

Consumptive Use and Net Irrigation Requirements For Oregon



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Consumptive Use and Net Irrigation Requirements For Oregon

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Introduction

Information on the consumptive use of water by crops is basic to the design of an efficient irrigation system. The allocation of a portion of the water of a river basin for irrigation purposes must be based on the irrigation requirements of the crops to be grown. These requirements must be known both on an annual and a short-term basis. In Station Bulletin 500, Tileston and Wolfe (1951) listed estimates of average seasonal and monthly consumptive use and net irrigation requirement for the principal crops grown in different areas of Oregon. Their report also recommended that the capacity of an irrigation system be greater than the monthly value when the irrigation interval is less than one month.

For a given crop, the irrigation requirement will vary from one year to the next, since it is affected by rainfall, temperature, humidity, solar radiation, wind movement, and length of growing season. Thus, the best design value for the capacity of an irrigation system is somewhat problematical. If the designer selects an average value, his system will be inadequate half of the time. If he designs for the maximum value, his system

may be more costly than necessary. To choose the most economical value he must know the probability of occurrence of the higher values.

This report presents revised estimates of average monthly consumptive use and net irrigation requirement as well as revised seasonal values. It also presents the chance of occurrence of monthly consumptive use higher than the median values for alfalfa at selected sites.

Consumptive use can be measured in the field or estimated from climatological data. Values measured in the field are applicable principally for the year in which they were determined, and they are costly to obtain. On the other hand, consumptive use may be estimated by computation for any year and locality for which the necessary climatological information is available. However, the estimating formulas involve assumptions which, under certain conditions, lead to incorrect values. Measured values from the field can be in error too, especially if there is appreciable unsaturated moisture flow up or down in the soil. Five comparisons between measured and computed values in Oregon are shown.

Climatic Information

Consumptive use values presented in this report were calculated from climatic data. Precipitation and temperature records from 81 weather stations having good long-term records were used to represent the various regions of Oregon. The state was subdivided into nine major divisions in accordance with United States Weather Bureau procedures. In addition, the 7 divisions which are most important agriculturally were subdivided into a total of 27 smaller areas. Boundaries of the divisions and locations of weather stations within the divisions are shown on the map (Figure 1). The divisions, areas,

and weather stations in each area are tabulated in Table 1. The station numbers in the table correspond to the numbers on the map. For the probability study, only those stations indicated by the filled in or solid circles were used.

An alphabetical list of the weather stations, showing their elevation, latitude, and numbers of years of record used in determining average temperature and precipitation, is given in Table 2. Mean monthly temperature and precipitation for each station are listed in Table 3.

