

U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

IN CO-OPERATION WITH THE

Iowa Weather and Crop Service

ANNUAL REPORT FOR 1907

GEO. M. CHAPPEL, Director

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LETTER OF TRANSMITTAL.

STATE OF IOWA,
OFFICE OF THE WEATHER AND CROP SERVICE,
Des Moines, February 21, 1908

TO HIS EXCELLENCY, ALBERT B. CUMMINS, Governor of Iowa:

SIR—In accordance with the requirements of the law, I have the honor to submit herewith the eighteenth annual report of the Iowa Weather and Crop Service for the year 1907.

I am, Sir, very respectfully,

Your obedient servant

GEO. M. CHAPPEL, *Director.*

ANNUAL REPORT, 1906.

This report is a compilation of climatic data and statistics of soil products, for the year 1907, in convenient form for reference and comparison.

During the year meteorological reports were received from United States weather bureau stations at Des Moines, Davenport, Dubuque, Charles City, Keokuk and Sioux City, Iowa, and Omaha, Neb. Reports were also received and are included in the meteorological tables, from 122 stations in charge of co-operative observers at well distributed stations in this State. The equipment of these co-operative stations has been materially improved within the past year.

During the year 1907 this office distributed about 68,000 copies of the weekly bulletin (issued during the six crop months); also 31,000 copies of the Monthly Review of the Weather and Crop Service.

There has been a steady increase in the dissemination of daily weather forecasts. About ninety-five thousand patrons of rural telephone lines in Iowa are now receiving the forecasts before noon of each working day. This service appears to be highly appreciated by the general public in towns and in the country districts.

CLIMATOLOGY OF THE YEAR 1907.

BAROMETER.—The mean pressure of the atmosphere for the year 1907 was 30.04 inches. The highest observed pressure was 30.79 inches on January 22d at Charles City, Floyd county. The lowest pressure was 29.18 inches on November 20th at Dubuque, Dubuque county. The range for the State was 1.61 inches.

TEMPERATURE.—The mean temperature for the State was 47.6°, which is the normal, for the State. The highest temperature reported was 102° on July 5th, at Thurman, Fremont county. The lowest temperature reported was 31° below zero on February 5th, at Washta, Cherokee county. The range for the year was 133°.

PRECIPITATION.—The average amount of rain and melted snow for the year, as shown by complete records of 103 stations was 32.06 inches, which is .03 inch above the normal, and .83 inch above the average amount in 1906. The greatest amount recorded at any station for the year was 43.90 inches at Mount Ayr, Ringgold county. The least amount recorded was

19.93 inches at Sioux City, Woodbury county. The greatest monthly rainfall was 13.66 inches at Belle Plaine, Benton county, in July. The least monthly precipitation was .05 inch at Sioux City, Woodbury county, in November, and Hancock, Pottawattamie county, in December. The greatest amount in any twenty-four consecutive hours was 5.30 inches at Belle Plaine, in Benton county, on July 9th. The average number of days on which .01 inch or more of rain fell was eighty-eight.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 66 miles per hour in Sioux City, Woodbury county, from the northwest on January 19th. The average daily movement of wind was 202 miles. There were 168 clear days; 94 partly cloudy, and 103 cloudy days; as against 163 clear days, 97 partly cloudy and 105 cloudy days in 1906.

MONTHLY SUMMARIES.

JANUARY.

The average of cloudiness for the State was in excess of the normal for January. The Northern section received the brunt of cold weather. The average temperature for that section was 14°, which is 3.6° below the normal. In the Central and Southern sections the mean temperature was slightly above the normal. At the Central station there was but one cold wave, and zero temperatures were recorded only on the 26th and 30th. It was an unusually mild and favorable month for all kinds of outside business operations, and especially favorable for live stock. Conditions were generally good for fall wheat and rye, tho the snowfall was light in the larger part of the State.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 115 stations, was 18.8°, which is 1.0° below the normal for January. By sections the mean temperatures were as follows: Northern section, 14.0°, which is 3.6° below the normal; Central section, 19.4°, which is 0.2° above the normal; Southern section, 23.1°, which is 0.6° above the normal. The highest monthly mean temperature was 28.9°, at Keokuk, and the lowest monthly mean was 8.0° at Rock Rapids. The highest temperature reported was 68° at Keokuk, on the 7th, and lowest was 22° below zero, at Forest City and Inwood, on the 30th. The average monthly maximum was 45.4°, and the average monthly minimum was -11.5°. The greatest daily range was 46° at Onawa; and the average of greatest daily ranges was 33.2°.

PRECIPITATION.—The average precipitation for the State, as shown by the records of 123 stations, was 1.52 inches, which is .57 inch above the normal. The averages by sections were as follows: Northern section, .96 inch, which is .20 inch above the normal; Central section, 1.41 inches, which is .37 inch above the normal; Southern section, 2.20 inches, which is 1.15 inches above the normal. The largest amount reported was 5.30 inches at Burlington, and the least amount reported was .10 inch at Atlantic. The greatest daily rainfall reported was 2.69 inches at Keokuk, on the 18th-19th. The average number of days on which .01 inch or more was reported was 7.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 66 miles per hour, from the northwest, at Sioux City, on the 19th. The average number of clear days was 8; partly cloudy 7, and cloudy days 16.

OBSERVERS' NOTES.

ALGONA.—*Dr. F. T. Seeley.* A thunderstorm with hail and sleet occurred on morning of the 7th.

ALTA.—*David E. Hadden.* January was cold and dry, the mean temperature being 2.5° below the 17-year normal. The precipitation was .10 inch below the average. Thunderstorm on the 7th—the first ever noted here in January.

AMANA.—*C. Schadt.* January was mild, with thunderstorm on morning of the 7th. There was heavy rainfall on the 19th, which caused high water in streams.

AUDUBON.—*Geo. E. Kellogg.* Most foggy and mild January we have had for years.

BONAPARTE.—*B. R. Vale.* Precipitation 4.48 inches, which is in excess of any recorded in January in 16 years. Temperature only went down to zero once. A foot of snow fell, but only remained four days.

BRITT.—*Geo. P. Hardwick.* January was damp, with excessive cloudiness and little snow. Temperature was below average. Thunderstorm occurred on morning of the 7th.

CHARITON.—*C. C. Burr.* An unusual number of damp and foggy days occurred in January. Eighty per cent of weather forecasts were verified.

CLINTON.—*Luke Roberts.* January, 1907, had the highest per cent of cloudiness of any month during the last 29 years. The records show 76 per cent of cloudiness. There were 21 cloudy and 6 partly cloudy days. It was the fourth consecutive month with abnormal cloudiness. The mean temperature was 5.5° above the normal for the past 29 years. The precipitation was 1.89 inches above the normal.

CRESTON.—*W. L. Gaston.* A very unusual and heavy thunderstorm occurred in the early morning of January 7th.

FOREST CITY.—*J. A. Peters.* The forepart of January was exceptionally fine; the latter part was colder, but there were no severe storms.

FORT MADISON.—*L. A. McCready.* Thunderstorms occurred on the 7th and 19th; on latter date it was severe, the lightning causing some damage.

GRINNELL.—*A. O. Price.* A thunderstorm occurred on the 7th, and a house was struck by lightning. Eight inches of snow fell during the month.

INWOOD.—*F. B. Hanson.* January was damp and cloudy. The solar halo on the 20th was the brightest I ever observed.

KEOSAUQUA.—*J. H. Landes.* A cloudy month, with 4.62 inches of precipitation; only one touch of zero weather. Ice on the river was not thick enough to put up; but a good quality of nine-inch ice is on the ponds.

RIDGEWAY.—*Arthur Betts.* A fine winter month; a great ice period was from the 7th to the 17th. A hard thunderstorm occurred on the 7th; there were seventy flashes of lightning and four discharges that shook the house and made the windows rattle.

SHELDON.—*A. W. Beach.* A cloudy month with three foggy days. The minimum went down to zero almost every day from the 20th to 31st.

STOCKPORT.—*C. L. Beswick.* Lightning struck and burned a barn in the early morning of the 7th. It was a fine month for stock.

WAUKEE.—*E. J. Leonard.* January was generally favorable, with no extreme or sudden changes. During the last twenty days the temperature went above freezing but once, and below zero only three times.

FEBRUARY.

The coldest weather of the winter occurred in the first week in February. This was followed by two weeks of unusually mild weather, with favorable conditions for outside work and the care of live stock. The last week was more nearly normal in temperature, closing with a nice storm of considerable severity, the not materially damaging to fruit trees and other property. During the warm period conditions were favorable for work in the fields, and in a few localities a beginning was made in seeding spring wheat. Wheat seeding in February has been occasionally noted in moderate winters since the early settlement of this State.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 116 stations, was 25°, which is 5.8° above the normal. By sections the mean temperatures were as follows: Northern section, 22.1°, which is 5.8° above the normal; Central section, 25.1°, which is 5.7° above the normal; Southern section, 27.7°, which is 5.9° above the normal. The highest monthly mean was 30.2°, at Keokuk, and the lowest monthly mean was 19.5°, at Sibley. The highest temperature reported was 65°, at St. Charles, on the 16th, and the lowest reported was -31°, at Washta, on the 5th. The average monthly maximum was 55.5°, and the average monthly minimum was -17.9°. The greatest daily range was 51°, at Sibley, and the average of greatest daily ranges was 37.5°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 126 stations, was .71 inch, which is .32 inch below the normal. The averages by sections were as follows: Northern section, .80 inch, which is .13 inch below the normal; Central section, .72 inch, which is .29 inch below the normal; Southern section, .61 inch, which is .53 inch below the normal. The largest amount reported was 1.95 inches, at Rockwell City and Thurman, and the least amount reported was .06 inch, at Stockport. The greatest daily precipitation reported was 1.26 inches, at Britt, on the 28th. There was an average of 4 days on which .01 inch or more was reported.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 52 miles an hour, from the northwest, at Sioux City, on the 1st. The average number of clear days was 14, partly cloudy 6, and cloudy 8.

OBSERVERS' NOTES.

ALOONA.—*F. T. Sealey.* On the evening of the 9th, between 7 and 8 o'clock, there was a fine display of northern lights.

ALLERTON.—*Rex Shriver.* A brilliant display of aurora borealis was observed on the evening of the 9th, with bands of light arching from east to west.

ALTA.—*David E. Hadden.* Bright aurora in the evening of the 9th. First week was very cold, but rest of the month was moderate.

ALTON.—*W. S. Stagle.* Bees were out several days this month. Maple sap flowed on 16th.

AMANA.—*C. Schadt.* Brilliant aurora on the 9th. Coldest day was the 6th, when the mercury went down to 16 below zero.

BONAPARTE.—*B. R. Vale.* Precipitation .10 inch, the lowest in 16 years. No storms. Spring birds in evidence the past week.

BOONE.—*Carl F. Henning.* On February 17th caught a frog in a meadow stream; on the 18th ducks were migrating; geese observed on the 19th; first robin on the 26th.

BRITT.—*Geo. P. Hardwick.* Mild weather fortunate, with hay crop short and fuel not plentiful.

CLINTON.—*Luke Roberts.* The mean temperature was 4.1° above the normal. Only five Februaries during last 29 years gave a higher mean temperature. There were 4 days with temperature below zero. Aurora observed on the 9th.

GINNELL.—*A. O. Price.* This has been the warmest February since 1896.

LEON.—*Morris Gardner.* This has been one of the finest Februaries ever experienced here. An auroral display was observed on evening of the 9th, from 7 to 9 o'clock. Darting rays of light, some of them reaching nearly to the zenith, traveled from west to east.

OLIN.—*Nathan Potter.* February was one of the finest winter months I remember in my 63 years in eastern Iowa. Stock in fine condition.

PLOVER.—*J. S. Smith.* Geese and ducks were going north on the 14th; in 1885 they came on February 8th.

RIDGEWAY.—*Arthur Betts.* Warmest February since 1898 and the driest recorded. There were 177 hours of sunshine, or 60 per cent. A magnificent auroral display on the evening of 9th. The mean temperature of the three winter months at Ridgeway was 20.4°. Precipitation 6.00 inches. There were 21 days with temperature below zero and 45 days with thawing temperature. The snowfall measured 21 inches.

MARCH.

The month was phenomenally mild, with less than the average amount of precipitation. The first half of the month was typical March weather, with alternate freezing and thawing; but the latter part was excessively warm and bright, the maximum temperatures during the last decade ranging from 70° to 90° in the Southern and Central sections. The surface dried rapidly, and farming operations were begun ten days to two weeks earlier than usual. The average rainfall was about a half-inch less than normal, and the greater part of it fell about the first two and the last three days of the month. With the exception of March, 1894, and 1905, it was the warmest March recorded since 1890. There was a great quickening of all vegetation, as evidenced by green coloring of the woods and fields. In large portions of the State seeding was in progress from the 20th to the 28th and a large acreage was plowed preparatory to the planting of corn. At a number of stations the maximum temperature exceeded 90°.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 116 stations, was 49.6°, which is 7.6° above the normal. By sections the mean temperatures were as follows: Northern section, 36.7°, which is 6.9° above the normal; Central section, 41.1°, which is 8.2° above the normal; Southern section, 44.1°, which is 8.0° above the normal. The highest monthly mean was 47.6°, at Keokuk. The lowest monthly mean was 31.8°, at Sibley. The highest temperature reported was 92°, at Clarinda and Massena, on the 25th. The lowest temperature reported was 7° below zero, at Inwood, Lyon county, on the 2d. The average monthly maximum was 54.0°; and the average monthly minimum was 10.2°. The greatest daily range was 59°, at St. Charles, and the average of greatest daily ranges was 44.6°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 124 stations, was 1.35 inches, which is 0.55 inch below the normal. The averages by sections were as follows: Northern section, 1.19 inches, which is 0.44 inch below the normal; Central section, 1.20 inches, which is 0.79 inch below the normal; Southern section, 1.66 inches, which is 0.43 inch below the normal. The largest amount reported was 5.95 inches at Keokuk. The least amount reported was 0.23 inch at Washta. The greatest daily rainfall was 3.50 inches, at Keokuk, on the 28th-29th. The average number of days reported on which 0.1 or more of precipitation fell was 6.

WIND AND WEATHER.—The prevailing direction of the wind was north-west. The highest velocity reported was 40 miles per hour, from the south, at Sioux City, on the 24th, and from the southwest, at Des Moines, on the 26th. The average number of clear days was 14, partly cloudy 7, and cloudy 10.

OBSERVERS' NOTES.

ALBIA.—*J. I. Chenoweth*. The season is about ten days early; leaves and fruit buds well started.

ALGONA.—*Dr. F. T. Seeley*. Robins were observed on the 18th; frogs were heard on 23d.

ALLERTON.—*Rex Shriver*. Month was unusually warm; nearly all oats were sown and many gardens planted. Frost on 30th and 31st caused damage.

ALTA.—*David E. Hadden*. A very pleasant month; the latter half was warm and dry. The maximum temperature (85°) on the 26th was the highest on record for March.

ALTON.—*W. S. Slagle*. A very fine month; seeding far advanced; rain was needed.

AMANA.—*Conrad Schadt*. The high temperature in the first half of the third decade gave a powerful stimulant to vegetation. Flower and leaf buds came near being fully developed, but were happily checked by colder weather at the close of the month; grass plats are as green as in summer.

ATLANTIC.—*J. W. Love*. On the 25th the temperature reached 91°—the highest ever recorded at this station in March.

BAXTER.—*W. R. Vandike*. A severe electric storm occurred on night of the 28th. Lightning struck and burned a stack on farm of E. Jontz.

BONAPARTE.—*B. R. Vale*. Precipitation, 2.90 inches; fell mostly at close of the month. It was an exceptionally warm March; much seeding was done between the 14th and 28th.

BRITT.—*Geo. P. Hardwick*. The growth of vegetation began unusually early; seeding small grain and plowing were well begun in March.

CHARITON.—*C. C. Burr*. Oats were about all sown in March. Grass made a fine start; stock wintered better than usual.

CLINTON.—*Luke Roberts*. This has been the warmest March during the last 29 years. The mean temperature was 8.8° above the normal. The maximum, 83°, was 14° above the normal. The movement of wind was 4,240 miles, which is 1,500 miles below the normal. The warmest day, the 26th, had a mean of 62.5°.

FOREST CITY.—*J. A. Peters*. The 26th was the warmest March day since 1895. Some wheat was sown the last day.

GRAND MEADOW.—*F. L. Williams*. The first robin was heard on the 24th; first sod plowing was done on 20th. Month was unusually warm.

INWOOD.—*F. B. Hanson*. The temperature for March was above average, and spring began early; some seeding was done during the last decade; grass and buds were well started.

IOWA FALLS.—*J. B. Parmelee*. On the 15th robins, bluebirds and black-birds were observed. On the 16th noted wild geese, and meadow-larks; and on the 21st frogs were croaking.

KEOSAUQUA.—*J. H. Landes*. Up to the 28th the month was remarkably dry. Very high temperatures were recorded from 21st to 28th. Oats all sown and much of it was up at end of month.

LEON.—*Morris Gardner*. This has been the driest March in six years. From the 16th to the 30th it was unseasonably warm. Ground was in extra fine condition and oats were about all sown. A small tornado did some damage in the western part of the county on the afternoon of the 28th.

MOUNT Ayr.—*A. F. Beard*. A tornado at 6:30 p. m. of the 28th, blew down houses, barns and cribs in the southeast part of the county.

OLIN.—*Nathan Potter*. It was the finest and warmest March for years. Good progress was made in plowing and seeding the last week.

PACIFIC JUNCTION.—*H. H. McCartney*. The warmest March day of the record here was the 25th. The maximum was 91° and the minimum 56°; the mean 73.5°.

RIDGEWAY.—*Arthur Betts*. A warm March with prevailing wind north-west. There were 220 hours of sunshine, with thawing temperature 63 per cent of the month; spring work has been in progress since the 24th.

STOCKPORT.—*C. L. Beswick*. Oats seeding began about the 20th; peach buds showed color but were checked by hard freeze on the 31st.

APRIL.

The month was a record-breaker as to temperature and precipitation. The tabulated reports for the State show that it was the coldest and driest April of which we have State-wide records. The most noteworthy feature was the remarkable equableness of low temperature thruout the month. On the average, ice-forming temperatures were recorded on two-thirds of the mornings in April. The temperature for the State was 41.5°, which is 7.7° below the normal. At the Des Moines station, and in the Southern section, April was nearly one degree a day colder than the preceding month of March. The Northern section was relatively warmer. The average monthly minimum was 16.4°, which indicates the persistence and severity of freezing weather. The average precipitation was 1.32 inches, which is less than half the normal amount for April. The driest part of the State was the Northern section, in which the average precipitation was .84 inch, or less than one-third the normal. In view of the extremely low temperature the prevalent dryness was a favorable condition, serving to prevent some measure of the damage to crops and fruit that might have resulted if the soil had been saturated. Despite the adverse conditions affecting germination of seed and growth of vegetation, very excellent progress was made in seeding and in preparation of the soil for planting corn, potatoes, etc. There was a much larger area in readiness for the planter than is usually seen at the close of April, and the soil was in extra fine tilth in all parts of the State. Unquestionably material damage was caused by the protracted period of freezing weather. The field crops suffered considerably, and in the southern districts early varieties of fruit were badly damaged.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 119 stations, was 41.5°, which is 7.7° below the normal. By sections the mean temperatures were as follows: Northern section, 39.2°, which is 8.7° below the normal; Central section, 41.9°, which is 6.8° below the normal; Southern section, 43.4°, which is 7.7° below the normal. The highest monthly mean was 46.3°, at Keokuk. The lowest monthly mean was 35.9°, at Sibley. The highest temperature reported was 80°, at Clarinda on the 24th. The lowest temperature reported was 10°, at Earlham on the 14th, and at Washta on the 17th. The average monthly maximum was 71.6°, and the average monthly minimum was 16.4°. The greatest daily range was 54°, at Woodburn; and the average of greatest daily ranges was 38.2°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 125 stations, was 1.32 inches, which is 1.59 inches below the normal. By sections the averages were as follows: Northern section, .84 inch, which is 1.81 inches below the normal; Central section, 1.27 inches, which is 1.66 inches below the normal; Southern section, 1.84, which is 1.30 inches below the normal. The largest amount reported was 3.22 inches at Burlington. The least amount reported was .24 inch at Inwood. The greatest daily rainfall reported was 1.50 inches, at Pacific Junction on the 28th. The average number of days on which .01 inch or more was reported was 6.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 52 miles per hour, from the northwest, at Sioux City on the 11th. The average number of clear days was twelve, partly cloudy 8, and cloudy 10.

OBSERVERS' NOTES.

AFTON.—N. W. Rozeil. Ice was noted 18 mornings this month. I have been in Iowa since 1847 and have not seen so cold an April in all these years.

