U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU AND
BUREAU OF AGRICULTURAL ECONOMICS

In Cooperation with the

IOWA WEATHER AND CROP SERVICE

Annual Report for 1922

CHARLES D. REED, M. Sc. Agr.

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Des Moines

LETTER OF TRANSMITTAL

HON. N. E. KENDALL, *Governor.*

SIR: In compliance with the requirements of the law, I have the honor to submit herewith the thirty-third annual report of the Iowa Weather and Crop Service for the year 1922.

CHARLES D. REED, *Director.*

Des Moines, Iowa, January 30, 1923.

HISTORICAL

The Iowa Weather and Crop Service was established by an Act passed by the Twenty-third General Assembly, and approved by the Governor April 25, 1890.

The object of the Service is to co-operate with the U. S. Weather Bureau in collecting crop statistics and meteorological data, and more widely disseminate the weather forecasts and storm and frost warnings for the producers and shippers of perishable products, and to promote general knowledge of meteorological science and the climatology of the State.

In accordance with the Act, on the recommendation of the directors of the State Agricultural Society, J. R. Sage was duly commissioned as director by Governor Boies on June 3, 1890, and General Greeley, then Chief Signal Officer, U. S. Army, detailed Dr. George M. Chappel to serve as assistant director of the State Service Mr. J. R. Sage resigned as director December 31, 1907, and Dr. George M. Chappel was commissioned on January 1, 1908, as director, and served in that capacity until March 31, 1918, when he resigned and was succeeded by Charles D. Reed. Toward the close of the year, 1919, co-operation in estimating acreage and production of crops was begun with the U. S. Bureau of Markets and Crop Estimates now known as the U. S. Bureau and Agricultural Economics, of which Mr. Charles F. Sarle is Agricultural Statistician for Iowa.

OFFICE FORCE DECEMBER 31, 1922

Charles D. Reed, M. Sc. Agr., Meteorologist and Director.
J. Earl Cook, Statistician.
Wilma Bishop, Stenographer and Clerk.
Warren J. Rice, Clerk.

COOPERATING ORGANIZATIONS

U. S. Weather Bureau

Fred L. Disterdick, Meteorologist and First Assistant.
Milton W. Davis and J. Melvin Martin, Assistants.
W. Davis Drake, Apprentice.

U. S. Bureau of Agricultural Economics
Division of Crop and Live Stock Estimates

Charles F. Sarle, Agricultural Statistician for Iowa.
Leslie M. Carl, Live Stock Statistician for Iowa.
Frank S. Pinney, Agricultural Statistician.
Mabel E. Atwood, Clerk.
Mildred I. Switzer, Clerk.

ANNUAL REPORT, 1922.

For convenient reference and comparison with past and future years, this report contains the summaries of the weekly, monthly and annual bulletins of the Iowa Weather and Crop Service in co-operation with the U. S. Weather Bureau and the United States Bureau of Agricultural Economics for the year 1922.

The regular meteorological, climatological and crop statistical work was maintained efficiently, though under great handicap from frequent resignation of employees, due to low salaries paid by the Government. The Thirty-ninth General Assembly placed the supervision of agricultural statistics collected by assessors, under the direction of this office, but failed to provide adequate funds to fully carry out the law for which a minimum of $10,000 was asked to cover all salaries, special clerk hire, traveling expenses, and office equipment, including all of the work heretofore done by county auditors on agricultural statistics. As only $7,500 were appropriated, it was necessary to ask for volunteers among the auditors to do the work without compensation. About half of them responded, otherwise the work could not have been done. Being voluntary work, it was done at the convenience of the auditors which caused a delay of 30 days in publishing the statistics. However, the bulletin containing the statistics was mailed about August 1, which is 60 days earlier than last year and the earliest ever mailed. Adequate funds would hasten publication at least 30 days and bring added improvement from close contact with more of the assessors.

Publications were distributed as follows: Monthly Climatological Data, about 17,000 copies; Weekly Weather-Crop Bulletins, about 20,000; Daily Weather Forecast Cards, to 1,593 addresses. Of the bulletin, "Iowa Monthly Crop Report," about 5,100 copies were distributed each month. Five hundred copies of the Monthly Climatological Data are distributed each month through the United States Department of Agriculture, Weather Bureau, to scientific institutions and libraries in this and foreign counties. In co-operation with the U. S. Bureau of Agricultural Economics, about 4,800 mimeographed copies of special monthly crop bulletins were issued to the press.

Daily weather forecasts were distributed by telegraph at the expense of the U. S. Weather Bureau to 64 towns. From these towns

the forecasts are made available by free telephone to 38,263 rural subscribers, and 145,801 town subscribers. Much attention was given to accuracy and promptness in the transmission of forecasts by telegraph and telephone.

Frost warnings are sent when necessary during the fruit blooming season to all orchardists in the State prepared to use orchard heaters and who make application in advance for the service.

Radio telephone distribution of daily weather forecasts was begun by the Electrical Engineering Department, Iowa State College, Ames, Iowa early in June, 1922. Forecasts based on observations taken throughout the United States at 7:00 a. m. (Central Standard Time) are broadcast from Ames (WOI) at 9:30 a. m. and 12:40 p. m. Forecasts based on similar observations at 7:00 p. m. are broadcast at 9:30 p. m.

Forecasts are also broadcast from WOC (Davenport) at 11:00 a. m.; 12:30 p. m.; and 9:40 p. m.

WEAB (Fort Dodge) at 10:00 a. m.

WKAA (Cedar Rapids) 12:15 p. m. and 9:45 p. m.

WEAU (Sioux City) 10:15 a. m.

Special warnings are sent from various stations between 4:00 p. m. and 5:00 p. m. All broadcasting is done at 485 meters wave length. Most any of the above stations can be heard anywhere in the State by the use of audion bulb receivers; and at a radius of 50 to 75 miles from the sending stations by the use of crystal receivers.

Increased transportation by automobile and motor truck has created a great demand for information as to the condition of roads. From April 1 to September 30, daily rainfall reports are telegraphed at the expense of the U. S. Weather Bureau from 26 Iowa towns to the central station at Des Moines. Many local and long-distance calls are received as to desireable detours to avoid wet areas. A special Highway Weather Service was maintained by the U. S. Weather Bureau Offices in Charles City and Dubuque. This is very popular, but cannot be conducted satisfactorily without more funds. In fact, the work was discontinued at Davenport, Des Moines, and Sioux City because of the failure of Congress to provide adequate salaries. Frequent resignations of trained employees made it impossible to continue this work.

CLIMATOLOGY OF THE YEAR, 1922

The year, 1922, with a mean temperature of 50.2, was next to the warmest of the 33 years of State wide record. The average daily

excess of temperature above the normal was 2.8°. Each of the months were above normal except July which was 2.6° below which made the midsummer season pleasant. Of the 28 consecutive months ending with December, 1922, 26 were above normal; and during this period the average daily temperature was 3.7° above normal—a most remarkable record. Precipitation averaged 29.98 inches, or 1.99 inches below normal. Snowfall, 13.5 inches, is a new low record for a calendar year, though the snowfall of the three winter months of 1921-1922 was only 9.5 inches. Wind movement averaged slightly less than normal, but unusual gales occurred on November 5th and 30th.

Crop production was unusually good. Corn was next to the largest crop of record, small grains were satisfactory, potatoes very good; apples unusually good, and other fruits above the average.

Barometer (reduced to sea level). The average pressure of the atmosphere for the year was 30.04 inches. The highest pressure was 30.97 inches, at Sioux City on February 28. The lowest pressure was 28.92 inches, at Des Moines, on April 8. The range for the State was 2.05 inches.

Temperature. The mean temperature for the State was 50.2° or 2.8° above normal. The highest annual mean was 54.2°, at Keokuk, Lee County. The lowest annual mean was 46.1°, in Dickinson County near Milford. The highest temperature reported was 104°, at Inwood, on June 23. The lowest temperature reported was −29°, at Charles City, Floyd County, on January 6 and at Mason City, Cerro Gordo County, on January 24. The range for the State was 133°.

Precipitation. The average amount of rainfall and melted snow for the year was 29.98 inches, or 1.99 inches less than normal, and 2.05 inches less than the average for 1921. The greatest amount at any station was 44.20 inches, at Mt. Ayr, Ringgold County, and the least amount was 19.08 inches, in Dickinson County, near Milford. The greatest monthly precipitation was 11.72 inches, at Mt. Ayr, Ringgold County, in July. The least amount was a trace at Cumberland, Glenwood, Harlan, and Thurman in southwest Iowa, in December. The greatest amount in any 24 consecutive hours was 5.83 inches, at Atlantic on August 30. Measurable precipitation occurred on an average of 84 days, 2 days less than in 1921 and one day less than normal.

Snowfall. The average amount of snowfall was 13.5 inches. The greatest amount reported from any station was 38.9 inches at Sioux Center, Sioux County, and the least amount was 2.0 inches at Bonaparte, Van Buren County. The greatest monthly snowfall was 23.0 inches at Rockwell City, Calhoun County, in January.

Wind. The prevailing direction of the wind was from the south. The highest velocity reported was 67 miles an hour from the south at Sioux City, Woodbury County, on June 8.

Sunshine and Cloudiness. The average number of clear days was 187; partly cloudy, 89; cloudy, 89; as against 171 clear, 99 partly cloudy, and 95 cloudy days in 1921. The average percentage of the possible amount of sunshine was 62 or about 1 per cent more than the normal.

MONTHLY SUMMARIES

JANUARY

January as a whole was a pleasant month, though subject to an unusual number of fluctuations above and below the normal, and there were some great extremes in temperatue, particularly on the 6th, when the minimum temperature ranged from 29 degrees below zero at Charles City to 11 above at Keokuk. The mean temperature averaged somewhat above normal, with an excess at every station except Mason City, and the mean was least over northern districts, where the ground was snow covered the entire month, except the first three days, and gradually increased to the south where the ground was covered on an average of less than 10 days. Zero weather was reported throughout the State except a small area along the Mississippi River in the extreme southeast corner.

Precipitation averaged slightly below normal, being slightly above normal over the northern division and somewhat below in the central and southern divisions. More than 75 per cent of the monthly total occurred during the storm of the 4th-5th, which was in the form of snow over the northern half of the State and rain over the southern half. The snowfall during this storm ranged as high as 14 inches and in sections drifted enough to interfere with wagon and automobile traffic but not enough to seriously delay rail traffic. Over the southern division and portions of the central division the precipitation in this storm was in the form of rain, which froze to all exposed surfaces. This general icy condition continued for several days, and in protected places, till the close of the month. Conditions were generally favorable for the usual outdoor activities and considerable building was in progress which was interrupted for but short intervals. There was sufficient cold weather to make ice of the desired thickness and by the close of the month a good harvest had been completed under the most favorable conditions. The lack of snow cover, the icy condition that followed the storm of the 4th-5th, and the alternate freezing and thawing, later, are thought to have seriously injured winter wheat and young clover over the southern and portions of the central divisions. At the end of the month more than half the State was without snow. Roads were in good condition, with sleighing nearly the entire month over the northern division. The health of stock continued good.

Pressure. The mean temperature (reduced to sea level) for the State was 30.20 inches. The highest recorded was 30.95 inches, at Dubuque, on the 23rd and the lowest was 29.44 inches at Davenport, on the 4th. The monthly range was 1.51 inches.

Temperature. The mean temperature for the State, as shown by the records of 97 stations, was 19.8°, or 1.9° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 15.6°, or 1.0° higher than the normal; Central, 20.5°, or 2.3° higher than normal; Central, 20.5°, or 2.3° higher than normal; Southern, 23.4°, or 2.5° higher than the normal. The highest monthly mean 25.8° at Centerville, and the lowest monthly mean 13.2° at Charles City. The highest temperature reported was 61°, at Harlan, on the 1st, and the lowest was 29° at Charles City on the 6th and Mason City on the 24th. The temperature range for the State was 90°.

Humidity. The average relative humidity for the State at 7 a. m. was 80 per cent and at 7 p. m. was 69 per cent. The mean for the month was 74 per cent, which is 8 per cent below the normal. The highest monthly mean was 87 per cent, at Charles City, and the lowest was 66 per cent, at Keokuk.

Precipitation. The average precipatation for the State, as shown by the records of 98 stations, was 0.89 inch, or 0.16 inch less than normal. By divisions the averages were as follows: Northern, 0.88 inch, or 0.04 inch more than normal; Central, 0.88 inch, or 0.23 inch less than the normal; Southern, 0.92 inch, or 0.27 inch less than the normal. The greatest amount, 2.30 inches, occurred at Rockwell City, and the least, 0.32 inch, at Postville. The greatest amount in any 24 consecutive hours, 1.80 inches, occurred at Mason City, on the 4th.

Snowfall. The average snowfall for the State was 5.3 inches, or 1.6 inches less than the normal. The greatest amount, 23.0 inches, occurred at Rockwell City, and the least a trace at Chariton and Pella.

Wind. The prevailing direction of the wind was from the southeast. The highest velocity reported from a regular Weather Bureau Station was at the rate of 47 miles per hour, from the northwest, at Sioux City on the 4th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 63, or 13 per cent more than the normal. The per cent of the possible amounts at the several Weather Bureau Stations was as follows: Charles City, 43; Davenport, 72; Des Moines, 64; Dubuque, 67; Keokuk, 72; Sioux City, 55; Omaha, Neb., 68.

Miscellaneous Phenomena. Aurora: 5th, 6th, 24th. Fog, dense: 4th, 10th, 12th, 16th, 21st, 28th, 30th, 31st. Hail: 4th, 31st. Halos (Lunar or Solar): 4th, 8th, 10th 11th, 17th, 18th, 19th, 29th. Parhelia: 5th, 19th. Sleet: 3d, 4th, 14th, 29th, 30th, 31st. Thunderstorms: 4th, 5th.

Rivers. Low to moderate stages prevailed on the Missouri River, with considerable fluctuation due to ice gorges. Low and nearly stationary stages prevailed on the Mississippi and all interior rivers during the entire month. The ice on the Mississippi and interior rivers increased gradually till the end of the month.

COMPARATIVE DATA FOR THE STATE—JANUARY

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	19.7	+1.8	61	—27	2.03	+0.98	3.46	0.35	------	------	------	------	------
1891	26.0	+8.1	58	— 4	1.75	+0.70	3.99	0.61	------	4	13	7	11
1892	15.3	—2.6	76	—38	1.09	+0.04	3.13	0.10	6.9	5	16	9	6
1893	9.3	—8.6	54	—34	0.74	—0.31	3.20	0.13	6.9	6	11	9	11
1894	19.3	+1.4	69	—37	1.09	+0.04	2.24	0.31	6.0	5	14	9	8
1895	13.6	—4.3	68	—31	0.85	—0.20	2.65	0.09	8.7	4	15	7	9
1896	23.4	+5.5	68	—20	0.48	—0.57	2.10	T.	2.8	3	10	10	11
1897	17.2	—0.7	66	—30	2.01	+0.96	6.16	0.15	8.2	7	12	7	12
1898	23.4	+5.5	52	—11	1.60	+0.55	5.32	T.	12.6	5	15	6	10
1899	19.8	+1.9	68	—34	0.28	—0.77	1.15	T.	1.5	3	15	10	6
1900	25.6	+7.7	66	—20	0.53	—0.52	2.47	T.	2.3	3	16	7	8
1901	23.7	+5.8	60	—21	0.74	—0.31	2.34	0.04	6.2	4	14	9	8
1902	22.4	+4.5	53	—31	0.88	—0.17	2.83	0.19	9.4	4	17	8	6
1903	23.0	+5.1	60	—12	0.28	—0.77	1.46	T.	2.0	4	13	7	11
1904	14.0	—3.9	57	—32	1.18	+0.13	3.68	0.02	6.1	6	12	8	11
1905	11.2	—6.7	56	—30	0.91	—0.14	1.82	0.12	11.1	7	14	7	10
1906	24.6	+6.7	69	—19	1.52	+0.47	4.71	0.28	11.3	5	14	6	11
1907	18.8	+0.9	68	—22	1.52	+0.47	5.30	0.10	6.0	7	8	7	16
1908	24.9	+7.0	60	—18	0.44	—0.61	1.50	0.06	4.6	2	17	8	6
1909	21.2	+3.3	72	—25	1.66	+0.61	3.74	0.41	7.8	6	9	6	16
1910	18.1	+0.2	56	—35	1.57	+0.52	3.15	0.55	12.6	6	13	7	11
1911	20.2	+2.3	66	—35	0.97	—0.08	3.73	0.11	7.3	5	9	8	14
1912	4.2	—13.7	49	—47	0.53	—0.52	1.90	T.	5.5	5	14	7	10
1913	20.9	+3.0	62	—25	0.77	—0.28	2.05	0.04	7.2	5	14	9	8
1914	27.8	+9.9	64	—10	0.88	—0.17	2.34	0.27	5.1	5	11	8	12
1915	17.5	—0.4	59	—32	1.63	+0.58	3.15	0.10	7.3	8	13	8	10
1916	17.8	—0.1	63	—34	2.62	+1.57	6.07	0.85	7.2	10	12	6	13
1917	17.0	—0.9	60	—28	0.83	—0.22	2.07	0.17	7.2	4	17	8	6
1918	8.6	—9.3	53	—35	1.02	—0.03	2.79	0.26	11.2	7	13	8	10
1919	26.8	+8.9	64	—32	0.24	—0.81	0.86	T.	2.8	2	20	5	6
1920	16.7	—1.2	58	—26	0.42	—0.63	1.05	T.	4.6	4	12	8	11
1921	28.4	+10.5	67	— 9	0.51	—0.54	1.92	0.10	4.1	4	11	7	13
1922	19.8	+ 1.9	57	—29	0.89	—0.16	2.30	0.32	5.3	4	17	6	8

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

FEBRUARY

February, like January, was subject to a large number of sudden temperature changes, but on the whole a very pleasant month with no periods of cold weather of long duration. The temperature averaged above normal except over a small area in the northwest corner and the departures increased uniformly to the south and southeast, the greater departures in the south being due principally to a storm that crossed the State on the 22d, which gave usually high temperatures over all the southern division and much of the central, while over a large portion of the northern division the maximum did not go much above freezing.

The precipitation averaged above normal over all divisions, though there was a deficiency over about half of the central and southern divisions. Most of the precipitation occurred from the 21st to the 23d, in connection with the storm that crossed the State on the 22d. Over a large area in the northeast portion the precipitation was excessive and as a result the worst flood ever experienced this early in the season occurred. The storm was accompanied by severe thunderstorms generally throughout the State and there was considerable loss to stock and buildings from lightning, but the greatest damage was due to floods, which affected most of the northeast section, being especially severe in Allamakee, Clayton, Winneshiek, Fayette, Bremer and Delaware counties. Over practically all of this area unusually heavy rainfall occurred, and, owing to the frozen condition of the ground, all the water soon found its way to the streams, which were soon out of banks, and many miles of roads and railroads were covered with from three to five feet of water. All railroads were damaged by having bridges washed out and road beds injured, but the Chicago, Milwaukee & St. Paul Railroad from West Union to Turkey River Junction was hardest hit, and the stage at points along the Turkey River was the highest ever known. Over this strip 24 railroad bridges were washed out and several miles of track was washed away, and it was necessary to suspend railroad traffic for 10 days. No railroad in the flooded area was able to maintain schedules. Many families were forced to vacate their homes and in Independence 10 blocks were flooded. There was also considerable damage from ice, as the storm terminated in a glaze storm, and as a result telephone, telegraph and electric wires were put out of commission and industries that depended on electric current for power were forced to suspend till the damage could be repaired and many homes had to resort to primitive lighting methods. Many valuable fruit and shade trees were ruined by the weight of the ice.

The snowfall was the least ever recorded in February since records have been kept, the average for the State being but 1.3 inches, and many stations reported no snow whatever, and there was less snow cover than in any previous February. In the winter wheat section there was practically no snow protection during the entire month, but the injury from freezing was apparently less than could be expected under the circumstances. Clover was injured somewhat in some of the northern counties.

The weather was generally favorable for the outdoor activities. Roads were unusually good for the season with very little sleighing except in the extreme northern portion, and until the general storm of the 21st-23rd, many roads in the southern and central divisions were dusty.

Pressure. The mean pressure (reduced to sea level) for the State was 30.14 inches. The highest recorded was 30.97 inches, at Sioux City on the 28th, and the lowest was 29.24 inches, at Charles City, on the 1st. The monthly range was 1.73 inches.

Temperature. The mean temperature for the State, as shown by the records of 96 stations, was 23.7°, or 3.2° higher than normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 18.4°, or 1.3° higher than the normal; Central 24.7°, or 4.0° higher than the normal; Southern, 28.0°, or 4.4° higher than the normal. The highest monthly mean was 31.3°, at Burlington, and the lowest 14.8°, at Rock Rapids. The highest temperature reported was 70°, at Clarinda and Mt. Ayr, on the 21st, and the lowest was -20°, at Inwood, on the 13th. The temperature range for the State was 90°.

Humidity. The average relative humidity for the State at 7 a. m. was 79 per cent, and at 7 p. m. it was 66 per cent. The mean for the month

was 72 per cent, or 8 per cent lower than the normal. The highest monthly mean was 85 per cent, at Charles City, and the lowest was 66 per cent, at Keokuk.

Precipitation. The average precipitation for the State, as shown by the records of 97 stations, was 1.59 inches, or 0.44 inch greater than the normal. By divisions the averages were as follows: Northern, 1.96 inches, or 1.05 inches more than the normal; Central, 1.43 inches, or 0.23 inch more than the normal; Southern, 1.39 inches, or 0.04 inch more than the normal. The greatest amount, 4.56 inches, occurred at Fayette, and the least, 0.40 inch at Spencer. The greatest amount in any 24 hours, 3.20 inches, occurred at Fayette, on the 21st-22d.

Wind. The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau Station was 55 miles per hour, from the west, at Sioux City, on the 1st.

Snowfall. The average snowfall for the State was 1.3 inches, or 6.1 inches less than normal. The greatest amount, 7.4 inches, occurred at Rock Rapids, and there were 21 stations that reported only traces and 10 stations no snow whatever. The snowfall for the State was the least ever recorded, being just half of the least amount previously recorded, which was in 1902.

Rivers. Low and nearly stationary stages prevailed on the Mississippi and interior rivers until after the general storm of the 21st-22nd, when a sharp rise occurred in the Mississippi and a high stage continued through the rest of the month. Ice gorges caused local floods on many interior rivers and bridges were threatened by ice jams which had to be dynamited. In the northeast portion of the State high water and ice caused great damage. Low and nearly stationary stages prevailed on the Missouri the entire month.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 65, or 9 per cent more than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 46; Davenport, 63; Des Moines, 73; Dubuque, 64; Keokuk, 68; Sioux City, 67; Omaha, Nebr., 73.

Miscellaneous Phenomena. Aurora: 12th, 14th.. Birds (migration of): Columbus Junction, robins, 16th; Earlham, blue birds, 21st, black birds, 22d. Fog: 1st, 9th, 19th, 21st, 22d. Hail: 1st, 21st, 22d, 23d. Halos (lunar and solar): 4th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 17th, 22d, 23d, 26th 27th, 28th. Meteor: 12th. Sleet: 1st, 4th, 5th, 18th, 21st, 22d, 23d, 26th, 27th. Thunderstorm: 19th, 21st, 22d.

COMPARATIVE DATA FOR THE STATE—FEBRUARY.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	26.0	+5.5	67	−24	0.83	−0.32	2.18	0.11	------	------	------	------	------
1891	19.4	−1.1	70	−31	1.16	+0.01	2.41	0.55	------	3	13	7	8
1892	28.1	+7.6	68	−20	1.20	+0.05	2.18	0.12	5.0	6	6	7	16
1893	16.4	−4.1	60	−28	1.39	+0.24	2.91	0.06	8.1	6	10	8	10
1894	19.7	−0.8	60	−19	0.89	−0.26	2.41	T.	8.4	3	16	8	4
1895	16.4	−4.1	73	−33	0.49	−0.66	1.34	0.02	3.3	4	13	9	6
1896	27.4	+6.9	78	−13	0.71	−0.44	2.40	0.04	5.4	4	12	9	8
1897	24.7	+4.2	61	−24	0.89	−0.26	1.81	0.22	8.0	5	6	10	12
1898	24.2	+3.7	62	−18	1.30	+0.05	3.65	0.10	7.8	5	10	9	9
1899	12.2	−8.3	75	−40	0.89	−0.26	4.32	0.12	7.1	5	11	10	7
1900	14.8	−5.7	60	−27	1.30	+0.15	4.57	0.18	9.9	6	10	8	10
1901	17.5	−3.0	49	−21	1.01	−0.14	3.00	0.12	9.7	4	15	7	6
1902	17.6	−2.9	62	−21	0.73	−0.42	2.39	0.02	2.6	4	13	8	7
1903	19.8	−0.7	56	−21	1.18	+0.03	3.25	0.30	7.9	4	13	7	8
1904	14.8	−5.7	70	−26	0.41	−0.74	1.99	T.	4.5	4	10	9	10
1905	12.8	−7.7	69	−41	1.57	+0.42	2.97	0.44	15.5	7	14	6	8
1906	23.6	+3.1	66	−32	1.29	+0.14	2.91	0.20	6.1	5	14	7	7
1907	25.0	+4.5	65	−31	0.71	−0.44	1.95	0.06	4.6	4	14	6	8
1908	24.3	+3.8	59	−16	1.69	+0.54	3.95	0.23	8.9	6	12	6	11
1909	26.2	+5.7	62	−26	1.54	+0.39	4.72	0.30	7.7	5	11	6	11
1910	17.8	−2.7	58	−21	0.46	−0.69	2.09	T.	4.0	3	14	8	6
1911	27.3	+6.8	71	−13	2.76	+1.61	5.46	0.50	7.0	6	13	6	10
1912	18.1	−2.4	57	−30	1.21	+0.06	3.25	0.04	11.2	5	10	9	10
1913	20.2	−0.3	70	−24	0.82	−0.33	2.39	0.07	7.3	4	14	7	7
1914	16.8	−3.7	59	−29	0.87	−0.28	1.99	0.32	9.2	6	10	9	9
1915	29.1	+8.6	62	− 8	2.93	+1.78	5.39	0.43	9.4	9	9	5	14
1916	19.0	−1.5	62	−32	0.55	−0.60	1.38	0.05	6.0	4	14	8	7
1917	15.2	−5.3	68	−37	0.36	−0.79	1.19	T.	3.5	3	14	8	6
1918	23.0	+2.5	70	−36	0.95	−0.20	2.10	0.09	6.0	5	14	7	7
1919	24.9	+4.4	65	−16	2.42	+1.27	4.12	1.32	9.9	8	11	5	12
1920	24.0	+3.5	59	−22	0.56	−0.59	1.75	0.04	4.1	5	9	6	14
1921	31.0	+10.5	76	− 5	0.77	−0.38	2.09	T.	6.5	5	13	7	8
1922	23.7	+ 3.2	70	−20	1.59	+0.44	4.56	0.40	1.3	4	14	7	7

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

THE WINTER OF 1921-1922.

The mean temperature for the three winter months was 23.9°, which is 3.1° above the normal for the State, and 4.7° lower than the mean for 1920-1921, which was the warmest winter ever recorded in the State. The highest temperature reported was 70°, at Clarinda and Mt Ayr, on February 21st. The lowest temperature reported was −29°, at Charles City, on January 6th, and Mason City, on January 24th.

The average monthly precipitation for the State was 1.17 inches and the average total precipitation was 3.50 inches or, 0.08 inch more than the winter normal. The average total snowfall, unmelted, was 9.5 inches, the least ever recorded, which is 11.0 inches below the normal, and 8.5 inches less than the winter of 1920-1921. The least ever recorded heretofore was 12.0 inches, during the winter of 1906-1907.

The total number of days with .01 inch or more of precipitation was 13, or 1 less than the winter of 1920-1921. The average number of clear days was 45; partly cloudy, 22; cloudy, 23, as compared with 34 clear days, 22 party cloudy days and 34 cloudy days during the winter of 1920-1921.

MARCH

The mild weather that prevailed throughout the winter continued during March and the usual features that characterize this month were lacking. Several storms of more than ordinary severity passed near the limits of the State, but they were generally accompanied by very little wind and less rain and snow than usual. The exception was the storm that passed immediately south of the State on the 19th, and the only damage of consequence reported occurred during the passage of this storm, which crippled telephone and telegraph service in the central and west-central portions of the State. It was necessary to route telegrams between Des Moines and Omaha in a roundabout way and telephone service was entirely suspended until the broken poles and wires could be replaced.

The temperature averaged 5.0° above normal, which is the greatest excess since the present series of months with the temperature above normal began in December. The month opened cold and the lowest temperature generally occurred on the 2d, with a minimum of zero, or lower, over most of the northern division and slightly above zero over the central and southern divisions. The temperature rose above normal on the 3d, and except on an occassional day, continued above normal till the 26th, when a moderately cold period set in and the rest of the month was slightly below normal.

The precipitation for the State was slightly above normal and was more uniform both as to distribution and the time of occurrence than usual, but over the greater portion of the State more than half of the monthly total occurred during the storm of the 18th-19th.

The general weather conditions were favorable for plant development, but farm work was somewhat retarded on account of the soil being too wet to work and at the end of the month no spring seeding had been done except in a few small, scattered areas. Fruit buds had not developed as far as usual and at the end of the month all buds were apparently uninjured. Winter wheat and grass were making good growth and it will be necessary to plow up very little winter wheat. Building operations made an active start under very favorable conditions.

Pressure. The mean pressure (reduced to sea level) for the State was 30.04 inches. The highest recorded was 30.81 inches, at Sioux City on the 1st, and the lowest 29.26 inches, at Charles City, on the 6th.

Temperature. The mean temperature for the State, as shown by the records of 98 stations, was 38.3°, or 5.0° above the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 35.8°, or 5.3° higher than normal; Central, 38.8°, or 5.3° higher than normal; Southern, 40.4°, or 4.5° higher than the normal. The highest monthly mean was 43.6°, at Fairport, and the lowest monthly mean was 33.6°, at Milford. The highest temperature reported was 74°, at Burlington, on the 23d, and the lowest was -5°, at Fayette, on the 2d. The temperature range for the State was 79°.

Humidity. The average relative humidity for the State at 7. a. m. was 81 per cent, and at 7 p. m. it was 68 per cent. The mean for the month was 74 per cent, which is practically normal. The highest monthly mean was 81 per cent, at Charles City, and the lowest was 72 per cent, at Sioux City.

Snow. The average snowfall for the State was 3.0 inches, or 2.3 inches less than the normal. The greatest amount, 9.0 inches occurred at Alta, and the least, a trace, at Bonaparte, Corning and Pella.

Precipitation. The average precipitation for the State, as shown by the records of 101 stations, was 1.97 inches, or 0.20 inch more than the normal. By divisions the averages were as follows: Northern, 1.39 inches, or 0.14 inch less than the normal; Central 2.00 inches, or 0.13 inch less than the normal; Southern, 2.52 inches, or 0.60 inch less than the normal. The greatest amount, 3.73 inches, occurred at Chariton, and the least, 0.76 inch, at Independence and Spencer. The greatest amount in any 24 consecutive hours, 2.18 inches, occurred at Belle Plaine on the 19th.

Wind. The prevailing direction of the wind was from the southeast. The highest velocity reported from a regular Weather Bureau Station was at the rate of 46 miles per hour, from the northwest, at Sioux City on the 25th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 49, or 9 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 46; Davenport, 42; Des Moines, 46; Dubuque, 47; Keokuk, 45; Sioux City, 55; Omaha, Nebr., 62.

Miscellaneous Phenomena. Aurora: 1st, 13th, 14th. Birds (migration of): Alton, meadow larks, 12th, robins, 13th; Corydon, robins, 5th, blue birds, 13th, black birds, 23d; Jefferson, meadow larks and robins, 4th; Nora Springs, robins 21st; Oskaloosa, blue birds and robins, 4th; Pocahontas, meadow larks, 3d, robins, 17th. Fog: 3d, 6th, 7th, 19th, 24th, 27th, 30th. Hail: 10th, 14th, 18th, 19th, 24th, 25th. Halos (lunar and solar): 2d, 4th, 5th, 6th, 9th, 10th, 12th, 14th, 25th. Parhelia: 10th, 13th. Sleet: 6th, 9th, 17th, 18th, 20th, 25th 28th 29th 31st. Thunderstorms: 6th, 10th, 18th, 19th, 23d, 24th, 25th.

