Consumptive Irrigation Requirements of Selected Irrigated Areas in New Mexico

Agricultural Experiment Station

in cooperation with

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Summary

The data in this bulletin (appendix tables 1 to 9) are intended to provide consumptive irrigation requirements for general planning purposes and to enable the user to approximate consumptive irrigation requirements of individual crops or the total consumptive irrigation requirement of a given cropping pattern. Except for New Mexico State Engineer hydrographic survey values, the individual consumptive irrigation requirement values of the appendix tables may tend to maximize the amounts required, because maximum growing seasons were generally used. In areas where more detailed and specific field information on local practices, cropping patterns, and other pertinent facts are available, such data should be given consideration in detailed estimates of water-use requirement for specific areas or projects.

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Consumptive Irrigation Requirements of Selected Irrigated Areas in New Mexico

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Agriculture in New Mexico utilizes a major portion of the state's water resources. In 1965, slightly more than a million acres (1,046,600 acres) were irrigated from surface water and groundwater sources (table 1). Irrigation of this acreage accounts for approximately 90 percent of the average annual depletion for beneficial uses of the state's surface and groundwater supplies (3).[3]

The arid nature of the state makes crop production more successful with irrigation than without. The large use of water by irrigation, relative to other uses, is of prime importance in a state with limited water supplies, such as New Mexico. There is a need for estimates of water requirements for irrigated crops not only as aggregates for the state but more particularly for every area within the state and for the crops grown in these areas. Knowledge of irrigation water requirements is necessary in planning conservation projects and for the full utilization of water supplies.

The purpose of this publication is to provide estimates of consumptive irrigation requirements for the major crops grown in most of the irrigated areas of the state and the requirements per acre for a selected cropping pattern in each area. The appendix tables (1 through 9) provide data on these requirements whether for use by the farmer in planning his irrigation program, the engineer in planning an irrigation project, or by others engaged in planning for water and related land resource use.

Nine major drainage systems, delineated by surface topography, are generally recognized in the state (figure 1). Information in this bulletin is organized by the drainage basin in which the irrigated areas lie. Location of irrigated lands within drainage basins is shown in figure 2. This figure also indicates source of irrigation water, *i.e.*, surface water, groundwater, or groundwater and surface water combined.

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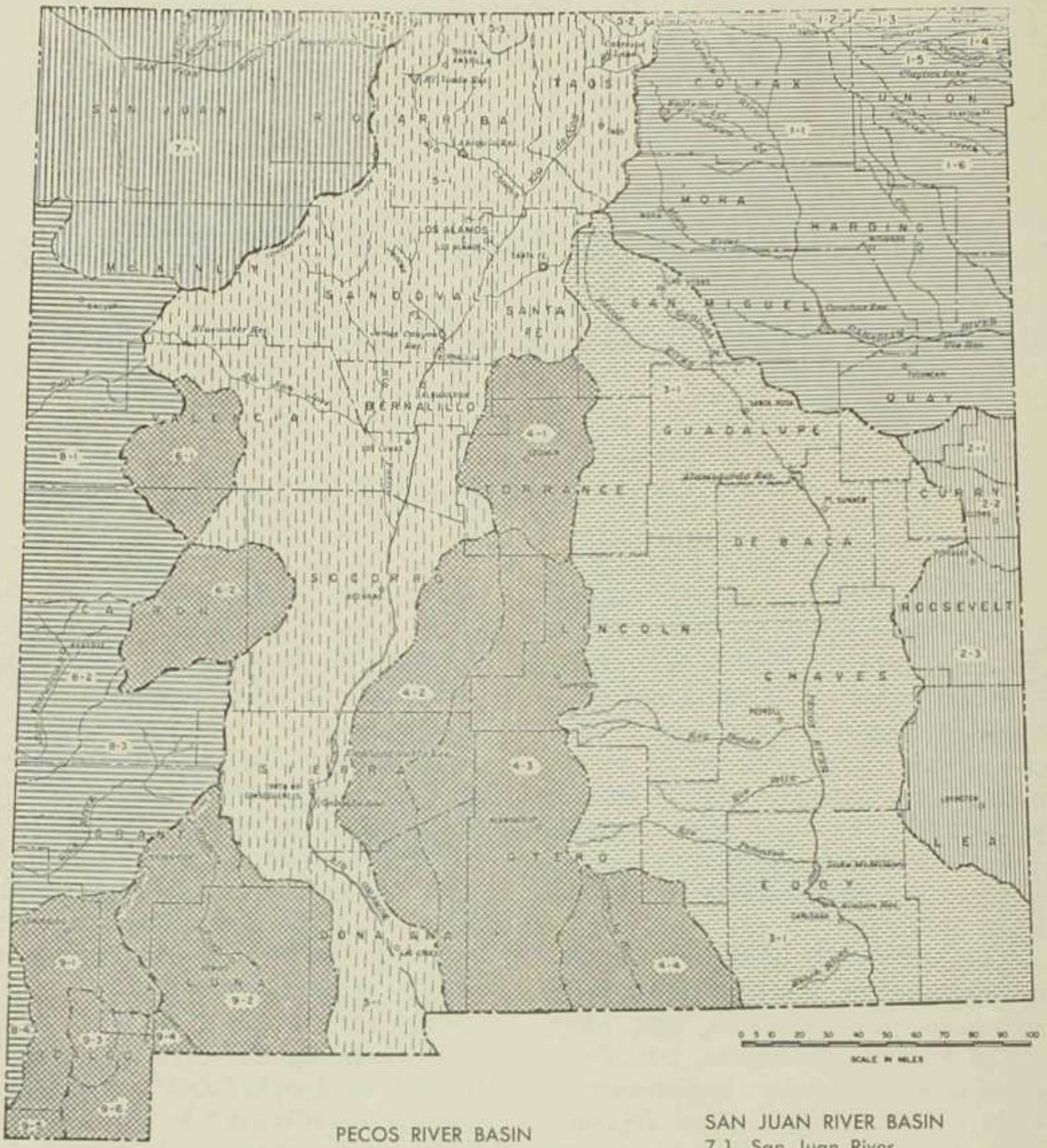
[2]Water Resource Engineer, New Mexico State Engineer Office.

[3]Numbers in parentheses refer to References Cited.

Fig. 1. Drainage basins of New Mexico



BASIN INDEX

ARKANSAS RIVER BASIN
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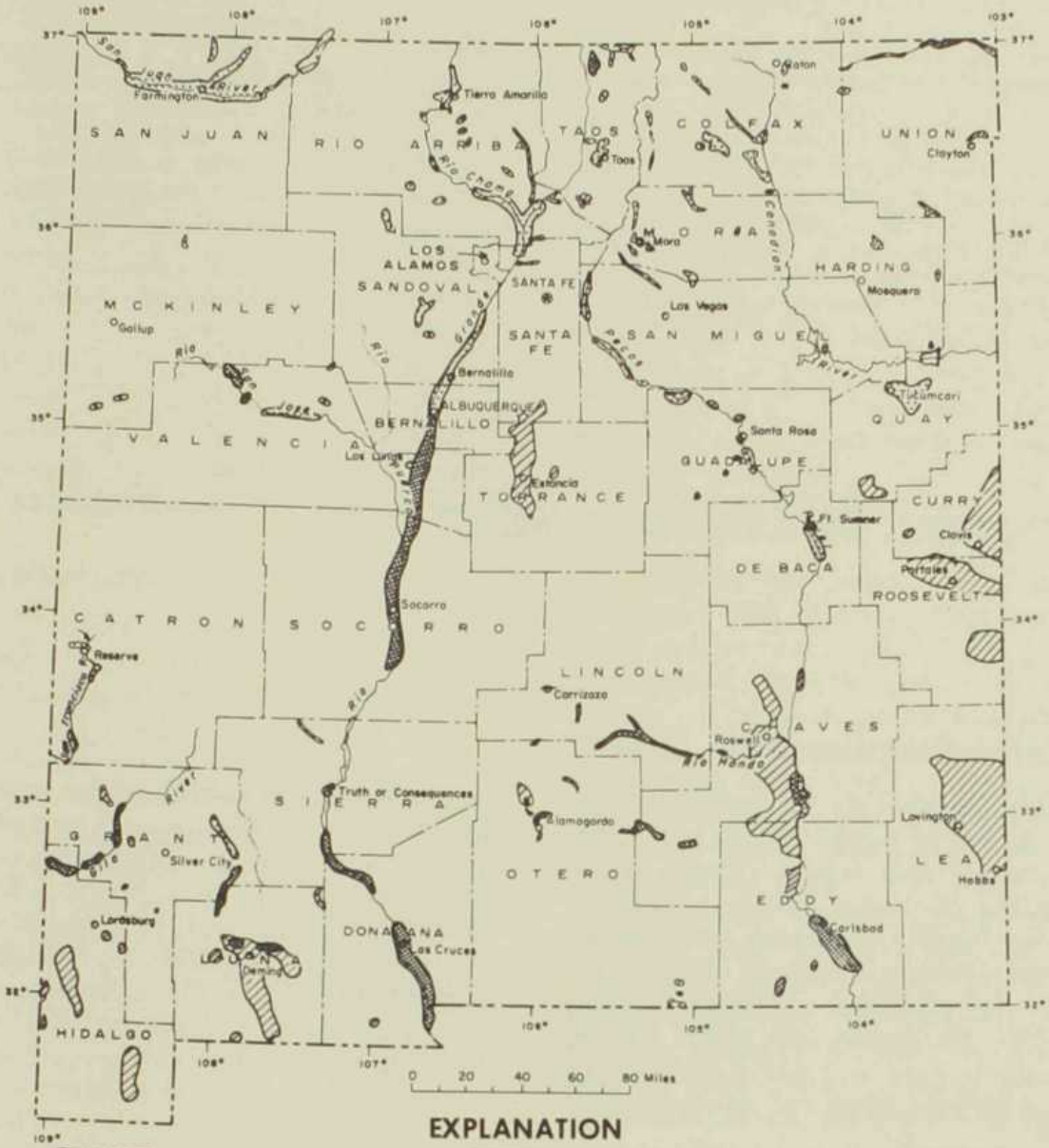
Source: New Mexico State Engineer (1966)

Fig. 2. Principal areas of irrigation in New Mexico



EXPLANATION

Areas irrigated with ground water

Areas irrigated with surface water

Areas irrigated with surface and ground water

Prepared by: U.S. Geological Survey

TABLE 1.—Acreage irrigated and source of water used in New Mexico, by drainage basins, 1965

Basin	Surface Water	Ground-water	Surface Water and Ground-water Combined	Total
	(acres)	(acres)	(acres)	(acres)
Arkansas River	84,500	13,300	300	98,100
Southern High Plains	0	329,000	0	329,000
Pecos River	29,600	125,900	38,400	193,900
Central Closed Basins	3,100	34,500	1,100	38,700
Rio Grande	119,700	18,100	109,900	247,700
Western Closed Basins	0	200	0	200
San Juan River	54,000	0	0	54,000
Lower Colorado River	8,600	4,100	5,900	18,600
Southwestern Closed Basins	300	65,100	1,000	66,400
Totals	299,800	590,200	156,600	1,046,600

Source: Data assembled by New Mexico State Engineer Office and Department of Agricultural Economics and Agricultural Business, NMSU Agricultural Experiment Station.

Water Supplies And Uses

The availability of water supplies or the use of these supplies is not discussed in this report. There are a number of studies which include information of this nature, and bibliographies from which more information can be obtained. Henderson and Stucky (3) summarize much of the available data on current land use in New Mexico. Hale and others (2) summarize the characteristics of the water supply in New Mexico and include an extensive selected bibliography for water resources in New Mexico. Reports for individual basins by the New Mexico State Engineer (5) include considerable detail on surface-water and ground-water supplies, uses of these supplies, and a bibliography for water resources in New Mexico.

Definition of Terms

The following definitions apply in this bulletin. They are quoted from Blaney and Hanson (1).

> *Consumptive use (evapotranspiration):* The unit amount of water used on a given area in transpiration, building of plant tissue, and evaporated from adjacent soil, water surface, snow, or intercepted precipitation in any specified time. Consumptive use may be expressed in volume per unit area such as acre-inches or acre-feet per acre, or simply in depth such as in inches or millimeters or feet.