ALBIA.—J. I. Chenoweth. March and April seem to have changed places. Mercury went down to 21° on the 26th, which is the lowest ever recorded here in the last decade of April.

ALTA.—David E. Hadden. An unusually cold April; freezing weather nearly every day.

ALTON.—W. S. Stagle. Heavy frost nearly every night in April; crops and foliage at a standstill; many young pigs lost from effects of cold weather.

AMANA.—Conrad Schadt. Temperature was at or below the freezing point on 15 mornings; the fruit buds which came near development in March, remained nearly dormant the greater part of April; deficiency of moisture in the ground and plants seems to have served as a protection; 4 inches of snow on morning of the 30th crowned the April weather.

BONAPARTE.—B. R. Yale. Precipitation 2.44 inches; ice was in evidence 16 mornings; the average minimum temperature of April was 33.5°, or 11.5° colder than the last half of March.

CHARITON.—C. C. Burr. Vegetation made little progress in April. Mercury rose 12° higher in March than in April.

CLINTON.—Luke Roberts. The mean temperature was 6.3° below the normal; it was the coldest April during the last 26 years; the minimum was 32° or below on 16 days; the lowest was 21°, on the 14th and 17th. Some damage to fruit, but extent of injury is not known.

ESTHERVILLE.—A. O. Peterson. Sleet during night of April 28th remained on trees and grass 48 hours.

GRINNELL.—A. O. Price. April was too cold for normal growth of crops; ground was in fine order for planting corn.

INWOOD.—F. B. Hanson. April was very backward, with freezing temperature on 22 mornings. Crop growth slow, but farm work is well advanced.

LARRABEE.—H. B. Streever. April was remarkably cold and dry. Seeding was begun on April 1st and was completed before the 15th.

LEON.—Morris Gardner. The coldest April ever experienced here; on morning of the 30th there was an inch of snow on the ground and icicles hung among peach and cherry bloom. Fruit nearly all killed and oats damaged.

MOUNT Ayr.—A. F. Beard. The temperature was at or below freezing on 19 days in April; five inches of snow fell on the 29th; ice was quarter of an inch thick.

MOUNT VERNON.—*J. W. Hubbard.* The most remarkable April in 20 years; average temperature 8° below the normal.

NORTHWOOD.—*Chas. H. Duclle.* The weather was cold, but not excessively wet. The general condition is better than it was last year at the close of April.

OLIN.—*Nathan Potter.* A cold month; pastures are ten days late; five or six inches of snow fell on the 29th, with rain and sleet, and snow banks were seen on north side of buildings on May 3d at sundown.

POCAHONTAS.—*F. E. Hronek.* The coldest April ever known here, with 26 frosts. Much corn ground in fine condition for planting, and some planting done at close of the month; oats coming and thin stand.

RIDGEWAY.—*Arthur Betts.* Coldest April on record; only 2.8° warmer than March; there were 241 hours of sunshine; 81 per cent of the month was thawing temperature.

STOCKPORT.—*C. L. Beswick.* The worst storm on live stock for 1907 began about noon on the 29th, the temperature about freezing, turning to snow in the night. Peaches, plums, cherries and apples were in bloom. Temperature of April was 1.6° below that of March.

WAUKEE.—*E. J. Leonard.* Month very cold and backward, ending with a storm considered the worst of the winter.

MAY.

Following the coldest April of record in this State, the month of May, 1907, is also a record-breaker as to the temperature. The average for the State, according to the records of 120 stations, was 53.5°, which is 7.2° below the normal. The lowest temperatures were recorded on the 3d and 4th, and the average monthly minimum for the State was 22.1°. Frosts were reported in all districts in every week during the month. At the central station light frosts were noted on the 2d, 8th, 20th and 27th; heavy frosts on the 1st, 11th and 16th and killing frost on the 4th. Light snow flurries were reported in all sections on the 3d and 15th. There was a deficiency of sunshine, the number of clear days being 11, cloudy days 10 and partly cloudy 10. The average precipitation for the State was 3.48 inches, which is .78 inch below the normal for May. During the first and second decades there were general complaints of lack of moisture for the germination of seed and the growth of grass and small grain. In a considerable area the drouth became somewhat serious. But during the last decade there were copious showers with generally sufficient rainfall to break the drouth and replenish the supply of water for stock. The average for the Northern section was 2.74 inches, and in a number of counties moisture was deficient at the close of the month.

The dry weather was favorable for plowing and preparation of soil for planting and the bulk of the corn acreage was planted under ideal conditions of soil. It is estimated that four-fifths of the crop was planted by the 20th of the month, tho the temperature was not favorable for germination. In the last decade the weather was generally cloudy, showery and unseasonably cool; and under these adverse

conditions field work was delayed and germination of corn was slow and unsatisfactory, necessitating more than the usual amount of replanting. The stand obtained was generally below the average and at the close of the month the condition of corn was rated several points below the normal. The wet and cool weather of the last decade however was favorable for meadows, pastures, oats, wheat, rye and barley, and the condition of these crops was materially improved. The cold weather of April and May greatly damaged orchard fruits and retarded the growth of garden truck. Small fruits, tho later than usual, give promise of better yield than was anticipated.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 120 stations, was 53.5°, which is 7.2° below the normal. By sections the mean temperatures were as follows: Northern section, 51.4°, which is 7.9° below the normal; Central section, 53.6°, which is 7.1° below the normal; Southern section, 55.5°, which is 6.7° below the normal. The highest monthly mean was 57.6°, at Keokuk, and the lowest monthly mean was 48.0°, at Sibley. The highest temperature reported was 96° at Elliot, on the 22d, and the lowest was 14° at Whitten, on the 4th. The average monthly maximum was 86.4°, and the average monthly minimum was 22.1°. The greatest daily range was 66°, and the average of greatest daily ranges was 46.3°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 126 stations, was 3.48 inches, which is .78 inch below the normal. The averages by sections were as follows: Northern section, 2.74 inches, which is 1.30 inches below the normal; Central section, 3.87 inches, which is .38 inch below the normal; Southern section, 3.84 inches, which is .64 inch below the normal. The largest amount reported was 7.68 inches at Tipton, and the least amount reported was .71 inch at Clear Lake. The greatest daily rainfall reported was 4.50 inches at Tipton, on the 23d. The average number of days on which .01 inch or more of rainfall was reported was 10.

WIND AND WEATHER.—The prevailing direction of the wind was north, southeast, south and southwest. The highest velocity reported was 52 miles per hour from the south at Sioux City, on the 12th. The average number of clear days was 11, partly cloudy 10, and cloudy 10.

OBSERVERS' NOTES.

ALBIA.—*J. I. Chenoweth.* A cold, backward month; first half dry, and in latter half there was too much rain at a time; temperature was down to 32° on the 20th and 35° on 27th.

ALTA.—*David E. Hadden.* May was phenomenally cold. The first half was very dry and frequent rains in latter half brought the total up to nearly the normal.

ALTON.—*W. S. Slagle.* There were too many frosts for garden truck, but small grain is looking well; some corn replanted on account of poor seed.

AMANA.—*Conrad Schadt.* May was unusually cold; fire was needed in dwellings most every day; the weather was unfavorable for vegetation.

AMES.—*G. V. Welch.* Good rains in the third week of May effectually broke the spring drouth.

BONAPARTE.—*B. R. Vale*. Except the second week the month was cold, cloudy and wet. Precipitation 6.20 inches, the greatest since May, 1899.

BOONE.—*Carl Fritz Henning*. On May 15th it began snowing at 8:15 a. m., and was raining, snowing and sleeting at times during the day. On May 17th corn was coming up.

BRITT.—*Geo. P. Hardwick*. Unseasonably cold, with excessive cloudiness and much freezing temperature; vegetation was very late, pasturage 15 days late; corn was not all planted at end of month.

CHARITON.—*C. C. Burr*. Early planted corn made a fair stand, surface was dry until the 21st.

CLARINDA.—*A. S. Van Sandt*. Cool and dry, corn plowing was just begun at end of the month.

CLANTON.—*Luke Roberts*. May was 5.4° per day below the normal, and the coldest May since 1882. All food and forage plants are very late; the soil has been in good condition and farmers are well up in their work; but plants cannot grow without heat.

ELLIOTT.—*Henry Barnes*. A good stand of corn and small grain and grass have done fairly well.

ESTHERVILLE.—*A. O. Peterson*. There was a heavy snowstorm on the 15th, which melted as it reached the ground.

FOREST CITY.—*J. A. Peters*. The season is very late; fruit tree bloom came three weeks later than last year, grass is short, and small grain has made slow growth.

GRINNELL.—*A. O. Price*. Five inches of rain fell during last third of May. It was the coldest May on record.

INWOOD.—*F. B. Hanson*. The first and second decades in May were quite dry and favorable for farm work; the season is about two weeks late; frost on 26th caused some damage to fruit.

LEON.—*Morris Gardner*. It was a very cold May; fruit was about all killed and crops are very backward; some corn replanted.

OLIN.—*Nathan Potter*. It was a cold month. The soil is in good condition and farm work is well done; corn making slow growth.

POCAHONTAS.—*F. E. Hronck*. May was 8° colder than last year. The ground was in excellent condition for planting, but too cool for good growth; much corn was replanted.

RIDGEWAY.—*Arthur Betts*. It was the coldest and driest May on record; there were 248 hours of sunshine; vegetation slow. The total ice formation in April was 6.8 inches; in May 1.2 inches.

WAUKEE.—*E. J. Leonard*. The month was unusually cold and dry up to the 20th; all crops improved by rains since that date.

WAVERLY.—*H. S. Hoover*. First half of May very cold and dry. Four mornings ice was found, and snow fell on 10th and 15th.

MAY WEATHER AT DES MOINES.

The month of May, 1907, will pass into history as a record-breaker, the average temperature for the month, 54.2°, being the lowest recorded at this station since its establishment in 1878. The average of all the years of record here is 60.9°. The station records show that in the years 1882, 1888 and 1892 the means for May were a fraction below 55°, but generally it has been a warm month in this valley. This year it was persistently cool, and there were only eight days on which the mean equaled or exceeded the normal. On twenty-two days the temperature ranged from normal to 22° below the normal. The sunshine was also abnormally deficient. The amount of sunshine for the month averaged 6.5 hours daily, or about 45 per cent of the possible amount. The rainfall, 3.97 inches, was slightly below the normal. On the whole it was a month to be remembered with a shivering sensation.

JUNE.

The average daily temperature of June for the State was 66.5°, which is about 3° below the normal. There have been but two cooler Junes since state-wide records have been compiled. In 1902 the average was 65.2°, and in 1903 it was 64.6°. Following the coldest April and May on record, June came in with nearly seasonable temperature, but the daily average of the first decade was 6° to 8° below the normal, with almost continuous wet and partly cloudy weather from the 2d to the 11th. The second decade brought more sunshine and higher temperature, with conditions more favorable for field work and growth of crops. The average rainfall for the month was 5.35 inches, which is 0.79 inch above the normal. The northern section received an average of 5.67 inches, the central section 4.98 inches, and the southern section 5.41 inches. The greater part of the rainfall came about the 3d to the 10th, and from the 21st to the 25th. For the State there was an average of 14 clear and 9 partly cloudy days, so there was sufficient sunshine to promote normal growth of cereals, and an abundance of moisture for pasture, potatoes and garden truck. In the larger part of the State conditions were favorable for cultivation of corn during most of the latter half of the month, and except on very low and undrained lands the corn fields were fairly well cleaned out before the first of July. As compared with the average, the corn crop was about eight to ten days late at the close of June, and the stand was 20 to 30 per cent below the normal. June as a whole was a fairly good month for the staple crops, especially the grasses and small grain. The pastures were at their best most of the month, and meadows were greatly improved by the copious showers, giving promise of a better

hay crop than was deemed possible at the close of May. A good start was made in harvesting clover during the last week in June. Timothy meadows were in bloom, and other grasses reinforced the meadows where soil conditions were favorable. Early potatoes were extra good and the late planted fields developed finely. All kinds of garden truck made luxuriant growth. Among the fruits the strawberry crop brought a fair yield, and other varieties of berries were quite promising at the end of June. Apples were doing well in the Northern section, but in the Southern section they were very much below an average.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 120 stations, was 66.5°, which is 2.9° below the normal. By sections the mean temperatures were as follows: Northern section 65.2°, which is 3.0° below the normal; Central section, 66.7°, which is 2.8° below the normal; Southern section, 67.7°, which is 2.8° below the normal. The highest monthly mean was 70.0° at Thurman, and the lowest monthly mean was 63.2° at Estherville. The highest temperature reported was 98° at Clarinda, on the 16th; and the lowest reported was 36° at Atlantic on the 2d. The average monthly maximum was 92.6°, and the average monthly minimum was 42.4°. The greatest daily range was 44° at Audubon and Atlantic. The average of greatest daily ranges was 34.2°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 129 stations, was 5.35 inches, which is 0.79 of an inch above the normal. The averages by section were as follows: Northern section, 5.67 inches, which is 1.03 inches above the normal; Central section, 4.98 inches, which is 0.45 inch above the normal; Southern section, 5.41 inches, which is 0.90 inch above the normal. The largest amount reported was 9.33 inches at Northwood, and the least amount reported was 2.07 inches at Davenport. The greatest daily rainfall reported was 3.60 inches at Clear Lake and Waukegan on the 9th. The average number of days on which .01 inch or more was reported was 11.

WIND AND WEATHER.—The prevailing direction of the wind was southwest. The highest velocity reported was 44 miles per hour, from the west, at Sioux City on the 23d. The average number of clear days was 14, partly cloudy 9 and cloudy 7.

OBSERVERS' NOTES.

ALTA.—*David E. Hadden.* The first decade of June was cool, wet and cloudy; balance of the month was warm and dry. Precipitation was 1.88 inches below the seventeen-year average.

ALTON.—*W. S. Slagle.* From the 11th conditions were favorable for all crops; corn advanced rapidly the last half of the month.

AUDUBON.—*Geo. E. Kellogg.* Very heavy rain, accompanied by hail, caused some damage to crops east of station on 29th and 30th.

BONAPARTE.—*B. R. Vale.* Rain 5.43 inches in June, following 6.20 in May. First ten days and last ten days were too wet for work in fields. Up to the last of June there has been seven inches excess of rain over 1906 for same period.

BURR.—*Geo. P. Hardwick.* There were no serious storms in June; temperature was slightly below the normal.

CHARITON.—*C. C. Burr.* Vegetation made rapid growth in June, but all crops were ten days late.

CLINTON.—*Luke Roberts.* The mean temperature was 2.3° below the normal, and rainfall was .77 inch below. The wind movement was 355 miles less than normal. The warmest day was 77°, and the coldest 54°. Crop growth was still in arrears at the close of the month.

CRESTON.—*Rev. W. L. Gaston.* Vegetation made remarkable growth, and the hay crop is much better than was promised a month ago.

ELLIOTT.—*H. Barnes.* On first of June season was ten days late; at its close it is nearly normal. Corn small, but good color; small grain an average.

FOREST CITY.—*J. A. Peters.* More rain has fallen during the month than in any June since establishment of this station, in 1884. Corn is three weeks behind average season; some fields not cultivated yet and none more than twice.

HUMBOLDT.—*H. S. Wells.* Rain 3.41 inches, and showers were frequent enough for all crops.

INWOOD.—*F. B. Hanson.* The season is late, but weather in June was an improvement over April and May, and crop prospects, except corn, are nearly up to the normal. The temperature was 1 degree above June, 1906.

KEOSAUQUA.—*J. H. Landes.* It was a cool June; corn backward, but was making fine progress at close of the month; grass, wheat and oats are good.

LAUREL.—*H. B. Strever.* Small grain improved materially during the month; corn was backward; a hailstorm on 30th did slight damage to crops.

LEON.—*Morris Gardner.* A good month for crops, with no bad storms.

OLIN.—*Nathan Potter.* June was a fine month for farm work; corn made rapid growth the last fifteen days; meadows and oats were up to average at close of month.

POCAHONTAS.—*F. E. Hronek.* The forepart of June was wet and cloudy, but the latter half was favorable; corn was about two weeks late, but doing well.

RIDGEWAY.—*Arthur Betts.* As a whole the month was cool, but June, 1902, was cooler. There were 309 hours of sunshine; plenty of showers and heavy dewfall. Three gales.

SHELDON.—*A. W. Beach.* June was a good growing month; corn about ten days late, but promising 75% of a crop.

SIBLEY.—*Frances C. Doolittle.* A furious storm of rain and hail struck this vicinity at 12:45 p. m., on the 30th, destroying many shade trees and damaging crops and gardens.

STOCKPORT.—*C. L. Beswick.* A good month for general farm work. Temperature did not reach the high point scored in March, by one degree. Rain 2.94 inches.

WAUKEE.—*E. J. Leonard.* Rain abundant. Very heavy shower on the 9th, when 3.60 inches fell in two hours, doing much damage.

WAVERLY.—*H. S. Hoover.* Corn improved the last week, and weeds were well subdued. There was a little more rain than was needed for corn, and not enough sunshine.

WEST BEND.—*Phil Dorweiler*. First half of June was cool and backward, but latter half was seasonable. On 30th a great thunderstorm with high wind and hail damaged crops and wrecked some small buildings.

ZEARING.—*Ward Bean*. In general the month was favorable, with many warm days and a moderate amount of rain.

JULY.

The average temperature of July was very nearly the normal, but the rainfall was very much in excess in all districts. The average for the State was 7.27 inches, which is very nearly 3 inches above the normal for July. The distribution by districts was very nearly equal, and every station reported some excess of moisture. Rain fell in measurable amount every day in the month in some part of the state. And yet there were, on an average, 16 clear days and 11 partly cloudy days. There was an ample amount of sunshine, and there was no material check in the growth of vegetation. The bulk of the rainfall came from the 3d to the 10th, and from the 13th to the 25th. And nearly every shower observed during the month was accompanied by lightning, with occasional windsqualls and scattered areas of hail. In a very considerable part of the State the excess of moisture retarded field work more than half the number of working days. In the first decade there was much difficulty experienced in cleaning out the corn fields, and only the well drained lands received the requisite amount of cultivation. The upland corn that received thoro cultivation made very excellent progress, and was fairly well advanced at the close of the month. The frequent showers interfered materially with the harvest of hay and small grain. Considerable amount of hay was badly damaged, but the crop was mostly in stack or barn at the close of the month. The heat and humidity caused rust of oats and spring wheat, and barley was discolored by wet weather during the harvest. Potatoes, pastures and garden truck made fine growth during the month.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 117 stations, was 73.7°, which is 0.4° below the normal. By sections the mean temperatures were as follows: Northern section, 71.9°, which is 1.1° below the normal; Central section, 74.1°, which is 0.1° below the normal; Southern section, 75.1°, which is 0.1° below the normal. The highest monthly mean was 76.9° at Ottumwa, and the lowest monthly mean was 69.1° at Fayette. The highest temperature reported was 102° at Thurman, on the 5th, and the lowest temperature reported was 41° at Alton, on the 2d. The average monthly maximum was 93.9°, and the average monthly minimum was 53.6°. The greatest daily range was 42° at Estherville. The average of greatest daily ranges was 30.4°.

PRECIPITATION.—The average precipitation for the State, as shown by the records of 126 stations, was 7.27 inches, which is 2.92 inches below the normal. The averages by sections were as follows: Northern section, 7.02 inches, which is 2.79 inches above the normal; Central section, 7.23 inches, which is 2.93 inches above the normal; Southern section, 7.56 inches, which is 3.02 inches above the normal. The largest amount reported was 13.66 inches at Belle Plaine; the least amount reported was

3.97 inches at Elkader. The greatest daily rainfall reported was 5.30 inches at Belle Plaine on the 9th. The average number of days on which .01 inch or more was reported was 13.

WIND AND WEATHER.—The prevailing direction of the wind was southwest; the highest velocity reported was 48 miles per hour, from the north, at Sioux City, on the 18th. The average number of clear days was 16; partly cloudy, 11, and cloudy, 4.

OBSERVERS' NOTES.

AFTON.—*N. W. Rowell*. Rain 5.96 inches—the greatest rainfall in July since 1902, when we had 8.67 inches.

ALLERTON.—*Rez Shriver*. Rain 9.12 inches. Harvest delayed by wet weather; oats badly damaged.

ALTA.—*David E. Hadden*. Rain 9.55 inches. During the first and second decades thunderstorms were of almost nightly occurrence, and lightning did considerable damage; the last decade was dry and very favorable for haying and harvesting.

ALTON.—*W. S. Stagle*. A good month for all crops; barley cutting commenced on 23d and early oats on 26th.

AMANA.—*Conrad Schadt*. The frequent and heavy rains during the middle decade caused great local floods and delayed harvest work.

AUDUBON.—*Geo. E. Kellogg*. Hail did some damage on the 6th and 7th; and high wind on night of the 18th.

BONAPARTE.—*B. R. Vale*. Rain 7.64 inches; twelve rainy days; conditions were more favorable at close of the month.