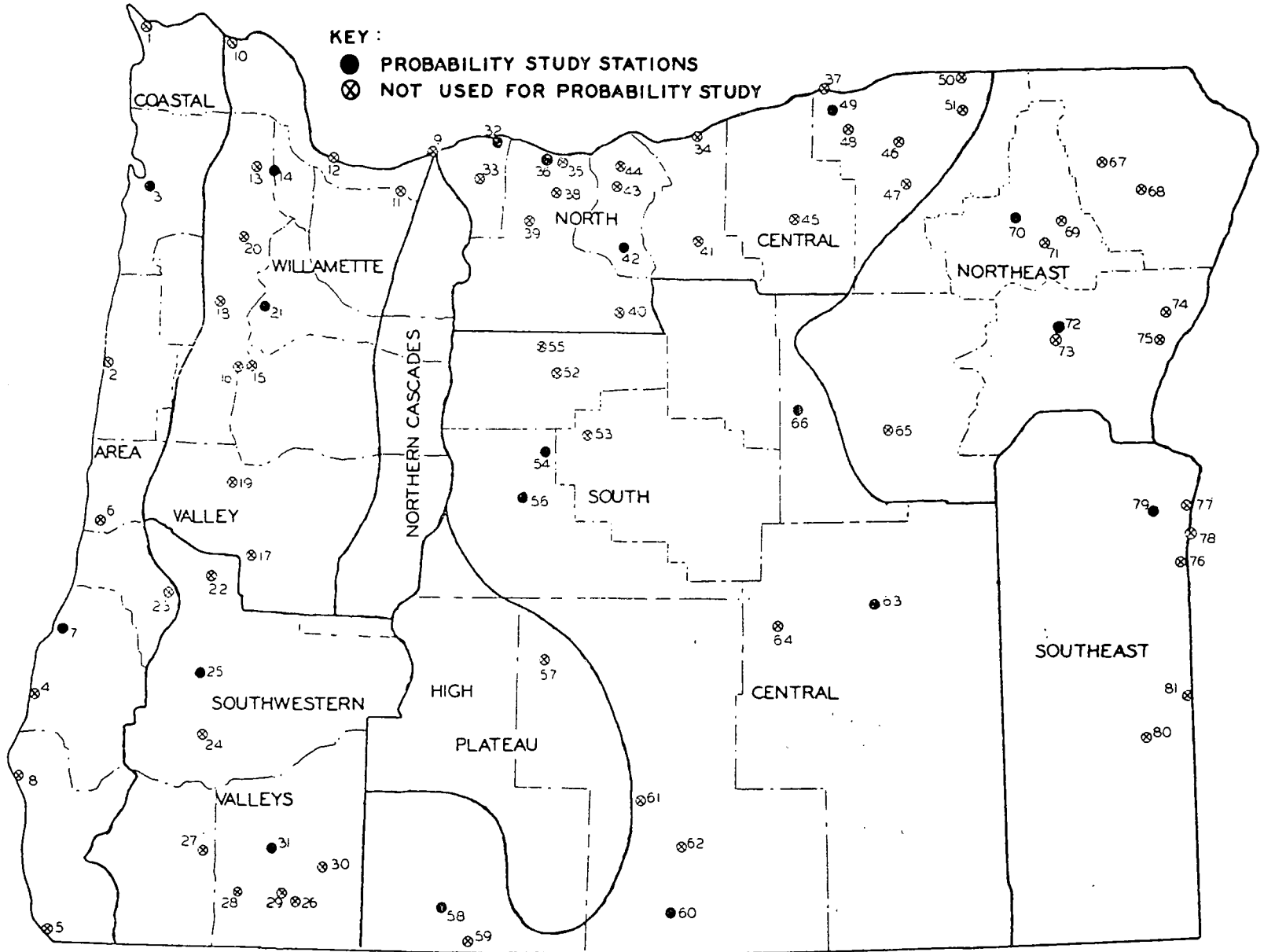


Figure 1. Division boundaries and weather station locations.

Computed Average Consumptive Use and Net Irrigation Requirements

Table 4 lists the average monthly and seasonal consumptive use and net irrigation requirement for the principal crops grown in Oregon. The data are tabulated according to the areas given in Table 1. Crops listed in Table 4 are, in general, those given in Oregon Agricultural Experiment Station Bulletin 500. Some additions and deletions were made, mostly at the suggestions of OSU Extension agents. One important change in this report is that all grass and hay crops, except alfalfa and grass-seed crops, are included under the heading "pasture grass."

The computed values of consumptive use given in Table 4 were determined by using a modified form of the Blaney-Criddle procedure. This procedure is discussed in USDA-SCS Technical Release 21 (1964). For the original Blaney-Criddle formula, monthly consumptive use is defined as:

$$u = kf$$

where: u = monthly consumptive use of water in inches

k = an empirical coefficient for a specific crop

$$f = t \times p$$

and where: t = mean monthly temperature in degrees Fahrenheit

P = percent of the total yearly day-time hours occurring in a given month.

The total seasonal consumptive use is the sum of the monthly consumptive use values.

The modified Blaney-Criddle formula bases the "k" factor on both crop and temperature influences. That is, the monthly $k = k_t \times k_c$, where k_t is a monthly temperature coefficient and k_c is a monthly crop coefficient.

The dependence of the monthly "k" value on temperature is also supported by recent findings of Pruitt (1965) at Davis, California.

In computing monthly consumptive use, values of the temperature coefficient were taken from tables in Technical Release 21. The crop coefficient for a given period was determined either directly from curves given in the technical release or from curves modified by results of field measurements and experience in Oregon.

As a first step, monthly temperature and precipitation data for each year of record for each station were collected. Monthly and annual means were then calculated for each station. The means for several stations in an area were averaged to obtain the mean monthly temperature and precipitation for that area.

For a given crop, consumptive use was calculated for the average growing season as determined by average planting and harvest dates for most annual crops, or average start of growth and end of growth dates for perennial crops. For fall-seeded grains, the period used was from the average start of growth date in the spring until harvest. These dates are listed in Table 5. Actual dates may vary from year to year by as much as two weeks to a month. Thus, the listed dates should not be used for the scheduling of planting and harvesting of crops.

The monthly net irrigation requirement was determined by subtracting the average total monthly precipitation from the monthly consumptive use. If the precipitation exceeded consumptive use, the net irrigation requirement was considered to be zero. When the length of time considered was only a third or a half of a month, then one-third or one-half of the total monthly rainfall was considered to have fallen in that period.

The computed values of net irrigation requirement do not take into account either water application efficiency or water conveyance efficiency, both of which must be considered when determining the total irrigation water requirement for a field or farm.

Probability of Occurrence of Higher Consumptive Use

Nineteen weather stations with long-term records were selected for a study to determine consumptive use values for alfalfa that would likely not be exceeded more than 2 out of 10 years, for example. The location of these stations is indicated by the solid circles in Figure 1.