Effective precipitation: Precipitation during the growing period of the crop that becomes available to help meet the consumptive water requirements of crops. . .

Consumptive irrigation requirement: The depth of irrigation water, exclusive of precipitation, stored soil moisture, or ground water, that is required consumptively for crop production.

Irrigation requirement: The quantity of water, exclusive of precipitation, that is required for crop production or the consumptive irrigation requirement divided by irrigation efficiency. . .

Irrigation efficiency: The percentage of irrigation water that is available for consumptive use. When the water is measured at the farm headgate it is called farm-irrigation efficiency; when measured at the field, it is designated as field-irrigation efficiency; and when measured at the point of diversion, it may be called project efficiency.

Procedure

Consumptive Use

The method used to compute consumptive irrigation requirements (CIR) was the Blaney-Criddle formula $U = KF$ where:

U = seasonal crop consumptive use

K = empirical crop consumptive-use coefficient for the growing period

F = sum of monthly consumptive-use factors for the growing period

R = sum of monthly effective rainfall for the growing period

CIR = consumptive irrigation requirement = $U-R$.

Blaney and Hanson (1) describe the Blaney-Criddle formula for computing consumptive-use requirements.

Blaney and Hanson provide data on consumptive use and consumptive irrigation requirements during the frost-free period[4] in most areas of the state for the major crops. Most perennial and some annual crops grow and use water outside the frost-free period. In some areas of the state, a pre-plant irrigation is applied for seed germination or seedbed preparation. In other areas of the state, specialty crops are grown. In this bulletin, the data of Blaney and Hanson are combined with additional material to provide the entire yearly consumptive irrigation requirements for major and specialty crops. The bulletin includes selected cropping patterns for major areas of irrigation and presents estimates of consumptive irrigation requirements for the selected cropping patterns.

[4]In Blaney and Hanson and in this report, frost-free period is considered to be the period between the average date of last occurrence of 32°F in the spring and the average date of first occurrence of 32°F in the fall for the period of record used.

Consumptive Irrigation Requirement

Consumptive irrigation requirements, both within and without the frost-free period, were estimated with the appropriate seasonal consumptive-use coefficient (K) from Blaney and Hanson (1), table 2. The length of the period of water use outside the frost-

TABLE 2.—Seasonal consumptive-use coefficients (K)* for irrigated crops in New Mexico

Crop	Normal Growing Season or Period	Consumptive-use Coefficient (K)	
		Frost-free period	Before and after frost-free period
Alfalfa	6 to 7 months	·0.85	0.50
Beans	3 months	.60	
Broomcorn	4 to 5 months	.70	
Cantaloupes	4 to 5 months	.65	
Carrots	4 months	.65	.40
Chile	5 months	.70	
Corn (grain)	4 months	.75	
Cotton	7 months	.62	.40#
Grain (small spring)	3 months	.70†	
Grain (small winter)	....	.70**	.35##
Grass-hay	6 to 7 months	.75	.50
Lettuce	....	.65	.40
Onions	....	.65	.40
Orchard (deciduous)	Between frosts	.65	.40
Pasture (improved mixed)	6 to 7 months	.75-.85	.50
Pasture (unimproved & vega)	6 to 7 months	.70-.75	.50
Peanuts	....	.70	
Pecans	Between frosts	.70	
Potatoes	....	.70	
Sorghum (grain)	4 to 5 months	.70	
Sugarbeets	6 months	.70	.40
Sweetpotatoes	....	.70	
Tomatoes	4 to 5 months	.70	

* $K = \frac{U}{F} = \frac{\text{Consumptive use}}{\text{Consumptive-use factor}}$ = consumptive-use coefficient.

\# Between pre-plant irrigation and planting date.

† Between planting and harvesting dates.

** Period March 1 to harvest date.

\#\# For months of Sept., Oct., Nov., Jan., and Feb.

Source: Blaney and Hanson (1).

free period was determined with a method described by the U.S. Department of Agriculture (7). The method utilizes mean air temperature at which various crops begin and cease to use moisture. Mean air temperatures at which the earliest and latest moisture uses generally occur are shown in table 3. The average dates of occurrence of these mean air temperatures at the various locations were used to determine length of water-using period outside the frost-free period.

In most instances, the water-use period within the frost-free period was obtained from data in appendix table 11. The table also shows areas where pre-plant irrigation is practiced.

For some annual crops, the growing season was established from data in table 3. In addition to mean air temperatures at which various crops

TABLE 3.—A guide for determining planting dates, maturity dates, and lengths of growing seasons as related to mean air temperature.

Crop	Earliest moisture-use or planting date as related to mean air temperature	Latest moisture-use or maturing date as related to mean air temperature	Growing-Season Days
Perennial Crops			
Alfalfa	50° mean temp.	28° frost	Variable
Grasses, cool	45° mean temp.	45° mean temp.	Variable
Orchards, decid.	50° mean temp.	45° mean temp.	Variable
Grapes	55° mean temp.	50° mean temp.	Variable
Annual Crops			
Beans, dry	60° mean temp.	32° frost	90 to 100
Corn	55° mean temp.	32° frost	140 Max.
Cotton	62° mean temp.[1]	32° frost	240 Max.
Grain, spring	40° mean temp.	32° frost	130 Max.
Potatoes, late	60° mean temp.	32° frost	130 Max.
Sorghum, grain	60° mean temp.	32° frost	130 Max.
Sugarbeets	28° frost	28° frost	180 Max.
Wheat, winter (Spring season)	32° frost		70 to Min.

[1] A previously published table (U.S. Department of Agriculture, 1964) gives a value of 60° for the mean air temperature for cotton. The former value (60°) was used in computations made for this bulletin.

Source: U.S. Department of Agriculture (6)

begin and cease to use moisture the table also shows the number of days required for maturity of some crops. For these crops, the length of growing season was assumed not to exceed the maximum growing-season days shown in table 3. Thus, the season for sorghums does not exceed 130 days; the season for corn does not exceed 140 days; the season for beans does not exceed 100 days; and other crops were handled in a similar fashion.

For uniformity, all pre-plant irrigations were assumed to be applied 15 days before the planting date. Table 2 lists a K of 0.40 for pre-plant irrigation of cotton, and review of other data indicates this value to be suitable for all crops requiring pre-plant irrigation; thus, a K of 0.40 was selected in computing the pre-plant irrigation water requirements.

Table 2 lists a range of coefficients for irrigated pasture. The value of the coefficient selected for pastures in this study was based on knowledge of conditions and types of pastures grown in the areas. In general, the more productive pastures were given the higher coefficients.

Blaney and Hanson (1) state that they determined the seasonal coefficients (K) (shown in table 2) for irrigated crops grown in New Mexico under normal conditions on the bases of observed temperatures, percentage of daylight hours, and measurements of consumptive use. The coefficients were computed by the formula $K = U/F$ and adjusted, where necessary, after data were analysed. The coefficients are based on the assumptions that the crops receive a full water supply throughout the growing season, and

that the fertility, crop vigor, crop stand, and management are average. Blaney and Hanson note that research on consumptive use continues and the results of such research may refine the coefficients.

Mean Air Temperature

A person needs to know the average date of occurrence for various mean air temperatures in a given area to use the information found in table 3. These dates were obtained from records of U.S. Weather Bureau stations as selected for each irrigated area (8, 9). The mean monthly air temperatures at each station were plotted on a graph with temperature on the vertical axis and months and days of the year on the horizonal axis. Lines were drawn to connect the plotted points. The date of occurrence of a given mean air temperature may be found by projecting vertically the intersection of a given temperature and connecting line to the horizontal axis. The horizontal axis shows the month and day of occurrence of that temperature. The average dates determined for selected U. S. Weather Bureau stations and used in this study are shown in appendix table 10.

Computed Consumptive Irrigation Requirements

Irrigation in New Mexico is practiced in scattered areas throughout the state and its basins. The general location of most of these areas is shown in figure 2. Appendix tables 1 to 9 include computed CIR for major crops grown in most of the state's irrigated areas. Appendix table numbers correspond to appropriate basin numbers in figure 1.

Consumptive irrigation requirements are based on the formula CIR = U—R and only values for CIR are shown in the appendix tables. No attempt was made to compute irrigation requirements, which reflect irrigation efficiencies.

Explanation Of Appendix Tables

CIR was computed for water required within the frost-free period, for growth requirements outside the frost-free period, and for pre-plant irrigation requirements where appropriate. In appendix tables 1 to 9, values for CIR are shown in tabular form, under the headings, "Frost-free," "Other," and "Total." When only one entry is shown (under "Total"), it is the amount required for the crop within the frost-free period (32° F spring to 32° F fall). When water requirements for growth outside the frost-free period or for pre-plant irrigation exist, these requirements are shown as "Other." In these instances, CIR for the frost-free period is shown under "Frost-free," and the sum of the two amounts is then shown as "Total" CIR for the crop. An exception is the computations for small grains which have a requirement for growth outside the frost-free period; these requirements are not stated separately, but both are included in the total CIR.

In the "Other" column of appendix tables 1 to 9, CIR for pre-plant irriga-

tion is identified with a double asterisk (**). Other values in this column indicate CIR for crops using water outside the frost-free period.

In areas where hydrographic surveys have been made by the New Mexico State Engineer Office, the cropping patterns and values of CIR computed for the areas and published in hydrographic survey reports are used in appendix tables 1 to 9. Computed values of CIR in these instances are based on results of detailed field studies and have been modified to fit local practices.

Selected cropping patterns for other areas in appendix tables 1 to 9 were based on county agricultural statistics, U. S. Bureau of Reclamation reports, New Mexico State Engineer Office reports and data in the files of that office, and survey data in the files of the Department of Agricultural Economics and Agricultural Business, New Mexico State University. The selected cropping patterns were used to compute CIR in acre-feet per acre. The values shown in appendix tables 1 to 9 are suitable for broad planning purposes but may require revision for use in detailed planning studies.

Computed CIR for a Specific Area

The method used to obtain values in appendix tables 1 to 9 and an example of how the appendix tables may be used are illustrated with some of the crops grown in the irrigated area of Animas Valley. These crops are alfalfa, corn, cotton, grain sorghums, and a mixed variety of vegetables in a typical family garden.

Data from appendix table 11, for the Animas Valley, is extracted below.

The dates given in appendix table 11 for some crops are general planting and harvesting dates and not necessarily indicative of the growing season for that crop. The first date shown for annual crops was considered in this bulletin to be the planting date of the crop. If the growing season indicated for these crops exceeded the maximum number of days required for maturity as set forth in table 3, the ending date was modified. Thus, the maximum number of days required for maturity of sorghums is 130 days (see table 3), and in the Animas area, planting on May 15 indicates a maturity date of September 22 instead of October 1 as shown in appendix table 11. The above points out cautions in the use of appendix table 11 for computing CIR.

Footnote three of appendix table 11 states that consumptive use for alfalfa, grass hay, apples, and pecans was computed for only the frost-free period, by Blaney and Hanson (1). An entry of an "X" on the line for an

Extract from Appendix Table 11

Estimated Normal Growing Seasons of Major Irrigated Crops in Farming Areas of New Mexico

Area	Frost-free Period	Alfalfa (3)	Corn	Sorghums	Cotton
Animas	4/24-10/28	X	5/15-9/15*	5/15-10/1*	4/22-10/28*

* Pre-plant irrigation required.

area in the column under any of the above crops indicates that the crop is grown in the area.