BRITT.—*Geo. P. Hardwick*. Rain 8.31 inches. But one clear and one cloudy day; no extremes in temperature; electric storms were frequent, with sharp lightning. Hay and grain harvest came together.

CHARITON.—*C. C. Burr*. Frequent showers damaged hay and delayed harvest; corn made rapid growth.

CLINTON.—*Luke Roberts*. The mean temperature of July was 73.9°, which is 0.5° above normal; the rainfall was 8.53 inches, which is double the normal amount; bulk of it fell the first decade; sunshine was 60%.

ELLIOTT.—*H. Barnes*. Rain 13.52 inches; despite the rain farm work progressed rapidly, with comparatively small loss; small grain and hay were harvested mostly in good condition; the corn crop is promising.

ELMA.—*H. A. Moore*. Crops are all doing well and harvesting is well under way; corn is looking fine.

FOREST CITY.—*J. A. Peters*. Rain 6.64 inches; temperature was one degree below the normal; some damage was done by hail on 3d.

GRAND MEADOW.—*F. L. Williams*. The month was showery; favorable for corn; oats were rusty; barley mostly in shock at end of the month; hay crop fair and pastures fine.

GRINNELL.—*A. O. Price*. Rain 8.88 inches—5 inches above the normal; exceeded but once in last twelve years, and that was in 1902, when the amount was 11.57 inches.

HANCOCK.—*W. Armstrong*. Corn plowing was completed on 12th, and haying was finished at close of the month; oats and wheat were ripe the 28th and badly rusted.

HUMBOLDT.—*H. S. Wells.* Rain 9.36 inches; grain being harvested; oats were badly crinkled and short; hay good quality; corn is recovering and looking well.

INWOOD.—*F. B. Hanson.* There were eighteen days with one-hundredth of an inch or more of rain in July; work was delayed and some hay damaged; early oats were lodged badly by heavy showers on the 21st.

KEOSAUQUA.—*J. H. Landes.* Rain 9.24 inches, which fell on fifteen days; it was too wet for harvesting, resulting in a big loss in the oats crop; hay crop is good, with prospect of well filled mows and good quality of timothy and clover.

LARRABEE.—*H. B. Strever.* A good growing month, but too wet for tillage of corn and hay making.

LEON.—*Morris Gardner.* This was one of the wettest Julys ever known; rain nearly all fell at night; so there was a large percentage of sunshine.

OLIN.—*Nathan Potter.* Rain 6.90 inches. July was characterized by an unusual number of thunderstorms, causing delay in corn plowing and later retarding haying.

OSKALOOSA.—*Jos. Boyd.* The month was very showery and hay was damaged to some extent.

PERRY.—*J. A. Harvey.* There was but one wholly clear day this month.

POLO.—*J. S. Smith.* Thunder was heard eighteen days this month, and rain fell seven nights in succession—14th to 20th inclusive.

POCAHONTAS.—*F. E. Hronek.* Rain, 8.80. Oats damaged by excessive rains; corn is two weeks behind; storms occurred usually at night.

RIDGEWAY.—*Arthur Betts.* Large amount of rainfall and heavy dews; temperature about 1° below the normal; there were 346 hours of sunshine, and only one wholly cloudy day.

ROCK RAPIDS.—*W. C. Wyckoff.* The month was characterized by the most severe electric storms ever experienced in this vicinity.

STOCKPORT.—*C. L. Beswick.* There was considerable loss of oats by excessive moisture during the second decade. Threshers report yield from 30 to 50 bushels per acre the last of the month.

THURMAN.—*C. R. Paul.* A severe wind and hailstorm occurred on night of the 6th, about seven miles north of this place. Crops were totally destroyed in path of the storm.

WEST BEND.—*Phil. Dorweiler.* The month was favorable for all crops, but heavy rains prevented cultivation of corn, which is backward.

ZEARING.—*Ward C. Bean.* July closed clear and warm; a good share of the oats crop was in shock, and most of the corn was tassel by the end of the month.

AUGUST.

There were in this month no wide departures from the normals of temperature, precipitation, sunshine and humidity. During the past eighteen years there have been ten warmer Augusts and seven that were slightly colder. The mean temperature for the State was less than a degree below the normal, while in the southern section there was an average excess of about the same amount. The lowest temperatures occurred

about the 2d to the 4th, and the 20th to the 22d. The warmest day was the 31st. The warm periods during the month were characterized by excessive humidity.

The precipitation, which averaged 0.57 inch above the normal, was unevenly distributed, ranging from a little above 1 inch to nearly 10 inches. About one-fourth of the State received less than 3.00 inches of rainfall. The records indicate that the heaviest downpours occurred in eastern districts and the amounts reported in the western districts were generally below the normal. While there were some complaints of shortage of moisture, there were many more reports of damage by excess of rainfall during the month. There were three periods of general showers during the month—4th to 7th, 14th to 18th, and 26th to 29th. There were light scattered showers in portions of the State nearly every day, and nearly all showers were accompanied by lightning. Severe local windstorms were reported on the 6th, the 16th and the 29th.

The number of clear days was in excess of the average.

As a whole the month was favorable for the normal advancement of all immature crops. The average temperature was nearly the normal, which is quite high in this midland region. The nights were generally cooler than usual, but there was sufficient heat by day to promote the healthful growth of vegetation. Except in a limited area there was an ample supply of moisture in the soil and the large percentage of humidity was evidenced by very heavy dews. The conditions were especially favorable for the growth of the grasses in pastures and meadows and the healthful development of the corn crop. The truck gardens and all minor farm crops were doing notably well at the close of the month. Tho it was rather showery for August, yet there were more than the usual number of clear days, with ample sunshine, and this afforded favorable conditions for finishing up the harvest of hay and small grain and thrashing from the shock. In portions of the eastern districts, however, the excessive rainfall materially retarded the usual farm operations. The drawbacks were chiefly local and temporary.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 113 stations, was 71.1°, which is 0.8° below the normal. By sections the mean temperatures were as follows: Northern section, 69.5°, which is 0.9° below the normal; Central section, 71.0°, which is 0.8° below the normal; Southern section, 72.7°, which is 0.8° above the normal. The highest monthly mean was 75.3° at Ottumwa. The lowest monthly mean was 67.6° at Sibley. The highest temperature reported was 99° at Ottumwa on the 31st. The lowest temperature reported was 37° at Osage on the 13th. The average monthly maximum was 92.9°; the average monthly minimum was 46.9°. The greatest daily range was 49° at Osage. The average of greatest daily ranges was 32.2°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 123 stations, was 4.33 inches, which is 0.57 inch above the normal. The average by sections was as follows: Northern section, 3.99 inches, which is 0.86 inch above the normal; Central section, 4.69 inches, which is 0.82 inch above the normal; Southern section, 4.30 inches, which is 0.54 inch above the normal. The largest amount reported was 9.67

inches at Delaware. The least amount reported was 1.05 inches at Rock Rapids. The greatest daily rainfall was 4.95 inches at Boone, on the 28th-29th. The average number of days on which .01 inch or more was reported was 9.

THE SUMMER OF 1907.

The tabulated records for the State for the months of June, July and August show that the past summer was some colder than usual, and received a considerable excess of rainfall. The mean temperature of June was 66.5°, which is 2.9° below the normal. July's average was 73.7°, which is 0.4° below the normal. August scored an average of 71.1°, which is 0.8° below the normal. This indicates an average daily deficiency of 1.4° in the summer's temperature. The rainfall averages by months were as follows: June, 5.35 inches; July, 7.27 inches; August, 4.33 inches. The total was 21.13 inches, which is 4.28 inches in excess of the very copious normal summer rainfall of Iowa. These figures afford a sufficient explanation of the general shortage of corn and small grain.

OBSERVERS' NOTES.

AFTON.—*N. W. Rowell.* On the afternoon of the 16th a tornado passed through a portion of Sand Creek township, Union county. It was about 300 feet wide and passed over three miles of country. No lives were lost. Two persons were slightly injured.

ALTA.—*David E. Hadden.* Only light showers occurred during August. The total rainfall was much below the normal. The month was quite free from destructive storms.

ALTON.—*W. S. Stagle.* It was a good month for crops; harvest work was completed without interference of bad weather; light frosts were noted on the 2d and 3d and hail on the 26th, but no damage resulted.

BONAPARTE.—*B. R. Vale.* A wet month—8.42 inches of rain; cool till about the close; last two days the warmest of the season; in the last four months the rainfall has been 27.70 inches.

BOONE.—*Carl Fritz Henning.* During the night of the 28th a severe thunderstorm occurred; several barns near Boone were burned and cattle were killed by lightning. Next morning many dead sparrows were found in the parks and other places in the city, having been killed by heavy rainfall—4.95 inches.

BRITT.—*Geo. P. Hardwick.* Frequent showers, heavy dews and excessive cloudiness made poor harvest weather; corn yield about half an ordinary crop; oats about 21 bushels per acre.

CHARITON.—*C. C. Burr.* Weather conditions in August were about normal until the last three days; the heat period at close was seldom equaled; corn was doing well at close of the month.

ELLIOTT.—*Henry Barnes.* A good month for farming and crops; pastures remarkably good; corn doing well.

INWOOD.—*F. B. Hanson.* Month favorable, with but little rain; oats light, weighing 20 to 30 pounds per bushel; barley quite good.

KEOSAUQUA.—*J. H. Landes.* August was a good month for maturing corn; also for fall pasture and plowing; rainfall 7.10 inches.

LEON.—*Morris Gardner.* On the 16th a small tornado developed about 15 miles northwest of this place, destroying several buildings and causing the death of a child.

OLIN.—*Nathan Potter.* August was changeable, with an abundance of rain; much of the oat crop was damaged by exposure in the shock; hay was put up in good condition the first half of the month.

POCAHONTAS.—*F. E. Hronek.* August was favorable for field work; every rainstorm was accompanied by lightning.

RIDGEWAY.—*Arthur Betts.* Rain, 7.97; the wettest August on record here; only one cooler in the past ten years (1903), and still there were no cloudy days; there were 321 hours of sunshine, or about 74 per cent. Sunset beams on 31st spanned the entire heavens and was the finest display observed in 40 years, lending a great glory to a clear sky.

WAVERLY.—*H. S. Hoover.* Corn has improved more than could have been looked for, with the cool nights we have had; pastures have been very good; sugar beets are improving, but are uneven.

DESTRUCTIVE WINDSTORMS.

August, 1907, was characterized by more than the usual number of storms of considerable severity, but happily they were limited to narrow areas. The most destructive windstorm occurred in the north central district on the afternoon of the 6th. The descriptions and photographic views of the wreckage in the pathway of the storm indicate that it was a tornado, tho its direction, northwest to southeast, was quite unusual for a storm of that distinctive type. It apparently originated near Kelster, Minnesota, and swept thru the northeast corner of Winnebago county, across the southwest corner of Worth county, thence diagonally across Cerro Gordo, expending its force in a widespread squall. The following description was furnished by Mr. C. H. Dwell, co-operative observer at Northwood:

The storm occurred about 4:15 to 5 p. m. It was a little singular in the fact that it traveled from N. N. W. to S. S. E. at a moderate rate of speed, giving those who were in its path ample time to seek shelter. Other storms of this type in past history have traveled from S. W. to N. E. This storm first appeared near Kelster, Minn., and passed within two miles west of Lake Mills. In Winnebago county it destroyed the buildings on the farms of O. G. Rugstad, Martin Peterson and H. Sunderland. Messrs. Ole Johnson, Chas. Kettleson, K. Hagen and I. Ness lost barns, outbuildings, crops and some stock. The heavy wooden bridge of the M. & St. L. railway over Lime creek was also demolished.

The first damage in Worth county seems to have been on the farm of L. L. Ramsay, near the county line. Here the outbuildings were destroyed. Next to him, on the Andrew Nelson place, everything was swept clean, not a board remaining of the house and outbuildings. Corn was stripped to the ground and small grain was thrashed and matted into the soft earth. This was the general appearance where the storm was at its worst. The Osmund Tweed place in Fertile township presented the most pathetic scene. Mr. Tweed, wife and son were killed, their bodies being carried some distance away. The family sought shelter in a grove

instead of the cellar and all perished except a servant girl, who was only a few feet away and uninjured. The mutilated body of Mrs. Tweed was found in the grove on the Petersburg farm. At this point the storm seemed to abate somewhat, but the place was covered with debris. Scores of cattle, horses, hogs and chickens were scattered over the fields. The storm was bearing down towards the village of Hanlontown, causing great consternation, but it seemed to be lifted into the air and left only traces of its force. It was evidently the same storm which damaged so many buildings in Clear Lake and injured two persons, also unroofing a church in Rockwell. It is of interest to note the fact that all persons who sought refuge in their cellars were safe from anything worse than slight bruises. The Tweed family first went into their cellar, and then left it to seek shelter in the grove.

Mr. Dwelle adds that on the day of the storm it was extremely sultry, with a strong southwest wind; about 5 p. m. the wind veered suddenly to the northwest and continued thru the night. At Northwood it was a severe electrical storm.

SMALL TORNADO IN UNION COUNTY.

The Afton Star-Enterprise of August 22d contained a report of a tornado which swept over a portion of Sand Creek township, Union county, on the afternoon of August 16th. It first struck the home of John Shields and destroyed the house. Mrs. Shields and child were carried about two hundred feet and were left unharmed, lying on the straw tick of a bed on which they had taken refuge when the storm came. The Star-Enterprise said:

"The storm was a genuine tornado, and not a cyclone that many people persist in calling it. It was attended by a dark funnel shape cloud whose spiral swept back and forth in zig-zag fashion, the lower edge touching the ground and destroying everything in its path. Shortly after demolishing the Shield's home, the cloud ascended into the air and gradually disappeared. It was accompanied by the usual roaring, rumbling sound which was heard by people living several miles beyond its range."

In the copy of the Star-Enterprise from which this report is clipped we find the following editorial article, written by the editor, A. T. Burrows, who served several years as an official in the U. S. Weather Bureau, and is well qualified to write on this topic.

TORNADOES AND CYCLONES.

In the minds of many people these two terms may be used interchangeably to indicate a storm of surpassing severity where buildings are blown down, people killed or injured, trees uprooted, etc. But the difference between a tornado and a cyclone is as wide as the difference between Niagara and the ebb and flow of the tide. A tornado is not a cyclone, and a cyclone is far from being a tornado.

Briefly, a tornado is the kind of a storm that visited Sand Creek township last Friday. It is invariably accompanied by a funnel-shaped cloud which whirls and dances about with fearful menace as it sweeps its destructive path over the land. A tornado most frequently occurs in

this section in the afternoon or evening of a warm, sultry day in the late spring or summer. None has been known to occur here in the winter, but they do manifest themselves in the extreme southern states as early as February. These storms are local in character, the most destructive efforts being usually confined to a strip not over a quarter of a mile wide and from a few miles to a hundred miles in length. The storm is of short duration and of irresistible fury. Its destructive effect is largely due to the whirling vortex of cloud in the funnel in which exists an almost complete vacuum. This vacuum draws up the air in its neighborhood with such enormous force that ordinary buildings can not withstand the pressure on their sides and collapse as if by magic. The wind seems to come from every direction, but after the passage of the storm it will be found that it blew from either side diagonally toward the center.

Now the ordinary cyclone known to meteorologists is nothing like this. Two or three of them pass over Union county every week, winter and summer, spring and fall. They are usually accompanied by clouds and generally rain or snow, depending upon the season of the year. The temperature warms up as they approach and falls again as they pass on east.

Generally speaking, a cyclone is a vast storm movement traveling across the country from southwest to northeast, of from 500 to 1,000 miles in diameter, whose daily movement is usually 400 or 500 miles toward the Atlantic ocean. The winds that circulate thru and about this vast storm area are warm and moist in the east and southeast sections and frequently bring rains; the south or southwest winds that succeed them are the warm winds of summer as well as winter, while the sharp blasts from the northwest which in winter signal the advent of a severe cold spell mark the passing of the cyclone and the arrival of another kind of weather, acting upon a somewhat different principle. The winds in the front part of a cyclone, being warm winds, rise and laden as they are with moisture, form clouds when they reach the cool atmosphere 5,000 and 10,000 feet above the earth's surface. If the condensation proceeds rapidly enough precipitation begins and thus our summer rains are formed and our winter snows are caused to fall.

In a cyclone the wind may be strong or it may be weak or vacillating, depending upon the energy of the storm itself, as their strength varies greatly with the season and other meteorological influences. The thunderstorm is a by-product of a general cyclone and usually occurs in the southeast quadrant of the cyclone. Here, too, is where tornadoes may be looked for, as they are a special form of thunderstorm, excessively developed by peculiar favorable circumstances not clearly understood by scientists.

SEPTEMBER.

The mean temperature of September was very nearly the normal, but it was characterized by sudden changes, causing the impression of unusual coldness. The average, however, was only seven-tenths of a degree below the normal. The second decade was much the warmer period in the month, the mean at the central station being 73°. The average

of the last decade was about 20° lower than the preceding ten days. During the past 18 years there have been five colder and twelve warmer Septembers. During the last decade of the month light frost was reported on the morning of the 23d, and heavy to killing frost visited every county in the State on the morning of the 25th. This was an unusual visitation in this State. The average rainfall was about .60 inch below the normal. There was the usual inequality in its distribution. About one-fifth of the State received less than 2.00 inches. The heaviest amounts were reported in the northeast and east central districts. The principal showery weather occurred from the 6th to the 10th, 16th to 20th and 26th to 30th. The percentage of sunshine was about the normal. The average number of clear days was 15, and cloudy days 6. The most damaging storms of wind and hail during the month occurred on the afternoon and evening of the 7th, in a pathway several miles in width, extending from Palo Alto and Pocahontas to Warren county, the direction of the storm being northwest to southeast.

The month opened with high temperature, but the average of the first week was below the normal, the average daily deficiency in temperature being about 2°. The nights were cool, but there was more than the usual amount of sunshine and warmth by day to promote the ripening of corn, which was then about two weeks late. The second week was cold and showery in the first three days, but the latter part was warm enough to give a slight excess in temperature with more than the normal amount of sunshine. At the close of that week the early planted corn was sufficiently well matured to begin the work of cutting in the central and southern districts. The third week brought five abnormally warm days, with brisk, drying winds, which were very favorable for hastening the ripening process of the belated portion of the corn crop. At the close of that week it was estimated that about 70 per cent of the crop was fairly well prepared to withstand the heavy frost which came on the morning of the 25th, in the early part of the closing week of the month. That week was abnormally cold, the average daily deficiency in temperature being about 6° to 8°. Reports indicated that it was a killing frost in exposed localities in the northern half of the State. In the southern half there was not more than ten per cent of the crop exposed to damage by frost. In the north central and northeast districts there will be more than the usual amount of corn below the commercial standard of ripeness.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 110 stations, was 62.8°, which is 0.7° below the normal. By sections the mean temperatures were as follows: Northern section, 60.8°, which is 1.2° below the normal; Central section, 62.9°, which is 0.5° below the normal; Southern section, 64.7°, which is 0.5° below the normal. The highest monthly mean was 66.6° at Keokuk and Leon. The lowest monthly mean was 58.0° at Sibley. The highest temperature reported was 98° at Clarinda and Thurman on the 1st. The lowest temperature reported was 25° at Elma on the 25th. The average monthly maximum was 89.5°, and the average monthly minimum was 31.8°. The greatest daily range was 51° at Storm Lake and Washta, and the average of greatest daily ranges was 36.3°.

PRECIPITATION.—The average precipitation for the State, as shown by the records of 118 stations, was 2.76 inches, which is 0.60 inch below the normal. The averages by sections were as follows: Northern section, 2.71 inches, which is 0.66 inch below the normal; Central section, 3.02 inches, which is 0.21 inch below the normal; Southern section, 2.54 inches, which is 0.95 inch below the normal. The largest amount reported was 6.06 inches at Ridgeway. The least amount reported was 1.38 inches at Washington. The greatest daily rainfall reported was 3.15 inches at Olin on the 27th and 28th. There was an average of 8 days on which .01 inch or more rainfall was reported.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 42 miles per hour, from the northwest, at Sioux City on the 23d. The average number of clear days was 15; partly cloudy, 9; cloudy, 6.

OBSERVERS' NOTES.

AFTON.—*N. W. Rowell*. Frost on 22d and 24th, but corn was advanced and no damage resulted, except on bottoms. Month cold and wet at close, but rain was needed.

ALBIA.—*J. I. Chenoweth*. Temperature went up to 90° on 18th and 19th, and down to 32° on night of 24th. Froze ice and checked vegetation.

ALLESTON.—*Rex Shriver*. Very little damage done by frost, corn ripened fairly well.

ALTA.—*David E. Hadden*. First light frost of the season on the morning of the 25th. During thunderstorm on morning of the 16th lightning struck and burned a large barn near town.