Rivers. Moderate stages with a general rising tendency prevailed on the Mississippi River and most interior streams with the crest stages after the general rains on the 18th-19th. The Missouri was subject to numerous fluctuations with a sharp rise at the beginning of the third week. The ice moved out of the upper reaches of the Mississippi River on the 6th and on the 13th ice in the Missouri broke up doing very little damage.

COMPARATIVE DATA FOR THE STATE—MARCH.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	28.0	—5.3	75	—24	1.57	—0.20	3.67	0.32	------	----	----	----	----
1891	26.8	—6.5	66	—19	2.60	+0.83	4.58	1.33	------	10	6	8	17
1892	31.9	—1.4	84	— 6	2.22	+0.45	4.58	0.57	3.9	6	11	8	12
1893	31.8	—1.5	84	— 8	2.14	+0.37	4.40	0.64	4.0	8	9	11	11
1894	41.0	+7.7	84	— 5	2.03	+0.26	4.52	0.26	2.7	6	13	10	8
1895	34.4	+1.1	94	—11	0.83	—0.94	2.00	0.22	2.9	4	16	8	7
1896	30.9	—2.4	81	—12	1.10	—0.67	3.99	0.16	5.4	5	12	9	10
1897	32.0	—1.3	72	—22	2.39	+0.62	6.16	0.29	5.5	8	9	8	14
1898	37.5	+4.2	72	— 2	1.94	+0.17	6.21	0.33	3.7	6	12	9	10
1899	23.0	—10.3	75	—16	1.62	—0.15	5.90	0.37	8.6	6	7	12	12
1900	30.7	—2.6	81	—13	2.06	+0.29	5.15	0.45	6.6	5	12	9	10
1901	34.2	+0.9	76	— 5	2.64	+0.87	5.25	0.70	12.6	7	10	8	13
1902	33.1	+5.8	79	—12	1.45	—0.32	4.33	0.13	1.3	7	9	11	11
1903	38.8	+5.5	82	6	1.38	—0.39	3.90	0.15	3.9	7	11	7	13
1904	34.8	+1.5	78	8	2.18	+0.41	4.57	0.50	4.4	7	8	8	15
1905	41.5	+8.2	84	1	2.04	+0.27	3.70	0.89	4.1	7	8	8	15
1906	27.1	—6.2	65	—14	2.34	+0.57	4.55	0.58	8.9	10	8	7	16
1907	40.6	+7.3	92	— 7	1.35	—0.42	5.05	0.23	4.1	6	14	7	10
1908	37.9	+4.6	85	— 8	1.58	—0.19	3.74	0.45	1.1	6	13	7	11
1909	32.5	—0.8	71	—12	1.53	—0.24	5.00	0.28	9.8	6	12	10	9
1910	48.9	+15.6	92	—10	0.17	—1.60	1.37	0.00	T.	1	23	6	2
1911	39.4	+6.1	83	2	0.93	—0.84	4.84	T.	1.9	5	16	9	6
1912	24.9	—8.4	70	—19	2.01	+0.24	5.25	0.60	19.1	7	15	6	10
1913	31.9	—1.4	78	—23	2.48	+0.71	5.88	0.74	5.3	9	11	10	10
1914	34.7	+1.4	78	— 5	1.69	—0.08	3.84	0.28	1.8	7	12	8	11
1915	29.3	—4.0	61	—5	0.96	—0.81	2.12	0.17	8.8	5	8	9	14
1916	35.2	+1.9	80	—18	1.57	—0.20	5.80	0.23	2.9	6	11	9	11
1917	34.6	+1.3	85	—12	1.84	+0.07	4.35	0.57	6.2	6	14	8	9
1918	42.9	+9.6	85	0	0.63	—1.14	2.12	0.03	2.6	3	19	7	5
1919	37.5	+4.2	78	—11	2.33	+0.56	5.40	0.81	1.1	6	15	8	8
1920	38.0	+4.7	80	—21	3.02	+1.25	5.70	0.47	2.4	7	15	7	9
1921	42.8	+9.5	86	4	1.57	—0.20	6.62	0.17	0.2	7	14	8	9
1922	38.3	+5.0	74	— 5	1.97	+0.20	3.73	0.76	3.4	7	12	6	13

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

APRIL

Nearly normal conditions prevailed during April, though both temperature and precipitation showed a slight excess. The temperature excess was general and uniform throughout the State except in the northeastern and south central portions where small areas showed a slight deficiency. The first nine days of the month were warm and in this period most of the excess occurred. During the rest of the month temperature changes were frequent, though not decided, with cool weather predominating. Frosts were general over the greater portion of the State as late as the 29th, but as vegetation had been retarded in growth the last two weeks very little damage resulted from frosts and it was thought that all fruit buds were uninjured at the end of the month, except possibly strawberries sustained slight damage in the south central portion.

The precipitation was below normal over most of the southern division, the extreme northwest and most of the counties bordering the Mississippi River. Most of the precipitation occurred during the first eleven days, when showers occurred almost daily, and as a result very little farm work

was accomplished in this period and the seeding of oats was delayed. After the eleventh only two shower periods occurred in connection with the relative strong winds that prevailed the greater portion of the time, the soil dried rapidly and caused a great deal of oats to fail to germinate or resulted in a very poor stand. At the end of the month many fields in the drier western sections that were intended for oats were being prepared for corn.

Many storms occurred throughout the State, especially during the first eleven days. On the evening of the 6th, shortly after 8 p. m. a tornado developed in the eastern portion of Dallas County and its influence was felt in Polk, Boone and Story Counties, but the greatest damage occurred in the northeast corner of Dallas County and the northwest corner of Polk County. The storm originated near Moran and moved in a generally northeasterly direction but the actual path was somewhat zigzag and the tail of the funnel did not reach the earth at all points in its course. Five farms were directly in its path. Two dwellings were partially destroyed, resulting in the death of one woman and the injury of eleven people. The loss to farm buildings was heavy, many being completely destroyed and the contents scattered in all directions. The loss to buildings, stored grain and stock was estimated at $200,000. On the same afternoon severe hail storms occurred at many places in the western portion of the State, the damage being particularly heavy to greenhouses in Council Bluffs and it was estimated that the damage to glass and hothouse plants amounted to $100,000. On the 11th there appeared to be several tornadoes in the southwestern portion of the State that were accompanied by severe hail, the greatest damage being confined to Adams, Taylor and Ringgold Counties. Many buildings were destroyed and many fruit trees and telephone poles broken down. No human lives were lost but the loss to stock was heavy. Horses were killed by buildings collapsing, and hogs and chickens were killed by hail stones which were as large as hen's eggs, and a stone in the shape of a disk was reported seven inches long and three inches wide. The northwestern portion of the State was visited by a heavy, wet snow on the 11th, that broke down trees and completely wrecked telephone and telegraph lines.

Pressure. The mean pressure (reduced to sea level) for the State was 30.00 inches. The highest recorded was 30.58 inches, at Davenport, on the 28th, and the lowest was 28.92 inches, at Des Moines, on the 8th. The monthly range was 1.66 inches.

Temperature. The mean temperature for the State, as shown by the records of 98 stations, was 49.9°, or 1.2° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows Northern, 47.5°, or 0.8° higher than the normal; Central, 50.4°, or 1.5° higher than the normal; Southern, 51.8°, or 1.2° higher than the normal. The highest monthly mean was 53.8° at Keokuk, and the lowest was 45.2° at Northwood. The highest temperature reported was 87° at Thurman, on the 6th, and the lowest was 21° at Boone, on the 1st. The temperature range for the State was 65°.

Humidity. The average relative humidity for the State at 7 a. m. was 79 per cent, and at 7 p. m. it was 59 per cent. The mean for the month

was 69 per cent, which is 3 per cent more than the normal. The highest monthly mean was 76 per cent at Charles City, and the lowest was 64 per cent at Sioux City.

Precipitation. The average precipitation for the State, as shown by the records of 100 stations, was 3.06 inches, or 0.20 inch more than the normal. By divisions the averages were as follows: Northern, 3.25 inches, or 0.57 inch more than the normal; Central, 3.30 inches, or 0.44 inch more than the normal; Southern, 2.63 inches, or 0.42 inch less than the normal. The greatest amount, 6.70 inches occurred at Algona, the least 1.04 inches, occurred at Inwood. The greatest amount in any 24 consecutive hours, 3.72 inches, occurred at Algona, on the 11th.

Snow. The average snowfall for the State was 1.0 inch, or 0.8 inch less than the normal. Practically all the snow occurred in the northwest portion of the State on the 11th, and only a few stations in the central and southern division reported more than a trace. The greatest fall reported was 10.0 inches at Spencer.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 53, or 7 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 48; Davenport, 45; Des Moines, 52; Dubuque, 48; Keokuk, 55; Sioux City, 53; Omaha, Neb., 67.

Miscellaneous Phenomena. Aurora: 21st, 22d. Fog: 3d, 4th, 5th, 6th, 7th, 8th, 10th, 24th, 25th. Hail: 6th, 7th, 8th, 9th, 10th, 11th, 12th, 14th, 16th, 17th. Halos (lunar and solar): 1st, 3d, 13th, 14th, 21st, 23d, 26th, 27th, 28th. Sleet: 10th, 11th, 13th, 17th. Thunderstorms: 3d, 6th, 7th, 8th, 10th, 11th, 12th, 16th, 17th, 18th, 24th. Tornado: 6th, 11th.

Wind. The prevailing direction of the wind was from the southeast. The highest velocity reported from a regular Weather Bureau Station was at the rate of 55 miles per hour, from the northwest, at Sioux City, on the 19th.

Rivers. High stages prevailed on all rivers the greater part of the month, but the flood stage was not reached except on the Mississippi River, where one of the worst floods in the history of the State occurred. The flood was caused principally from the discharge of streams in Wisconsin and Minnesota.

COMPARATIVE DATA FOR THE STATE—APRIL.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	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	−0.19	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	6.60	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	2.0	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
1915	57.2	+ 8.5	95	18	1.41	−1.45	4.02	0.05	T.	7	15	10	5
1916	47.1	− 1.6	90	11	2.62	−0.24	5.92	1.13	1.1	10	10	9	11
1917	45.5	− 3.2	88	17	4.55	+1.69	7.84	2.05	3.8	11	9	7	14
1918	44.8	− 3.9	79	12	2.32	−0.54	4.20	1.01	3.5	9	12	8	10
1919	48.4	− 0.3	81	20	4.78	+1.92	9.00	1.94	0.7	14	8	8	14
1920	42.4	− 6.3	78	22	4.59	+1.73	7.13	1.93	2.0	12	8	9	13
1921	52.4	+ 3.7	88	14	3.34	+0.48	6.69	0.99	3.6	10	13	7	10
1922	49.9	+ 1.2	87	21	3.06	+0.20	6.70	1.04	1.0	9	11	9	10

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

REPORT ON MISSISSIPPI RIVER FLOOD OF APRIL, 1922, DUBUQUE DISTRICT.

By Thomas A. Blair, Meteorologist.

Weather Bureau Office, Dubuque, Iowa, May 11, 1922.

Warm weather during the latter half of March over the drainage area of the Mississippi River above Dubuque, particularly in Minnesota and Wisconsin, had resulted in considerable run-off, raising the Mississippi and its tributaries above Dubuque to rather high levels. There followed during the first ten days of April frequent and moderately heavy rains, attended by unusually warm weather. Although the snow cover was thought to be less than the average, the result was a flood beginning at La Crosse on April 12, and reaching its maximum stage at Dubuque on the 21st, of a magnitude which has been equaled but three times in the past 50 years.

In the maximum stages reached this flood was very nearly the counterpart of that of March and April, 1920, but in the manner of rise there was considerable difference. In 1920 a rather rapid rise began immediately

after the breaking up of the ice, becoming very rapid as the crest of the flood was approached. In 1922 the river opened about the middle of March and from that time to the end of March moderately high stages, sufficient to overflow the lower islands and bottoms, were maintained with little change. Then began a continuous and approximately uniform rise until about five days before the peak was reached, then the rate increased considerably but did not attain the rate reached in 1920. In the latter half of its rise it resembled very closely the floods of 1880 and 1888, but these latter were more rapid in the early stages.

Maximum stages reached from La Crosse to Dubuque in the six floods of the past 50 years are shown in the accompanying table:

	Flood Stage	1880	1881	1888	1916	1920	1922
La Crosse	12	16.0	13.2	14.5	13.6	14.2	13.7
Lansing	18	.....	.....	.....	16.4	17.3	17.3
Prairie du Chien	18	21.5	19.0	20.0	18.3	19.6	19.4
Dubuque	18	21.7	20.2	21.4	19.8	21.0	21.0

It is evident that a large part of the flood waters came from above La Crosse, for the maximum stage there was 1.7 feet above flood stage, and the highest at Lansing was the same as that of two years ago, but a flood exceeding that of 1920 was in progress on the Wisconsin River at the same time and added considerably to the stages reached at Prairie du Chien and Dubuque. The peak of the Wisconsin flood wave reached Prairie du Chien, however about three days earlier than that from the Mississippi and hence the crests occurred at Prairie du Chien and Dubuque a little earlier and were a little lower than would have been the case if the Wisconsin flood had been a few days later.

From below La Crosse to below Lansing the damage was comparatively slight, as is usually the case with spring floods. The largest item aside from the injury to and the cost of protection of railroad roadbeds was the collapse of a warehouse filled with ice at Lansing. At Prairie du Chien about one-fourth of the town was under water, and the people were traveling on the streets by boat. As a result of the warnings, all live stock and much movable property were moved to higher portions of the city, while many families either moved from their residences altogether or moved to the second floors. Railroad traffic east into the Wisconsin Valley and north into the Kickapoo Valley was suspended. Opposite Prairie du Chien, at Marquette and McGregor, Iowa, buildings along the river front were inundated, causing interruption of business. Much land was overflowed in the vicinity of Cassville, Wis., and Waupeton, Iowa, causing a loss estimated at about $50,000.

At Dubuque the overflow was a duplicate of that of 1920. Many plants and establishments along the river front and on the lower ground back from the river were surrounded or partially surrounded by water, and several were forced to suspend operations. Practically all of the factories and wholesale houses in the southern end of the town suffered flooded basements. Considerable lengths of track of the Illinois Central, the Chicago, Burlington & Quincy, and the Chicago, Milwaukee & St. Paul railroads were under water, and traffic was diverted and partially suspended. Much labor and material were used in protecting tracks and

embankments from undermining. A high northwest wind on the 19th, when the river was within five inches of its maximum stage, added to the difficulties of the railroads and others in preventing the wearing away of dikes.

Many families living in the lowlands on both sides of the river were temporarily driven from their homes, and a much larger number had flooded basements. At least 14 cottages, situated on the islands in the vicinity of Dubuque and used as summer residences, were carried away by the flood waters in conjunction with the high wind on the 19th.

On April 12th, nine days before the crest of the flood reached Dubuque, flood warnings were issued for the entire district from below La Crosse to Dubuque. On April 17th definite forecasts of maximum stages were made, as follows: Lansing, 17.0 feet; Prairie du Chien, 19.5 feet; Dubuque, 21.0 feet. Warnings were distributed by mail to all towns in the district, an those having property subject to overflow in general did whatever could be done to remove or protect it, so that the preventable loss was slight.

Statistics of Money Loss by Flood in the Mississippi River, Dubuque River District, April, 1922.

Losses to tangible property that can only be restored by the outlay of cash, includes loss to buildings, factories, municipal plants, highways and bridges	$68,000
Losses to railroads, principally expenditures in protecting and restoring tracks and roadbeds	35,000
Loss of crops	10,000
Loss of prospective crops	3,500
Loss of live stock or other movable property	4,000
Loss due to suspension of business	20,000
Total losses reported	$140,500
Money value of property saved by warnings, as reported	154,000

MISSISSIPPI RIVER FLOOD

From below Dubuque to Muscatine, April, 1922.

By Andrew M. Hamick, Meteorologist.

Weather Bureau Office, Davenport, Iowa, May, 20, 1922.

During the first 21 days of April, 1922, rain fell on some part of the watershed of the Mississippi River from Muscatine northward on every day but three. The frequent rains, while not very heavy, except on the 10th and 16th, fell on a well-saturated soil and the run-off was above normal.

As an index of the general situation, note the conditions at Davenport: The precipitation during the month of March was 3.40 inches, 1.19 inches above normal. There were 21 cloudly days during the month, and consequently little evaporation. The percentage of possible sunshine was 42, 16 per cent below the normal for March.

The rivers were rising steadily in the vicinity of Prairie du Chien and Dubuque by the end of March, and the continued rainy weather during the first ten days of April made it apparent that a flood would be experienced in the Davenport District during the last decade of the month. Forecasts were issued daily for a steady rise, and on April 14 interests were advised that the crest stage would reach Davenport during the week of April 23-29. On April 17 a general flood warning was issued to the effect that the crest stages would equal those of the 1920 flood in this District. On Wednesday, April 19, the following definite stages were forecast: Clinton, 19.0 feet by Saturday; Le Claire, 13.0 feet by Saturday; Davenport, 17.0 feet by Saturday, and Muscatine, 19.0 feet by Saturday night. Those stages were reached within one-tenth of a foot at all stations.

At Davenport, the crest stage was 17.1 feet on April 23, exactly the same as the crest in the flood of 1920; at Clinton, the crest stage was 19.0 feet, during the night of April 21-22, exactly the same as the crest in 1920; at Le Claire the crest was 12.9 feet during the night of April 22-23, 0.5 foot less than the crest in 1920, but the difference was due to the gage readings being affected by a dam which has been built near Le Claire since 1920, as the overflowed area was practically the same; at Muscatine, the water rose above the permanent river gage, and a temporary gage showed a stage of 19.1 feet on the morning of the 23d, and reached the crest stage of 19.5 feet on the 24th, the highest of record. Levees in the vicinity of Muscatine have been strengthened considerably since the flood of 1920, and, therefore, a much higher gage reading resulted; the highest stage reached in 1920 was 18.0 feet, but the levees gave way and prevented what would have been at least another foot rise. On April 26, the levee broke at a point ten miles north of Burlington, and that relieved the situation at Muscatine, even though the crest had already been reached at the latter place.

Forecasts and warnings were given wide distribution by mail, newspapers, telephone, and radio, and all interests had ample time to protect their property. No losses were sustained as a result of being unprepared to meet the emergency. In the vicinity of Muscatine and New Boston hundreds of men worked day and night, patrolling and strengthening the levees; high northwest winds on April 19 made conditions critical for the Illinois side of the river, but fortunately the levees held, and favorable weather prevailed during the remainder of the week.

A careful survey of the Tri-Cities and their environs is summed up as follows.

Loss and damage due to flooding of property which could not be protected	$37,000
Added expenses, incurred in protection work	9,000
Losses due to suspension of business	1,000

Muscatine reports items similar to above and crop loss totaling $31,000, also that $400,000 worth of property was saved by the warnings.

No loss of life by drowning occurred in this District as a direct result of the flood.

MAY

May, 1922, was characterized by remarkably uniform temperatures, the range between the northern and southern divisions amounting to only 2.4° and the range for the State was the least ever recorded since State wide records began in 1890. For the second time in 33 years the minimum temperature did not reach the freezing point, the lowest temperature recorded being 34°, which is the highest May minimum of record, and only a few light frosts occurred on the 13th which did no damage. The mean temperature averaged nearly three degrees above the normal and most of the excess occurred during the first twelve days. During the rest of the month the temperature was near normal though mostly slightly below normal and the last two days rather cool.

The precipitation averaged more than an inch below normal and was very unevenly distributed. The greatest deficiency occurred in the northern division. The central and southern division averaged near normal due to decided excess over the central and south-central sections. Over much of the western and north-central portions of the State a drouth set in during April that was not relieved during the entire month of May and at the end of the month the drouth was serious over a large area. Up until the 23d only light showers occurred at frequent intervals, but on the 23d a general shower period set in that continued for five days over a large portion of the State and excessive amounts were recorded at many points in the central, south-central and southeastern portions of the State. Over this area farm work was temporarily stopped or greatly retarded and many corn fields became weedy and large patches were covered with water. At most stations reporting reavy amounts the rate of fall was moderate and most of the water was absorbed by the soil without causing serious flood damage, but at Burlington the rain fell at a remarkably rapid rate on the afternoon of the 26th, and a serious flood occurred. Rain began falling at 2:30 p. m. and increased rapidly and at 3:15 p. m. the total fall for 45 minutes from the time of beginning was 2.35 inches, which is one of the heaviest falls ever experienced in the State. The sewers were not adequate to carry the water from the streets and at points in the city the water was over four feet deep. Great damage was done to all kinds of property but power plants, railroads and business houses with goods stored in basements were the heaviest losers. The damage to property and goods in Burlington was estimated at $200,000, and the loss to crops, and buildings and railroads in the vicinity was probably as great.

Hail storms were frequent and covered much of the State and in localities were severe. On the evening of the 6th a storm occurred at Boone and vicinity that did considerable damage to greenhouses and crops and on the late afternoon a severe storm occurred in the vicinity of Iowa City that damaged fruit greatly, broke many window glasses and killed chickens. This storm assumed tornadic characteristics particularly near Tiffin, Johnson County, and did considerable damage to fruit trees and small farm buildings. On the afternoon of the 11th a tornado occurred about one mile southeast of Plainfield, Bremer County, which caused damage to a number of homes and destroyed a large number of farm

buildings. One man was severly injured; horses, cattle, hogs and chickens were killed and fruit trees suffered considerable damage as a result of this storm. The path of the storm where the greatest damage occurred was about two miles wide and four miles long.

Pressure. The mean pressure (reduced to sea level) for the State was 29.92 inches. The highest recorded was 30.38 inches at Dugubue, on the 28th, and the lowest was 29.41 inches at Davenport, on the 18th. The monthly range was 0.97 inch.

Temperature. The mean temperature for the State, as shown by the records of 98 stations was 63.4° or 2.9° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 61.9°, or 2.9° higher than the normal; Central, 64.0°, or 3.3° higher than the normal; Southern, 64.3°, or 2.6° higher than the normal. The highest monthly mean was 67.8°, at Fairport, and the lowest was 60.4°, at Estherville. The highest temperature reported was 91° at Cedar Rapids, on the 10th, and the lowest was 34° at Pocahontas on the 13th and Washta, on the 7th and 13th. The temperature range for the State was 57°.

Humidity. The average relative humidity for the State at 7 a. m. was 77 per cent, and at 7 p. m. it was 58 per cent. The mean for the month was 68 per cent, which is just normal. The highest monthly mean was 72 per cent, at Charles City, and the lowest was 62 per cent, at Sioux City.

Precipitation. The average precipitation for the State, as shown by the records of 100 stations, was 3.53 inches, or 1.04 inches less than the normal. By divisions the averages were as follows: Northern, 2.47 inches, or 2.01 inches less than the normal; Central, 3.92 inches, or 0.67 inch less than the normal; Southern, 4.21 inches, or 0.43 inch less than the normal.

The greatest amount, 8.36 inches, occurred at Ames, and the least, 0.47 inch, occurred at Algona. The greatest amount in 24 consecutive hours, 3.90 inches, occurred at Lacona, on the 24th

Wind. The prevailing direction was from the south. The average velocity was 8.0 miles per hour, or 0.7 mile less than the normal. The highest velocity reported from a regular Weather Bureau Station was at the rate of 48 miles an hour, from the southwest, at Sioux City, on the 11th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 59, or 3 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 56; Davenport, 55; Des Moines, 56; Dubuque, 52; Keokuk, 65; Sioux City, 54; Omaha, Nebr., 72.

Miscellaneous Phenomena. Aurora: 20th. Fog: 3d, 13th, 16th, 17th, 24th, 30th. Frost: (light) 13th. Hail: 2d, 3d, 5th, 6th, 8th, 11th, 12th, 13th, 14th, 15th, 16th, 20th, 24th, 25th, 26th, 28th, 30th. Halos: 1st, 2d, 3d, 4th, 7th, 8th, 13th, 14th, 15th, 27th. Rainbows: 5th, 15th, 16th, 17th, 26th. Thunderstorms: All dates except 1st, 7th, 19th, 20th, 21st, 28th, 29th, 31st. Tornadoes: 8th, 11th.

Rivers. Gradually falling stages prevailed on the Mississippi River except south of Clinton, where a slight rise occurred after the rains that set in on the 23d. Moderate stages prevailed on the Missouri River with very little fluctuation except about the middle of the month when a moderate rise occurred. Low stages prevailed on most interior rivers but a sharp rise accurred on the Skunk, Des Moines and Raccoon Rivers after the heavy rains the last week of the month.

COMPARATIVE DATA FOR THE STATE—MAY.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With prec. .01 in. or more	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	96	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	5.96	+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
1915 -----	56.1	−4.4	99	25	7.34	+2.77	13.21	3.82	T.	14	9	9	13
1916 -----	59.9	−0.6	94	27	4.93	+0.36	10.44	2.14	T.	12	13	10	8
1917 -----	55.1	−5.4	95	18	3.87	−0.70	7.33	1.69	0.6	10	15	8	8
1918 -----	64.9	+4.4	98	25	6.87	+2.30	11.96	2.72	T.	13	13	11	7
1919 -----	58.2	−2.3	93	30	3.11	−1.46	7.14	0.73	0	9	13	11	7
1920 -----	59.4	−1.1	89	29	3.26	−1.31	5.73	0.62	0	8	14	9	8
1921 -----	63.3	+2.8	99	25	4.23	−0.34	9.41	1.32	0	10	14	10	7
1922 -----	63.4	+2.9	91	34	3.53	−1.04	8.36	0.47	0	12	13	10	8

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

JUNE

June was considerably warmer than normal and unusually dry. The month opened cool and the first three days were the coldest of the month. After the third the temperature was continuously above normal except a single day near the middle of the month and a short period during the last week when temperatures were slightly below normal. The warmest day occurred over practically the entire State on the 23d and temperatures of 100°, or higher, were reported from a number of stations in the northwest portion.

The outstanding feature of the month's weather was a severe drouth that covered practically the entire State. The rainfall average for the State was the same as in 1911, which previous to this June was the driest of record. Light showers occurred at frequent intervals, but they were not sufficient to maintain the normal growth of staple crops. Corn had not advanced to a stage where it could be permanently injured, but the hot weather started the leaves to curl in many fields in the drier sections. Oats suffered most. Much of the crop in the west-central and northwest counties headed too short to be harvested and was grazed off. Barley and spring wheat also were injured. Pastures, hay, truck crops and gardens also suffered greatly on account of the dry weather. Winter wheat, alfalfa and rye were not materially injured. High winds were frequent and considerable damage resulted from this source to standing grain, farm buildings, windmills and trees, but they were all straight blows and no tornadoes are known to have occurred.

Hailstorms occurred at many places on many dates, but the damage was much less than usual on account of the storms being confined to smaller areas than ordinary. A rather severe storm in Union Township, Kossuth County, on the 5th did considerable damage to crops and killed several hundred chickens, a number of hogs and cattle and two horses. Another hailstorm, of more than ordinary severity, in Cerro Gordo County on the 12th caused much damage to crops and broke the glass in greenhouses. In both storms stones of unusual dimensions were reported and heaps of stones remained unmelted for ten hours.

The month was unusually favorable for all outside work. Building operations were carried on with practically no interruption and at the end of the month most of the corn crop had been laid by. The general rain the last of the month greatly relieved the drouth, but it came too late to save many gardens, truck crops and berries. Roads were unusually good during the entire month.

Temperature. The mean temperature for the State, as shown by the records of 95 stations, was 72.2°, or 3.1° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 70.9°, or 3.3° higher than the normal; Central, 72.6°, or 3.3° higher than the normal; Southern, 73.1°, or 2.8° higher than the normal. The highest monthly mean was 75.2°, at Glenwood and Thurman, and the lowest was 67.3°, at Postville. The highest temperature reported was 104°, at Inwood, on the 23d, and the lowest was 38°, at Decorah on the 1st and Washta on the 3d. The temperature range for the State was 66°.

Pressure. The mean pressure (reduced to sea level) for the State was 29.96 inches. The highest recorded was 30.37 inches, at Sioux City, on the 25th, and the lowest was 29.53 inches, at Sioux City, on the 10th. The monthly range was 0.84 inch.

Humidity. The average relative humidity for the State at 7 a. m. was 74 per cent, and at 7 p. m. was 51 per cent. The mean for the month was 62 per cent, or 8 per cent below the normal. The highest monthly mean was 67 per cent, at Dubuque, and the lowest was 58 per cent at Sioux City.

Precipitation. The average precipitation for the State, as shown by the records of 99 stations, was 1.82 inches, or 2.56 inches less than the normal. By divisions, the averages were as follows: Northern, 1.67 inches, or 2.76 inches less than the normal; Central, 1.34 inches, or 2.98 inches less than the normal; Southern, 2.46 inches, or 1.93 inches less than the normal. The greatest amount, 7.19 inches, occurred at Corning, and the least, 0.28 inch, at Iowa City. The greatest amount in 24 consecutive hours, 3.20 inches, occurred at Corning on the 30th.

Wind. The prevailing direction of the wind was from the southwest. The highest velocity reported from a regular Weather Bureau station was 67 miles an hour, from the south, at Sioux City on the 8th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 75, or 6 per cent above the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 74; Davenport, 82; Des Moines, 74; Dubuque, 70; Keokuk, 81; Sioux City, 61; Omaha, Nebr., 81.

Miscellaneous Phenomena. Fog: 2d, 3d. Hail: 4th, 5th, 9th, 10th, 12th, 13th, 15th, 18th, 25th, 26th. Halos (lunar and solar): 1st, 4th, 10th, 14th, 16th, 24th. Strong Winds: 4th, 5th, 6th, 8th, 12th, 13th, 15th, 18th, 22d, 23d, 24th. Thunderstorms: all days during the month except on the 1st, 2d, 3d, 4th, 7th, 17th, 21st, 23d, 29th.

Rivers. Low, gradually falling stages prevailed on the Mississippi River till the middle of the month, after which nearly stationary stages prevailed. Low and nearly stationary stages prevailed on all interior rivers. A moderate rise occurred on the Missouri River at the beginning of the month and a general rising tendency prevailed most of the time.

COMPARATIVE DATA FOR THE STATE—JUNE.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	72.7	+3.6	106	44	7.76	+3.38	16.53	1.57	.....	11	12	10	8
1891	69.1	0.0	99	37	5.39	+1.01	19.88	1.68	.....	11	8	10	12
1892	69.2	+0.1	102	42	5.19	+0.81	14.16	0.67	.....	10	12	11	7
1893	71.2	+2.1	100	40	3.91	−0.47	7.56	1.36	.....	8	15	11	4
1894	73.2	+4.1	104	34	2.67	−1.71	6.20	0.57	.....	7	16	10	4
1895	69.7	+0.6	102	34	4.32	−0.06	9.26	0.98	.....	10	11	11	8
1896	69.1	0.0	100	40	3.11	−1.27	7.89	0.81	.....	9	12	13	5
1897	69.1	0.0	103	29	3.81	−0.57	9.38	1.03	.....	10	10	12	8
1898	71.4	+2.3	99	42	4.72	+0.34	12.48	1.90	.....	9	13	10	7
1899	70.7	+1.6	100	42	5.04	+0.66	11.99	1.10	.....	10	12	13	5
1900	69.7	+0.6	102	38	3.98	−0.40	12.35	0.67	.....	5	17	10	3
1901	72.3	+3.2	106	30	3.71	−0.67	7.84	1.05	.....	9	15	11	4
1902	65.2	−3.9	97	32	7.16	+2.78	16.04	1.46	.....	14	8	11	11
1903	64.6	−4.5	96	30	2.86	−1.52	6.04	0.75	.....	10	13	10	7
1904	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
1915	65.1	−4.0	91	31	4.16	−0.22	9.99	1.72	.....	11	12	12	6
1916	64.5	−4.6	96	38	3.71	−0.67	7.96	1.41	.....	10	13	11	6
1917	66.0	−3.1	100	32	6.65	+2.27	13.82	3.04	.....	12	13	10	7
1918	70.8	+1.7	104	38	5.29	+0.91	10.19	1.55	.....	11	16	10	4
1919	71.9	+2.8	98	41	6.13	+1.75	12.25	1.82	.....	13	12	12	6
1920	70.7	+1.6	99	40	3.56	−0.82	8.48	1.25	.....	9	16	10	4
1921	74.7	+5.6	100	40	3.76	−0.62	8.85	0.56	.....	9	16	10	4
1922	72.2	+3.1	104	38	1.82	−2.56	7.19	0.28	.....	6	19	8	3

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

JULY

July was cool and wet. Since State-wide records began in 1890 there have been but five times that the mean temperature for July has been lower and only four times has there been more rainfall. The month was characterized by remarkably uniform temperature, the entire absence of hot periods and an unusual number of damaging wind, hail and thunderstorms.