Temperature data necessary for the computations of CIR in this bulletin from appendix table 10 for the Animas U. S. Weather Bureau station is extracted below:

Average occurrence of last date in spring and first date in fall

32° Spring	32° Fall	28° Spring	28° Fall
Apr. 24	Oct. 28	Apr. 8	Nov. 4

Average date of occurrence of mean air temperatures

50° Spring	50° Fall	45° Spring	45° Fall	60° Spring
Mar. 9	Nov. 12	Feb. 12	Dec. 5	Apr. 18

Alfalfa: Alfalfa begins to grow when the mean air temperature reaches 50° F in the spring and ceases to grow at the occurrence of 28° F in the fall (table 3). The average date of occurrence of 50° F in the spring and 28° F in the fall at Animas is March 9 and November 4, respectively (appendix table 10). The dates of the frost-free period determined from appendix table 10 were April 24-October 28. Thus, the growth period for alfalfa outside the frost-free season would be March 9 to April 23 in the spring and from October 29 to November 4 in the fall. The K value for before and after the frost-free period is 0.50; the K value during the frost-free period is 0.85 (table 2). CIR was computed with a K value of 0.85 for the period April 24 to October 28 and 0.50 for the growth periods March 9 to April 23 and October 29 to November 4.

Corn: Appendix table 11 indicates corn is planted about May 15 in the Animas Valley. This date occurs after the beginning of the frost-free period (April 24) and well after the air temperature has reached 55° (60° spring date is April 18). The fall date noted in appendix table 11 is September 15, which is 123 days after the planting date of May 15 and within the 140-day maximum shown in table 3; thus, the growing period for corn was established. Appendix table 11 indicates pre-plant irrigation is required for corn, and the assumption was that the irrigation would be applied 15 days before the planting date. The appropriate K values are 0.40 for pre-plant irrigation and 0.75 for the normal growing season (table 2). CIR was computed with a K value of 0.75 for the period May 15 to Sept. 15 and 0.40 for the 15 days prior to May 15.

Cotton: Appendix table 11 indicates cotton is planted April 22, harvested at the end of the frost-free period (October 28) and that pre-plant irrigation is required. Appendix table 10 indicates the frost-free period starts April 24, so there is a two-day growing period before the frost-free period begins. However, this growth takes place after 60° mean air temperature is reached (April 18). From April 22 to October 28, there are 189 days, or less than the 240 days maximum shown in table 3 for cotton. Therefore, the growing period was considered to be from April 22 to October 28, and pre-plant irrigation would be applied 15 days before April 22. CIR was computed with the growing periods defined above, a K value of 0.40 for growth outside the frost-free period and for pre-plant irrigation, and a K value of 0.62 for the frost-free period (table 2).

Sorghums: Appendix table 11 indicates sorghums are planted about May 15 in Animas Valley and that pre-plant irrigation is required. With 130 days maximum to reach full maturity and be ready for harvest (see table 3), the harvest date is September 22.

These dates establish the growing-season period. Pre-plant irrigation would be applied 15 days before May 15. The K values are 0.40 and 0.70, respectively, for pre-plant irrigation and for growth during the frost-free period (table 2). CIR was computed for sorghums in Animas Valley with the coefficients (K) and growing periods as noted above.

Mixed Variety of Vegetables: Table 2 does not give a K value for a mixed variety of vegetables that might be planted in a typical family garden. Growing season for a mixed variety of vegetables is obviously variable and would be dependent upon the crops that were planted. Thus, some judgment is required in choosing growing season days and a value for K. The main concern is to furnish sufficient irrigation water to mature most of the crops that might be planted. In computing CIR for a mixed variety of vegetables that might be planted in Animas Valley, the data of table 2 were examined. It was observed that several crops required a K value of 0.70 and the normal growing period was about four months. These quantities would apparently satisfy the requirements for most vegetables that might be planted and CIR was computed on this basis. A planting date of May 15 was chosen, and the growing season was assumed to end about September 15, four months after the planting date. It was further assumed that these crops would be planted without a significant application of pre-plant irrigation water.

The foregoing explains how the CIR values of appendix table 9 for Animas Valley were obtained, and the described procedure was used to determine other CIR values of the appendix tables. The procedure can be used to obtain the CIR value of any crop omitted from the tables.

Use of the Appendix Tables

CIR values in the appendix tables may be used in a number of ways. The data for crops grown in Animas Valley can be used as examples. Data from appendix table 9 for Animas Valley is extracted on page 14.

Some of the ways in which CIR values in the above tabulation may be used are:

(1) For area planning. For example, assume that a planner knows that the acreage planted in Animas Valley is about 12,800 acres in a given year. Assuming that climatic conditions for the year are about average, he can approximate the depletion of water by crops in Animas Valley by multiplying 12,800 acres times 1.576, the CIR in acre-feet per acre for the selected cropping pattern (appendix table 9). The indicated depletion by crops is about 20,200 acre-feet for that year.

(2) For on-farm computation of the amount of water needed for a given crop. For example, assume that a farmer will plant an acre of corn. He can look at the "total" CIR for corn and determine that his consumptive irrigation requirement (CIR) for this crop is 17.63 inches or 1.48 feet per acre. By applying the irrigation efficiency appropriate for his farm, he can then compute the approximate

Extract from Appendix Table 9

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			
		Frost-free	Other	Total	(A*)
(A) Animas valley, Playas basin	Alfalfa	27.77	3.49	31.26	6.5
	Other hay	23.74	3.49	27.23	1.2
	Winter sm. grains	....	....	17.01	4.1
Weather station: **Animas**	Spring sm. grains	....	....	14.98	4.5
	Sorghums	15.75	1.15	16.90	29.0
	Corn	16.48	1.15	17.63	1.7
	Beans	9.87	1.15	11.02	3.9
	Misc. vegetables and family gardens	....	....	15.05	1.1
	Cotton	18.62	0.94	19.56	48.0
					100.0
CIR in acre-feet per acre					1.576

* Selected crop distribution in percent.

quantity of water he must pump from his well to mature the acre of corn.

(3) For on-farm computation of total amount of water needed. For example, assume another farmer desires to plant 1 acre of corn, 10 acres of cotton, 10 acres of sorghums, 1 acre of miscellaneous vegetables. He has 5 acres of alfalfa in crop rotation. The farmer can tabulate the acreage of crops, determine the percentage each is of his cropping pattern, and approximate his total consumptive irrigation requirement for this particular year in the following manner:

The total of the weighted consumptive irrigation requirement for the above cropping pattern for this particular farm is obtained by multiplying CIR of each crop by its percentage of the cropping pattern grown, and adding these quantities together. This amount divided by 12 is the CIR in acre-feet per acre or is equal to 1.71 feet (20.51 ÷ 12). By multiplying the total number of acres by the above CIR, the total consumptive irrigation requirement can be approximated. In this instance, total requirement is 1.71 feet x 27 acres or about 46 acre-feet. If the farmer knows that his irrigation efficiency is about 65 percent, he can determine that he must furnish about 71 acre-feet at his well (46 ÷ 0.65) during the irrigation season.

Sample computation of irrigation water needs

Crop	No. of acres	Total CIR (inches)	Percent crop distribution	Weighted CIR of crops (inches)
Alfalfa	5	31.26	18.6	5.81
Sorghums	10	16.90	37.0	6.25
Misc. vegetables	1	15.05	3.7	0.56
Corn	1	17.63	3.7	0.65
Cotton	10	19.56	37.0	7.24
Totals	27		100.0	20.51

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Preface to Appendix Tables

Appendix tables 1 to 9 contain CIR for specific crops grown in selected irrigated areas of New Mexico. The consumptive irrigation requirements were calculated with data from United States Weather Bureau stations selected for each irrigated area. Periods of record used were: Temperature, 1931-1960; precipitation, 1931-1960; frost-free, 1940-1962; on that portion of the periods for which United States Weather Bureau records are available (1). The CIR values shown are representative of those which can be expected over a period of years, rather than being specific for a single year. The values are suitable for planning purposes and will give approximate requirements for a particular year (see page 14).

List of Appendix Tables

Table 1--Selected irrigated areas in the Arkansas River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Canadian main stem and tributaries above Vermejo Project	Alfalfa	14.89	1.15	16.04	31.5	54.3		
	Irrigated pasture	13.52	2.41	15.93	--	3.7		
	Other hay	12.16	1.15	13.31	41.4	18.3		
(B) Vermejo Project	Winter sm. grains	--	--	11.12	8.2	9.4		
	Spring sm. grains	--	--	9.01	8.2	4.0		
Weather station: Maxwell	Sorghums	9.60	0.20**	9.80	2.4	--		
	Corn	--	--	11.04	8.1	10.3		
	Beans (dry)	5.38	0.20**	5.58	0.2	--		
					100.0	100.0		
CIR in acre-feet per acre					1.113	1.190		
(A) Cimarron Creek and tributaries	Alfalfa	16.15	1.18	17.33	31.5			
	Other hay	13.14	1.18	14.32	38.0			
	Vega	11.64	2.38	14.02	3.4			
Weather station: Springer	Winter sm. grains	--	--	10.76	8.2			
	Spring sm. grains	--	--	9.25	8.2			
	Sorghums	10.03	0.26**	10.29	2.4			
	Corn	--	--	11.39	8.1			
	Beans (dry)	5.78	0.26**	6.04	0.2			
					100.0			
CIR in acre-feet per acre					1.184			

*Refers to area in column under selected crop distribution by area in percent.

**Pre-plant irrigation.

Table 1--Selected irrigated areas in the Arkansas River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Mora River and tributaries	Alfalfa	14.72	0.74	15.46	22.0			
	Other hay	11.84	0.74	12.58	15.0			
	Vega	11.84	1.99	13.83	15.0			
Weather station: Valmora	Spring sm. grains	--	--	9.62	24.0			
	Corn	--	--	10.55	19.0			
	Misc. vegetables and family gardens	--	--	9.28	5.0			
					100.0			
CIR in acre-feet per acre					1.011			
(A) Arch Hurley Irrigation District and Quay County near Logan	Alfalfa	24.10	1.70	25.80	15.9			
	Irrigated pasture	22.04	3.19	25.23	9.9			
	Other hay	19.99	1.70	21.69	1.0			
	Winter sm. grains	--	--	13.52	7.5			
	Spring sm. grains	--	--	10.31	1.0			
Weather station: Tucumcari	Sorghums	--	--	13.04	41.7			
	Broom corn	--	--	13.04	8.2			
	Corn	--	--	13.32	4.0			
	Beans	--	--	7.54	0.8			
	Misc. vegetables and family gardens	--	--	11.61	0.6			
	Cotton	13.09	0.40**	13.49	9.4			
					100.0			
CIR in acre-feet per acre					1.364			

** Pre-plant irrigation

Table 1--Selected irrigated areas in the Arkansas River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Cimarron River (Dry Cimarron)	Alfalfa	14.12	0.59	14.71	26.3			
	Other hay	11.27	0.59	11.86	27.4			
	Winter sm. grains	--	--	8.81	9.3			
Weather station: Des Moines	Spring sm. grains	--	--	6.94	1.8			
	Sorghums	--	--	9.15	31.5			
	Corn	--	--	10.05	3.7			
					100.0			
CIR in acre-feet per acre					0.943			
(A) Clayton and vicinity	Alfalfa	19.88	2.20	22.08	26.3			
	Other hay	16.37	2.20	18.57	27.3			
Weather station: Clayton	Winter sm. grains	--	--	11.56	9.3			
	Spring sm. grains	--	--	8.57	1.9			
	Sorghums	--	--	12.17	31.5			
	Corn	--	--	14.23	3.7			
					100.0			
CIR in acre-feet per acre					1.373			

Table 2--Selected irrigated areas in the Southern High Plains - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Clovis	Alfalfa	21.81	1.32	23.13	0.5	0.5		
(B) House	Winter sm. grains	--	--	11.19	44.8	44.8		
	Sorghums	--	--	11.53	50.4	50.4		
Weather station: Clovis	Corn	--	--	12.87	2.2	2.2		
	Misc. vegetables and family gardens	--	--	11.38	0.1	2.1		
	Cotton	11.38	0.57**	11.95	2.0	--		
					100.0	100.0		
CIR in acre-feet per acre					0.956	0.955		
(A) Portales Valley	Alfalfa	20.80	2.06	22.87	8.2	--		
(B) Causey-Lingo	Irrigated pasture	20.80	3.67	24.28	3.2	--		
	Winter sm. grains	--	--	11.71	--	21.6		
Weather station: Portales	Sorghums	--	--	11.07	56.8	58.4		
	Broom corn	--	--	11.07	--	0.5		
	Sweet potatoes	--	--	12.80	1.5	--		
	Peanuts	--	--	11.53	12.0	--		
	Misc. vegetables and family gardens	--	--	10.50	--	0.7		
	Cotton	11.09	0.61**	11.70	18.3	18.8		
					100.0	100.0		
CIR in acre-feet per acre					1.056	0.944		

*Refers to area in column under selected crop distribution by area in percent.