For each year of the period of record, month-by-month values of precipitation and mean monthly temperature and the date of the first killing frost in the fall

of the year were tabulated on punch cards. A digital computer program which incorporated the modified Blaney-Criddle consumptive use equation as outlined in SCS Technical Release 21 was prepared. For a given weather station, the data for each month of each year of record were processed through the program to calculate consumptive use and net irrigation requirement. Net requirement was computed as consumptive use minus effective precipitation. For each month of the

growing season and for annual totals, the computed values of irrigation requirement for all the years of record were tabulated in order from the largest to the smallest. For example, 55 years of record were used for Salem. Thus for the month of July, 55 values of irrigation requirement were computed, sorted, and tabulated. After arranging the data, the values were plotted on log-normal probability paper. Net monthly irrigation requirements which would likely be adequate for 5 out of 10, 7 out of 10, 8 out of 10, and 19 out of 20 years were picked from the graphs and listed in Table 6.

Computed values may, for certain conditions, underestimate actual values. The Blaney-Criddle procedure makes no allowance for increased evapotranspiration caused by advective energy, except when the input of advective energy is reflected in higher air temperature. Thus, in areas such as Hermiston, which are subject to considerable wind movement from hot, bare soil to cropped fields, the irrigation requirement for a particular month may be underestimated.

Implicit in the mathematical model was the assumption that the soil moisture reservoir was full at the beginning of crop growth in the spring. For certain years in central and eastern Oregon, a dry fall and winter may result in a considerable soil moisture deficit at the beginning of the growing season. Under these conditions, the early season irrigation requirement would be higher than the computed values.

To simplify computations, the growing season each year was assumed to start when the mean monthly temperature reached 45°. The exact starting date was computed by interpolating between tabulated monthly temperatures. The end of the growing season was assumed to coincide with the first killing frost in the fall.

The estimates of effective precipitation tabulated in Technical Release 21 were used. The curves of crop coefficient versus month and the equation for temperature coefficient were also used without modification.

A value in Table 6 which will likely not be exceeded more than 5 out of 10 years is a *median* or middle value for all the years of record. It may differ slightly from the corresponding *average* value shown in Table 4.

Table 6 suggests that a design value higher than the average should be selected. Furthermore, if the period between irrigations is less than one month, which it usually is, the selected rate must be even higher, and it increases with shorter irrigation intervals. A procedure for estimating this extra increase is suggested in Technical Release No. 21 as follows:

$$u_p = \frac{0.034}{0.34} u_m^{1.09} I^{-0.09}$$

where: u_p = average daily peak period consumptive use in inches

u_m = average consumptive use for the peak month in inches

I = net irrigation application in inches.

For the Hermiston area, an estimate of short-period consumptive use was made using solar radiation and mean air temperature, following the procedure of Jensen and Haise (1963). Solar radiation data were obtained from Prosser, Washington, and the mean air temperature from Hermiston. Only the peak values for the entire summer are shown in Table 7. From the means of the peak values, one might estimate that, since $0.365/0.323 = 1.13$, about 13% more irrigation system capacity is required to meet the peak demand when the soil holds only a 5-day supply of water as compared with a 20-day supply. Monthly estimates from the Jensen-Haise method for July averaged about 14% greater than those calculated using Technical Release No. 21, but no measured values are available to indicate which set of estimates are more accurate. All of the Jensen-Haise data were provided by Marvin E. Jensen, Northwest Branch, Soil and Water Conservation Research Division, Agricultural Research Service, USDA.

Comparison Between Measured and Calculated Values

The accuracy of estimating consumptive use can be observed by comparison with measured values as shown in Figures 2 through 6. All of the measured values came from field sites and are subject to errors caused by unmeasured deep seepage, upward flow from a water table, variance across the field, human error, and instrumental error. There is general agreement between the estimated and the measured date of the beginning of the growing season.

The measured consumptive use values from Ontario were compiled by Fred Tileston and were reported in his annual progress reports for 1951 and 1953. This work was cooperative between the Oregon Agricultural Experiment Station and five United States government agencies. There seems to be good agreement on the Ed Kerr alfalfa field, Figure 2, when the measured and calculated values are each plotted accumulatively, although at one point the deviation is about three and one-

