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7-11-1936

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Weaver, J. E., "Reports From "Drought Front" Tell State or Vegetation" (1936). *Agronomy & Horticulture -- Faculty Publications*. 497.

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AGRICULTURE

Reports From "Drought Front" Tell State of Vegetation

"Bad Water," "No Grass—Not Even Russian Thistles," "Wheat Shriveled, Corn Now in Danger"—So Replies Run

TO OBTAIN really authentic information about the drought and its effects on both agriculture and natural vegetation, Science Service asked five scientists—ecologists and agronomists—in the five states from North Dakota to Oklahoma for brief summary statements of conditions as they saw them and received reports. Following are their answers, as of the first days in July.

By PROF. L. R. WALDRON, Agronomist, North Dakota Agricultural College

THE SOUTHWESTERN half of North Dakota, which carried above one million animal units in 1935, is now nearly devoid of feed.

This same area, with 63 per cent of its acreage a total failure and the balance

with very low yields in 1934, suffered heavy stem-rust loss to wheat last year, and this year faces practically total failure.

Most of the remainder of the state is in bad condition, with total failures almost certain in large areas. Only a few inches of soil was moist this spring and this was rapidly taken by the growing crop and high temperatures. The short growing season precludes growing very late-sown catch crops, such as the sorghums, and these depend upon rain.

The wheat and flax crops of the state furnish nearly all of the cash crop income. Flax will suffer more than wheat. Corn is holding out well in areas, but this crop is grown mainly in the drier southern area. Water supplies are in very serious condition. Bad quality of water is combined with scarcity.

Drought overshadows any threats of insects or plant diseases. Farming this spring was started on a shoestring, and another one must be supplied from Washington next year. The problem is very grave and no satisfactory solution seems at hand.

By PROF. S. P. SWENSON, Agronomist, South Dakota Agricultural College

THE AVERAGE June rainfall for the state this year was about two-tenths of an inch, most of it in the east central and southeastern sections. Small grain is ruined, except that in the extreme east central and southeastern areas. Corn crop prospects are good within a slightly larger area, but need rain soon.

The forage situation is acute except in the east central and southeastern counties. There is no grass or legume forage in the stricken areas—not even Russian thistles west of Huron.

Livestock numbers on ranges are about as high as before the 1933 drought shipment. The cattle must be sold, moved, or depend on relief feed for the remainder of the year.

It is too dry for emergency forage crops. Farmers have been advised to cut all vegetation for roughage. Most areas are dependent on shipping in feed. Some localities have a little hay carried over from last year. Some ranchers are looking for pastures in other sections.

By PROF. J. E. WEAVER, Ecologist, University of Nebraska

DEVELOPMENT of the natural prairie vegetation is an excellent indicator of the intensity of drought.

The extreme drought of 1934 left many bare areas in the grasslands and all but swept away most of the least drought-resistant species. The dry early spring and later summer of 1935 witnessed great increases in needlegrass, western wheat grass, and the invasion of a host of weeds. The favorable spring of 1936 promoted an abundant growth and emphasized the great changes in the prairie flora.

Expectations of normal yields were decreased after June. During a month of very light rainfall, soil moisture has been reduced at all depths to six feet until the wilted grasses are now in a condition reached in early May during the great drought of 1934.

Scattered showers characteristic of drought years have modified conditions locally, but recent study shows that



DROUGHT BRINGS DESOLATION

The twin evils, drought and grasshoppers, have brought destruction such as this to farms in the Dakotas. Whole fields have been stripped of their crops, leaving the fields practically bare. Dust storms add to the horrors. Even the weeds along the fence have been destroyed. This is an official Government photograph taken for the Resettlement Administration by Carter.

lack of water in soil and subsoil is common from western Iowa across Kansas and Nebraska and eastern Colorado.

By **DIRECTOR L. E. CALL, Agronomist, Kansas Agricultural Experiment Station**

DROUGHT in Kansas is only now approaching a critical stage. Good rain during the fall of 1935 supplied subsoil moisture through central and eastern Kansas that carried the crops through the early spring months. Rainfall in May, especially heavy in central and western Kansas, supplied moisture that was needed to mature the wheat crop, to produce a good growth of native pasture grasses, and to assure good stands and early growth of row crops.