**Pre-plant irrigation.

Table 2--Selected irrigated areas in the Southern High Plains - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Tatum-Lovington-Hobbs	Alfalfa	24.90	2.04	26.94	6.0			
	Winter sm. grains	12.54	0.36**	12.90	3.8			
Weather station: Average of Hobbs and Tatum	Spring sm. grains	11.02	0.40**	11.42	0.4			
	Sorghums	12.76	0.28**	13.04	59.4			
	Misc. vegetables and family gardens	11.82	0.28**	12.10	3.6			
	Cotton	13.28	0.68**	13.96	26.8			
					100.0			
CIR in acre-feet per acre					1.173			
(A) Hobbs	Alfalfa	26.98	2.01	28.99	6.0			
	Winter sm. grains	13.05	0.43**	13.48	3.8			
Weather station: Hobbs	Spring sm. grains	11.34	0.43**	11.77	0.4			
	Sorghums	13.26	0.26**	13.52	59.4			
	Corn	12.92	0.77**	13.69	0.2			
	Misc. vegetables and family gardens	12.30	0.26**	12.56	3.4			
	Cotton	14.13	0.72**	14.85	26.8			
					100.0			
CIR in acre-feet per acre					1.230			
(A) Tatum, Lovington	Alfalfa	22.82	2.07	24.89	6.5			
	Winter sm. grains	12.03	0.30**	12.33	3.8			
Weather station: Tatum	Spring sm. grains	10.70	0.38	11.08	0.6			
	Sorghums	12.26	0.31**	12.57	59.5			
	Corn	12.03	0.65**	12.68	1.0			
	Misc. vegetables and family gardens	11.34	0.31**	11.65	2.1			
	Cotton	12.44	0.65**	13.09	26.5			
					100.0			
CIR in acre-feet per acre					1.123			

** Pre-plant irrigation.

Table 3--Selected irrigated areas in the Pecos River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Gallinas	Alfalfa	15.14	0.71	15.85	22.0	27.2	22.0	
(B) Storrie Project	Other hay	12.24	0.71	12.95	15.0	--	14.9	
(C) San Jose 1/	Vega	12.24	1.75	13.99	15.0	--	14.9	
	Winter sm. grains	--	--	11.31	13.2	25.0	13.2	
Weather station: Las Vegas	Spring sm. grains	--	--	8.36	10.8	20.6	10.9	
	Sorghums	9.67	0.28**	9.95	--	27.2	--	
	Corn	10.84	0.28**	11.12	19.0	--	19.0	
	Misc. vegetables and family gardens	--	--	10.20	5.0	--	5.1	
					100.0	100.0	100.0	
CIR in acre-feet per acre					1.046	0.964	1.045	
(A) Dilia 2/	Alfalfa	20.33	1.55	21.88	60.3			
	Other hay	16.99	1.55	18.54	4.2			
Weather station: Dilia	Spring sm. grains	--	--	12.15	2.6			
	Sorghums	12.41	0.72**	13.13	17.7			
	Corn	--	--	13.63	9.6			
	Beans	6.89	0.73**	7.62	4.5			
	Misc. vegetables and family gardens	--	--	10.00	1.1			
					100.0			
CIR in acre-feet per acre					1.530			

*Refers to area in column under selected crop distribution by area in percent.

1/ Area encompasses small communities located above Anton Chico.

2/ Agricultural areas from Anton Chico to Santa Rosa. Most of these lands are in Guadalupe County.

**Pre-plant irrigation.

Table 3--Selected irrigated areas in the Pecos River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Santa Rosa and Puerto de Luna	Alfalfa	23.73	1.90	25.63	40.1			
	Irrigated pasture	21.75	3.84	25.59	45.0			
Weather station: Santa Rosa	Other hay	19.77	1.90	21.67	2.4			
	Spring sm. grains	--	--	12.51	--			
	Sorghums	13.05	0.45**	13.50	4.6			
	Corn	--	--	14.80	1.6			
	Beans	7.41	0.47**	7.88	--			
	Misc. vegetables and family gardens	--	--	11.17	5.0			
	Orchards	19.39	2.07	21.46	1.3			
					100.0			
CIR in acre-feet per acre					2.004			
(A) Fort Sumner Project	Alfalfa	25.01	2.18	27.19	44.6	13.6		
(B) Outside project area	Irrigated pasture	22.95	3.86	26.81	15.9	1.2		
	Other hay	20.90	2.18	23.08	7.9	--		
Weather station: Fort Sumner	Winter sm. grains	15.23	0.39**	15.62	11.1	--		
	Spring sm. grains	--	--	12.95	0.7	54.5		
	Sorghums	13.75	0.52**	14.27	3.5	30.7		
	Corn	--	--	16.52	2.1	--		
	Misc. vegetables and family gardens	--	--	11.87	2.0	--		
	Orchards	16.78	2.16	18.94	3.9	--		
	Cotton	13.93	0.57**	14.50	8.3	--		
					100.0	100.0		
CIR in acre-feet per acre					1.922	1.288		

** Pre-plant irrigation.

Table 3--Selected irrigated areas in the Pecos River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Roswell artesian basin	Alfalfa	28.44	2.31	30.75	32.3			
	Spring sm. grains	--	--	11.66	13.9			
Weather station: Average of Artesia and Roswell	Sorghums	14.81	0.68**	15.49	23.1			
	Misc. vegetables and family gardens	--	--	15.17	0.9			
	Cotton	18.20	0.72**	18.92	29.8			
					100.0			
CIR in acre-feet per acre					1.742			
(A) Roswell	Alfalfa	27.51	2.21	29.72	32.0			
	Spring sm. grains	--	--	10.91	14.5			
Weather station: Roswell	Sorghums	14.61	0.72**	15.33	23.1			
	Misc. vegetables and family gardens	--	--	15.00	0.7			
	Cotton	17.50	0.70**	18.20	29.7			
					100.0			
CIR in acre-feet per acre					1.679			
(A) Artesia	Alfalfa	29.37	2.41	31.78	32.6			
	Spring sm. grains	--	--	12.40	13.3			
Weather station: Artesia	Sorghums	15.01	0.65**	15.66	23.1			
	Misc. vegetables and family gardens	--	--	15.34	1.1			
	Cotton	18.91	0.74**	19.65	29.9			
					100.0			
CIR in acre-feet per acre					1.806			

** Pre-plant irrigation

Table 3--Selected irrigated areas in the Pecos River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Rio Hondo	Alfalfa	23.83	2.70	26.53	20.0	37.1		
(B) Rio Penasco	Irrigated pasture	19.98	5.34	25.32	21.2	7.2		
	Winter sm. grains	--	--	15.37	6.6	34.6		
Weather station: Picacho	Sorghums	13.33	0.69**	14.02	3.0	--		
	Corn	15.74	0.69**	16.43	--	3.8		
	Misc. vegetable and family gardens	--	--	11.55	--	4.0		
	Orchards	16.14	3.01	19.15	49.2	13.3		
					100.0	100.0		
CIR in acre-feet per acre					1.794	1.718		
(A) Carlsbad Irrigation District	Alfalfa	29.61	3.04	32.65	37.5	44.2		
(B) Outside CID)	Irrigated pasture	27.31	5.71	33.02	4.2	1.8		
	Spring sm. grains	--	--	12.66	3.5	7.9		
	Sorghums	14.97	0.56**	15.53	1.1	5.2		
Weather station: Carlsbad	Corn	15.99	0.54**	16.53	0.6	0.5		
	Misc. vegetables and family gardens	--	--	13.67	0.1	1.1		
	Orchards	20.36	3.10	23.46	0.1	--		
	Cotton	18.52	1.02**	19.54	52.9	39.3		
					100.0	100.0		
CIR in acre-feet per acre					2.060	2.062		

** Pre-plant irrigation.

Table 4--Selected irrigated areas in the Central Closed basins - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Estancia basin	Alfalfa	16.01	2.03	18.04	27.4			
	Irrigated pasture	13.31	3.55	16.86	3.4			
Weather station: McIntosh	Other hay	13.31	2.03	15.34	1.0			
	Winter sm. grains	--	--	12.78	5.4			
	Sorghums	11.30	0.57**	11.87	3.9			
	Corn	11.93	0.57**	12.50	25.5			
	Beans	6.54	0.60**	7.14	10.5			
	Potatoes	12.17	0.54	12.71	6.2			
	Misc. vegetables and family gardens	--	--	11.61	14.1			
	Sugar beets	--	--	14.28	2.6			
					100.0			
CIR in acre-feet per acre					1.130			
(A) Alamogordo-Tularosa area	Alfalfa	31.49	2.62	34.11	28.0			
	Spring sm. grains	14.08	0.43**	14.51	16.0			
	Sorghums	15.56	1.09**	16.65	16.0			
Weather station: Average of Alamogordo and Tularosa	Orchards	25.00	2.67	27.67	4.0			
	Cotton	18.92	0.90**	19.82	36.0			
					100.0			
CIR in acre-feet per acre					1.898			

*Refers to area in column under selected crop distribution by area in percent.

**Pre-plant irrigation.

Table 4--Selected irrigated areas in the Central Closed basins - Consumptive irrigation requirements of major crops, selected distribution and average annual CIR (continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Alamogordo	Alfalfa	31.38	2.49	33.87	26.0			
	Sorghums	15.69	1.08**	16.77	35.5			
Weather station: Alamogordo	Corn	18.96	1.07	20.03	0.5			
	Cotton	19.00	0.91**	19.91	38.0			
					100.0			
CIR in acre-feet per acre					1.868			
(A) Tularosa	Alfalfa	31.60	2.76	34.36	30.0			
	Spring sm. grains	14.08	0.43**	14.51	16.0			
Weather station: Tularosa	Sorghums	15.42	1.09**	16.51	15.5			
	Corn	18.77	1.09	19.86	0.5			
	Orchards	25.00	2.67	27.67	4.0			
	Cotton	18.85	0.89**	19.74	34.0			
					100.0			
CIR in acre-feet per acre					1.926			

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Costilla	Alfalfa	13.98	1.15	15.13	44.3	17.1	25.8	
(B) Sunshine Valley	Irrigated pasture	11.71	2.32	14.03	--	16.9	21.0	
(C) Cerro, Llano, and San Cristobal	Other hay	11.71	1.15	12.90	--	--	3.8	
	Vega	10.57	2.32	12.89	4.1	--	--	
	Winter sm. grains	--	--	11.13	--	8.1	--	
Weather station: Cerro	Spring sm. grains	--	--	9.59	38.5	21.1	45.3	
	Lettuce	--	--	10.40	--	4.5	--	
	Corn	--	--	10.81	0.4	--	1.0	
	Misc. vegetables and family gardens	--	--	9.71	12.7	32.3	3.1	
					100.0	100.0	100.0	
CIR in acre-feet per acre					1.017	0.958	1.008	
(A) Rio Hondo	Alfalfa	16.58	1.72	18.30	41.9	1.4	7.5	
(B) Taos	Irrigated pasture	14.03	2.74	16.77	24.9	67.7	18.6	
(C) Pilar	Other hay	14.03	1.72	15.75	6.6	27.8	--	
	Vega	12.76	2.74	15.50	--	--	--	
	Spring sm. grains	--	--	10.70	19.1	1.2	--	
Weather station: Taos	Corn	--	--	12.14	3.2	1.4	--	
	Misc. vegetables and family gardens	--	--	11.03	1.6	0.5	3.5	
	Orchards	11.48	1.25	12.73	2.7	--	70.4	
					100.0	100.0	100.0	
CIR in acre-feet per acre					1.320	1.362	1.153	