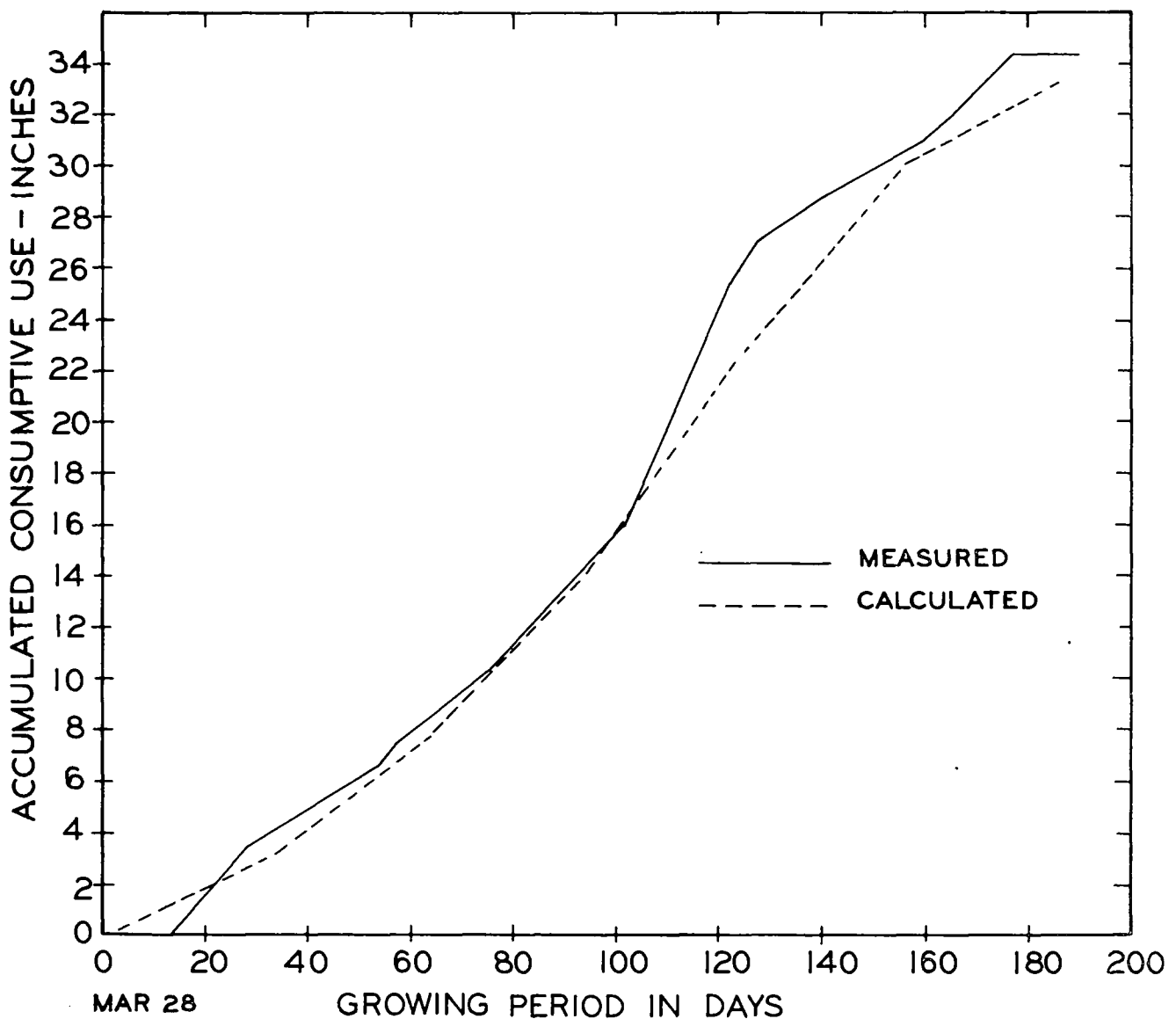


Figure 2. Measured and calculated consumptive use of alfalfa—Ed Kerr farm, Ontario, 1951.

half inches. On the Winn farm, Figure 3, the lines appeared to digress for a four-week period starting near the end of April, but they are remarkably parallel from there on. The error during this period may be due to unmeasured deep percolation. One other field of alfalfa was measured by Tileston in 1953, but it is not included here because in his report he indicated a likelihood that his measurements were in error. Calculations were based on climatic data from Vale.

The measured values of consumptive use of alfalfa from Madras appear to fall closer to the calculated values. The two plotted curves for the Brewer farm,

Figure 4, deviate rather sharply near the end of the season; but this is surely caused by some kind of measurement error because the consumptive use rate could not be so high late in the season. Measurements on the Kiser farm, Figure 5, follow the calculated values more closely. These measured values were obtained by Jack Currie and are reported in Miscellaneous Paper 72. Calculations were based on climatic data from Redmond.