The mean temperature for the month was 2.6° below normal and the deficiency was uniform over all divisions. This is the first month of the year that the mean temperature has been below normal and the second since August, 1920. Over most of the northern division, about half of the central and a large portion of the southern division the maximum temperature was below 90° and only once since 1890 has the maximum for the State been lower.

There was a decided excess in precipitation and all stations, except a few in the northern division, reported more than the normal. The first general rainstorm set in on the 5th, and the drouth that had prevailed over portions of the State since May was effectually broken, except in a few small areas, and thereafter rather general thunderstorms occurred at frequent intervals and at the end of the month there was sufficient moisture over the entire State. Nearly all the rains were attended by severe hail, strong winds and destructive lightning and the damage from these sources was unusually heavy. The first hailstorm of a damaging character occurred on the evening of the 5th, starting near the junction of Calhoun, Green and Webster Counties and moving southeastward across Boone County to the southern portion of Story County and the northern portion of Polk County. Many thousand acres of corn were severely damaged and areas covering whole sections were entirely ruined. One township in Story County reported damage ranging from 10 to 85 per cent to 20,000 acres and the entire loss in this storm from wind and hail probably exceeded $1,000,000. Another severe hail and windstorm occurred in Bremer and Blackhawk Counties on the 15th that damaged corn and other crops over a large area. On the late afternoon of the 16th a severe hail, wind and electric storm developed in the northern portion of Green County and moved southeastward to Jasper County. At Paton, Boone, Colfax and Newton tornadic characteristics developed and many buildings were wrecked fruit and shade trees uprooted and cornfields leveled, but the greatest damage came from hail, which entirely destroyed many fields. Floyd and Bremer Counties were visited by a severe wind and hailstorm on the night of the 29th-30th that did much damage to crops and small buildings. The storm apparently originated in Minnesota and moved across Mitchell County into Floyd and Bremer Counties and increased in severity and disappeared in Chickasaw County. Tornadic characteristics were evident at Colwell, Floyd County, but the principal damage was caused by hail and straight winds. A large number of scattered hail and windstorm occurred over the State that did considerable damage. A detailed account will appear in the August report.

The losses caused by the destructive storms were more than offset by the benefit derived from the copious rainfall and the corn crop generally became excellent in condition, other growing crops greatly revived and pastures and meadows were almost as green as in early spring. The soil was in good condition for plowing and many acres were prepared for winter wheat. Small grain, both in shock and standing, were damaged greatly by the continued wet weather and wind. The apple crop is unusually heavy and many trees are breaking down under the great load of fruit.

Pressure. The mean pressure (reduced to sea level) for the State was 30.00 inches. The highest pressure recorded was 30.35 inches, at Dubuque, on the 13th, and the lowest was 29.46 inches, at Sioux City, on the 9th. The monthly range was 0.54 inch.

Temperature. The mean temperature for the State, as shown by the records of 98 stations, was 71.5°, or 2.6° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 69.8°, or 2.9° lower than the normal; Central, 71.7°, or 2.6° lower than the normal; Southern, 73.0°, or 2.2° lower than the normal. The highest monthly mean was 75.5°, at Keokuk, and the lowest was 67.2°, at Postville. The highest temperature recorded was 98°, at Burlington, on the 9th, and the lowest was 40°, at Estherville, on the 7th. The temperature range for the State was 58°.

Humidity. The average relative humidity for the State at 7 a. m. was 79 per cent, and at 7 p. m. it was 57 per cent. The mean for the State was 68 per cent, which is the normal. The highest monthly mean was 72 per cent, at Charles City, and the lowest was 62 per cent at Keokuk.

Precipitation. The average precipitation for the State, as shown by the records of 100 stations, was 6.31 inches, or 2.35 inches more than the normal. By divisions the means were as follows: Northern, 5.23 inches, or 1.35 inches more than the normal; Central, 6.59 inches, or 2.61 inches more than the normal; Southern, 7.11 inches, or 3.09 inches more than the normal. The greatest amount, 11.72 inches, occurred at Mt. Ayr, and the least, 3.13 inches, at Northwood. The greatest amount in 24 consecutive hours was 4.32 at Fayette, on the 6th and 7th.

Wind. The prevailing direction of the wind was from the south. The highest velocity reported from a regular Weather Bureau station was 48 miles per hour, from the northeast, at Sioux City, on the 8th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 64, or 10 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 65; Davenport, 65; Des Moines, 56; Dubuque, 60; Keokuk, 75; Sioux City, 53; Omaha, Nebr., 74.

Miscellaneous Phenomena. Fog: 11th, 30th. Hail: 5th, 6th, 8th, 9th, 15th, 16th, 25th, 26th, 28th, 30th. Halos (Lunar and Solar): 6th, 11th, 20th, 21st, 28th. Rainbow: 15th, 31st. Thunderstorms: all dates during the month except 3d, 4th, 13th, 18th. Tornado: 16th, 29th.

Rivers. Moderate stages prevailed on the principal rivers with very little change except following the heavy rainstorms. Stages were generally low in the interior rivers, though rather high in the lower reaches of the Des Moines and Skunk Rivers following the heaviest rains. Most of the rains were absorbed by the soil and the run-off was gradual.

COMPARATIVE DATA FOR THE STATE—JULY.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre., .01 in. or more	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	109	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
1915	69.5	−4.6	92	40	8.32	+4.36	15.83	3.68	.....	14	10	12	9
1916	79.7	+5.6	105	48	1.78	−2.18	6.87	0.10	.....	5	23	7	1
1917	74.3	+0.2	106	38	2.27	−1.69	6.06	0.23	.....	7	21	8	2
1918	73.1	−1.0	105	40	3.17	−0.79	8.05	0.26	.....	8	19	8	4
1919	77.4	+3.3	104	41	2.86	−1.10	7.82	0.39	.....	6	22	8	1
1920	72.3	−1.8	102	45	4.22	+0.26	7.49	1.11	.....	9	19	9	3
1921	77.9	+3.8	104	41	2.53	−1.43	7.45	0.42	.....	7	19	9	3
1922	71.5	−2.6	98	40	6.31	+2.35	11.72	3.13	.....	11	14	12	5

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

AUGUST

August was the warmest month of the season. The mean temperature for the State averaged two degrees above the normal and the excess was general except over small areas along the south-central border and the extreme northeastern corner. Most of the excess in temperature occurred in the period beginning about the middle of the second week and continuing until the 24th, when the daily mean temperature was continuously above normal, though there were no periods of unusually high temperature and only a few days had very high maxima. Over most of the State the highest temperature occurred on the 24th when a decided change to cooler occurred, the drop in temperature amounting to nearly 50 degrees at a number of stations. The only cool periods occurred immediately preceding and following the principal warm period.

The precipitation was characterized by contrasts and more than 75 per cent of the State had considerably less than the normal for August. A few stations along the Mississippi river in the east-central portion had less than half an inch while in the west-central portion two stations re-

ported more than nine inches. Harlan with over nine inches had but four days with appreciable precipitation and Davenport with only 0.48 inch had appreciable precipitation on eleven days, Le Claire had nine days with .01 inch, or more, and the total amount was only 0.33 inch. In the area of the greatest precipitation some damage resulted to grain that was still in shock and over much of the northern and eastern portions of the State the lack of rainfall interfered with plowing and, in connection with low humidity that prevailed, caused a large amount of corn to ripen prematurely and burned pastures brown and cut short gardens and truck crops.

A large portion of the State was visited by hail storms which caused much damage to crops. The first storm occurred on the 1st and affected portions of Dubuque, Jackson, Delaware, Linn and Jones Counties. Light hail fell over most of the counties mentioned but the severe hail was confined to numerous patches. Dubuque reported one of the most severe storms ever experienced but the greatest destruction to crops occurred in an irregular strip from one-half to four miles wide and forty miles long from the northwest corner of Delaware County southeastward. Hail drifted to a depth of six inches and the total damage was nearly $500,000. The most severe hail storm occurred on the 9th, and covered a large area in the west-central portion, but the greatest damage occurred in Crawford, Shelby, Audubon and Guthrie Counties. The principal damage was to corn but chickens and young pigs were reported killed by the score and two cows were killed. Many thousand acres of corn were damaged in varying degrees and in portions of the area whole sections were hailed out so completely that not a single whole stalk of corn was left standing. In Guthrie County fields were white with hail and ditches two feet deep were completely filled. Four days after the storm there was sufficient hail in ditches to make ice cream. The damage from this storm exceeded $500,000. Another severe storm occurred on the 16th over much of the same counties as on the 9th, but no reliable estimate could be made of the damage done on account of the previous damage.

Severe local wind squalls occurred in the vicinity of Mason City on the 18th and at Cedar Rapids on the 24th that caused considerable damage to small buildings, broke telephone and telegraph wires, leveled corn fields and knocked apples off. The heavy rains of the 30th caused washouts and road traffic was interrupted for several days.

Pressure. The mean pressure (reduced to sea level) for the State was 29.97 inches. The highest recorded was 30.21 inches, at Dubuque and Davenport, on the 14th, and the lowest was 29.59 inches, at Dubuque, on the 31st. The monthly range was 0.62 inch.

Temperature. The mean temperature for the State, as shown by the records of 100 stations, was 73.8°, or 2.0° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 72.9°, or 2.5° higher than the normal; Central, 74.0°, or 2.3° higher than the normal; Southern, 74.4, or 1.2° higher than the normal. The highest monthly mean was 76.8° at Thurman, and the lowest was 69.1° at Postville. The highest temperature recorded was 102°, at Belmond, on the 17th and Clarinda on the 24th, and the lowest was 42°, at Mason City, on the 8th. The temperature range for the State was 60°.

Precipitation. The average precipitation for the State as shown by the records of 102 stations, was 3.06 inches, or 0.62 inch less than the normal. By divisions the averages were as follows: Northern, 2.50 inches, or 0.98 inch less than the normal; Central, 2.82 inches, or 0.95 inch less than the normal; Southern, 3.87 inches, or 0.09 inch more than the normal. The greatest amount, 9.80 inches, occurred at Atlantic, and the least, 0.33 inch occurred at Le Claire. The greatest amount in 24 consecutive hours, 5.83 inches, occurred at Atlantic on the 30th.

Humidity. The average relative humidity for the State at 7 a. m., was 80 per cent, and at 7 p. m., was 60 per cent. The mean for the month was 70 per cent, or 2 per cent less than the normal. The highest monthly mean was 74 per cent at Charles City, and the lowest was 64 per cent at Davenport.

Wind. The prevailing direction of the wind was from the south. The highest velocity reported from a regular Weather Bureau Station was 43 miles per hour at Sioux City, from the north on the 17th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 71, or 1 per cent more than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 73; Davenport, 73; Des Moines, 67; Dubuque, 60; Keokuk, 73; Sioux City, 72; Omaha, Nebr., 80.

Miscellaneous Phenomena. Aurora: 24th, 25th. Fog: 9th, 10th, 22d, 23d, 24th. Hail: 1st, 6th, 8th, 9th, 10th, 17th, 23d, 25th, 26th, 28th, 30th. Halos (Lunar and Solar): 2d, 6th, 26th. Thunderstorms: all dates except 3d, 4th, 5th, 12th, 14th, 16th, 19th, 27th.

Rivers. Low, gradually falling stages prevailed on the Mississippi River and moderate stages with considerable fluctuation, but mostly falling stages prevailed on the Missouri River. A few moderate rises occurred on the interior rivers in the southern portion of the State on the 24th and high stages occurred in the southwestern portion following the heavy rain on the 30th.

COMPARATIVE DATA FOR THE STATE—AUGUST.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	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	−1.44	4.69	0.65	.....	5	18	9	4
1893	69.4	−2.4	101	39	2.22	−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	16.63	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
1915	65.9	−5.9	91	30	2.81	−0.87	9.14	0.27	.....	8	16	8	7
1916	74.0	+2.2	106	35	2.58	−1.10	6.23	0.49	.....	7	18	9	4
1917	69.4	−2.4	102	31	2.29	−1.39	6.31	0.70	.....	7	19	8	4
1918	76.0	+4.2	113	38	3.61	−0.07	8.38	0.54	.....	8	16	10	5
1919	71.5	−0.3	103	38	2.59	−1.09	5.72	0.97	.....	7	19	9	3
1920	69.3	−2.5	98	39	3.35	−0.33	8.52	0.44	.....	7	18	8	5
1921	72.1	+0.3	102	37	5.04	+1.36	9.04	2.20	.....	8	16	11	4
1922	73.8	+2.0	102	42	3.06	−0.62	9.89	0.33	.....	8	19	8	4

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

SEPTEMBER

September was warm and considerably drier than the average. The chief characteristic of the month was a remarkably warm period that prevailed the first eight days. Another outstanding feature was a period of almost continous sunshine that occurred from the 20th until the 27th. The first week ranked with the warmest of the season and over most of the State the highest temperatures of the year occurred. A large number of stations in the eastern and northern portions of the State, including two regular Weather Bureau Stations, reported the highest September maxima of record and the record of one station extends over a period of more than 50 years. Light frost occurred over the northwestern portion of the State on the 10th and on the 11th light frost was general in low lands over nearly all sections. Light frost also occurred on the 16th, 25th, 26th and 27th. Only one station reported a temperature below freezing, but no damage whatever resulted from frost.

The precipitation was below normal over practically the entire State and there was only two shower periods of any consequence, and taking the

State as a whole, more than half of the monthly total occurred during a single 24-hour period. While the precipitation was generally deficient, there was sufficient to keep pastures in good condition and benefited truck crops, but the lack of rain over the northern and western portions of the State caused a suspension of plowing, prevented the germination of winter wheat and caused a shortage of stock water. The weather was unusually favorable for the maturing of the corn crop and at the end of the month not more than 6 per cent was susceptible to injury from frost. Low humidity, hot weather and an excess of sunshine caused some corn to mature too rapidly so it became loose on the cob and lessened the yield somewhat. The dry weather retarded the seeding of winter wheat somewhat, but much seeding was intentionally delayed to avoid the Hessian fly pest.

No severe storms of any character occurred during the month. The only damage reported was from a local wind squall in the northern portion of Cerro Gordo County that blew down a number of telephone poles, frail buildings and trees. Roads were in good condition except somewhat rough after the rainy periods and all outside work was carried on with very little interruption.

Pressure. The mean pressure (reduced to sea level) for the State was 30.07 inches. The highest recorded was 30.54 inches, at Dubuque, on the 16th, and the lowest was 29.62 inches, at Des Moines, on the 1st and Sioux City, on the 5th. The monthly range was 0.92 inch.

Temperature. The mean temperature for the State, as shown by the records of 100 stations, was 67.1°, or 3.7° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 66.0°, or 4.2° higher than the normal; Central 67.3°, or 3.8° higher than the normal; Southern, 68.1°, or 3.1° higher than the normal. The highest monthly mean was 70.4°, at Fairport, and the lowest was 63.0°, at Postville. The highest temperature reported was 103°, at Belle Plaine and Mason City, on the 6th, and the lowest was 31°, at Washta, on the 11th. The monthly range for the State was 72°.

Precipitation. The average precipitation for the State, as shown by the records of 103 stations, was 2.03 inches, or 1.33 inches less than the normal. By divisions, the averages were as follows: Northern, 1.69 inches, or 1.36 inches less than the normal; Central, 2.24 inches, or 1.22 inches less than the normal; Southern, 2.17 inches, or 1.39 inches less than the normal. The greatest amount, 4.34 inches, occurred at Iowa Falls, and the least, 0.31 inch, occurred at Inwood and Milford. The greatest amount in 24 consecutive hours, 3.05 inches, occurred at Le Mars, on the 18th.

Humidity. The average relative humidity for the State at 7 a. m. was 81 per cent, and at 7 p. m. was 60 per cent. The mean for the month was 70 per cent, or 4 per cent below the normal. The highest monthly mean was 77 per cent at Charles City, and the lowest was 62 per cent, at Sioux City.

Sunshine. The average per cent of the possible amount of sunshine was 71, which is 9 per cent above the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles

City, 71; Davenport, 73; Des Moines, 69; Dubuque, 63; Keokuk, 71; Sioux City, 73; Omaha, Neb., 77.

Wind. The prevailing direction of the wind was from the south. The highest velocity reported from a regular Weather Bureau station was at the rate of 33 miles per hour, from the north, at Sioux City, on the 8th.

Rivers. Low stages prevailed on all rivers with very little fluctuation, but with a falling tendency prevailing. Only once in September has a lower mean stage been recorded at Dubuque.

Miscellaneous Phenomena. Fog: 1st, 2d, 3d, 4th, 14th, 15th, 18th, 19th, 20th, 21st, 22d, 23d, 26th, 27th, 28th. Frost light: 10th, 11th, 16th, 25th, 26th, 27th. Hail: 8th, 17th. Halos: 1st, 10th, 15th. Rainbow: 7th. Thunderstorms: 1st, 2d, 4th, 6th, 7th, 8th, 9th, 10th, 13th, 15th, 16th, 17th, 18th, 19th, 29th, 30th.

COMPARATIVE DATA FOR THE STATE—SEPTEMBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	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	—2.03	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	4.08	+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	30	1.20	—2.16	3.46	0.25	-------	3	21	6	3
1909	62.4	—1.0	94	30	3.58	+0.22	7.84	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	7.58	+4.22	16.24	2.48	-------	10	16	7	7
1915	63.7	+0.3	91	30	6.03	+2.67	12.45	2.88	-------	11	11	8	11
1916	62.5	—0.9	98	21	3.89	+0.53	9.71	1.45	-------	7	17	8	5
1917	62.6	—0.8	97	28	2.90	—0.46	8.68	0.39	-------	7	15	7	8
1918	58.6	—4.8	93	26	1.87	—1.49	4.62	0.48	-------	6	16	8	6
1919	67.5	+4.1	99	33	5.34	+1.98	11.82	1.49	-------	8	16	6	8
1920	66.5	+3.1	98	24	3.20	—0.06	7.21	0.69	-------	8	17	8	5
1921	67.3	+3.9	99	31	6.72	+3.36	11.95	1.72	-------	11	14	8	8
1922	67.1	+3.7	103	31	2.03	—1.33	4.34	0.31	-------	6	20	6	4

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

OCTOBER

October was warm and dry, being considerably warmer and drier than October, 1921, and since records of the State have been kept there have been but four Octobers with higher mean temperatures. Of the last 26 consecutive months, this month makes 24 that have been warmer than the normal. There were two unusually warm periods, the first six and the last eight days. At a number of stations in all sections the maxima for October were equalled, and never before have such high maxima occurred so late in the season as occurred on the 27th and 28th. Killing frosts occurred on the 9th over a large area in the northwestern portion and on the 12th over most of the State except a few Mississippi River counties which did not experience a killing frost until the 18th. The corn crop was practically all matured when the frosts occurred and the damage was of very little consequence.

Precipitation was deficient over all sections, though there were local areas in all sections that had an excess, but only one station had an important excess. The lack of precipitation was magnified by the fact that at a large number of stations most of the total occurred on the last two days and at most other stations the greater portion occurred in a single shower period on the 5th-6th.

The weather was favorable for all outdoor work and while the dry weather prevented fall plowing in some sections, conditions were very favorable for gathering corn and at the close of the month a large amount had been cribbed. The dry weather also retarded the germination of some wheat fields but over most of the State the precipitation was ample for germination and the average condition was very good considering that seeding had been generally delayed to avoid the Hessian fly.

The month was free from severe storms and except for short periods the roads were unusually good. Clear days averaged 21 over the State which has never been exceeded by October.

There was a serious shortage of freight cars and this condition prevented the marketing of valuable truck crops. In the chief truck growing center every available warehouse was filled and some fields were not gathered for the lack of storage room.

Pressure. The mean pressure (reduced to sea level) for the State was 30.00 inches. The highest recorded was 30.43 inches at Sioux City, on the 12th, and the lowest was 29.45 inches at Sioux City, on the 28th. The monthly range was 0.98 inch.

Temperature. The mean temperature for the State, as shown by the records of 98 stations, was 56.1°, or 5.3° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 54.4°, or 5.4° higher than the normal; Central, 56.4°, or 5.5° higher than the normal; Southern, 57.4°, or 4.8° higher than the normal. The highest monthly mean was 59.6°, at Columbus Junction, and the lowest was 52.0°, at Estherville. The highest temperature reported was 96°, at Guthrie Center on the 4th, and the lowest was 14° at Little Sioux on the 17th. The temperature range was 82°.

Humidity. The average relative humidity for the State at 7 a. m. was 77 per cent, and at 7 p. m. it was 53 per cent. The mean for the month was 65 per cent, or 6 per cent less than the normal. The highest monthly mean was 74 per cent at Charles City, and the lowest was 59 per cent at Sioux City. The lowest observed was 20 per cent at Keokuk on the 11th, and Sioux City on the 24th.

Precipitation. The average precipitation for the State, as shown by the records of 103 stations, was 1.81 inches, or 0.65 inch less than the normal. By divisions, the averages were as follows: Northern, 2.06 inches, or 0.28 inch less than the normal; Central, 1.66 inches, or 0.83 inch less than the normal; Southern, 1.70 inches, or 0.84 inch less than the normal. The greatest amount, 3.93 inches, occurred at Fayette, and the least 0.06 inch, at Davenport (Pine Acres). The greatest amount in 24 consecutive hours, 2.75 inches, occurred at Fayette, on the 6th and 7th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 72, or 12 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 68; Davenport, 70; Des Moines, 72; Dubuque, 69; Keokuk, 71; Sioux City, 77, Omaha, Nebr., 75.

Wind. The prevailing direction of the wind was from the southwest. The highest velocity reported from a regular Weather Bureau station was at the rate of 42 miles per hour, from the northwest, at Sioux City on the 16th.

Snow. A few light snow flurries occurred in each division, but no station reported more than a trace.

Miscellaneous Phenomena. Fog: 1st, 2d, 3d, 9th, 10th, 14th, 15th, 16th, 26th 31st. Frost (Killing): 9th, 12th, 15th, 17th, 18th. Hail: 11th. Halos (Lunar and Solar): 3d, 4th, 27th, 28th. Sleet: 13th. Thunderstorms. 6th, 7th, 8th, 10th, 13th, 14th, 16th, 20th, 21st, 22d, 30th and 31st.

Rivers. Low and nearly stationary stages prevailed on all the rivers of the State. At most places along the principal rivers the extreme variations of the stages were less than half a foot.

COMPARATIVE DATA FOR THE STATE—OCTOBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall.	With pre. .01 in. or more	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	1	7	8
1892	54.5	+3.7	96	14	1.55	−0.91	2.58	0.0	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	29	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	5	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
1915	54.4	+3.6	86	19	1.31	−1.15	3.25	T.	T.	5	19	6	6
1916	50.9	+0.1	92	6	2.00	−0.46	4.33	0.20	2.0	8	16	7	8
1917	42.9	−7.9	85	0	1.41	−1.05	4.00	0.15	2.2	6	10	11	10
1918	55.1	+4.3	93	21	3.64	+1.18	7.56	1.26	0.8	7	13	7	11
1919	50.7	−0.1	89	8	3.02	+0.56	8.65	0.45	T.	10	11	8	12
1920	57.7	+6.9	90	11	2.13	−0.33	4.64	0.48	T.	6	19	6	6
1921	54.6	+3.8	99	21	1.96	−0.50	3.61	0.21	T.	6	17	8	6
1922	56.1	+5.3	96	14	1.81	−0.65	3.93	0.06	T.	5	21	4	6

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

NOVEMBER

November was decidedly warm and wet. Since state wide records began in 1890, there have been but three warmer Novembers and only one with more precipitation. The temperature excess was uniform over the state and nearly continuous, there being only five days below normal, and over no portion of the state were there more than two consecutive days below normal. The minimum temperature for the state, 11 degrees, was the highest ever recorded in November and the range in temperature, 63 degrees, the least.

Precipitation as well as temperature, showed an excess at every station. Compared with the state average, the distribution was the most uniform ever experienced in November. Only three times in the last 33 years has the precipitation shown an excess at every station in the state in November. Over 90 per cent of the precipitation occurred during the first 18 days and there were four general rainy periods, the principal one extending from the 11th to the 13th. The rain that occurred on the 5th, in connection with a rather severe storm that passed along the western

border, was accompanied by strong winds that blew down some corn, and owing to the soft conditions of the fields corn husking was nearly impossible the greater portion of the first three weeks so that a small per cent that was down started to germinate and rot in the muddy fields. After the 18th the weather was favorable for all outdoor work; corn husking was pushed and at the close of the month 14 per cent or about the normal amount remained to be gathered.

The warm wet weather caused all vegetation to make unusual growth. Pastures were in excellent condition generally, dandelions were in bloom and reports were numerous from all portions of the state of ripe strawberries and hardy vegetables taken from the garden at the end of the month. The weather was generally favorable for winter wheat, particularly the late sown, but some of the early sown was injured by the Hessian fly. Bees were able to make a good flight during the high temperature that was general on the 30th and were ready to go into winter quarters in good condition.

Unusually high wind velocities accompanied the storms that passed over the state on the 5th and 30th. On the 30th Des Moines experienced the highest wind velocity of record for November (52 miles per hour from the southwest) and in the last 45 years there have been but three times in any month that a higher wind velocity has been reached.

The roads were in bad condition most of the first three weeks, and especially bad after the general rain from the 11th to the 13th. It is reliably reported that 1,000 automobiles were stranded on the principal highways leading out of Iowa City following a big home coming celebration on the 11th, to which a large number of persons had motored from surrounding States.

Pressure. The mean pressure (reduced to sea level) for the state was 30.08 inches. The highest was 30.49 inches at Sioux City, on the 24th, and the lowest was 29.30 inches at Sioux City, on the 5th. The monthly range was 1.19 inches.

Temperature. The mean temperature for the state, as shown by the records of 97 stations, was 42.2°, or 7.2° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 40.1°, or 7.3° higher than the normal; Central, 42.7°, or 7.6° higher than the normal; Southern, 43.8° of 6.7° higher than the normal. The highest monthly mean was 45.4°, at Keokuk, and the lowest was 37.6°, at Sanborn. The highest temperature reported was 74°, at Clarinda, on the 4th, and the lowest was 11°, at Decorah, on the 25th. The temperature range for the state was 63°.

Precipitation. The average precipitation for the state, as shown by the records of 100 stations, was 3.54 inches, or 2.03 inches more than the normal. By divisions, the averages were as follows; Northern, 3.58 inches, or 2.17 inches more than the normal; Central, 3.36 inches, or 1.83 inches more than the normal; Southern, 3.69 inches, or 2.11 inches more than the normal. The greatest amount, 5.28 inches, occurred at Iowa City, and the least, 1.96 inches, at Perry. The greatest amount in 24 consecutive hours, 2.08 inches, occurred at Glenwood, on the 1st.

Wind. The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau station was at the rate of 56 miles per hour, from the southwest, at Sioux City, on the 30th.

Snowfall. The average snowfall for the state was 0.3 inch, or 2.2 inches less than the normal. Only twice, in 1912 and 1914 when only a trace was reported, has a less amount of snow occurred in November. The measurable snowfall was confined to the northeastern portion of the state and a small area in the extreme northwest corner. The snow in the northwestern portion occurred on the 12th and in the northeastern portion on the 27th. None of the snow remained on the ground more than three days. In the southern division only three stations reported snowfall, and these only a trace.

Humidity. The average relative humidity for the state at 7 a. m. was 82 per cent and at 7 p. m. 72 per cent. The mean for the month was 77 per cent, or 1 per cent above the normal. The highest mean was 84 per cent at Charles City, and the least was 73 per cent, at Keokuk.

Sunshine. The average per cent of the possible amount of sunshine was 45 per cent, or 7 per cent less than the normal. The per cent of the possible amounts at the regular Weather Bureau stations was as follows: Charles City, 28; Davenport, 45; Des Moines, 53; Dubuque, 31; Keokuk, 53; Sioux City, 47; Omaha, Nebr., 57.

Miscellaneous Phenomena. Fog: 1st, 2d, 3d, 9th, 12th, 13th, 17th, 21st, 28th, 30th. Hail: 4th. Halos (Lunar and Solar): 4th, 10th, 24th, 29th, 30th. Rainbows: 1st, 17th. Sleet: 12th. Thunderstorms: 1st, 3d, 4th, 5th, 10th, 11th, 12th, 13th, 30th. Winds, strong: 5th, 6th, 7th, 23d, 27th, 28th, 29th, 30th.

Rivers. Moderate rises accurred on the Missouri and most interior rivers after the general rain that set in on the 11th, but during most of the month low and nearly stationary stages prevailed. On the Mississippi River low and nearly stationary stages prevailed throughout the month but with a slight tendency to higher stages. All rivers remained open the entire month.

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. or more	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	0.66	------	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
1915	40.2	+5.2	83	— 5	1.94	+0.43	4.86	0.30	1.2	6	11	10	9
1916	37.3	+2.3	80	— 8	1.61	+0.10	3.65	0.05	3.6	5	16	6	8
1917	40.7	+5.7	77	3	0.28	—1.23	1.02	T.	1.4	3	14	6	10
1918	39.9	+4.9	76	0	2.11	+0.60	5.10	0.70	4.4	7	13	5	12
1919	33.6	—1.4	68	—12	3.40	+1.89	6.22	1.97	6.3	8	11	7	12
1920	35.4	+0.4	71	5	2.18	+0.67	4.45	0.73	1.2	8	10	5	15
1921	33.6	—1.4	70	— 5	0.58	—0.93	1.61	T.	3.4	5	10	5	15
1922	42.2	+7.2	74	11	3.54	+2.03	5.28	1.96	0.3	9	11	6	13

T. indicates an amount too small to measure, or less than .006 inch rainfall, and less than .05 inch snowfall.

DECEMBER

December was an unusually pleasant month with the temperature very near the normal. The month opened with a mild period extending to the 5th over most of the State, followed by a rather severe cold period that continued through the 20th. Zero weather was general over the entire State. A number of stations in the northern portion of the State reported zero weather on 12 days which gradually diminished to the south and at Keokuk zero was reached on but a single day. From the 21st till the end of the month an unusually mild period prevailed, and while no abnormally high temperatures were experienced, the high record for Christmas was exceeded at many places in all portions of the State. For the State as a whole the temperature averaged 0.1° higher than the normal, the northern half being generally below and the southern half generally above the normal.

The precipitation, 0.37 inch, was with one exception the least of record for December, the same amount having been recorded in 1910. The average number of days with 0.01 inch or more, of precipitation was three and this also equaled the record for December. There were but two periods

of general precipitation, 6th-7th, and 14th. On the 6th-7th a light rain over most of the State froze to all exposed surfaces. This thin sheet of ice continued for several days. It was not sufficiently heavy to seriously interfere with rail traffic, but walking, especially in cities, was difficult and dangerous and many accidents to pedestrians resulted. Many automobiles were damaged by skidding and a great many that were without chains slid into ditches and had to be temporarily abandoned.

The month was free from severe storms. The snowfall was unusually light, but during the most severe weather, most of the State was covered sufficiently to prevent serious damage to winter wheat. It did not drift nor interfere with traffic. Building operations were checked temporarily by cold weather but conditions were generally favorable for out door work and at the close of the month very little corn remained to be gathered.

During the cold weather the ice rapidly increased in thickness and some was harvested but the continued mild weather reduced the thickness and made it too soft and spongy to store. More cold weather is needed to insure an adequate ice harvest.

Except for the ice that prevailed during the early part of the month the roads were in good condition, but the alternate freezing and thawing made all roads somewhat rough the latter part of the month.

