers on the 22d and 23d, the weather was unusually mild and pleasant and favorable for farm and construction work. The first cool wave of the season spread over the State between the 24th and 27th, causing the first killing frost in all sections, except in the extreme northwestern corner of the State, where

killing frost occurred on the 15th. Light snow flurries, the first of the season, occurred in the eastern counties on the 26th. Much of the corn crop was harvested and pastures, meadows and fall sown grains were in excellent condition.

The weather during November was remarkably mild, dry and sunshiny. The general absence of precipitation caused dusty roads in some parts of the State, but the lack of moisture did not materially shorten pasturage for stock, which was out all the month. Corn gathering progressed with but little interruption, and by the close of the month a large percentage of the crop had been cribbed.

December was, with one exception, the coldest month of that name of record. There was more cloudiness, more snow, and a greater number of days with measurable precipitation than usual, but these adverse conditions were counterbalanced by the fact that the wind movement was extremely light. Snow flurries were frequent after the 7th, and the temperature was unusually low during the second and third decades of the month. At Iowa City, the 26th was the coldest December day since December 31, 1863. Grains and grasses were well protected by a thick mantle of snow during the coldest weather. Rivers were frozen over between the 10th and 16th and by the end of the month ice was 8 to 12 inches thick. The ice harvest began on the 28th at many places in the state.

CLIMATE AND CROP BULLETINS.

Summaries of Weekly Bulletins Issued in the Season of 1914.

Bulletin No. 1. For the week ending April 12, 1914.—The winter of 1913-14 was the warmest winter of record and was, with four exceptions, the driest winter since 1890. The average temperature for the five months, November to March, inclusive, was only 0.4 degree below the freezing point, and there was less snowfall than for any winter since state-wide observations began. March was warmer and drier than usual, but owing to wet, inclement weather during the last decade of the month and unusually cold weather during the first eleven days of April farm work has been delayed and fruit buds are still dormant. Freezing temperatures were general on four or five mornings of the past week, and as a result but little field work could be done. While the sub-soil is dry, the recent rains and snows have been sufficient to thoroughly moisten the surface and the ground is in excellent condition for plowing and seeding as soon as warmer weather prevails. Fall sown grains and clovers suffered but little damage from winter killing, due to the fact that although the winter was mild the temperature was uniformly moderately cool. There are, however, some fields in the extreme southern counties that appear to be spotted, and the Hessian fly is reported to have caused 8 to 10 per cent damage to the crop in Scott county, but the condition for the state as a whole is at least 5 per cent better than it was on April 1, 1913, and the acreage is considerably greater than it was last year. Owing to the continued cold weather the seeding of oats has but fairly begun. The bulk of the spring wheat seeding is finished, and the acreage will be somewhat greater than last year. But little has been done in the way of gardening and only a few potatoes have been planted. Grass appears to be in good condition, but has barely started to grow. All live stock came through the winter in a thrifty condition and there is sufficient feed and roughage left to last until new pasturage is obtainable. The spring pig crop is fairly good considering the great loss of breeding stock last season from cholera. The week closes with clear weather and much higher temperature, and if these conditions continue, all farm operations will be rushed during the coming week. Up to the present time the prospects are favorable for a bountiful crop year.

Bulletin No. 2. For the week ending April 19, 1914.—The past week was, until Saturday, unusually warm, and all conditions, except brisk to high winds on Friday, were favorable for farm work and the growth of vegetation. The average daily temperature was six degrees above the normal, and on Thursday and Friday the maximum temperature readings were considerably above 80 degrees in nearly all parts of the state. There was practically no rainfall until Saturday morning, and the amount of sunshine was excessive. Under these conditions farm work progressed rapidly, and the bulk of the small grain was seeded, a large proportion of the early potato crop was planted and much ground was plowed for corn. The warm weather hastened the growth of vegetation, and pasturage will soon be sufficient for the support of stock. Fruit buds are swelling, and leaves are appearing on early shrubs and some varieties of trees. Winter wheat is reported to be in good condition except in a few southern and southwestern counties where some fields are spotted. Showers and rapidly falling temperature occurred on Saturday, with general rain or snow on Saturday night, and the week closes with indications of frost and temperatures near or below the freezing point Sunday night.

Bulletin No. 3. For the week ending April 26, 1914.—Another full week of comparatively dry and warm weather has enabled farmers to do more than the average amount of field work. Spring seeding is finished, early potatoes and garden truck planted and much ground is ready for corn. Owing to a great amount of fall plowing and the favorable conditions prevailing this spring, farm work is farther advanced than usual at this season of the year. Spring grains and grass have started nicely, and oats show a good stand. Winter wheat and rye are generally in good condition, but a good, soaking rain is needed soon to keep up normal growth and produce an average crop of hay. The heavy frost and freezing temperatures on the morning of the 20th did but little if any damage, and the prospects for a fruit crop are still excellent. All fruit trees are in blossom in the southern counties, and shade and forest trees are becoming green in all parts of the state. Some corn has been planted, and if favorable weather continues much of it will be planted during the coming week.

Bulletin No. 4. For the week ending May 3, 1914.—The week as a whole was cold and cloudy. The average temperature was slightly above the normal in the eastern and central and slightly below the normal in the western districts. No frost occurred except in the extreme northwestern counties, where the vegetation was not far enough advanced to be injured. Copious to heavy showers occurred in all sections, but the rainfall was generally less than the normal in the east central and was heavy and, in some localities, excessive in the western counties; the greatest amounts being reported from the southwestern district. The wet weather delayed plowing, and the cold nights retarded corn planting. The rain, however, was of great value to grasses and small grains. Cherry, plum and peach trees are in full bloom in the central and southern counties, but many apple trees are not showing the usual amount of blossoms, probably owing to the drought of last summer and the heavy crop produced last year. A heavy and damaging hailstorm occurred in the eastern part of Polk county on the afternoon of May 3d.

Bulletin No. 5. For the week ending May 10, 1914.—The average temperature was slightly above the normal in the extreme eastern districts and below in the central and western. Light frost occurred on low places in many localities on two or three nights, but no damage was done except to check the growth of vegetation and the germination of corn. Local and generally light showers occurred in nearly all parts of the state on one or more days, but the rainfall was not heavy enough to interfere with field work. Plowing, and in some sections, corn planting progressed rapidly. In a few localities more than half of the corn has been planted, and if favorable weather continues the bulk of the crop will be in by the close of the coming week. Grass and small grains are in good condition. Winter wheat is jointing and rye is heading in the extreme southeastern counties.

The following report by the secretary of the Iowa State Horticultural Society shows the average condition of fruit on May 1st: Apples, 58 per cent; pears, 78; American plums, 88; European plums, 76; cherries, 90; peaches, 69; grapes, 90; red raspberries, 74; black raspberries, 75; blackberries, 82; currants, 87; gooseberries, 83; strawberries, 78 per cent of perfect condition. The average condition of all fruits is 78 per cent, or 7½ per cent less than in April.

Bulletin No. 6. For the week ending May 17, 1914.—Unseasonably cool weather prevailed during most of the past week. Frost occurred in nearly all parts of the state and freezing temperatures are reported from the western counties, but no damage was done except to tender garden truck. Excessive rains, accompanied in some localities by hail and high winds, occurred in the central and north central counties on Sunday night and Monday morning. In the areas of heaviest rainfall field work was delayed for one or two days, and considerable damage was done by rain, hail and wind. But for the state as a whole the conditions were favorable for field work, and at the close of the week fully four-fifths of the corn area has been planted. In the southern districts much of the early planted corn is up, shows a good stand, and is being cultivated. The soil is generally in good condition, but rain is needed in the south central, southwestern and northwestern counties. The prospects for small grain and fruit are still promising.

Bulletin No. 7. For the week ending May 24, 1914.—The past week was warmer than usual, with a slight deficiency of sunshine. The daily excess of temperature ranged from one to four degrees. The rainfall was, up to the time most of the reports were mailed, considerably less than the normal, but the few telegraphic reports received Sunday indicate that copious to heavy showers were quite general Saturday night. The conditions were favorable for field work. The bulk of the corn has been planted, and the late planted is germinating quickly under the effects of warmer weather. The stand is good, but cut and wire worms are doing considerable damage in southern counties. The area planted appears to be fully up to and may prove to be in excess of last year's acreage. Small grain is generally in good condition, but was beginning to show the effect of lack of moisture in many localities, especially in southern districts. A few reports indicate that the Hessian fly is still active in winter wheat, and that some fields have been plowed up on account of the damage done by the fly. Hay, grass and potatoes are doing well, but need more rain. In some sections hay has a tendency to head short, due to lack of moisture. Tree fruits, except apples, give promise of good yields.

Bulletin No. 8. For the week ending May 31, 1914.—Warm, growing weather prevailed during the past week. The average temperature was about 9 degrees above the normal, and the daily maximum temperatures were near or above 90 degrees on several days. The rainfall was considerably less than the normal, but showers occurred in nearly all parts of the state on Thursday or Friday, being copious in the southeastern counties. The heavy showers, referred to in the last bulletin as having occurred on the night of the 23d, were quite general over the northern half of the state. Rain is badly needed in the southern districts, yet up to the present time corn is making rapid growth and is in good condition. Much of it has been cultivated once and some of it twice. Small grain and grass show the effect of drougth to some extent, and winter wheat is seriously damaged in Fremont and Page counties by Hessian fly. Many fields have been plowed up and planted to corn. Over the northern half of the state all crops are in extra fine condition. Fruits, except apples, are still promising, but berries must have rain soon.

Bulletin No. 9. For the week ending June 7, 1914.—The week was hot, and up to Thursday night, very dry. The average temperature was about six degrees above the normal and the daily readings were the highest recorded this season. Showers were frequent over the larger part of the state during the last three days and the rainfall was excessive in some localities, especially in the east central, and northwestern counties. Fol-

lowing are some of the greatest amounts reported: Wright county, 6.61 inches; Marshall, 5.13; Osceola, 4.97; Dickinson, 4.17; Linn, 4.63; Black Hawk, 4.53, and Scott, 4.38 inches. The rainfall was practically nil over the south central counties, and within this area all crops, except corn, suffered from lack of moisture, and stock water is getting scarce. Over the balance of the state, all crops are in fine condition and were greatly improved by the timely rains. The week, as a whole, was exceptionally favorable for farm work and the growth of vegetation, but considerable damage was done in the area of heaviest rainfall by floods and soil erosion. Some damage also resulted from wind squalls, hail and lightning. Probably the most destructive storm of the week occurred in the northern part of O'Brien county on Friday night. Considerable alfalfa was put up during the week in the best of condition and some clover will be cut during the coming week.