Figure 6 compares the consumptive use of pasture rather than alfalfa as measured on the OSU dairy farm near Corvallis in 1951. In this case, the calculated line for pasture was obtained from the monthly calculated

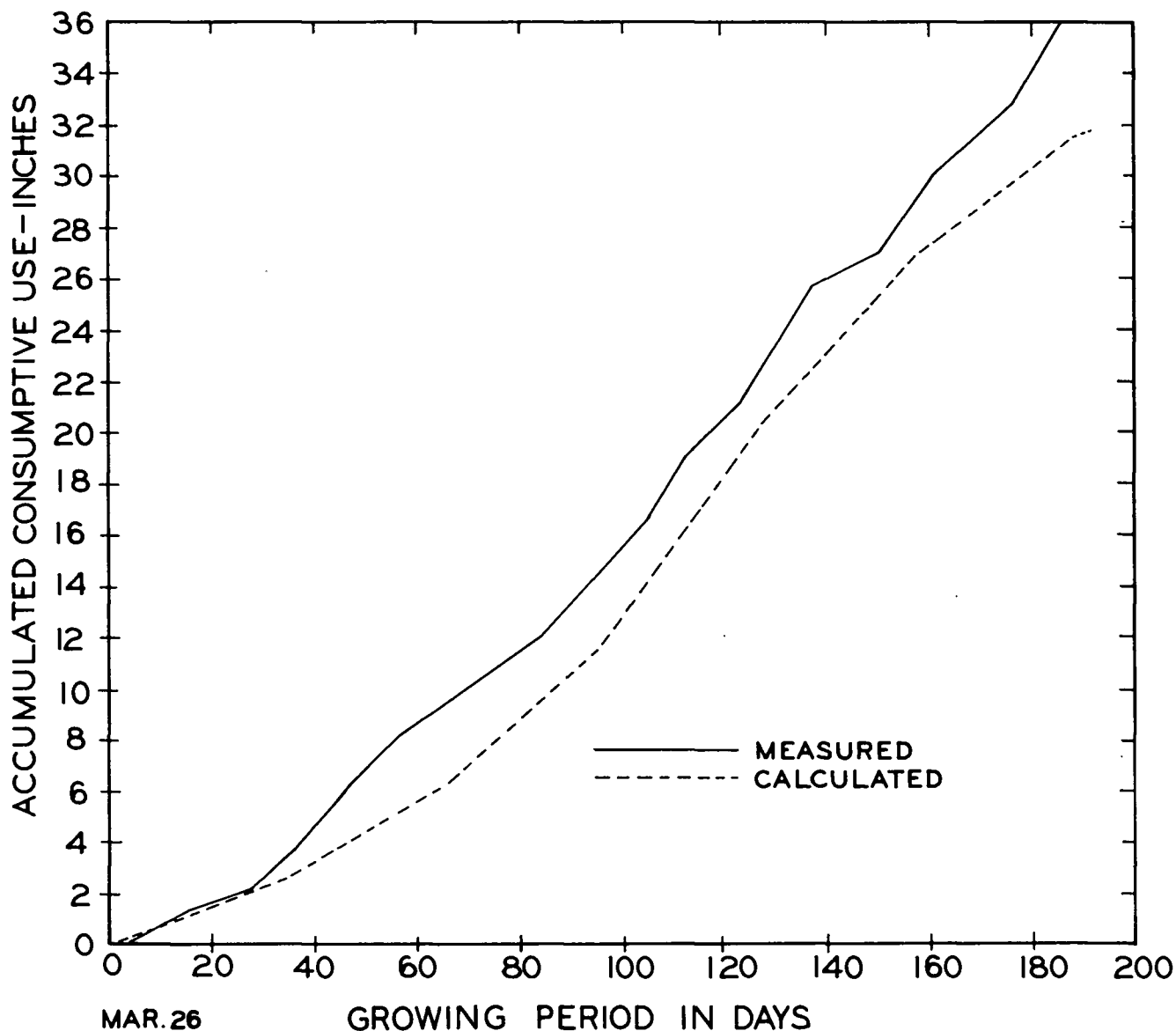


Figure 3. Measured and calculated consumptive use of alfalfa—Winn farm, Ontario, 1953.

consumptive use for alfalfa at Salem for that year. Each monthly value was multiplied by a ratio, a number obtained by dividing the average monthly consumptive use for pasture in the Willamette Valley taken from Table 4, by the corresponding value for alfalfa from Table 4. The water table on the Amity site was about three feet below the surface and could have caused a continued gravity drainage from the two-foot root zone

as the water table steadily receded between irrigations, resulting in an apparently higher consumptive use rate. The water table on the Willamette site was about five feet below the ground surface. A comparison of the three lines on the graph of pasture consumptive use suggests that the measured value on the 68th day for the Willamette soil was in error. Otherwise, the Willamette soil shows very good agreement with the estimated consumptive use curve.