*Refers to area in column under selected crop distribution by area in percent.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Truchas	Alfalfa	13.32	1.40	14.72	10.4	11.4		
(B) Embudo Creek	Other hay	11.01	1.40	12.41	14.9	25.9		
	Vega	9.85	2.29	12.14	62.1	41.8		
Weather station: Truchas	Spring sm. grains	--	--	8.81	6.8	8.3		
	Corn	--	--	10.44	2.6	5.7		
	Misc. vegetables and family gardens	--	--	9.34	2.3	1.6		
	Orchards	8.70	0.97	9.67	0.9	5.3		
					100.0	100.0		
CIR in acre-feet per acre					1.008	0.996		
(A) Espanola valley north to Velarde	Alfalfa	20.79	2.01	22.80	30.6	16.5		
	Irrigated pasture	17.78	3.55	21.33	8.9	36.0		
(B) Santa Clara and San Ildefonso	Other hay	17.78	2.01	19.79	--	3.5		
	Winter sm. grains	--	--	15.71	4.0	--		
	Spring sm. grains	--	--	11.07	4.0	8.7		
	Corn	16.07	0.68**	16.75	5.3	4.9		
Weather station: Espanola	Beans	--	--	9.10	--	---		
	Misc. vegetables and family gardens	--	--	12.73	8.8	6.9		
	Orchards	14.76	1.81	16.57	38.4	23.5		
					100.0	100.0		
CIR in acre-feet per acre					1.527	1.557		

** Pre-plant irrigation

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Ojo Caliente[1/] weather station (see note)	Alfalfa	17.39	1.27	19.66	35.0			
	Planted & native pasture & hay	15.67	2.48	18.15	36.0			
	Native pasture	14.31	1.27	15.58	8.0			
	Orchards	12.94	1.18	14.12	8.0			
	Corn	--	--	14.32	2.0			
	Spring grain	--	--	11.74	7.0			
	Garden	--	--	11.00	4.0			
					100.0			
CIR in acre-feet per acre					1.445			
(A) Lower Vallecitos[1/] (B) Lower Tusas[1/] weather station (see note)	Alfalfa	12.94	1.60	14.54	7.0	12.0		
	Planted & native pasture & hay	10.79	2.36	13.15	81.0	72.0		
	Native pasture	9.70	1.60	11.30	5.0	15.0		
	Garden	--	--	8.67	7.0	1.0		
					100.0	100.0		
CIR in acre-feet per acre					1.070	1.083		
(A) Upper Vallecitos[1/] (B) Upper Tusas[1/] weather station (see note)	Planted & native pasture & hay	8.84	1.65	10.49	88.0	70.0		
	Native pasture	7.89	1.28	7.89	12.0	30.0		
					100.0	100.0		
CIR in acre-feet per acre					0.848	0.809		

Note: Correlation of available data for U. S. Weather Station at Ojo Caliente, Tres Piedras, Espanola, El Rito and Aspen Grove Ranch.

1/ Data from State Engineer Rio Chama Hydrographic Survey Report, Volume 2.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Nambe-Pojoaque-Tesuque[1/]	Alfalfa	20.62	2.15	22.77	33.0			
	Planted pasture	19.13	3.01	22.14	11.0			
Weather station: Espanola	Planted & native pasture & hay	17.62	3.01	20.63	4.0			
	Native pasture	16.10	2.15	18.25	17.0			
	Orchards	14.59	1.32	15.91	13.0			
	Corn	15.73	0.39**	16.12	6.0			
	Garden and chili	16.61	0.21**	16.82	8.0			
	Spring grain	--	--	11.17	8.0			
					100.0			
CIR in acre-feet per acre----------					1.596			

1/ Data from State Engineer Nambe-Pojoaque-Tesuque hydrographic survey report.

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches) Frost-free	Other	Total	Selected crop distribution by area in percent (A)	(B)	(C)	(D)
(A) Rio Chama above El Vado Dam	Alfalfa	11.41	1.28	12.69	2.9			
	Irrigated pasture	9.41	2.04	11.45	33.3			
	Other hay	9.41	1.28	10.69	46.4			
Weather station: Chama	Winter sm. grains	--	--	7.32	6.1			
	Spring sm. grains	--	--	8.79	10.3			
	Misc. vegetables and family gardens	--	--	8.94	1.0			
					100.0			
CIR in acre-feet per acre					0.882			
(A) Santa Cruz[1/]	Alfalfa	21.95	2.61	24.56	31.0			
	Native pasture & hay	18.76	2.14	20.90	9.0			
Weather station: Espanola	Corn	--	--	15.55	5.0			
	Orchards	--	--	15.57	38.0			
	Spring sm. grains	9.29	1.04**	10.33	8.0			
	Garden	--	--	12.75	9.0			
					100.0			
CIR in acre-feet per acre					1.514			
(A) Espanola-Abiquiu section[2/]	Alfalfa	21.48	2.66	24.14	24.0			
	Pasture and hay	18.31	2.17	20.48	42.0			
	Corn	--	--	15.67	12.0			
Weather station: Espanola	Orchards	--	--	15.10	11.0			
	Spring sm. grains	9.38	1.06**	10.44	7.0			
	Garden	--	--	12.85	4.0			
					100.0			
CIR in acre-feet per acre					1.598			

1/ Data from State Engineer Santa Cruz hydrographic survey report.
2/ Data from State Engineer Rio Chama hydrographic survey report, volume 1.
** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Rio Chama, tributaries above Abiquiu Reservoir	Alfalfa	12.10	1.80	13.90	19.3			
	Irrigated pasture	10.04	2.91	12.95	41.4			
	Other hay	10.04	1.80	11.84	25.2			
Weather station: Tierra Amarilla	Spring sm. grains	--	--	9.41	7.5			
	Corn	--	--	9.31	3.7			
	Misc. vegetables and family gardens	--	--	8.34	2.2			
	Orchards	7.97	1.30	9.27	0.7			
					100.0			
CIR in acre-feet per acre					1.026			
(A) Bernalillo	Alfalfa	24.07	2.59	26.66	54.8			
	Irrigated pasture	22.38	3.93	26.31	12.1			
	Other hay	20.70	2.59	23.29	--			
	Winter sm. grains	--	--	16.84	4.6			
Weather station: Bernalillo	Spring sm. grains	--	--	12.76	2.5			
	Sorghums	--	--	15.99	6.6			
	Corn	16.95	0.90**	17.85	10.3			
	Beans	9.80	0.90**	10.70	0.3			
	Peppers, chile	--	--	18.88	0.9			
	Misc. vegetables and family gardens	--	--	13.63	2.6			
	Orchards	17.30	2.29	19.59	5.3			
					100.0			
CIR in acre-feet per acre					1.948			

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches) Frost-free	Other	Total	Selected crop distribution by area in percent (A)	(B)	(C)	(D)
(A) Albuquerque	Alfalfa	24.87	2.27	27.14	56.9			
	Irrigated pasture	23.16	4.04	27.20	12.1			
	Other hay	21.44	2.27	23.71	--			
Weather station: Average of Los Lunas and Bernalillo	Winter sm. grains	16.84	0.80 **	17.64	4.6			
	Spring sm. grains	--	--	13.02	2.5			
	Sorghums	--	--	16.44	6.6			
	Corn	17.21	0.91 **	18.12	10.3			
	Beans	10.22	0.92 **	11.14	0.3			
	Pepper, chile	--	--	20.23	0.9			
	Misc. vegetables and family gardens	--	--	14.06	2.6			
	Orchards	17.99	2.76	20.75	3.2			
					100.0			
CIR in acre-feet per acre					2.006			
(A) Jemez	Alfalfa	18.23	0.99	19.22	21.3			
	Irrigated pasture	14.86	1.81	16.67	30.2			
Weather station: Jemez Springs	Other hay	14.86	0.99	15.85	27.8			
	Spring sm. grains	--	--	9.51	8.3			
	Corn	--	--	12.19	6.2			
	Misc. vegetables and family gardens	--	--	9.22	6.2			
					100.0			
CIR in acre-feet per acre					1.304			

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Cuba	Alfalfa	12.88	2.73	15.61	20.0			
	Irrigated pasture	10.76	3.82	14.58	30.0			
Weather station: Cuba	Other hay	10.76	2.73	13.49	29.0			
	Spring sm. grains	--	--	9.51	8.0			
	Corn	--	--	10.36	7.0			
	Misc. vegetables & family gardens	--	--	7.73	6.0			
					100.0			
CIR in acre-feet per acre					1.113			

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Grants-Bluewater	Alfalfa	23.69	1.91	25.60	31.4			
	Irrigated pasture	20.24	3.70	23.94	9.2			
	Winter sm. grains	--	--	16.76	45.1			
	Spring sm. grains	--	--	12.19	6.2			
Weather station: Laguna	Misc. vegetables and family gardens	--	--	11.24	4.1			
	Corn	--		17.39	4.0			
					100.0			
CIR in acre-feet per acre					1.643			
(A) Belen	Alfalfa	28.20	2.22	30.42	56.9			
	Irrigated pasture	26.29	3.74	30.03	12.1			
Weather station: Belen	Winter sm. grains	--	--	17.69	4.6			
	Spring sm. grains	--	--	13.88	2.5			
	Sorghums	--	--	17.32	6.6			
	Corn	17.86	1.10**	18.96	10.3			
	Beans	10.58	1.10**	11.68	0.3			
	Peppers, chile	--	--	20.13	0.9			
	Misc. vegetables and family gardens	--	--	16.99	2.6			
	Orchards	20.56	2.19	22.75	3.2			
					100.0			
CIR in acre-feet per acre					2.215			

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Socorro	Alfalfa	29.28	2.00	31.28	44.1			
	Irrigated pasture	27.19	3.88	31.07	8.9			
Weather station: Socorro	Winter sm. grains	--	--	16.65	3.4			
	Spring sm. grains	--	--	13.04	1.8			
	Sorghums	16.48	0.93**	17.41	4.9			
	Corn	--	--	18.30	7.6			
	Beans	--	--	9.40	0.2			
	Peppers, chile	--	--	21.36	0.7			
	Misc. vegetables and family gardens	--	--	16.09	1.9			
	Cotton	19.13	0.83**	19.96	26.5			
					100.0			
CIR in acre-feet per acre					2.114			
(A) Chuchillo	Alfalfa	33.29	1.83	35.12	41.7	35.3		
(B) Hot Springs, Palomas, Sierra County pump	Irrigated pasture	31.00	3.85	34.85	33.2	14.1		
	Winter sm. grains	--	--	18.59	11.7	10.6		
	Corn	19.14	1.12**	20.26	6.7	4.7		
	Misc. vegetables and family gardens	--	--	16.87	6.7	5.9		
Weather station: Truth or Consequences	Cotton	21.29	0.89**	22.18	--	29.4		
					100.0	100.0		
CIR in acre-feet per acre					2.573	2.312		

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches) Frost-free	Other	Total	Selected crop distribution by area in percent (A)	(B)	(C)	(D)
(A) Las Animas Creek and Monticello[1/]	Alfalfa	29.59	1.08	30.67	24.4			
	Planted pasture	25.30	1.72	27.02	22.0			
Weather station: Average of Hillsboro and Caballo	Planted & native pasture	23.15	1.72	24.87	7.3			
	Native pasture	10.96	1.40	12.36	20.8			
	Corn	11.85	0.59**	12.44	2.8			
	Cotton	18.28	1.47**	19.75	3.9			
	Orchards	20.61	1.72	22.33	12.3			
	Winter sm. grains	--	--	15.63	2.3			
	Gardens	15.98	0.89**	16.87	4.2			
					100.0			
CIR in acre-feet per acre					1.896			

1/ Data from State Engineer Las Animas Creek hydrographic survey report.

** Pre-plant irrigation.

Table 5--Selected irrigated areas in the Rio Grande basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Elephant Butte Irrigation District and vicinity	Alfalfa	30.94	2.45	33.39	18.0			
	Other hay	26.60	2.45	29.05	0.1			
	Winter sm. grains	--	--	16.02	4.8			
	Sorghums	16.40	1.12**	17.52	0.6			
Weather station: State University	Corn	18.08	1.12**	19.20	3.0			
	Lettuce	--	--	8.14	1.5			
	Onions	--	--	16.00	2.6			
	Peppers, chile	--	--	23.56	1.1			
	Misc. vegetables and family gardens	--	--	16.56	0.9			
	Orchards	24.51	2.74	27.25	6.8			
	Cotton	20.89	0.88	21.77	60.6			
					100.0			
CIR in acre-feet per acre					1.957			

** Pre-plant irrigation.

Table 6--Selected irrigated areas in the Western Closed basins - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) San Augustin Plains	Alfalfa	12.70	2.59	15.29	40.0			
	Irrigated pasture	10.63	5.26	15.89	35.0			
Weather station: Quemado	Spring sm. grains	--	--	10.71	25.0			
					100.0			
CIR in acre-feet per acre					1.196			

*Refers to area in column under selected crop distribution by area in percent.

Table 7--Selected irrigated areas in the San Juan River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) San Juan River basin	Alfalfa	25.98	1.66	27.64	29.0			
	Irrigated pasture	24.22	3.02	27.24	9.0			
Weather station: Average of	Spring sm. grains	--	--	13.50	18.0			
Bloomfield and Shiprock	Sorghums	--	--	17.24	2.0			
	Corn	--	--	19.74	31.0			
	Orchards	18.95	1.46	20.41	13.0			
					100.0			
CIR in acre-feet per acre					1.823			
(A) Bloomfield and vicinity	Alfalfa	25.77	1.25	27.02	29.0			
	Irrigated pasture	24.00	2.52	26.52	9.0			
Weather station: Bloomfield	Spring sm. grains	--	--	13.25	16.0			
	Sorghums	--	--	16.78	2.0			
	Corn	--	--	19.23	31.0			
	Orchards	18.69	1.02	19.71	13.0			
					100.0			
CIR in acre-feet per acre					1.767			
(A) Shiprock and vicinity	Alfalfa	26.18	2.07	28.25	29.0			
	Irrigated pasture	24.44	3.52	27.96	9.0			
Weather station: Shiprock	Spring sm. grains	--	--	13.75	16.0			
	Sorghums	--	--	17.71	2.0			
	Corn	--	--	20.24	31.0			
	Orchards	19.21	1.89	21.10	13.0			
					100.0			
CIR in acre-feet per acre					1.857			

* Refers to area in column under selected crop distribution by area in percent.

Table 8--Selected irrigated areas in the Lower Colorado River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches) Frost-free	Other	Total	Selected crop distribution by area in percent (A)	(B)	(C)	(D)
*(A) Zuni and vicinity	Alfalfa	19.43	2.14	21.57	26.0			
	Irrigated pasture	16.53	3.51	20.04	2.0			
Weather station: Zuni	Winter sm. grains	--	--	13.86	11.1			
	Spring sm. grains	--	--	12.04	41.9			
	Corn	14.95	0.85**	15.80	13.0			
	Beans	--	--	11.65	4.0			
	Misc. vegetables and family gardens	--	--	10.70	2.0			
					100.0			
CIR in acre-feet per acre					1.277			
(A) Luna[1/]	Alfalfa	6.36	4.92	11.28	3.7			
	Other hay	4.87	4.92	9.79	90.0			
Weather station: Luna	Spring sm. grains	--	--	9.21	3.4			
	Misc. vegetables and family gardens	--	--	6.96	2.9			
					100.0			
CIR in acre-feet per acre					0.812			
(A) Aragon and Apache Creek[2/]	Alfalfa	14.69	3.92	18.61	4.3			
	Other hay	12.36	3.92	16.28	58.5			
Weather station: Danley Ranch	Native pasture	11.20	3.92	15.12	18.1			
	Corn	14.66	0.59**	15.25	16.4			
	Misc. vegetables and family gardens	--	--	9.79	2.0			
	Orchards	9.59	3.37	12.96	0.7			
CIR in acre-feet per acre					1.322			

1/ Data from State Engineer Gila Hydrographic Survey Report, Volume 7.
2/ Data from State Engineer Gila Hydrographic Survey Report, Volume 8.
* Refers to area in column under selected crop distribution by area in percent.
** Pre-plant irrigation.

Table 8--Selected irrigated areas in the Lower Colorado River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Reserve[3/]	Alfalfa	14.67	3.72	18.39	19.4			
	Irrigated pasture	13.43	3.72	17.15	7.8			
Weather station: Reserve	Other hay	12.20	3.72	15.92	30.5			
	Native pasture	10.96	3.72	14.68	22.8			
	Winter sm. grains	--	--	11.60	3.7			
	Corn	14.26	0.58**	14.84	12.0			
	Misc. vegetables and family gardens	--	--	9.46	2.1			
	Orchards	9.31	2.85	12.16	1.7			
					100.0			
CIR in acre-feet per acre					1.312			
(A) Glenwood[4/]	Alfalfa	23.80	2.51	26.31	18.4			
	Irrigated pasture	21.93	2.51	24.44	15.9			
Weather station: Glenwood	Other hay	20.06	2.51	22.57	42.5			
	Native pasture	18.29	2.51	20.70	6.8			
	Winter sm. grains	--	--	12.04	10.9			
	Sorghums	--	--	14.63	1.1			
	Corn	--	--	16.11	2.0			
	Misc. vegetables and family gardens	--	--	10.10	0.7			
	Orchards	16.11	1.99	18.10	1.7			
					100.0			
CIR in acre-feet per acre					1.825			

3/ Data from State Engineer Gila Hydrographic Survey Report, Volume 6.

4/ Data from State Engineer Gila Hydrographic Survey Report, Volume 5.

** Pre-plant irrigation.

Table 8--Selected irrigated areas in the Lower Colorado River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Gila River above Gila[5/]	Alfalfa	14.36	2.60	16.96	15.0			
	Irrigated pasture	13.07	2.60	15.67	28.9			
Weather station: Gila Hot Springs	Other hay	11.79	2.60	14.39	2.2			
	Native pasture	10.50	2.60	13.10	5.2			
	Spring sm. grains	--	--	10.33	44.4			
	Orchards	--	--	9.21	4.3			
					100.0			
CIR in acre-feet per acre					1.088			
(A) Cliff-Gila area[6/]	Alfalfa	21.15	3.49	24.64	18.7			
	Irrigated pasture	19.45	3.72	23.17	19.3			
Weather station: Cliff	Other hay	17.76	3.72	21.48	24.6			
	Native pasture	16.07	3.72	19.79	8.2			
	Winter sm. grains	--	--	10.68	23.3			
	Corn	--	--	15.09	4.8			
	Orchards	--	--	14.39	1.1			
					100.0			
CIR in acre-feet per acre					1.612			

5/ Data from State Engineer Gila Hydrographic Survey Report, Volume 4.

6/ Data from State Engineer Gila Hydrographic Survey Report, Volume 3.

Table 8--Selected irrigated areas in the Lower Colorado River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Red Rock 7/	Alfalfa	24.45	3.29	27.74	8.0			
	Irrigated pasture	22.61	2.59	25.20	31.5			
Weather station: Red Rock	Other hay	20.78	2.59	23.37	18.9			
	Native pasture	--	--	9.53	1.2			
	Winter sm. grains	--	--	12.27	23.8			
	Corn	--	--	16.60	1.9			
	Orchards	--	--	17.12	0.2			
	Cotton	16.03	1.44**	17.47	14.5			
					100.0			
CIR in acre-feet per acre					1.708			
(A) Virden Valley	Alfalfa	27.98	3.35	31.33	33.5			
	Winter sm. grains	--	--	16.80	13.0			
Weather station: Duncan, Arizona	Spring sm. grains	--	--	13.91	13.0			
	Sorghums	16.59	1.13**	17.72	12.5			
	Misc. vegetables and family gardens	--	--	12.58	5.0			
	Cotton	18.99	0.90**	19.89	23.0			
					100.0			
CIR in acre-feet per acre					1.826			

7/ Data from State Engineer Gila Hydrographic Survey Report, Volume 2.

** Pre-plant irrigation.

Table 8--Selected irrigated areas in the Lower Colorado River basin - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) San Simon Creek[8/]	Alfalfa	--	--	31.35	1.0			
	Irrigated pasture	--	--	31.35	7.0			
Weather station: Rodeo	Spring sm. grains	--	--	14.74	2.0			
	Sorghums	--	--	18.66	15.0			
	Misc. vegetables and family gardens	--	--	13.05	1.0			
	Cotton	--	--	19.79	74.0			
					100.0			
CIR in acre-feet per acre----------					1.697			

8/ Data from State Engineer Gila Hydrographic Survey Report, Volume 1.

Table 9--Selected irrigated areas in the Southwestern Closed basins - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR.

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
*(A) Mimbres basin, Nutt-Hockett basin	Alfalfa	29.99	2.71	32.70	4.4			
	Other hay	25.76	2.71	28.47	1.9			
	Winter sm. grains	--	--	16.08	2.4			
Weather station: Deming	Spring sm. grains	--	--	14.33	2.5			
	Sorghums	15.77	1.15**	16.92	34.0			
	Corn	17.83	1.15**	18.98	2.2			
	Beans	9.14	1.25**	10.39	6.3			
	Pepper, chile	--	--	22.53	0.2			
	Misc. vegetables and family gardens	--	--	15.11	3.7			
	Orchards	23.64	2.71	26.35	0.4			
	Cotton	20.25	0.90**	21.15	42.0			
					100.0			
CIR in acre-feet per acre					1.595			
(A) Lordsburg Valley	Alfalfa	32.44	2.17	34.61	6.6			
	Other hay	27.89	2.17	30.06	1.1			
Weather station: Lordsburg	Winter sm. grains	--	--	16.89	4.1			
	Spring sm. grains	--	--	15.02	4.6			
	Sorghums	16.64	1.19**	17.83	28.9			
	Corn	17.38	1.19**	18.57	1.7			
	Beans	10.52	1.20**	11.72	3.9			
	Misc. vegetables and family gardens	--	--	15.04	1.1			
	Cotton	20.11	0.90**	21.01	48.0			
					100.0			
CIR in acre-feet per acre					1.681			

*Refers to area in column under selected crop distribution by area in percent.

**Pre-plant irrigation.

Table 9--Selected irrigated areas in the Southwestern Closed basins - Consumptive irrigation requirements of major crops, selected crop distribution and average annual CIR (Continued).

Irrigated areas and selected weather station	Crop	Period of use and CIR (inches)			Selected crop distribution by area in percent			
		Frost-free	Other	Total	(A)	(B)	(C)	(D)
(A) Animas Valley, Playas basin	Alfalfa	27.77	3.49	31.26	6.5			
	Other hay	23.74	3.49	27.23	1.2			
	Winter sm. grains	--	--	17.01	4.1			
Weather station: Animas	Spring sm. grains	--	--	14.98	4.5			
	Sorghums	15.75	1.15**	16.90	29.0			
	Corn	16.48	1.15**	17.63	1.7			
	Beans	9.87	1.15**	11.02	3.9			
	Misc. vegetables and family gardens	--	--	15.05	1.1			
	Cotton	18.62	0.94	19.56	48.0			
					100.0			
CIR in acre-feet per acre					1.576			

** Pre-plant irrigation.

Table 10.--Temperature data for selected U. S. Weather Bureau stations in New Mexico.

Basin and Station	Average occurrence of last date in spring and first date in fall				Average date of occurrence of mean air temperature				
	32° Spring	32° Fall	28° Spring	28° Fall	50° Spring	50° Fall	45° Spring	45° Fall	60° Spring
Arkansas River Basin									
Cimarron	May 8	Oct 10	Apr 23	Oct 24	Apr 21	Oct 22	Apr 2	Nov 4	May 26
Clayton	Apr 28	Oct 15	Apr 24	Oct 27	Mar 13	Oct 28	Mar 30	Nov 8	May 17
Des Moines	May 14	Oct 3	May 2	Oct 14	Apr 28	Oct 18	Apr 10	Oct 30	May 29
Eagle Nest	Jun 26	Jul 23	Jun 12	Sep 7	May 30	Sep 20	May 10	Oct 7	Jul 16**
Gascon	Jun 12	Sep 5	May 23	Sep 28	May 18	Oct 2	Apr 29	Oct 17	Jun 30
Logan	Apr 19	Oct 21	Apr 12	Oct 29	Mar 25	Nov 5	Mar 5	Nov 17	Apr 25
Maxwell	May 14	Sep 26	May 8	Oct 7	Apr 22	Oct 18	Apr 5	Oct 28	May 30
Raton	May 11	Sep 30	Apr 27	Oct 14	Apr 27	Oct 18	Apr 9	Oct 31	Jun 3
Roy	May 1	Oct 13	Apr 24	Oct 23	Apr 17	Oct 27	Mar 30	Nov 8	May 19
Springer	May 10	Oct 3	May 2	Oct 11	Apr 15	Oct 21	Mar 29	Nov 3	May 20
Tucumcari	Apr 16	Oct 25	Apr 15	Nov 5	Mar 24	Nov 7	Mar 5	Nov 21	Apr 25
Valmora	May 9	Oct 2	May 3	Oct 11	Apr 25	Oct 19	Apr 7	Oct 31	May 30
Southern High Plains									
Clovis	Apr 16	Oct 26	Apr 8	Nov 1	Mar 25	Nov 6	Mar 4	Nov 22	Apr 27
Elida	Apr 18	Oct 25	Apr 12	Nov 5	Mar 25	Nov 7	Feb 28	Nov 23	Apr 27
Hobbs	Apr 5	Nov 9	Mar 23	Nov 12	Mar 8	Nov 16	Feb 12	Dec 10	Apr 12
Portales	Apr 21	Oct 20	Apr 11	Oct 31	Mar 21	Nov 4	Mar 1	Nov 15	Apr 24
Tatum	Apr 17	Oct 24	Apr 8	Nov 3	Mar 18	Nov 8	Feb 24	Nov 26	Apr 22
Pecos River Basin									
Artesia	Apr 8	Nov 2	Mar 26	Nov 10	Mar 8	Nov 14	Feb 16	Dec 1	Apr 12
Carlsbad	Apr 7	Nov 5	Mar 14	Nov 15	Feb 23	Nov 23	Jan 25	Dec 13	Apr 3
Dilia	May 1	Oct 12	Apr 24	Oct 24	Apr 10	Oct 27	Mar 22	Nov 9	May 15
Fort Sumner	Apr 15	Oct 23	Apr 4	Nov 4	Mar 15	Nov 6	Feb 25	Nov 23	Apr 23
Las Vegas	May 12	Oct 8	May 1	Oct 16	Apr 28	Oct 19	Apr 10	Oct 31	May 31
Pecos Ranger Station	May 29	Oct 6	May 15	Oct 6	Apr 23	Oct 17	Apr 5	Oct 30	Jun 2
Picacho	Apr 23	Oct 26	Apr 8	Nov 5	Mar 17	Nov 10	Feb 20	Dec 2	Apr 28
Roswell	Apr 11	Oct 24	Mar 31	Nov 4	Mar 13	Nov 11	Feb 17	Nov 29	Apr 16
Ruidoso	Jun 6	Sep 15	May 26	Sep 29	Apr 30	Oct 13	Apr 8	Oct 28	Jun 6
Santa Rosa	Apr 19	Oct 24	Apr 12	Oct 31	Mar 22	Nov 6	Feb 27	Nov 22	Apr 28

** 59°

Table 10.--Temperature data for selected U. S. Weather Bureau stations in New Mexico.

Basin and Station	Average occurrence of last date in spring and first date in fall				Average date of occurrence of mean air temperature				
	32° Spring	32° Fall	28° Spring	28° Fall	50° Spring	50° Fall	45° Spring	45° Fall	60° Spring
Central Closed Basins									
Alamogordo	Apr 7	Nov 2	Mar 23	Nov 10	Mar 5	Nov 13	Feb 5	Dec 7	Apr 12
Estancia	May 18	Oct 2	May 4	Oct 8	Apr 19	Oct 18	Apr 1	Oct 31	May 25
McIntosh	May 18	Sep 28	Apr 29	Oct 11	Apr 18	Oct 20	Apr 1	Oct 31	May 24
Tularosa	Apr 4	Nov 1	Mar 23	Nov 11	Mar 1	Nov 13	Jan 29	Dec 11	Apr 13
Rio Grande Basin									
Belen	Apr 22	Oct 17	Apr 10	Oct 25	Mar 26	Nov 1	Mar 10	Nov 11	Apr 27
Bernalillo	May 3	Oct 10	Apr 22	Oct 24	Apr 3	Oct 27	Mar 17	Nov 8	May 8
Bluewater	Jun 3	Sep 17	May 24	Sep 22	Apr 27	Oct 13	Apr 8	Oct 25	Jun 1
Cerro	May 30	Sep 25	May 14	Oct 4	May 10	Oct 10	Apr 20	Oct 22	Jun 15
Chama	Jun 9	Sep 23	May 25	Oct 6	May 19	Oct 6	May 2	Oct 19	Jul 1
Cuba	Jun 7	Sep 20	May 26	Oct 4	May 4	Oct 12	Apr 17	Oct 24	Jun 5
Espanola	May 12	Oct 5	Apr 30	Oct 14	Apr 13	Oct 22	Mar 27	Nov 2	May 18
Hatch	Apr 10	Oct 25	Apr 27	Nov 2	Mar 9	Nov 15	Feb 12	Dec 2	Apr 15
Jemez Springs	May 2	Oct 21	Apr 16	Oct 31	Apr 13	Oct 25	Mar 25	Nov 6	May 22
Laguna	May 2	Oct 16	Apr 21	Oct 23	Apr 8	Oct 29	Mar 20	Nov 10	May 14
Los Lunas	May 3	Oct 15	Apr 16	Oct 21	Apr 1	Oct 28	Mar 14	Nov 7	May 7
Socorro	Apr 14	Oct 28	Apr 3	Nov 1	Mar 18	Nov 5	Feb 24	Nov 17	Apr 23
Santa Fe	May 11	Oct 13	Apr 24	Oct 21	Apr 22	Oct 20	Apr 4	Nov 1	May 26
State University	Apr 9	Oct 28	Mar 26	Nov 5	Mar 10	Nov 9	Feb 12	Nov 29	Apr 19
Taos	May 25	Sep 30	May 7	Oct 15	Apr 30	Oct 15	Apr 11	Oct 25	Jun 3
Tierra Amarilla	Jun 4	Sep 17	May 25	Oct 3	May 10	Oct 6	Apr 21	Oct 20	Jun 11
Truth or Consequences	Mar 31	Nov 4	Mar 16	Nov 13	Mar 9	Nov 12	Feb 12	Nov 29	Apr 16
Truchas	May 26	Sep 23	May 9	Oct 12	May 10	Oct 12	Apr 22	Oct 21	Jun 10
Western Closed Basins									
Quemado	Jun 4	Sep 16	May 29	Sep 23	May 2	Oct 17	Apr 12	Oct 28	Jun 5

Table 10.--Temperature data for selected U. S. Weather Bureau stations in New Mexico.

Basin and Station	Average occurrence of last date in spring and first date in fall				Average date of occurrence of mean air temperature				
	32° Spring	32° Fall	28° Spring	28° Fall	50° Spring	50° Fall	45° Spring	45° Fall	60° Spring
San Juan River Basin									
Aztec Ruins National Monument	May 20	Oct 14	Apr 27	Oct 24	Apr 14	Oct 23	Mar 28	Nov 3	May 23
Bloomfield	May 1	Oct 19	Apr 23	Oct 29	Apr 18	Oct 22	Mar 30	Nov 3	May 15
Dulce	Jun 21	Aug 23	Jun 1	Sep 18	May 12	Oct 7	Apr 24	Oct 19	Jun 15
Farmington	May 13	Oct 9	Apr 29	Oct 18	Apr 13	Oct 23	Mar 30	Nov 2	May 13
Shiprock	May 2	Oct 12	Apr 20	Oct 19	Apr 6	Oct 26	Mar 22	Nov 5	May 10
Lower Colorado River Basin									
Cliff	May 11	Oct 16	Apr 29	Oct 29	Apr 1	Nov 4	Mar 8	Nov 17	May 8
Glenwood	May 2	Oct 28	Apr 19	Nov 2	Mar 21	Nov 4	Feb 22	Nov 28	Apr 25
Luna	Jun 12	Sep 10	Jun 8	Sep 21	May 15	Oct 8	Apr 23	Oct 22	Jun 19
Newcomb	May 8	Oct 12	May 2	Oct 21	Apr 12	Oct 21	Mar 25	Oct 31	May 13
Quemado	Jun 4	Sep 16	May 29	Sep 23	May 2	Oct 17	Apr 12	Oct 28	Jun 5
Redrock	May 7	Oct 21	Apr 25	Nov 2	Mar 25	Nov 12	Feb 28	Nov 30	Apr 28
Reserve	Jun 3	Sep 30	May 18	Oct 10	Apr 17	Oct 23	Mar 29	Nov 5	May 27
Rodeo	Apr 20	Oct 30	Apr 7	Nov 8	Mar 4	Nov 19	Feb 3	Dec 13	Apr 19
Virden Valley (Duncan, Ariz*)	Apr 23	Oct 23	Apr 14	Nov 5	Mar 14	Nov 11	Feb 18	Dec 1	Apr 23
Zuni	May 18	Oct 12	Apr 30	Oct 21	Apr 22	Oct 21	Apr 3	Nov 2	May 28
Southwestern Closed Basins									
Animas	Apr 24	Oct 28	Apr 8	Nov 4	Mar 9	Nov 12	Feb 12	Dec 5	Apr 18
Deming	Apr 15	Oct 29	Apr 5	Nov 9	Mar 15	Nov 11	Feb 14	Dec 1	Apr 17
Fort Bayard	May 6	Oct 24	Apr 21	Oct 31	Apr 5	Nov 2	Mar 14	Nov 17	May 15
Hachita	Apr 20	Oct 19	Apr 6	Nov 5	Mar 13	Nov 11	Feb 12	Dec 3	Apr 22
Lordsburg	Apr 3	Nov 3	Mar 27	Nov 11	Mar 1	Nov 17	Jan 30	Dec 6	Apr 15

* Station

Table 11. Estimated normal growing seasons of major irrigated crops in farming areas of New Mexico

COUNTY	AREA ①	FROST FREE PERIOD ①	1 ALFALFA ③	2 GRASS HAY ③	3 APPLES ③	4 PECANS ③	5 CORN
BERNALILLO	Albuquerque	(4/8-11/2) 5/3-10/12 ②	X		X		5/10 - 9/10 *
CATRON	Luna	6/12 - 9/10	—				
	Reserve	6/3 - 9/30	X	X			6/10 - 9/30
	Glenwood	5/2 - 10/28	X	X			5/10 - 9/30
CHAVES	Roswell	4/11 - 10/24	X			X	
COLFAX	Maxwell - Springer	5/14 9/26 5/10 10/3	X	X			5/15 - 9/15
CURRY	Clovis	4/16 - 10/26	X				5/10 - 9/15
DE BACA	Ft. Sumner	4/15 - 10/23	X		X	X	5/1 - 9/30
DOÑA ANA	State University - Hatch	4/9 10/28 4/10 10/25	X	X		X	6/1 - 10/15 *
EDDY	Artesia	4/8 - 11/2	X			X	
	Carlsbad	4/7 - 11/5	X			X	
GRANT	Cliff	5/11 - 10/16	X	X			5/20 - 10/1 *
	Mimbres	5/29 - 10/10	X	X	X		6/1 - 10/1 *
	Red Rock	5/7 - 10/21	X	X			
GUADALUPE	Dilia	5/1 - 10/12	X	X			5/20 - 9/25
	Santa Rosa	4/19 - 10/24	X	X			5/15 - 9/25
HARDING	Roy	5/1 - 10/13	X	X			
HIDALGO	Animas - Lordsburg	4/24 10/28 4/3 11/3	X				5/15 - 9/15
LEA	Hobbs - Tatum	4/5 11/9 4/17 10/24	X				6/15 - 10/15 *
LINCOLN	Ruidoso	6/6 - 9/15	X	X	X		5/22 - 9/15 *
	Picacho	4/23 - 10/26	X	X	X		5/15 - 10/1 *
LUNA	Deming	4/15 - 10/29	X			X	6/1 - 10/15 *
McKINLEY	Zuni	5/18 - 10/12	X				5/25 - 10/1 *
MORA	Gascon	6/12 - 9/5	X	X			6/1 - 9/5
	Valmora	5/9 - 10/2	X	X			
OTERO	Tularosa-Alamogordo	4/4 11/1 4/7 11/2	X	X			5/15 - 10/1 *
QUAY	Tucumcari	4/16 - 10/25	X	X			6/10 - 10/10
RIO ARRIBA	Chama-Tierra Amarilla	6/9 9/23 6/4 9/17	X	X			6/10 - 9/17
	Española	5/12 - 10/5	X	X	X		5/25 - 10/1 *
	Truchas	5/26 - 9/23	X	X			6/1 - 9/23
ROOSEVELT	Portales	4/21 - 10/20	X		X		5/15 - 9/25

AREA	6 WINTER SMALL GRAINS	7 SPRING SMALL GRAINS	8 SORGHUMS	9 COTTON	10 DRY BEANS	11 IRISH POTATOES	12 CHILE	13 CANTALOUPES	14 TOMATOES ④	15 ONIONS (a) spring (b) fall	16 LETTUCE (a) spring (b) fall
Albuquerque	9/1 - 7/5 *	3/7 - 7/10	5/20 - 10/12			4/25 - 8/15		5/10 - 10/1	5/10 - 10/12	(a) 4/7 - 10/10	(a) 3/15 - 6/10 (b) 8/5 - 10/20
Luna		4/20 - 8/1									
Reserve	9/1 - 7/10	4/10 - 7/25			5/30 - 9/15						
Glenwood	9/1 - 7/5	4/1 - 7/20	5/15 - 8/31		5/30 - 9/15						
Roswell	9/13 - 6/15	3/1 - 6/15	6/1 - 10/24 *	4/15 - 10/24 *							
Maxwell - Springer	9/15 - 7/1	3/15 - 7/10	6/1 - 9/29 *		6/1 - 9/15						
Clovis	9/17 - 6/24		5/20 - 10/21	4/30 - 10/26	4/25 - 8/1						
Ft. Sumner	9/2 - 7/1 *	3/1 - 7/7	5/18 - 10/20	5/5 - 10/22 *				5/1 - 9/15 *			
State University - Hatch	9/25 - 6/15		5/25 - 10/18	4/11 - 10/27 *			4/15 - 10/25	4/11 - 8/1 *	3/20 - 10/27 *	(a) 11/1 - 6/20 * (b) 1/15 - 7/20	(a) 12/11 - 5/20 (b) 8/10 - 11/10
Artesia	9/13 - 6/15	3/1 - 6/25	6/1 - 10/31 *	4/10 - 11/2 *							
Carlsbad	9/13 - 6/15	3/1 - 6/25	6/1 - 10/31 *	4/10 - 11/2 *							
Cliff	9/1 - 6/30	3/15 - 7/1									
Mimbres	9/1 - 7/10		6/10 - 10/10 *		6/15 - 9/15 *		4/15 - 9/30				
Red Rock	9/1 - 6/30										
Dilia		3/15 - 7/15	5/25 - 10/1 *		6/1 - 9/15 *		5/1 - 9/30				
Santa Rosa		3/10 - 7/15	5/15 - 10/1 *		6/1 - 9/15 *		5/1 - 9/30				
Roy		3/15 - 7/10	5/25 - 10/1 *								
Animas - Lordsburg	9/1 - 6/20	2/15 - 6/25	5/15 - 10/1 *	4/22 - 11/3 *	5/15 - 8/15 *						
Hobbs - Tatum	9/2 - 6/20 *	3/10 - 7/1 *	5/22 - 10/7 *	5/1 - 11/1 *	6/22 - 9/15 *			4/15 - 8/5 *	4/15 - 10/1 *	(b) 2/1 - 8/1 *	
Ruidoso	9/1 - 7/5	4/15 - 7/15	6/1 - 9/15 *		6/15 - 9/15						
Picacho	9/1 - 7/1		5/22 - 10/1 *		6/15 - 9/15 *						
Deming	9/15 - 6/15	3/10 - 7/1	6/1 - 10/15 *	4/15 - 10/29 *	6/15 - 9/15 *		4/15 - 10/15	4/15 - 8/25 *	4/15 - 10/29 *	(b) 2/15 - 9/1 *	
Zuni	9/12 - 7/10	3/20 - 7/15				5/1 - 8/10					
Gascon						5/15 - 8/20 *					
Valmora		3/15 - 7/25	5/25 - 9/10 *								
Tularosa-Alamogordo	10/7 - 6/17 *		6/1 - 10/20 *	4/28 - 11/1 *							
Tucumcari	9/1 - 6/25	3/30 - 7/15	5/20 - 10/5	5/8 - 10/25	5/20 - 8/25		5/5 - 10/15	5/10 - 9/5	5/5 - 9/15		
Chama-Tierra Amarilla		5/1 - 8/10					5/15 - 9/20				
Española											
Truchas		5/1 - 8/10									
Portales	9/1 - 6/20		6/1 - 10/15	5/1 - 10/20		4/15 - 8/1 9/1			5/1 - 9/30	(a) 3/15 - 8/15	

① Where two stations are shown on one line, the station name and frost-free period dates are presented in the same order.

② Frost-free dates of 5/3 to 10/12 for the Albuquerque area were computed as an average of the frost-free period at the stations by Los Lunas, located 20 miles south of Albuquerque, and Bernalillo, located 20 miles north of Albuquerque. The frost-free dates for Albuquerque airport, 4/8 to 11/2, are not representative of the Albuquerque irrigated area.

③ Consumptive use was computed for the frost-free period only for this report. K-values to estimate the use outside the frost-free period are included in Table 6 of the report.

Source: Blaney and Hanson (1).

④ Tomatoes are field seeded in Doña Ana and Luna counties. Other counties transplant.

⑤ Climatological data for Duncan, Arizona, used for Virden Valley.

* Indicates areas where crops are planted on moisture from preplanting irrigation. All other crops are "irrigated up" or are planted on available soil moisture.

X Indicates areas where crops in heading are grown.

Table 11. Estimated normal growing seasons of major irrigated crops in farming areas of New Mexico (continued)

COUNTY	AREA ①	FROST FREE PERIOD ①	1 ALFALFA ②	2 GRASS HAY ③	3 APPLES ③	4 PECANS ③	5 CORN
SANDOVAL	Bernalillo	5/3 – 10/10	X				6/1 – 10/10
	Cuba	6/7 – 9/20	X	X			6/10 – 9/20
	Jemez Springs	5/2 – 10/21	X	X			5/15 – 9/25
SAN JUAN	Bloomfield	5/1 – 10/19	X		X		5/15 – 10/10
	Farmington	5/13 – 10/9	X		X		5/25 – 10/9
	Shiprock	5/2 – 10/12	X		X		5/15 – 10/12
	Aztec Ruins	5/20 – 10/14	X		X		5/25 – 10/14
SAN MIGUEL	Las Vegas	5/12 – 10/8	X	X			5/25 – 10/1 *
	Pecos	5/29 – 10/6	X	X			6/6 – 10/8*
SANTA FE	Stanley	5/4 – 10/6	X	X	X		5/25 – 10/6 *
	Santa Cruz	5/12 – 10/5	X		X		5/25 – 10/1 *
SIERRA	Truth or Consequences	3/31 – 11/4	X	X		X	5/15 – 9/25 *
SOCORRO	Socorro	4/14 – 10/28	X				5/15 – 9/25
TAOS	Cerro	5/30 – 9/25	X	X			
	Taos	5/25 – 9/30	X	X	X		6/10 – 9/30
TORRANCE	Estancia – McIntosh	5/8 – 9/28	X	X			5/25 – 9/20*
UNION	Des Moines	5/4 – 10/3	X	X			6/1 – 10/1
	Clayton	4/28 – 10/15	X	X			5/15 – 10/1
VALENCIA	Laguna	5/2 – 10/16	X				5/15 – 10/1
	Los Lunas – Belen	5/3 – 4/27 10/15 10/7	X		X		5/30 – 10/1
HIDALGO ⑤	Virden Valley	4/23 – 10/23	X				5/15 – 9/15

6 WINTER SMALL GRAINS	7 SPRING SMALL GRAINS	8 SORGHUMS	9 COTTON	10 DRY BEANS	11 IRISH POTATOES	12 CHILE	13 CANTALOUPES	14 TOMATOES ④	15 ONIONS (a) spring (b) fall	16 LETTUCE (a) spring (b) fall
9/1 – 7/1	4/1 – 7/15	5/15 – 10/1		6/1 – 9/1 *		5/10 – 10/20	5/10 – 9/15	5/10 – 10/1	(a) 4/7 – 10/15	
9/1 – 7/15	4/15 – 7/20			6/15 – 9/20						
	4/1 – 7/15			6/10 – 9/15						
9/1 – 7/1		5/15 – 10/19		6/1 – 9/1	5/10 – 9/1	5/10 – 10/1	5/10 – 9/15	5/10 – 10/1		
9/1 – 7/1		5/27 – 10/9		6/15 – 9/15	5/10 – 9/1	5/10 – 10/1	5/10 – 9/15	5/10 – 10/1		
9/1 – 7/1		5/15 – 10/12		6/1 – 9/1	5/10 – 9/1	5/10 – 10/1	5/10 – 9/15	5/10 – 10/1		
9/1 – 7/5		6/1 – 10/14		6/15 – 9/15	5/10 – 9/1	5/10 – 10/1	5/10 – 9/15	5/10 – 10/1		
9/5 – 7/10	4/1 – 7/15	5/15 – 9/30*		6/15 – 9/15						
	4/15 – 7/20			6/20 – 9/25						
9/3 – 7/10	4/15 – 7/15				5/6 – 9/15	5/7 – 10/6 *	5/10 – 9/15			
						5/7 – 10/5 *				
9/15 – 6/25		5/5 – 10/1 *	4/15 – 11/4 *			4/25 – 10/15*				
9/15 – 6/25	3/15 – 7/1	5/15 – 10/4	4/20 – 10/28*			4/20 – 10/15			(a) 2/15 – 6/15	
	4/15 – 8/1			6/10 – 9/15 *	5/8 – 8/15					
	4/15 – 8/1									
9/3 – 7/1		5/25 – 9/28*		6/1 – 9/15 *	5/6 – 9/15 *					
9/1 – 7/1	4/1 – 7/15									
9/1 – 7/1	4/1 – 7/15	5/20 – 10/1								
	4/1 – 7/15			6/1 – 9/15 *	5/1 – 8/15					
8/15 – 7/1	3/22 – 7/10	5/22 – 10/7	5/3 – 10/15		4/25 – 8/15	5/10 – 10/15	5/5 – 9/15	4/20 – 10/5	(a) 4/7 – 10/15	(a) 3/15 – 6/10 (b) 8/5 – 10/20
9/1 – 6/20	3/1 – 6/25	5/15 – 10/1	4/23 – 10/23	5/15 – 8/15						

① Where two stations are shown on one line, the station name and frost-free period dates are presented in the same order.

② Frost-free dates of 5/3 to 10/12 for the Albuquerque area were computed as an average of the frost-free period at the stations by Los Lunas, located 20 miles south of Albuquerque, and Bernalillo, located 20 miles north of Albuquerque. The frost-free dates for Albuquerque airport, 4/8 to 11/2, are not representative of the Albuquerque irrigated area.

③ Consumptive use was computed for the frost-free period only for this report. K-values to estimate the use outside the frost-free period are included in Table 6 of the report.

④ Tomatoes are field seeded in Doña Ana and Luna counties. Other counties transplant.

⑤ Climatological data for Duncan, Arizona, used for Virden Valley.

* Indicates areas where crops are planted on moisture from preplanting irrigation. **All other crops are "irrigated up" or are planted on available soil moisture.**

X **Indicates areas** where crops in heading are grown.