Bulletin No. 10. For the week ending June 14, 1914.—The conditions during the past week were unusually favorable for the growth of vegetation. The average temperature was about 8 degrees above the normal, and all parts of the state received copious to heavy rains. Most too much rain has fallen in the northern and western districts, and as a result field work has been delayed and small grain is getting too rank. However, in the south central and southeastern districts, where droughty conditions have prevailed during the past month, the rains will be of great help to all crops except hay, which will be light. Corn has made phenomenal growth and, in some localities, will average knee high. Oats are heading in all sections, and in the southern counties are filling well, although the straw will be short. In the northern and western counties some oats were lodged even before they began heading. Much clover and alfalfa hay was put up during the week.

Bulletin No. 11. For the week ending June 21, 1914.—With the exception of light and widely scattered showers on Thursday, Friday and Saturday night, the week was dry, and until Saturday, cool. The conditions were, however, unusually favorable for field work and the growth of crops. The average temperature was about five degrees below the normal, and two nights were quite cool. Corn has continued to make rapid growth and most fields are clean. Much of it, in southern counties, has been laid by, and in many fields, in all parts of the state, it is knee high. The cooler weather has been beneficial to small grain and grass. Winter wheat and rye harvest has begun in southern districts and will be in full progress during the coming week. There has been some damage by drougth and in some localities by Hessian fly, but there has been but little rust. Oats are filling well, but the straw is short. In the northern part of the state all small grain is rank. The recent rains were also beneficial to fruits, but more moisture is needed in southern counties. Potatoes are promising and garden truck is generally in good condition.

Bulletin No. 12. For the week ending June 28, 1914.—High temperature prevailed until Saturday, and over the northern two-thirds of the state showers were frequent, and in some localities heavy to excessive. The rainfall, however, was not well distributed. While there was little or no rain over the southern two tiers of counties, west of Monroe and Appanoose, the next two tiers of counties received heavy to excessive showers. Over the northern half of the state the rainfall was about normal, although heavy showers occurred in some localities. In many sections the showers were accompanied by high winds, and in a few instances by hail, which did considerable damage to small grain. Probably half of the corn has been laid by in southern districts, and in northern counties some of it is getting too large to cultivate. The crop probably was never in better condition or further advanced at the end of June than it is now. Much winter wheat, rye and some early oats are in shock in the southern part of the state. Most reports indicate that although the straw is short the yield will be good but not up to last year's crop. In northern sections all small grain is in head and filling well, but dry weather is needed to prevent further damage by lodging and the possibility of rust. Haying is well advanced in southern and will become general in central and northern districts during the coming week. Pastures, potatoes and garden truck are generally in excellent condition, except in southwestern counties where dry weather continues. In the fruit district of western Iowa the prospects are satisfactory. Apples promise good size if the weather continues favorable. Both apples and grapes are further advanced than normal, and the grape crop, especially in Pottawattamie county will be large.

Bulletin No. 13. For the week ending July 5, 1914.—Ideal weather prevailed during the last seven days for haying and harvesting fall wheat, rye and early oats, and the time was well improved. The average temperature was about four degrees below the normal and only a few light, scattered showers occurred. Practically all of the winter wheat, rye and early oats are in shock in the southern counties, and the work is well advanced in the central districts. Haying was general and the crop is being put up in fine condition. The yield is, however, considerably below the normal in southern districts but is fair to good over the central and northern counties. The bulk of the corn has been laid by in good condition, and the crop, as a whole, is a week to ten days in advance of the average for this time of the year. Much of it is showing tassels in the southern part of the state but will soon need rain in those sections. Threshing has begun in the south and will begin in central districts during the coming week. Early reports indicate good yields of winter wheat, but not up to those of last year. Early potatoes are generally small and have only a few in a hill. Pastures are in fine condition, except in the southern counties, where rain is badly needed for all growing crops and to replenish the water supply, which is getting short.

Bulletin No. 14. For the week ending July 12, 1914.—This has been the hottest and one of the driest weeks of the season. The average temperature was about 6 degrees above the normal, and the daily maximum tem-

peratures ranged from 90 to 104 degrees. The rainfall was decidedly deficient except in a few localities, of small area, where heavy local showers occurred. The excessive heat and dry weather are beginning to show injurious effects on corn in the southern counties, but the crop as a whole is making rapid growth and is still in good condition. The early planted fields, in all parts of the state, are tasseling and are approaching that stage of growth when rain will be needed soon. Favorable conditions have prevailed for haying, harvesting and threshing. Considerable rust is reported in late oats and smut is appearing in many localities where the seed was not treated. The rust, however, is the red variety and came too late to do serious harm. In some sections more or less rust is reported in all small grain. The early potato crop is nearly a failure.

A summary of the reports on apples for July 1st shows the following percentages of the 1913 crop in the several districts: Northeastern, 23; north central, 41; northwestern, 27; west central, 51; central, 44; east central, 29; southeastern, 36; south central, 58; southwestern, 53 per cent. The average of all reports received shows an estimated production of 40 per cent. Estimating from the assessors' reports for 1913, Iowa will harvest this year a million-bushel apple crop. The fruit is far in advance of the normal for this time of the year and with normal rainfall should reach good size by harvest time. The coddling moth is very bad in unsprayed orchards and the curculio is reported as having done considerable damage in parts of the state. The plum crop will be about 62 per cent and grapes above 90 per cent of the 1913 crop.

Bulletin No. 15. For the week ending July 19, 1914.—Hot weather prevailed until Thursday evening, when quite general showers preceded a cool wave. Heavy showers also occurred in many localities on the night of the 12th, the heaviest rain, both on the 12th and 16th, being reported from the eastern part of the south central and southeastern counties, where the moisture was badly needed. In many localities the showers were accompanied by high winds and electrical storms, and in some sections by hail. Much damage was done to corn and grain. Corn was blown down and uncut grain was badly lodged. The storms were, however, of a local character, and the beneficial effects of the rain will far exceed the amount of damage done by wind and hail. Corn over the greater part of the state is still in good condition and earing well, but more rain would be beneficial. Harvesting is about completed in the southern counties and is well advanced in northern districts. Threshing is progressing rapidly and reports indicate fair to good yields of all grains. Rain is needed for pastures, potatoes, blackberries and apples, and would benefit corn.

Bulletin No. 16. For the week ending July 26, 1914.—High temperatures, bright sunshine and generally dry weather prevailed during the last seven days. The average temperature was about five degrees above the normal, and the daily maximum readings were above 100 degrees on two or three days, in the southern districts. Showers occurred in nearly all parts of the state, but the amounts of rainfall were light, except in a few localities of small area. The drougth has been injurious to pastures, potatoes and spring seeded clover and timothy, and has damaged corn to some extent in the southern counties, but even there it is not beyond redemption for an average yield. As a whole the crop is still in good condition, but would be benefited by rain, and the late planted fields must have rain soon to insure good earing. The small grain harvest is practically completed and threshing is well advanced in central and nearing completion in many localities in southern districts. The yield of grain is variable, ranging from fair to good. Wheat ranges from twenty to thirty bushels per acre; barley sixteen to twenty-five, and oats from twenty to forty-five bushels. A reliable estimate of the average yields cannot now be given on account of the limited number of reports received. The storm of the 15th blew off many apples in Page and Fremont counties. Water for stock is very scarce in southern districts.

Bulletin No. 17. For the week ending August 2, 1914.—Quite general showers occurred on Thursday and Thursday night, but the amount of rainfall was unevenly distributed. In some localities the rainfall was nil, while in others the amounts were light to heavy; the southern counties received the least. In some localities, in the northern counties there was sufficient rainfall to insure the early corn, but for the state as a whole, and especially in the southern districts, corn, potatoes and pastures are needing rain badly. Corn has already suffered considerable damage in the southern part of the state, but the average condition of the whole crop is only four points below the July 1st estimate, or 97 per cent. Much trouble is being experienced in southern districts in obtaining water for stock and for threshing. Small streams and many wells are dry. Threshing is progressing rapidly under favorable conditions. Preliminary estimates show the average yield of winter wheat to be about twenty-three bushels per acre; spring wheat, sixteen; oats, thirty-four; barley, twenty-seven and rye, nineteen bushels per acre. If these estimates are maintained by final returns the state will produce about 175,000,000 bushels of oats; 16,500,000 of wheat; 11,000,000 of barley, and 1,300,000 bushels of rye.

Bulletin No. 18. For the week ending August 9, 1914.—The week was hot and generally dry; the average daily excess of temperature being about three degrees, and the rainfall was much below the normal. There were,. however, many local but generally light showers, which afforded slight relief from the severe drought and intense heat. Corn in the northern part of the state is holding its own remarkably well and gives promise of a large yield and early maturity. In some fields corn is beginning to dent. In the southern counties corn is steadily retrograding and the crop is being cut two to four million bushels a week. The scarcity of water is becoming serious. The drought is also severe on pastures, potatoes, gardens and fruit, and is preventing any fall plowing being done. Threshing continues under favorable conditions and is well advanced.

Following is a summary showing average condition of crops on August 1st, as compared with the average of past years on that date, except fruit, which is compared with last year's crop as shown by reports of township assessors: Corn, 97 per cent; pastures, 84; potatoes, 80; flax, 91; apples, 25; plums, 52; grapes, 87 per cent.

Bulletin No. 19. For the week ending August 16, 1914.—The average temperature for the week was about normal, the days being bright and hot and the nights cool. Light to copious showers occurred in a few localities, but over the larger part of the State the rainfall was practically nil or the amounts were too small to be of any material benefit. The greatest measurements of rainfall were reported from the west central, northwestern, north central and eastern counties and the least from the central and southern sections. Corn is steadily retrograding, and much of it in the southern districts is past the stage where rain would be of any benefit. Corn on sandy soil is firing badly in all parts of the state, and the prospective crop has been reduced eight to ten million bushels during the week, yet in many localities over the northern half of the state the crop is in excellent condition, and there has been sufficient rainfall to assure its maturity. In some of the southern counties, corn is being cut to save the fodder. Pastures are brown and afford but little or no feed. Spring seeded grasses are burned out, and late potatoes are suffering badly. Shallow wells and small streams are dry, and the lack of water for stock is serious. Threshing is progressing rapidly and is completed in many localities. But little fall plowing has been done.

Bulletin No. 20. For the week ending August 23, 1914.—The high temperatures and hot winds that prevailed at the close of last week continued during the first two days of this week. The remainder of the week was slightly cooler, with more or less cloudiness and local showers on two or three days in a few localities. The week was, however, hot and generally dry, the average temperature being about 9 degrees above the normal. The rainfall was nil or light except over the east central district and in portions of Madison, Union, Adams and Decatur counties, where the amounts exceeded an inch. The hot winds were very damaging to corn, and on high and sandy land the crop is badly fired. However, with normal weather during the next three weeks the northern half of the state will produce more per acre than the state average of past years. In the southern counties the crop will be much below the average, yet in some localities, where timely showers occurred, the yield will exceed thirty bushels per acre. The dry, hot weather was also damaging to potatoes, pastures, apples and garden truck.