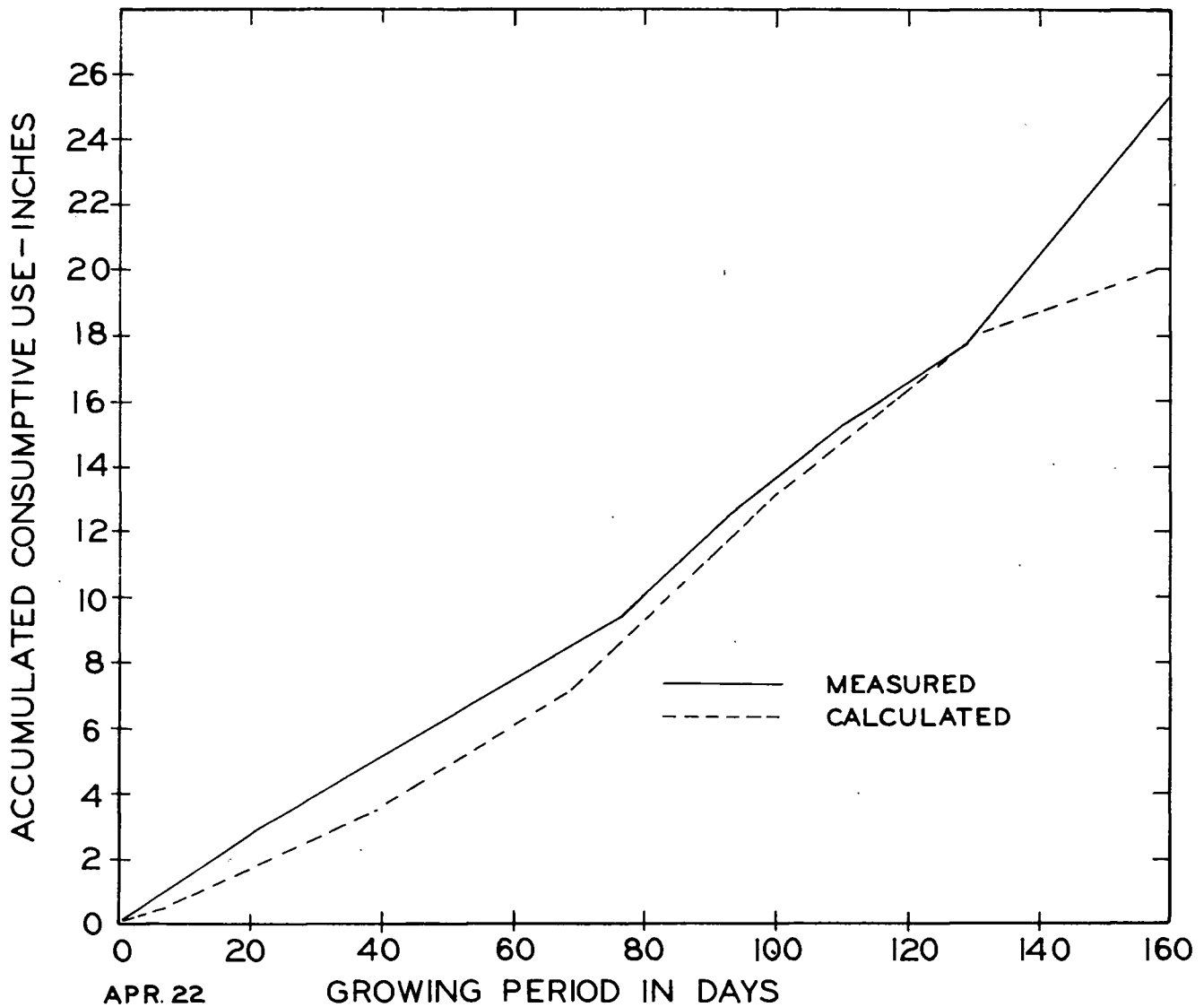


Figure 4. Measured and calculated consumptive use of alfalfa—Brewer farm, Madras, 1953.