The Mississippi River at Keokuk reached the lowest stage ever experienced, 3.1 feet below the zero of the gage. The continued low stage caused great trouble and expense to manufacturing interests.

Pressure. The mean pressure (reduced to sea level) for the State was 30.12 inches. The highest recorded was 30.76 inches, at Dubuque, on the 18th, and the lowest was 29.42 inches, at Sioux City, on the 29th. The monthly range was 1.33 inches.

Temperature. The mean temperature for the State as shown by the records of 100 stations, was 24.0°, or 0.1° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 19.8°, or 1.4° lower than the normal; Central, 24.4°, or 0.3° higher than the normal; Southern, 27.7°, or 1.3° higher than the normal. The highest monthly mean was 30.5°, at Keokuk, and the lowest 16.4°, at Sanborn. The highest temperature recorded was 65°, at Thurman, on the 29th, and the lowest was 25° below zero at Decorah, Nora Springs and Rock Rapids, on the 18th. The temperature range for the State was 90°.

Humidity. The average relative humidity for the State at 7 a. m. was 79 per cent, and at 7 p. m. was 68 per cent. The mean for the month was 74 per cent, which is 7 per cent below the normal. The highest monthly mean was 86 per cent at Charles City, and the lowest was 68 per cent at Keokuk.

Precipitation. The average precipitation for the State, as shown by the records of 101 stations, was 0.37 inch, or 0.85 inch less than the normal. By divisions the averages were as follows: Northern, 0.43 inch, or 0.64 inch less than the normal; Central, 0.31 inch, or 0.94 inch less than the normal; Southern, 0.36 inch, or 0.99 inch less than the normal. The

greatest amount, 0.97 inch occurred at Wescott, and the least, a trace at Cumberland, Glenwood, Harlan and Thurman. The greatest amount in 24 consecutive hours, 0.71 inch occurred at Humboldt, on the 14th.

Sunshine and Cloudiness. The average per cent of the possible amount of sunshine was 50, or 2 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 51; Davenport, 42; Des Moines, 59; Dubuque, 40; Keokuk, 46; Sioux City, 52; Omaha, Nebr., 58.

Snowfall. The average snowfall for the State was 2.2 inches, or 4.0 inches less than the normal. The greatest amount 8.0 inches, occurred at Milford, and the least was a trace at Bonaparte, Clarinda, Cumberland, Glenwood, Harlan, Keosauqua, Stockport and Thurman.

Wind. The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau station was at the rate of 46 miles per hour, from the northwest, at Sioux City, on the 11th.

Miscellaneous Phenomena. Aurora: 17th. Fog: 4th, 7th, 8th, 22d, 23d, 24th, 25th, 27th, 28th. Hail: 4th. Halos (Lunar and Solar): 1st, 17th, 25th, 28th, 29th, 30th, 31st. Sleet: 4th, 6th, 7th, 21st, 27th, 30th, 31st. Thunderstorms: 4th.

Rivers. Low stages prevailed on all rivers. There were sharp fluctuations on the Missouri River and slight fluctuation on the Mississippi due to ice gorges. The Mississippi River at Dubuque closed on the 13th and remained frozen the rest of the month. The lowest stage of record 3.1 feet below the zero of the gage, probably due to the manipulation of the dam, was recorded at Keokuk.

COMPARATIVE DATA FOR THE STATE—DECEMBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	29.1	+5.2	72	—13	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	62	—31	1.30	+0.08	2.24	0.57	11.1	9	10	6	15
1915	25.0	+1.1	56	—10	0.69	—0.53	1.70	T.	4.6	5	11	8	12
1916	18.7	—5.2	67	—25	1.04	—0.18	2.00	0.35	6.7	6	15	8	8
1917	14.5	—9.4	62	—40	0.56	—0.66	1.70	0.14	6.7	6	10	9	12
1918	22.7	+8.8	68	— 7	1.30	+0.08	3.30	0.37	5.1	8	9	8	14
1919	15.0	—8.9	52	—36	0.54	—0.68	1.55	0.08	5.8	4	11	7	13
1920	26.4	+2.5	65	—26	1.16	—0.06	2.64	0.26	7.4	5	10	8	13
1921	28.2	+4.3	69	—22	1.02	—0.20	3.72	T.	2.9	4	14	9	8
1922	24.0	+0.1	65	—25	0.37	—0.85	0.97	T.	2.2	3	16	7	8

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

MONTHLY STATE DATA FOR 1922.

MONTH	Barometric Pressure, Inches (Sea level)				Temperature, Degrees, F.				Rel. Humidity, Per Cent		Precipitation, Inches				Number of Days			Sunshine	Wind	
	Mean	Highest	Date	Lowest	Mean	Departure from normal	Highest	Lowest	12 noon§	7 p. m.*	Average	Departure from normal†	Greatest	Least	Snowfall	With .01 inch or more precipitation	Clear	Partly cloudy	Cloudy	Per cent of the possible amount	Departure from normal	Average hourly velocity	Departure from normal	Prevailing direction
January	30.20	30.66	23	29.44	4	19.8	57	—29	80	69	0.89	—0.16	2.30	0.32	5.3	4	17	6	8	63	+13	8.5	—0.2	se.
February	30.14	30.97	29	29.24	1	23.7	70	—20	79	66	—6	—0.25	4.56	0.49	1.3	4	14	7	7	65	+9	9.8	+0.5	sw.
March	30.05	30.81	1	29.25	6	28.3	74	—8	84	68	0.76	—0.20	3.73	0.76	3.4	7	13	9	9	49	+1	10.0	+0.1	se.
April	30.00	30.58	28	29.02	6	49.9	87	17	79	59	+3.10	+0.20	6.70	1.04	1.0	9	11	9	10	53	+7	9.1	—0.6	e.
May	29.92	30.28	28	29.41	18	63.4	91	34	77	55	—1.04	—8.36	6.47	0.47	0	12	13	10	8	75	+3	8.0	—0.7	s.
June	29.96	30.37	25	29.53	10	72.2	104	48	74	51	—6.21	—2.56	7.19	0.28	0	6	19	12	6	75	+10	6.8	—0.8	sw.
July	30.00	30.35	13	29.46	9	71.5	98	49	79	56	—0.95	+2.33	11.72	3.13	0	11	14	12	4	64	+9	6.2	—0.5	s.
August	29.97	30.21	14	29.59	24	73.8	102	42	80	55	—2.30	—0.62	9.80	0.33	0	8	19	8	4	71	+9	5.8	—1.0	s.
September	30.07	30.54	16	29.62	11	67.1	103	31	81	51	—4.19	—1.33	4.34	0.31	T.	6	20	6	4	71	+12	6.2	—1.3	sw.
October	30.00	30.43	12	29.45	28	56.1	96	14	77	45	—6.20	—0.65	3.93	0.00	T.	5	21	4	6	72	+7	6.8	—1.4	nw.
November	30.08	30.49	24	29.30	5	42.2	74	11	82	68	+1.82	+2.03	5.28	1.96	0.3	9	11	13	6	45	—7	9.6	+1.4	nw.
December	30.12	30.76	18	29.43	29	24.0	65	—25	79	63	—7.18	0.37	—0.85	0.97	T.	2.2	3	16	7	8	50	+2	8.3	+0.2	s.
Means and extremes	30.04	30.97	Feb. 20	28.92		60.2	104	—29				—29.88	—1.99		13.5	84	187	80	89	62	+1	7.9	—0.3	s.
Normals and records	30.02	31.49	Jan. 1 1905	28.69	Feb. 1 1902	47.4	113	—47		81		31.97			30.7	85	166	101	98	61		8.2		nw.

†Also on 25th. ‡Also on 28th. §Local mean time. *Normal central time.
7 a. m. and 7 p. m. observations only.

COMPARATIVE DATA FOR THE STATE—Annual.

Year	Temperature: Mean annual	Highest	Date	Lowest	Date	Precipitation in inches: 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	—34	February 1	26.77	35.25	18.57	26 0
1896	48.6	104	July 3	—29	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	35.65	47.44	25.06	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	38.93	19.34	29.2
1905	47.2	104	August 11	—41	February* 2	30.56	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	19.93	24 0
1908	49.5	101	August 5	—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	39.5
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	31.93	44.11	23.30	27.5
1915	47.8	99	May 14	—32	January 28	39.53	51.15	27.29	31.3
1916	47.2	106	August 4	—34	January 13	28.90	46.34	22.48	29.5
1917	44.8	106	July 30	—40	December 29	27.81	36.00	20.78	32.4
1918	49.2	113	August 4	—36	February 4	32.78	47.53	25.03	33.4
1919	48.6	104	July* 30	—36	December 10	36.76	48.16	26.88	26 6
1920	48.2	102	July 23	—26	January* 4	31.75	44.00	20.95	21.7
1921	52.2	104	July* 11	—22	December 25	32.03	46.47	20.44	30.7
1922	50.2	104	June 23	—29	January 6	29.98	44.20	19.08	13 5

*And other dates.

MONTHLY STATE DATA FOR 1922.

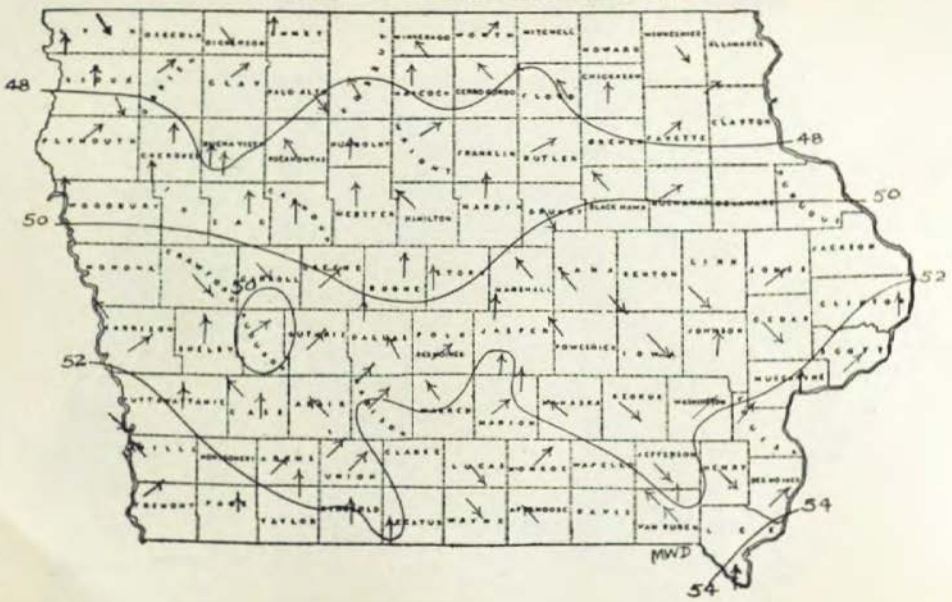
STATIONS	Killing Frosts: Last in Spring	Killing Frosts: First in Autumn
Northern Division		
Algona	April 20†	Oct. 9
Allison	April 29	Oct. 12
Alta	April 19†	Oct. 12
Alton	April 20†	Oct. 9
Belmond	April 29†	Oct. 9†
Britt	April 29†	Oct. 9†
Charles City	April 22	Oct. 12
Cherokee	April 20†	Oct. 9
Decorah	April 28†	Oct. 9†
Estherville	April 28†	Oct. 10
Fayette	April 30†	Oct. 9
Forest City	April 20†	Oct. 9†
Humboldt	April 29†	Oct. 9
Inwood	April 26†	Oct. 9
Le Mars	April 20†	Oct. 9†
Mason City	April 29†	Oct. 9
Milford (near)	April 19†	Oct. 12
New Hampton	April 22†	Oct. 12
Nora Springs	April 28	Oct. 9
Northwood	April 28†	Oct. 12
Pocahontas	April 20†	Oct. 9†
Postville	April 29†	Oct. 9
Rock Rapids	April 28†	Oct. 9
Sanborn	April 28†	Oct. 12
Sioux Center	April 30†	Oct. 9†
Spencer	April 29†	Oct. 9
Storm Lake	April 20†	Oct. 12
Washta	April 30†	Oct. 9
Waverly	April 30†	Oct. 9
West Bend	April 26†	Oct. 9

STATIONS	Killing Frosts: Last in Spring	Killing Frosts: First in Autumn
Central Division		
Ames	April 18†	Oct. 12
Audubon	April 30†	Oct. 12
Baxter	April 29	Oct. 10
Belle Plaine	April 29†	Oct. 12
Boone	April 30†	Oct. 9
Carroll	April 19†	Oct. 9
Cedar Rapids	April 29	Oct. 17
Clinton	April 20†	Oct. 18
Davenport	March 31†	Oct. 17
Denison	April 19†	Oct. 9
Des Moines	April 19	Oct. 12
Dubuque	April 20	Oct. 18
Fairport	April 14	Oct. 17
Fort Dodge	April 29†	Oct. 9
Grinnell	April 20†	Oct. 12
Grundy Center	April 29†	Oct. 12
Guthrie Center	April 19†	Oct. 12
Harlan	April 24	Oct. 9
Independence	April 28†	Oct. 15
Iowa City	April 29	Oct. 10
Iowa Falls	April 29†	Oct. 9
Jefferson	April 29†	Oct. 9
Little Sioux	April 19†,	Oct. 9
Logan	April 19†	Oct 9
Marshalltown	April 20†	Oct. 12
Monroe	April 18†	Oct. 12
Olin	April 29†	Oct. 9
Onawa		Oct. 9
Perry	April 20†	Oct. 9
Rockwell City		Oct. 9
Sac City	April 22†	Oct. 9
Sioux City	April 12	Oct. 9
Tipton	April 29†	Oct. 15
Toledo	April 29†	Oct. 12
Waterloo	April 29†	Oct. 9
Waukee	April 20	Oct. 9
Webster City	April 29†	Oct. 9
Williamsburg	April 29†	Oct. 10

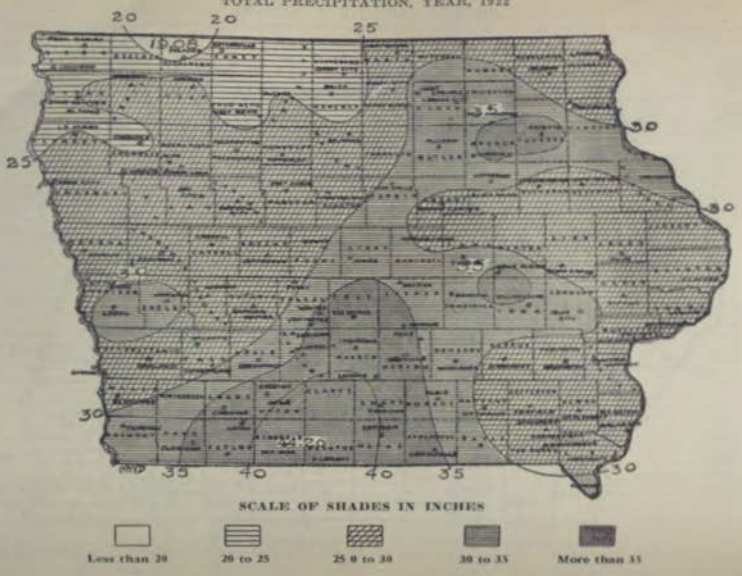
STATIONS	Killing Frosts: Last in Spring	Killing Frosts: First in Autumn
Southern Division		
Afton	April 19†	Oct. 12†
Albia	April 20†	Oct. 12
Atlantic	April 30†	Oct. 9†
Bonaparte	April 20†	Oct. 12†
Burlington	April 18†	Oct. 17†
Centerville	April 29†	Oct. 12
Chariton	April 30†	Oct. 12†
Clarinda	April 20†	Oct. 9†
Columbus Junction	April 20	Oct. 17
Corning	April 29†	Oct. 9†
Corydon	April 29†	Oct. 9†
Creston	April 19†	Oct. 12
Cumberland		Oct. 12
Earlham	April 29†	Oct. 9†
Fairfield	April 30†	Oct. 12†
Glenwood	April 19†	Oct. 9†
Greenfield	April 19†	Oct. 9†
Indianola	April 20†	Oct. 12†
Keokuk	March 31†	Oct. 17
Keosauqua	April 30	Oct. 12
Knoxville	April 29†	Oct. 12†
Lamoni	April 29†	Oct. 14†
Lenox	April 21	Oct. 12†
Mount Ayr	April 19†	Oct. 12
Mount Pleasant	April 29†	Oct. 12†
Oakland	April 21†	Oct. 9†
Oskaloosa	April 20†	Oct. 12
Pella	April 29	Oct. 12
Sigourney	April 30	Oct. 9
Stockport	April 30†	Oct. 10†
Thurman	April 19†	Oct. 9
Washington	April 30†	Oct. 17†
Westcott (near)		Oct. 17
Winterset	April 29	Oct. 9
Omaha, Neb	April 19	Oct. 12

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

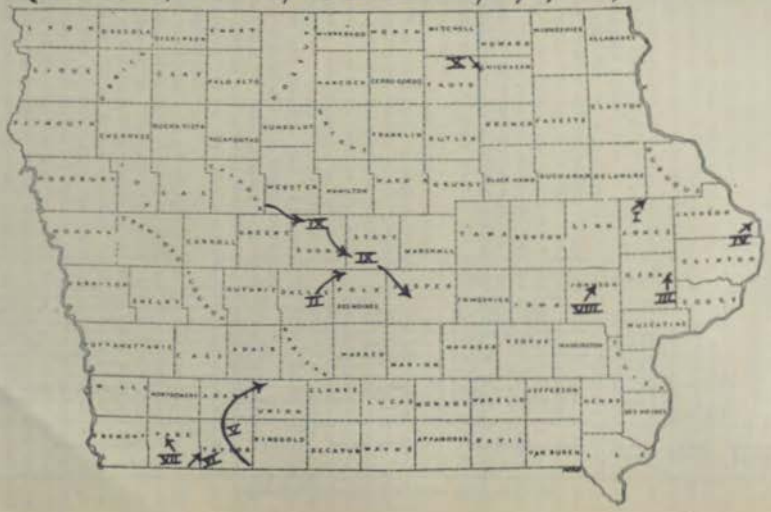
MEAN ISOTHERMS AND PREVAILING WINDS



TOTAL PRECIPITATION, YEAR, 1922



TORNADO PATHS IN IOWA DURING THE YEAR 1922.
(Numerals Refer to Descriptive Data in Accompanying Table)



TORNADOES IN IOWA DURING THE YEAR 1922.

Storm No.	Nearest towns	Date	Hours, From—to	Storms moved from	Length of path	Persons killed	Persons injured	Estimated damage
I	Monticello	February 1	12 noon	W. to N. E.	Short	0	0	$ 1,000
II	Dallas Center to Stuart	April 6	8:30 to 8:45 p. m.	W. to N. E.	10 miles	0	0	200,000
III	Bennett	April 8	9:30 p. m.	S. to N.	10 miles	0	0	1,000
IV	Afton to Creston	April 8	10:20 p. m.	W. to N. E.	Short	0	0	1,000
V	Bradyville	April 30	4:30 to 5:00 p. m.	W. to N. E.	10 miles	0	0	10,000
VI	Page Center	May 5	4:30 p. m.	E. to N. W.	6 miles	0	0	2,000
VII	Tilden to North Liberty	May 5	4:30 to 4:45 p. m.	W. to N. E.	18 miles	0	0	1,000
VIII	Goose to Newton	July 16	4:30 to 7:00 p. m.	W. to S. E.	17 miles	0	0	30,000
IX	Colwell	July 26	5:15 p. m.	W. to S. E.	20 miles	0	0	300,000
X					2 miles	0	0	20,000
				Totals	140 miles	1	0	$756,000

WEATHER AND CROP REVIEW

The winter preceding the crop season of 1922 was warmer and slightly more moist than normal with snowfall of only 9.5 inches for the three winter months, which is the least of record and 2.5 inches less than the winter of 1906-1907 which has heretofore held the record. The storm of January 4th-5th left a coating of ice over the southern and part of the central counties that remained for several days. Another ice or "glaze" storm February 21st-23rd damaged fruit and shade trees. It was feared that these two storms would kill considerable winter wheat and tame grass but for some reason only two per cent of the winter wheat was killed, which is far less than the average.

Considerable precipitation in February and toward the last of March made the soil too wet to work until well into April. Scarcely a beginning had been made in spring seeding during the first ten days of April, but drying weather the rest of the month permitted rapid progress in seeding and toward the close of the month there was some complaint in the drier western counties that soil moisture was not sufficient to germinate oats. Not much spring wheat was sown.

The rather unusual warmth and moisture advanced vegetation rapidly but did not swell the fruit buds to the danger point and no frost damage to fruit occurred.

Livestock in general wintered well. Sows bred for spring pigs increased 29 per cent over the proceeding spring, but the superabundance of cheap corn and the scarcity of ready cash to buy supplemental feeds, caused the sows to be fed an unsuitable ration. Cholera, "flu" and other diseases weakened the sows so that the size, vitality and uniformity of litter were considerably reduced, and the unfavorable weather of April caused considerable loss of pigs. Though May did not warm up as rapidly as usual, it was dry and sunshiny and with coming of tender shoots of grass, the condition of sows and pigs improved rapidly.

Preparations for corn planting proceeded without interference, except in a few central and eastern counties where heavy local rains occurred May 23rd-26th. 60 per cent of the acreage was planted by May 15th, and 96 per cent by June 1.

Drouth continued in June, the average rainfall for the month, 1.82 inches, being as little as June, 1911, when one of the more notable drouths of the State set in. Temperatures were very high, the warmest day of the year in the northwest portion of the State being June 23, when temperatures of 100° or higher occurred. Inwood reported 104°. Corn was not materially injured though the leaves curled some on hot afternoons. By the close of the month the earliest corn was more than waist high and about half of the crop was laid by. Oats headed very short—too short to harvest in some localities in the west central and northwest counties, yet thrashing returns showed yields slightly above the 10-year average over most of the State and the quality was much better than last year. Winter wheat, spring wheat and barley were not injured as much as expected, the yield and quality being generally satisfactory.

In contrast with June, July was cool and wet, which went far to repair the crop damage. In only a few northern counties did the temperature get

as high as 90°. Beginning with a general rainstorm July 5th-7th, frequent copious rains broke the drouth. Much damaging hail attended the rain, yet the benefits of the storms far outweighed the damage. Some of the storms had tornadic characteristics in small areas. Small grains, standing and in shock, were damaged by the wind and rain. Yet harvest progressed well. Much fruit was blown from the trees, but an abundance remained for full development.

August was the warmest month of the year, the greatest temperature excess occurring about the 15th-24th, followed by an abrupt change to 56° colder at a number of stations. Excessive rainfall in some southwest counties was centered in Shelby county, where 9.46 inches fell at Harlan, but for the State as a whole precipitation was deficient. Shocked grain was damaged in the wet area, while corn, pastures and truck crops were injured by drouth in some eastern counties. Much of the State was visited by severe hailstorms and there was considerable damage from wind squalls.

September was warm and considerably drier than the average, the warmest period being the first eight days, during which over much of the State the highest temperatures of the year occurred. Many northern and eastern stations had the highest September temperatures of record—at one station the highest in 50 years. Slight frosts occurred on the 10th, 11th, 16th, 25th, 26th and 27th but no damage resulted. Silo filling and fodder cutting made good progress. The corn stood up much better than last year, and there was much less damage from corn ear worm. Commercial sweet corn and tomato canning proceeded under favorable conditions, the quality of the pack being very good and the quantity considerably larger than last year. Deficient rainfall impeded plowing and preparation for winter wheat seeding, and together with the heat wave, is thought to have shortened the corn yield slightly, but this was off-set by hastening the maturity of the corn. Winter wheat seeding was delayed to avoid Hessian fly, which was unusually numerous till the close of the month.

The first six and last eight days of October were unusually warm. Killing frosts occurred on the 9th over a large area in the northwest portion, and on the 12th over most of the State, except a few Mississippi River counties which did not experience a killing frost till the 18th. About 97 per cent of the corn matured without frost damage. The crop dried rapidly and much was cribbed toward the close of the month. Winter wheat seeding progressed rapidly at the beginning of the month and 85 per cent was finished by October 10. Moisture was generally sufficient for germination of the wheat which made good growth until near the close of November. Considerable damage to early seeded wheat by Hessian fly was reported.

An unusual windstorm November 5 blew much corn to the ground over the western two-thirds of the State. Current and subsequent rains damaged the down corn, which lay in the muddy fields at temperatures high enough to cause rotting and sprouting. Husking was considerably delayed by the wet fields through which full loads of corn could not be drawn. Another windstorm Thanksgiving Day, November 30, the most severe in many years, caused further damage to the remnant of corn remaining in the fields.

Iowa's 1922 corn crop is the second largest of record. The old corn on Iowa farms November 1 was estimated at 29,668,000 bushels; new corn, December 1, 455,535,000 bushels; total corn 495,203,000 bushels; compared with a total of 502,344,000 bushels in 1921, and 506,943,000 bushels in 1920. New corn is 28 per cent above pre-war normal; old corn 159; and total corn 33 per cent above pre-war normal. Fortunately, Iowa farmers are much better provided with livestock to consume this corn than they were last year and the corn production for the country as a whole is less.

It is unusual that both warm weather and cool weather crops produce well in the same season, but in 1922, practically all crops yielded above the 10-year average and fruit, particularly apples, made an unusually large crop. The total value of crops is 57 per cent greater than a year ago.

Bulletin No. 1, April 11, 1922—

A rather mild winter with the least snow in 32 winters preceded the crop season of 1922. The ground froze more deeply than usual. March was warm with an excess of precipitation in the central and south portions. Winter wheat, rye, grasses, alfalfa and clover wintered well in spite of the deficiency in moisture and snow cover during much of the winter. The recent moist, warm weather has been favorable for these crops.

Scarcely a beginning has been made in seeding of oats and spring wheat, due to the frequent, heavy rains. The soil is generally saturated and packed. Several days of sunshine are needed to put the soil into condition to work. At this date last year approximately 85 per cent of the oats had been seeded but they met disaster in the severe freeze that came later, from which they never fully recovered. Not much spring wheat will be seeded.

A few potatoes have been planted and some gardening has been done. Fruit prospects are believed to be unusually promising in most sections, yet there is danger that the prevailing warmth and moisture may rush the buds forward too fast.

Numerous small tornadoes and local windstorms did considerable damage. Severe hailstorms visited Council Bluffs and Diagonal. Dirt roads are generally impassable.

Livestock in general wintered well. The number of sows bred for spring pigs is about 25 per cent greater than last year, but the reports on early spring pigs are very discouraging. It appears that the superabundance of cheap corn on the farms and the scarcity of ready cash to buy the supplemental feeds needed by brood sows has resulted in overfeeding the sows with corn. Besides, cholera, "flu" and other diseases caused many of them to fail to conceive or greatly reduced the size and vitality of the litters. Contagious abortion is prevalent. The cloudy, rainy weather has been very unfavorable for the young pigs. So the net result will be much less than a 25 per cent increase in pork production.

Bees generally wintered well. Though the weather has been unusually cloudy and rainy, it has been warm, and occasional periods of sunshine have afforded the bees ample opportunity for cleansing flights and a little chance to work on maples.

Bulletin No. 2, April 18, 1922—

Cool cloudy weather with rain or snow prevailed at the beginning and close of the week, but Thursday, Friday and Saturday (13th-15th) were favorable for field work in many counties. Frost and freezing temperatures were general on the mornings of the 12th and 16th, but nothing was susceptible to damage.

Spring seeding and work in general is unusually variable in adjacent counties or localities. Seeding of oats averages about 40 per cent completed, ranging from none in some of the northeast counties to between 75 and 90 per cent in a belt extending from Palo Alto county southeast to Polk and thence southwest to Adams, Taylor and Ringgold counties.

An increase in barley acreage is mentioned by some correspondents. Barley will stand a little later seeding date than oats. Mention is also made of the possibility that the backward season may divert some of the intended oats acreage to corn, to the extent that the 1922 corn acreage may be larger than the 1921 which, with a normal season, would mean a repetition of the overproduction of corn. However, the outlook for weather this morning (18th) is for several days of fair weather with rising temperature, so that there is yet time for active work in seeding oats. In some localities early seeded oats are up and showing green.

Winter wheat, rye, pastures and meadows look unusually good. Pastures in the south half of the State are already affording considerable grazing and by May 1 will take the place of nearly all dry feed.

Spring pig reports are very disappointing, due to the causes mentioned last week and to the cool, damp and cloudy weather.

Favorable wintering of bees is being offset by the unfavorable spring weather which does not permit the bees to work. "Spring dwindling" is becoming serious.

Fruit bloom has been beneficially retarded in most of the State but peaches and plums are in full bloom in the extreme southern counties where there is a possibility of some damage by the freezing temperatures of Tuesday morning (18th), though of course it will take several days to accurately judge the amount of damage, if any. Otherwise the fruit outlook is promising.

Bulletin No. 3, April 25, 1922—

Mostly dry weather till the rain of Monday, 24th, with sunshine above normal and considerable wind dried the soil so that field work made excellent progress—the best of the season.

The bulk of the oats and barley seeding was finished, though little more than a beginning has been made in some of the extreme northern counties. Some localities report the work completed and most of the fields up and showing green. The favorable weather of the past week removed the necessity for shifting oats acreage to corn. Speculative prices of clover seed have decreased the intended acreage of clover.

Plowing for corn got a good start in the central and southern districts. The prospects for an increased acreage are not as strong as seemed probable earlier in the season.

Temperatures were generally below normal, with frost, freezes and ice on the 19th. These with the freeze of the 17th and 18th are believed to have caused slight damage to plums, pears and peaches in the southern district, but in the central and northern districts buds were not far enough advanced to be injured. Only a few early plums are in bloom in the central districts. All fruit buds are dormant in the northern districts. Apple buds have not opened yet.

Pastures and meadows did not make much progress due to the cool weather, yet live stock have been put on pasture quite generally.

Gardens, potatoes and commercial onions were planted this week to a considerable extent.

A flood crest passed down the Mississippi River this week, inundating considerable low land.

Bulletin No. 4, May 2, 1922—

Cool, dry and mostly cloudy weather permitted rapid progress in field work, retarded the germination and growth of spring grains and the growth of winter wheat and grasses, and beneficially delayed the blooming of fruits.

Horses and men were able to perform a maximum of work under the prevailing dry, cool conditions. At least half the preparation for corn planting has been done. Planting was begun on dry, rolling uplands in many localities about the 25th and 29th, Pocahontas County being the most northerly county reporting this. The soil is yet too cold to make general planting advisable.

Oats seeding is practically completed in all but the extreme northern counties and some wet lowlands elsewhere. In the central and northern districts about one-third of the seed lay ungerminated in the dry soil, but in the localities covered by the showers of May 1-2, these oats will come up quickly. Where the moisture is sufficient, the oats are up to a good stand and look green and fine. In some localities in the southern counties there is complaint of too much moisture on lowlands.

Winter wheat, rye and grasses made slow growth. Hay, pastures and spring wheat need more rain in the northern and central counties.

Commercial onion and potato planting is about finished under favorable weather and soil conditions.

Frosts occurred on several mornings. On the 29th, temperatures slightly below freezing occurred as far south as the south line of the State. Strawberry blossoms were damaged considerably in the south, but were not far enough advanced for damage elsewhere. Plums, peaches and cherries were in full bloom this week in the central counties, but not yet open in the north. Apples are about to open. The frosts and freezes are not believed to have damaged tree fruits appreciably. Spraying has been active.

The recent dry weather has been more favorable for young pigs and chickens.

Roads were better than usual during the last week of April.

Bulletin No. 5, May 9, 1922—

Warm, mostly dry and sunny weather was favorable for field work, growth of small grains and grasses and the development and fertilization of fruit blossoms, except in the northwest district where the drouth was unfavorable till relieved by the rain of Monday, 8th.

Corn planting has begun in practically all sections and as usual is farther advanced in the Raccoon and Middle Des Moines valleys than elsewhere. At least one-third of the planting is done in that portion of the State. The seed bed is warm but rather cloddy. A good soaking rain would be beneficial.

Oats seeding was completed in the northern counties. Over much of the State oats fields are green and beautiful. In the northwest counties considerable seed lay ungerminated in the dry soil but the recent rain will give this a start.

