

The present prospect is for about 10 per cent of a full crop, which would indicate about 15,000,000 bushels. In 1911 the State harvested, in round numbers, 60,000,000 bushels; in 1901, 43,000,000 bushels; and even in 1874, when the crop was the least of any year since 1868, there were 16,000,000 bushels, as shown by the reports of the Kansas State Board of Agriculture. In about half the counties of the State the crop is reported a complete failure. Practically the only fields that will produce enough corn to be worth husking are those in the lowlands. An unusual amount of corn was cut and stored in silos, which will help materially toward relieving the shortage of stock feed this winter.

THE HAY CROP.

The damage to wild or prairie hay varies from about 50 per cent in the eastern counties to a total failure in the southwestern, though a few favored counties report the usual crop. Alfalfa seems to have stood the drought better, and in the eastern half of the State from two to three cuttings were generally obtained. The usual number in that part varies from four to five cuttings. In the western half there were one or two cuttings, the first being generally extra heavy and of good quality, and a fine seed crop later in the summer has compensated in a large measure for the deficiency in hay.

DAMAGE TO VEGETABLES.

The vegetable crop, with the exception of early potatoes and a few other early vegetables, was practically a failure except in the few places where it was irrigated. Early potatoes made about half a crop.

THE WHEAT CROP.

Over the eastern half of the State the drought began too late to damage wheat. In the western, and especially the southwestern portion, wheat was badly damaged. In some counties there was less than 50 per cent of a crop, and a few counties along the Colorado line raised no wheat at all.

PROSPECT FOR STOCK FEED NEXT WINTER.

In nearly every county of the State it is reported that stock feed was never before so scarce at this time of the year. In the northwestern part of the State, however, feed is more plentiful than in either 1901 or 1911. There has been an unprecedented movement of cattle to the eastern markets, which will result in a marked scarcity of beef cattle for the next year or two. About three-fourths of the counties report that, with the number of cattle already shipped out and the increased use of corn for ensilage, they will have enough feed to carry their stock through the winter, though in many instances it will be necessary to use forage that is not desirable.

EFFECT ON WATER SUPPLY.

It is generally reported that the drought caused stock water to be scarcer than it ever was before, except in the western counties and those along the Arkansas River east to Sedwick County, where there is an inexhaustible supply of underground water—the "underflow," as it is commonly called. Creeks and small lakes are dried up that were never before known to be dry. Only a few reports

state that the water supply was lower in 1860 or 1901. In some of the larger cities, notable among which is Topeka, ample provision had been made for a supply of water that was sufficient for all purposes, but individual farmers and smaller towns in the eastern half of the State experienced much difficulty in obtaining sufficient water. In several instances it was necessary to ship the water supply for whole towns in tank cars, and to make this possible the State utilities commission put into effect emergency rates on water. The Rock Island Railroad was compelled to haul 18 tank cars—180,000 gallons—of water daily from the Kansas River at Topeka to supply its shops at Horton, a distance of 45 miles. It also found it necessary to haul water in tank cars for steam purposes at Pawnee, Sabetha, Prairie View, Herington, and Caldwell, though these hauls were shorter than the one from Topeka to Horton.

EFFECT OF THE DROUGHT ON PEOPLE GENERALLY.

The health of the people in the State was so much better than would have been expected from such extreme weather conditions as to cause considerable comment. Only 17 deaths from the direct effects of the heat were reported to the State board of health during June and July, as against eight in the corresponding months last year; and the report for August, while not yet complete, will not show much more of an excess over the corresponding number for August last year. The prolonged period of hot days and uncomfortably warm nights was debilitating, but not in the degree that might have been expected from the temperatures that occurred. There was considerably more than the usual summer travel to cooler climates, and the railroads report the heaviest summer passenger business they ever had. The work that was to be performed during the summer went on with almost the usual energy, though there was a general feeling of depression, due mostly to the knowledge that the continued drought was ruining the crops, upon which the prosperity of the State depends almost entirely.

THE DROUGHT OF 1913 AT CONCORDIA, KANS.

By J. W. BYRAM, Observer.

The summer of 1913 was remarkable on account of the intense thermal conditions and extraordinary drought which overspread this section. This drought was a continuation of the general deficiency in precipitation which began in January, 1910.

Thunderstorms on June 4, 5, and 6, 1913, were attended by 2.01 inches of rain. From June 7 to 30, inclusive, no rain, other than local showers on the 19th, 21st, and 30th, occurred.

On May 31 the precipitation for the year 1913 to that date was 0.35 of an inch in excess of the normal, and the rain of June 4, 5, and 6—2.01 inches—increased the departure to +1.40 inches. The rains of June 19, 21, and 30 amounted to 0.75 of an inch, a deficiency of 3.26 inches during the 24-day period June 7 to 30, inclusive. So, for purposes of this report, the drought of 1913 will be considered as having its inception June 7 and ending September 8, when rains and cooler weather materially changed the outlook and modified to some extent the effects of the most disastrous period of heat and drought in the history of north-central Kansas.

JUNE, 1913.

The month, while dry, was fairly pleasant. The mean temperature, 75.2°, was 2.5° above normal. The highest temperature, 99°, occurred on the 26th, and readings of 90° or more obtained on 12 days. Hot but not destructive winds occurred on the 20th and 27th. The rainfall, 2.76 inches, was 2.21 inches less than the normal; and as 2.01 inches fell on the 4th, 5th, and 6th, the greater portion of the month was decidedly droughty. Showers and cool, droughty weather marked the close of the month.