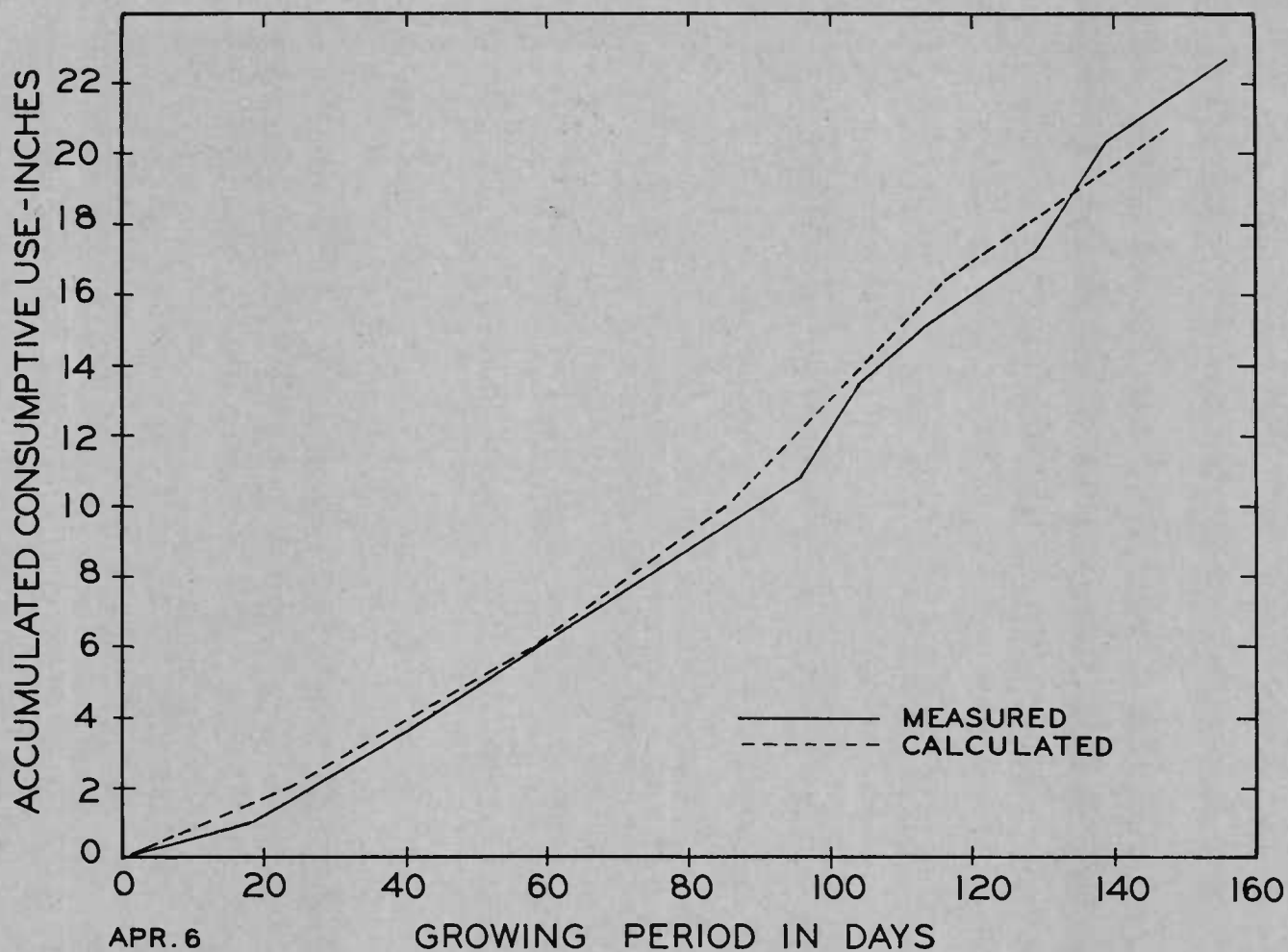
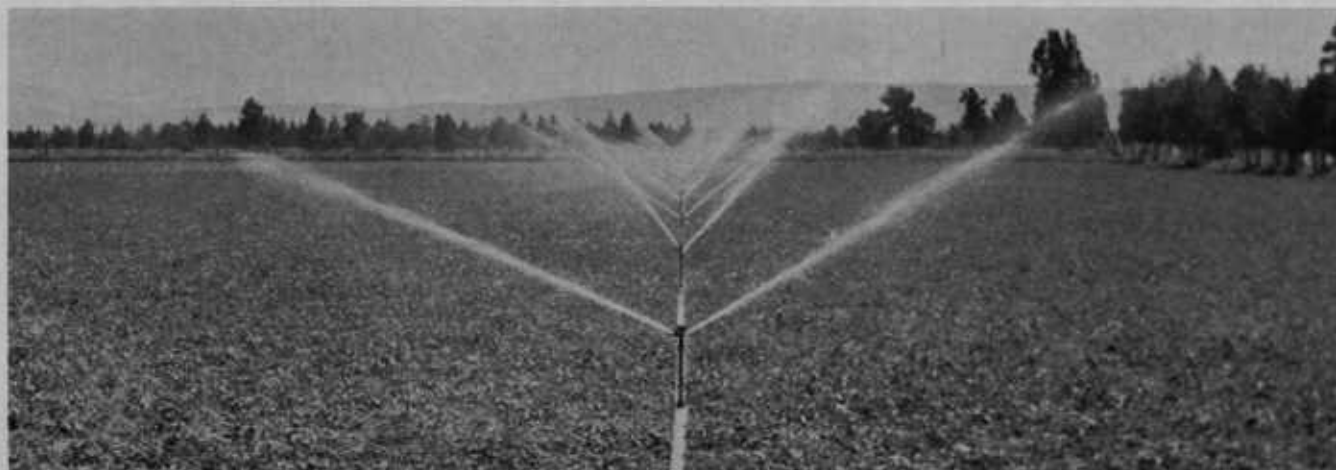


Figure 5. Measured and calculated consumptive use of alfalfa—Kiser farm, Madras, 1952.



