

CLIMATOLOGICAL DATA FOR APRIL, 1913.

DISTRICT NO. 9, COLORADO VALLEY.

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GENERAL SUMMARY.

Of the important storms that crossed the country during April, the Colorado Basin contributed its usual share. In the district the storms were of two classes—those that originated in the middle portion of the Colorado Basin and those that first appeared as offshoots of depressions which came from the Pacific in the distant north and crossed the mountains where the Continental Divide is too low to form much of a barrier. These secondary depressions which had their beginning in the southern loops of northern depressions required several days to develop, but ultimately they became more important east of the mountains than the storms of which they were offshoots. In the district, however, the attending precipitation was local or generally light, and, except the storm at the beginning of the third decade, were not followed by severe temperature conditions. This storm on the morning of the 22d was in the form of a broad trough extending from Manitoba southwestward to northern Arizona, while high pressure overlay the north Pacific coast. Twelve hours later a secondary depression was central in southeastern Colorado, with loops extending westward to southern Utah. With the movement of the front of the high pressure southeastward during the next 24 hours, sharp falls in temperature occurred throughout the northern half of the district. On the morning of the 23d freezing temperatures were general in Wyoming, Utah, and Colorado, and by the following morning freezing weather had spread over the rest of the district, except southern Arizona and southwestern New Mexico. Timely warnings of approaching freezing temperatures were issued, affording growers opportunity to protect such fruits as were in advanced stages.

In western Wyoming and western Colorado temperatures averaged somewhat above the normal, but in the rest of the district a deficiency was general. The extremes of temperature did not vary materially from those common to April, except the minimum temperature in western Wyoming, which was higher than that which occurred in Colorado, Utah, and New Mexico. As a whole the precipitation was the least of any April in the past four years; the deficiency was marked in the northern drainage areas, while a slight excess occurred on the Mimbres and Gila areas in the extreme southern part of the Colorado Basin.

TEMPERATURE.

The monthly mean for the stations reporting was 51.2°, or 0.6° below the normal. The mean for April, 1912, was 46.8°. The highest monthly mean was 69.8°, at Yuma,

Ariz., and the lowest 23.6° at Corona, Colo. The first of the month and the last four days were warmer, and the 23d and 24th colder than the normal. During the rest of the month the departures from the normal were generally slight and for the most part negative. The highest temperatures occurred principally on the 27th, while the lowest occurred on the 24th and on a number of dates in the first half of the month. Zero temperature or lower occurred at one station in Utah and five in Colorado. The highest temperature was 100° at Maricopa and Quartzsite, Ariz., on the 27th, and the lowest, -12°, at Dillon, Colo. on the 11th.

Details of temperature are summarized in the following table:

Areas of States in District No. 9.	Temperature.					
	Mean.	Departure from normal.	Highest.	Station.	Lowest.	Station.
Western Wyoming.....	39.0	+3.3	76	Wamsutter...	9	Daniel.
Western Colorado.....	42.7	+0.4	87	Grand Valley...	-12	Dillon.
Eastern Utah.....	47.6	-0.9	87	2 stations.....	0	Strawberry Tunnel (east).
Western New Mexico...	49.0	-1.2	92	Rodeo.....	5	Haynes.
Arizona.....	58.3	-1.1	100	2 stations.....	10	Alpine.
Southeastern Nevada..	58.5	+5.3	93	Logan.....	20	Caliente.

PRECIPITATION.

The average for the stations reporting was 0.47 inch, or 0.24 inch below the normal. The average for April, 1912, was 0.94 inch. On the 2d-3d and 7th-9th precipitation occurred in the northern half of the district, while from the 17th to the 25th a wider distribution occurred, and practically all the precipitation of the month occurred during this period in New Mexico and Arizona. At no time, however, was the precipitation heavy, and a fall as much as 1 inch in a day occurred at only 1 station each in Colorado, New Mexico, and Arizona. The greatest monthly amount was 5.21 inches at Corona, Colo., while none occurred at 3 stations in eastern Utah and 6 in Arizona. Monthly snowfalls of 5 inches or more occurred at 3 stations in western Wyoming and 22 in western Colorado. The greatest monthly amount was 25 inches at Horsefly, Colo. The average number of days with 0.01 inch or more precipitation was 3 in western Wyoming, 5 in western Colorado, 1 each in eastern Utah and Arizona, and 2 each in western New Mexico and southeastern Nevada. For the district as a whole the average was 2 days.