Bulletin No. 21. For the week ending August 30, 1914.—The weather conditions were much more favorable during the past week than they were during the preceding three weeks. The temperature was below normal, and the nights were cool, which, together with a few showers,

checked the rapid dessication of corn. The average temperature was about four degrees below the normal, and while the rainfall was light over the central and northeastern counties it was copious to heavy over the southern and northwestern counties, where the amounts were considerably more than an inch in many localities. The rain, however, came too late to be of material benefit to corn or late potatoes in the southern half of the state, but it will help pastures and fall plowing. Practically all the corn in the southern districts is dry and beyond further injury by either drought or frost. Much of it has been cut, and many silos have been filled. The yield, although greatly reduced by the drought and hot winds, will be about up to the average of last year in those districts. In the northern counties corn is generally in good condition, and a heavy yield is promised, although on high or sandy land the crop has been injured by the dry, hot weather. More rain is needed for pastures, late potatoes, fall plowing and to replenish the water supply.

Bulletin No. 22. For the week ending September 6, 1914.—More rain fell in the state during the last seven days than in any other week of the season. The rainfall was heavy except over the northwestern quarter of the state; the amounts, in many localities, in the eastern and southern districts exceeded three inches, and a few stations report more than five inches. In many localities the rains were accompanied by destructive wind squalls and hailstorms, which did much damage to corn. The average temperature was nearly normal, although several nights were quite cool. Light frost occurred in exposed places over the northwestern counties, but no damage was done. The rains were of great benefit to pastures, aftermath, late potatoes, plowing and to some of the late corn. Plowing is now progressing rapidly, and a large area is being prepared in the southern districts for fall wheat and rye. Corn is maturing rapidly and fully three-fourths of it will be beyond danger of frost by the end of the coming week. More than 90 per cent of it will be safe by the 20th and practically all of it by the end of the month. The average condition of corn on September 1st was placed at 87 per cent, or a loss of 10 per cent during August. The condition of late potatoes was 68 per cent and pastures 70 per cent. With favorable weather in the future corn husking will begin earlier than usual.

Bulletin No. 23. For the week ending September 13, 1914.—Cool, cloudy and wet weather prevailed during the week. The average temperature was about 5 degrees below the normal, and the rainfall was copious to excessive. Pastures have revived and are now in good condition, and fall plowing and seeding of winter wheat and rye is progressing rapidly. Late potatoes and some late corn will be benefited by the rains, but the bulk of the corn is dry and beyond danger of injury by frost.

Based on present conditions and an area of 9,324,000 acres, the state will produce about 320,000,000 bushels of corn.

A summary of reports received September 1st, with 86 per cent of the threshing completed, shows the average yield of small grains to be as follows: Oats, 33 bushels per acre; winter wheat, 22; spring wheat, 15; barley, 26; rye, 19, and timothy seed, 4.2 bushels per acre. If these estimates are maintained by final returns, the state will produce about 165,000,000 bushels of oats, 11,000,000 of winter wheat, 4,000,000 of spring wheat, 11,000,000 of barley and 1,300,000 bushels of rye.

IOWA CROP REPORT, JUNE 1, 1914.

Following is a summary showing conditions of crops on June 1st, as compared with the average of past years on that date: Corn, 101 per cent; oats, 99; spring wheat, 98; winter wheat, 96; barley, 95; rye, 97; flax, 96; potatoes, 99; tame hay, 92; wild hay, 95; pastures, 97; alfalfa, 101; apples, 56; plums, 75; peaches (southern Iowa), 84; grapes, 92; strawberries, 90; raspberries, 89; blackberries, 91; and cherries, 87 per cent.

The condition of live stock is as follows: Cattle, 101 per cent; sheep, 100; hogs, 95; spring pigs, 88; horses, 99; foals, 94.

Last year on June 1st the conditions were as follows: Corn, 80; oats, barley and rye, 95; spring wheat, 94; winter wheat, 96; flax, 90; potatoes, 87; tame hay and alfalfa, 102; wild hay, 100; pastures, 103.

IOWA CROP REPORT, JULY 1, 1914.

Acreage of Farm Crops and Estimated Condition of Staple Crops and Fruit.

Reports received July 1st, from county and township correspondents of the Iowa Weather and Crop Service, show the following results as to the acreage and average condition of staple farm crops, and the condition of fruit.

Corn.—As compared with the area reported by the township assessors for 1913, we have an increase of 142,000 acres, or a total of 9,324,300 acres this year. The average condition on July 1st was 102 per cent, or 9 per cent better than on July 1, 1913.

Oats.—Area sown, 5,154,200 acres, or about 50,000 acres less than the acreage of 1913. The average condition is 94, as compared with 91 per cent on the same date last year.

Wheat.—The area of winter wheat is 538,400 acres, or about 12,000 acres more than in 1913. Spring wheat, 261,000 acres, making a total wheat acreage of 799,400. The estimated condition of spring wheat is 96 and of winter wheat 95 per cent, as compared with 92 and 97 per cent last year.

Barley.—Acreage sown, 437,400 acres; decrease 24,000 acres; condition, 90 per cent.

Rye.—Acreage, 73,150; condition, 97 per cent.

Flax.—Acreage, 14,400; condition, 98 per cent.

Hay.—Acreage of tame and wild hay, 3,571,320; condition, 88 per cent.

Alfalfa.—Acreage, 100,300; increase, 11,700 acres.

Pastures.—Acreage, 9,375,300; condition, 95 per cent.

Fruits.—Condition, apples, 40 per cent; grapes, 90 per cent; plums, 69 per cent.

IOWA CROP REPORT, AUGUST 1, 1914.

Following is a summary of reports from crop correspondents on August 1st, showing the average condition of staple crops as compared with the average condition of past years on that date, and the condition of fruit as compared with last year:

Corn, 97 per cent; pastures, 84; potatoes, 80; flax, 91. Preliminary estimates show the average yield of winter wheat to be about 23 bushels per acre; spring wheat, 16; oats, 34; barley, 27; and rye, 19 bushels per acre. If these estimates are maintained by final returns, the State will produce about 175,000,000 bushels of oats; 16,500,000 of wheat; 11,000,000 of barley, and 1,300,000 bushels of rye.

A summary of the reports from special fruit crop reporters gives the estimated production as follows, based in percentages upon the apples produced in 1913:

Apples.—Northwest Iowa, 28 per cent; north central Iowa, 27; northeast Iowa, 13; west central Iowa, 31; central Iowa, 24; east central Iowa, 21; southwest Iowa, 36; south central Iowa, 28; southeast Iowa, 29 per cent. Average for the state as a whole, 71 counties reporting, is 25.4 per cent. The reports of the assessors show that Iowa harvested a little over 2,000,000 bushels of apples last year. Based on these figures, the State will harvest from three-fourths of a million to one million bushels of apples this year.

IOWA CROP REPORT, SEPTEMBER 1, 1914.

The following is a summary of reports from correspondents on September 1st. The estimated condition of corn as compared with the average of past years on that date was placed at 87 per cent, which is ten points below the August 1st estimate. As in 1913 the crop in the northern counties is generally in fine condition, and will average above the normal. The decrease in condition is due to the drougth and hot winds over the southern half of the state, yet there are many localities within that area where the corn is better than it was a year ago, due to timely local showers. The crop is farther advanced toward maturity than usual, and practically all of it will be out of danger of injury by frost by the end of September.

POTATOES.—The drougth was also damaging to potatoes; the average condition on September 1st being 68 per cent, but this is 21 points better than on September 1, 1913.

Pastures, like corn and potatoes, were in poor condition in the southern counties, but were generally good in the northern counties. The average for the state was placed at 70 per cent.

Eighty-six per cent of the threshing was done. The average yield of winter wheat is 22 bushels per acre; spring wheat, 15; oats, 33; barley, 26; rye, 19; timothy seed, 4.2 bushels per acre.

APPLES.—Sixty-two counties reporting show that there will be harvested this year 22 per cent as many apples as last year. This would indicate that there will be harvested about one-half million bushels of apples. Of this quantity the reports show 64 per cent for the state as a whole will be marketable. Estimating by districts there will be slightly more than one-third of a million bushels that will be marketable. This relatively high percentage is due to the fact that only well cared for sprayed orchards are producing this year. The average for the state August 1st was 25.4 per cent. The crop estimate has dropped 3.4 per cent during August.

FINAL REPORT FOR THE STATE—TOTAL YIELD OF SOIL PRODUCTS—VALUE AT FARM PRICE, DECEMBER 1, 1914.

Following is a summary of reports from crop correspondents of the Iowa Weather and Crop Service, showing the average yield per acre and total yields of staple soil products, and the average price at the nearest station, December 1, 1914:

CORN.—As in 1913, drought reduced the yield in the southern counties, but timely and copious showers over the northern districts more than made up the loss, and the State produced 21,000,000 bushels more than it did last year. The average yield per acre was 39 bushels, and the total yield 363,689,600 bushels. The average price at the nearest station was 55 cents, making the total value of the crop $200,029,280. The weather during the latter half of October and all of November was ideal for harvesting, and the quality of the crop was never better.

OATS.—The area harvested was 5,154,200 acres; average yield, 34 bushels per acre; total yield, 172,696,000 bushels; aggregate value at 34 cents per bushel, $70,805,360. Last year the average yield was 34.2 bushels per acre; total yield, 164,851,000; aggregate value at 34 cents per bushel, $56,049,340.

SPRING WHEAT.—Area harvested, 261,025 acres; average yield, 13 bushels per acre; total yield, 3,389,070 bushels; price per bushel, 94 cents; total value, $3,185,725.

WINTER WHEAT.—Area harvested, 538,410 acres; average yield per acre, 22 bushels; total yield, 11,670,710 bushels; average price, 97 cents per bushel; total value, $11,320,588. The total yield of all wheat is 15,059,780 bushels, as compared with 16,348,807 bushels last year; but the value of this year's crop exceeds that of 1913 by $2,284,748.

BARLEY.—Average per acre, 26 bushels; total yield, 11,423,310 bushels; average price, 56 cents; total value, $5,397,053.

RYE.—Average yield, 19 bushels per acre; total crop, 1,369,260 bushels; farm price, 77 cents; total value, $1,054,320.

FLAX SEED.—Average per acre, 11 bushels; total product, 152,280 bushels; total value, at $1.21 per bushel, $184,258.

POTATOES.—Average yield per acre, 87 bushels; total yield, 9,540,200 bushels; total value at 87 cents per bushel, $5,533,316.

HAY (TAME).—Average yield, 1.4 tons; total yield, 4,234,370 tons; average price, $10.78; total value, $45,646,508.

HAY (WILD).—Average yield, 1.3 tons; total yield, 860,280 tons; average price, $8.26 per ton; total value, $7,123,118.

ALFALFA.—Area, 88,070 acres; average yield, 3.6 tons per acre; total yield, 319,853 tons; average price, $12.50 per ton; total value, $3,998,162.

TABULATED CROP SUMMARY.

	Acreage	Average Yield per Acre	Average price	Total Yield	Total Value
Corn	9,324,300	39.0 bu.	$ 0.55	363,689,600 bu.	$ 200,029,280
Oats	5,154,200	34.0 bu.	.41	172,696,000 bu.	70,805,360
Spring wheat	261,025	13.0 bu.	.94	3,389,070 bu.	3,185,725
Winter wheat	538,410	22.0 bu.	.97	11,670,710 bu.	11,320,588
Barley	437,400	26.0 bu.	.56	11,423,310 bu.	5,397,053
Rye	73,150	19.0 bu.	.77	1,369,260 bu.	1,054,320
Flax seed	14,440	11.0 bu.	1.21	152,280 bu.	184,258
Potatoes	110,205	87.0 bu.	.58	9,540,200 bu.	5,533,316
Hay (tame)	2,923,250	1.4 tons	10.78	4,234,370 tons	45,646,508
Hay (wild)	684,070	1.3 tons	8.28	860,280 tons	7,123,118
Alfalfa	88,070	3.6 tons	12.50	319,853 tons	3,998,162
Pastures and grazing				Estimated	84,000,000
Ensilage				Estimated	3,750,000
Timothy seed				Estimated	2,600,000
Clover seed				Estimated	500,000
Sweet corn				Estimated	525,000
Pop corn				Estimated	500,000
Fruit crop				Estimated	5,000,000
Garden truck				Estimated	5,000,000
Miscellaneous crops				Estimated	9,000,000
Total value					$ 465,152,688
The value of soil products for 1913 was					$ 438,157,440

IOWA CROPS, 1914, NUMBER OF ACRES BY COUNTIES.

Counties	Corn Acres	Oats Acres	Spring Wheat Acres	Winter Wheat Acres	Barley Acres	Rye Acres	Flax Acres	Potatoes Acres	Tame Hay Acres	Wild Hay Acres	Alfalfa Acres	Pastures Acres
Adair	100,000	46,000	3,000	6,100	3,000	370	----------	1,060	37,000	3,900	100	115,000
Adams	66,000	23,500	400	15,000	630	240	----------	420	26,700	1,850	270	95,500
Allamakee	41,000	34,800	800	1,300	11,000	1,000	35	950	48,000	1,200	70	164,000
Appanoose	46,000	20,000	200	2,680	----------	1,000	----------	200	32,700	1,200	40	104,000
Audubon	89,200	42,600	4,800	2,000	8,500	140	----------	750	24,800	2,350	425	68,000
Benton	125,000	79,500	350	250	13,600	980	----------	1,200	43,200	4,400	60	104,000
Black Hawk	102,000	56,000	300	1,500	5,400	2,300	----------	2,250	28,800	9,600	70	86,300
Boone	118,500	63,000	1,250	3,300	900	100	----------	1,100	22,900	12,400	230	83,200
Bremer	60,000	50,400	200	310	1,850	1,430	----------	1,150	15,800	19,000	40	70,000
Buchanan	91,000	57,600	200	250	1,200	1,300	----------	700	34,300	11,600	5	100,000
Buena Vista	117,000	85,000	600	360	2,100	40	150	1,400	20,000	15,500	250	75,200
Butler	103,000	74,600	500	360	1,500	2,800	30	1,290	23,200	10,200	5	94,000
Calhoun	120,000	91,800	200	1,200	1,700	----------	50	520	18,000	8,100	70	52,000
Carroll	113,500	77,600	5,000	2,300	5,000	30	60	2,200	21,100	10,500	300	73,400
Cass	106,000	39,100	6,600	24,500	3,700	330	----------	1,050	31,500	1,800	500	92,000
Cedar	100,000	36,300	220	1,300	17,000	800	----------	1,000	42,000	160	50	95,000
Cerro Gordo	95,000	91,600	700	360	4,000	200	500	1,300	24,000	16,900	80	77,000
Cherokee	121,000	81,000	850	260	4,700	50	----------	1,650	24,400	10,300	1,100	80,600
Chickasaw	64,000	58,000	1,700	500	5,300	750	375	1,500	21,300	16,000	----------	84,000
Clarke	53,200	22,500	30	9,200	90	130	----------	215	30,000	240	15	95,000
Clay	99,000	77,800	1,060	220	4,600	470	500	800	20,500	17,800	100	73,300
Clayton	72,200	73,600	570	1,960	11,400	3,200	----------	1,600	58,500	1,400	40	173,000
Clinton	116,500	42,000	600	3,000	11,000	2,100	----------	950	58,000	3,300	110	152,000
Crawford	138,000	66,800	12,400	2,400	6,400	225	----------	1,850	43,500	6,300	2,100	115,100
Dallas	120,000	51,000	950	10,000	1,800	160	----------	400	25,100	4,000	320	94,400
Davis	44,700	23,200	100	1,650	----------	720	----------	320	35,000	35	10	122,100
Decatur	59,900	25,500	----------	9,900	----------	720	----------	100	32,300	640	170	97,000
Delaware	88,400	49,000	120	110	6,900	2,900	----------	920	48,000	6,650	50	120,000
Des Moines	73,000	33,000	100	2,450	380	1,900	----------	820	23,500	120	170	89,500
Dickinson	53,000	40,800	1,800	85	4,200	150	675	490	10,150	15,800	60	46,000
Dubuque	64,900	52,200	440	600	2,470	1,150	----------	1,860	57,700	870	70	157,000
Emmet	55,100	45,000	900	45	5,000	200	750	780	13,000	12,000	15	46,700
Fayette	95,000	67,500	600	740	6,500	2,100	70	1,300	50,600	10,800	100	148,000
Floyd	81,800	72,400	920	450	2,000	2,000	240	1,600	26,300	4,600	100	64,000
Franklin	110,000	86,400	700	380	1,790	120	160	2,200	27,000	14,300	100	87,000
Fremont	112,000	12,000	750	29,100	120	800	----------	600	11,500	4,500	7,300	69,600
Greene	129,000	67,400	630	1,650	1,150	60	----------	660	23,800	8,800	100	79,800
Grundy	95,000	70,000	240	260	8,100	140	----------	2,400	24,500	5,800	15	70,000
Guthrie	103,500	50,200	2,900	3,600	2,450	35	----------	570	28,800	4,200	53	119,000
Hamilton	122,000	84,000	470	720	600	----------	100	670	23,900	10,200	115	74,200
Hancock	99,000	86,500	2,800	35	5,500	250	760	1,000	21,400	25,000	70	84,000
Hardin	100,000	70,500	460	400	850	110	50	1,180	23,900	9,200	90	69,100
Harrison	127,500	21,200	18,700	18,300	1,500	380	----------	750	10,400	7,900	10,500	63,000
Henry	74,000	32,000	----------	1,020	90	1,200	----------	310	24,500	----------	55	80,100
Howard	55,100	52,300	960	1,080	8,200	1,080	1,100	1,050	30,000	9,300	35	74,200
Humboldt	84,000	66,000	1,490	700	1,650	100	230	460	17,000	10,500	150	48,100
Ida	88,000	49,900	1,900	460	10,400	70	----------	790	23,600	2,500	445	55,700
Iowa	92,300	47,600	800	1,150	1,300	500	----------	1,200	36,500	440	70	105,200
Jackson	58,100	30,100	780	1,570	2,550	1,220	----------	920	60,000	1,490	50	167,400
Jasper	131,500	59,800	2,600	5,670	280	480	----------	910	43,800	850	70	143,000
Jefferson	57,600	27,200	340	1,860	400	420	----------	470	26,500	----------	25	84,000
Johnson	90,000	64,000	470	1,630	1,600	2,000	----------	950	45,300	850	110	113,500
Jones	76,600	33,700	300	340	6,150	1,100	----------	580	48,000	200	45	127,000
Keokuk	94,300	44,400	1,600	1,800	500	1,500	----------	570	40,200	200	85	129,000
Kossuth	156,000	133,000	3,900	300	6,600	220	1,100	1,940	27,600	47,000	125	116,000
Lee	54,000	23,700	40	6,400	550	4,700	----------	1,100	33,500	90	90	116,000
Linn	96,500	56,800	920	630	680	1,440	----------	1,100	50,500	2,800	25	158,000
Louisa	63,500	24,000	120	4,000	230	2,100	----------	250	16,300	750	175	66,000
Lucas	42,800	21,200	200	6,300	70	130	----------	420	33,200	150	30	114,000
Lyon	119,000	88,000	5,500	200	21,500	550	50	2,100	10,300	8,750	1,100	57,000
Madison	80,600	28,500	1,400	13,300	1,900	330	----------	630	31,400	840	80	130,000
Mahaska	87,000	48,500	1,300	3,900	1,900	600	----------	660	32,200	300	100	98,800
Marion	78,200	27,800	1,600	14,200	850	400	----------	500	26,500	280	50	109,000
Marshall	113,500	70,700	800	2,900	800	120	----------	1,300	37,900	820	35	81,500
Mills	82,500	18,900	2,700	22,000	400	500	----------	490	13,600	4,300	9,100	67,500
Mitchell	69,000	74,400	2,000	210	6,500	250	1,600	2,700	26,000	2,700	20	59,400
Monona	144,000	22,900	10,600	29,800	2,900	200	----------	840	9,500	15,400	9,200	85,000
Monroe	38,300	13,900	1,600	6,600	120	300	----------	180	31,800	120	40	121,000
Montgomery	82,000	18,300	3,800	27,100	300	550	----------	480	21,000	680	2,375	66,800
Muscatine	73,700	21,600	260	2,640	7,900	2,760	----------	2,500	26,900	960	270	91,000
O'Brien	110,000	80,000	1,900	300	16,700	80	120	4,300	22,700	8,500	300	75,000
Osceola	76,000	61,600	1,430	200	11,000	300	600	1,130	11,100	11,900	50	43,600
Page	104,600	20,000	1,800	32,500	700	1,000	----------	1,070	31,400	980	1,500	97,800
Palo Alto	139,800	83,000	900	50	3,200	150	300	790	10,600	30,000	35	76,200
Plymouth	188,000	85,300	39,000	2,300	11,000	100	20	2,130	23,000	21,500	4,500	102,300
Pocahontas	113,900	90,200	550	420	1,260	170	475	1,100	15,000	18,400	45	61,000
Polk	94,400	38,400	2,300	28,200	250	200	----------	1,860	24,800	3,100	300	71,700
Pottawattamie	197,000	45,700	12,900	34,000	5,600	930	----------	2,300	32,700	9,200	15,400	132,600
Poweshiek	107,600	52,400	900	1,000	1,950	450	----------	900	45,300	550	60	109,000
Ringgold	73,400	29,200	125	10,600	40	190	----------	190	43,000	140	55	112,200

IOWA CROPS, 1914, NUMBER OF ACRES BY COUNTIES—Continued.