ALTON.—*W. S. Slagle*. Killing frost of the 25th caught about 10 to 20 per cent of the corn unripe; soil is in fine condition for plowing.

AMANA.—*C. Schadt*. First and second decades were warm and helped the corn crop, which was belated. In the third decade the temperature dropped to near the freezing point, first ice of the season formed on 25th; soaking rains put the soil in workable condition.

AUDUBON.—*Geo. E. Kellogg*. Killing frost on the 25th did no damage to corn.

BONAPARTE.—*B. R. Vale*. Rain, 1.99; a cold, dry month; plowing and seeding difficult; no damage from frost.

BRITT.—*Geo. P. Hardwick*. All field crops are short, except hay and pasturage; frost cut off the already short corn crop, and prevented cutting a large acreage for fodder; flax, millet and buckwheat fair, but acreage small.

BOONE.—*Carl Fritz Henning*. Heavy frost on 25th damaged late corn to some extent.

CHARITON.—*C. C. Burr*. The freeze on 25th injured all late planted corn; on low lands all foliage was killed; pastures good.

ELMA.—*H. A. Moore*. Storms on 17th and 18th did much damage; barns were struck; cattle and horses were killed by lightning.

FOREST CITY.—*J. A. Peters*. Killing frost on 25th; about 50 per cent of the corn crop was safe.

GRAND MEADOW.—*F. L. Williams.* The month was wet, with extremes of temperature; corn was killed by frost on 25th; about three-fourths of the crop was ripe; pastures are extra good.

GRINNELL.—*A. O. Price.* Average temperature was 1° below the ten years' normal; rainfall was one-half inch below average; pastures are good.

HANCOCK.—*W. Armstrong.* Corn was doing nicely at close of September; potato crop is fair; oat crop very light.

HOPEVILLE.—*M. L. Ashley.* On the morning of the 25th a white frost occurred; heavier on low ground; no harm done on uplands; corn is safe and considerable cut.

HUMBOLDT.—*H. S. Wells.* Very little corn was cut up before the frost on the 25th, but much has been cut since.

INDIANOLA.—*John L. Tilton.* A very severe hailstorm passed north-west-southeast across the county on evening of the 7th, the path being about 1 to 3 miles wide. It passed about 3 miles northeast of Indianola. It was destructive to corn, and dented pumpkins.

INWOOD.—*F. B. Hanson.* First half of month was quite warm and dry; heavy thunderstorms occurred 14th to 19th. About 85 to 90 per cent of corn was safe from damage by the first frost on 25th and 26th.

OLIN.—*N. Potter.* A very favorable month for farm work and ripening the corn crop up to the 25th; last five days wet and cloudy.

PACIFIC JUNCTION.—*H. H. McCartney.* Unseasonable weather, hot and cold, dry and wet; do not remember a similar September, though I can recall weather conditions since 1855.

POLOVER.—*J. S. Smith.* Hail on the 7th, about 8 miles in width, started in Palo Alto county, 15 miles northwest, causing almost total loss of corn which was in milk at that time.

POCAHONTAS.—*F. E. Hronek.* Frost on 25th killed garden truck and damaged late corn; about 75 per cent was out of danger.

RIDGEWAY.—*Arthur Betts.* Temperature of September, 2° below normal; 255 hours of sunshine; frost on 25th ruined the corn crop. Rainfall for the last 4 months was 25.59 inches.

SHELDON.—*A. W. Beach.* A good month to mature late corn, and most of it was safe; a good crop of potatoes being harvested; soil is in good condition to finish fall plowing.

WAUKEE.—*E. J. Leonard.* Heavy frost on 25th killed most vegetation, except on very high and protected ground; very little damage to corn, however.

WAVERLY.—*H. S. Hoover.* A cloudy month and cooler than the average; a heavy frost on 25th killed all delicate plants; no corn escaped on high or low lands.

ZEARING.—*Ward C. Bean.* Frost on 25th did considerable damage to corn, injuring it for shocking.

OCTOBER.

This month will stand on the records as one of the finest and most agreeable autumnal months ever enjoyed in this section. The average temperature was about 2° below the normal, but the percentage of sunshine was considerably above the average, and the clear, crisp air of the

coldest mornings was one of the most enjoyable features of the month. There were about three weeks of typical Indian Summer weather, and there was very little discomfort in the few stormy days. During the past eighteen years there have been 6 colder and 11 warmer Octobers. The average precipitation was 1.50 inches, which is 0.89 inch below the State normal. There have been but three dryer Octobers since 1889. There were showers distributed over the larger part of the State during the first three and last three days of the month, and also some local rainfall on the 15th. The heaviest rainfall was recorded in the central district, in the valley of the Des Moines river. In over four-fifths of the counties the amount was less than 2 inches.

Generally conditions were highly favorable for drying out the corn crop, preparatory to husking and cribbing. Some progress was made during the last decade in the corn harvest, but as a rule the ears were not dry enough to be cribbed. Considerable progress was made in plowing with the soil in good condition. The harvest of potatoes, apples and other minor crops progressed under favorable conditions, and the output was generally below the average of recent years. All in all the month of October contributed very largely to the material prosperity of the State.

TEMPERATURE.—The monthly mean temperature for the State, as shown by records of 115 stations, was 50.4°, which is 2.1° below the normal. By sections the mean temperatures were as follows: Northern section, 48.4°, which is 2.5° below the normal; Central section, 50.4°, which is 1.6° below the normal; Southern section, 52.4°, which is 2.1° below the normal. The highest monthly mean was 54.1°, at Onawa, and the lowest monthly mean was 46.2°, at Plover. The highest temperature reported, 85°, at Hampton on the 2d, and at Keosauqua and Massena on the 17th. The lowest temperature reported was 10° at Audubon and Massena on the 28th. The average monthly maximum was 79.4°, and the average monthly minimum was 18.7°. The greatest daily range was 50°, at Clarinda and Guthrie Center, and the average of greatest daily ranges was 39°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 124 stations, was 1.50 inches, which is 0.89 inch below the normal. By sections the averages were as follows: Northern section, 1.24 inches, which is 1.01 inches below the normal; Central section, 1.73 inches, which is 0.70 inch below the normal; Southern section, 1.53 inches, which is 0.97 inch below the normal. The largest amount reported was 3.71, at Boone; the least amount reported was 0.30 inch, at Tipton. The greatest daily rainfall was 2.24 inches, at Perry on the 3d. The average number of days on which .01 inch or more was reported was 5.

WIND AND WEATHER.—The prevailing direction of the wind was north-west. The highest velocity reported was 40 miles per hour from the north at Sioux City on the 7th. The average number of clear days was 20; partly cloudy days, 5, and cloudy, 6.

OBSERVERS' NOTES.

ALBIA.—*J. I. Chenoweth.* During a thunderstorm on the night of the 15th lightning struck and burned a large dry goods store and one barn in this town. The month ended rainy.

ALTA.—*David E. Hadden.* The first heavy frost of the season was on the 8th, and the first killing frost came on the 11th. With exception of the first three and last two days the month was ideal. Indian summer days were numerous.

ALTON.—*W. S. Stagle.* It was a very fine month for finishing plowing, threshing and other fall work. Corn was not dry enough to put into cribs.

AMANA.—*Conrad Schadt.* October was dry, with many fine days. There was sufficient moisture in the soil, and winter wheat and rye look bright and green. Killing frost occurred on the 13th and put a stop to growth of vegetation; corn did not become dry enough for husking.

BONAPARTE.—*B. R. Vale.* October was dry and pleasant. The first killing frost occurred on the 13th, and there was no more freezing till the 28th, when the leaves fell at once.

BOONE.—*Carl Fitz Henning.* Ice one-fourth of an inch thick formed on the 11th. On the 28th ice formed on edge of creeks. It was an ideal month.

BRITT.—*Geo. P. Hardwick.* It was an ideal month for drying the unripe corn, which will yield about 18 bushels per acre. Potatoes above average, yield and quality 100 per cent; hay plentiful.

CHARITON.—*C. C. Burr.* Farmers have made good progress with all farm work; corn is yielding better than was anticipated.

CLINTON.—*Luke Roberts.* The mean temperature was about the normal, and rainfall was below the normal. The clear days outnumbered all previous Octobers—the number being 7 above the normal. Corn is a full average crop in Clinton county.

DE SOTO.—*R. D. Minard.* The first killing frost was on October 12th. Weather was fine until the last week. It was a good month for farm work.

FOREST CITY.—*J. A. Peters.* No corn was cribbed this month; too much soft corn. Ground quite dry for plowing.

GRINNELL.—*A. O. Price.* The first three and last three days were rainy; balance of the month fine for farm work.

INWOOD.—*F. B. Hanson.* A very favorable month for farm work and drying the corn. There were 20 days with 100 per cent of sunshine.

KEOSAUQUA.—*J. H. Landes.* A beautiful month. Corn matured nicely and is now ready to crib; pastures are good.

MOUNT Ayr.—*A. F. Beard.* The record for fine weather in October is broken, with 21 clear days in succession this month.

RIDGEWAY.—*Arthur Betts.* This was the driest October on record, and only in 1898 and 1905 was it colder. There were 230 hours of sunshine.

SHELDON.—*A. W. Beach.* Fall work is being finished with fine weather conditions. It was ideal for curing the corn; some husking begun on the 24th and the yield is good.

WAVERLY.—*H. S. Hoover.* The last half of the month was dry and dusty; a fine month for putting away the crops.

NOVEMBER.

The weather was exceptionally favorable for outdoor business, the average temperature and sunshine being above the normal, and the precipitation generally lighter than usual, with almost entire absence of severe storms. The climatic records of the State show that there have been twelve colder and five warmer Novembers within the past eighteen years. In the same period there have been twelve Novembers that brought greater precipitation, and five which recorded less than this month. In respect to sunshine this has been especially notable, following the unusually bright October. It seemed like Nature's atonement for shortcomings during the preceding months of this erratic crop season. There has not been a more favorable autumn for harvesting the late maturing crops, and for preparing the ground for the coming spring. The corn crop was quite thoroughly dried out, and at the close of the month more than 90 per cent of that valuable cereal was safely stored in cribs. There were many frosty nights and considerable freezing weather, yet the ground was generally in good condition for plowing until the close of the month. The pastures afforded considerable sustenance to stock during the month and conditions were favorable to fall wheat and rye.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 115 stations, was 36.7°, which is 1.3° above the normal. By sections the mean temperatures were as follows: Northern section, 34.7°, which is 2.0° above the normal; Central section, 36.8°, which is 1.6° above the normal; Southern section, 38.7°, which is 0.5° above the normal. The highest monthly mean was 43.6°, at Bedford. The lowest monthly mean was 32.3° at Elma. The highest temperature reported was 68° at Baxter on the 6th. The lowest temperature reported was 4° below zero at Elma on the 14th. The average monthly maximum was 59.3°, and the average monthly minimum was 11.3°. The greatest daily range was 43° at Baxter; and the average of greatest daily ranges was 32.2°.

PRECIPITATION.—The average precipitation for the State, as shown by records of 123 stations, was 1.93 inches, which is 0.29 inch below the normal. The averages by sections were as follows: Northern section, 0.91 inch, which is 0.37 inch below the normal; Central section, 1.04 inches, which is 0.31 inch below the normal; Southern section, 1.15 inches, which is 0.19 inch below the normal. The largest amount reported was 2.27 inches at Logan, and the least amount reported was .05 inch at Sioux City. The greatest daily rainfall was 1.70 inches at Logan on the 1st. The average number of days on which .01 or more precipitation was reported was 4.

WIND AND WEATHER.—The prevailing direction of the wind was northwest. The highest velocity reported was 44 miles per hour, from the northwest at Sioux City on the 30th. The average number of clear days was 17; partly cloudy, 6; cloudy, 7.

OBSERVERS' NOTES.

AFTON.—*Hon. N. W. Rowell.* A splendid month for corn gathering, which is probable four-fifths completed; stock still on pasture.

ALBIA.—*J. I. Chenoiseth.* An extraordinary month. Precipitation 1.08 inches, against 2.52 inches in November, 1906. Six cloudy days, against 15 last year.

ALGONA.—*Dr. P. T. Seeley.* Another fine fall month is closed—one of the finest Novembers for years.

ALTA.—*David E. Hadden.* November was an ideal month for corn harvesting, which was nearly completed at its close. First snow of the season on the 10th, when 1 inch fell.

ALTON.—*W. S. Stagle.* Fine fall weather; corn all picked without interference; cattle getting full benefit of stalks, which are very leafy.

AMANA.—*Conrad Schadt.* November was generally dry and favorable for corn harvesting, which is about completed; first snow flurries on the 10th.

ATLANTIC.—*J. W. Love.* An ideal month for all kinds of fall work; roads in fine condition.

AUDUBON.—*George E. Kellogg.* Corn picking was about all finished by the close of November. Crops below average. Plowing was done on the 30th, an unusual occurrence.

BONAPARTE.—*B. R. Vale.* A mild, pleasant month; no storms and no snow. Corn is mostly in crib, and much plowing has been done.

BRITT.—*Geo. P. Hardwick.* An exceptionally fine month for finishing corn harvest, most of which was cribbed by the end of November; and plowing is well along. Hay plenty, but more corn will be needed for stock.

CHARITON.—*C. C. Burr.* With almost constant sunshine by day, and frosty nights, the month was all that could be desired for farm operations.

CLINTON.—*Luke Roberts.* The mean temperature, 36.7°, is just normal. The rainfall, 1.31 inches, is .56 inch below the normal. Clear days were greater in number than any previous November.

CORYDON.—*Clara Miller.* November was a fine fall month for farm work; corn is mostly in crib—a good yield and good quality.

CRESTON.—*Rev. W. L. Gaston.* A month of delightful weather, with 21 days of sunshine; fine for corn husking, and stock has been on pasture.

FOREST CITY.—*J. A. Peters.* Corn was all cribbed at close of month—an exceptionally fine November.

INWOOD.—*F. B. Hanson.* Ideal weather for corn husking prevailed the greater part of the month, and the work is practically finished, with yields ranging from 25 to 40 bushels per acre.

RIDGEWAY.—*Arthur Betts.* There were 186 hours of sunshine, or 55 per cent. Northern lights were observed seven evenings. Dandelions and mallows were in bloom up to the 30th, and plowing was in progress nearly all the month. Poorest corn crop in fifty years.

SHELDON.—*A. W. Beach.* Eighty per cent of corn is in crib. It was a beautiful fall month, with 74 per cent of sunshine.

WAVERLY.—*H. S. Hoover.* A most excellent month for farmers to harvest their corn and fodder. No snow to stop work.

DECEMBER.

The mean temperature of December was 5.9° above the normal, making it the warmest December since 1896. The month was characterized by uniformly mild and pleasant weather; there being no severe storms nor any zero temperatures reported during the entire month, except in the northern portion of the State. The coldest period was on the 30th and 31st, and those were the only dates on which the cold was general over the whole State. The average precipitation was .24 inch below the normal, but the amounts were quite evenly distributed, and was mostly in the form of rain. The snowfall was below the normal and there was but a small portion of the State covered with snow at any time during the month until the 29th and 30th. There was more than the usual amount of cloudiness. The average number of clear days was 10; partly cloudy, 7; and cloudy, 14.

It was an exceptionally pleasant month with no very cold weather and the cold periods were few and of short duration. The precipitation was below the normal, and the amount of snowfall was considerably less than usual. There was an excess of cloudiness, but there were no severe storms. The conditions were favorable for all farm work, and plowing was done in portions of the southern districts up to the close of the month. The temperature was not low enough to injure winter grains notwithstanding the fact that the snowfall was light and offered but little protection, and winter wheat and rye were in good condition at the close of the month.

TEMPERATURE.—The monthly mean temperature for the State, as shown by the records of 117 stations, was 28.8°, which is 5.9° above the normal for Iowa. By sections the mean temperatures were as follows: Northern section, 26.2°, which is 6.2° above the normal; Central section, 29.2°, which is 6.1° above the normal; Southern section, 31.1°, which is 8.2° above the normal. The highest monthly mean was 34.9°, at Keokuk, and the lowest monthly mean 23.2° at Osage. The highest temperature reported was 62° at Mount Pleasant on the 9th. The lowest temperature reported was -9° at Osage on the 28th. The average monthly maximum was 51.8° and the average monthly minimum was 5.4°. The greatest daily range was 43° at Elkader. The average of greatest daily ranges was 31.3°.

PRECIPITATION.—The average precipitation for the State, as shown by the records of 123 stations, was 1.90 inch, which is .24 inch below the normal. By sections the averages were as follows: Northern section, 1.21 inches, which is .13 inch above the normal; Central section, .75 inch, which is .52 inch below the normal; Southern section, 1.05 inches, which is .31 inch below the normal. The largest amount reported was 2.28 inches at Plover. The least amount reported was .05 inch at Hancock. The greatest daily rainfall reported was 1.85 inches at Thurman, on the 9th. The average number of days on which .01 inch or more was reported was 5.

WIND AND WEATHER.—The prevailing direction of the wind was north-west. The highest velocity of wind reported was 58 miles per hour, from the northwest, at Sioux City, on the 24th. The average number of clear days was 10; partly cloudy, 7; cloudy, 14.

OBSERVERS' NOTES.

ALBIA.—*J. I. Chenoweth*. Another exceptionally fine month. Precipitation, 1.22 inches. No zero temperature recorded, but on the contrary, the mercury registered 44° on the morning of the 27th.

ALGONA.—*Dr. F. T. Seeley*. December, 1907, goes on record at this station, without a zero temperature, a remarkable December.

ALTA.—*David E. Hadden*. Pleasant winter weather prevailed during the greater part of December. Heavy rain fell during the night of the 8th, and heavy snow on the 29th. Total precipitation, 1.68 inches.

ALTON.—*W. S. Slagle*. Fine weather for December; no stormy, windy days.

AMANA.—*Conrad Schadt*. December was mild, with many cloudy days but little precipitation. The roads were good, but there was not enough snow for sleighing. Total snowfall, 2.8 inches.

ATLANTIC.—*J. W. Love*. A delightful winter month. Cattle on pasture up to the 28th. Lightning on the 8th.

BONAPARTE.—*B. R. Vale*. A mild, pleasant month with but .97 inch of precipitation. The lowest temperature recorded was 11° on the 4th, and much plowing has been done.

BRITT.—*Geo. P. Hardwick*. Fine weather with very little wind made favorable conditions for live stock in fields. Such conditions were advantageous with a short corn crop.

BURLINGTON.—*I. S. Shontz*. First ice in river on the 4th.

CHARITON.—*C. C. Burr*. The month has been fine for farm work. Stock in good condition and feed plentiful.

CLINTON.—*Luke Roberts*. The weather was mild and uniform; the mean temperature being 5° above normal and the rainfall, .88 inch, is .95 inch below normal. The minimum temperature, 11°, is 15° above the normal.

CHESTON.—*Rev. W. L. Gaston*. No zero weather during the month and stock has been in pastures every day.

ELLIOTT.—*Henry Barnes*. A splendid month for business and pleasure. Stock of all kinds doing well. Some grain moving at good prices.

FOREST CITY.—*J. A. Peters*. Certainly a beautiful month. The temperature was 6° above the normal and zero recorded but once. This was the first December since the establishment of this station, in 1894, that the thermometer did not register below zero.

GRAND MEADOW.—*F. L. Williams*. The month was very favorable for stock in pastures. Roads good.

GRINNELL.—*A. O. Price*. Warmest December in twelve years. The precipitation, .45 inch, was .84 inch below the normal. Fine month for stock in fields.

HOPEVILLE.—*Milton T. Ashley*. Much cloudy, damp weather, but stock is doing well in stalk pasturage.

HUMBOLDT.—*Henry S. Wells*. Rain and melted snow, .75 inch. Fine month for gathering the corn crop. There has been good pasturage nearly all of the month. Roads are good.

INWOOD.—*F. B. Hanson*. The weather has been fine during the month, except the last few days.

KEOSAUQUA.—*J. H. Landes*. A beautiful month with very little suggestion of winter.

LARRABEE.—*H. B. Streever*. December has been extremely mild; the temperature falling to zero but once during the entire month.

OLIN.—*Nathan Potter*. An unusually good month; no zero weather; no severe storms or wind. Plowing on the 13th. Stock in fine condition on January 1, 1908.

POCAHONTAS.—*F. E. Hronek*. The month was remarkably fine. The roads were in good condition for marketing grain.

RIDGEWAY.—*Arthur Betts*. Warmest of all the Decembers on record at this station. Good wheeling up to the 29th. Last wild flowers on the 9th, when the ground became frozen.