JULY, 1913.

The month was hot and dry, the total precipitation, 0.15 of an inch, being 3.47 inches less than the normal. This is the least amount of rainfall ever recorded at this station during any July, the previous driest July being that of 1890, with a rainfall of 0.23 of an inch. The mean temperature for the month, 83.2°, was 5.1° above the normal, and temperatures above the normal were recorded from the 1st to the 9th, 13th to 18th, and 26th to 30th. The maximum temperature was 90°, or above, on 26 days; 95°, or above, on 18 days; 100°, or above, on 13 days; 105°, or above, on 6 days; and 110° on 1 day.

From the 13th to the 17th, the maximum temperature readings ranged from 101° to 110°, and the average maximum for the 5-day period was 107°. The culmination of the heated period occurred during the afternoon of the 14th, when the temperature attained a maximum of 110°.

The monthly mean relative humidity, 47 per cent. was 19 per cent less than the July normal, and the 7 p. m. mean, 29 per cent, was 24 per cent less than the average. The lowest recorded during the month was 13 per cent, at 7 p. m. of the 16th, and percentages of 20 per cent, or less, occurred on the 7th, 15th, 16th, 17th, and 22d.

AUGUST, 1913.

The rainfall during the month was 0.30 of an inch, a deficiency of 2.51 inches compared with the normal. This is likewise the least rainfall ever recorded at this station during any August. The previous dry August was that of 1909, when the rainfall amounted to 0.37 of an inch.

The mean temperature for the month was 85°, an excess of 8.5° compared with the normal. Temperatures slightly below the normal were recorded on the 1st, 2d, and 22d. The maximum temperature was 90°, or above, on 29 days; 95°, or above, on 27 days; 100°, or above, on 21 days; and 105°, or above, on 6 days. The mean of the daily maximum temperatures was 101°, the highest ever obtained at this station, being 1° higher than the mean maximum for July, 1901.

A temperature of 107° was attained on the 5th, 8th, and 27th; this is the highest ever recorded at this station during any August. The mean relative humidity for the month, 42 per cent, was 25 per cent below the 25-year average, and the afternoon mean, 25 per cent, was 30 per cent below the normal.

SEPTEMBER, 1913.

Hot, dry weather continued during the first 7 days of the month. The maximum temperature was 99° on the 1st, 2d, and 3d; 100° on the 4th, 102° on the 5th, 103° on the 6th, and 100° on the 7th. Light rains and lower

temperatures occurred on the 8th, 9th, and 10th, and the drought of 1913 passed into history.

Many wells in this city and county failed during the drought, but the main wells of the city water system contained an ample supply for all purposes during the entire summer.

The bed of the Republican River has been dry and dusty since the first decade in August.

It is not believed that any loss of life can be attributed to the heat of the summer, but there were many cases of illness due to the debilitating effect of the long periods of terrific heat.

All farm work was necessarily suspended during the periods of extreme heat, but the care taken of the stock was such that no loss occurred. Fruit and garden truck were complete failures, the hay crop cut about 50 per cent, and potatoes were damaged 85 per cent. The corn crop was practically destroyed. The most conservative estimates place the loss at 96 to 98 per cent. In 1894 the corn was damaged 75 per cent, and in 1895 the loss was 65 per cent.

NOTES ON THE DROUGHTS AND HOT WEATHER DURING THE SPRING AND SUMMER OF 1913 IN THE VICINITY OF DODGE CITY, KANS.

By H. MCP. BALDWIN, Observer.

There have been two droughts in this vicinity since March 1, 1913, the first drought beginning the latter part of April and continuing throughout May. The second began June 14 and continued until September 8, when a heavy rain began falling over Ford County.

During the first drought winter wheat, the principal crop of this section, was seriously injured. This crop, which had withstood the rather dry weather that had prevailed during a greater portion of the preceding fall and winter and which promised an average yield, if not better, when the drought set in, was one of the poorest that has been harvested, three-fourths of it having been destroyed by the dry weather and hot winds. The money value of the injured wheat in this county is generally considered to be about one and a half million dollars. The total precipitation during the first drought was 0.81 inch, or only 22 per cent of the normal. During the same period there was an excess of 141° in the temperature, with extremely hot weather during the last four days of May, the daily excess ranging from 9° to 14°.

Winds of 30 miles or higher were experienced on April 29 and 30, May 1, 2, 13, 17, and 19, and were accompanied by generally abnormally high temperatures.

During the second drought, which continued 86 days, the total precipitation was 1.68 inches, or 19 per cent of the normal. The greatest 24-hour rainfall during July was only 0.26 inch, which was not sufficient to be of any material benefit, and there was no rain in August sufficiently heavy to relieve to any appreciable extent the protracted drought. The average mean temperature for June, July, and August was 78.5°, only 0.7° lower than the average for the same months in 1901, the hottest summer in the history of the station. There never was a hotter month in this vicinity than August of the present year, the mean temperature for the month, 82.4°, equaling the highest mean temperature of July, which occurred in 1890 and 1901. From June 14 to September 8, inclusive, there were 66 days with a temperature of 90° or higher and 17 days with a temperature of 100° or higher. Compared with other dry seasons, there were more days