Counties	Corn Acres	Oats Acres	Spring Wheat Acres	Winter Wheat Acres	Barley Acres	Rye Acres	Flax Acres	Potatoes Acres	Tame Hay Acres	Wild Hay Acres	Alfalfa Acres	Pastures Acres
Sac	112,000	69,200	370	430	8,400	60	20	1,000	27,800	8,000	325	75,000
Scott	73,800	21,400	520	5,600	28,400	3,100	----------	6,100	31,000	2,600	425	74,300
Shelby	127,000	52,000	9,700	2,580	12,800	270	----------	1,090	30,400	5,300	1,780	90,000
Sioux	161,000	85,000	26,800	1,100	21,500	35	90	3,300	15,800	18,300	2,000	80,500
Story	134,000	69,500	580	2,400	120	70	----------	390	27,800	5,600	190	67,500
Tama	126,000	68,300	2,200	925	12,200	300	----------	1,670	45,500	2,350	90	121,200
Taylor	71,000	21,400	180	23,300	390	600	----------	350	30,800	620	250	104,100
Union	61,000	26,500	560	3,400	150	200	----------	1,500	29,000	760	40	93,300
Van Buren	55,000	21,900	70	2,900	130	1,170	----------	240	31,000	40	215	123,400
Wapello	58,000	22,800	250	7,800	200	1,310	----------	570	31,000	25	30	95,200
Warren	80,800	24,700	760	37,800	500	430	----------	400	38,100	500	85	145,200
Washington	84,800	48,000	340	1,200	480	570	----------	450	36,000	----------	20	99,400
Wayne	67,600	34,400	50	7,000	110	640	----------	190	42,200	100	35	105,100
Webster	135,000	100,000	2,850	900	880	50	400	820	24,000	20,000	85	91,000
Winnebago	59,900	42,600	10,300	50	6,500	40	730	1,180	13,800	24,200	150	54,400
Winneshiek	79,000	66,000	4,100	1,280	18,200	1,540	1,120	1,000	53,000	5,190	70	145,000
Woodbury	196,000	56,300	8,500	10,800	5,700	50	----------	1,560	22,000	13,200	10,500	105,300
Worth	53,700	52,300	5,800	200	5,100	280	1,800	660	17,900	17,200	60	58,400
Wright	111,000	88,000	1,200	350	1,760	75	180	840	25,900	11,300	20	70,400
Total	9,324,300	5,154,200	261,025	538,410	437,400	73,150	14,440	110,205	2,923,250	684,070	88,070	9,375,300

FINAL CROP REPORT, 1914.

AVERAGE YIELD PER ACRE AND TOTAL PRODUCT BY COUNTIES.

Counties	Corn		Oats		Spring Wheat		Winter Wheat	
	Bushels per acre	Total Bushels	Bushels per acre	Bushels per acre	Bushels per acre	Tons per acre	Bushels per acre	Total Bushels
Adair	37	3,700,000	31	1,426,000	13	39,000	20	122,000
Adams	29	1,914,000	33	775,500	15	6,000	24	360,000
Allamakee	46	1,886,000	31	1,078,800	20	16,000	25	32,500
Appanoose	35	1,610,000	32	640,000	16	3,200	21	56,280
Audubon	43	3,835,600	29	1,235,400	8	38,400	22	44,000
Benton	44	5,500,000	38	3,021,000	17	5,950	27	6,750
Black Hawk	38	3,876,000	33	1,848,000	22	6,600	22	33,000
Boone	42	4,977,000	38	2,394,000	16	20,000	22	72,600
Bremer	45	2,700,000	35	1,764,000	17	3,400	21	6,510
Buchanan	42	3,822,000	36	2,073,000	18	3,600	16	4,000
Buena Vista	46	5,382,000	38	3,230,000	14	8,400	19	6,840
Butler	37	3,811,000	30	2,238,000	16	8,000	16	5,760
Calhoun	44	5,280,000	40	3,672,000	15	3,000	19	22,800
Carroll	42	4,767,000	28	2,172,800	14	70,000	24	55,200
Cass	38	4,028,000	29	1,133,900	12	79,200	23	563,500
Cedar	46	4,600,000	34	1,234,200	22	4,840	20	26,000
Cerro Gordo	45	4,275,000	35	3,206,000	13	9,100	18	6,480
Cherokee	37	4,477,000	37	2,997,000	15	12,750	20	5,200
Chickasaw	34	2,176,000	29	1,682,000	14	23,800	17	8,500
Clarke	23	1,223,000	24	540,000	14	420	17	129,400
Clay	40	3,960,000	36	2,800,800	17	17,000	18	3,960
Clayton	46	3,321,200	33	2,428,000	15	8,550	20	39,200
Clinton	46	5,359,000	30	1,260,000	18	10,800	30	90,000
Crawford	45	6,210,000	25	1,670,000	11	136,400	33	79,200
Dallas	41	4,920,000	36	1,836,000	15	14,250	23	230,000
Davis	32	1,430,400	29	672,800	10	1,000	19	31,350
Decatur	30	1,797,000	24	612,000	----	----------	18	178,200
Delaware	41	3,624,000	34	1,666,000	16	1,920	20	2,200
Des Moines	30	2,190,000	30	990,000	19	1,900	23	56,350
Dickinson	35	1,855,000	28	1,142,400	12	21,600	19	1,620
Dubuque	35	2,271,000	36	1,879,200	18	8,120	20	12,000
Emmet	36	1,983,600	33	1,485,000	12	10,800	15	670
Fayette	45	4,275,000	35	2,362,500	15	9,000	21	15,540
Floyd	41	3,353,800	31	2,244,400	15	13,800	30	13,500
Franklin	45	4,950,000	37	3,196,800	17	11,900	21	7,560
Fremont	37	4,144,000	29	348,000	14	10,500	22	640,200
Greene	44	5,676,000	34	2,291,600	17	10,710	25	367,500
Grundy	45	4,275,000	36	2,520,000	15	3,600	21	7,560
Guthrie	41	4,243,500	32	1,606,400	16	46,400	23	82,800
Hamilton	38	4,536,000	37	3,108,000	16	7,520	18	12,960
Hancock	41	4,059,000	32	2,768,000	15	42,000	22	770
Hardin	44	4,400,000	34	2,397,000	17	7,820	18	7,200
Harrison	40	5,100,000	35	742,000	13	243,100	20	366,000
Henry	28	2,072,000	34	1,088,000	----	----------	26	26,520
Howard	36	1,983,000	28	1,464,400	11	10,560	10	10,800
Humboldt	45	3,780,000	39	2,574,000	15	22,350	23	16,100
Ida	46	4,048,000	37	1,846,000	15	28,500	19	8,740
Iowa	37	3,415,100	33	1,570,000	18	14,400	27	31,050
Jackson	46	2,672,600	32	963,200	20	1,560	19	29,830
Jasper	42	5,523,000	39	2,332,200	16	41,600	23	130,410
Jefferson	34	1,958,400	30	816,000	18	6,100	21	39,000
Johnson	41	3,690,000	35	2,240,000	17	8,000	22	35,900
Jones	44	3,370,400	28	943,600	18	5,400	28	9,500
Keokuk	27	2,546,100	30	1,332,000	19	30,400	22	39,600
Kossuth	38	5,928,000	35	4,655,000	13	50,700	17	5,100
Lee	31	1,674,000	29	687,300	12	500	21	134,400

Barley		Rye		Flax Seed		Potatoes		Hay—Tame		Hay—Wild		Alfalfa	
Bushels per acre	Tons Bushels	Bushels per acre	Total Bushels	Bushels per acre	Total Bushels	Bushels per acre	Bushels Total	Tons per acre	Total Tons	Tons per acre	Total Tons	Tons per acre	Total Tons
21	63,000	12	4,440	---	------	64	67,840	1.0	37,000	1.5	5,850	3.0	300
25	15,650	30	7,200	---	------	45	18,900	0.9	24,030	1.2	2,220	2.5	400
24	264,000	19	19,000	10	350	12	106,400	1.9	91,200	1.5	1,800	4.0	280
----	----------	18	18,000	----	--------	75	15,000	1.2	39,240	1.5	1,800	3.0	120
28	238,000	24	3,360	----	--------	105	78,750	1.6	39,680	2.0	4,700	4.0	1,700
28	380,800	20	19,600	----	--------	103	123,600	1.7	73,440	1.8	7,920	1.5	75
27	145,800	17	39,100	----	--------	87	195,750	1.5	43,200	1.2	11,520	3.0	210
27	24,300	20	2,000	----	--------	61	67,100	1.5	34,350	1.1	13,640	2.7	390
30	55,500	15	21,450	----	--------	84	96,600	1.8	28,440	1.4	26,600	2.8	110
35	42,000	16	20,800	----	--------	78	54,600	1.6	54,880	1.3	15,000	3.5	20
32	67,200	18	720	8	1,200	105	147,000	1.6	32,000	1.5	23,250	3.0	750
24	36,000	17	47,600	9	270	66	85,140	1.7	38,440	1.3	13,260	3.0	15
30	51,000	----	----------	10	500	42	21,840	1.3	23,400	1.1	8,900	3.0	210
27	135,000	16	480	11	660	107	235,400	1.9	40,090	1.6	16,800	4.3	1,290
26	96,200	17	5,610	----	--------	77	80,850	1.3	40,950	1.2	2,160	4.0	2,000
30	510,000	26	20,800	----	--------	101	101,000	2.0	84,000	2.0	320	4.0	200
27	108,000	17	3,400	10	5,000	117	152,100	1.5	36,600	1.0	16,900	4.2	340
31	145,700	18	900	----	--------	63	108,950	1.6	39,040	1.2	12,360	3.0	3,300
29	153,700	21	15,750	12	4,500	73	109,500	1.4	29,820	1.4	22,400	----	--------
20	1,800	12	1,560	----	--------	63	13,540	0.6	18,000	1.0	240	1.0	15
28	128,800	18	8,460	10	5,000	69	55,200	1.5	30,750	1.0	17,800	2.5	250
27	307,800	19	60,080	----	--------	100	160,000	1.9	111,150	1.5	2,100	2.2	90
20	220,000	20	42,000	----	--------	98	93,100	1.2	69,600	1.1	3,630	4.5	500
28	179,200	25	5,620	----	--------	64	118,400	1.9	82,650	1.3	8,300	4.0	8,400
25	45,000	20	3,200	----	--------	60	24,000	1.4	35,140	1.2	4,800	3.2	725
----	----------	19	13,680	----	--------	47	15,000	1.1	38,500	1.0	35	2.5	25
----	----------	16	11,520	----	--------	32	3,200	0.8	25,840	0.9	580	2.4	410
29	200,100	18	52,200	----	--------	117	107,640	1.7	81,600	1.3	8,600	2.5	125
26	9,880	21	39,900	----	--------	143	117,260	1.1	25,850	1.5	200	3.0	510
22	92,400	14	2,100	9	6,080	75	13,750	1.6	16,240	1.2	18,960	2.0	120
27	66,690	16	18,400	----	--------	105	195,300	1.2	69,240	0.8	700	3.0	210
26	130,000	11	2,200	9	6,750	78	60,840	1.5	19,500	1.2	14,400	2.7	40
27	175,500	20	42,000	10	700	92	119,600	1.6	80,960	1.0	10,800	3.2	320
25	50,000	18	36,000	8	1,920	94	150,400	1.6	42,080	1.1	5,060	2.5	250
27	48,330	18	2,160	11	1,760	98	215,600	1.6	43,200	1.0	14,300	2.0	200
27	3,240	21	16,800	----	--------	75	45,000	1.3	14,850	1.2	5,400	3.1	22,600
25	28,750	25	1,500	----	--------	85	56,100	1.6	38,080	1.1	9,700	2.8	280
26	210,600	25	3,500	----	--------	88	211,200	1.7	41,650	1.3	7,500	5.0	75
24	58,800	17	600	----	--------	54	30,780	1.8	51,840	1.6	6,700	2.2	120
28	16,800	----	----------	10	1,000	60	40,200	1.5	35,850	1.1	11,200	2.7	310
25	137,500	17	4,250	10	7,600	125	125,000	1.6	34,240	1.2	30,000	3.5	245
22	18,700	18	1,980	8	400	61	71,980	1.7	40,630	1.2	11,000	4.5	400
30	45,000	20	7,600	----	--------	100	75,000	2.2	22,880	2.1	16,500	4.5	47,200
25	2,250	20	25,800	----	--------	62	19,220	1.5	36,750	----	--------	3.2	180
22	180,400	16	17,280	11	12,100	86	90,300	1.8	54,000	1.2	11,100	2.0	70
34	56,100	20	2,000	11	2,530	101	46,460	1.6	27,200	1.1	11,500	3.3	500
32	332,800	20	1,400	----	--------	94	74,280	1.5	35,400	1.5	3,750	4.0	1,780
31	40,300	20	10,000	----	--------	93	111,600	1.6	58,400	1.2	530	4.9	340
29	81,600	19	23,180	----	--------	120	110,400	1.8	108,000	1.3	1,900	5.0	250
32	8,960	30	14,400	----	--------	75	68,250	1.5	65,700	1.1	900	4.0	280
31	12,400	16	6,700	----	--------	85	33,900	1.2	31,800	----	--------	3.3	80
26	41,600	20	40,000	----	--------	97	92,000	1.4	63,400	1.0	850	2.8	300
23	141,400	15	16,500	----	--------	140	81,000	1.7	81,600	1.5	440	3.0	135
24	12,000	25	37,500	----	--------	88	50,000	1.5	60,300	1.3	260	3.0	255
32	211,200	17	3,700	10	11,000	105	204,000	1.4	38,600	1.2	56,400	3.5	440
25	13,800	20	94,000	----	--------	69	75,900	1.3	43,500	1.5	130	3.2	290

FINAL CROP

Counties	Corn		Oats		Spring Wheat		Winter Wheat	
	Bushels per acre	Total Bushels	Bushels per acre	Total Bushels	Bushels per acre	Bushels per acre	Bushels per acre	Total Bushels
Linn	43	4,149,500	39	2,215,200	22	20,200	21	13,200
Louisa	32	2,032,000	33	792,000	20	2,400	21	84,000
Lucas	31	1,326,800	32	678,400	16	3,200	20	126,000
Lyon	45	5,355,000	34	2,992,000	14	77,000	17	3,400
Madison	37	2,982,200	31	883,500	13	18,200	23	305,900
Mahaska	42	3,654,000	34	1,649,000	16	20,800	21	81,900
Marion	38	2,971,600	36	1,060,800	14	22,400	24	340,800
Marshall	43	4,880,500	36	2,545,200	18	14,400	22	63,800
Mills	35	2,887,500	32	604,800	10	27,000	21	462,000
Mitchell	43	2,967,000	39	2,901,600	17	34,000	25	5,200
Monona	35	5,040,000	30	687,000	14	148,000	20	596,000
Monroe	26	995,800	28	389,200	18	28,800	21	138,600
Montgomery	38	3,116,000	37	677,100	14	53,200	23	623,300
Muscatine	42	3,095,400	32	691,200	15	3,900	19	50,200
O'Brien	38	4,180,000	35	2,800,000	18	34,200	19	5,700
Osceola	37	2,812,000	35	2,156,000	16	22,800	20	4,000
Page	34	3,556,400	35	700,000	12	21,600	23	747,500
Palo Alto	38	5,312,400	33	2,739,000	10	9,000	20	1,000
Plymouth	31	5,828,000	31	2,644,300	11	429,000	15	34,500
Pocahontas	44	5,011,600	37	3,337,400	20	11,000	18	7,500
Polk	40	3,776,000	37	1,420,800	16	36,800	26	733,000
Pottawattamie	36	7,092,000	31	1,416,700	12	154,800	21	714,000
Poweshiek	42	4,519,200	32	1,676,800	15	13,500	28	28,000
Ringgold	30	2,202,000	28	817,600	17	2,100	19	201,400
Sac	45	5,040,000	35	2,107,000	15	3,500	21	9,000
Scott	43	3,173,400	33	706,200	20	10,400	22	123,200
Shelby	44	5,588,000	28	1,456,000	11	106,700	29	51,600
Sioux	37	5,957,000	32	2,720,000	13	348,400	18	19,800
Story	44	5,896,000	39	2,710,500	17	9,900	27	64,800
Tama	40	5,040,000	33	2,253,900	19	41,800	24	22,200
Taylor	28	1,988,000	32	684,800	12	2,200	20	466,000
Union	27	1,647,000	28	742,000	18	10,000	19	64,600
Van Buren	27	1,485,000	27	591,300	12	800	20	50,000
Wapello	35	2,030,000	34	765,200	17	4,200	26	202,800
Warren	30	2,424,000	25	617,500	16	12,200	21	793,800
Washington	32	2,713,600	33	1,584,000	19	6,500	22	26,400
Wayne	35	2,366,000	31	1,096,400	15	750	21	147,000
Webster	42	5,670,000	36	3,600,000	15	42,700	19	17,100
Winnebago	45	2,695,500	35	1,491,000	11	113,300	15	750
Winneshiek	42	3,318,000	27	1,782,000	14	57,400	16	20,500
Woodbury	27	5,292,000	32	1,801,600	12	102,000	19	205,200
Worth	45	2,416,500	36	1,882,800	12	69,600	18	3,600
Wright	43	4,773,000	31	2,728,000	15	18,000	19	6,600
Totals		363,689,600		172,696,000		3,389,070		11,670,710
Averages	30		34		13		22	

REPORT, 1914—Continued.

Barley		Rye		Flax Seed		Potaoes		Hay—Tame		Hay—Wild		Alfalfa	
Bushels per acre	Total Bushels	Bushels per acre	Total Bushels	Bushels per acre	Total Bushels	Bushels per acre	Total Bushels	Tons per acre	Total Tons	Tons per acre	Total Tons	Tons per acre	Total Tons
27	18,400	18	25,900	----	--------	98	107,800	1.3	65,700	1.6	3,000	4.0	100
25	5,700	18	37,800	----	--------	88	22,000	1.3	21,200	1.5	1,100	3.2	560
22	1,540	15	2,000	----	--------	27	11,300	1.3	43,200	1.7	250	2.5	75
27	580,500	16	8,800	7	350	112	235,000	1.6	16,500	1.4	12,250	3.8	4,180
24	45,600	18	5,400	----	--------	122	76,800	1.2	37,700	1.0	840	3.2	260
28	53,200	16	9,600	----	--------	49	32,600	1.4	45,000	1.3	470	3.7	370
25	21,200	23	9,200	----	--------	72	36,000	1.2	31,800	1.2	340	2.2	110
26	20,800	20	2,400	----	--------	84	109,000	1.5	56,800	1.0	820	4.0	140
23	9,200	20	10,000	----	--------	70	34,000	1.8	24,500	1.0	4,300	3.7	33,700
26	169,000	20	5,000	16	25,600	122	329,000	1.9	49,400	1.8	4,900	3.0	60
26	75,400	10	2,000	----	--------	82	68,900	1.9	18,000	1.9	29,260	3.8	35,000
24	2,800	14	4,200	----	--------	83	14,900	0.8	25,400	1.0	120	3.0	120
30	9,000	19	10,400	----	--------	65	31,000	1.4	29,400	1.2	820	3.9	9,260
23	181,700	18	49,700	----	--------	83	217,000	1.0	26,900	1.0	950	2.0	540
27	450,900	12	960	10	1,200	90	387,000	1.9	43,100	1.3	11,000	2.0	600
30	330,000	15	4,500	10	6,000	125	141,000	1.5	16,600	1.5	17,850	3.5	175
25	17,500	21	21,000	----	--------	73	78,000	1.5	47,100	1.5	1,470	3.3	4,950
30	96,000	16	2,400	9	2,700	67	52,900	1.7	18,000	1.2	36,700	4.0	140
23	253,000	15	1,500	10	200	62	132,000	1.2	27,600	1.2	25,800	4.0	18,000
20	25,200	20	3,400	11	5,200	116	127,000	1.6	24,000	1.3	23,900	3.0	135
21	5,200	20	4,000	----	--------	53	98,500	1.6	39,700	1.2	3,720	3.7	1,330
25	140,000	18	16,700	----	--------	82	108,000	1.4	45,800	1.3	12,000	3.6	55,400
33	64,300	17	7,600	----	--------	60	54,000	1.5	68,000	1.0	550	3.0	180
23	920	18	3,400	----	--------	61	11,600	1.1	47,300	0.9	130	3.6	200
29	243,600	25	1,500	12	240	81	81,000	1.6	44,500	1.2	9,600	2.8	940
23	653,000	17	52,700	----	--------	87	500,000	1.0	31,000	1.0	2,600	4.1	1,740
23	294,400	21	5,700	----	--------	85	92,600	1.4	42,600	1.4	7,400	4.0	7,120
24	516,000	11	400	13	1,170	89	303,000	1.0	15,800	0.7	12,800	2.8	5,600
28	3,400	24	1,700	----	--------	68	26,500	1.4	38,900	1.0	5,600	3.0	570
26	317,200	18	5,400	----	--------	144	240,000	1.7	77,400	1.0	2,350	2.8	250
33	11,500	20	12,000	----	--------	66	23,000	1.2	37,000	1.0	620	3.0	750
25	3,800	19	3,800	----	--------	66	99,000	0.7	20,300	1.0	760	3.1	125
22	2,900	18	21,000	----	--------	46	11,000	1.1	34,100	1.3	50	3.0	645
20	4,000	17	22,300	----	--------	62	35,300	1.1	34,100	1.5	35	4.0	120
20	10,000	20	8,600	----	--------	82	32,800	1.2	45,700	1.2	600	2.8	240
28	13,400	23	13,100	----	--------	50	22,500	2.3	82,800	----	--------	3.0	60
23	2,500	16	10,200	----	--------	70	13,300	0.9	38,000	1.6	160	4.5	160
30	25,800	20	1,000	10	4,000	50	41,000	1.5	36,000	1.1	22,000	2.8	240
24	156,000	20	800	10	7,300	127	149,000	1.9	26,200	1.5	36,300	4.0	600
24	436,800	21	32,800	9	10,100	75	75,000	1.9	47,700	1.7	8,800	4.0	280
22	125,400	18	900	----	--------	71	110,000	1.5	33,000	1.1	14,500	3.3	34,650
28	142,800	20	5,600	9	18,200	124	81,800	2.1	37,600	1.6	27,500	1.2	72
24	42,200	16	1,200	15	2,700	62	52,000	1.5	38,800	1.1	12,400	3.8	76
	11,423,310		1,369,260		152,280		9,540,200		4,234,370		860,280		319,853
26		19		11		87		1.4		1.3		3.6	

REPORT ON FUNGUS DISEASES OF PLANTS FOR 1914.

By L. H. Pammel.

Climate plays an important role in the cause of fungus diseases of plants. The writer presented a brief account last year of the more important diseases of plants for 1912. These records have been kept for a series of years. From 1886 to 1889 notes were kept by Dr. Byron D. Halsted who was then the professor of Botany in Iowa State College. In 1892 the writer began a series of observations. These notes have been published from time to time. A summary was published by the writer and Miss Charlotte M. King in 1907. Since the publication of this paper notes have been published in report of the Iowa State Horticultural society.* For a number of years this work has been carried on with the co-operation of the Bureau of Plant Industry of the United States Department of Agriculture. I have also received much help from the volunteer observers of the Iowa Weather and Crop Service. To these and other correspondents who have assisted in this work the writer desires to express his thanks.

*Proc. Ia. Acad. Sci. 16:41.

In the opening paragraph the statement was made that one of the important factors in disease is *climate*, meaning thereby rainfall, humidity and temperature; *soil* is another important factor; the *variety* is a third important factor. However, we cannot draw conclusions in regard to all of these factors until we have more data.

WEATHER DATA.

In order to show the climatic conditions for the growing season of 1914 I am giving the weather data for Decorah in northeastern Iowa, Keokuk in southeastern Iowa, Des Moines in central Iowa, Woodbury county in northwestern Iowa. This will give a fairly good idea of the weather for the past season. The season has been much drier than usual, especially during the growing season. The spring was drier than for several years past owing to a deficiency of snowfall and the fall rains of 1912. The yield of small grain crops was above the average in the state this year, while corn was below the larger yields of some years. The apple crop was small. Small fruits too were below the average.

WEATHER CONDITIONS AND TEMPERATURE.

Temperature and Precipitation—Decorah—

	April			May			June			July			August			September		
	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.
1	46	39	----	70	43	----	78	53	----	80	57	----	86	56	----	83	55	.40
2	53	36	----	69	46	----	79	48	----	84	54	----	88	73	----	72	43	----
3	42	31	----	70	54	.13	90	60	.55	90	56	.72	85	59	----	68	44	----
4	38	29	.10	81	50	----	83	68	----	88	62	.08	90	54	----	79	41	T
5	51	21	----	78	52	----	68	58	.70	91	65	----	86	62	----	86	53	T
6	48	35	----	67	43	----	87	62	.92	91	67	----	87	58	----	79	50	----
7	41	29	----	58	42	T	87	69	----	81	70	----	87	53	----	61	46	----
8	30	19	----	68	40	----	90	68	----	84	61	----	94	64	----	68	47	----
9	47	23	.23	76	39	----	88	70	T	92	59	----	95	69	----	65	40	.18
10	51	33	----	81	55	----	88	60	T	95	64	----	85	60	.45	69	53	----
11	43	24	----	69	41	1.60	80	60	.85	99	69	----	78	50	----	73	53	----
12	67	32	----	62	38	----	75	65	.18	95	75	.18	87	56	----	72	45	----
13	70	33	----	63	42	----	68	59	1.00	85	69	----	82	43	----	62	53	1.57
14	76	35	----	63	36	----	60	59	T	85	68	----	90	44	----	71	61	1.00
15	77	37	----	68	33	----	75	60	----	92	62	----	89	60	----	82	49	----
16	82	39	----	70	32	----	72	45	----	86	67	.40	94	64	.81	80	62	.95
17	82	54	----	75	42	----	76	42	----	78	56	----	92	69	.15	80	64	----
18	75	50	.40	78	64	----	78	58	.35	82	49	----	85	66	----	82	62	----
19	54	32	----	78	56	----	78	53	.54	83	63	----	80	64	.57	86	63	----
20	62	35	----	73	64	.31	69	48	T	92	53	----	86	54	.18	85	60	----
21	63	40	----	75	63	.35	90	64	.72	93	61	----	84	57	----	84	67	----
22	67	50	----	70	51	----	89	63	----	94	58	----	82	67	.60	68	44	----
23	64	43	----	70	50	.05	80	64	----	91	71	----	76	54	.25	69	35	.78
24	73	54	1.02	82	55	3.28	90	63	.12	86	68	1.15	79	48	----	68	46	T
25	73	55	----	86	60	----	89	67	----	92	62	----	76	47	----	67	34	----
26	86	46	----	91	61	----	92	65	.29	95	65	----	67	51	----	72	34	----
27	83	59	.81	86	65	----	76	63	.08	96	67	.45	60	53	----	78	42	----
28	71	55	.82	88	68	----	69	53	----	81	65	----	83	46	.08	79	50	----
29	61	43	----	80	58	----	77	50	----	81	52	----	87	63	----	80	52	----
30	51	41	----	79	45	----	78	57	T	78	53	----	88	62	----	78	47	----
31	----	----	----	81	52	.10	----	----	----	79	55	----	----	----	----	----	----	----
Totals	----	----	3.38	----	----	5.72	----	----	6.30	----	----	2.98	----	----	3.09	----	----	5.48

Temperature and Precipitation—Keokuk—

1	52	46	.26	62	41	----	81	65	.39	83	64	.01	88	69	----	86	67	1.88
2	61	40	----	67	47	----	78	55	----	87	62	----	93	71	.42	74	58	----
3	43	32	----	78	56	.07	91	63	.03	89	65	----	88	64	----	81	57	----
4	44	32	----	76	61	.14	95	74	----	90	72	----	89	65	----	78	55	----
5	51	32	----	81	57	----	91	69	----	94	60	----	92	65	.06	84	61	.14
6	52	41	.67	68	48	T	93	74	----	92	71	----	90	65	.30	85	68	----
7	44	31	----	60	46	.13	95	74	----	92	72	.02	93	66	----	70	59	.35
8	34	26	T	62	42	----	94	74	----	92	72	----	95	72	----	65	55	----
9	44	25	----	72	44	.49	97	77	.19	96	68	----	90	74	T	64	52	T
10	55	34	.01	82	62	----	93	75	----	98	72	----	81	70	T	60	55	1.76
11	46	34	----	83	50	.42	92	68	T	102	74	----	84	64	----	67	55	----
12	60	31	----	50	40	.08	86	71	----	96	74	.13	92	62	----	71	54	----
13	62	37	----	62	46	----	80	64	1.93	89	75	----	93	74	T	80	57	.04
14	68	42	----	69	44	----	82	63	.10	87	70	----	84	60	----	84	67	1.47
15	70	45	----	68	46	----	74	63	T	94	69	----	92	61	----	78	63	----
16	81	49	----	70	46	----	70	53	----	98	72	1.05	95	74	T	84	66	.09
17	82	58	----	74	50	----	77	53	----	85	69	.01	95	75	----	84	67	.32
18	70	48	.10	78	51	----	86	61	T	79	59	----	97	77	----	83	61	----
19	48	35	----	81	59	----	83	57	----	89	60	----	93	70	.55	86	66	----
20	58	32	----	81	57	----	88	49	----	90	65	----	89	67	----	85	70	----
21	83	48	----	82	63	.02	96	77	----	82	70	.23	89	70	----	88	71	----
22	80	52	----	77	58	----	89	73	.65	95	70	----	92	67	----	74	50	.17
23	67	48	0.1	83	57	----	95	73	.02	101	79	----	93	70	.15	71	44	----
24	80	60	T	86	69	----	98	75	T	98	76	----	71	65	----	70	54	----
25	79	60	----	89	72	----	94	72	----	95	76	T	82	59	----	66	47	----
26	85	50	.23	91	74	----	100	78	----	98	73	----	82	63	----	72	47	----
27	79	64	----	96	73	.03	88	67	.01	100	75	.38	80	61	----	76	52	----
28	69	50	.66	89	71	.01	74	58	----	93	72	----	71	59	.42	78	55	----
29	55	46	----	77	63	.39	80	56	----	85	62	----	80	59	----	79	55	----
30	51	44	----	80	59	----	78	59	.01	87	59	.24	88	65	.05	81	55	----
31	----	----	----	89	62	----	----	----	----	85	63	.02	87	60	.66	----	----	----
Totals	----	----	1.94	----	----	1.78	----	----	3.33	----	----	2.09	----	----	2.61	----	----	6.22

WEATHER CONDITIONS AND TEMPERATURE.

Temperature and Precipitation—Des Moines—

	April			May			June			July			August			September		
	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.	Max.	Min.	Prec.
1	52	43	----	63	45	----	80	59	----	82	61	----	85	65	----	75	57	T
2	54	36	----	43	68	T	76	57	T	87	60	----	91	70	----	75	50	----
3	40	31	----	75	56	.02	90	62	----	87	66	----	89	67	----	82	53	----
4	49	30	T	78	55	.40	95	74	----	89	66	----	92	66	.25	77	48	T
5	46	32	.01	73	52	----	90	64	.22	93	69	----	82	66	----	96	63	.16
6	48	36	.23	66	43	.03	91	65	.10	84	70	.05	89	64	----	86	65	----
7	39	29	T	55	44	.07	92	76	----	85	71	----	94	63	----	65	57	.78
8	37	25	T	64	41	----	92	75	----	88	63	----	97	72	----	61	53	T
9	46	23	----	74	45	T	91	72	T	93	68	----	94	60	----	68	53	.23
10	55	36	.01	86	59	1.27	90	65	.02	97	71	----	80	64	T	63	51	1.81
11	46	29	----	75	41	1.31	79	64	.22	98	76	----	79	59	.02	69	54	T
12	64	31	----	52	38	.01	87	70	----	101	78	T	92	60	----	71	56	----
13	65	38	----	62	42	----	73	64	.83	85	71	----	86	66	----	71	52	3.78
14	70	39	----	70	43	----	82	60	1.04	84	68	----	80	52	T	76	57	1.56
15	75	44	T	71	44	----	76	62	----	94	68	----	94	58	----	76	57	----
16	82	45	----	71	48	----	70	55	----	87	68	.51	98	76	----	82	53	4.87
17	81	60	----	75	40	----	76	52	T	86	60	----	98	70	----	83	66	T
18	76	40	.38	78	50	----	88	62	----	78	56	----	98	80	----	85	67	----
19	40	33	.16	73	57	.01	73	60	----	89	60	----	88	70	.04	82	66	----
20	60	32	----	79	62	.03	90	52	----	88	66	----	91	66	----	85	63	T
21	80	52	----	79	59	----	92	77	.02	90	67	.07	88	69	----	82	68	1.59
22	71	52	----	78	53	1.58	90	72	----	98	71	T	96	68	----	82	60	----
23	60	46	.09	78	59	----	95	69	----	96	73	----	86	65	.12	64	49	.03
24	74	59	.02	87	62	----	95	70	.18	88	75	----	79	58	----	75	47	----
25	78	52	----	90	70	.04	85	64	1.21	93	70	----	84	59	T	71	52	----
26	84	57	.28	92	69	----	94	74	.02	96	71	----	72	56	----	66	47	----
27	77	59	.29	89	71	----	78	63	----	100	71	----	72	56	.03	71	47	----
28	63	46	.07	85	69	T	70	58	T	92	72	----	73	57	.32	76	52	----
29	52	44	----	73	58	.06	78	54	----	86	63	----	82	54	----	77	53	----
30	49	42	----	84	49	----	74	60	T	80	62	.59	87	66	----	79	55	----
31	----	----	----	90	69	----	----	----	----	82	61	----	86	65	.99	81	55	----
Totals	----	----	1.52	----	----	4.83	----	----	3.89	----	----	1.22	----	----	1.77	----	----	14.81