The average precipitation and departures from the normal on the different watersheds are given in the following table:

Watershed.													
Green.		Grand.		San Juan.		Little Colorado.		Gila.		Mimbres.		Colorado proper.	
Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.
0.29	-0.57	0.81	-0.54	0.62	-0.55	0.27	-0.59	0.41	+0.02	0.35	+0.09	0.31	-0.13

MISCELLANEOUS.

The average amount of sunshine in percentages, with departures from the normal, was as follows: Grand Junction, 78, +9; Durango, 77, +5; Phoenix, 90, +3, and Yuma, 95, +1.

The relative humidity reported was: Grand Junction, 34, -12 per cent; Durango, 45, -6; Phoenix, 36, +3; and Yuma, 40, +2.

RIVERS.

In the Colorado stages were slightly above the normal, except near the Gulf of California. The breaking up of an ice gorge in the Grand on the 1st of the month carried away a bridge in course of construction near Radium. As usual at this time of year the fluctuations in the volume of water discharged followed closely the fluctuations in temperature.

DAMAGE BY FROST IN WESTERN COLORADO.

By E. S. NICHOLS, local forecaster, Grand Junction, Colo.

The only night during the month when the fruit in this district was in serious danger was that of the 23d. Warning of freezing temperature during the night was received

with the morning forecast from Denver on the 23d. As conditions shown on the morning weather map were very threatening, fruit growers were warned to prepare to smudge their orchards. The local forecast issued in the morning warned of temperatures several degrees below freezing at Grand Junction, Vineland, and Palisade; below 25° in the middle and lower Grand Valley; and below 20° in Delta and Montrose Counties and at Rifle. The temperatures that occurred were very close to the limits set. Apples were not sufficiently advanced, it was thought, to be materially injured in the middle and lower Grand Valley; so pears, which were in full bloom, were practically the only fruit smudged. However, on the following day it was found that apples had been damaged considerably, although generally sufficient were left to make a good crop.

The exceptional damage to apples at the temperatures that occurred (generally from 23° to 25°, although 21° occurred near Fruita) in the middle and lower Grand Valley was probably due to the extreme dryness of the air, the evening dew point at Grand Junction being only 3°. Extreme dryness during a freeze must be injurious to fruit buds and blossoms for the following reasons: First, the depression of the surface temperatures of the buds and blossoms is increased because cooling by radiation is rapid. Second, cooling by evaporation of moisture from the buds and blossoms is also rapid. These two effects may together produce a material depression below the air temperature. Third, the drying out of the buds and blossoms when they are thawing in the morning sunshine, and even during the night when they are still frozen, is especially rapid in very dry air. It seems likely that open blossoms are more easily killed than those "in the pink" just ready to open, not only because their tissues are more tender and their interiors are more exposed to low temperature, but also because drying out of the vital parts is more rapid.

Growers in this vicinity have heretofore been advised not to let temperatures get as low before smudging on dry nights as on ordinary ones; but more attention should be paid to moisture conditions in the future.

TABLE 1.—Climatological data for April, 1913. District No. 9—Continued.

Table with multiple columns: Stations, Counties, Elevation, Length of record, years, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, unmeasured), Sky (Number of rainy days, Number of clear days, Number of partly cloudy days, Number of cloudy days), Prevailing wind direction, and Observers. The table is organized into sections for Utah, New Mexico, and Arizona.

TABLE 2.—Daily precipitation for April, 1913. District No. 9—Continued.