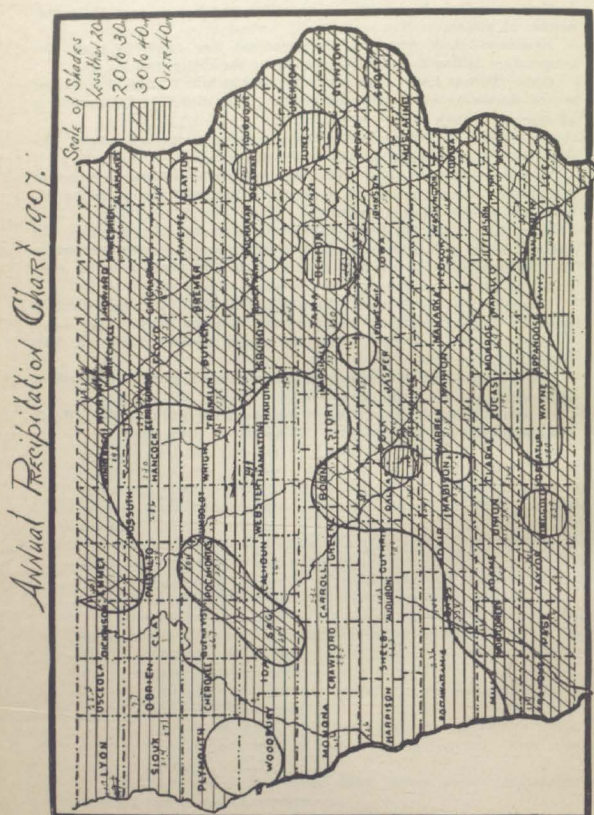
ROCK RAPIDS.—*W. C. Wyckoff*. The snow on the 29th, 5 inches, was wet and heavy and made very good sleighing as the ground was frozen and the light snow on the 23d, .5 inch, with mild weather on the 26th, made the roads very smooth.

STOCKPORT.—*C. L. Beswick*. Unusually fine month on stock which is generally in good condition. Plowing done up to the last day.

WAVERLY.—*H. S. Hoover*. Mild and cloudy weather with very little precipitation.

WEST BEND.—*Phil Dorweiler*. A pleasant month with no blizzards or high winds and but little snow.

ZEARING.—*Ward C. Bean*. Month has been exceptionally fine. Roads have been good and weather mild. Comparatively little snow.



DATE OF LAST KILLING FROST IN SPRING AND FIRST IN FALL
 IN IOWA FOR 1907

| Stations | Killing Frost | |
|-------------------|----------------|-----------------|
| | Last in Spring | First in Autumn |
| Afton | May 27 | October 12 |
| Albia | May 27 | September 25 |
| Algona | May 27 | September 25 |
| Allerton | May 27 | September 25 |
| Alta | May 4 | September 25 |
| Alton | May 27 | October 9 |
| Amana | May 27 | September 25 |
| Ames | May 29 | September 25 |
| Atlantic | May 29 | September 25 |
| Audubon | May 27 | September 25 |
| Baxter | May 20 | September 25 |
| Bedford | May 27 | September 25 |
| Belle Plaine | May 16 | September 25 |
| Bloomfield | May 27 | September 25 |
| Boone | May 4 | September 25 |
| Britt | May 11 | October 12 |
| Burlington | May 20 | September 25 |
| Carroll | May 27 | September 25 |
| Cedar Rapids | May 5 | September 25 |
| Chariton | May 27 | September 25 |
| Charles City | May 11 | September 25 |
| Clarinda | May 11 | September 25 |
| Clear Lake | May 20 | September 25 |
| Climon | May 16 | October 8 |
| Columbus Junction | May 27 | October 8 |
| Corning | May 16 | September 25 |
| Corydon | May 11 | September 25 |
| Creston | May 27 | September 25 |
| Davenport | May 4 | September 23 |
| Decorah | May 27 | September 25 |
| Delaware | May 11 | September 25 |
| Denison | May 21 | September 23 |
| Des Moines | May 27 | September 25 |
| De Soto | May 27 | September 25 |
| Dows | May 4 | October 12 |
| Dubuque | May 20 | September 25 |
| Earlham | May 27 | September 25 |
| Elkader | May 4 | October 13 |
| Elliott | May 20 | October 8 |
| Estherville | May 27 | September 25 |
| Fayette | May 16 | September 25 |
| Forest City | May 27 | September 25 |
| Fort Dodge | May 27 | September 25 |
| Grand Meadow | May 27 | September 25 |
| Greene | May 27 | September 25 |
| Greenfield | May 27 | September 25 |
| Grinnell | May 27 | September 25 |
| Grundy Center | May 20 | September 25 |
| Guthrie Center | May 20 | September 25 |
| Hampton | May 20 | September 25 |
| Hancock | May 27 | September 25 |
| Harlan | May 15 | September 25 |
| Hopeville | May 16 | September 25 |
| Humboldt | May 15 | October 12 |
| Independence | May 20 | September 25 |

DATE OF LAST KILLING FROST IN SPRING AND FIRST IN FALL IN IOWA IN
1907—CONTINUED.

| Stations | Killing Frost | |
|------------------|----------------|-----------------|
| | Last in Spring | First in Autumn |
| Indianola | May 4 | September 25 |
| Inwood | May 27 | September 25 |
| Iowa City | May 11 | September 25 |
| Iowa Falls | May 20 | September 25 |
| Jefferson | May 4 | October 13 |
| Keokuk | May 4 | October 12 |
| Keosauqua | May 11 | October 12 |
| Knoxville | May 27 | September 25 |
| Larrabee | May 27 | September 25 |
| Le Mars | May 27 | September 25 |
| Lenox | May 16 | October 12 |
| Leon | May 27 | September 25 |
| Little Sioux | May 11 | September 25 |
| Logan | May 20 | September 25 |
| Marshalltown | May 27 | September 25 |
| Mason City | May 27 | September 25 |
| Massena | May 27 | October 8 |
| Mount Ayr | May 4 | October 12 |
| Mount Pleasant | May 16 | September 25 |
| Mount Vernon | May 27 | September 25 |
| New Hampton | May 27 | September 25 |
| Northwood | May 27 | September 25 |
| Odebolt | May 27 | September 25 |
| Ogden | May 27 | September 25 |
| Olin | May 20 | September 25 |
| Omaha, Neb. | May 3 | October 12 |
| Onawa | May 16 | October 12 |
| Osage | May 27 | September 25 |
| Oskaloosa | May 11 | October 12 |
| Ottumwa | May 4 | October 12 |
| Pacific Junction | May 27 | October 8 |
| Pella | May 11 | October 12 |
| Perry | May 20 | September 25 |
| Plover | May 27 | September 24 |
| Pocahontas | May 27 | September 25 |
| Ridgeway | May 27 | September 25 |
| Rock Rapids | May 27 | October 12 |
| Rockwell City | May 11 | October 12 |
| Saint Charles | May 27 | September 25 |
| Sheldon | May 27 | September 25 |
| Sibley | May 16 | September 25 |
| Sigourney | May 27 | October 8 |
| Sioux Center | May 15 | October 12 |
| Sioux City | May 11 | September 25 |
| Stockport | May 27 | September 25 |
| Storm Lake | May 20 | October 12 |
| Stuart | May 27 | October 8 |
| Thurman | May 4 | October 13 |
| Tipton | May 20 | September 25 |
| Toledo | May 6 | September 25 |
| Wapello | May 11 | September 25 |
| Washington | May 27 | September 25 |
| Washita | May 20 | September 25 |
| Waterloo | May 30 | September 25 |
| Waukegan | May 27 | September 25 |
| Waverly | May 27 | September 25 |
| Webster City | May 27 | September 25 |
| West Bend | May 27 | September 25 |
| Whitten | May 11 | September 25 |
| Wilton Junction | May 4 | September 25 |
| Winterset | May 20 | September 25 |
| Woodburn | May 20 | September 25 |
| Zearing | May 20 | September 25 |

CLIMATE AND CROP REVIEW.

CROP SEASON OF 1907.

The mean temperature and average precipitation for the State were about the normal for the year, tho the monthly averages were more than usually variable. The mean temperature of the three winter months was 24.2°, which is 3.6° above the normal. The mean of the spring was 45.2°, which is 0.9° below the normal. The mean of the summer was 70.1°, which is 1.7° below the normal. The mean of autumn was 49.9°, which is 0.5° below the normal. February, March, November, and December were much warmer than usual, and all the other months were deficient in temperature. The average of February was 5.8°, and March 7.6° above the normal. The greatest deficiency in temperature occurred in April, May and June, the average of these three critical crop months being about 6° below the normal.

The average precipitation for the year, 31.62 inches, was 0.41 inch below the normal. The records of four months showed an excess, and the other months a deficiency in precipitation. The heaviest rainfall occurred in June and July, and the most harmful deficiency of moisture was in April and May, during the prevalence of abnormally cold weather. The following table shows the monthly average temperatures and precipitation, and departures from the normal for the year 1907:

| Months | Mean Temp. | Departures | Precipitation | Departures |
|-----------|------------|------------|---------------|------------|
| January | 18.8 | -1.1 | 1.32 | +0.57 |
| February | 25.0 | +5.8 | 0.71 | -0.32 |
| March | 40.6 | +7.6 | 1.35 | -0.55 |
| April | 41.5 | -7.7 | 1.22 | -1.59 |
| May | 53.1 | -7.2 | 3.48 | -0.78 |
| June | 65.6 | -2.9 | 5.35 | +0.79 |
| July | 73.7 | -0.4 | 7.27 | +2.92 |
| August | 71.1 | -0.5 | 4.30 | +0.57 |
| September | 62.8 | -0.7 | 2.76 | -0.60 |
| October | 50.4 | -2.1 | 1.50 | -0.89 |
| November | 36.7 | +1.3 | 1.00 | -0.29 |
| December | 29.8 | +5.9 | 1.00 | -0.24 |
| Annual | 47.4 | -0.2 | 31.62 | -0.41 |

The above records show the abnormal features of the year, as affecting the growth of staple crops, and the harvest of hay and cereal products.

The coldest weather of the winter occurred in the latter half of January and the first week in February. This was followed by two weeks of very mild weather, with favorable conditions for outside work and care of stock.

March was phenomenally mild with less than the usual amount of precipitation. The first half was typical March weather, with alternate freezing and thawing, but the latter half was excessively warm and

bright, the maximum temperatures during the last decade ranging above 70° in portions of the southern section. The fields dried rapidly during that warm period, and farming operations were begun ten days to two weeks earlier than usual. The rainfall was less than normal, and the greater part occurred in the first half of the month. With two exceptions it was the warmest March since 1890. There was a great quickening of all vegetation, and in the larger part of the State seeding was begun between the 20th and 28th of the month, and a large acreage was plowed for corn.

April was a record-breaker as to temperature and precipitation, being the coldest and driest of which we have state-wide records. The daily mean temperature was 7.7° below the normal. At several stations the records show that the month was about a degree colder than the preceding March. The average monthly minimum for the State was 16.4°, which shows the remarkable persistence of freezing weather. The precipitation was less than half the usual amount for April. The conditions were unfavorable for germination of seed and growth of all forms of vegetation, but the soil was in fine tilth and favorable for plowing and planting. Fruit buds were well advanced by the warm weather in March, but blooming was greatly retarded by the abnormally low temperatures in April and May, and the heavy frosts were very destructive to all early varieties of fruits, especially in the southern half of the State. Seeding operations were generally completed earlier than usual, but in respect to germination and growth of farm crops the season was two or three weeks late.

Following the coldest April of record in this State, the month of May was also a record-breaker as to temperature, the mean being 7.2 below the normal. The lowest temperatures occurred on the 3d and 4th, and the average monthly minimum was 22.1°. Frosts were reported in all districts in every week of the month. Light snow flurries were general on the 3d and 15th. During the first and second decades there were many complaints of insufficient moisture for the germination of seed and growth of grass. But the last decade brought copious showers, and generally sufficient moisture to break the drouth and replenish supplies of water for stock. The bulk of the corn acreage was planted under ideal conditions were quite unfavorable in large portion of the State for cultivation and the stand was very far below the average. The wet and cold weather during the latter part of the month was favorable for grass and early sown small grain.

June was cooler than usual, and exceedingly showery, with general deficiency of sunshine, especially during the first half of the month. The conditions were quite unfavorable in large portions of the State for cultivation of corn, causing abandonment of many thousands of acres which were planted on low lands in the dry period of May. The latter half of the month was more favorable, and crop conditions were more encouraging to farmers. Pastures and meadows were much improved, and nearly up to the average.

July was nearly normal in temperature, but the rainfall was about 3.00 inch above the average. Rain fell in some part of the State every

day during the month. In the first decade the wet weather caused much difficulty and delay in cleaning out the corn fields. And later in the month the frequent showers interfered seriously with the harvest of grain and hay, impairing the quality of these products. Heat and humidity caused rust of oats and spring wheat.

The mean temperature of August was less than a degree below the normal, and there was about the usual amount of sunshine. The rainfall averaged 0.57 inch above the normal, but it was quite unequally distributed, about one-third of the State receiving less than three inches, the deficiency being mostly in the western districts. There were more than the usual number of wind squalls and hailstorms, causing considerable damage to crops in scattered localities. The conditions were generally favorable for pastures, and corn made fair progress toward maturity, tho the crop was two to three weeks later than the average at the close of August. Good progress was made in threshing small grain in the western districts.

September was slightly cooler than usual, with frequent alternations in temperature. The second decade was the warmest period, and the average of the last decade was about 20° below the preceding ten days. Heavy frost occurred on the 22d, and heavy to killing frost visited every county on the morning of the 25th, causing material damage to immature portions of the corn crop. The percentage of sunshine was about the normal. Considerable damage was caused by wind and hail in the afternoon and evening of the 7th.

October will stand upon the records as one of the finest and most agreeable autumnal months ever enjoyed in this section. The average temperature was about 2° below the normal, but the percentage of sunshine was considerably above the average, and the clear crisp air of the coldest mornings was one of the most enjoyable features of the month. There were about three weeks of typical Indian Summer weather, and there was very little discomfort in the few stormy days. During the past eighteen years there have been six colder and eleven warmer Octobers. The average precipitation was 1.50 inches, which is 0.89 inch below the State normal. There have been but three dryer Octobers since 1889. There were showers distributed over the larger part of the State during the first three and last three days of the month, and also some local rainfall on the 15th. The heaviest rainfall was recorded in the Central district, in the valley of the Des Moines river. In over four-fifths of the counties the amount was less than 2 inches. Generally conditions were highly favorable for drying out the corn crop, preparatory to husking and cribbing. Some progress was made during the last decade in the corn harvest, but as a rule the ears were not dry enough to be cribbed. Considerable progress was made in plowing, with the soil in good condition. The harvest of potatoes, apples and other minor crops progressed under favorable conditions, and the output was generally below the average of recent years. All in all the month of October contributed very largely to the material prosperity of the State.

November was exceptionally favorable, the average temperature and sunshine being above the normal. There has not been a more favorable

autumn for harvesting the late maturing crops, and for preparing the ground for the coming spring. The corn crop was quite thoroly dried out, and at the close of the month more than 90 per cent of that valuable cereal was safely stored in cribs. Tho there were many frosty nights and considerable freezing weather, yet the ground was generally in good condition for plowing until the close of the month. The pasture afforded considerable sustenance to stock during the month and conditions were favorable to fall wheat and rye.

The average temperature of the State was about 6° above the normal in December, with less than the usual precipitation, and a large percentage of cloudiness. It was unusually fine and agreeable, with excellent conditions for outdoor business. The year closed with benign conditions thruout the central valley.

CLIMATE AND CROP BULLETINS.

SUMMARIES OF WEEKLY BULLETINS ISSUED IN THE SEASON OF 1907.

BULLETIN No. 1, WEEK ENDING APRIL 8.

Following an unusually mild winter, spring opened about two weeks early, with phenomenally warm weather in the last decade of March, and very favorable conditions for an early beginning of farm operations. The surface dried rapidly, and in all districts a considerable amount of seeding was done on fall plowed land before the 1st of April.

The first week in April was relatively cooler, tho the average was about the normal. The first half was slightly above and the latter part below the average, with heavy frost and ice on the morning of the 6th. The rainfall was below the normal, except in a limited portion of the south-east district. Well distributed showers on Saturday night and Sunday followed by light snow flurries afforded very welcome moisture to the newly seeded fields.

The crop season opens with flattering prospects. Very much more than the usual amount of seeding has been done, with the soil in extra good tilth for the reception of seed, and plowing is in progress preparatory for planting corn. The chief drawback on the farms is scarcity of help to take advantage of favorable conditions.

As yet we have no reports of serious damage to fruit buds.

BULLETIN No. 2, APRIL 15.

The past week was abnormally cold, the daily temperature ranging from 9° to 12° below the normal. The lowest temperature reported for the week was 13°, at Carroll, on the morning of the 14th, and at several stations the minimum was 15°. Temperature below freezing was recorded at some stations in the State every night. This cold snap in the middle of April is by no means unprecedented. Two years ago, on the morning of the 14th, the temperature dropped to 10° at Sibley and Inwood, and ranged from 11° to 20° at many stations in the State. Heavy frosts and ice were reported in all districts, with considerable snow; and in that season March was warmer than this year and seeding was completed earlier.

Heavy winds from the west and northwest added to the unfavorable conditions of the past week. And the precipitation was very light in all parts of the State. Tho retarded by frozen ground in early part of the day, good progress has been made in finishing seeding and preparation of soil for planting corn. The weather was too cold for growth of vegetation. The effects on fruit buds and tender vegetation cannot be determined at this time. Many widely diverse opinions have been expressed, reflecting generally the temperament of the men who give them utterance. Meantime, hope is closely allied to wisdom.

BULLETIN No. 3, APRIL 22.

The week has been unseasonably cold and dry, with average daily temperatures ranging from 11° to 14° below the normal. The precipitation was light and mostly in form of snow flurries. Temperatures below freezing were recorded nearly every night, and ice and frost were much in evidence in all districts.

Under these unfavorable conditions all vegetation has remained practically dormant. As yet it is not possible to ascertain the extent of damage caused by freezing weather to fruits and early seeded cereals. Reports indicate that a considerable number of farmers have begun re-seeding operations in their fields of oats and barley. Good progress has been made in plowing for corn, and the soil is in very fine condition. In all districts rain is needed for grass and small grain. The week closed with indications of fair and warmer weather.

BULLETIN No. 4, APRIL 29.

The weather conditions during the past week were more favorable than in the preceding two weeks, tho the average daily temperature was about 6° below the normal, and the precipitation was very light in all districts. There were several moderately warm days, but the nights were abnormally cold, with frost, ice, snow and sleet in evidence at numerous stations in the State. The month as a whole is likely to score a record as one of the coldest Aprils ever known in this valley.

Conditions have been unusually favorable for field work, and very good progress has been made in plowing and preparing ground for planting. The soil is in fine tilth, and reports are at hand that some farmers have ventured to begin planting corn. Vegetation has made very little growth, and it is difficult to estimate the amount of damage resulting from freezing. Many farmers have reseeded oats in early sown fields.

BULLETIN No. 5, MAY 6.

Another extremely cold week has been added to the score of this abnormally cool and dry season. The average daily temperature of the past week was 9 to 15° below the normal. Minimum temperatures of 18° were recorded at several stations on the night of May 3d. On April 29th six to ten inches of snow fell in considerable portions of the southern and central sections, and snow flurries were quite general on the 3d. The precipitation was generally very light in the northern section, and in the larger part of the State there is a deficiency of moisture.

This is the fourth consecutive week of unseasonably low temperature, and despite adverse conditions very good progress has been made in farm work. A large portion of the corn acreage has been plowed, and is in fine condition for planting. A considerable number of farmers have begun planting, and this work will be general as soon as the weather becomes sufficiently warm to insure ready germination.

There are conflicting reports from the fields as to the extent of damage caused by freezing weather. It is probable that early fruit has suffered material loss. And possibly early seeded wheat, oats and barley have been somewhat injured in some localities.

BULLETIN No. 6, MAY 13.

The average daily temperature for the week ending Monday morning, May 13th, was 3 to 5° below the normal. The lowest temperature reported was 26° on the morning of the 11th. The highest reported was 90° at Sioux City on the 12th. The amount of precipitation was very light, and was mainly in the form of snow flurries in the northeast district, the larger part of the State being practically rainless. The continued cold and dry weather has been unfavorable to the normal germination of seed and growth of vegetation. But reports indicate that there has been sufficient warmth and moisture to maintain vitality and promote the slow growth of small grain, and the fields give promise of fair crops if normal weather conditions are restored in the near future. The damage to cereal crops by freezing has not been as great as former reports indicated. The fruit crops in the southern half of the State have suffered most heavily.

Good progress has been made in corn planting, and the soil has been sufficiently dry to preserve the seed from damage by the protracted cold weather. The bulk of the corn acreage is in fine condition, and planting is likely to be completed as early as usual. The worst effects of the abnormal weather are in evidence in the meadows and pastures. The hay crop is likely to be very light.

BULLETIN No. 7, MAY 20.

There was a continuance of erratic weather during the first half of the past week, but on the whole there has been an improvement in conditions in all parts of the State. The average daily deficiency in temperature was 3 to 6°, and the minimum was near or below freezing on three mornings. The amount of precipitation was very light, except in portions of the southeast and east central districts. On the 14th light showers with occasional snow flurries were reported at numerous stations in the north and central sections. The moisture was beneficial and there was sufficient heat to start germination of seed and perceptible growth of vegetation.

The week was favorable for field work, and reports indicate that from 80 to 90% of the corn acreage has been planted, under excellent conditions as to the soil. Tho the season is late in respect to growth of crops, farm operations are as well advanced as usual at this time of the year. With normal heat and moisture in the near future there will be an ample yield of staple farm crops.

BULLETIN No. 8, MAY 27.

The week began and ended with temperature at or near the frost line, and the average ranged from 2 to 4° below the normal. There was an excess of cloudiness with copious rainfall, and reports indicate that the drouth has been effectually broken in all parts of the State. In extensive areas there was considerable excess of rainfall, which caused damage to crops in some localities, and retarded farm operations several days.

On the whole the week was favorable to the growing crops. The weather was sufficiently warm two or three days to quicken germination of seed and cause marked improvement in grain fields, meadows and pastures. Early planted corn appears to be coming up fairly well, and there will be not more than the usual amount of replanting. Cultivation is in progress, and the general crop situation is encouraging.

BULLETIN No. 9, JUNE 3.

The abnormally cool and cloudy weather continued until the morning of June 1st, which brought the summer type of weather, with promise of normal conditions. The average daily deficiency of temperature for the week was 8 to 10°, and there was excessive cloudiness in the larger part of the State. The rainfall was ample in all districts, and quite heavy in portions of the central and south central districts. But it came moderately, and the larger part was absorbed by the dry subsoil. The beneficial effects of abundant moisture, followed closely by sunshine and warmth, were visible in pastures, meadows and fields of small grain. The corn crop has made fair progress, considering the adverse conditions, but reports indicate that the stand is uneven, and somewhat more than the usual amount of replanting will be done. It needs a period of warm, dry weather. At the best it is likely to fall below the high standard of 1906.

BULLETIN No. 10, JUNE 10.

The average daily deficiency in temperature was 7 to 9°, and there was also a large excess of cloudiness. Showers of varying amount were reported every day but one during the week, and heavy downpours with considerable damage by wind and local floods occurred on Sunday afternoon and night. It was generally a very unfavorable week for field work, and the corn fields show the need of cultivation, as also the need of heat and sunshine to restore normal color and promote growth of the plants. Reports are quite general as to the deficient stand of corn, and the unusual amount of replanting being attempted. Conditions have been more favorable for oats, wheat, barley, potatoes, meadows and pastures, and improvement is noted in garden truck and small fruit.

BULLETIN No. 11, JUNE 17.

The week opened with cool, wet and cloudy weather, and excessive moisture in the fields in the larger part of the State. But the skies were quickly cleared, with rising temperature and normal sunshine, and in

the later half of the week conditions were generally favorable for field work and the growth of all crops. Reports indicate that fair progress has been made in cleaning out the weedy corn fields, and the plants are showing better color and the good effects of sunshine and warmth. The week was very favorable for grass and small grain. The pastures are especially good, and the meadows give promise of a better hay crop than seemed possible a few weeks ago, tho the average yield will be materially short in comparison with recent years. Potatoes and gardens are doing notably well.

Secretary Greene reports that the general condition of fruit in Iowa is 24 per cent below the estimate made in June last year, and apples cannot exceed half a crop.

BULLETIN No. 12, JUNE 24.

The week was about all that could be desired in respect to temperature, sunshine and rainfall in the larger part of the State. The mean temperature was slightly above the normal. Generally clear and fair weather prevailed from Monday to Friday, and the balance of the week was partly cloudy, with frequent and beneficial showers in all districts. Conditions were favorable four to five days for cultivation of corn, and the time was well improved. Reports indicate that a large part of the corn acreage is now receiving its second plowing, and the color is normal. The stand is reported to be less than the average of the best seasons. In well cultivated fields the growth has been satisfactory. Meadows are showing material improvement, and pastures are very good. Oats and barley are beginning to show heads. On rich and moist lands the oats crop is growing quite rank. Garden truck and potatoes are doing very well. The small fruits are fairly good.

BULLETIN No. 13, JULY 1.

The average daily temperature was about 4° below the normal for the last week in June. The week began and ended with showers, varying in amount, but fairly well distributed over the State. The showers on the 24th caused local damage by wind, hail and lightning, in limited areas in the central and north central districts, but generally they were moderate and beneficial. In the larger part of the State there were four to five days of seasonable weather, with conditions favorable for field work and growth of crops. Fair progress has been made in cleaning out the corn fields, which generally have received a second plowing. The belated and deficient in stand, the corn crop has made fair progress and shows a healthy color. Reports indicate that a beginning has been made in the clover harvest, and meadows are much improved. Small grain, pastures and garden truck are doing well.

BULLETIN No. 14, JULY 8.

The first week in July was the most favorable of the season. The average daily temperature was slightly above the normal, and there was more than the usual amount of sunshine. The rainfall was ample in all sections, and somewhat excessive in portions of the central, north

central and southwest districts. In limited areas there was some damage caused by hail and wind. Generally the conditions are about all that could be desired for the rapid advancement of the corn crop, which is now receiving its third or final cultivation. Except in low, wet lands the cornfields are well cleaned, and a portion of the crop will be laid by by the 10th. Oats, spring wheat and barley are doing well and the minor crops are fairly good.

BULLETIN No. 15, JULY 15.

The temperature of the past week was nearly the normal, and there was generally the usual amount of sunshine. Heavy showers were reported from special stations on the 9th, 10th, 11th, 14th and 15th, and in all districts there was great excess of rainfall, ranging from 2 to 7 inches in scattered localities, causing considerable damage by floods and erosion of soil. In the larger part of the State conditions were favorable for field work three to four days, and fair progress has been made in finishing cultivation of corn and beginning the harvest of hay, winter grain, early oats and barley. In the southern section oats made rank growth, and reports indicate that some damage may result from rust. The corn crop has made rapid growth in well cultivated fields. The hay crop gives promise of being nearly up to the normal in yield. Pasture has never been better in the midsummer period. Conditions have been favorable for potatoes, garden truck and the minor crops.

BULLETIN No. 16, JULY 22.

The week was seasonable in temperature, and tropical in respect to humidity, cloudiness and rainfall. Thunderstorms were of daily occurrence in some portions of the State, and in extended areas heavy damage resulted from torrential showers, severe wind squalls and lightning. All observers report an excess of moisture and saturated condition of the soil, causing loss of crops on low lands by flooding, and delaying farm work in corn, meadows and grain fields.

The extent of damage caused by wind and floods cannot be estimated at this time, but it is certain that the result will be apparent in the final report of the staple crops. The corn crop has suffered a loss of acreage by floods and abandonment to the weeds, probably more than double the estimated increase of acreage indicated in the June report. On well drained lands, where the crop was laid by in good condition, corn has made very rapid growth, and tassels are shown in early planted fields. With favorable weather in the future the final yield may be fairly good. The oats crop is mostly ready for the harvest, and some of it is in shock. It has suffered material loss by the wet weather and windstorms of the past two weeks. Spring wheat and barley have suffered from the same adverse conditions. The hay crop has suffered some loss by wet weather, but the pastures have gained materially. The week closed with clearing skies and a brighter outlook.

BULLETIN No. 17, JULY 29.

The average temperature of the week was slightly below the normal. Showery weather prevailed from Tuesday to Friday, but the rainfall was generally much less than in the preceding two weeks. The heaviest showers occurred in the north central district. The week closed with fair weather, and as a whole it was favorable for the growing crops in the larger part of the State. Except on low, wet ground the corn crop has made very rapid advancement, having generally reached the tasseling stage. On well-drained and thoroly cultivated lands it gives promise of a fair yield under normal conditions in the balance of the season. Work in the harvest fields has been resumed wherever the soil is sufficiently dry. Reports indicate that considerable hay has been damaged, and in some localities small grain in shock has suffered material loss. There are numerous reports of rust in oats and spring wheat, which will possibly impair the quality of the grain. With better weather for the harvest in the future the final output is likely to exceed present expectations.

BULLETIN No. 18, AUGUST 5.

Seasonable temperature prevailed the first three days, and the balance of the week was cooler than usual. The average daily deficiency of temperature was 5 to 7°. The sunshine was generally above the normal. The six work days were rainless in the larger part of the State, and the light showers on Sunday were timely and beneficial. It was an ideal week for field work, and the time was well improved in harvesting hay and grain. Threshing from the shock is in progress. Reports of the yield of winter wheat indicate fairly good returns. The output of oats is generally below the average, the grain being materially damaged by rust. Corn has made very good progress on well tilled land. The hay crop is nearly all in stack or barn. Pasturage, potatoes and gardens are doing notably well.

BULLETIN No. 19, AUGUST 12.

The average daily temperature was about 3° above the normal, with excessive humidity and nearly the normal amount of sunshine, rendering the weather oppressive to man and beast. Frequent showers, mainly at night, with heavy dews and fogs, interfered with farm operations in haying, harvesting and threshing. Except in the northwest district, the rainfall was generally excessive. On the evening of the 7th considerable damage to crops and buildings was caused by heavy windstorms in the north central district.

Reports indicate that some progress was made during the latter half of the week in haymaking, harvesting and threshing. The corn crop has made very rapid advancement in all well-cultivated fields. Pastures have never been better. Potatoes on dry soil are very promising, and the gardens are unusually productive.

BULLETIN No. 20, AUGUST 19.

During the past week there was a slight excess in the average temperature, sunshine and mean relative humidity. Fair weather prevailed generally the first three to four days affording favorable conditions for field work. The latter part of the week was showery, and heavy storms were reported in portions of the central, south central, southeast and east central districts. In the southeast district very heavy downpours occurred, accompanied in some localities by destructive wind squalls, hail and lightning, causing considerable damage to corn and unstacked oats and wheat. Reports indicate that good progress has been made in threshing and finishing the harvest of small grain in the northern and western districts, where there was but little hindrance by storms. The weather was favorable for the rapid growth of corn, and that crop is doing notably well, except in the limited areas swept by wind and hail. In the most advanced fields on well-drained soil corn has reached the full roasting-ear stage, and is heavily eared. There is more than the usual inequality in the condition of that crop. Potatoes, pastures and garden truck are in extra good condition.

BULLETIN No. 21, AUGUST 26.

The average daily temperature of the past week was 3 to 4° below normal, and sunshine was generally above the average. Light to heavy showers occurred on Monday in the northern section, but in the larger part of the State the weather was dry, fair and cool. In portions of the western districts rain is needed for the growing crops, and to soften the soil for plowing.

On the whole, it was a very good week for farm work, and not detrimental to the crops. Good progress has been made in stacking and threshing small grain, and a good beginning has been made in fall plowing. Reports indicate generally light yield and weight of oats. Winter and spring wheat and barley are fair in yield and quality of grain. Corn has made fairly good advancement, tho the nights were too cool for the rapid growth which is desired for the belated portion of the crop. Pastures are in good condition, and the meadows show a fine growth of aftermath.

BULLETIN No. 22, SEPTEMBER 2.

The past week was very warm and showery. The average daily temperature was 3 to 5° above the normal. Very heavy showers occurred on Wednesday night and Thursday morning in the central district, and copious rainfall was reported in all except the southwest and south central districts. The wet weather caused some delay in threshing, but the rain was generally beneficial to all growing crops, and the soil is now in good condition for plowing. Corn has made very good advancement. Reports indicate that with normal conditions the most advanced fields will be practically safe about the 25th of September. To ripen the major portion of the crop there is need of warm days and frostless nights till October 1st, and a warm week beyond that date will be very helpful.

BULLETIN No. 23, SEPTEMBER 9.

The week was cooler than usual, with normal sunshine and very light scattered showers. The average daily deficiency in temperature was about 2°. It was a very favorable week for outside work, and the time was well employed in threshing from shock and stack, harvesting aftermath and pairle hay, and fall plowing. The nights were unseasonably cool, but there was sufficient warmth by day to promote the ripening of the corn crop, tho the process is slower than may be desired in view of its belated condition. The deficiency of rainfall is favorable for corn, tho more moisture is needed in a considerable area. The potato crop is fairly good, and the gardens have been very productive.

BULLETIN No. 24, SEPTEMBER 16.

Cool weather prevailed the first half of the week, but the latter part was warm enough to give a slight excess of temperature, with more than the usual amount of sunshine. The amount of rainfall was generally very light, the showers being widely scattered. In some portions of the State rain is needed to maintain growth of pasturage and late maturing vegetables, and to facilitate fall plowing.

The warm and dry weather has been favorable to the corn crop, which has made very satisfactory progress. Reports indicate that early planted and well cultivated fields in the southern districts are ripe enough to be cut and shocked. In the central and northern districts the ears are hardening, and the fields are rapidly putting on the brown colors of maturity. With a continuance of normal weather during the balance of this month four-fifths of the corn crop will be practically safe. The pastures are still yielding a fair supply of forage.

BULLETIN No. 25, SEPTEMBER 23.

During the past week abnormally high temperatures prevailed five days, with brisk, drying winds. The last two days were much colder, bringing the average excess of temperature for the week down to 4 to 6°. Light frosts were reported on Sunday morning in northern, central and eastern districts. There was ample rainfall in all sections, and some local excess in portions of the northern and eastern counties. It was the warmest week in September, very favorable for hastening the maturity of the corn crop. Reports from the fields indicate that for the State at large about 70 per cent of the crop is ripe enough to be cut and shocked, and cutting is in progress in nearly all districts. The belated 30 per cent is more than usually variable as to hardness of the ears, and most of it needs ten to fifteen days of ripening weather to make it practically safe. Fair progress has been made in plowing. The pastures are unusually good for the last of September.

BULLETIN No. 26, SEPTEMBER 30.

The closing week in September was abnormally cold, with an excess of cloudiness. The average daily temperature was 6 to 8° below the normal. The latter part of the week was showery, and copious rainfall was

reported in all districts except a portion of the north central. The moisture was generally beneficial.

The most unfavorable event of the week was the untimely frost which visited all parts of the State on Wednesday morning, causing material damage to the immature portion of the corn crop. All reports from the three districts in the northern section call it a killing frost, and deadly in its effects on belated corn, which is a variable quantity, ranging from 20 to 40 per cent. In the three central districts, east to west, it was a heavy frost, and killing in exposed localities. In that belt it was less destructive in the west than in the central and eastern counties, and the percentage of unripe corn ranges from 10 to 30 per cent. In the southern section the central counties reported the lowest temperatures, and fully 90 per cent of the corn crop was fairly well matured.

Those who took warning and began cutting early, saved their corn and fodder in the best condition. It was the climax of an erratic season, which will be noted in climatic records as strikingly exceptional in this favored region.

IOWA CROP REPORT—JUNE 1, 1907.

ACREAGE OF FARM CROPS. ESTIMATED CONDITION OF STAPLE CROPS. FRUIT AND LIVE STOCK.

Reports received June 1st from correspondents of the Iowa Weather and Crop Service show a slight increase in the acreage of corn, and a small general decrease in the area seeded to spring wheat, oats, rye and barley. The estimated condition of all crops is below the average of recent years, as a result of unseasonable weather in April and May. Considering the adverse conditions prevalent since April 1st the estimates are materially higher than had been anticipated.

CORN.—The dry weather prevalent in April and the larger part of May was favorable for plowing and preparation of soil for this great staple, and this resulted in an average increase of 3 per cent as compared with the acreage planted in 1906. So the acreage of corn is about 103; and the average condition on June 1st was rated at 88 per cent. Last year at corresponding date it was 99 per cent.

WHEAT.—There appears to be a reduction of about 6 per cent in the area of spring wheat. The condition of winter wheat is 91 per cent and spring wheat 88. Last year the estimates were 98 per cent.

OATS.—The acreage of oats is placed at 98 per cent and the average condition 89 per cent. Last year the condition on June 1st was 96 per cent.

BARLEY.—Acreage seeded, compared with last year 94 per cent (decrease 6 per cent); and the average condition is 81 per cent.

RYE.—Acreage 91; estimated condition 90 per cent, as compared with 97 per cent last year.

FLAX.—Area seeded 87 per cent, condition 83 per cent.

POTATOES.—Acreage planted 100 per cent; condition 86 per cent. Last year condition 101 per cent.

Meadows.—Reports indicate a slight reduction in the area of meadows, the acreage being about 95 per cent. The condition is placed at 74 per cent. The condition last year was 92 per cent. The hay crop is likely to be 20 to 25 per cent of an average.

Pastures are about 100 per cent in acreage and 80 per cent in condition.

CONDITION OF FRUIT.—Apples, 55 per cent; peaches, 27; plums, 42; cherries, 30; grapes, 80; strawberries, 78; raspberries, 81; blackberries, 86.

CONDITION OF LIVE STOCK.—Cattle, 86 per cent; hogs, 96; horses, 98; sheep, 97; goats, 95; spring pigs, 83.

IOWA CROPS—NUMBER OF ACRES BY COUNTIES, REPORTED JUNE 1, 1907.

| Counties | Winter Wheat Acres | Spring Wheat Acres | Corn Acres | Oats Acres | Barley Acres | Rye Acres | Flax Acres | Potatoes Acres | Hay (Tame) Acres | Hay (Wild) Acres | Pastures Acres |
|------------------|--------------------------|--------------------------|---------------|---------------|-----------------|--------------|---------------|-------------------|------------------------|------------------------|-------------------|
| Adair..... | 54 | 2,540 | 92,680 | 34,670 | 2,370 | 95 | ..... | 970 | 48,190 | 4,420 | 111,510 |
| Adams..... | 773 | 1,310 | 74,640 | 21,300 | 1,720 | 180 | ..... | 880 | 32,550 | 2,380 | 87,040 |
| Allamakee..... | 1,135 | 670 | 43,410 | 69,640 | 11,810 | 770 | 310 | 1,140 | 43,190 | 990 | 102,900 |
| Appanoose..... | 957 | 20 | 56,920 | 20,450 | 110 | 610 | ..... | 650 | 77,020 | 2,070 | 138,410 |
| Audubon..... | 40 | 7,530 | 91,420 | 35,860 | 5,890 | 15 | ..... | 780 | 32,590 | 4,020 | 81,910 |
| Benton..... | 33 | 460 | 130,710 | 70,880 | 11,820 | 210 | ..... | 1,580 | 47,170 | 10,220 | 105,570 |
| Black Hawk..... | 32 | 140 | 92,140 | 53,170 | 4,100 | 1,640 | ..... | 2,890 | 30,420 | 11,410 | 88,380 |
| Boone..... | 45 | 1,630 | 103,740 | 53,140 | 740 | 280 | ..... | 1,090 | 24,610 | 18,530 | 81,640 |
| Bremer..... | 27 | 150 | 60,240 | 50,720 | 3,420 | 630 | 110 | 2,250 | 19,670 | 15,510 | 68,490 |
| Buchanan..... | 14 | 110 | 85,880 | 50,590 | 3,050 | 490 | 60 | 1,010 | 37,980 | 14,510 | 100,830 |
| Buena Vista..... | 26 | 1,320 | 101,450 | 74,510 | 1,140 | 110 | 420 | 1,280 | 22,920 | 19,690 | 79,290 |
| Butler..... | 5 | 210 | 103,290 | 70,250 | 2,110 | 1,810 | ..... | 1,480 | 24,110 | 11,910 | 88,000 |
| Calhoun..... | 35 | 710 | 108,920 | 70,920 | 3,060 | 210 | 310 | 1,040 | 18,230 | 19,100 | 71,270 |
| Carroll..... | 71 | 7,410 | 105,860 | 57,890 | 3,940 | 70 | 90 | 1,750 | 25,770 | 13,360 | 75,380 |
| Cass..... | 1,440 | 8,910 | 110,120 | 40,810 | 3,390 | 100 | ..... | 1,260 | 45,190 | 2,890 | 102,250 |
| Cedar..... | 364 | 970 | 102,430 | 32,180 | 13,120 | 560 | ..... | 1,120 | 46,250 | 310 | 96,410 |
| Cerro Gordo..... | ..... | 430 | 93,890 | 75,410 | 2,010 | 790 | 610 | 1,350 | 31,570 | 12,610 | 73,900 |
| Cherokee..... | 83 | 36,610 | 110,750 | 70,100 | 2,530 | 30 | ..... | 1,280 | 29,670 | 13,810 | 82,070 |
| Chickasaw..... | 40 | 560 | 59,110 | 42,510 | 4,520 | 450 | 2,580 | 1,490 | 24,610 | 15,830 | 61,790 |
| Clarke..... | 558 | 40 | 54,340 | 16,230 | 420 | 190 | ..... | 420 | 47,170 | 240 | 90,600 |
| Clay..... | 101 | 1,120 | 78,490 | 65,840 | 1,590 | 120 | 160 | 780 | 28,740 | 18,530 | 68,140 |
| Clayton..... | 1,043 | 1,280 | 75,830 | 58,320 | 12,210 | 2,020 | 20 | 1,750 | 51,410 | 3,220 | 134,700 |
| Clinton..... | 465 | 1,580 | 116,760 | 39,540 | 8,210 | 1,230 | ..... | 1,340 | 51,180 | 4,120 | 126,570 |
| Crawford..... | 181 | 19,210 | 137,820 | 58,910 | 3,620 | 120 | ..... | 1,760 | 44,910 | 7,580 | 118,400 |
| Dallas..... | 584 | 1,290 | 113,510 | 44,820 | 1,370 | 480 | ..... | 690 | 27,540 | 8,140 | 99,580 |
| Dalboun..... | 1,013 | ..... | 49,590 | 18,920 | 60 | 1,240 | ..... | 620 | 45,120 | 60 | 204,650 |
| Decatur..... | 1,342 | ..... | 58,010 | 16,210 | 40 | 1,440 | ..... | 470 | 44,710 | 710 | 101,340 |
| Des Moines..... | 42 | 170 | 92,560 | 40,120 | 12,120 | 1,210 | 40 | 1,380 | 52,110 | 7,210 | 107,950 |
| Dickinson..... | 3,327 | 20 | 64,160 | 23,660 | 790 | 1,120 | ..... | 1,140 | 26,530 | 560 | 79,300 |
| Dubuque..... | 99 | 1,060 | 42,620 | 42,070 | 3,270 | 90 | 790 | 610 | 15,080 | 17,280 | 41,450 |
| Emmet..... | 1,050 | ..... | 66,870 | 45,200 | 5,810 | 390 | ..... | 2,460 | 48,120 | 1,770 | 117,380 |
| Emmet..... | 38 | 710 | 47,720 | 43,210 | 590 | 110 | 690 | 490 | 18,710 | 12,400 | 46,010 |

IOWA CROPS—NUMBER OF ACRES BY COUNTIES, REPORTED JUNE 1, 1907—CONTINUED.

| Counties | Winter Wheat Acres | Spring Wheat Acres | Corn Acres | Oats Acres | Barley Acres | Rye Acres | Flax Acres | Potatoes Acres | Hay (Tame) Acres | Hay (Wild) Acres | Pastures Acres |
|-----------------|--------------------------|--------------------------|---------------|---------------|-----------------|--------------|---------------|-------------------|------------------------|------------------------|-------------------|
| Fayette | 185 | 810 | 89,690 | 65,510 | 1,820 | 320 | 930 | 1,610 | 54,510 | 12,860 | 131,080 |
| Floyd | 17 | 180 | 82,380 | 72,120 | 2,550 | 880 | 1,020 | 1,520 | 32,230 | 4,980 | 63,910 |
| Franklin | 1,610 | 102,450 | 75,570 | 1,450 | 370 | 900 | 1,420 | 27,410 | 16,130 | 82,110 | 70,340 |
| Fremont | 2,660 | 3,230 | 125,350 | 15,090 | 130 | 320 | 530 | 21,210 | 4,210 | 10,340 | 10,340 |
| Greene | 34 | 350 | 110,230 | 49,560 | 1,630 | 260 | 60 | 1,020 | 25,140 | 16,230 | 82,110 |
| Grundy | 57 | 880 | 99,890 | 65,290 | 5,080 | 50 | 20 | 2,980 | 22,410 | 8,920 | 98,730 |
| Guthrie | 224 | 2,820 | 87,420 | 33,410 | 1,550 | 140 | ..... | 920 | 35,190 | 5,550 | 55,530 |
| Hamilton | 287 | 1,940 | 104,810 | 62,210 | 530 | 90 | 300 | 1,030 | 24,830 | 20,480 | 78,070 |
| Hancock | 34 | 1,810 | 79,520 | 80,700 | 1,680 | 120 | 320 | 850 | 21,910 | 16,780 | 66,390 |
| Hardin | 190 | 2,470 | 104,180 | 61,250 | 1,370 | 150 | 50 | 1,190 | 24,970 | 15,790 | 85,070 |
| Harrison | 2,580 | 25,210 | 135,940 | 24,510 | 2,350 | 910 | ..... | 1,350 | 21,120 | 18,050 | 91,110 |
| Henry | 1,180 | 72,980 | 28,410 | 320 | 1,730 | ..... | ..... | 580 | 25,250 | 50 | 81,740 |
| Howard | 46 | 740 | 45,560 | 51,160 | 7,780 | 340 | 8,270 | 770 | 36,480 | 11,170 | 81,740 |
| Humboldt | ..... | 3,050 | 75,110 | 55,130 | 910 | 110 | 270 | 670 | 20,940 | 15,580 | 55,510 |
| Ida | 252 | 6,390 | 85,250 | 38,750 | 7,860 | 40 | ..... | 940 | 26,250 | 3,540 | 60,050 |
| Iowa | 367 | 1,070 | 94,500 | 39,640 | 2,490 | 520 | ..... | 1,190 | 45,370 | 940 | 103,030 |
| Jackson | 349 | 1,230 | 71,240 | 31,730 | 6,690 | 110 | ..... | 1,230 | 63,110 | 1,810 | 155,390 |
| Jasper | 420 | 4,020 | 130,370 | 51,690 | 1,690 | 520 | ..... | 1,350 | 46,290 | 2,270 | 143,810 |
| Jefferson | 1,551 | 110 | 57,310 | 22,410 | 640 | 1,720 | ..... | 430 | 33,810 | 1,920 | 93,730 |
| Johnson | 247 | 820 | 104,530 | 47,350 | 4,750 | 1,490 | ..... | 1,350 | 52,690 | 1,920 | 104,290 |
| Jones | 38 | 330 | 76,670 | 28,850 | 7,370 | 750 | ..... | 1,180 | 51,700 | 880 | 115,390 |
| Keokuk | 955 | 640 | 91,490 | 35,270 | 3,190 | 900 | ..... | 920 | 44,920 | 290 | 103,660 |
| Kossuth | 40 | 4,210 | 130,890 | 115,420 | 2,520 | 410 | 1,420 | 1,570 | 41,930 | 58,970 | 124,650 |
| Lee | 9,287 | ..... | 58,090 | 21,460 | 70 | 3,120 | ..... | 1,380 | 39,410 | 3,090 | 108,610 |
| Linn | 66 | 730 | 106,610 | 48,690 | 1,290 | 780 | ..... | 1,920 | 46,480 | 5,770 | 115,120 |
| Louis | 3,292 | 80 | 64,390 | 22,760 | 510 | 1,920 | ..... | 590 | 18,410 | 780 | 85,410 |
| Lucas | 798 | 50 | 48,560 | 13,180 | 110 | 540 | ..... | 410 | 41,020 | 780 | 85,410 |
| Lyon | 254 | 8,500 | 88,670 | 75,050 | 3,640 | 110 | 41 | 1,980 | 17,120 | 11,270 | 52,220 |
| Madison | 336 | 940 | 87,620 | 23,520 | 3,410 | 330 | ..... | 690 | 41,220 | 22,210 | 130,610 |
| Mahaska | 655 | 890 | 90,470 | 32,430 | 3,220 | 410 | ..... | 960 | 35,710 | 1,190 | 92,580 |
| Marion | 1,472 | 2,380 | 99,210 | 28,260 | 2,420 | 450 | ..... | 790 | 38,910 | 2,230 | 84,930 |
| Marshall | 333 | 2,310 | 106,380 | 54,110 | 1,580 | 380 | 35 | 1,920 | 36,970 | 2,230 | 84,930 |
| Mills | 1,446 | 4,850 | 90,570 | 15,620 | 1,090 | 270 | ..... | 780 | 20,250 | 5,070 | 60,540 |
| Mitchell | 90 | 620 | 57,260 | 70,910 | 7,240 | 210 | 5,860 | 1,270 | 28,210 | 2,840 | 57,050 |
| Monona | 10,167 | 10,160 | 127,480 | 28,620 | 2,710 | 340 | 160 | 1,210 | 10,610 | 16,550 | 85,280 |
| Monroe | 1,474 | 40 | 38,120 | 5,540 | 320 | 320 | ..... | 320 | 32,990 | 150 | 88,320 |
| Montgomery | 2,498 | 9,410 | 91,550 | 18,070 | 1,680 | 20 | ..... | 670 | 29,120 | 1,110 | 71,720 |
| Muscatine | 963 | 820 | 68,060 | 20,660 | 8,940 | 2,730 | ..... | 2,210 | 24,510 | 1,660 | 67,730 |
| O'Brien | 130 | 3,050 | 90,650 | 61,650 | 13,110 | 110 | 190 | 1,380 | 27,130 | 11,070 | 58,370 |
| Osceola | ..... | 2,070 | 51,670 | 70,270 | 8,710 | 240 | 910 | 580 | 18,160 | 9,380 | 34,820 |
| Page | 6,320 | 4,560 | 110,270 | 19,620 | 1,380 | 650 | ..... | 930 | 31,430 | 4,240 | 101,140 |
| Palo Alto | 12 | 720 | 63,670 | 56,910 | 690 | 60 | 760 | 1,220 | 14,290 | 31,890 | 56,530 |
| Plymouth | 2,048 | 44,050 | 178,510 | 82,420 | 10,510 | 170 | 410 | 1,820 | 27,020 | 24,790 | 115,180 |
| Pocahontas | ..... | 510 | 46,840 | 78,670 | 630 | 130 | ..... | 1,020 | 16,880 | 28,230 | 70,790 |
| Polk | 528 | 3,040 | 101,300 | 41,140 | 470 | 320 | ..... | 2,050 | 27,240 | 6,950 | 82,630 |
| Pottawattamie | 1,020 | 19,210 | 190,050 | 45,240 | 2,080 | 270 | ..... | 2,740 | 43,690 | 11,580 | 135,130 |
| Poweshiek | 13 | 1,140 | 109,990 | 40,250 | 4,010 | 190 | ..... | 980 | 43,780 | 2,230 | 115,060 |
| Ringgold | 731 | 40 | 66,010 | 19,820 | 160 | 290 | ..... | 420 | 49,660 | 370 | 111,690 |
| Sac | 115 | 2,050 | 114,220 | 63,090 | 5,290 | 50 | 170 | 1,070 | 26,750 | 13,970 | 81,090 |
| Scott | 1,297 | 2,210 | 79,380 | 24,290 | 29,480 | 1,220 | ..... | 6,340 | 36,710 | 5,100 | 67,050 |
| Shelby | 185 | 15,240 | 122,350 | 45,530 | 7,020 | 110 | 90 | 1,270 | 37,710 | 6,450 | 90,650 |
| Sioux | 507 | 32,120 | 151,270 | 75,480 | 28,460 | 160 | 120 | 1,410 | 52,460 | 20,010 | 78,510 |
| Story | 190 | 620 | 110,220 | 50,120 | 720 | 250 | ..... | 820 | 28,050 | 12,880 | 74,680 |
| Tama | 22 | 2,530 | 115,210 | 54,690 | 12,120 | 400 | ..... | 1,850 | 51,970 | 4,580 | 121,260 |
| Taylor | 3,309 | 190 | 80,380 | 19,210 | 1,870 | 710 | ..... | 610 | 44,720 | 1,510 | 116,090 |
| Union | 313 | 90 | 52,040 | 16,290 | 440 | 110 | ..... | 640 | 35,810 | 1,220 | 81,100 |
| Van Buren | 2,166 | ..... | 51,160 | 18,830 | 80 | 1,850 | ..... | 490 | 41,000 | 210 | 185,430 |
| Wapello | 1,742 | 80 | 53,740 | 17,690 | 660 | 1,030 | ..... | 820 | 30,500 | 10 | 85,290 |
| Warren | 928 | 990 | 82,990 | 35,290 | 1,210 | 410 | ..... | 1,040 | 44,280 | 1,450 | 109,020 |
| Washington | 1,030 | 230 | 87,380 | 40,390 | 1,460 | 690 | ..... | 890 | 38,940 | 110 | 94,210 |
| Wayne | 286 | ..... | 73,460 | 21,840 | 30 | 310 | 416 | ..... | 66,130 | 3,020 | 124,160 |
| Webster | 5 | 3,240 | 112,840 | 78,490 | 860 | 140 | ..... | 1,160 | 22,380 | 31,690 | 97,930 |
| Winnebago | ..... | 4,080 | 49,159 | 42,220 | 1,520 | 70 | 1,810 | 690 | 14,750 | 19,370 | 46,450 |
| Winneshek | 437 | 3,170 | 73,480 | 71,170 | 15,860 | 380 | 7,210 | 1,410 | 47,240 | 11,320 | 117,960 |
| Woodbury | 3,536 | 15,480 | 172,650 | 55,290 | 6,770 | 460 | 150 | 1,790 | 23,160 | 16,580 | 83,090 |
| Worth | ..... | 1,700 | 40,640 | 50,420 | 2,390 | 160 | 3,780 | 620 | 18,140 | 14,150 | 51,960 |
| Wright | ..... | 3,340 | 99,300 | 79,180 | 1,190 | 10 | 318 | 990 | 32,280 | 10,980 | 73,400 |
| Total for State | 85,785 | 335,340 | 8,888,080 | 4,536,170 | 397,210 | 53,450 | 42,790 | 117,350 | 3,372,470 | 806,290 | 9,088,480 |

IOWA CROP REPORT, JULY 1, 1907.

Following is a summary of reports received from crop correspondents of the Iowa Weather and Crop Service, showing the estimated condition of the staple crops July 1, 1907:

Corn, 76 per cent; spring wheat, 90; oats, 89; barley, 90; rye, 94; flax, 91; hay crop, 78; potatoes, 98; apples, 42; grapes, 80.

The relatively low estimates of corn is due to the deficient stand, as compared with the average.

Condition last year—Corn, 99 per cent; wheat, 94; oats, 84; barley, 91; rye, 93; flax, 92; potatoes, 94; hay, 75; apples, 70; grapes, 85.

Wesley Greene, secretary of the Iowa Horticultural Society, issued the following report on the condition of the fruit crop in Iowa, dated July 6, 1907:

Summer apples, 31 per cent; fall apples, 32; winter apples, 32; pears, 8; cherries, 7; American plums, 17; Japanese plums, 5; European plums, 12; peaches, 24; grapes, 78; red raspberries, 60; black raspberries, 72; blackberries, 84; currants, 38; gooseberries, 46; and strawberries, 71 per cent of a full crop.

The distribution of the apple crop is about as follows: 10 to 25 per cent in the southern third of the State; 20 to 45 per cent in the central, and 30 to 65 per cent in the northern section. Plums, pears and cherries will be scarce. Peaches about quarter of a crop; a large per cent of it will be from seedling trees. Raspberries, blackberries and grapes are in good condition.

Insects and fungus have not injured the tree fruits to any extent and they promise to make up in quality what they lack in quantity.

IOWA CROP REPORT, AUGUST 1, 1907.

Following is a summary of reports received from crop correspondents of the Iowa Weather and Crop Service, showing the estimated condition of the staple crop August 1, 1907:

Corn, 79 per cent; spring wheat, 85; oats, 76; barley, 85; flax, 88; hay, 80; potatoes, 90; pastures, 100; apples, 40; grapes 84.

Conditions last year—Corn, 99 per cent; wheat, 93; oats, 90; flax, 95; hay, 79; pastures, 83; potatoes, 91; apples, 70; grapes, 94.

FINAL CROP REPORT, 1907.

FINAL REPORT FOR THE STATE—TOTAL YIELD OF SOIL PRODUCTS—VALUE AT FARM PRICES, DECEMBER 1, 1907.

On account of abnormal weather during the spring and summer, the farm products of this season fall materially below the very heavy output of 1906, but as compared with the general averages of the past two decades the showing is fairly satisfactory. The principal shortage is in the yield and quality of corn and oats, the other cereals coming nearly up to the average, while the yield of grass in pastures and meadows was somewhat better than usual.

CORN.—The soil was dry and in fine tilth at planting time, and reports showed a total acreage of 8,858,000 acres. The heavy rains and flooded fields in June caused the abandonment of a considerable area, amounting to an estimated total of 530,390 acres. The acreage harvested was about 8,327,690 acres, and the average loss of acreage was about 6 per cent for the whole State, the variable in different sections.

The tabulated reports by counties show the yield of corn to have been quite variable ranging from 20 to 35 bushels per acre. The average for the state appears to be 29.6 bushels per acre and the total yield is 246,898,460 bushels, as against 41 per acre and a total of 388,348,000 bushels last year. The average farm price of corn is reported to be 44 cents per bushel, and the total value of the crop is \$108,635,322. Last year's corn crop was estimated at \$128,155,143, on December 1st, at an average of 33 cents per bushel.

WINTER WHEAT.—This cereal is now reported to be grown in 81 counties, with satisfactory results. The average yield was 19.8 bushels per acre and the total was 1,698,101 bushels. The value of the crop was \$1,408,423, the average price being 83 cents per bushel.

SPRING WHEAT.—The area of spring wheat harvested was 335,340 acres and the total yield was 4,402,320 bushels, the average being 13 bushels per acre. At 81 cents per bushel the value was \$3,565,879.

OATS.—The oats crop was very disappointing in yield and quality. The area sown was 4,536,170 acres. The returns show an average of 24.5 bushels per acre, and a total of 111,190,400 bushels at 39 cents per bushel the crop is worth \$43,364,256.

BARLEY.—Area seeded, 397,210 acres. Average yield, 24.6 bushels per acre. Value \$5,935,998, at 60 cents per bushel.

RYE.—Area seeded, 52,450 acres. Average yield, 17 bushels per acre. Total yield, 900,060 bushels. Value, \$549,036, at 61 cents per bushel.

FLAX.—Area seeded, 42,790 acres. Product 10.8 bushels per acre. Total, 461,960 bushels. Value, \$408,640, at an average of 98 cents per bushel.

POTATOES.—Area planted, 117,350 acres. Yield, 84 bushels per acre. Total, 9,847,430 bushels. Value, \$6,105,406, at an average of 62 cents per bushel.

HAY (TAME).—Area harvested, including timothy, clover and all cultivated forage crops, 3,372,470 acres. Total yield, 5,117,878 tons—an average of 1.5 tons per acre. Value, \$42,401,963—an average of \$8.50 per ton.

HAY (WILD).—Area, 896,260 acres. Yield 1.3 tons per acre. Total crop, 1,172,590 tons. Value at \$6.75 per ton, \$7,914,982.

PASTURAGE AND GRAZING.—This includes pastures and grazing in meadows and grain fields after harvest, and in corn fields during the fall and winter. The total value is estimated at \$90,000,000, or an average value of a little over \$400 per farm.

TABULATED CROP SUMMARY.

| Crops | Total Yield | Farm Values Dec. 1, 1907 |
|------------------------------|------------------|-----------------------------|
| Corn..... | 246,898,460 bus. | \$ 108,635,222 |
| Winter wheat..... | 1,698,101 bus. | 1,489,423 |
| Spring wheat..... | 4,402,329 bus. | 3,565,879 |
| Oats..... | 111,190,400 bus. | 43,961,256 |
| Barley..... | 9,869,320 bus. | 5,935,598 |
| Rye..... | 900,000 bus. | 549,036 |
| Flax..... | 416,960 bus. | 428,640 |
| Potatoes..... | 9,847,430 bus. | 6,105,406 |
| Hay (tame)..... | 5,117,878 tons | 43,401,963 |
| Hay (wild)..... | 1,172,590 tons | 7,914,982 |
| Pasturage and grazing..... | Estimated | 90,000,000 |
| Buckwheat..... | Estimated | 90,000 |
| Sweet potatoes..... | Estimated | 145,000 |
| Sorghum and broom corn..... | Estimated | 180,000 |
| Timothy and clover seed..... | Estimated | 1,500,000 |
| Alfalfa and millet..... | Estimated | 510,000 |
| Sweet corn..... | Estimated | 750,000 |
| Fruit crops..... | Estimated | 2,250,000 |
| Garden truck..... | Estimated | 6,000,000 |
| Total..... | | \$ 322,715,905 |

The above figures take no account of the increment of value derived from the consumption of soil products in the live stock industry of this state.

FINAL CROP REPORT, 1907.
AVERAGE YIELD PER ACRE AND TOTAL PRODUCTS—BY COUNTIES.

| Counties | Winter Wheat | Spring Wheat | Corn | Oats | Rye | Barley | Flax Seed | Potatoes | Hay (Tame) | Hay (Wild) |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---------------|------------|
| | Bushels per acre | Bushels per acre | Bushels per acre | Bushels per acre | Bushels per acre | Bushels per acre | Bushels per acre | Bushels per acre | Tons per acre | Total tons |
| Adair..... | 20 | 30,480.32 | 2,038,560.25 | 901,420.15 | 1,710.25 | 66,300 | ... | 56 | 1.5 | 72,220 |
| Adams..... | 22 | 29,200.35 | 2,560,250.24 | 513,000.15 | 2,580.30 | 2,500 | ... | 50 | 1.5 | 72,220 |
| Allamakee..... | 16 | 6,700.30 | 1,480,200.24 | 1,180,800.15 | 9,150.35 | 310 | ... | 50 | 1.5 | 72,220 |
| Appanoose..... | 17 | 7,800.32 | 1,680,200.24 | 1,180,800.15 | 9,150.35 | 310 | ... | 50 | 1.5 | 72,220 |
| Ashtabula..... | 20 | 70,800.21 | 2,777,000.21 | 749,200.15 | 2,580.30 | 164,200 | ... | 50 | 1.5 | 72,220 |
| Benton..... | 20 | 6,440.30 | 2,080,100.25 | 1,842,800.15 | 5,580.37 | 313,140 | ... | 52 | 1.5 | 72,220 |
| Benton Park..... | 20 | 6,440.30 | 2,080,100.25 | 1,842,800.15 | 5,580.37 | 313,140 | ... | 52 | 1.5 | 72,220 |
| Boone..... | 20 | 16,800.29 | 2,790,500.24 | 1,275,400.15 | 2,580.30 | 123,000 | ... | 52 | 1.5 | 72,220 |
| Bremer..... | 20 | 1,650.25 | 1,142,750.20 | 1,011,800.14 | 6,560.25 | 79,300.9 | ... | 52 | 1.5 | 72,220 |
| Bureau..... | 15 | 15,840.24 | 2,505,800.20 | 2,203,800.18 | 6,560.25 | 79,300.9 | ... | 52 | 1.5 | 72,220 |
| Buena Vista..... | 15 | 2,940.23 | 2,136,000.22 | 1,842,800.15 | 2,580.30 | 63,300 | ... | 52 | 1.5 | 72,220 |
| Butler..... | 18 | 8,320.30 | 2,973,000.21 | 2,186,320.16 | 3,200.25 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Calhoun..... | 18 | 8,320.30 | 2,973,000.21 | 2,186,320.16 | 3,200.25 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Carroll..... | 20 | 18,800.32 | 3,215,100.27 | 1,857,000.15 | 2,580.30 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Cass..... | 20 | 5,475.14 | 2,211,200.25 | 1,857,000.15 | 2,580.30 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Cerro Gordo..... | 20 | 4,800.25 | 2,107,000.23 | 1,774,400.15 | 2,580.30 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Cherokee..... | 20 | 8,400.24 | 2,107,000.23 | 1,774,400.15 | 2,580.30 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Chickasaw..... | 20 | 8,400.24 | 2,107,000.23 | 1,774,400.15 | 2,580.30 | 51,250.9 | ... | 52 | 1.5 | 72,220 |
| Clarke..... | 18 | 9,844.35 | 1,884,100.29 | 1,480,600.15 | 8,100.25 | 113,000.12 | ... | 52 | 1.5 | 72,220 |
| Clay..... | 18 | 13,513.12 | 1,884,100.29 | 1,480,600.15 | 8,100.25 | 113,000.12 | ... | 52 | 1.5 | 72,220 |
| Clayton..... | 15 | 17,800.25 | 1,945,000.23 | 1,411,300.15 | 3,200.22 | 250,250 | ... | 52 | 1.5 | 72,220 |
| Crawford..... | 15 | 7,440.14 | 2,964,100.24 | 1,945,000.23 | 3,200.22 | 250,250 | ... | 52 | 1.5 | 72,220 |
| Crawford..... | 22 | 2,882.15 | 4,197,170.25 | 1,331,000.20 | 4,560.25 | 205,250 | ... | 52 | 1.5 | 72,220 |
| Dallas..... | 16 | 9,344.32 | 3,323,320.22 | 1,983,040.20 | 9,000.25 | 34,250 | ... | 54 | 1.5 | 72,220 |
| Davis..... | 18 | 15,284.30 | 3,534,800.25 | 2,154,800.20 | 18,000.25 | 34,250 | ... | 54 | 1.5 | 72,220 |
| Decatur..... | 19 | 2,550.24 | 2,390,900.22 | 1,854,640.15 | 21,280.30 | 228,000 | ... | 54 | 1.5 | 72,220 |
| Des Moines..... | 22 | 73,194.14 | 2,390,900.22 | 1,854,640.15 | 21,280.30 | 228,000 | ... | 54 | 1.5 | 72,220 |
| Dickinson..... | 22 | 14,840.23 | 2,390,900.22 | 1,854,640.15 | 21,280.30 | 228,000 | ... | 54 | 1.5 | 72,220 |
| Dubuque..... | 20 | 1,800.12 | 2,032,800.22 | 1,595,720.15 | 5,760.30 | 174,300 | ... | 70 | 1.5 | 72,220 |

AVERAGE YIELD PER ACRE AND TOTAL PRODUCTS—BY COUNTIES—CONTINUED.

| Counties | Winter Wheat | | Spring Wheat | | Corn | | Oats | | Rye | | Barley | | Flax Seed | | Potatoes | | Hay (Tame) | | Hay (Wild) | |
|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|---------------|------------|---------------|------------|
| | 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 | Bushels per acre | Total bushels | Tons per acre | Total tons | Tons per acre | Total tons |
| Emmet | 16 | 11,360.22 | | 987,850.26 | | 1,223,460.15 | | 1,650.31 | | 18,230.12 | | 8,280 | 92 | 45,090.1.6 | | 29,000.1.2 | | 14,880 | | |
| Fayette | 30 | 3,700.14 | 11,340.23 | 1,898,190.21 | | 1,375,710.20 | | 64,000.26 | | 47,320.10 | | 9,300 | 85 | 106,850.1.5 | | 81,760.1.2 | | 15,430 | | |
| Floyd | 12 | 2,160.23 | | 1,800,210.24 | | 1,720,880.16 | | 13,250.27 | | 68,850.10 | | 10,200 | 70 | 106,400.1.5 | | 48,340.1.3 | | 6,470 | | |
| Franklin | 12 | 19,230.22 | | 2,666,380.26 | | 1,964,820.16 | | 5,520.20 | | 29,000 | | | 60 | 127,800.1.3 | | 36,530.1.6 | | 16,130 | | |
| Fremont | 22 | 58,520.12 | | 38,760.33 | | 3,929,970.23 | | 345,690.20 | | 6,400.22 | | 5,000 | 60 | 35,400.1.8 | | 38,170.1.5 | | 6,310 | | |
| Greene | 20 | 680.13 | 4,550.30 | 2,976,300.26 | | 1,288,560.20 | | 5,200.28 | | 45,640.10 | | 600 | 76 | 77,520.1.2 | | 30,160.1.2 | | 19,470 | | |
| Grundy | 15 | 855.12 | 10,560.25 | 2,247,750.24 | | 1,590,960.16 | | 800.28 | | 158,940 | | | 90 | 208,200.1.8 | | 42,130.1.5 | | 13,400 | | |
| Guthrie | 20 | 4,490.12 | 33,840.31 | 2,629,800.26 | | 868,660.16 | | 2,240.25 | | 38,750 | | | 85 | 78,200.1.2 | | 42,190.1.2 | | 7,020 | | |
| Hamilton | 16 | 4,598.15 | 29,110.28 | 2,641,240.25 | | 1,555,250.20 | | 1,800.30 | | 15,900.10 | | 3,000 | 65 | 66,850.1.7 | | 42,210.1.5 | | 30,720 | | |
| Hancock | 10 | 18,100.30 | | 1,192,800.21 | | 1,694,700.20 | | 4,200.24 | | 40,320.10 | | 5,200 | 90 | 76,500.1.8 | | 39,430.1.5 | | 23,170 | | |
| Hardin | 16 | 1,600.13 | 32,110.24 | 2,531,680.23 | | 1,448,750.16 | | 2,400.25 | | 34,250.9 | | 430 | 81 | 96,390.1.6 | | 39,950.1.6 | | 25,290 | | |
| Harrison | 22 | 57,800.12 | 278,530.31 | 3,941,650.24 | | 588,240.15 | | 13,650.30 | | 70,500 | | | 65 | 87,750.2.0 | | 42,340.1.3 | | 15,660 | | |
| Henry | 24 | 28,392.11 | 34 | 2,428,620.21 | | 506,610.20 | | 30,400.25 | | 13,000 | | | 83 | 48,300.1.8 | | 45,450.1.0 | | 100 | | |
| Howard | 16 | 736.14 | 11,960.27 | 1,104,480.22 | | 1,125,520.20 | | 6,500.25 | | 194,500.12 | | 99,240 | 65 | 50,050.1.5 | | 44,720.1.2 | | 13,400 | | |
| Humboldt | 14 | 42,700.30 | | 2,029,000.31 | | 1,869,630.20 | | 2,300.30 | | 27,900.10 | | 2,700 | 120 | 89,400.1.4 | | 41,910.1.2 | | 18,690 | | |
| Ida | 15 | 3,780.13 | 83,670.26 | 2,105,740.25 | | 968,500.20 | | 800.28 | | 220,080 | | | 96 | 90,240.1.4 | | 36,790.1.1 | | 3,800 | | |
| Iowa | 20 | 7,430.15 | 19,260.32 | 2,883,440.23 | | 917,200.20 | | 10,400.22 | | 54,780 | | | 70 | 94,500.1.5 | | 72,550.1.2 | | 300 | | |
| Jackson | 15 | 5,235.12 | 14,760.33 | 2,232,440.24 | | 761,320.20 | | 2,300.26 | | 173,940 | | | 95 | 116,850.1.8 | | 113,390.1.5 | | 2,710 | | |
| Jasper | 18 | 7,560.14 | 56,280.30 | 2,521,680.23 | | 1,588,870.15 | | 2,800.26 | | 43,690 | | | 80 | 107,200.1.5 | | 69,430.1.5 | | 3,400 | | |
| Jefferson | 19 | 37,069.15 | 1,560.35 | 2,005,800.25 | | 590,230.17 | | 23,240 | | 16,640 | | | 91 | 54,600.1.5 | | 30,570.1.5 | | 60 | | |
| Johnson | 22 | 5,434.15 | 12,450.33 | 3,415,170.26 | | 1,231,100.15 | | 21,900.30 | | 142,500 | | | 80 | 105,300.1.5 | | 78,990.1.0 | | 1,920 | | |
| Jones | 20 | 760.14 | 4,900.33 | 2,408,720.26 | | 750,100.19 | | 14,250.30 | | 221,100 | | | 100 | 118,000.1.7 | | 87,800.1.0 | | 880 | | |
| Keokuk | 20 | 17,350.15 | 9,600.35 | 3,106,250.26 | | 917,020.18 | | 16,200.25 | | 54,750 | | | 85 | 74,700.1.8 | | 89,850.1.2 | | 310 | | |
| Kossuth | 12 | 50,620.25 | 2,617,500.23 | | 2,654,660.16 | | 6,560.26 | | 65,530.10 | 14,200 | | | 70 | 109,900.1.2 | | 41,420.1.3 | | 76,660 | | |
| Lee | 23 | 213,501 | 35 | 1,829,450.28 | | 600,880.19 | | 59,280.25 | | 1,750 | | | 82 | 113,160.1.8 | | 79,930.1.2 | | 3,710 | | |
| Linn | 20 | 1,320.13 | 9,490.30 | 3,851,500.24 | | 1,165,160.20 | | 15,600.30 | | 38,700 | | | 75 | 144,000.1.5 | | 65,070.1.3 | | 7,500 | | |
| Louis | 18 | 29,256.14 | 1,120.35 | 2,017,450.25 | | 599,000.16 | | 30,720.22 | | 11,220 | | | 75 | 44,250.1.8 | | 33,140.1.5 | | 830 | | |
| Lucas | 17 | 13,566.15 | 750.33 | 1,522,620.23 | | 303,140.16 | | 8,640.20 | | 2,300 | | | 72 | 25,320.1.4 | | 37,400.1.0 | | 780 | | |
| Lyon | 16 | 4,064.14 | 119,000.24 | 2,064,240.21 | | 1,776,050.18 | | 1,980.22 | | 80,680 | | | 68 | 133,280.1.5 | | 25,680.1.5 | | 16,860 | | |
| Madison | 20 | 6,720.15 | 14,100.33 | 2,832,710.22 | | 517,440.15 | | 490.25 | | 85,290 | | | 75 | 47,300.1.4 | | 57,710.1.3 | | 28,870 | | |
| Manaska | 21 | 13,755.14 | 12,460.32 | 2,591,680.23 | | 6,145,630.15 | | 8,140.30 | | 16,500 | | | 70 | 72,000.1.5 | | 53,690.1.2 | | 1,360 | | |
| Marion | 20 | 3,650.15 | 34,650.30 | 2,946,900.31 | | 1,677,410.18 | | 7,650.24 | | 58,680 | | | 90 | 64,800.1.3 | | 45,670.1.0 | | 800 | | |
| Marshall | 20 | 6,660.15 | 34,650.30 | 2,946,900.31 | | 1,677,410.18 | | 6,840.23 | | 33,340 | | | 98 | 148,960.1.5 | | 55,450.1.5 | | 1,340 | | |
| Mills | 24 | 34,704.13 | 63,030.30 | 2,635,500.23 | | 2,774,880.16 | | 7,740.20 | | 17,880.10 | | | 70 | 54,600.1.5 | | 30,570.1.5 | | 7,660 | | |
| Mitchell | 16 | 162,672.11 | 111,760.28 | 3,381,080.30 | | 1,772,750.16 | | 3,360.24 | | 173,760.11 | | 86,460 | 72 | 91,440.1.5 | | 42,310.1.5 | | 4,290 | | |
| Monona | 16 | 162,672.11 | 111,760.28 | 3,381,080.30 | | 1,772,750.16 | | 3,360.24 | | 173,760.11 | | 86,460 | 72 | 91,440.1.5 | | 42,310.1.5 | | 4,290 | | |
| Monroe | 18 | 25,632.15 | 600.30 | 1,088,690.19 | | 177,460.15 | | 4,800.20 | | 5,900 | | | 80 | 46,280.1.2 | | 39,430.1.0 | | 130 | | |
| Montgomery | 20 | 49,080.14 | 121,840.35 | 3,204,250.23 | | 415,610.20 | | 1,400.35 | | 42,000 | | | 90 | 60,300.1.8 | | 52,410.2.0 | | 2,220 | | |
| Muscatine | 22 | 21,186.15 | 12,300.32 | 2,069,120.22 | | 455,180.18 | | 41,140.24 | | 214,560 | | | 73 | 161,330.1.8 | | 44,120.1.5 | | 2,490 | | |
| O'Brien | 15 | 1,860.10 | 30,500.28 | 2,032,520.25 | | 1,541,250.15 | | 1,650.30 | | 393,300.8 | | 1,520 | 115 | 146,300.1.9 | | 51,540.1.8 | | 21,540 | | |
| Oseola | 12 | 240,840.27 | 1,283,850.28 | | 1,967,560.16 | | 3,840.24 | | 249,040.9 | 8,190 | | | 85 | 49,400.1.5 | | 27,240.1.3 | | 12,190 | | |
| Page | 24 | 151,080.12 | 54,720.34 | 3,561,840.22 | | 431,890.18 | | 11,790.30 | | 41,700 | | | 90 | 84,700.1.3 | | 40,860.1.5 | | 6,860 | | |
| Palo Alto | 15 | 10,900.22 | 1,260,820.23 | | 1,310,080.12 | | 720.24 | | 16,560.8 | 6,080 | | | 100 | 122,000.1.5 | | 21,430.1.0 | | 31,800 | | |
| Plymouth | 18 | 36,864.11 | 484,550.28 | 4,712,680.25 | | 2,060,500.15 | | 2,570.23 | | 241,720.9 | | 3,690 | 65 | 136,500.1.5 | | 40,530.1.5 | | 37,170 | | |
| Pocahontas | 16 | 6,120.20 | 1,715,200.22 | | 1,730,740.19 | | 5,760.25 | | 11,750 | | | | 85 | 96,700.1.5 | | 25,170.1.2 | | 32,570 | | |
| Polk | 16 | 13,248.13 | 15,330.32 | 3,014,720.22 | | 746,280.18 | | 5,760.25 | | 11,750 | | | 75 | 135,750.1.5 | | 40,860.1.2 | | 8,340 | | |
| Pottawattamie | 17 | 17,240.11 | 211,310.32 | 5,918,080.20 | | 904,800.15 | | 4,050.30 | | 62,400 | | | 88 | 241,120.1.5 | | 65,530.1.3 | | 15,050 | | |
| Poweshiek | 18 | 414.15 | 17,100.32 | 3,135,040.25 | | 1,066,250.15 | | 2,850.27 | | 108,270 | | | 80 | 78,400.1.9 | | 82,180.1.5 | | 3,440 | | |
| Ringgold | 19 | 13,880.16 | 640.33 | 2,091,210.25 | | 495,500.20 | | 5,800.30 | | 4,800 | | | 78 | 32,760.1.4 | | 69,520.1.2 | | 420 | | |
| Sac | 20 | 2,200.12 | 36,720.30 | 3,385,300.26 | | 1,640,240.17 | | 850.31 | | 163,560.9 | | 1,430 | 85 | 90,860.1.5 | | 30,120.1.5 | | 20,750 | | |
| Scott | 21 | 27,227.13 | 29,720.32 | 2,464,320.21 | | 569,880.14 | | 17,080.22 | | 648,500 | | | 80 | 507,200.2.0 | | 73,430.1.5 | | 7,630 | | |
| Shelby | 18 | 3,280.12 | 182,880.31 | 3,676,000.25 | | 1,088,250.15 | | 1,650.23 | | 161,460 | | | 78 | 99,060.1.4 | | 32,790.1.2 | | 7,740 | | |
| Sioux | 22 | 20,614.14 | 449,680.32 | 4,589,720.30 | | 2,294,400.16 | | 1,500.35 | | 711,850.9 | | 1,080 | 85 | 133,880.2.6 | | 46,920.1.5 | | 30,120 | | |
| Story | 16 | 3,184.12 | 7,440.30 | 3,141,360.22 | | 1,102,640.17 | | 4,550.23 | | 19,560 | | | 75 | 61,500.1.5 | | 42,970.1.2 | | 15,460 | | |
| Tama | 20 | 440.12 | 30,240.31 | 3,339,150.26 | | 1,421,680.20 | | 8,000.25 | | 37,400 | | | 92 | 169,200.1.5 | | 77,050.1.0 | | 4,580 | | |
| Taylor | 22 | 50,798.11 | 2,690.33 | 2,549,910.23 | | 280,500.16 | | 11,360.30 | | 37,400 | | | 82 | 56,120.1.7 | | 76,020.1.2 | | 1,810 | | |
| Union | 16 | 4,900.12 | 1,080.35 | 1,802,200.26 | | 423,540.16 | | 1,760.24 | | 10,560 | | | 98 | 62,720.1.2 | | 42,970.1.0 | | 1,220 | | |
| Van Buren | 17 | 36,882.13 | 32 | 1,555,520.22 | | 414,280.12 | | 22,200 | | 21,900 | | | 60 | 29,400.1.5 | | 61,000.1.0 | | 210 | | |
| Wapello | 20 | 34,840.12 | 960.30 | 1,531,500.22 | | 389,190.16 | | 16,480.25 | | 15,180 | | | 80 | 65,600.1.5 | | 45,750.1.5 | | 30 | | |
| Warren | 21 | 19,488.14 | 13,880.30 | 2,864,600.18 | | 455,040.16 | | 6,560.22 | | 26,840 | | | 60 | 61,800.1.6 | | 70,840.1.2 | | 1,740 | | |
| Washington | 18 | 18,540.12 | 2,760.32 | 2,681,280.23 | | 928,970.16 | | 11,040.30 | | 43,800 | | | 80 | 54,400.1.6 | | 62,300.1.5 | | 160 | | |
| Wayne | 20 | 7,960.13 | 33 | 2,349,000.25 | | 563,500.15 | | 4,650 | | 2,520.25 | | | 100 | 51,000.1.5 | | 39,190.1.5 | | 4,630 | | |
| Webster | 15 | 48,960.22 | 3,148,960.27 | | 2,040,740.18 | | 2,520.25 | | 2,520.25 | | | | 90 | 104,400.2.0 | | 44,760.1.5 | | 32,490 | | |
| Winnebago | 12 | 48,960.22 | 1,074,400.23 | 1,058,000.15 | | 1,260.24 | | 36,480.9 | | 16,290 | | | 80 | 47,600.1.5 | | 22,120.1.0 | | 19,370 | | |
| Winneke | 16 | 7,812.13 | 41,210.22 | 1,454,640.20 | | 1,423 | | | | | | | | | | | | | | |