Winter wheat and rye have made very good progress. Moisture has been ample over the winter wheat districts of the State. Grasses, clovers, alfalfa and pastures have made good growth, except in the northwest district where it has been too dry.

All fruit prospects are good. Damage by frosts and freezes of last week were unimportant. Apples are in full bloom in the south and opening rapidly in the central districts, with a better outlook than usual. Spraying has been active. Hail damage was reported in a few localities on the 5th and 8th.

Gardens and gardening made good progress, though more rain would be beneficial in most localities. About one-third of the sugar beet area was planted this week.

Bulletin No. 6, May 16, 1922—

Abnormally warm weather at the beginning of the week followed by cooler on the 12th with abundant sunshine over much of the State and little rain except in a few southeast counties, favored rapid progress in

plowing for corn, corn planting and other field work, but was unfavorable for germination of corn and growth of small grains, grasses and gardens.

About two-thirds of the corn has been planted, ranging from nearly completed in the upper Raccoon Valley to less than half done in the extreme south central, extreme northeast and extreme northwest counties. Much of that planted in the last 10 days in the western half of the State lies ungerminated in the dry soil. The early planted fields are up and show rows except in dry patches. Corn cultivation has begun in Pocahontas county. Recently prepared seed beds were so dry that they plowed up cloddy and are in poor condition. A good soaking rain is badly needed except in the southeast portion of the State.

Oats that were up before the dry weather came have made fair progress, but in the drier west central and northwest counties in many fields the oats still lie ungerminated in the dry soil. In Crawford county some land seeded to oats has been plowed up and will be planted to corn as it is believed to be too late for these oats to grow and make a crop. The drouth is opening large cracks in the soil.

Winter wheat and rye need rain but are not suffering seriously. Rye has begun to head out in the southern counties.

The recent dry, warm, sunny weather has been favorable for young animals, especially pigs. The later farrowed litters are much better than the earlier due not only to the weather but to the effect of succulent grass on the condition of the sows.

Tree fruits are in full bloom in the northern counties. In the central and southern counties a large quantity of fruit has set on. Strawberries are blooming profusely in the central counties but the crop will be disappointing throughout the State if rain does not come soon.

Bulletin No. 7, May 23, 1922—

Insufficient rain except in the northeast and southeast districts, temperature slightly below normal and sunshine deficient in the eastern and central districts were unfavorable for the best progress of crops. In some western counties the drouth was becoming serious, but rain is falling over most of the State this morning (23d) and the amounts are already large enough to break the drouth in the southwestern counties.

Corn is coming up very unevenly. In dry patches it has not yet come through the ground while the earliest under favorable conditions is three to four inches high and has been cultivated once. Planting is about 90 per cent completed. Dry, cloddy soil has greatly retarded this work in the south central and southeast counties.

Oats that were up and well established before the drouth are doing fairly well, but much of the acreage shows a thin stand with large areas still ungerminated or making a struggle to come through the ground. The outlook for an oats crop is not very good at this time.

Winter wheat has made fair progress but will be benefited by the rain that is falling. The same is true of grasses, pastures, alfalfa, gardens and all other crops in most of the State. Rye is heading in the central districts.

Strawberries have set an unusually heavy crop but rain has been badly needed. Grapes are beginning to bloom in the central districts. The Secretary of the State Horticultural Society reports the condition of fruit and vegetables on May 15th, as follows: "Apples 92; pears 86; plums 95; cherries 91; strawberries 92; grapes 90; red raspberries 79; black raspberries 88; blackberries 81; gooseberries 80; currants 93; peaches 81; early potatoes 90; late potatoes 89; early cabbage 89; late cabbage 90; onions 94; sweet corn 95; tomatoes 94 per cent.

Bulletin No. 8, May 30, 1922—

Three weeks with deficient rainfall constitute a serious and damaging drouth in the west-central and northwest districts, while in the southern and eastern districts rain has been copious and in some localities damaging. Considerable lowland has been overflowed in the lower Des Moines valley.

Corn planting and cultivation has been delayed in the extreme southern and eastern counties, where about 10 per cent of the planting remains to be done.

Oats have been seriously damaged in the drier districts, where the stand is thin and the general appearance of the crop is poor.

Winter wheat is heading short in the southern and eastern counties, yet it is believed that prospects for this crop are generally good. Rye looks generally good.

Grasses and pastures are poor in the west-central and northwest districts. In these districts the hay crop from timothy and clover will be light, but alfalfa promises a fair crop.

The fruit outlook continues good except that strawberries badly need rain in the west-central and northwest districts. The berries are beginning to ripen in the central districts.

Bees have done exceptionally well in recent weeks. The honey flow has been large enough and the weather suitable for abundant brood rearing. As a rule, colonies are approaching the main flow of honey from white clover, sweet clover and linden in strong condition and should make good returns from these sources which promise well.

Bulletin No. 9, June 6, 1922—

Drouth continues in the west-central and northwest counties, where oats and spring wheat have been seriously damaged and all other crops more or less damaged. Much corn lies ungerminated in the dry soil.

In about four-fifths of the State moisture has been ample, but throughout the State temperatures have been deficient during the past week, to the extent that furnace fires were needed. The minimum temperatures were low in the 40s on several mornings with light frost at Buck Grove, Crawford county, on the 21st.

Corn has mostly been cultivated once except in the dry, backward counties; and cross cultivation is well started. For the State, as a whole, the percentage condition of the crop on June 1st was 92 per cent as shown by about 1000 reports. This is about the 10-year average. The recent rains have softened the clods in the southern and eastern counties so that cultivation is much easier. Considerable replanting has been necessary in these counties on account of heavy rains and the depredations of cut worms and wire worms. Reports from 1000 correspondents show that 60 per cent of the corn was planted up to May 15th, and 96 per cent, up to June 1st. The former is somewhat more than usual.

Winter wheat is heading rapidly, mostly on short straw, but with fair prospects for a crop. Rye is making good progress, being in full head generally and filling well in the southern counties. Barley is doing well except in dry territory.

A very good first cutting of alfalfa has been or is being harvested in the Missouri River counties. The quality is excellent, due to the prevailing dry weather with ample sunshine, which has been favorable for curing. Red clover is being cut in the southern counties and is blooming freely in the north. Timothy promises well except in the dry counties.

Fruit prospects are excellent, especially peaches. Strawberries are somewhat disappointing due to drouth in the northwest and west-central counties and excessive rains in the south and east. Grapes are about in the middle of their blooming period.

Commercial cabbage setting is progressing under favorable conditions in Mitchell county. Onions were so nearly overcome by weeds that many fields were plowed up and replanted. Commercial tomatoes are all planted in Mahaska county but considerable trouble with cut worms is reported.

The honey flow from yellow sweet clover has begun, having been hastened somewhat where drouth prevails.

Bulletin No. 10, June 13, 1922—

Warm and mostly dry weather with abundant sunshine was favorable for corn and other warm weather crops over most of the State, though the light showers of the week failed to break the drouth in the west central and northwest counties where all crops are suffering for rain.

Corn grew rapidly, the tallest now being from six inches to "knee" high. Cultivation made good progress. Much of the crop has been cultivated twice. Conditions were fine for weed killing and fields are mostly clean. Planting and replanting was finished during the week.

Oats need rain badly almost everywhere, and in the drouth stricken west-central and northwest counties this crop will be poor. However, this crop shows improvement in the extreme southern counties. Other spring grains are not very promising.

Winter wheat made good progress generally and the heads are filling nicely, but considerable damage from Hessian fly is reported in Polk county.

First cutting of alfalfa continued under favorable condition for curing and a good crop, of excellent quality, has been secured. Red clover is generally heavy except in the drier regions. The hay crop other than alfalfa will be light in the western counties.

Strawberries have yielded well except in the dry counties. About a week's picking remains in the central counties and 10 days to two weeks in the extreme north. Early cherries are ripening rapidly and a large crop is indicated. Apples, pears and peaches have had a considerable "June drop," especially where the winds have been strong, but an abundant crop remains on the trees.

Commercial cabbage setting was completed in Mitchell county this week. Onions and tomatoes made good progress. A few early tomatoes are in bloom.

Honey producing plants are loaded with bloom or buds and a large flow of honey is in prospect with the bees in good condition to harvest it.

Bulletin No. 11, June 20, 1922—

Mostly hot, dry weather with nearly normal sunshine and strong drying wind was favorable for second and third cultivation of corn and for cutting clover hay but unfavorable for oats, spring wheat and potatoes. Drouth continues in the west central and northwest counties though slightly relieved by showers in a few localities.

Much corn is now "knee high"; the second cultivation is generally completed and the third well advanced. This with good weed killing weather makes the fields mostly clean and the general condition of the crop good, though poor stands are reported from many dry localities.

Oats continued to deteriorate in the drouthy counties where they are heading too short to be cut with a binder and will be mostly cut with a mower. In some instances stock is being turned in to pasture oats, which are not worth cutting. The hot, dry winds with temperatures high in the 90's the first half of the week, caused oats to head short and fill poorly over much of the State.

Winter wheat made fair progress in filling and a few fields are turning color, but more moisture would be beneficial. More than usual damage from Hessian fly is reported in Madison and Polk counties, particularly in fields that were seeded before September 15.

Early potatoes are in bloom, but the prevailing hot, dry weather is untimely for this crop. Colorado potato beetles are unusually numerous and much spraying is being done to save the crop.

The honey flow from linden and white clover is at its height in the central and southern counties, somewhat earlier than usual. Bees were generally in good condition to harvest the crop and a large production seems assured. The best colonies of bees in Scott county have already stored 150 pounds of surplus honey.

Early cherry harvest is progressing rapidly with very satisfactory results. The later strawberries were cut short by the hot, drying winds and dry weather and picking is about over.

The timothy hay crop is reported as unpromising, also clover in the dry west central and northwest counties, but first cutting of alfalfa yielded a good crop which with favorable weather was harvested in excellent condition and the second growth of alfalfa is vigorous and promising.

Flax is looking well and beginning to bloom in the northern counties, to which it is largely confined.

Bulletin No. 12, June 27, 1922—

Mostly hot, dry, sunny weather with brisk, drying winds on some days was unfavorable for nearly all crops, though favorable for cultivating corn and harvesting clover hay during the past week.

The drouth and heat were sufficient to curl the corn leaves in the afternoons in the west central, northwest and north central districts where temperatures near 100 occurred on the 23d, the highest being just 100 at Cherokee. In other sections corn has not been injured much but would be benefitted by a good soaking rain. The earliest corn in all portions of the State ranges from knee high to waist high, shades the ground, and much has been "laid by," but for the State as a whole the height averages about 15 inches, the late planted is fighting a losing battle with the drouth and much of it shows a poor stand. The fields are generally clean. Chinch bugs are damaging corn in Lee county.

Oats are mostly in the critical milk stage. They have headed very short, and nothing but a long period of abnormally cool, moist weather can prevent a poor crop. Cattle have been turned into many fields that are too short to cut. However, a few of the earliest fields promise a fair crop.

Winter wheat is turning rapidly and considerable has been cut in the southeast counties. Good yield and quality are indicated, but more damage from Hessian fly is reported than for many years. Spring wheat, which is mostly raised in the drier counties along the Missouri and Big Sioux rivers, is generally in poor condition.

Clover harvest progressed rapidly with conditions favorable for curing. The yield is good except in western counties where the drouth set in early. Timothy needs rain badly. Second crop alfalfa will be short unless good rains come soon in the western counties, where it is mostly raised. Pastures are drying up and turning brown like late July or August.

Early cherries are about all gathered. The yield has been good. Cane fruits are seriously needing rain.

Potatoes and gardens have been greatly injured by the heat and drouth, though truck crops in Mitchell county are still in good condition.

Bulletin No. 13, July 4, 1922—

Good rains in western Iowa temporarily relieved the long drouth, but came too late for oats, spring wheat, clover and timothy hay and potatoes which suffered irreparable injury. Deficient rain elsewhere is unfavorable for filling of oats which are generally in the milk or dough stage, though some early fields have been harvested.

Early planted corn made good progress. More than half the crop has been laid by in good condition. Late corn has had a hard battle with the drouth. Several stations report the lightest June rainfall in 25 years. Corn varies in height from six inches to six feet. As a whole the outlook for this crop is good.

Winter wheat harvest is progressing rapidly and while there are a few adverse reports, the yield in general will be above the average and of excellent quality. Rye harvest is about finished with satisfactory results.

Clover and timothy haying was favored by the absence of rain. The quality of the crop is excellent, though the yield has been somewhat reduced by the drouth.

Potatoes, both early and late, have been seriously injured by the heat and drouth. Unless general soaking rains come soon the crop will be nearly a failure. Gardens and pastures have also suffered.

The main honey flow is past and an excellent crop has been secured. The flow from sweet clover continues.

Bulletin No. 14, July 11, 1922—

Rainfall the past week exceeded one inch except in some west-central counties. In large areas the rainfall was between three and four inches, and in a few localities exceeded four inches. The drouth was effectually broken, yet more rain will soon be needed in the west-central counties where soil moisture is greatly deficient. For the State as a whole, June, 1922, was the driest June on record.

Some local damage resulted from excessive rains, windsqualls and hailstorms. In portions of Boone and Story counties hail, July 5, caused total destruction of crops over considerable areas, amounting to hundreds of thousands of dollars. Small grains were beaten down by the rain over large areas. Temperatures and sunshine were noticeably deficient.

Corn was greatly benefited by the rains and made good progress. The earliest fields are beginning to show tassels in nearly all portions of the State. About 85 per cent of the crop has been laid by. Reports from hundreds of correspondents on July 1st showed the condition of the crop to be about the 10-year average, and considerable improvement has occurred since that time.

Oats, July 1, showed the lowest percentage condition since 1911. The cool, rainy weather of the past week will materially aid the filling of late oats but came too late for early oats which are already being harvested. Though the straw is short the grains are of good quality.

Winter wheat harvest made rapid progress. More than half of the crop is in shock. Good to excellent yield and quality are indicated. Spring wheat has been seriously damaged in the large producing west-central counties. The condition July 1 was the lowest since 1894. Poor results in recent years have diminished the acreage so that this crop is now of relatively little importance. Barley harvest is in progress. The condition of this crop is the poorest since 1911.

Late potatoes were greatly improved by the recent cool, cloudy and rainy weather, but early potatoes were too far along to be helped. Cabbage, onions and garden truck were also benefited.

Hay making was greatly impeded by the rain. Considerable hay was damaged in the making. The second cutting of alfalfa is in progress in the west-central, alfalfa section, where the frequency and intensity of rainfall has not greatly interfered.

Bulletin No. 15, July 18, 1922—

Copious to excessive rains occurred this week in all but the extreme northern and western counties. The rain was attended by strong wind and hail in many localities. The principal damage so far reported is in Black Hawk, Boone, Cerro Gordo, Fayette, Greene, Polk, Story and Wright counties. Temperature and sunshine were again deficient.

Harvesting and thrashing were delayed in the storm area. Unharvested small grain, mostly oats, were beaten down by wind and rain over large areas. Thrashing of winter wheat, barley and early oats, which was well under way in the southern third of the State, was interrupted by the rains. Shocked grain was saturated and in some cases had started to heat, germinate and rot. The dry, sunny weather that is following will help to dry the grain much of which will have to be spread out for this purpose. Early thrashing returns show a yield of winter wheat slightly above the average and quality excellent. The recent cool, moist weather has beneficially prolonged the ripening of late oats. Early oats that have been thrashed yielded a little better than was expected, though considerably

below the average. The quality is better than last year. Much hay has been damaged in the making.

Corn has made good growth. Tasseling is becoming general and ears are appearing in the earliest fields. In general the crop is about a week or ten days later than last year.

The Secretary of the State Horticultureal Society reports the condition of fruits and vegetables on July 15 as follows: "Summer apples, 80; fall apples, 73; winter apples, 70; pears, 63; plums, 75; grapes, 95; red raspberries, 76; black raspberries, 80; blackberries, 70; gooseberries, 86; currants, 86; peaches, 82; early potatoes, 71; late potatoes, 80; early cabbage, 86; late cabbage, 87; onions, 84; sweet corn, 90; tomatoes, 59; watermelons, 80; cucumbers, 80; sweet potatoes, 86 per cent."

Bulletin No. 16, July 25, 1922—

Light to moderate showers with temperature and sunshine slightly below normal were generally favorable for crops and not seriously detrimental to harvesting and thrashing. Hail storms of the 16th, mentioned last week, though wreaking total destruction of crops in areas as large as 25 farms, were not of great importance as compared with the total crops of the State. The accompanying wind and rain over large areas and also windstorms of the 22d in the western part of the State damaged the overloaded fruit trees, blew off much fruit, flattened the uncut grain and damaged the shock grain. Corn, though blown over badly, will mostly recover.

Corn made satisfactory progress. It varies greatly in stage of development, some fields showing large ears and abundant silk and others not yet showing tassels. In general the crop it at least a week later in development than last year and is silking and tasseling on shorter stalks but this is probably not a disadvantage.

Harvesting is practically completed excepting in the northern third of the State. The cool, moist weather of July has greatly improved late oats. Thrashing has been considerably delayed by wet shocks and slightly delayed in localities by coal shortage resulting from the miners' strike. Early thrashing returns show unusual variability in yields. In general winter wheat yield has been very satisfactory and oats has turned out better than expected from the exceedingly short straw. The usual large movement of grain from the machine to market has been delayed by car shortage resulting from the railroad strike.

Most of the timothy seed crop was headed or otherwise harvested during the last week. The indications are that the total crop will be somewhat less than last year. Second cutting of alfalfa is in progress.

Though many apples, plums, pears and peaches have been blown from the trees by recent windstorms, there is still an abundance of fruit. Early apples and windfalls are being fed to hogs. The berry crop is good and there is an excellent prospect for grapes. Watermelons and muskmelons are promising.

Bulletin No. 17, August 1, 1922—

Generous rains occurred throughout the State, particularly in the western portion where moisture has been seriously deficient. The temperature which has been deficient most of July, rose toward the close of the week and several stations reported their only 90 temperatures of the month on the last day. Destructive winds are reported over relatively small areas and a tornado in Floyd county near Colwell.

Shocked grain was saturated by the heavy rains. The quality of oats was considerably reduced by molding, sprouting and rotting. Thrashing has been greatly delayed by the wet weather and slightly by coal shortage. Considerable of the thrashed oats are not dry enough to keep in bins, partly because of the wet weather and partly because they were cut too green. A beginning has been made in thrashing in all but some of the ex-

treme northern counties and several localities report this work one-fourth done. Yields of oats are generally better than expected and the quality would have been very good but for the rain damage. Winter wheat yields are slightly above the average. Considerable is going from machine to market at $1.00 per bushel.

Abundant moisture and greater warmth pushed corn ahead at a normal rate. Practically all is tasseled, much is silked and large ears are seen in the earliest fields in all portions of the State. The outlook for this crop is promising.

Potatoes were greatly favored by the cool, moist July and the outlook for this crop is better than for several years, at this time of the year. The acreage is, however, rather small, due to repeated failures in recent years. Cabbage, onions, tomatoes, melons and other truck crops have made good progress. Apples are unusually abundant and where sprayed the crop is of excellent quality. Peaches, pears and plums are in excellent condition.

Recent rains have started honey producing plants to blooming freely and a very good late flow of honey is indicated. Buckwheat looks good.

Pastures, second growth clover and third growth alfalfa are making unusual progress for the time of year. Some alsike and medium red clover seed from first cutting has been thrashed and the yields are reported good. Timothy seed thrashing, though delayed by wet weather, has made good progress and the yields are satisfactory.

Bulletin No. 18, August 8, 1922—

Little or no rain over most of the State, seasonable temperature and normal sunshine were favorable conditions for finishing the harvest in the northern counties and for drying the shocked grain; and with ample soil moisture from previous rains corn made very good progress.

Thrashing was nearly suspended till after the middle of the week. The wet bundles could scarcely be fed through the machines and the thrashed grain heated in the bins. Strong northerly winds with low humidity set in Sunday night, drying the grain rapidly so that shocked thrashing and stacking are making rapid progress. For the State as a whole not more than one-fourth of the thrashing has been done. Yields of oats, especially late oats, are turning out better than expected and in general will probably be up to or slightly above the 10-year average and considerably better than last year.

Corn made good progress. Roasting ears are reported in the earliest fields in the southern counties and the milk stage in the northwest. In general the crop is about 10 days later than last year, but with normal weather a good crop is indicated.

Abundant soil moisture has made plowing easy and a good beginning has been made in some localities. A large acreage of fall wheat will be seeded in Taylor county.

Truck crops, potatoes and pastures are in good to excellent condition. Considerable commercial cabbage has been shipped from Mitchell county and onions are maturing gradually and will be a good crop. Tomatoes have set a good crop and are ripening rapidly. Late potatoes are more promising than for several years. The peach crop will be the largest for several years. Apples are so abundant that there is no market for them and they are rotting or being fed to hogs. Early grapes are beginning to turn, and a heavy crop is indicated.

Bulletin No. 19, August 15, 1922—

Rainfall of the week was normal or above in the south-central, central and north-central districts and portions of the southwest and west-central districts, but deficient elsewhere. Temperatures were abnormally low at the beginning of the week but became higher toward the close and reached 96 degrees or higher at many stations on Monday, 13th. Sunshine was deficient in the northeast and above normal in the southwest portion of the

State. Hail occurred over large areas on the 9th and caused complete destruction of crops in unusually large areas in Audubon, Cass, Crawford, Dickinson and Shelby counties.

Corn made fair progress, but needs higher temperature in all portions of the State during the next three weeks to bring it through ahead of frost. Recent favorable conditions in the west-central and northwest districts caused the corn there to catch up to the rest of the State but everywhere the corn is 10 days to two weeks later than last year. The earliest fields are just beginning to dent; the bulk of the crop has scarcely reached the roasting ear stage; much is yet in the milk; and the latest is just tasseling. There are no complaints of barren stalks as was the case last year. With favorable weather a large crop will be matured. Rain is needed in some northeast and southeast counties for the best development of the crop.

Thrashing, though delayed by wet weather, is about 75 per cent completed. The coal shortage has caused more than the usual amount of stacking in some sections. Yield reports continue good to excellent, except that oats in the west-central and northwest districts are about half a crop. Flax harvest began on the 10th. Considerable timothy is standing in the shocks unthrashed.

A good second crop of red clover and a third crop of alfalfa is ready to harvest and this work has already begun in Scott county. Clover is reported full of seed, but needs warm, dry weather to ripen the seed. Considerable mildew is reported on clover.

Fall plowing has made good progress in many sections, but is much harder to do than would ordinarily be expected from the amount of rain that has fallen. The soil is turning up cloddy. Increased fall wheat acreage is indicated in several counties.

Melons, sweet corn, tomatoes and onions are yielding well. The commercial canning season is at its height. Considerable shipments of onions have been made from the large onion producing sections in Mitchell and Harrison counties. Potatoes, though yielding better than usual in gardens and on ordinary farms, are below normal in the Mitchell county commercial producing region.

Bulletin No. 20, August 22, 1922—

The warmest week of the season with ample to copious rains over most of the State and sunshine above normal made an unusual meteorological medley beneficial to corn, pastures and most other crops, while potatoes are not believed to have been injured by the heat. Most of the rain fell Monday morning, the 21st. Temperatures were high in the 90's on several afternoons.

Soil moisture is now generally sufficient to mature the corn crop, but two weeks of hot weather are needed. The earliest corn is past the roasting ear stage and some is nearly ready for the silo, but much is yet in the milk.

Shock thrashing is about finished in most sections of the State. Yields are usually variable but will average good, except oats in the west-central and northwest portions of the State.

Third cutting of alfalfa and second cutting of medium red clover was pushed rapidly. The heat and sunshine of the early part of the week cured the crop nicely. Late reports from timothy thrashing indicate good yields. Second clover crop blossoms are full of seed and a good seed crop is indicated. Some first clover thrashed for seed has yielded well.

Recent rains have aided plowing. Further reports of increased acreage to be seeded to fall wheat have been received.

The Secretary of the State Horticultural Society reports the condition of fruits August 15 as follows: Summer apples, 89; fall apples, 77; winter apples, 76; pears, 69; grapes, 95; red raspberries, 76; black raspberries, 87; blackberries, 87; peaches, 82; plums, 62; early potatoes, 73; late potatoes,

85; early cabbage, 80; late cabbage, 90; onions, 82; sweet corn, 95; tomatoes, 93; cucumbers, 85; watermelons, 83; and sweet potatoes, 85 per cent of a full crop.

Bulletin No. 21, August 29, 1922—

Hot weather at the beginning of the week culminated in the highest temperature of the season on the 24th, followed by a fall of about 40 degrees in 12 hours and cool thereafter. Heavy rains fell in Polk county and in adjacent west-central, central and south-central counties. Elsewhere the rain was mostly light to moderate. More rain is needed in the east-central and northeast counties.

Corn made excellent progress till the cool weather came. Much of it is dented and a little in the northern part of the State is considered safe from frost. Cutting for fodder and silo will begin soon in the north-central counties. More hot weather is needed but more rain would probably be a disadvantage. The general condition of the crop is good. Reports from a special list of correspondents show that the average date of planting was May 12, the same as last year, and that the average date when 75 per cent was silked was July 27, 75 days after planting and 10 days later than last year. The loss of 10 days was due to the cool period extending from the first of July to the middle of August, when the temperature averaged about two degrees per day below normal. No harm will result if temperatures are normal or higher during the next three weeks.

Thrashing of small grain has been completed in many localities and is nearly completed everywhere. Shipments of grain are slow, owing to poor transportation. Roads are mostly good. Clover seed hulling and timothy seed thrashing are in progress with mostly good reports. Considerable second crop clover remains to be cut and reports on seed prospects from second crop clover are rather conflicting.

Late potatoes, truck and pastures are generally good, though more rain is rather seriously needed in the east and southeast counties. Onion and potato harvest is progressing well in Mitchell county and cabbage is being shipped when refrigerator cars can be obtained. Apples are over-abundant with practically no market. Other fruits are plentiful.

Commercial sweet corn and tomato canning made good progress. These crops have yielded well.

Plowing was interrupted by the hot weather and by heavy rains over the sections where these fell, but has now been resumed except in the east and northeast counties, where the soil is too dry.

Bees are storing a large amount of honey of excellent quality from fall flowers and Hubam sweet clover and building up strength to withstand the winter.

Bulletin No. 22, September 5, 1922—

The past week was next to the warmest of the season. Rainfall ranging from practically none in the north and east to excessive local downpours in the southwest portions.

Corn made very good progress. Considerable of the earliest is safe from frost, particularly in the northern counties, and only a little of the latest has not dented. Seed corn can now be gathered. Silo filling and fodder cutting is due to begin any time, though as yet none has been reported. The general condition of the crop is good, though the yield has been somewhat reduced by drouth in the northern and eastern counties.

Where rain has been sufficient, fall plowing and preparation for seeding winter wheat and rye has made good progress. The favorable conditions in the usual winter wheat raising sections of the State, together with more favorable yield and price of that crop compared with oats, will result in a considerable increase in acreage seeded to winter wheat. Seeding will be delayed to avoid the Hessian fly. Over the western half of the State soil and

weather conditions have been favorable for fall seeding of alfalfa which will augment the steady increase in acreage of this valuable crop. Three cuttings of alfalfa have been made in most sections this season and a fourth is in prospect in some localities.

Sugar beet yield has been shortened considerably by drouth in some localities, but the quality of the beets for sugar making purposes is reported as good. Sorghum cutting and grinding is now in progress.

The dry, hot weather in the northern counties has been unfavorable for late potatoes. Such commercial potatoes as are raised in Iowa come mostly from these counties. Onion harvest is well advanced in Mitchell and Harrison counties. Cabbage cutting has been suspended in Mitchell county on account of scarcity of suitable cars in which to ship.

Bulletin No. 23, September 12, 1922—

September 4th to 8th, inclusive, was the hottest five-day period of the season. Many stations reported maximum temperatures around the 100 mark on the 6th and several established new high records for September. The temperature fell decidedly on the 9th and 10th. Light frosts were reported in the northwest on the 10th and at several places in nearly all districts of the morning of the 11th with temperaures in the 30's, the lowest reported being 31 at Washta. There was no material damage except to tender garden truck. Rains following the heated term were generous except in the northwest and north central districts.

Reports from hundreds of monthly correspondents on September 1 showed that with normal weather, 68 per cent of the corn would be safe from frost by September 20; 81 per cent by September 30; and if frost held off till October 15, 93 per cent would be safe and until October 21, 98 per cent. The recent hot, dry weather has hastened maturity so that more than 70 per cent is already safe, but it is believed that the crop has been shortened somewhat by this premature ripening, particularly in the northern and eastern counties where the drouth has been acute for several weeks. Some of the latest corn has not dented yet. Fodder cutting and silo filling is being pushed vigorously. It is probable that more of the crop will be handled this way than last year, since it is standing up well generally.

Truck crops, pastures and plowing were greatly benefited by the rains, but more rain is needed in the northwest and north central counties. Shipping of potatoes, onions and cabbage is brisk in Mitchell county.

Canning factories are bringing the season's work to a close, though some are still running a full force on sweet corn and will soon begin on pumpkins. The pack of sweet corn is larger than last year, but only about half that of 1920.

The fourth crop of alfalfa was also benefited by the rains. The honey flow from fall flowers was shortened in the drouthy districts.

Over most of the winter wheat counties, soil conditions have been favorable for plowing and preparation of seed bed, but the actual work of seeding is awaiting a date safe from Hessian fly, which is more numerous than for many years.

Bulletin No. 24, September 19, 1922—

Rains of the week were generous and well distributed over a wide belt extending from southwest to northeast across the State, but generally deficient elsewhere. Temperature and sunshine were deficient.

Corn made rather slow progress as a result of the cool weather, though this will probably be an advantage if frost holds off long enough, for it offset to some extent the premature ripening of previous hot weeks. Probably 85 per cent of the crop is now safe from moderate frost, though not from a severe freeze. During the last 10 years only 82 per cent of the crop on the average has escaped frost damage, but this 10-year period includes the three unusually bad years, 1912, 1915 and 1917. Slight damage occurred on lowlands from frost on the 11th. The rapid drying of the crop

during the first part of September hastened silo filling and fodder cutting. In some localities the work has been completed. There are a few reports that "hogging down" has begun.

Potato digging is well under way in some localities, with good reports as to yield and quality. The yield will be about double that of last year. Late truck crops and pastures were improved by the rains. Tomatoes and melons are in good condition, although slightly nipped by frost on lowlands in some localities on the 11th.

Preparations for winter wheat seeding have continued in the usual winter wheat section of the State and extended northward more than usual, though the acreage in the northern half of the State will of course be relatively small. Seeding has begun in Lee and Woodbury counties, but is being generally delayed to avoid the Hessian fly. It is probable that the fly-free date will be announced by the State Entomologist at Ames, after which the winter wheat will be seeded with a rush.

The Secretary of the State Horticultural Society reports the condition of fruits and vegetables, on September 15, as follows: Fall apples, 85; winter apples, 70; pears, 69; plums, 75; grapes, 95; peaches, 80; late potatoes, 75; late cabbage, 81; onions, 84; tomatoes, 92; watermelons, 86; cucumbers, 78; sweet potatoes, 77 per cent of a full crop.

Bulletin No. 25, September 26, 1922—

Warm days, cool nights and almost rainless weather were favorable for maturing corn, digging potatoes, fall plowing, winter wheat seeding and other farm work.

Corn is about up to the normal stage of advancement though a few late planted fields are still green. Less than 10 per cent would now be damaged by a moderately heavy frost. Considerable fodder cutting and silo filling was done the past week and a little cribbing has been done from the earliest fields. Light frost in some localities of the northwestern portion of the State on the morning of the 25th did no appreciable damage.

Winter wheat seeding is under way in a good many counties though there is still danger that wheat seeded now may come up in time to catch a liberal deposit of Hessian fly eggs. During the warm afternoons recently the State Entomologist reported a large increase in eggs deposited. In Warren county 13 eggs per wheat plant were deposited on the 23d. A few early seeded winter wheat fields in Lucas and Wayne counties are already up and 3 inches high. There are reports of winter wheat seeding extending northward into new territory in central Iowa.

Buckwheat is being harvested and the crop is reported as good in the northeastern part of the State, to which this crop is mostly confined. Sugar beet harvest is about to begin in Wright county, where the quality of the beets is reported as good.

Fall apple picking is in progress. The crop is excellent in quantity and quality where spraying was attended to properly. Grape harvest is about finished; the crop was abundant.

Potatoes and onions by the trainload in Mitchell county are being held in warehouses on account of shortage of cars in which to ship.

As a whole the season has been favorable for nearly all crops and in this respect Iowa has been more favored than surrounding states. For this reason prices should be more satisfactory this year than last year provided products are not rushed to market too fast.

CROP SEASON WEATHER, 1922, BY WEEKS.

Average rainfall, mean temperature and mean sunshine with departures from the normal, as derived from the records of selected stations.

Week ending	Rainfall (inches)		Temperature (Deg. Fahr.)		Sunshine	
	State average	Departure	Mean	Departure	Per cent	Departure
April 4	0.7	+0.2	41	−7	37	−23
April 11	2.0	+1.4	54	+7	34	−15
April 18	0.5	−0.3	47	−2	49	−10
April 25	0.1	−0.6	51	−2	68	+6
May 2	0.1	−0.7	52	−2	55	+6
May 9	0.8	−0.2	65	+7	69	+7
May 16	0.8	−0.6	68	+3	71	+9
May 23	0.9	0	62	−1	69	+4
May 30	1.4	+0.3	67	+2	44	−20
June 6	0.5	−0.8	64	−3	62	−3
June 13	0.7	−0.4	76	+7	81	+14
June 20	0.2	−0.9	75	+4	71	+2
June 27	0.3	−0.8	74	+2	80	+19
July 4	0.5	−0.5	72	−2	68	−4
July 11	2.3	+1.4	71	−4	58	−14
July 18	1.8	+1.0	73	−3	68	−6
July 25	0.4	−0.4	74	−2	68	−5
August 1	1.6	+0.8	74	−1	60	−13
August 8	0.3	−0.5	75	0	73	+1
August 15	0.4	−0.4	73	−1	71	0
August 22	1.1	+0.3	79	+6	81	+11
August 29	0.7	0	73	+2	69	+1
September 5	0.2	−0.4	76	+8	67	+4
September 12	1.4	+0.6	74	+7	73	+8
September 19	0.7	−0.1	63	−2	58	−6
September 26	†	−0.7	62	0	71	+9
October 3	0.1	−0.5	68	+8	82	+21
For the season	20.0	−2.8	67	+1	64	−2

†Not more than .05 inch.

MONTHLY PERCENTAGE CONDITION OF CROPS, 1922, AND YIELD PER ACRE.

Crops	April 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Yield per acre
Corn			92	91	94	94	96	45.0 bu.
Oats			86	75	84	90		27.0 bu.
Winter wheat	92	95	91	91				23.0 bu.
Spring wheat			86	79	81			15.0 bu.
Barley			91	82	87	91		28.4 bu.
Rye	93	97	95	93				19.0 bu.
Flax				84	87	90	90	10.0 bu.
Potatoes			92	79	84	85	86	100.0 bu.
Tame hay		93	87	85	87			1.49 tons
Wild hay		93	87	85	87			1.14 tons
Alfalfa			98	96	93			2.67 tons
Pastures		87	91	83	90	91	86	

FINAL ESTIMATES OF IOWA CROPS, 1922

(Dated December 1, 1922)

An increase of 57 per cent in the total value of Iowa's 1922 crops over 1921 is shown by the final joint estimates of the U. S. Bureau of Agricultural Economics and the Iowa Weather and Crop Service.

Four bumper corn crops in succession is Iowa's unprecedented record. The 1922 crop of 455,535,000 bushels was raised on 10,123,000 acres with the average yield of 45 bushels to the acre, worth, December 1, fifty-four cents per bushel, or a total value of $245,989,000.

The total crop of 1922 is exceeded only by that of 1920. The old corn on hand November 1, 39,668,000 bushels (latest revision) plus the 1922 crop makes the total corn on farms 495,203,000 bushels compared with 502,344,000 in 1921 and 506,943,000 in 1920. New corn is 28 per cent above prewar normal; old corn 159 per cent above; and total corn 33 per cent above prewar normal. Fortunately, Iowa farmers are much better provided with live stock to consume this corn than they were last year and the corn production for the country as a whole is less.

The quality of the 1922 corn crop is good, the moisture content of that received at elevators during the last week of November was 16.8 per cent as compared with 16.0 per cent last year. Ninety-seven per cent matured without frost damage. On December 1, 86 per cent of the corn husking had been done which is about the usual. About 8 per cent of the crop was hogged and grazed down.

Oats were a much better crop than last year, yielding a total of 222,851,000 bushels on 6,023,000 acres with an average yield of 37 bushels per acre, worth 34 cents per bushel or a total value of $75,769,000.

Spring wheat dropped to 68,000 acres which is probably the least since Iowa became a State. The yield per acre was 15 bushels; total crop 1,020,000 bushels; worth at 95 cents per bushel, $969,000.

Winter wheat is steadily gaining favor in Iowa. The acreage in 1922 increased to 689,000; the yield per acre was 23 bushels; the total yield, 15,847,000 bushels; the price 97 cents per bushel and the total value, $15,372,000. Winter killing was only 2 per cent in the winter of 1921-22. A further increase in acreage seeded is reported for the 1923 crop but there are indications that this will be somewhat reduced by the depredations of the Hessian fly.

Barley acreage is estimated at 150,000; yield per acre, 28.4 bushels; total, 4,260,000 bushels, worth, at 52 cents per bushel, $2,215,000.

Rye acreage was 60,000; yield per acre, 19 bushels; total yield 1,140,000 bushels; price 71 cents per bushel; value $809,000.

Flaxseed:—Area harvested 8,000 acres; average yield, 10 bushels; total yield, 80,000 bushels; price per bushel, $2.07; total value, $166,000.

Timothy seed:—Area harvested, 230,000 acres; average yield 4.53 bushels; total yield, 1,042,000 bushels; average price, $2.49; total value, $2,595,000.

Clover seed:—Area harvested, 132,000 acres; yield per acre, 1.7 bushels; total yield, 224,000 bushels; price per bushel, $10.40; total value, $2,330,000.

Tame hay increased to 3,393,000 acres, including 200,000 acres of alfalfa. The average yield was 1.40 tons; total production, 4,750,000 tons; price $10.40 per ton; total value, $49,400,000.

Alfalfa yielded 2.67 tons per acre or a total of 534,000 tons; price $14.80 per ton; total value $7,903,000.

Wild Hay:—Area, 432,000 acres; yield per acre, 1.14 tons; total production, 492,000 tons; price $8.50 per ton; total value $4,182,000.

Minor miscellaneous crops such as garden truck, fruit, pop corn, sweet corn, buckwheat, sugar beets, pasturage, etc. are lumped off at a paltry $75,101,000 worth.

Increased values due to feeding a considerable portion of these crops to live stock are not considered in this report.

Details by counties are shown on the following pages.

FARM WAGES IN 1922

The wages of male farm labor in Iowa during 1922 were as follows: Average rate per month when hired by the year with board, $37.00, compared with $39.55 last year; without board, $48.00, compared with $52.40 last year. Average wage per day for day labor for harvest work with board, $2.70, compared with $2.76 last year; without board, $3.59, compared with $3.57 last year. Average wage per day for day labor for other than harvest work with board, $2.13, compared with $2.25 last year; without board, $2.58, compared with $2.72 last year. See table on page 16.

FUEL ON IOWA FARMS IN 1922

The average number of cords of fire wood burned per farm reporting for 1922 is estimated at 7.5 cords, compared with 9 cords last year.

The average price per cord, 4-ft. length, for 1922 is estimated at $5.20, compared with $5.14 last year. The average number of tons of coal burned per farm reporting this year was 6.6 tons and the average price estimated at $10.25 per ton. See pages 17 to 19.

IOWA FARM PRICES, DECEMBER 1, 1922

The prices of Iowa farm crops are steadily climbing. A dollar's worth of crops in Iowa November, 1913—before the war—would have sold for 72 cents a year ago in November; for 78 cents in October of this year, and for 83 cents in November of this year. A dollar's worth of crops December 1913 would sell for more than 99 cents today, practically at par again.

The reason for this sudden change in purchasing power is due to several factors. One of which is the demand for feed by an increased number of live stock on feed, 50 per cent more cattle in Iowa and 20 per cent more sheep in the United States. Another is the fact that the normal tendency of crop prices is slightly downward during the fall months. Car shortage in some sections acting as a break on crop movements tends to keep corn prices up.

With live stock—cattle, hogs, sheep, poultry, horses and dairy cows—a dollar's worth in November, 1913, would sell for 97 cents in November, 1922.

With live stock products, milk, butter, eggs, and wool a dollar's worth in November 1913 would sell for $1.46 November 1922.

Wholesale prices of what the farmer has to buy are still 50 per cent or more higher than in 1913 for the United States. A dollar's worth of clothing in 1913 would cost $1.88 this fall, building materials $1.83, house furnishings goods $1.76.

C. F. S.

WINTER WHEAT AND RYE OUTLOOK IN IOWA, 1923.

The acreage of winter wheat sown in Iowa this fall, as reported by the Division of Crop and Live Stock Estimates of the United States Department of Agriculture, in co-operation with the Iowa Weather and Crop Service, is 773,000 acres, compared with 689,000 acres harvested during 1922. The condition December 1 was 91 per cent of the normal. Considerable loss from Hessian fly is indicated.

The acreage sown to rye in Iowa this fall is estimated at 59,000 acres, compared with 60,000 acres harvested this year. The growing condition December 1 was 94 per cent of normal.

County estimates of acreage seeded to winter wheat and rye for the 1923 crop and the condition in per cent of normal is shown on page 26.

TABULATED CROP SUMMARY, 1922
IOWA

Crop	Acres	Average yield	Total yield	Average price	Gross value per acre	Total value
Corn	10,123,000	45.00 bus.	455,535,000	$ 0.54	$ 24.30	$246,988,000
Oats	8,023,000	27.00 bus.	222,851,000	0.34	12.58	75,702,000
Spring wheat	68,000	15.00 bus.	1,020,000	0.95	14.25	969,000
Winter wheat	680,000	22.00 bus.	15,547,000	0.97	22.31	15,272,000
Barley	150,000	29.40 bus.	4,200,000	0.52	14.77	2,215,000
Rye	60,000	19.00 bus.	1,140,000	0.71	13.49	810,000
Flax seed	8,000	10.00 bus.	80,000	2.07	20.70	166,000
Timothy seed	230,000	4.53 bus.	1,042,000	2.49	11.28	2,585,000
Clover seed	122,000	1.70 bus.	224,000	10.40	17.65	2,330,000
Potatoes	*94,000	90.00 bus.	8,460,000	0.62	55.80	5,245,000
Hay (tame)	2,287,000	1.40 tons	4,750,000	10.40	14.56	49,400,000
Hay (wild)	422,000	1.14 tons	422,000	8.50	9.68	4,102,000
Alfalfa	230,000	2.67 tons	534,000	14.80	39.52	[b] 7,903,000
Pasture and grazing	10,130,000			5.58		56,525,000
Ensilage	304,000	8.00 tons	2,432,000	3.40	27.20	[c] 8,259,000
Sweet corn (com'l crop)	20,000	3.00 tons	90,000	7.00	21.00	630,000
Pop corn	5,500	2,300.00 lbs.	12,100,000	0.03	66.00	363,000
Buckwheat (estimated)	5,000	14.00 bus.	70,000	1.19	16.66	83,000
Fruit crop (estimated)						10,000,000
Garden truck (estimated)						5,000,000
Miscellaneous (estimated)						2,500,000
Total value, not including live stock products, for the year, 1922						$480,142,000
					1921	305,459,429
					1920	560,460,538

*Subject to revision when assessors' figures become available.
[b] Alfalfa included in tame hay and therefore excluded from grand total.
[c] Ensilage, acreage, production and value is included in corn and therefore excluded from grand total.

MISCELLANEOUS TABLE

Corn moisture. Price of buckwheat, sorghum sirup, hogs for market, cattle for market, feeder cattle and wages of farm labor.

Districts	Moisture in corn marketed November 20-30—%	Average Price December 1, 1922					Wages of Male Farm Labor, 1922					
		Buckwheat, per bushel of 48 lbs.	Sorghum sirup, per gallon	Hogs for market, per cwt.	Cattle for market, per cwt.	Cattle, feeder stock, per cwt.	Average rate per month when hired by the year		Average wage per day for day labor for harvest work		Average wage per day for day labor other than harvest work	
							With board	Without board	With board	Without board	With board	Without board
Northwest	16.6		$ .86	$ 7.00	$ 8.00	$ 5.70	$27.50	$32.00	$ 2.03	$ 2.56	$ 2.20	$ 2.86
North Central	17.5	$ 1.07	1.07	7.00	8.45	5.90	26.00	30.00	2.57	3.10	2.20	2.72
Northeast	18.0	.98	1.04	7.21	8.44	6.76	27.00	30.00	2.52	3.09	2.19	2.77
West Central	17.0		.97	7.15	8.92	6.26	25.00	32.00	2.69	3.35	2.10	2.57
Central	16.9	1.50	1.04	7.22	9.04	6.45	27.00	40.00	2.75	3.50	2.50	2.74
East Central	17.9	.55	1.01	7.30	8.86	6.82	24.00	40.00	3.30	3.54	2.16	2.80
Southwest	14.5		1.01	7.26	9.12	6.54	27.75	48.00	2.58	3.21	2.00	2.53
South Central	16.2	1.05	.95	7.40	8.86	6.94	24.00	45.00	2.49	2.92	1.88	2.30
Southeast	16.2	2.56	.88	7.30	8.80	6.50	35.00	44.80	2.49	2.96	1.91	2.25
State	16.8	1.25	.97	7.20	8.52	6.40	26.80	40.79	2.79	3.35	2.11	2.67

IOWA CROPS, 1922, ESTIMATED NUMBER OF ACRES BY COUNTIES

Districts and Counties	Corn	Oats	Winter Wheat	Spring Wheat	Barley	Rye	*Potatoes	Tame Hay (Including Alfalfa)	Wild Hay	Alfalfa	Pasture
Northwest—											
Buena Vista	135,000	91,000	20	50	260	60	870	25,020	5,060	1,220	66,300
Cherokee	130,000	86,000	20	50	330	......	1,050	27,160	7,070	3,460	75,300
Clay	116,000	89,000	20	90	430	30	520	22,150	9,390	300	72,000
Dickinson	70,000	57,000	20	230	1,300	90	480	14,730	9,200	150	50,000
Emmet	75,000	58,000	......	20	820	170	200	16,040	5,750	140	51,000
Lyon	121,000	112,000	106	140	1,790	10	2,080	16,740	9,630	4,440	62,000
O'Brien	130,000	98,000	20	210	1,840	......	1,020	22,030	6,020	1,430	49,000
Osceola	87,000	79,000	19	20	350	60	1,110	14,720	7,180	220	44,300
Palo Alto	110,000	90,000	10	30	200	720	580	18,800	15,400	300	61,000
Plymouth	196,000	116,000	2,300	8,480	6,300	280	1,880	26,800	17,240	15,360	107,500
Pocahontas	134,000	112,000	10	30	150	270	770	20,470	8,390	470	54,500
Sioux	167,000	128,000	880	2,040	4,920	110	2,000	29,490	14,000	10,290	81,000
For District	1,501,000	1,117,000	3,470	11,370	18,280	1,010	12,850	265,170	112,640	38,270	702,500
North Central—											
Butler	107,000	78,000	30	40	440	1,970	1,220	26,720	11,330	20	94,000
Cerro Gordo	105,000	74,000	20	40	980	110	1,760	32,040	9,100	140	80,300
Floyd	86,000	83,000	20	30	490	760	1,700	31,940	4,190	40	75,000
Franklin	113,000	91,000	30	40	690	140	1,720	29,820	6,970	20	82,500
Hancock	108,000	97,000	20	160	850	140	1,300	26,790	12,110	90	75,000
Humboldt	98,000	72,000	20	50	560	30	500	30,410	3,970	410	42,500
Kossuth	199,000	174,000	10	180	900	330	1,200	41,310	26,880	510	116,000
Mitchell	69,000	74,000	70	140	630	40	8,000	31,350	3,250	20	70,500
Winnebago	72,000	56,000	20	230	2,080	80	1,050	16,880	15,800	80	53,000
Worth	60,000	57,000	30	470	1,270	270	1,300	21,710	12,500	10	59,000
Wright	122,000	95,000	30	60	500	60	800	28,890	4,880	90	68,300
For District	1,140,000	951,000	240	1,530	9,660	4,010	21,160	308,830	111,080	1,430	822,100
Northeast—											
Allamakee	45,000	34,000	1,850	720	2,690	680	1,040	56,410	1,250	10	159,000
Black Hawk	102,000	75,000	420	60	1,800	2,400	1,090	31,680	7,280	80	92,000
Bremer	68,000	57,000	50	90	410	630	1,340	21,810	21,210	110	76,000
Buchanan	100,000	77,000	20	60	430	1,230	670	30,090	10,580	50	107,000
Chickasaw	62,000	62,000	50	210	500	170	680	22,610	12,400	10	81,000
Clayton	81,000	71,000	2,500	640	2,940	600	1,880	72,640	380	140	128,000
Delaware	91,000	61,000	80	230	2,200	1,420	800	47,880	9,350	80	114,000
Dubuque	66,000	53,000	650	670	880	250	2,010	67,270	480	70	150,000
Fayette	96,000	75,000	470	590	7,350	880	1,330	59,610	11,040	10	150,000
Howard	55,000	61,000	140	170	1,890	430	880	35,510	18,400	10	91,000
Winneshiek	62,000	76,000	980	1,000	8,630	300	1,270	58,340	5,120	40	151,000
For District	850,000	705,000	7,170	4,510	24,490	8,670	12,010	519,910	94,160	610	1,379,000
West Central—											
Audubon	94,000	46,000	1,570	850	4,800	50	800	30,600	930	2,000	75,000
Calhoun	145,000	108,000	70	......	50	50	500	30,510	2,390	610	53,000
Carroll	123,000	77,000	740	1,200	1,310	90	1,750	34,300	5,000	700	79,500
Crawford	140,000	77,000	4,420	6,660	3,230	130	1,610	53,740	4,560	9,340	126,000
Greene	140,000	84,000	430	30	110	......	270	23,220	3,670	220	72,200
Guthrie	112,000	59,000	3,710	400	1,310	110	410	35,310	2,880	510	123,000
Harrison	161,000	47,000	29,060	8,700	2,790	460	1,280	19,500	6,480	21,800	103,000
Ida	102,000	61,000	50	340	1,580	50	740	33,390	1,380	2,380	60,000
Monona	143,000	45,000	41,710	4,140	1,420	110	1,000	23,220	9,210	16,250	99,000
Sac	135,000	86,000	80	120	2,150	20	1,000	28,640	2,910	1,040	71,000
Shelby	129,000	62,000	1,690	1,800	6,560	530	1,040	29,300	2,910	6,200	83,100
Woodbury	150,000	76,000	15,720	2,440	1,210	280	2,000	47,690	6,270	26,390	108,000
For District	1,619,000	828,000	109,260	26,840	26,520	1,880	12,440	396,600	50,900	89,000	1,002,800
Central—											
Boone	130,000	82,000	720	300	460	210	220	22,540	4,110	930	81,600
Dallas	129,000	67,000	28,600	300	490	90	150	25,400	1,450	800	100,800
Grundy	102,000	80,000	120	20	470	20	1,850	25,130	4,560	30	72,000
Hamilton	132,000	97,000	100	170	260	110	500	24,420	2,300	220	67,700
Hardin	121,000	82,000	100	30	400	20	1,060	30,790	4,350	490	81,500
Jasper	146,000	75,000	5,400	870	200	730	450	50,540	290	140	148,600
Marshall	118,000	68,000	1,220	430	200	250	620	40,590	270	90	69,600
Polk	106,000	51,000	25,820	2,170	20	350	710	25,070	650	870	84,700
Poweshiek	112,000	57,000	200	220	330	130	600	42,200	90	100	121,000
Story	140,000	92,000	800	30	80	190	80	30,040	1,800	240	60,000
Tama	121,000	79,000	1,580	1,030	1,070	170	1,200	55,880	1,050	60	141,000
Webster	156,000	124,000	280	470	320	90	750	23,950	7,180	1,150	82,000
For District	1,524,000	955,000	65,960	6,050	4,310	2,270	8,510	396,630	30,530	5,250	1,134,700
East Central—											
Benton	140,000	93,000	1,350	290	3,400	1,310	1,000	51,050	1,380	150	116,200
Cedar	100,000	50,000	3,730	260	4,930	570	670	51,070	120	70	114,000
Clinton	110,000	53,000	4,290	850	4,850	2,340	560	39,530	1,850	220	156,000
Iowa	100,000	40,000	2,280	560	1,580	360	1,160	40,140	340	40	119,700
Jackson	62,000	35,000	2,550	700	520	950	1,060	61,200	770	60	202,000
Johnson	96,000	40,000	2,500	430	430	840	850	49,820	620	520	130,000
Jones	79,000	44,000	200	220	1,290	810	850	51,470	150	70	150,000
Linn	115,000	70,000	620	240	890	1,410	1,050	56,470	2,820	170	120,000

IOWA CROPS, 1922, ESTIMATED NUMBER OF ACRES, BY COUNTIES—Continued

Districts and Counties	Corn	Oats	Winter Wheat	Spring Wheat	Barley	Rye	*Potatoes	Tame Hay (Including Alfalfa)	Wild Hay	Alfalfa	Pasture
Muscatine	75,000	25,000	7,980	420	1,200	4,500	750	26,600	270	450	77,300
Scott	77,000	25,000	19,989	1,500	13,320	2,430	2,680	34,850	1,320	1,450	81,000
For District	964,000	494,000	45,629	5,490	33,040	13,500	10,640	462,310	9,760	3,210	1,285,200
Southwest—											
Adair	97,000	54,000	5,800	290	5,730	240	650	34,680	2,000	180	117,000
Adams	71,000	30,000	11,577	90	940	440	430	21,420	1,880	820	100,000
Cass	109,000	57,000	22,770	580	7,480	530	800	30,720	770	920	105,000
Fremont	120,000	19,000	22,800	210	110	280	920	20,530	2,400	10,430	78,000
Mills	102,000	21,000	27,479	1,130	540	650	680	20,220	2,500	11,020	67,000
Montgomery	86,000	27,000	25,123	170	750	490	440	26,360	550	5,460	76,000
Page	108,000	18,000	22,402	320	720	740	200	33,120	770	6,430	108,000
Pottawattamie	202,000	57,000	30,233	2,640	11,820	870	2,050	50,100	5,220	21,800	128,000
Taylor	97,000	35,000	29,645	50	----	650	400	27,700	530	1,000	125,500
For District	1,097,000	314,000	208,909	6,140	28,870	4,850	6,450	264,960	17,980	58,000	956,100
South Central—											
Appanoose	41,000	24,000	5,640	210	30	310	210	45,290	880	80	146,300
Clarke	54,000	23,000	6,260	50	130	280	150	25,830	130	30	105,000
Decatur	67,000	30,000	17,420	40	50	950	170	26,730	210	120	147,000
Lucas	48,000	26,000	11,130	40	----	250	90	32,910	20	110	119,000
Madison	85,000	28,000	25,910	310	1,480	710	420	34,730	1,600	520	140,000
Marion	88,000	39,000	20,190	1,610	220	240	210	35,340	230	340	135,000
Monroe	44,000	17,000	9,320	250	150	580	200	34,340	140	40	130,500
Ringgold	85,000	30,000	3,900	40	110	700	220	30,060	310	60	120,000
Union	64,000	31,000	2,880	10	480	440	550	28,000	960	60	130,000
Warren	85,000	33,000	33,376	720	270	440	880	33,010	470	510	122,500
Wayne	61,000	35,000	5,970	50	30	320	80	42,620	40	120	120,000
For District	723,000	322,000	142,000	3,430	3,150	5,180	3,200	379,390	4,880	1,900	1,415,300
Southeast—											
Davis	54,000	18,000	6,110	100	40	390	450	41,640	10	40	138,100
Des Moines	65,000	29,000	15,920	120	280	1,530	1,700	25,080	----	230	92,000
Henry	75,000	28,000	3,280	50	20	490	800	21,070	----	70	108,000
Jefferson	62,000	29,000	7,500	100	70	370	370	28,480	10	80	122,000
Keokuk	93,000	34,000	3,990	840	400	550	640	45,470	50	70	125,000
Lee	56,000	16,000	16,510	220	320	6,310	1,180	38,900	70	720	147,910
Louisa	75,000	18,000	16,560	120	40	3,970	900	22,360	90	80	78,000
Mahaska	106,000	34,000	9,440	680	270	350	470	28,800	160	60	120,000
Van Buren	80,000	22,000	9,720	70	80	880	240	36,440	10	440	153,000
Wapello	55,000	22,000	15,250	70	70	540	420	32,950	----	150	107,000
Washington	102,000	47,000	2,150	200	70	290	550	43,650	10	50	153,000
For District	795,000	286,000	106,270	2,640	1,670	15,600	6,250	392,910	270	2,010	1,320,000
For State	10,123,000	6,023,000	689,000	68,000	150,000	60,000	94,000	3,363,000	422,000	200,000	10,130,000

*Potato acreage subject to revision when assessors' figures become available.

AVERAGE AND TOTAL YIELDS OF IOWA CROPS, 1922, BY COUNTIES

Districts and Counties	Corn		Oats		Winter Wheat		Spring Wheat		Barley		Rye		*Potatoes		Tame Hay		Wild Hay		Alfalfa	
	Bushels per acre	Total bushels	Bushels per acre	Total bushels	Bushels per acre	Total bushels	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
Northwest—																				
Buena Vista	44	5,940,000	40	3,640,000	20	400	18	900	23	9,600	27	1,600	98	95,000	1.3	20,800	1.0	5,100	3.5	4,000
Cherokee	42	5,460,000	33	2,828,000	20	400	14	700	31	10,200			98	107,000	1.4	33,500	1.1	7,800	2.6	9,000
Clay	41	4,756,000	36	3,204,000	19	400	17	1,500	27	11,300	18	500	110	57,000	1.3	28,000	1.3	11,500	2.9	15,900
Dickinson	34	2,380,000	31	1,707,000	15	300	12	2,500	28	26,400	15	1,200	79	36,000	1.3	17,300	1.0	9,300	2.2	800
Emmet	34	2,550,000	37	2,146,000			14	300	35	18,200	14	2,400	120	47,000	1.4	22,300	1.2	6,900	2.2	300
Lyon	43	5,633,000	35	3,920,000	20	2,000	14	1,900	27	45,300	21	400	105	281,000	1.5	18,400	1.2	12,500	3.0	13,300
O'Brien	40	5,300,000	37	3,628,000	29	400	15	3,200	33	60,700			94	96,000	1.2	28,000	1.0	6,000	3.1	4,400
Osceola	40	3,480,000	34	2,686,000	30	200	14	300	27	9,400	20	1,300	124	128,000	1.2	17,300	1.3	9,300	2.9	900
Palo Alto	43	4,730,000	34	3,060,000	20	200	14	400	28	5,600	22	16,100	98	55,000	1.4	35,900	0.9	13,900	3.0	900
Plymouth	42	8,222,000	31	3,596,000	22	52,000	14	120,700	30	186,000	28	10,600	141	265,000	1.3	28,000	1.0	17,300	2.0	30,600
Pocahontas	45	6,030,000	37	4,181,000	20	200	20	600	30	4,500	21	5,700	111	85,000	1.2	24,000	1.2	7,700	3.1	1,500
Sioux	45	8,415,000	35	4,480,000	19	17,000	16	33,000	29	142,700	21	2,300	118	220,000	1.3	25,000	1.1	15,000	2.6	28,800
For District	41	62,806,000	35	39,144,000	20	73,500	14	166,600	30	542,900	22	42,000	116	1,498,000	1.32	298,200	1.09	122,200	2.80	109,000
North Central—																				
Butler	42	4,494,000	38	2,964,000	20	200	17	700	30	12,200	20	29,400	123	162,000	1.7	45,400	1.1	12,400	2.7	50
Cerro Gordo	45	4,735,000	41	3,034,000	18	360	15	600	19	28,400	20	3,800	112	197,000	1.4	46,000	1.1	10,000	2.8	520
Floyd	35	3,066,000	40	3,320,000	21	420	15	400	29	14,300	21	15,300	123	209,000	1.4	44,700	1.2	5,500	2.3	90
Franklin	48	5,424,000	42	3,948,000	19	100	17	700	34	22,400	14	2,000	96	163,000	1.2	35,800	1.6	11,200	4.4	90
Hancock	44	4,752,000	32	3,104,000	17	340	16	2,000	27	23,000	18	2,500	130	169,000	1.5	40,000	0.8	9,700	2.4	220
Humboldt	47	4,606,000	36	2,592,000	17	240	20	1,000	27	15,100	12	400	109	54,000	1.2	24,000	1.0	4,000	3.1	1,300
Kossuth	43	8,557,000	39	6,782,000	16	160	17	3,500	32	38,800	25	8,200	89	142,000	1.4	57,100	0.8	21,500	2.7	1,380
Mitchell	41	2,929,000	41	3,034,000	17	1,190	20	3,000	26	16,400	30	1,200	138	1,104,000	1.4	43,800	1.0	3,200	2.7	50
Winnebago	42	3,024,000	38	2,128,000	17	240	16	5,600	27	56,200	24	1,900	110	115,000	1.2	30,200	1.0	16,000	2.4	120
Worth	42	2,520,000	39	2,223,000	16	480	15	7,500	27	24,200	20	5,400	78	106,000	1.3	28,200	1.3	16,300	2.3	30
Wright	43	5,289,000	40	3,800,000	17	170	20	1,500	32	25,600	17	1,000	81	70,000	1.4	40,200	1.0	4,800	3.1	280
For District	43	49,316,000	39	36,330,000	17	4,100	17	27,500	29	277,600	20	81,700	118	2,491,000	1.39	435,500	1.02	114,600	2.90	4,210
Northeast—																				
Allamakee	35	2,475,000	41	1,204,000	18	34,000	20	15,600	22	88,100	28	19,000	107	108,000	1.9	107,200	1.5	1,900	2.7	30
Black Hawk	47	4,794,000	30	2,925,000	20	8,600	20	1,300	27	50,400	22	54,100	104	113,000	1.7	53,700	1.2	9,700	2.2	180
Bremer	45	3,090,000	44	2,208,000	24	1,200	14	1,100	32	13,100	18	11,300	134	180,000	1.6	34,700	1.2	23,800	4.4	480
Buchanan	45	4,500,000	32	2,464,000	21	700	17	1,300	25	10,800	18	22,100	74	50,000	1.4	50,400	1.3	13,700	3.3	180
Chickasaw	40	2,480,000	42	2,646,000	21	1,000	12	2,500	35	10,500	22	3,700	108	73,000	1.3	42,400	1.2	14,000	2.2	30
Clayton	52	4,212,000	44	3,124,000	26	65,000	18	12,500	32	94,100	25	15,000	109	218,000	1.7	112,300	1.4	1,400	2.7	520
Delaware	40	3,640,000	34	2,074,000	12	1,000	14	3,300	28	61,600	25	37,600	94	77,000	1.3	62,100	1.4	7,500	2.4	190
Dubuque	47	3,102,000	41	2,173,000	20	11,000	20	18,400	28	23,800	20	5,000	130	253,000	1.6	107,700	1.3	600	3.3	230
Fayette	49	4,802,000	39	2,935,000	20	9,400	18	7,500	35	80,000	22	8,400	115	141,000	1.5	89,400	1.1	12,100	3.3	30
Howard	39	2,145,000	40	2,440,000	16	2,200	12	2,000	32	60,500	16	6,900	86	76,000	1.5	53,200	1.5	27,600	5.0	50
Winneshiek	42	3,444,000	41	3,116,000	25	24,500	17	19,000	32	276,200	24	8,600	88	112,000	1.6	93,200	1.1	5,600	4.0	160
For District	46	38,654,000	40	27,789,000	21	158,600	17	84,200	30	767,100	22	172,100	121	1,556,000	1.56	806,200	1.26	118,800	3.30	2,050
West Central—																				
Audubon	43	4,042,000	28	1,288,000	25	39,200	13	12,000	30	144,000	20	1,000	91	72,000	1.4	40,000	1.3	1,200	3.1	6,200
Calhoun	49	7,105,000	38	4,104,000	24	1,700			28	1,400	20	1,000	94	47,000	1.3	25,100	1.0	2,400	2.7	1,650
Carroll	45	5,535,000	33	2,541,000	23	17,000	12	17,000	29	28,000	10	900	108	185,000	1.4	46,900	1.3	7,300	2.9	2,000
Crawford	38	5,220,000	23	2,156,000	28	122,800	25	104,000	28	91,700	22	2,900	94	151,000	1.3	56,900	1.3	5,900	2.4	23,900
Greene	50	7,000,000	39	3,276,000	17	7,100	18	500	28	3,100			76	20,000	1.2	27,600	0.8	2,500	1.6	150
Guthrie	44	4,928,000	37	2,182,000	23	85,300	12	4,800	29	28,000	19	2,100	105	42,000	1.3	45,200	1.3	3,700	3.8	1,940
Harrison	46	7,406,000	28	1,316,000	22	741,000	14	122,800	23	64,300	19	8,700	100	126,000	1.9	14,600	1.5	9,700	2.6	56,680
Ida	39	2,978,000	32	1,332,000	22	1,100	12	4,100	28	44,200	17	800	92	85,000	1.2	26,300	1.3	3,100	3.5	11,760
Monona	38	5,424,000	28	1,280,000	21	675,900	12	50,700	29	41,500	20	2,200	107	113,000	1.3	9,100	1.0	9,200	2.6	42,420
Sac	48	6,480,000	35	3,010,000	22	1,800	19	2,300	31	66,600	20	400	109	109,000	1.5	41,400	1.2	3,500	3.4	3,540
Shelby	41	5,289,000	29	1,798,000	29	49,000	14	26,000	28	170,000	23	12,200	80	82,000	1.4	47,200	1.4	4,100	3.4	21,100
Woodbury	32	6,240,000	25	1,900,000	27	424,400	12	31,000	28	33,900	17	4,800	108	216,000	1.2	21,300	0.6	5,000	2.5	65,180
For District	43	66,757,000	32	26,784,000	24	2,387,300	14	375,200	28	727,300	20	37,000	101	1,251,000	1.30	401,500	1.11	56,600	2.60	237,530

AVERAGE AND TOTAL YIELD OF IOWA CROPS, 1922, BY COUNTIES—Continued

Districts and Counties	Corn		Oats		Winter Wheat		Spring Wheat		Barley		Rye		Potatoes		Tame Hay		Wild Hay		Alfalfa	
	Bushels per acre	Total bushels	Bushels per acre	Total bushels	Bushels per acre	Total bushels	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
Central—																				
Boone	46	5,980,000	27	3,034,000	21	15,100	18	7,900	29	12,200	19	4,000	81	19,000	1.5	22,900	1.1	4,500	2.8	2,040
Dallas	49	6,221,000	38	2,546,000	24	686,400	18	4,300	31	15,200	20	1,800	120	18,000	1.5	36,900	1.2	1,900	3.0	2,400
Grundy	50	5,150,000	43	3,440,000	22	2,600	21	400	37	17,400	28	600	106	197,000	1.6	40,200	1.3	5,900	2.1	60
Hamilton	52	6,864,000	42	4,074,000	22	4,200	18	3,300	31	8,100	23	2,500	84	42,000	1.2	28,900	1.1	3,900	2.6	800
Hardin	52	6,292,000	46	2,818,000	25	2,800	16	300	39	15,600	20	600	117	126,000	1.4	42,400	1.4	6,000	2.2	1,020
Jasper	50	7,300,000	39	2,925,000	27	145,800	15	14,000	31	6,300	21	15,300	86	39,000	1.5	75,600	1.4	516	2.6	300
Marshall	51	6,018,000	45	2,060,000	22	30,400	20	9,400	39	7,800	16	4,000	94	58,000	1.7	68,800	1.1	400	4.2	280
Polk	47	4,282,000	40	2,040,000	25	646,200	12	27,000	29	600	18	6,300	81	58,000	1.7	41,100	1.4	900	3.0	2,610
Poweshiek	47	5,264,000	39	2,222,000	21	20,000	14	3,700	28	9,200	26	3,400	80	71,000	1.8	76,000	1.2	100	1.9	190
Story	49	6,860,000	42	3,864,000	25	20,000	16	400	26	2,100	20	2,800	84	7,000	1.5	44,700	1.2	2,500	2.7	650
Tama	50	6,550,000	39	3,081,000	31	49,000	16	17,000	31	23,200	18	3,100	97	133,000	1.6	89,200	1.1	1,200	2.8	610
Webster	46	7,176,000	39	4,836,000	22	6,400	17	8,400	29	9,600	15	1,400	81	61,000	1.5	22,700	1.2	8,600	3.3	3,800
For District	49	74,757,000	41	38,941,000	24	1,629,500	17	95,300	32	138,300	20	46,800	98	831,000	1.56	610,500	1.30	36,446	3.08	16,180
East Central—																				
Benton	49	6,860,000	42	2,006,000	23	21,000	19	5,500	27	91,800	20	26,200	102	102,000	2.2	112,000	1.5	2,000	4.4	660
Cedar	51	5,100,000	47	2,350,000	27	100,700	20	5,300	28	138,000	28	16,000	70	47,000	1.9	96,900	1.2	150	3.3	230
Clinton	42	4,998,000	37	1,961,000	23	98,700	15	12,900	24	117,100	18	42,100	96	51,000	1.5	89,900	1.1	2,000	3.0	690
Iowa	45	4,500,000	41	1,640,000	24	54,200	18	10,100	24	28,400	15	5,400	106	123,000	1.7	68,200	1.1	400	2.2	90
Jackson	47	2,961,000	41	1,425,000	16	40,800	13	9,100	25	13,800	16	15,200	113	154,000	1.6	97,900	1.1	800	3.5	210
Johnson	47	4,512,000	42	2,058,000	24	62,200	16	6,300	29	12,500	17	14,300	100	86,000	1.8	88,700	1.1	700	2.3	1,200
Jones	50	3,950,000	39	1,716,000	22	4,600	17	2,900	34	43,900	15	12,200	108	92,000	1.5	77,100	1.1	200	2.4	170
Linn	48	5,520,000	39	2,730,000	23	15,900	18	4,300	30	26,700	20	28,200	95	100,000	1.5	84,400	1.1	3,100	4.6	780
Muscatine	45	2,375,000	40	1,000,000	22	175,600	15	6,400	24	38,200	17	76,500	73	53,000	1.6	41,900	1.1	400	3.5	1,580
Scott	48	3,696,000	41	1,435,000	26	519,500	16	24,000	25	343,400	17	41,000	74	138,000	1.7	56,800	1.2	1,600	2.0	4,350
For District	47	45,472,000	41	20,221,000	23	1,103,200	17	88,200	27	863,800	18	277,100	95	1,011,000	1.70	812,800	1.17	11,350	3.12	9,900
Southwest—																				
Adair	42	4,074,000	35	1,890,000	23	133,400	16	3,000	29	166,300	15	3,600	90	58,000	1.2	41,400	1.7	3,500	2.2	400
Adams	45	3,195,000	34	1,020,000	22	254,300	17	1,500	27	25,400	24	10,600	104	45,000	1.4	28,800	1.2	2,300	2.2	2,710
Cass	46	4,968,000	35	1,855,000	21	478,200	14	8,100	27	213,000	18	9,400	106	85,000	1.4	41,700	1.1	800	3.3	3,040
Fremont	44	6,116,000	28	522,000	23	526,500	16	5,300	26	10,700	22	6,200	88	46,000	1.2	12,100	2.0	4,800	3.0	21,290
Mills	48	4,944,000	31	651,000	20	550,300	12	12,900	26	14,000	16	10,400	85	58,000	1.5	12,900	1.5	5,200	2.8	20,860
Montgomery	43	3,698,000	22	864,000	22	560,400	12	9,300	27	20,200	22	10,800	88	19,000	1.4	29,300	1.3	700	2.4	12,100
Page	48	5,184,000	33	594,000	25	835,000	12	4,200	31	22,300	24	17,800	68	20,000	1.3	34,700	1.1	800	2.3	14,790
Pottawattamie	45	9,135,000	39	1,710,000	22	674,100	16	42,300	27	324,600	20	17,400	76	156,000	1.6	45,300	1.2	6,600	2.0	43,000
Taylor	47	4,324,000	35	1,225,000	24	711,400	14	1,100			25	16,200	74	36,000	1.8	48,000	1.3	700	2.7	2,700
For District	45	45,638,000	32	10,341,000	23	4,723,600	14	88,000	27	796,400	21	102,400	86	549,000	1.43	295,200	1.42	25,40	2.45	142,490
South Central—																				
Appanoose	42	1,722,000	28	672,000	15	84,600	14	2,900	28	800	17	8,700	88	18,000	1.4	62,300	1.6	1,400	2.8	300
Clarke	42	2,222,000	36	1,044,000	17	106,400	14	700	29	2,600	12	2,400	125	19,000	1.3	33,500	1.3	200	2.0	60
Decatur	42	2,814,000	29	870,000	19	331,200	12	500	30	1,000	16	15,200	109	18,000	1.4	51,200	1.2	280	3.3	400
Lucas	47	2,256,000	28	728,000	18	200,700	15	600			10	500	67	6,000	1.5	49,300	1.1	30	2.2	240
Madison	49	4,214,000	35	980,000	26	673,700	16	5,000	29	42,900	18	2,800	126	57,000	1.2	29,000	1.2	1,300	3.7	1,020
Marion	47	4,136,000	35	1,265,000	25	504,800	14	22,500	25	8,000	19	4,600	88	18,000	1.5	52,200	1.2	400	3.4	1,160
Monroe	45	1,980,000	29	493,000	20	186,400	13	4,000	28	4,200	15	8,700	75	15,000	1.5	51,400	1.2	200	2.2	90
Ringgold	46	3,910,000	33	990,000	24	93,600	14	600	27	3,000	16	12,300	75	16,000	1.4	50,400	1.4	400	2.0	120
Union	47	3,008,000	37	1,147,000	24	69,400	18	300	29	12,900	20	8,800	84	46,000	1.3	36,400	1.4	1,300	2.6	160
Warren	46	3,910,000	36	1,188,000	22	767,500	14	10,100	35	13,000	21	9,200	102	40,000	1.5	48,700	1.1	500	2.9	1,490
Wayne	43	2,623,000	32	1,120,000	18	107,500	10	500	28	800	12	6,200	91	7,000	1.2	51,000	1.1	40	2.0	300
For District	45	32,806,000	33	10,507,000	21	3,125,800	16	45,200	28	91,200	16	81,300	97	260,000	1.39	517,300	1.22	6,020	3.15	6,290
Southeast—																				
Davis	46	2,484,000	29	322,000	22	134,400	18	1,800	28	1,100	14	5,300	93	42,000	1.1	49,900	1.6	16	3.1	120
Des Moines	50	2,250,000	36	1,044,000	28	445,800	18	3,400	35	9,800	21	27,900	78	94,000	1.6	39,700			2.4	670
Henry	49	2,675,000	38	1,064,000	27	88,600	25	1,200	28	500	20	9,800	45	23,000	1.5	46,500			4.4	310
Jefferson	44	2,728,000	30	840,000	30	150,000	20	2,000	36	1,800	19	10,800	77	25,000	1.3	46,000	1.1	11	2.8	220
Keokuk	45	4,275,000	38	2,032,000	28	101,900	15	12,600	21	8,400	19	10,400	75	48,000	1.6	72,600	1.2	60	2.2	150
Lee	46	2,576,000	35	560,000	26	429,200	22	4,800	26	8,600	19	119,900	102	130,000	1.7	61,500	1.2	84	3.6	2,630
Louisa	50	2,750,000	41	728,000	26	430,600	23	2,800	26	1,000	20	78,400	73	26,000	1.6	35,700	2.0	100	2.2	130
Mahaska	48	5,088,000	38	2,052,000	26	245,400	19	12,900	31	8,400	20	7,000	118	55,000	1.5	98,200	1.6	256	3.0	180
Van Buren	44	2,200,000	29	638,000	23	223,600	15	1,000	27	2,200	15	12,300	78	19,000	1.4	50,400	0.8	8	2.9	1,280
Wapello	44	2,420,000	32	704,000	24	366,000	15	1,000	21	1,500	20	10,800	40	17,000	1.2	29,400			3.1	460
Washington	47	4,794,000	40	1,880,000	21	45,400	14	2,800	31	2,200	18	5,000	67	37,000	1.9	82,800	1.0	10	2.7	130
For District	47	37,240,000	35	12,094,000	24	2,661,000	19	46,200	27	45,500	19	298,500	80	506,000	1.49	582,700	1.47	545	3.13	6,220
For State	45	455,535,000	37	222,851,000	23	15,847,000	15	1,020,000	28.4	4,260,000	19	1,140,000	106	9,162,000	1.40	4,750,000	1.13	492,000	2.67	534,000

*Total production of potatoes subject to revision when assessors' figures become available.

AVERAGE PRICE OF FARM PRODUCTS DECEMBER 1, 1922, BY COUNTIES

Districts and Counties	Corn per bushel of 70 lbs. in ear or 56 lbs. shelled	Oats per bushel of 32 pounds	Spring wheat per bushel of 60 pounds	Winter wheat per bushel of 60 pounds	Barley per bushel of 48 pounds	Rye per bushel of 56 pounds	White potatoes (Irish) per bushel of 60 pounds	Tame hay (loose) per ton of 2,000 pounds	Wild hay (loose) per ton of 2,000 pounds	Alfalfa (loose) per ton of 2,000 pounds	Timothy seed per bushel of 45 pounds	Clover seed per bushel of 60 pounds	Pop-corn, per pound, shelled	Apples, per bushel of 48 pounds	Cream per pound of butter fat	Butter, per pound	Chickens (live wgt.) per pound	Eggs, per dozen	Honey (per lb.) Comb in sections	Honey (per lb.) Extracted (less cost of container)	Honey (per lb.) In tank
Northwest—																					
Buena Vista	$ .55	$ .37	$ 1.02	$ 1.02	$ .70	$ .70	$ .61	$12.00	$11.00	$14.44	$ 2.25	$14.00	$ .05	$ 1.02	$ .43	$ .44	$ .13	$ .40	$ .19	$ .14	$ .15
Cherokee	.52	.33			.48		.60	12.00	12.26	12.00	3.50	12.00		2.23	.44	.39	.15	.40	.18	.12	.11
Clay	.50	.32	1.00		.45	.60	.63	11.37	9.14	12.00	3.00		.06	1.83	.43	.45	.13	.37	.15	.15	.14
Dickinson	.52	.33	.95	1.25	.45		.47	13.00	10.00	15.00		10.50	.05	1.61	.43	.45	.13	.37	.15	.15	
Emmet	.52	.33			.42		.50	11.43	7.80		2.50	9.33	.02	1.30	.47	.44	.13	.40	.18	.16	
Lyon	.54	.35	1.00	1.00	.50		.57	11.14	9.14	13.57	2.00	13.00		1.68	.47	.48	.13	.38	.20	.20	.15
O'Brien	.53	.32			.44		.45	13.87	11.00	18.83	2.25	14.00	.04	1.41	.45	.48	.13	.42	.17	.17	.17
Osceola	.52	.33					.43	10.00	8.75	12.50	2.05	11.20	.08	1.87	.46	.47	.12	.39	.15	.19	.19
Palo Alto	.52	.31					.61	6.25	7.00		2.62	13.00		1.67	.47	.45	.14	.39	.15	.19	.15
Plymouth	.54	.33	.94	.91	.46	.60	.58	11.14	10.66	13.16	2.50	8.75		1.71	.47	.47	.12	.38	.15	.16	
Pocahontas	.51	.32					.52	12.50	9.00	20.00	2.50	10.33	.04	1.56	.43	.41	.12	.37	.15		
Sioux	.54	.33	.93	.85	.48		.42	12.87	10.37	15.78			.05	1.87	.46	.46	.13	.39	.16	.11	
For District	$ .53	$ .33	$ .97	$ 1.01	$ .49	$ .60	$ .52	$11.48	$ 9.67	$14.83	$ 2.70	$11.41	$ .04	$ 1.68	$ .43	$ .45	$ .13	$ .39	$ .18	$ .15	$ .14
North Central—																					
Butler	$ .51	$ .34				$ .70	$ .54	$ 8.50	$ 6.50					$ 1.58	$ .40	$ .40	$ .13	$ .47	$ .16	$ .15	
Cerro Gordo	.51	.36	$ 1.00		$ .80		.54	14.00	10.00		$ 3.50	$12.00		1.75	.50	.47	.12	.48	.23	.25	$ .20
Floyd	.53	.35			.55	.85	.39	9.08	5.50	$14.00	2.50	13.00	$ .05	1.50	.44	.46	.14	.44	.17	.15	
Franklin	.52	.33	.85	.90	.65	.65	.53	10.90	9.67	15.50	2.83	13.00		1.53	.43	.45	.14	.44	.25	.23	.20
Hancock	.52	.32	.90	.95	.51	.66	.47	10.75	9.26	15.00		12.00		1.83	.46	.48	.13	.41	.26	.21	.21
Humboldt	.52	.32					.77	11.00	8.12	15.00				1.50	.42	.42	.13	.36	.28	.20	
Kossuth	.54	.33	1.00				.55	10.96	8.15	15.00	2.00	11.33	.10	1.40	.45	.46	.12	.43	.25	.20	.18
Mitchell	.54	.34	.90		.45		.31	7.50	4.83		3.00	11.17	.05	1.92	.46	.49	.13	.44	.22	.21	.19
Winnebago	.52	.34	.95		.47	.58	.59	10.00	6.94	15.00	2.50			1.31	.49	.47	.13	.44	.23	.15	
Worth	.48	.23	.86	.80	.49	.63	.43	9.25	7.00		2.50	14.00		1.48	.49	.50	.13	.42	.19		
Wright	.52	.33	1.01	.90	.54	.65	.59	13.06	10.00	20.00	3.31	9.80	.04	1.61	.42	.46	.13	.40	.20	.17	.18
For District	$ .52	$ .34	$ .93	$ .89	$ .56	$ .67	$ .50	$10.49	$ 7.81	$15.64	$ 2.15	$12.00	$ .00	$ 1.58	$ .46	$ .46	$ .14	$ .43	$ .23	$ .20	$ .19
Northeast—																					
Allamakee	$ .52	$ .32	$ 1.01	$ 1.01	$ .49	$ .67	$ .51	$10.37	$ 9.50		$ 2.73	$ 9.85		$ 1.16	$ .48	$ .49	$ .14	$ .41	$ .24	$ .20	$ .18
Black Hawk	.57	.39	1.08		.55	.75	.71	10.00	7.65	$18.00	2.92	10.25	.07	1.29	.49	.53	.14	.47	.26	.14	.18
Bremer	.51	.31	.90	.97	.52	.82	.85	9.43	6.78	12.00	2.00	12.20	.06	1.55	.45	.48	.15	.43	.22	.25	.18
Buchanan	.53	.31	.90	.90	.50	.63	.75	9.77	5.43		2.25	10.50	.06	1.38	.43	.45	.13	.40	.22	.18	.17
Chickasaw	.51	.32	.90		.46	.65	.56	9.32	7.00		1.87	8.00		1.56	.49	.50	.16	.44	.19	.16	
Clayton	.54	.36	.96	1.01	.52	.78	.60	11.11	8.00		2.40	11.17	.07	1.57	.53	.47	.15	.36	.21	.15	.23
Delaware	.55	.35		1.10	.56	.64	.59	9.30	6.30	10.00	2.87	10.00	.05	1.13	.46	.49	.15	.42	.19	.14	.18
Dubuque	.57	.38	.97	.97	.52	.70	.64	14.25	10.50	18.00	2.80	11.25		1.60	.49	.49	.14	.43	.27	.17	.15
Fayette	.56	.37			.50		.64	8.12	5.50		2.71	8.50	.05	1.09	.48	.49	.14	.39	.22	.19	.17
Howard	.51	.33	.98	1.05	.54	.67	.42	8.30	5.00		2.73	10.28	.05	1.75	.43	.40	.14	.39	.22	.18	.07
Winneshiek	.52	.35	.94	1.00	.47	.85	.56	10.50	6.00		4.20	12.50	.06	2.00	.46	.48	.15	.37	.25	.20	.23
For District	$ .54	$ .34	$ .96	$ 1.00	$ .51	$ .71	$ .55	$10.09	$ 7.01	$14.50	$ 2.82	$10.41	$ .06	$ 1.49	$ .47	$ .48	$ .14	$ .41	$ .23	$ .18	$ .17
West Central—																					
Audubon	$ .55	$ .32	$ .96	$ 1.02	$ .47		$ .80	$ 7.50	$ 6.67	$15.50	$ 2.50	$10.50	$ .06	$ 1.05	$ .42	$ .44	$ .14	$ .37	$ .23		
Calhoun	.55	.34					.73	12.00	10.00	15.00	4.00	9.00		1.18	.45	.45	.15	.42	.20	.15	.19
Carroll	.56	.34	1.25	1.05	.46		.53	12.80	7.82	19.00	2.50	14.00		1.15	.52	.46	.14	.39	.19	.15	
Crawford	.56	.32	.95	.99	.46	.75	.57	12.57	13.20	14.44	2.44	12.40	.05	1.50	.50	.50	.14	.38	.19	.18	.16
Greene	.51	.32	.85	.91	.42	.75	.66	10.80	7.25	15.00	2.18	10.75	.08	1.38	.47	.48	.13	.37	.20	.20	.18
Guthrie	.54	.34	1.03	1.03	.50	.76	.86	8.71	7.00	12.25	2.35	9.82	.04	.96	.41	.44	.12	.37	.25		
Harrison	.55	.31	.96	.98	.46	.80	.42	12.96	10.00	12.71		8.00	.04	1.09	.44	.47	.15	.37	.17	.16	.15
Ida	.55	.33	.93	.95	.50	.65	.42	13.50	10.00	19.00	2.00	8.00	.03	1.09	.41	.40	.15	.39	.17	.13	
Monona	.53	.31	.96	.98		.72	.51	9.60	8.50	11.00			.08	1.09	.44	.48	.13	.40	.18	.13	.19
Sac	.54	.35	.90	.90	.62		.58	11.43	10.50	14.00	2.78	12.67	.02	1.19	.44	.44	.13	.39	.17	.17	.18
Shelby	.56	.34	.92	.95	.62	.63	.53	12.90	9.50	16.17	2.75	9.67		1.19	.51	.39	.16	.40	.19	.20	
Woodbury	.55	.32	.97	.98	.55	.65	.52	10.00	8.09	13.00	2.50	9.50	.04	1.70	.42	.41	.15	.34	.18	.15	.19
For District	$ .55	$ .32	$ .97	$ .98	$ .48	$ .74	$ .59	$11.47	$ 9.08	$14.94	$ 2.82	$10.48	$ .05	$ 1.29	$ .43	$ .41	$ .14	$ .38	$ .20	$ .18	$ .16
Central—																					
Boone	$ .55	$ .34	$ .95	$ .95			$ .71	$12.60	$ 9.64	$20.67	$ 2.45	$11.22	$ .06	$ 1.82	$ .45	$ .44	$ .14	$ .42	$ .24	$ .19	$ .19
Dallas	.54	.34	.91	.97	.52	.69	.80	10.89	8.10	13.80	2.96	11.00	.05	.94	.43	.42	.15	.40	.22		
Grundy	.52	.34	.95	.97	.52	.69	.45	8.72	6.33		1.94	10.29		1.21	.44	.45	.14	.39	.22	.19	.19
Hamilton	.54	.33	1.00	.99	.53	.71	.72	11.50	10.21	11.67	2.94	13.50	.05	1.29	.46	.49	.13	.44	.22	.19	.18
Hardin	.54	.33		1.00			.67	9.40	8.33	13.75	2.67	11.67	.04	1.34	.46	.44	.14	.43	.20	.16	.18
Jasper	.54	.34	.98	1.01	.60	.77	.70	8.64	7.85	11.00	2.14	9.22	.04	.99	.41	.39	.12	.39	.24	.21	.19
Marshall	.56	.35	1.00	1.00	.45	.70	.61	9.66	8.00	10.00	2.70	12.00	.05	1.20	.40	.42	.15	.40	.25	.18	.18
Polk	.53	.34	.92	.94			.76	10.25	6.00	12.00	2.81	10.75	.04	.80	.40	.40	.14	.40	.21	.15	.15
Poweshiek	.53	.32	.97	.98	.70	1.00	.79	9.43	7.00	12.00	2.72	7.80		.81	.37	.44	.14	.38	.24	.17	.22
Story	.53	.34	.96	.96		.70	.82	11.22	8.75	16.00	2.58	13.00		1.22	.42	.45	.13	.43	.25	.20	
Tama	.53	.31	.94	1.06	.55	.72	.61	9.66	7.25		2.75	11.20	.06	.92	.41	.39	.13	.42	.20	.23	.20
Webster	.52	.29	.85	.87	.55		.86	12.75	9.40	16.80	2.25	6.67	.09	1.33	.39	.41	.14	.42	.22	.16	.17
For District	$ .54	$ .32	$ .95	$ .98	$ .55	$ .72	$ .71	$10.22	$ 8.07	$13.87	$ 2.53	$10.61	$ .05	$ 1.15	$ .42	$ .42	$ .14	$ .41	$ .23	$ .21	$ .19

AVERAGE PRICE OF FARM PRODUCTS, DECEMBER 1, 1922, BY COUNTIES—Continued

Districts and Counties	Corn per bushel of 70 lbs. in ear or 56 lbs. shelled	Oats per bushel of 32 pounds	Spring wheat per bushel of 60 pounds	Winter wheat per bushel of 60 pounds	Barley per bushel of 48 pounds	Rye per bushel of 56 pounds	White potatoes (Irish) per bushel of 60 pounds	Tame hay (loose) per ton of 2,000 pounds	Wild hay (loose) per ton of 2,000 pounds	Alfalfa (loose) per ton of 2,000 pounds	Timothy seed per bushel of 45 pounds	Clover seed per bushel of 60 pounds	Pop-corn, per pound, shelled	Apples, per bushel of 48 pounds	Cream per pound of butter fat	Butter, per pound	Chickens (live wgt.) per pound	Eggs, per dozen	Honey (per lb.) Comb in sections	Extracted (less cost of container)	In bulk
East Central—																					
Benton	$ .55	$ .36	$ .97	$ .99	$ .58	$ .56	$ .71	$ 9.42	$ 7.00	$15.00	$ 2.00	$ 9.79	$ .08	$ 1.03	$ .44	$ .41	$ .15	$ .44	$ .22	$ .15	$ .13
Cedar	.57	.35	.92	.98	.51	.70	.87	11.22	------	15.00	2.96	10.33	.04	1.11	.44	.44	.12	.43	.22	.20	.20
Clinton	.56	.35	1.00	1.03	.60	.69	[illegible]	11.50	6.67	15.00	2.50	11.00	------	[illegible]	.42	.42	.15	.46	.17	.15	.13
Iowa	.52	.35	.93	.91	.53	.87	.67	11.32	------	------	2.39	9.39	.12	.92	.40	.44	.13	.46	.23	.22	.15
Jackson	.57	.37	.92	.95	.62	.80	.67	13.75	12.00	17.83	2.43	10.39	.05	1.08	.44	.47	.13	.44	.22	.22	.21
Johnson	.55	.35	.94	.90	.50	.79	.72	10.85	------	10.00	2.20	10.42	.03	1.22	.43	.42	.13	.47	.22	.18	.16
Jones	.57	.37	------	------	.54	------	.70	11.50	------	16.00	2.15	9.75	------	1.21	.48	.47	.15	.45	.20	.17	.15
Linn	.54	.36	.91	.98	.56	.63	.64	10.44	9.25	------	2.81	12.58	.05	1.00	.44	.45	.15	.42	.25	.17	------
Muscatine	.52	.31	.98	1.01	.61	.76	.72	10.44	7.50	14.50	2.25	9.66	.04	.99	.46	.43	.15	.43	.20	.21	.17
Scott	.52	.38	.96	1.00	.54	.78	.71	14.62	10.80	19.41	2.33	10.50	.06	1.02	.42	.42	.16	.42	.21	.16	.19
For District	$ .56	$ .36	$ .95	$ .98	$ .57	$ .73	$ .72	$11.49	$ 8.87	$15.34	$ 2.49	$10.44	$ .06	$ 1.09	$ .44	$ .44	$ .14	$ .44	$ .21	$ .18	$ .16
Southwest—																					
Adair	$ .55	$ .34	$ .93	$ .97	$ .57	$ .75	$ .74	$ 8.22	$ 6.25	$12.67	$ 2.00	$ 9.87	$ .04	$ .91	$ .40	$ .39	$ .14	$ .37	$ .18	$ .15	$ .15
Adams	.60	.36	.85	.96	.48	------	.75	15.17	8.00	14.00	2.60	9.75	.05	.89	.44	.42	.14	.42	.22	.16	.18
Cass	.58	.36	.94	1.00	.50	.66	.68	11.31	8.90	13.80	2.21	10.50	.05	.98	.42	.41	.13	.40	.27	.20	.17
Fremont	.56	.34	.92	.99	------	------	.79	11.75	8.25	11.14	2.25	13.00	------	.91	.35	.37	.14	.36	.25	.15	.12
Mills	.59	.32	1.00	.99	.55	.72	.50	10.60	10.00	12.50	2.25	11.00	.03	.95	.39	.38	.14	.42	.18	.14	.12
Montgomery	.57	.34	1.00	1.01	.48	.78	.60	9.71	7.00	12.43	2.80	10.66	.04	.84	.42	.42	.14	.40	.25	.22	.25
Page	.57	.35	.97	.99	.50	.80	.75	11.50	10.00	15.40	2.94	10.75	------	1.11	.42	.40	.13	.34	.30	.25	------
Pottawattamie	.59	.33	1.00	1.00	.53	.80	.61	12.25	10.86	13.33	2.25	13.67	------	1.21	.44	.39	.14	.43	.25	.25	------
Taylor	.50	.37	.90	.90	------	.75	1.10	9.67	10.00	13.50	2.42	8.50	------	.68	.42	.43	.16	.35	.20	.25	.25
For District	$ .57	$ .35	$ .95	$ .99	$ .52	$ .76	$ .74	$11.25	$ 8.81	$13.19	$ 2.64	$10.82	$ .04	$ .91	$ .41	$ .40	$ .14	$ .39	$ .24	$ .20	$ .17
South Central—																					
Appanoose	$ .56	$ .37	$ .96	$ .96	$ .70	$ .74	$ .74	$10.66	$ 9.00	------	$ 2.25	$10.00	$ .04	$ 1.13	$ .38	$ .41	$ .15	$ .39	$ .25	$ .11	$ .15
Clarke	.55	.34	1.00	.92	.80	.75	.86	7.50	------	------	2.11	9.87	------	1.14	.39	.38	.14	.35	.22	------	------
Decatur	.58	.35	1.00	.95	------	.75	.75	7.44	4.75	$10.00	2.01	9.25	.06	.98	.39	.37	.13	.40	.22	.22	.19
Lucas	.57	.32	1.00	.95	------	------	.76	9.32	8.00	14.75	2.32	8.72	.05	.94	.41	.42	.15	.43	.25	.22	.19
Madison	.55	.32	.98	.95	.46	.65	.72	7.60	6.00	11.67	2.12	8.97	.04	.87	.37	.36	.12	.40	.25	.17	.18
Marion	.57	.34	.98	1.08	.50	.75	.69	9.28	------	11.62	2.54	10.56	------	1.08	.42	.36	.14	.40	.21	.14	.16
Monroe	.51	.34	.92	.91	.50	.68	.87	9.20	------	20.00	1.97	8.28	.04	.92	.40	.34	.13	.43	.25	.22	.18
Ringgold	.56	.30	.92	.95	.55	.74	.94	7.08	6.50	14.00	2.16	9.91	------	.94	.39	.37	.14	.38	.26	.21	.20
Union	.54	.34	.94	.96	.51	.65	.60	8.28	6.00	15.00	2.09	8.67	.04	.92	.43	.37	.12	.38	.22	.22	.20
Warren	.56	.34	.96	1.02	.51	.72	.78	8.80	6.67	11.17	2.24	11.60	.04	.97	.44	.40	.14	.41	.21	.18	.16
Wayne	.59	.35	1.01	.97	------	.75	.82	8.22	4.00	------	2.22	9.00	.05	1.11	.42	.39	.13	.42	.24	.17	.19
For District	$ .56	$ .34	$ .97	$ .96	$ .52	$ .72	$ .78	$ 8.50	$ 6.36	$14.65	$ 2.19	$ 9.34	$ .04	$ 1.00	$ .40	$ .37	$ .14	$ .40	$ .22	$ .19	$ .18
Southeast—																					
Davis	$ .61	$ .37	$ 1.00	$ 1.00	------	$ .75	$ .79	$ 7.81	------	$10.00	$ 2.44	$10.14	$ .08	$ 1.05	$ .21	$ .40	$ .14	$ .37	$ .26	$ .18	$ .20
Des Moines	.56	.37	.97	1.01	$ .50	.70	.77	10.67	------	16.00	2.77	9.02	.05	.61	.43	.42	.15	.47	.22	.15	------
Henry	.58	.35	.96	1.02	.45	.73	.72	9.70	------	14.00	2.82	9.72	.04	1.00	.43	.41	.16	.44	.25	.14	.22
Jefferson	.53	.36	.93	.96	.55	.72	.88	8.75	------	12.00	2.27	9.66	.08	.88	.41	.48	.15	.46	.17	.16	.12
Keokuk	.56	.36	.97	.98	------	------	.84	9.00	------	------	2.48	9.28	.07	1.23	.42	.35	.14	.42	.25	.20	.19
Lee	.58	.34	.98	1.01	------	.72	.80	9.50	------	14.00	2.11	10.35	.04	.73	.41	.38	.14	.48	.20	.18	.16
Louisa	.48	.36	.90	.98	------	.68	.86	9.88	------	15.67	2.20	10.50	------	1.08	.38	.38	.14	.38	.25	.26	.14
Mahaska	.55	.37	.93	.96	.55	.67	.75	8.40	------	12.00	2.17	10.22	.04	1.02	.38	.38	.14	.40	.21	.23	.24
Van Buren	.50	.32	.92	.99	------	.69	.82	9.00	------	15.00	2.20	9.58	.05	.75	.44	.39	.14	.44	.22	.16	.15
Wapello	.58	.38	.84	.86	------	.55	.78	10.70	$ 8.00	18.57	2.41	9.50	.04	.94	.39	.42	.14	.43	.22	.22	.19
Washington	.56	.36	.89	.96	------	.60	.74	9.43	------	15.00	2.75	9.00	.06	.94	.42	.42	.14	.40	.25	.19	------
For District	$ .56	$ .36	$ .94	$ .98	$ .51	$ .71	$ .80	$ 9.35	$ 8.00	$13.62	$ 2.42	$ 9.74	$ .06	$ .94	$ .41	$ .40	$ .14	$ .42	$ .22	$ .18	$ .18
For State	$ .54	$ .34	$ .95	$ .97	$ .52	$ .71	$ .62	$10.40	$ 8.50	$14.80	$ 2.49	$10.40	$ .05	$ 1.26	$ .42	$ .42	$ .14	$ .40	$ .22	$ .19	$ .18

MISCELLANEOUS TABLE, BY COUNTIES

Corn husked; average and total yield clover and timothy seed; per cent of apples shipped out; firewood and coal.

Districts and Counties	Husked Dec. 1	Clover Seed: Average yield per acre	Clover Seed: Total yield	Timothy Seed: Average yield per acre	Timothy Seed: Total yield	Apples shipped out of county where grown	Firewood: Average cords cut per farm	Firewood: Average cords burned, per farm	Firewood: Value per Cord: Short cords	Firewood: Value per Cord: Long cords	Coal: Number tons consumed, per farm	Coal: Average cost, per ton
	Per cent	Bushels of 60 Lbs.	Bushels of 60 Lbs.	Bushels of 45 Lbs.	Bushels of 45 Lbs.	Per cent	128 Cu. Ft.	128 Cu. Ft.	43 Cu. Ft.	128 Cu. Ft.	Tons of 2,000 Lbs.	Tons of 2,000 Lbs.
Northwest—												
Buena Vista	94	2.0	1,290	2.0	120	5	2	2	$ 2.16	$ 5.20	5	$13.95
Cherokee	94	1.7	840	5.0	780	0	2	4	3.17	6.75	2	12.00
Clay	77	1.7	510	2.1	1,650	0	1	1	3.00	5.00	2	13.16
Dickinson	84	2.5	330	3.9	1,540	0	.....	.....	.....	.....	6	13.86
Emmet	76	1.5	210	3.2	130	0	2	2	2.87	6.67	5	14.07
Lyon	86	2.4	340	3.2	170	0	6	6	.....	6.33	4	15.10
O'Brien	88	1.3	690	3.2	3,260	0	6	7	4.00	6.16	4	15.28
Osceola	77	1.5	540	4.5	3,810	0	8	7	.....	5.00	4	16.83
Palo Alto	73	1.5	310	3.0	340	0	2	3	2.00	3.50	8	14.00
Plymouth	81	1.7	1,090	4.5	900	0	12	8	3.34	5.10	6	14.06
Pocahontas	86	1.4	400	3.2	300	0	3	3	2.00	5.00	8	10.37
Sioux	94	1.7	450	3.2	180	0	5	5	.....	5.00	3	15.73
For District	84	1.68	7,000	3.21	13,180	0	4	4	$ 2.82	$ 5.43	5	$13.40
North Central—												
Butler	91	2.1	550	4.5	5,070	0	10	.....	2.75	5.00	6	11.60
Cerro Gordo	92	1.4	710	5.0	1,920	0	.....	.....	.....	.....	10	10.37
Floyd	87	1.5	480	4.3	11,540	6	2	2	2.00	5.35	6	11.59
Franklin	86	2.6	1,670	6.5	2,810	5	4	4	2.66	6.12	10	10.43
Hancock	86	1.3	400	3.0	120	1	4	4	2.50	5.75	6	12.18
Humboldt	84	1.4	100	4.4	240	0	1	1	.....	.....	8	12.25
Kossuth	82	2.1	1,350	4.6	510	0	6	4	3.00	7.16	10	14.08
Mitchell	92	1.2	40	4.3	19,970	0	4	4	2.50	6.67	7	11.16
Winnebago	91	1.4	100	6.0	690	2	2	2	2.12	5.50	5	13.08
Worth	92	2.4	780	4.3	3,900	4	5	5	2.67	5.90	6	11.12
Wright	86	2.3	820	2.8	780	5	4	4	1.83	4.64	9	10.79
For District	88	1.7	7,000	4.36	47,640	2	4	3	$ 2.45	$ 5.84	7	$11.35
Northeast—												
Allamakee	89	1.7	3,030	6.3	27,710	0	24	14	$ 4.67	$ 6.30	11	$12.73
Black Hawk	86	2.1	920	6.2	5,470	6	4	4	2.73	4.75	6	11.83
Bremer	91	2.1	300	4.6	910	0	20	11	2.44	6.96	4	12.96
Buchanan	83	1.4	690	4.5	4,650	4	12	10	1.67	5.67	7	10.21
Chickasaw	88	1.3	40	4.4	24,330	0	16	13	.....	6.00	5	13.67
Clayton	96	1.3	7,510	5.6	18,770	8	12	12	3.88	6.80	5	11.97
Delaware	89	2.5	1,490	5.3	8,360	0	7	9	2.80	5.37	6	10.53
Dubuque	95	1.6	7,140	7.0	9,500	8	8	8	4.75	6.62	7	9.17
Fayette	88	1.1	370	4.5	21,290	0	8	9	3.00	6.75	13	11.50
Howard	97	1.5	20	4.7	20,450	0	4	8	.....	6.33	6	11.90
Winneshiek	95	1.1	110	4.3	40,740	0	11	10	.....	6.00	6	11.16
For District	91	1.67	22,000	5.16	201,730	2	11	10	$ 3.37	$ 6.15	7	$11.30

MISCELLANEOUS TABLE—Continued

Districts and Counties	Corn: Husked Dec. 1	Clover Seed: Average yield per acre	Clover Seed: Total yield	Timothy Seed: Average yield per acre	Timothy Seed: Total yield	Apples shipped out of county where grown	Firewood: Average cords cut per farm	Firewood: Average cords burned, per farm	Firewood: Value per Cord: Short cords	Firewood: Value per Cord: Long cords	Coal: Number tons consumed, per farm	Coal: Average cost, per ton
	Per cent	Bushels of 60 Lbs.	Bushels of 60 Lbs.	Bushels of 45 Lbs.	Bushels of 45 Lbs.	Per cent	128 Cu. Ft.	128 Cu. Ft.	43 Cu. Ft.	128 Cu. Ft.	Tons of 2,000 Lbs.	Tons of 2,000 Lbs.
West Central—												
Audubon	96	1.9	1,100	4.0	9,390	0	2	2	$ 2.00	.....	4	$15.70
Calhoun	88	1.3	790	2.0	140	0	.....	.....	.....	.....	8	9.80
Carroll	92	1.7	3,900	3.0	4,310	0	2	1	1.50	$ 4.00	9	10.25
Crawford	87	2.6	5,820	3.0	1,650	2	6	6	3.00	7.32	5	10.71
Greene	84	1.7	860	3.0	620	1	2	3	2.75	5.50	12	8.33
Guthrie	82	1.7	4,530	4.4	27,870	2	6	11	2.35	5.00	8	6.17
Harrison	75	1.8	740	2.9	610	.....	8	9	1.50	5.62	2	13.33
Ida	94	1.7	370	5.0	990	0	2	5	.....	4.50	4	11.30
Monona	80	2.5	5,890	4.0	300	4	4	4	2.25	4.25	4	18.00
Sac	86	1.7	1,180	5.7	3,200	2	2	2	3.60	7.50	10	12.43
Shelby	89	1.7	6,040	3.9	5,130	0	16	14	3.90	7.00	5	12.00
Woodbury	82	2.6	5,810	2.5	580	3	.....	5	.....	.....	3	11.50
For District	87	1.75	37,000	3.89	54,720	1	4	6	$ 2.36	$ 5.63	7	$11.30
Central—												
Boone	84	2.0	870	3.7	210	9	5	5	$ 3.50	$ 7.50	9	$ 7.22
Dallas	81	1.3	900	5.3	1,160	13	12	10	4.17	6.75	9	8.21
Grundy	89	2.2	540	5.6	5,100	2	16	9	2.08	5.33	6	12.81
Hamilton	87	1.6	510	5.1	1,130	0	4	4	2.90	5.20	6	10.83
Hardin	83	1.5	1,570	5.0	1,440	1	4	5	2.00	5.00	6	11.90
Jasper	80	1.7	5,400	5.5	4,000	12	5	5	2.00	4.50	9	8.19
Marshall	86	1.7	2,890	5.7	16,010	8	6	8	3.00	4.00	6	10.11
Polk	85	1.5	1,040	4.1	390	3	6	6	2.38	4.25	12	6.52
Poweshiek	86	1.6	4,840	5.1	50,540	3	4	4	.....	6.00	8	8.62
Story	87	1.3	90	5.5	510	0	12	6	2.02	7.33	5	9.04
Tama	89	1.7	3,170	4.4	18,750	9	5	4	2.25	5.40	4	12.22
Webster	86	2.0	520	4.3	520	5	3	6	2.00	4.40	7	10.79
For District	85	1.75	23,000	5.00	100,350	8	7	6	$ 2.62	$ 5.47	7	$ 9.65
East Central—												
Benton	96	1.6	1,910	6.8	12,130	10	9	9	$ 2.69	$ 5.58	7	$13.23
Cedar	97	2.4	1,880	5.0	8,020	1	8	8	2.90	5.54	6	10.44
Clinton	96	1.1	300	4.9	3,870	15	4	4	1.75	3.90	8	8.90
Iowa	97	1.7	6,040	5.3	104,010	6	6	5	3.12	5.00	12	10.75
Jackson	98	1.1	1,600	4.5	2,670	6	12	11	2.18	4.50	2	13.23
Johnson	91	1.8	4,730	5.8	12,210	3	11	12	2.33	6.00	5	10.33
Jones	92	1.4	440	4.1	2,000	0	6	6	.....	5.70	8	10.21
Linn	97	1.8	2,430	4.8	3,790	17	6	6	3.32	5.83	8	11.21
Muscatine	95	1.7	1,140	5.2	3,080	2	4	7	2.30	5.00	8	7.92
Scott	96	2.0	2,530	5.7	2,230	6	6	6	2.90	5.60	7	9.21
For District	94	1.75	23,000	5.80	150,080	7	7	7	$ 2.61	$ 5.34	7	$10.25
Southwest—												
Adair	87	1.6	1,970	4.3	19,820	2	6	9	.....	$ 5.33	8	$10.07
Adams	86	1.9	840	5.0	7,330	18	12	9	$ 3.00	5.50	6	8.50
Cass	85	2.1	4,790	5.5	5,600	5	13	9	3.07	4.00	7	7.22
Fremont	69	1.4	1,380	4.4	270	33	6	6	2.67	5.00	3	11.50
Mills	79	2.1	800	5.0	300	7	6	6	3.50	5.25	6	12.28
Montgomery	86	1.4	1,700	3.7	640	4	3	5	2.25	3.40	6	9.15
Page	83	1.8	1,470	3.7	310	3	2	5	2.50	4.62	5	9.58
Pottawattamie	77	2.4	7,100	4.5	5,080	13	9	9	.....	3.00	8	12.28
Taylor	76	1.1	900	4.8	11,765	18	3	3	3.00	4.00	9	10.32
For District	80	1.66	21,000	4.37	51,690	9	7	7	$ 2.94	$ 4.46	6	$10.00

MISCELLANEOUS TABLE—Continued

Districts and Counties	Corn	Clover Seed		Timothy Seed		Firewood					Coal	
	Husked Dec. 1	Average yield per acre	Total yield	Average yield per acre	Total yield	Apples shipped out of county where grown	Average cords cut per farm	Average cords burned, per farm	Value per Cord		Number tons consumed, per farm	Average cost, per ton
									Short cords	Long cords		
	Per cent	Bushels of 60 Lbs.	Bushels of 60 Lbs.	Bushels of 45 Lbs.	Bushels of 45 Lbs.	Per cent	128 Cu. Ft.	128 Cu. Ft.	42 Cu. Ft.	128 Cu. Ft.	Tons of 2,000 Lbs.	Tons of 2,000 Lbs.
South Central—												
Appanoose	81	2.4	1,380	4.1	22,356	9	6	6	$ 1.00	$ 3.00	6	$ 4.00
Clarke	71	1.9	1,900	4.2	26,154	9	10	10	2.67	7.00	6	8.67
Decatur	72	1.2	620	3.6	44,770	11	14	12	2.07	4.44	7	7.07
Lucas	85	1.7	2,920	3.9	30,108	4	14	12	1.87	4.25	8	7.87
Madison	78	1.6	3,800	4.5	7,020	29	5	5	2.00	2.75	8	9.00
Marion	74	1.5	3,080	4.3	1,419	4	14	15	3.08	3.99	9	5.64
Monroe	75	1.5	1,020	4.2	4,620	14	8	7	2.82	4.40	9	4.54
Ringgold	86	1.3	600	3.9	24,405	20	12	12	2.83	3.89	7	7.98
Union	82	1.6	2,000	4.1	39,000	16	7	8	3.17	.....	7	10.00
Warren	76	1.5	2,920	4.0	5,700	23	13	12	2.80	4.55	10	7.00
Wayne	70	1.5	2,680	3.9	80,000	3	8	16	1.69	4.38	8	6.85
For District	77	1.67	30,000	3.95	298,000	12	10	11	$ 2.27	$ 4.35	8	$ 7.46
Southeast—												
Davis	86	1.7	2,450	4.5	10,750	12	17	18	$ 2.30	$ 3.83	6	$ 4.63
Des Moines	88	1.6	4,320	6.2	3,940	14	9	9	1.63	4.25	9	8.09
Henry	93	1.2	3,060	5.1	2,950	8	8	8	2.00	5.00	6	7.67
Jefferson	89	1.5	8,160	5.0	8,480	17	9	8	2.15	4.36	5	5.70
Keokuk	88	1.3	5,340	4.7	6,000	3	14	12	3.31	4.88	5	8.08
Lee	85	1.6	6,770	5.0	20,020	24	12	10	2.50	5.60	9	8.50
Louisa	85	1.3	1,220	4.4	2,970	6	6	5	4.00	5.08	6	9.20
Mahaska	86	1.2	3,540	4.4	1,430	13	8	9	2.23	4.00	11	5.66
Van Buren	86	1.2	5,000	4.1	15,656	26	11	12	2.70	3.86	9	8.46
Wapello	79	2.5	2,800	4.2	2,820	19	8	6	1.95	3.70	10	5.20
Washington	87	2.3	15,120	4.8	3,610	10	6	6	4.62	5.00	8	10.75
For District	87	1.67	58,000	4.57	119,000	14	10	9	$ 2.69	$ 4.51	7	$ 7.60
For State	86	1.7	224,000	4.53	1,042,000	8	7.5	7.3	$ 2.81	$ 5.20	6.6	$ 8.25

AVERAGE YIELD PER ACRE OF PRINCIPAL IOWA CROPS

From records of the Iowa Weather and Crop Service

Year	Corn	Oats	Spring Wheat	Winter Wheat	Barley	Rye	Flax Seed	Potatoes	Tame Hay	Wild Hay	Alfalfa
1890	27.9	28.7	11.4	16.5	24.0	16.8	9.1	48.8	1.4	.....	.....
1891	38.0	40.0	15.0	20.0	29.0	20.0	10.7	142.0	1.7	.....	.....
1892	32.0	25.0	12.2	17.0	24.3	15.5	8.0	51.0	1.8	.....	.....
1893	25.7	24.0	12.4	15.8	22.6	16.3	9.1	59.2	1.7	1.4	.....
1894	12.0	24.0	12.8	16.7	18.4	15.1	8.0	40.7	0.8	.....	.....
1895	28.0	48.0	19.0	19.0	33.0	19.0	11.0	106.0	1.1	1.0	.....
1896	29.0	36.0	13.0	17.0	29.0	16.0	9.5	87.0	1.5	1.5	.....
1897	29.0	30.0	13.4	15.0	25.5	15.0	10.0	61.6	1.6	1.2	.....
1898	34.5	32.5	14.8	16.5	27.7	16.0	10.5	78.0	1.7	1.2	.....
1899	35.5	34.5	12.7	11.2	28.4	16.2	11.2	98.8	1.5	1.2	.....
1900	40.2	34.7	14.5	12.3	25.2	15.6	11.2	72.0	1.4	1.1	.....
1901	26.3	30.2	15.3	17.6	24.2	15.8	8.8	27.4	1.4	1.2	.....
1902	34.1	31.0	12.0	18.0	25.0	17.0	8.0	87.1	1.8	1.3	.....
1903	31.2	33.9	12.6	16.9	24.7	15.6	8.7	53.8	1.9	1.3	.....
1904	30.0	29.4	9.1	14.2	25.0	15.0	11.0	125.0	1.5	1.2	.....
1905	41.1	34.0	15.6	22.0	30.5	17.5	10.7	101.0	1.3	1.2	.....
1906	29.6	24.5	13.0	19.8	24.8	17.0	10.8	84.0	1.5	1.3	.....
1907	25.9	25.5	15.4	19.7	28.7	17.1	11.3	89.9	1.8	1.6	.....
1908	32.9	27.4	13.8	20.5	21.6	16.3	10.0	88.0	1.7	1.4	.....
1909	39.7	38.9	20.2	22.2	30.5	18.8	10.2	79.0	1.2	.....	.....
1911	32.9	25.7	12.1	19.7	22.9	16.8	8.5	70.7	0.8	0.9	.....
1912	45.8	41.4	18.7	24.3	32.5	20.7	11.3	104.0	1.6	1.4	.....
1913	34.9	34.2	15.1	23.1	32.8	18.2	10.0	67.2	1.5	1.3	.....
1914	39.0	34.0	13.0	22.0	30.0	19.0	11.0	87.0	1.4	1.2	3.6
1915	30.0	38.0	15.9	21.2	30.6	18.6	9.5	92.0	1.8	1.3	2.6
1916	25.2	37.0	13.4	17.5	30.7	22.8	10.5	42.3	1.8	1.4	4.4
1917	40.0	46.0	18.0	18.0	25.0	20.0	11.0	109.0	1.3	1.2	3.4
1918	34.7	40.5	18.2	19.9	31.3	18.1	10.1	76.1	1.3	1.2	2.8
1919	41.6	34.0	9.5	17.4	25.5	15.9	9.5	42.0	1.6	1.3	2.1
1920	46.0	60.0	11.2	19.7	27.5	16.2	10.0	110.0	1.44	1.27	2.84
1921	43.0	50.0	10.3	19.2	23.5	16.1	8.7	43.0	1.39	1.16	2.97
1922	45.0	37.0	15.0	23.0	28.4	19.0	10.0	106.0	1.40	1.14	2.67
Avg. 1890 to 1899	31.9	31.3	12.7	16.3	26.0	16.6	9.7	77.1	1.48	1.27	.....
Avg. 1900 to 1909	34.5	30.1	12.4	16.1	25.1	16.5	10.0	82.3	1.61	1.35	.....
Avg. 1910 to 1919	37.4	37.4	15.5	20.6	28.9	18.9	10.1	75.1	1.42	1.22	.....
Avg. 1913 to 1922	38.9	36.7	14.0	20.1	28.2	18.4	10.0	75.7	1.49	1.26	3.28

UNITED STATES CROP SUMMARY, DECEMBER 1, 1922

The December estimates of the Crop Reporting Board of the Bureau of Agricultural Economics of the Acreage, Production, and Value (based on prices paid to farmers on December 1) of the important farm crops of the United States in 1920, 1921, and 1922, based on the reports of the correspondents and agents of the Bureau, are as follows:

Crop		Acreage	Production			Farm Value December 1	
			Per Acre	Total	Unit	Per Unit	Total
						Cents	Dollars
Corn	1920	101,699,000	31.5	3,208,584,000	bu.	67.9	32,150,232,000
	1921	105,749,000	29.6	3,068,569,000	bu.	43.2	1,327,213,000
	1922	102,428,000	28.2	2,860,712,000	bu.	65.7	1,900,327,000
Winter Wheat	1920	40,016,000	15.2	610,197,000	bu.	148.6	907,291,000
	1921	42,414,000	13.9	600,316,000	bu.	95.1	571,044,000
	1922	43,127,000	13.9	596,304,000	bu.	104.8	614,561,000
Spring Wheat	1920	23,127,000	10.5	232,436,000	bu.	130.4	289,972,000
	1921	19,293,000	10.6	214,589,000	bu.	85.6	183,706,000
	1922	19,103,000	14.1	270,007,000	bu.	92.4	249,578,000
All Wheat	1920	63,143,000	13.6	833,027,000	bu.	143.7	1,197,263,000
	1921	61,696,000	12.8	814,905,000	bu.	92.6	754,854,000
	1922	61,230,000	14.0	856,311,000	bu.	100.9	864,139,000
Oats	1920	42,491,000	35.2	1,496,281,000	bu.	46.0	688,211,000
	1921	45,495,000	23.7	1,078,341,000	bu.	30.2	325,954,000
	1922	40,662,000	29.9	1,215,496,000	bu.	39.4	478,845,000
Barley	1920	7,600,000	24.9	189,324,000	bu.	71.3	135,063,000
	1921	7,414,000	20.9	154,946,000	bu.	41.9	64,954,000
	1922	7,890,000	25.2	198,110,000	bu.	52.5	97,731,000
Rye	1920	4,409,000	13.7	60,400,000	bu.	126.8	76,625,000
	1921	4,598,000	13.6	61,675,000	bu.	69.7	43,014,000
	1922	6,210,000	15.4	95,497,000	bu.	69.2	66,085,000
Buckwheat	1920	701,000	18.7	13,142,000	bu.	123.3	16,362,000
	1921	680,000	20.9	14,207,000	bu.	81.3	11,540,000
	1922	785,000	19.2	15,050,000	bu.	88.5	13,312,000
Flax Seed	1920	1,737,000	6.1	10,774,000	bu.	176.7	19,039,000
	1921	1,108,000	7.2	8,029,000	bu.	145.1	11,648,000
	1922	1,308,000	9.4	12,238,000	bu.	211.4	25,880,000
Potatoes	1920	3,657,000	110.3	403,296,000	bu.	114.5	461,778,000
	1921	3,941,000	91.9	361,950,000	bu.	110.1	398,302,000
	1922	4,321,000	104.2	451,185,000	bu.	58.2	262,658,000
Sweet Potatoes	1920	992,000	104.8	103,925,000	bu.	113.4	117,834,000
	1921	1,056,000	92.5	98,054,000	bu.	88.1	86,394,000
	1922	1,116,000	98.1	109,534,000	bu.	77.1	84,402,000
Hay, tame	1920	58,101,000	1.51	87,855,000	tons	$ 17.76	1,560,235,000
	1921	58,760,000	1.40	82,379,000	tons	$ 12.11	997,527,000
	1922	61,308,000	1.58	96,987,000	tons	$ 12.59	1,217,044,000
Hay, wild	1920	10,787,000	1.11	17,405,000	tons	$ 11.35	198,115,000
	1921	15,622,000	.98	15,301,000	tons	$ 6.62	101,301,000
	1922	15,842,000	1.02	16,104,000	tons	$ 7.12	114,625,000
All Hay	1920	73,808,000	1.42	105,213,000	tons	$ 16.79	1,758,350,000
	1921	74,401,000	1.31	97,770,000	tons	$ 11.25	1,098,518,000
	1922	77,050,000	1.46	113,791,000	tons	$ 11.81	1,331,679,000
Cotton	1920	35,878,000	[a]178.4	13,439,603	bales	[b]13.9	933,678,000
	1921	20,589,000	[a]184.5	7,953,641	bales	[b]16.2	643,903,000
	1922	33,747,000	[a]141.6	9,964,000	bales	[b]23.8	1,190,761,000

UNITED STATES CROP SUMMARY—Continued.

Crop		Acreage	Production			Farm Value December 1	
			Per Acre	Total	Unit	Per Unit	Total
						Cents	Dollars
Cotton Seed	1920			5,971,000	tons	$ 23.00	135,246,000
	1921			3,531,000	tons	$ 29.15	102,929,000
	1922			4,424,000	tons	$ 40.18	177,756,000
Clover Seed	1920	1,662,000	1.8	1,944,000	bu.	$ 11.95	23,227,000
	1921	880,000	1.7	1,538,000	bu.	$ 10.75	16,535,000
	1922	1,130,000	1.7	1,875,000	bu.	$ 10.08	18,903,000
Sugar Beets	1921[c]	815,000	9.15	7,782,000	tons	$ 6.38	49,627,000
	1922[c]	527,000	9.76	5,243,000	tons	$ 5.65	29,605,000
Beet Sugar	1921[c]	815,000	2,304	2,040,978,000	lbs.		
	1922[c]	527,000	2,074	1,322,000,000	lbs.		
Sorghum Sirup	1920	530,000	92.4	49,595,000	gals.	196.9	52,943,000
	1921	519,000	89.9	45,566,000	gals.	62.9	28,681,000
	1922	448,000	81.5	36,522,000	gals.	71.9	25,948,000
Beans[d]	1920	847,000	10.8	9,185,000	bu.	$ 2.95	27,134,000
	1921	777,000	11.8	9,150,000	bu.	$ 2.47	24,389,000
	1922	1,043,000	11.4	11,895,000	bu.	$ 3.74	44,429,000
Grain Sorghums[d]	1920	5,126,000	26.8	137,408,000	bu.	92.9	127,629,000
	1921	4,625,000	24.6	113,800,000	bu.	39.1	44,575,000
	1922	5,051,000	17.9	90,281,000	bu.	87.6	79,136,000
Onions[de]	1921	57,000	249	14,406,000	bu.	[f]$ 1.31	18,856,000
	1922	64,300	279	17,940,000	bu.	[f]$ 0.92	16,471,000
Cabbage[de]	1921	103,300	6.5	672,000	tons	[f]$ 24.66	16,612,000
	1922	134,000	8.2	1,097,000	tons	[f]$ 13.03	14,301,000
Apples, total	1920			223,677,000	bu.	114.8	256,669,000
	1921			99,002,000	bu.	168.6	166,943,000
	1922			203,628,000	bu.	99.3	202,102,000
Apples, commercial	1920			33,905,000	bbls.	$ 3.74	126,800,000
	1921			21,557,000	bbls.	$ 4.60	99,131,000
	1922			31,000,000	bbls.	$ 2.94	91,584,000
Peaches	1920			45,620,000	bu.	210.4	95,970,000
	1921			22,005,000	bu.	158.7	34,739,000
	1922			56,705,000	bu.	133.3	75,612,000
Pears	1920			16,905,000	bu.	165.8	27,895,000
	1921			11,297,000	bu.	170.6	19,268,000
	1922			18,661,000	bu.	106.0	19,780,000
Total[g]	1920	247,847,000					8,125,620,000
	1921	248,435,000					5,729,912,000
	1922	248,969,000					7,571,850,000

[a]Pounds per acre. [b]Cents per pound. [c]Including beets grown in Canada for United States factories. [d]Principal producing states. [e]Commercial crop. [f]Price for season. [g]Some crops omitted from body of table.

The wheat crop of 1922 is 5 per cent greater than the crop of 1921 instead of 3 per cent as shown in preliminary estimates. The production of 856,000,000 bushels should be compared with the revised estimated 1921 production of 813,000,000 and not with the preliminary estimate of 794,000,000. Like comparisons should be made for other crops.

WORLD CORN PRODUCTION, 1922.

The total area planted to corn during 1922 in 13 countries amounted to 131,893,000 acres compared with 133,613,000 acres for the same countries in 1921 and an average of 133,639,000 acres for the period 1909-13.

The corn production for 16 countries this year amounts to 3,455,712,000 bushels, as compared with 3,792,537,000 bushels for the same countries last year, and an average of 3,573,096,000 bushels for the five years 1909-13. Decreases were shown for all countries reporting except Canada, Hungary and Chile. The production of the United States, Canada and Mexico this year is 2,972,077,000 bushels as compared with 3,166,281,000 bushels in 1921 and 2,894,318,000 bushels for the period 1909-13. Six European countries produced 273,554,000 bushels in 1922, as compared with 324,530,000 bushels last year and 459,494,000 bushels for 1909-13. Five countries in the southern hemisphere produced 195,160,000 bushels this year, as compared with 284,638,000 bushels in 1921 and 210,377,000 bushels for the period 1909-13. Reports are not available for many of the tropical corn producing countries of which Brazil is probably the most important. The Brazilian corn crop for 1920-21 was estimated to be about 186,450,000 bushels.

The United States and Argentina supply approximately 80 per cent of the corn entering into the world trade. Argentina frequently exceeds the United States in the quantity of corn exported, but in 1921 shipments from the United States exceeded those from Argentina by 21,000,000 bushels. In 1920, exports from Argentina were 50 per cent more than the prewar average, but in 1921 were slightly less than for the period 1909-13. The United States exported 132,000,000 bushels in 1921 as compared with 45,000,000 bushels during the period 1909-13, an increase of 193 per cent. Exports from Rumania show a decided decrease, amounting to 17,000,000 bushels and 30,000,000 bushels in 1920 and 1921, respectively, as compared with the prewar average of 39,000,000 bushels. Imports into the United Kingdom, France, Germany and Belgium show a decrease over the prewar years. In 1921 the United Kingdom took 78,000,000 bushels as compared with 83,000,000 bushels during 1909-13, France 12,000,000 bushels as compared with the prewar average of 19,000,000 bushels; Belgium 19,000,000 bushels as compared with 26,000,000 bushels during the prewar period; and Germany took 16,000,000 bushels or about half as much in 1920 as during 1909-13. Imports into Canada and the Scandinavian countries show an increase over the prewar average. Imports into Denmark were 19,000,000 bushels in 1921 as compared with 11,000,000 bushels during the period 1909-13 or an increase of over 70 per cent.

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