Temperature and Precipitation—Sioux Center—April, May and June, and Sioux City, July, August and September—

1	55	39	----	62	40	----	80	50	----	82	58	----	81	68	----	71	54	T
2	50	30	----	64	51	T	71	60	.43	86	57	----	87	69	.03	75	47	----
3	45	29	----	74	55	.42	88	66	----	84	63	T	80	62	----	78	50	----
4	43	26	.30	84	49	----	92	69	.22	91	60	----	89	66	.47	77	44	----
5	47	31	.02	80	51	----	88	63	.63	89	71	----	87	66	.46	88	62	----
6	50	36	.05	65	35	----	88	61	1.28	86	71	.18	87	62	.02	82	56	T
7	39	27	T	61	41	.05	85	73	----	84	64	----	95	69	----	65	55	.52
8	41	18	----	67	35	----	85	72	T	87	58	----	96	74	----	63	54	----
9	50	17	----	81	46	----	86	62	.48	90	66	----	91	64	----	50	54	1.60
10	56	35	T	88	50	T	80	60	.92	95	67	----	78	54	----	69	56	----
11	50	18	----	83	41	.20	86	63	.27	99	75	----	73	53	.01	74	51	----
12	69	27	----	56	34	----	85	63	----	96	72	----	88	57	.43	60	55	T
13	73	40	----	63	31	----	85	66	.02	86	67	----	88	64	T	68	52	.38
14	73	41	----	70	32	----	84	63	----	91	65	----	81	57	T	67	51	.58
15	79	37	----	75	44	----	79	64	----	92	70	----	93	62	----	78	52	----
16	88	37	----	75	46	----	75	55	----	87	65	----	96	73	.04	80	62	----
17	86	33	----	77	49	----	79	55	.36	83	58	----	100	74	----	80	57	----
18	82	44	T	80	57	----	89	56	----	86	58	----	96	76	T	85	66	----
19	58	32	T	75	60	.63	87	57	----	90	63	----	81	66	T	83	60	----
20	70	29	----	77	60	1.05	90	59	T	85	66	----	83	65	.04	79	65	----
21	80	47	----	76	61	----	94	68	----	93	69	----	88	64	----	73	50	.23
22	79	48	----	78	52	----	87	67	.16	81	69	T	100	74	----	65	43	----
23	76	55	----	86	62	.73	92	62	----	90	65	----	84	50	----	78	51	----
24	73	53	1.25	89	62	.87	87	65	.42	90	70	----	77	54	----	72	47	----
25	81	47	----	92	70	----	93	63	----	94	72	----	68	54	.03	73	44	----
26	82	51	.90	92	63	----	92	64	.87	97	74	----	67	52	.01	76	50	----
27	75	56	.72	88	64	----	85	60	----	97	76	.45	62	54	.20	81	53	----
28	61	38	----	81	68	.18	74	55	----	92	71	----	74	50	----	82	56	----
29	53	37	----	77	53	.32	82	53	----	80	69	----	83	50	----	79	53	----
30	57	38	----	79	47	----	77	62	.12	76	63	.85	87	60	----	82	51	----
31	----	----	----	87	63	----	----	----	----	81	62	----	92	69	----	----	----	----
Totals	----	----	3.24	----	----	3.85	----	----	6.18	----	----	1.48	----	----	1.74	----	----	3.31

CEREAL DISEASES.

Rust of wheat (*Puccinia graminis* and *P. rubigo-vera*) was commonly observed but not as destructive as during the wet years. A few seasonable rains for infection occurred in some parts of the state. Late sown grain suffered more severely than the early. In an experimental plat sown very late the rust was so severe that the plants did not head out. There was also some rust (*Puccinia graminis*) on the stems of oats and leaf of oats (*P. coronata*) L. With us in Iowa, rye is quite as severely rusted as wheat and that with *Puccinia rubigo-vera*. The yellow leaf disease of the barley (*Helminthosporium gramineum*) and leaf spot (*H. sativum*) were serious, in some cases materially reducing the yield of barley. In Story county the former damaged the crop to the extent of 4-15 per cent, while the latter occurred on from 50 to 60 per cent of the leaves. It probably reduced the yield of barley 25 per cent in the State. Of the barley smut the naked smut (*Ustilago nuda*) was most common. The damage was probably not far from 22 per cent. For the first time ergot (*Claviceps purpurea*) was common on barley. Oat smut (*Ustilago aveneae*) was common and the damage has been estimated at $7,000,000 this year. Too few of the farmers treat their seed with formalin to prevent the disease. No wheat bunt was observed. There was, however, an abundance of wheat smut which damaged the crop to the extent of 2 per cent. A bacterial disease of oats was observed in Clinton county. The young oat leaves turned yellowish brown.

DISEASES OF CORN.

Corn is the most important crop in Iowa. The usual amount of smut (*Ustilago Zeae*) was observed, about one per cent; some rust (*Puccinia Sorghi*), however not as severe as in 1912. An unusual and widespread disease of corn caused by fungus *Fusarium* appeared in nearly every part of Iowa. In some cases the loss from this fungus was 50 per cent, in other cases 6-15. The yield for the whole state was materially reduced. In this disease the roots were diseased, having a pinkish color,the wind blew over the corn, many such stalks were barren. In other cases the fungus attacked the stem, destroying the pith and causing the corn to fall over, usually breaking close to the joint. The damage caused by this fungus has been estimated at nearly $25,000,000. The disease was not local but quite general in the state. It is probable that the lack of moisture checked the development of roots and thus materially injured the corn when attacked by the fungus. There was also much complaint about ear rots. These have not been connected with root or stem disease. While the moist weather of September may have contributed somewhat to the abundance of this mould (*Fusarium*), it is a true parasite.

POME FRUIT DISEASES.

The apple crop was so small this year that not much need to be said about pome diseases. There was in some sections of the state a little apple scab on the fruit, but more abundant on the leaves especially such varieties as Fameuse. Illinois or Blister canker (*Nummularia discreta*)

was abundant in southwestern Iowa. Apple blight was severe only on the Transcendent crab apple, then only in June. No infection occurring later. Some bitter rot of the apple was reported from western Iowa.

DISEASES OF SMALL FRUIT.

Blackberries in some places were infected with the Red rust (*Caeoma nitens* or *Gymnocomia Peckiana*). Such infection can be traced to old diseased plants. There was also some spot of the blackberry (*Septoria Rubi*). The strawberry blight (*Mycosphaerella Fragariae*) was not abundant. Here and there we noted some crown gall on blackberry (*Pseudomonas tumefaciens*). Some gooseberry mildew (*Sphaerotheca mors-uvae*) in northern Iowa on cultivated gooseberries. In a few cases the spot disease of currants (*Gloeosporium Ribis* and *Cercospora angulata*) were abundant only however locally.

STONE FRUITS.

The Brown rot of plum (*Sclerotinia fructigeana*) was not common only in late plums. Plum scab (*Cladosporium carpophilum*) was rare. On the other hand this fungus was common on the peach in southeastern Iowa. Mildew on the cherry, though occurring, was less abundant than in previous years, 1912 and 1913. The spot disease of the cherry (*Cylindrosporium padi*) was rare, except late in the season. Plum pocket (*Exoascus Pruni*) was rare, enlarged branches (*Exoascus communis*) were common in a few places on the Miner plum.

DISEASES OF THE GRAPE.

There was little of the Powdery Mildew (*Uncinula necator*) anywhere in the state. In western Iowa in the vicinity of Council Bluffs there was some Downy Mildew (*Plasmopara viticola*) on the Concord grape. No Black rot or Bird's Eye fungus was observed.

DISEASES OF ORNAMENTAL PLANTS.

There was much mildew (*Sphaerotheca pannosa*) on the Crimson Rambler rose. There was some mildew on the lilac later in the season. China asters in one part of the state were attacked by a species of Fusarium and in a Des Moines greenhouse the snap dragon rust (*Puccinia antirrhinii*) was reported.

DISEASES OF ROOT CROPS.

Potato scab (*Oospora Scabies*) was reported from numerous points in the state especially severe on the early Ohio. After an investigation of the Powdery Scab in the state it may be stated that it has not been reported to us. The Fusarium disease of the potato is quite widely scattered in Iowa. In some cases beet scab was reported and onion smut was reported from Scott county.

DISEASES OF VEGETABLES.

Asparagus rust occurred in usual amounts in many parts of Iowa. There was some Fusarium rot of cucumbers in greenhouses and in the field. During the fall rains, tomatoes were badly attacked by Fusarium.

A few reported cases of Bean anthracnose and beet spot (*Cercospora beticola*). Melon wilt reported from Muscatine county. Cabbage yellows (*Fusarium*) serious near Muscatine.

DISEASES OF FORAGE CROPS.

Alfalfa mildew (*Peronospora Trifoliorum*) reported for the first time from Allamakee county by Mr. O. Schultz and the alfalfa root rot (*Rhizoctonia violacea*) from Scott county by Prof. G. R. Bliss and Mr. Lau, also for the first time. Clover rust was abundant during September, also the alfalfa rust. There was much silver top in Eastern Iowa, in some cases 50 per cent of the blue grass heads were killed.

FOREST TREE DISEASES.

Buckeye was seriously attacked by a spot disease (*Phyllosticta aesculi*). So severe was it in Boone county that many trees were defoliated in May. There was less of the Black spot of the Maple (*Rhytisma acerinum*) than usual. There was as usual some of the Sycamore blight (*Gloeosporium nerviscquum*) but less than in 1913. Many shade trees suffered because of the dry weather; this was particularly true of the American or white elm.