The crops have therefore passed through the month of June, which has been excessively hot and dry, without serious loss except to wheat and barley in the western sections of the state where these crops were immature and have suffered more from high temperatures than from drought.

General, well-distributed rains, followed by lower temperatures, would assure excellent crops of corn and sorghum. These crops, however, are now reaching a critical condition. A continuation of present high temperatures and drought will result in serious losses.

Crop production up to this time assures a less critical feed shortage than occurred in 1934. More grain has been produced, pastures are better, and row crops fully as promising. July and August rainfall will determine the production of these crops. It is not too late to produce an average crop in Kansas.

By **PROF. PAUL B. SEARS, Ecologist, University of Oklahoma**

PLANT life in a grassland region depends largely upon moisture stored in soil before the growing season begins. At the beginning of this growing season, the soil was drier than in many years, having been depleted by successive dry years.

In places the growing of alfalfa has had to be abandoned because it depletes soil moisture reserve even in favorable years. It will take more than one year of good rain to restore soil moisture reserves.

East of the short-grass area in Oklahoma, spring rains have favored wheat, but much of it was stunted and shriveled, and corn is now in danger. Along

the mountain front in Colorado, abundant snow insures irrigation and well-filled reservoirs this year.

Managers of large tracts agree that native grassland is their most dependable source of income, because it is adjusted to drought and other hazards. Extensive restoration of native grasses and restriction of field crops to areas of

favorable soil moisture should be good drought insurance.

Studies of weather records and tree rings here show that recurring groups of dry years are a normal phenomenon in grassland states, and must be taken into account in any permanent policy of land use.

Science News Letter, July 11, 1936

CLIMATOLOGY

U.S. Climate Not Changing— We Are Just in "Dry Phase"

By **J. B. KINCER, Chief of the Division of Climate and Crop Weather, U. S. Weather Bureau**

IT HAS been said that the usual weather is unusual; and the only trouble with our recent weather is that it has been more unusual than it usually is unusual.

The unusual happenings in recent years include these:

1. Extremely high summer temperatures.
2. Many warm winters, to be followed by an extremely severe one in 1935-1936.
3. Recent, unprecedented floods in the East.
4. Disastrous tornadoes in the South.
5. Three drought years, 1930, 1934, and 1936, establishing new records for dryness over large areas, all of which were of tremendous national significance.

Because of these things, many people have grown alarmed and express fear for the future.

We have weather records for more than 5,000 different localities in the United States, but unfortunately a very few are for periods as long as 100 years. Our longest records indicate that there has been no permanent change in climate. Rather, we are going through a dry phase of our normal climate.

Climate Doesn't Change

Climate is the general run, or sum total, of weather, and that sum total does not seem to be undergoing any fundamental changes. Weather is the phase of climate that we experience from day to day, from week to week, or even year to year. Therefore, as everyone knows from reading the Weather

Bureau forecasts, as published in every daily newspaper in the country, weather varies, often markedly, from day to day, due to vast changes in air mass movements.

When the run of weather conforms to the general climate of a region, that is, when it is about normal, it receives very little attention or discussion. But when it varies greatly from the normal in heat, cold, destructive floods, drought, and the like, it at once becomes of popular interest, and in some cases of national concern.

Now, we readily observe that different weather phases—warm, then cool; cloudy and rainy, then sunny and dry—follow one another at intervals usually counted in days or weeks: that is, at short intervals. This we call weather trends.

Dry, Warm Phase

There are climatic trends of a similar nature, the yardstick being years instead of days. In recent years, we have been going through a dry, warm phase of climate and unusually frequent drought is the result.

These up and down trends in rainfall make, when the record is smoothed, a wave-like pattern, but the length of the periods appears to be too irregular to justify a definite long-range forecast as to what will happen in the future. If records were available for a thousand years instead of from 50 to 100, we possibly could discover a definite law of succession.

The Bible, in the story of Joseph and the dreams of Pharaoh, gives us the first historical reference to this important characteristic of rainfall—the tendency of a number of successive years having comparatively heavy rains to be