Stations.	Watershed.	Day of month.																													Total.		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	
<i>Arizona—Continued.</i>																																	
Naco.....	San Pedro.....																						.17									0.17	
Natural Bridge.....	Verde.....																	T.					.95									0.95	
Oracle.....	San Pedro.....																					T.	.84									0.84	
Osborn.....	do.....																.07															0.07	
Paradise.....	Desert.....																					T.	.20	.01			T.					0.21	
Farker.....	Colorado.....																															0.00	
Payson.....	Verde.....																	.06				T.	.57	.02								0.65	
Phoenix.....	Salt.....																						.10	.41								0.51	
Phoenix (1).....	do.....																	T.														0.60	
Phoenix (2).....	do.....																							.56									0.56
Final Ranch §§.....	Gila.....																																
Pinedale.....	Little Colorado.....																	.12					.30									0.42	
Pinto.....	do.....																	.04					.45									0.49	
Prescott.....	Hassayampa.....																	T.					.08									0.08	
Prescott Dry Farm.....	Verde.....																	.07					.03									0.10	
Quartzsite.....	Colorado.....																						.30									0.30	
Redrock.....	Santa Cruz.....																																
Rice.....	Gila.....																					T.	.28	.06								0.34	
Roosevelt.....	Salt.....																						.66									0.66	
Sacaton.....	Gila.....																						.40									0.40	
St. Johns.....	Little Colorado.....																						.20									0.20	
St. Michaels.....	do.....																					T.	.12									0.37	
Salome.....	Colorado.....																																
San Simon.....	Gila.....																						T.	.15								0.15	
Seligman.....	Verde.....																	.25														0.25	
Sentinel.....	Gila.....																						.46									0.46	
Silverbell.....	Santa Cruz.....																						.25									0.25	
Snowflake.....	Little Colorado.....																						.20									0.20	
Springerville.....	do.....																						.09									0.09	
Supai.....	Colorado.....																						.22									0.22	
Tempe.....	Salt.....																															0.68	
Thatcher.....	Gila.....																						T.	.27	.02							0.29	
Tombstone.....	San Pedro.....																							.09									0.09
Truxton.....	Colorado.....																																
Tuba.....	Little Colorado.....																															0.28	
Tucson.....	Santa Cruz.....																							.70									0.70
Tucson (1).....	do.....																						.60									0.60	
Tucson (2).....	do.....																						T.	.32								0.32	
Vail.....	do.....																															0.00	
Walnut Grove.....	Hassayampa.....																	.05							.30							0.35	
Wickenburg.....	do.....																						.01									0.68	
Willcox.....	Desert.....																						T.	.30								0.30	
Williams.....	Colorado.....																						.01									0.01	
Winslow.....	Little Colorado.....																						T.	.03								0.03	
Yuma.....	Colorado.....																						.02		.16							0.18	
Yuma (1).....	do.....																						.01		.14							0.15	
<i>Nevada.</i>																																	
Caliente.....	Colorado.....																																
Las Vegas.....	do.....																						T.	.25	.05							0.06	
Logan.....	do.....																						T.	.10	.12							0.30	

* Precipitation included in that of the next measurement.
 † Separate dates of falls not recorded.
 §§ Precipitation for the 24 hours ending on the morning when it is measured.
 T. Precipitation is less than 0.01 inch rain or melted snow.

TABLE 3.—Maximum and minimum temperatures for April, 1913. District No. 9, Colorado Valley.

Table with columns for Wyoming (Daniel, Green River), Colorado (Durango, Grand Junction, Gunnison, Meeker, Steamboat Springs), Utah (Emery, Hite, Moab, St. George, Fort Duchesne), and New Mexico (Bloomfield, Fort Bayard). Rows show daily temperature data from April 1 to 30, including maximum and minimum values for each location, and a means row at the bottom.

Table for Arizona and Nevada. Columns include Arizona (Bisbee, Flagstaff, Fort Apache, Grand Canyon, Parker, Phoenix, Prescott, St. Michaels, Tucson, Yuma) and Nevada (Logan). Rows show daily temperature data from April 1 to 30, including maximum and minimum values for each location, and a means row at the bottom.

*, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from the record. §§ Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs.