

Colorado's Net Irrigation Requirements for Agriculture, 1995

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Overview

This paper provides estimates of net irrigation requirements for each crop (including pastureland) by county in Colorado for the year 1995. These estimates were generated from weather and crop water requirement data at 44 locations provided by the Natural Resources Conservation Service-USDA (NRCS) and from harvested irrigated cropland acreage published by the Colorado Agricultural Statistics Service and the Bureau of the Census.

As defined by the NRCS, *net irrigation requirement* is the amount of irrigation water—exclusive of precipitation, soil moisture, or groundwater—that is required to meet potential crop consumptive use requirements. In this paper, 'net irrigation requirement' means the *on-field* requirement and excludes conveyance losses and leaching requirements. Consequently, the estimates given in this paper understate the amount of water needed by agriculture to produce irrigated crops at full yield potential levels.

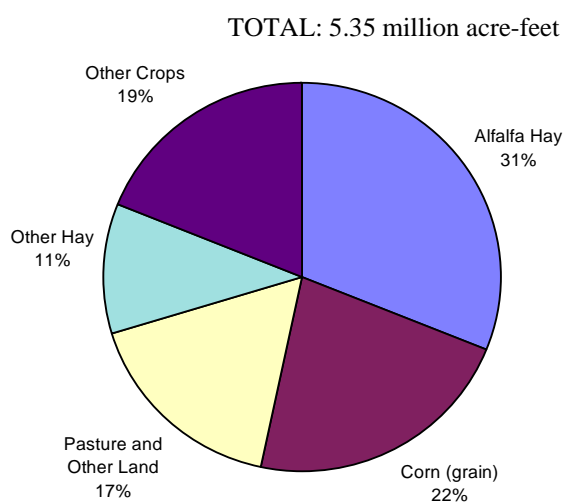
For each crop in a given county, its net irrigation requirement (measured in acre-inches of water per acre) is multiplied by the number of irrigated acres harvested of that crop in the given county for 1995. The resulting figure, divided by 12, is the number of acre-feet of irrigation water required at the field level to produce the irrigated crop at its full yield potential in the given county. These figures are then summed for all crops and all counties to give a total state-level estimate of 5.35 million acre-feet for 1995.

Actual consumptive use of irrigation water by Colorado crops cannot be directly inferred from these estimates of net irrigation requirements because some fields are known to receive less than a full water supply. Nevertheless, the estimated state-level net irrigation requirement of 5.35 million acre-feet calculated in this paper is quite close to irrigation consumptive use estimates developed by the U.S. Geological Survey of 5.5 million acre-feet in 1995.³

State-level Findings

Top Five Crops (Thousand acre-feet)		Top Five Counties (Thousand acre-feet)	
Alfalfa Hay	1,661	Weld	570
Corn (grain)	1,196	Yuma	451
Pasture/Other Land	901	Prowers	271
Other Hay	582	Morgan	234
Corn (silage)	163	Kit Carson	233
Subtotal	4,503	Subtotal	1,759
State Total	5,350	State Total	5,350

1995 Colorado Net Irrigation Requirements



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³ 1995 water-use estimate from the U.S. Geological Survey Water-Use Web Site page (<http://water.usgs.gov/watuse/pdf1995/pdf/irrigation.pdf>), Table 16, "Irrigation Water Use by State, 1995."

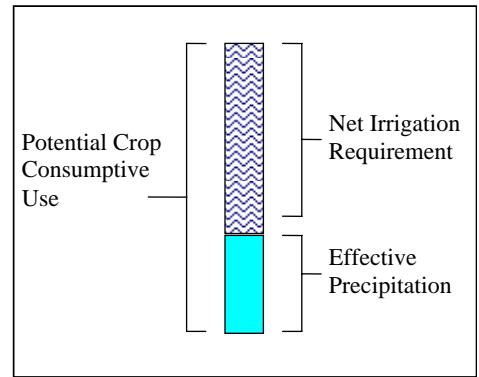
Methodology

Definitions

Potential crop consumptive use. The amount of water required to meet the evapotranspiration needs of a crop at the field level so that its production is not limited from lack of water. Alternatively, the amount of water, if available, that would be removed from the soil and plant surfaces of a vegetative area.

Effective precipitation. Precipitation received during the growing period that is available to meet the potential consumptive use requirements of a crop. Alternatively, the portion of precipitation remaining on the foliage or in the soil that is available for evapotranspiration.

Net irrigation requirement. The amount of irrigation water—exclusive of precipitation, soil moisture, or groundwater—that is required to meet potential crop consumptive use requirements. Net irrigation requirement excludes conveyance losses and leaching requirements.



Description of the Method

The Natural Resources Conservation Service (NRCS) has calculated net irrigation requirements for up to 20 crops at 64 weather stations in 44 counties, using a modification of the Blaney-Criddle method and weather data.⁴ The NRCS calculated potential crop consumptive use by considering average monthly temperature, total monthly precipitation, typical planting and harvesting dates, elevation, and crop growth-stage water requirement curves. Steps taken to derive Colorado’s 1995 net irrigation water requirements of 5.35 million acre-feet are listed below.

First, in consultation with NRCS staff, *normal year* net irrigation requirements for each crop in each county were estimated from NRCS’s report covering 44 counties (Table 1). *Normal year* is defined by the NRCS as a year in which the growing season effective precipitation will be equaled or exceeded five out of 10 years. In some cases, estimates were based upon data from two locations within the same county. In counties with no NRCS locations, estimates were derived from NRCS data from appropriate adjacent counties.

Second, county-level harvested acreage for 1995 for Colorado’s major irrigated crops was obtained from the Colorado Agricultural Statistics Service (CASS)⁵, which updates this information annually (see Table 2, columns 1-13). Harvested acreage for 1992 for Colorado’s minor and specialty irrigated crops, including pastureland, was obtained from the federal Bureau of the Census⁶ (see Table 2, columns 14-26). This data is updated once every five years.

Third, the total net irrigation requirement for each crop and county was then estimated by “multiplying” its net irrigation requirement per acre [Table 1] by its harvested irrigated acreage [Table 2] and dividing the result by 12 [Table 3]. The resulting table was then simplified by combining some columns containing minor and specialty crops, producing Table 3. This “multiplication” is not straightforward, as the column heading for Tables 1 and 2 are not identical. Table 4 displays the relationship used between these sets of column headings before cell-by-cell multiplication of Tables 1 and 2.

<p style="text-align: center;">Table 1 Net Irrigation Requirements per acre for 20 crops in 63 counties. (acre-inches/acre)</p>	X	<p style="text-align: center;">Table 2 Irrigated Harvested Cropland for 26 crops in 63 counties. (acres)</p>	X	$\frac{1 \text{ foot}}{12 \text{ inches}}$	=	<p style="text-align: center;">Table 3 Total Net Irrigation Requirements for each crop and county in Colorado. (acre-feet)</p>
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⁴ Natural Resources Conservation Service-USDA, *Estimated Irrigated Crop Water Requirements for Selected Crops and Locations in Colorado*, Unpublished report, 1990, (Lakewood, Colorado 1990).

⁵ Colorado Agricultural Statistics Service-USDA, *Colorado Agricultural Statistics 1996*, (Lakewood, Colorado 1996).

⁶ Bureau of the Census-U.S. Department of Commerce, *1992 Census of Agriculture*, Volume 1, Part 6: Colorado and County Data, (Washington, D.C., 1994).

Sources for Net Irrigation Requirements and Harvested Irrigated Acreage

Table 1	Table 2	Table 2	Table 3
NRCS Net Irrigation Data	Harvested Irrigated Acreage from the CASS 1996	Harvested Irrigated Acreage from the 1992 Ag Census	Crops with calculated Net Irrigation Requirements
Alfalfa	Alfalfa Hay		Alfalfa Hay
Corn (grain)	Corn (grain)		Corn (grain)
Pasture Grass/Turf		Sod	Turf
Potatoes	Potatoes		Potatoes
Sorghum (grain)	Sorghum (grain)		Sorghum (grain)
Dry Beans	Dry Beans		Dry Beans
Sugar Beats	Sugar Beets		Sugar Beats
Avg. of Orchards w/o cover and w/ Cover		Orchards	Orchards
Sunflowers	Sunflowers		Sunflowers
Melons/Cantaloups		Combined Melons and Cantaloups	Melons/Cantaloups
Corn (sweet)		Sweet Corn	Sweet Corn
Tomatoes		Tomatoes	Tomatoes
Small Vegetables		Dry Onions	Dry Onions
Small Vegetables		Lettuce	Lettuce
Small Vegetables		Spinach	Spinach
Small Vegetables		Sum of small vegetables less dry onions, sweat corn, lettuce, spinach, and snap beans	Small Vegetables
Snap Beans		Snap Beans	Snap Beans
Corn (silage)	Corn (silage)		Corn (silage)
Soybeans		Soybeans	Soybeans
Winter Wheat (fall)	Winter Wheat		Winter Wheat
Winter Wheate (spring)	Spring Wheat		Spring Wheat
Spring Grain	Oats		Oats
Spring Grain	Barley		Barley
Pasture Grass/Turf		Pastureland and Other Land	Pasture and Other Land
Pasture Grass/Turf	Other Hay	Other Hay	Other Hay

Future Refinements and Considerations

1. Use this method to estimate irrigation requirements for 1985 and 1990 and compare the results with published USGS consumptive use estimates for the same years.
2. Use this method to estimate irrigation requirements for each basin and sub-basin in Colorado.
3. Investigate the relationship between estimates of net irrigation requirements and consumptive use.
4. Use this method with dry—instead of normal—year precipitation data to estimate irrigation requirements under drought conditions. As defined by the NRCS a *dry year* is a year in which the growing season effective precipitation will be equaled or exceeded 8 out 10 years.
5. Refine this method by including non-harvested as well as harvested irrigated cropland. Non-harvested irrigated acreage may occur because of hail damage, for example.
6. Combine net irrigation requirement data with economic data to estimate gross sales and profitability in dollars per acre-foot for all crops. Use linear programming techniques to generate scenarios for maintaining current levels of agricultural sales and profitability with reduced levels of water for agricultural use.

Table 1: Normal Year Net Irrigation Requirements (acre-inches of water)

County	Alfalfa Hay	Corn (grain)	Corn (silage)	Corn (sweet)	Dry Beans	Green Peas	Melons/ Cantelopes	Orchards	Pasture Grass/Turf	Potatoes	Small Vegetables	Snap Beans	Sorghum grain	Soybeans	Spring Grain	Sugar Beets	Sunflowers	Tomatoes	Winter Wheat (fall)	Winter Wheat (spring)
Adams ²	22.32	18.33	17.85	14.55	14.51	12.11	12.57	22.72	22.38	21.57	8.88	11.96	17.16	14.24	14.42	21.45	17.57	16.84	1.90	10.68
Alamosa	20.60	13.66	13.84	13.14	13.77	12.40	8.36	17.59	19.26	18.70	9.26	10.66	12.95	11.15	15.98	15.92	13.98	13.39	2.17	14.01
Arapahoe ^{1,2} (Adams)	22.32	18.33	17.85	14.55	14.51	12.11	12.57	22.72	22.38	21.57	8.88	11.96	17.16	14.24	14.42	21.45	17.57	16.84	1.90	10.68
Archuleta	16.72	10.16	10.33	9.23	11.26	10.33	6.70	13.91	15.14	15.48	6.66	9.02	8.74	8.15	12.97	11.12	10.56	10.19	0.88	11.66
Baca	30.83	22.19	19.84	15.15	14.64	12.09	10.97	25.91	26.60	22.96	8.94	12.88	21.32	17.17	13.58	23.86	19.12	20.84	1.73	10.04
Bent	35.42	26.07	23.22	18.27	17.62	14.53	13.64	30.26	30.97	26.37	11.25	15.22	25.40	20.66	15.75	27.38	22.08	24.84	1.99	11.34
Boulder	25.68	20.18	18.95	15.13	14.28	11.58	9.75	23.35	23.43	22.87	9.19	12.77	19.74	15.60	14.57	24.68	18.67	18.58	1.60	10.38
Chaffee ²	19.08	13.68	14.18	13.50	13.85	12.51		12.48	20.05	18.83	8.45	10.97	13.41	11.03	15.73		14.27	13.43	1.82	12.61
Cheyenne	28.49	20.83	18.91	15.51	15.18	13.76	8.59	23.76	24.28	21.75	10.14	11.68	15.91	15.48	14.42	24.13	14.21	18.72	1.84	10.80
Clear Creek ¹ (Grand)	11.05	8.68	9.03	8.41	10.94	9.98	6.39	12.21	14.47	14.37		8.60	8.05	7.23	12.40	9.92	9.27	8.99	1.98	12.00
Conejos ¹ (Costilla)	20.19	13.35	13.46	12.70	13.30	12.03	8.04	17.21	18.75	18.27	8.83	10.52	12.74	10.78	15.35	15.74	13.66	13.01	2.07	13.44
Costilla	20.19	13.35	13.46	12.70	13.30	12.03	8.04	17.21	18.75	18.27	8.83	10.52	12.74	10.78	15.35	15.74	13.66	13.01	2.07	13.44
Crowley ²	32.18	24.40	22.07	17.96	17.77	15.76	13.31	27.97	28.52	25.50	11.90	13.78	21.82	19.08	15.59		21.51	24.07	1.91	11.40
Custer	15.07	10.37	9.36	9.34	10.82	9.97			15.17	13.93		8.64	9.57	8.55	12.09		9.29	10.27	1.75	11.74
Delta	29.99	23.07	21.87	18.82	18.01	15.55	11.32	27.17	27.71	25.82	11.98	14.46	21.87	18.32	17.35	26.94	21.55	21.92	1.77	12.83
Denver ¹ (Adams)	22.32	18.33	17.85	14.55	14.51		12.57	22.72	22.38	21.57	8.88		17.16	14.24	14.42	21.45	17.57	16.84	1.90	10.68
Dolores	23.36	16.21	16.15	14.31	14.87	13.44	8.98	20.10	21.11	20.49	10.03	11.72	15.18	13.10	16.40	18.61	16.28	15.57	1.40	13.23
Douglas ¹ (El Paso)	23.63	16.52	15.67	12.90	12.46	10.65	12.13	19.91	20.34	19.15	7.96	10.50	16.33	12.06	13.82	20.81	15.51	15.15	1.87	10.62
Eagle	20.25	13.41	13.72	12.45	13.64	12.26	8.11	17.27	19.14	18.39	9.06	10.65	12.43	10.87	15.52	15.41	13.70	13.19	1.75	13.15
El Paso	23.63	16.52	15.67	12.90	12.46	10.65	12.13	19.91	20.34	19.15	7.96	10.50	16.33	12.06	13.82	20.81	15.51	15.15	1.87	10.62
Elbert ¹ (El Paso)	23.63	16.52	15.67	12.90	12.46	10.65	12.13	19.91	20.34	19.15	7.96	10.50	16.33	12.06	13.82	20.81	15.51	15.15	1.87	10.62
Fremont ²	31.94	23.72	21.26	16.92	16.32	13.55		30.06	28.53	24.92	8.06	14.09	23.75	18.88	12.76		20.84	23.07	1.66	10.81
Garfield	22.07	17.15	16.98	14.85	14.64	13.14	8.69	20.99	21.39	21.02	9.84	11.48	16.56	13.84	15.16	20.87	16.94	16.33	1.39	11.40
Gilpin ¹ (Grand)	11.05	8.68	9.03	8.41	10.94	9.98	6.39	12.21	14.47	14.37		8.60	8.05	7.23	12.40	9.92	9.27	8.99	1.98	12.00
Grand	11.05	8.68	9.03	8.41	10.94	9.98	6.39	12.21	14.47	14.37		8.60	8.05	7.23	12.40	9.92	9.27	8.99	1.98	12.00
Gunnison	11.51	8.80	9.32	8.48	11.36	10.27	6.78	12.48	15.35	14.89	8.97	8.28	7.41	13.11	10.24		9.25	2.13	12.34	
Hindsdale ¹ (Saguache)	20.03	12.79	12.94	12.50	12.89	11.61	7.82	16.98	18.48	17.78	8.51	10.22	12.72	10.65	14.84	15.73	13.16	12.82	1.79	13.20
Huerfano ²	28.06	20.10	18.98	15.27	15.23	13.11	24.40		28.89	22.48	9.66	12.48	19.07	15.51	14.88		18.55	18.63	1.63	11.25
Jackson	10.99	5.46	5.81	7.49	9.96	9.12	5.81	8.63	12.17	11.83	0.56	7.81	5.97	5.34	9.43	7.68	6.10	6.40	1.86	11.50
Jefferson ¹ (Boulder)	25.68	20.18	18.95	15.13	14.28	11.58	9.75	23.35	23.43	22.87	9.19	12.77	19.74	15.60	14.57	24.68	18.67	18.58	1.60	10.38
Kiowa	30.94	22.41	20.19	15.83	15.34	12.78	10.00	30.01	26.43	23.58	9.58	13.17	20.83	17.25	14.28	26.41	19.64	20.84	1.83	10.50
Kit Carson	24.89	19.06	17.83	14.17	14.03	11.93	12.30	23.66	22.88	21.36	8.72	11.35	16.32	14.48	14.06	21.52	17.37	17.40	1.93	10.63
La Plata	19.95	13.64	13.66	12.43	13.03	11.84	7.84	17.47	18.41	17.93	7.88	10.37	12.78	10.94	14.46	15.92	13.83	13.29	1.23	12.07
Lake ¹ (Chaffee)	19.08	13.68	14.18	13.50	13.85	12.51			20.05	18.83	8.45	10.97	13.41	11.03	15.73		14.27	13.43	1.82	12.61
Larimer	20.95	17.09	16.79	13.96	13.66	11.55	8.57	20.13	20.31	20.40	9.10	11.33	16.22	13.14	13.88	20.55	16.54	15.47	1.55	9.92
Las Animas	28.16	20.22	18.18	14.68	14.80	12.33	12.31	23.55	24.52		9.32		18.41	15.23	14.14	22.14	17.71	18.57	1.74	10.76
Lincoln ¹ (Kit Carson)	24.89	19.08	17.83	14.17	14.03	11.93	12.30	23.66	22.88	21.36	8.72	11.35	16.32	14.48	14.06	21.52	17.37	17.40	1.93	10.63
Logan	22.39	17.97	17.34	13.72	13.44	11.11	8.47	21.23	21.60	20.98	7.99	11.41	17.07	13.96	13.65	22.19	16.97	16.41	1.78	9.89
Mesa	31.77	23.79	21.62	18.30	18.09	15.53	11.92	28.80	28.55	25.59	12.23	14.99	23.16	18.77	16.79	28.28	21.51	22.84	1.58	12.02
Mineral ¹ (Saguache)	20.03	12.79	12.94	12.50	12.89	11.61	7.82	16.98	18.48	17.78	8.51	10.22	12.72	10.65	14.84	15.73	13.16	12.82	1.79	13.20
Moffat	20.86	14.02	14.23	13.57	13.77	12.45	8.13	17.76	18.95	18.81	9.50	10.75	13.49	11.28	15.54	16.88	14.31	13.63	1.56	12.80
Montezuma	25.15	20.07	19.48	16.73	16.45	14.83	10.04	24.02	24.47	22.57	11.31	13.02	18.78	15.79	16.83	22.84	19.33	19.01	1.54	12.83
Montrose	35.19	25.99	23.88	19.27	18.85	15.88	12.43	30.06	30.09	27.77	12.55	15.82	5.55	20.39	16.82	31.27	23.41	24.54	1.35	9.49
Morgan	28.17	20.55	19.39	15.36	14.64	12.65	9.86	27.47	24.18	23.20	9.28	12.93	19.69	13.30	15.32	24.92	18.97	16.33	1.92	11.07
Otero	34.59	25.32	22.70	17.37	16.76	13.71	13.31	29.46	29.92	25.94	10.61	14.82	22.87	19.95	14.74	26.75	21.93	24.07	1.99	11.13
Ouray ¹ (San Miguel)	20.63	13.49	13.66	12.48	13.07	11.84	7.79	17.31	18.42	17.95	8.54	10.30	12.61	10.72	14.63	15.61	13.86	13.00	1.37	12.55
Park ¹ (Fremont)	31.94	23.72	21.26	16.92	16.32	13.55			28.53	24.92	8.06	14.09	23.75	18.88	12.76		20.84	23.07	1.66	10.81
Phillips	25.30	18.56	16.97	13.17	12.86	10.54	8.41	21.13	21.38	19.79	7.79	11.03	16.91	13.94	12.83	21.62	16.34	16.33	1.81	10.52
Pitkin ¹ (Gunnison)	11.51	8.80	9.32	8.48	11.36	10.27	6.78	12.48	15.35	14.89		8.97	8.28	7.41	13.11	10.24		9.25	2.13	12.34
Prowers	32.52	23.65	21.15	16.33	15.62	12.72	12.41	27.42	27.77	24.27	9.67	13.83	22.89	18.39	13.26	25.08	20.24	22.24	1.74	10.24
Pueblo ²	33.47	24.49	22.12	17.96	16.53	13.51	14.18	28.60	28.89	25.73	10.48	14.47	24.17	19.08	16.41	25.81	21.64	23.20	1.92	12.13
Rio Blanco	21.22	14.63	14.67	13.81	13.80	12.53	8.11	18.24	19.18	19.10	9.52	10.74	13.47	11.77	15.42	16.70	14.70	13.92	1.44	12.59
Rio Grande	18.39	12.72	12.84	12.55	12.72	11.44	7.72	16.83	18.48	17.49	8.48	10.07	12.82	10.55	14.63	15.86	13.00	12.76	0.93	13.00
Routt	14.79	10.31	10.72	10.21	11.45	10.45	6.55	13.72	15.40	15.63	8.83	8.89	9.47	8.48	12.74	11.87	10.85	10.16	1.31	11.38
Saguache	20.03	12.79	12.94	12.50	12.89	11.61	7.82	16.98	18.48	17.78	8.51	10.22	12.72	10.65	14.84	15.73	13.16	12.82	1.79	13.20
San Juan ¹ (Dolores)	23.36	16.21	16.15	14.31	14.87	13.44	8.98	20.10	21.11	20.49	10.03	11.72	15.18	13.10	16.40	18.61	16.28	15.57	1.40	13.23
San Miguel	20.63	13.49	13.66	12.48	13.07	11.84	7.79	17.31	18.42	17.95	8.54	10.30	12.61	10.72	14.63	15.61	13.86	13.00	1.37	12.55
Sedgwick ¹ (Phillips)	25.30	18.56	16.97	13.17	12.86	10.54	8.41	21.13	21.38	19.79	7.79	11.03	16.91	13.94	12.83	21.62	16.3			

1995 IRRIGATED HARVESTED COLORADO CROPLAND

County	Alfalfa	Other	Com	Com	Winter	Spring	Dry	Potatoes	Sorghum	Sugar	Oats	Sunflowers	Barley	Dry	Sweet	Lettuce	Spinach	Snap	Cantaloups	Melons	Tomatoes	Dther Smal	Orchards	Pastureland	Turf	Soybeans	County	County	
	Hay	Hay	(grain)	(silage)	Wheat	Wheat	Beans	acres	(grain)	Beets	acres	acres	acres	Onions	Corn	acres	acres	Beans	acres	acres	acres	Vegetables	acres	& Other	acres	acres	Totals	%	
acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	%
Adams	7,200	1,400	9,000	700	3,500	300	700	0	200	1,250	0	6,100	400	925	108	322	430	96	6	0	19	2,050	3	2,019	1,095	0	37,823	1.16%	
Alamosa	30,000	8,300	0	0	5,300	0	0	26,100	0	0	1,500	11,000	0	0	0	0	0	0	0	0	0	0	0	25,470	0	107,670	3.30%		
Arapahoe	1,800	400	0	400	0	0	0	0	0	0	0	2,500	100	0	0	0	0	0	0	0	0	0	0	281	0	5,281	0.16%		
Archuleta	1,400	2,800	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	10,273	0	14,475	0.44%		
Baca	2,500	800	20,000	1000	28,500	0	0	0	13,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	803	0	67,003	2.05%		
Bent	42,500	2,000	7,000	2000	3,500	0	0	0	3,800	0	200	0	400	0	0	0	0	0	0	0	0	0	0	1,876	0	63,276	1.94%		
Boulder	9,600	3,800	5,000	1700	1,000	600	800	0	0	700	300	0	1,600	0	196	0	1	0	17	0	2	241	14	8,090	0	33,661	1.03%		
Chaffee	4,500	5,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6,650	0	16,655	0.51%		
Cheyenne	1,700	900	9,000	400	6,000	0	400	0	0	0	0	6,800	0	0	0	0	0	0	0	0	0	0	0	0	0	25,200	0.77%		
Clear Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%	
Conejos	50,000	17,000	0	0	0	700	0	1,300	0	0	3,200	0	8,000	0	0	0	315	0	0	0	0	0	0	30,178	0	110,693	3.39%		
Costilla	14,000	2,900	0	0	2,000	0	0	4,200	0	0	500	0	5,500	0	0	0	0	0	0	0	2,515	0	6,992	0	38,607	1.18%			
Crowley	7,500	1,000	2,000	600	0	0	0	0	0	0	0	0	0	24	0	0	0	0	30	51	154	63	6	1,390	0	12,818	0.39%		
Custer	1,800	9,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,831	0	16,631	0.51%		
Delta	18,300	8,800	4,000	3700	500	300	3,000	0	0	0	900	0	0	769	468	101	0	1	0	0	4	252	5,054	24,590	0	70,739	2.17%		
Denver	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%	
Dolores	5,200	0	0	0	400	0	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,141	0	8,741	0.27%		
Douglas	3,700	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	671	0	5,371	0.16%		
Eagle	5,500	5,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,399	0	20,599	0.63%		
El Paso	5,900	2,100	0	400	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2,681	760	12,049	0.37%		
Elbert	10,400	2,400	0	400	0	0	0	0	0	0	700	0	0	0	0	0	0	0	0	0	0	0	4	298	0	14,202	0.44%		
Fremont	5,000	3,800	0	500	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	1	54	445	2,835	0	12,639	0.39%		
Garfield	25,900	7,400	1,000	400	0	0	0	0	0	800	0	200	0	0	0	0	0	0	0	0	0	13	92	16,056	0	51,861	1.59%		
Gilpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%	
Grand	2,500	26,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,270	0	37,770	1.16%		
Gunnison	500	19,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,199	0	39,299	1.20%		
Hindsdale	0	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	490	0	1,290	0.04%		
Huerfano	14,400	3,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1,493	0	19,596	0.60%		
Jackson	500	62,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23,021	0	85,521	2.62%		
Jefferson	700	600	0	0	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	18	9	1,053	0	2,433	0.07%		
Kiowa	500	0	1,500	500	2,500	0	0	0	400	0	0	1,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,700	0.21%	
Kit Carson	5,800	2,500	78,000	7800	37,000	0	17,600	0	500	0	700	34,900	300	0	0	0	0	0	0	0	0	0	0	0	694	0	185,794	5.69%	
La Plata	21,800	9,800	0	0	200	0	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	115	6,023	0	38,838	1.19%		
Lake	0	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53,155	0	53,555	1.64%		
Larimer	17,500	5,200	15,000	9000	2,000	500	4,000	0	0	2,360	0	4,200	0	0	48	0	0	60	2	0	4	1,034	97	14,178	608	75,791	2.32%		
Las Animas	14,700	7,100	400	300	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,456	0	27,156	0.83%		
Lincoln	2,300	1,200	1,000	600	1,500	0	0	1,300	0	0	1,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,200	0.28%		
Logan	32,300	5,000	46,000	6000	4,000	0	5,900	0	0	5,070	500	5,500	200	0	0	0	0	0	23	0	0	35	0	3,417	0	113,945	3.49%		
Mesa	28,700	8,700	7,000	3000	2,000	300	1,900	0	0	1,200	0	900	0	0	296	0	0	20	40	7	130	428	3,142	22,486	0	80,249	2.46%		
Mineral	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%	
Moffat	6,900	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,261	0	18,161	0.56%		
Montezuma	37,500	5,000	1,000	400	700	0	2,100	0	0	1,200	0	0	0	0	0	0	0	0	0	0	0	53	440	19,329	0	67,722	2.08%		
Montrose	26,000	11,200	7,000	3500	1,200	600	10,500	0	0	1,200	0	700	0	1,739	1,046	129	0	0	0	0	2	292	481	24,345	0	89,934	2.76%		
Morgan	20,000	1,000	72,500	8000	10,000	600	6,800	1,200	100	9,560	500	5,100	500	1,412	15	0	0	0	0	0	0	63	0	2,471	0	139,821	4.29%		
Otero	26,000	2,700	16,800	1500	5,000	0	1,400	0	700	0	1,100	200	0	1,176	65	0	2	1,168	411	104	256	16	5,821	120	64,539	1.98%			
Ouray	3,000	6,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,816	0	12,516	0.38%		
Park	0	4,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,099	0	7,199	0.22%	
Phillips	2,300	0	60,000	600	2,000	0	8,700	0	0	150	0	4,400	0	0	0	0	0	0	0	0	0	0	0	0	1,634	0	79,784	2.45%	
Pitkin	4,000	3,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,156	0	13,156	0.40%		
Prowers	71,500	3,000	18,000	3500	15,000																								

Estimated Net Irrigation Requirements for Colorado Crops, 1995 (acre-feet)

	Alfalfa Hay	Corn (grain)	Pasture & Other Land	Other Hay	Corn (silage)	Dry Beans	Sunflowers	Potatoes	Grain Crops	Other Crops	County Totals	County as % of State
County	1	2	3	4	5	6	7	8	9	10	acre-feet	%
Weld	159,548	152,442	53,863	17,648	61,930	32,914	8,894	5,976	20,004	56,594	569,615	10.6%
Yuma	35,937	309,700	15,226	4,444	5,792	34,953	33,197	6,283	4,410	908	450,849	8.4%
Prowers	193,735	35,468	5,758	6,943	6,169	0	0	0	21,803	688	270,562	5.1%
Morgan	46,950	124,156	4,979	2,015	12,927	8,296	8,062	2,320	3,594	21,013	234,312	4.4%
Kit Carson	12,030	123,988	1,323	4,766	11,588	20,570	50,518	0	7,787	0	232,567	4.3%
Montrose	76,245	15,161	61,045	28,084	6,965	16,494	0	0	3,273	5,148	212,414	4.0%
Mesa	75,987	13,876	53,501	20,700	5,405	2,864	0	0	3,502	8,747	184,583	3.5%
Logan	60,266	68,885	6,151	9,000	8,670	6,608	7,778	0	1,390	9,415	178,162	3.3%
Conejos	84,125	0	47,153	26,563	0	0	0	1,979	15,111	232	175,162	3.3%
Rio Grande	36,770	0	44,535	14,168	0	0	0	41,393	36,590	418	173,874	3.2%
Alamosa	51,500	0	40,879	13,322	0	0	0	40,673	22,834	0	169,207	3.2%
Saguache	36,722	0	36,115	33,264	0	0	0	24,892	32,297	3,030	166,318	3.1%
Bent	125,446	15,208	4,842	5,162	3,870	0	0	0	9,411	0	163,938	3.1%
Delta	45,735	7,688	56,772	20,317	6,742	4,503	0	0	1,696	13,304	156,756	2.9%
Otero	74,934	35,448	14,514	6,732	2,837	1,955	0	0	3,760	3,561	143,741	2.7%
Montezuma	78,594	1,673	39,415	10,196	649	2,879	0	0	1,773	931	136,109	2.5%
Phillips	4,849	92,800	2,911	0	849	9,324	5,991	0	302	270	117,296	2.2%
Larimer	30,545	21,356	23,990	8,799	12,589	4,553	0	0	5,527	6,136	113,496	2.1%
Garfield	47,634	1,429	28,620	13,191	566	0	0	0	1,263	172	92,875	1.7%
Lake	0	0	88,813	668	0	0	0	0	0	0	89,481	1.7%
Sedgwick	12,650	57,227	2,624	1,425	1,131	6,109	6,128	0	622	0	87,916	1.6%
Jackson	458	0	23,347	62,878	0	0	0	0	0	0	86,683	1.6%
Baca	6,424	36,983	1,780	1,773	1,654	0	0	0	27,908	0	76,522	1.4%
Pueblo	28,171	11,837	6,934	6,982	1,106	3,582	0	0	1,247	2,699	62,556	1.2%
La Plata	36,243	0	9,240	15,035	0	0	0	0	1,105	167	61,790	1.2%
Boulder	20,540	8,406	15,792	7,418	2,684	952	0	0	2,958	1,916	60,666	1.1%
Washington	13,123	23,898	1,399	2,961	1,833	3,899	11,133	0	1,641	630	60,515	1.1%
Las Animas	34,496	674	9,105	14,508	455	0	0	0	307	0	59,544	1.1%
Costilla	23,555	0	10,925	4,531	0	0	0	6,395	9,915	1,851	57,171	1.1%
Adams	13,392	13,748	3,765	2,611	1,041	846	8,931	0	1,588	7,300	53,223	1.0%
Routt	4,191	0	21,540	25,658	0	0	0	0	0	0	51,389	1.0%
Gunnison	480	0	24,559	25,072	0	0	0	0	0	0	50,110	0.9%
Huerfano	33,672	0	3,594	8,908	0	0	0	0	0	2	46,177	0.9%
Grand	2,302	0	11,178	31,352	0	0	0	0	0	0	44,832	0.8%
Rio Blanco	9,195	0	10,897	20,778	0	0	0	0	0	0	40,871	0.8%
Eagle	9,281	0	14,991	9,092	0	0	0	0	0	0	33,364	0.6%
Cheyenne	4,036	15,623	0	1,821	630	506	8,052	0	920	0	31,588	0.6%
Crowley	20,113	4,067	3,304	2,377	1,104	0	0	0	0	499	31,462	0.6%
Fremont	13,308	0	6,740	9,035	886	0	0	0	0	1,159	31,127	0.6%
Moffat	11,992	0	9,885	7,894	0	0	0	0	0	0	29,770	0.6%
Chaffee	7,155	0	11,111	9,190	0	0	0	0	0	5	27,461	0.5%
Elbert	20,479	0	505	4,068	522	0	905	0	0	7	26,486	0.5%
San Miguel	5,501	0	12,839	4,298	0	0	0	0	0	17	22,655	0.4%
El Paso	11,618	0	4,544	3,560	522	0	0	0	272	1,301	21,818	0.4%
Custer	2,261	0	7,371	11,378	0	0	0	0	0	0	21,009	0.4%
Ouray	5,158	0	4,323	10,285	0	0	0	0	0	0	19,765	0.4%
Archuleta	1,951	0	12,961	3,533	0	0	0	0	0	1	18,446	0.3%
Park	0	0	7,368	9,748	0	0	0	0	0	0	17,116	0.3%
Pitkin	3,837	0	7,875	3,838	0	0	0	0	0	0	15,549	0.3%
Dolores	10,123	0	3,766	0	0	1,239	0	0	47	0	15,175	0.3%
Lincoln	4,771	1,590	0	2,288	891	0	1,882	0	2,009	0	13,429	0.3%
Douglas	7,286	0	1,137	1,895	0	0	0	0	0	0	10,118	0.2%
Arapahoe	2,976	0	524	746	595	0	3,660	0	120	0	8,622	0.2%
Kiowa	1,289	2,801	0	0	841	0	2,128	0	1,076	0	8,135	0.2%
Summit	0	0	1,676	4,220	0	0	0	0	0	0	5,897	0.1%
Jefferson	1,498	0	2,056	1,171	0	0	0	0	0	98	4,823	0.1%
Teller	0	0	147	2,853	0	0	0	0	0	0	3,000	0.1%
Hinsdale	0	0	755	1,232	0	0	0	0	0	0	1,987	0.0%
Clear Creek	0	0	0	0	0	0	0	0	0	0	0	0.0%
Denver	0	0	0	0	0	0	0	0	0	0	0	0.0%
Gilpin	0	0	0	0	0	0	0	0	0	0	0	0.0%
Mineral	0	0	0	0	0	0	0	0	0	0	0	0.0%
San Juan	0	0	0	0	0	0	0	0	0	0	0	0.0%
Crop Totals	1,661,073	1,196,129	900,964	582,187	163,440	163,044	157,059	129,910	248,058	148,219	5,350,082	100.0%
% of State	31.0%	22.4%	16.8%	10.9%	3.1%	3.0%	2.9%	2.4%	4.6%	2.8%	100.0%	

Sources:

Irrigated acres harvested from "Colorado Agriculture Statistics, 1996"; Colorado Agricultural Statistics Service for the following columns: 1, 2, 4, 5, 6, 7, 8, 9 and sugar beets in 10.

Irrigated acres harvested from "1992 Census of Agriculture"; U.S. Department of Commerce for the following columns: 3 and 10.

Natural Resources Conservation Service provided net irrigation and consumptive use data for selective crops across Colorado counties. Net irrigation data unavailable for the following crops with crop-substitute data in parentheses: oats(spring grain), barley(spring grain), other hay(pasture grass/turf).

"Grain Crops" include barley, oats, sorghum grain, spring wheat, winter wheat.

"Other Crops" include fruits and vegetables, soybeans, sugar beets, and sod.

Table prepared by Tony Frank, 2/97.