System capacity must be larger than the figures in the table because of application efficiency and short periods of higher consumptive use.

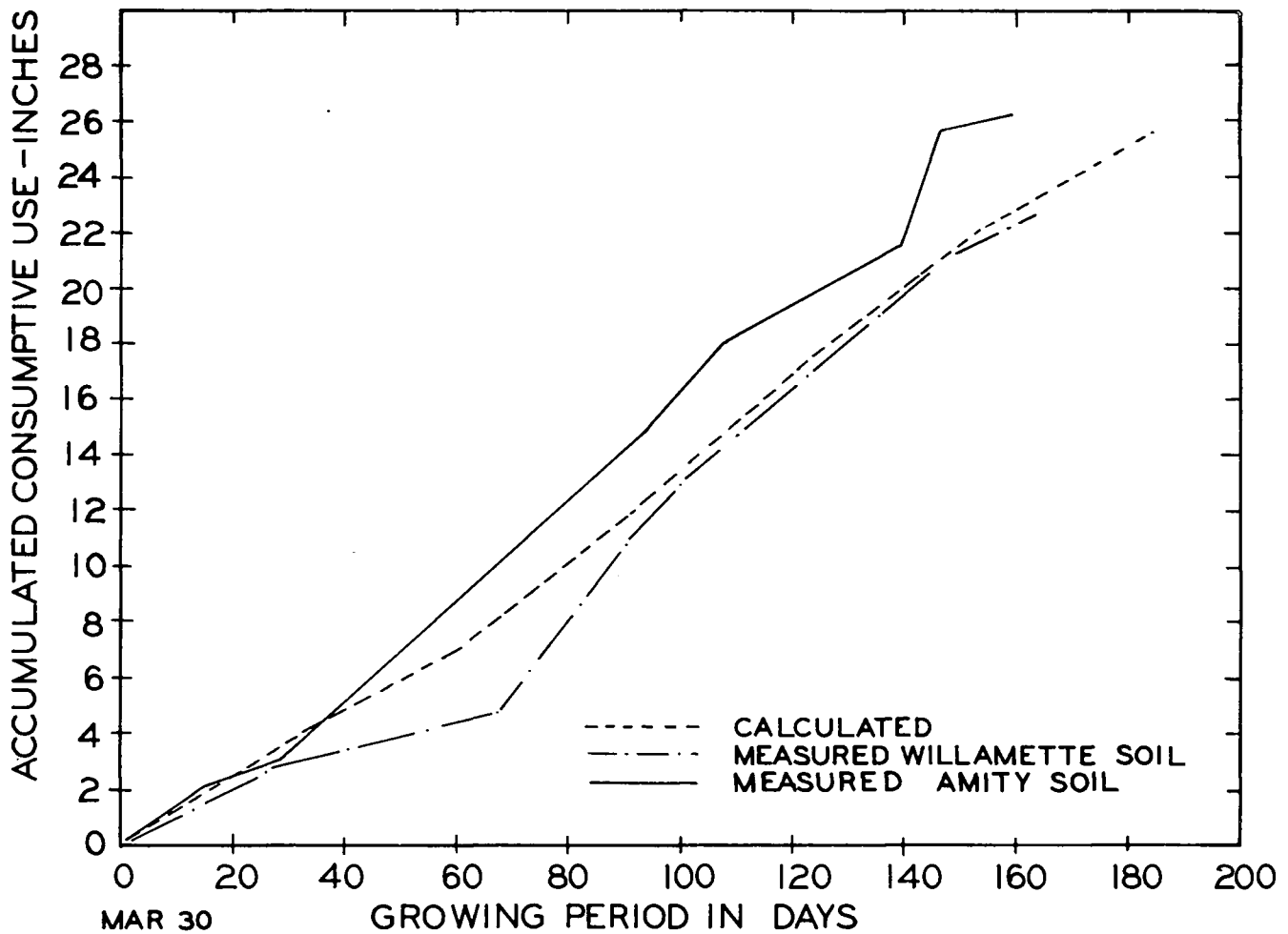


Figure 6. Measured and calculated consumptive use of pasture—OSU farm, Corvallis, 1951.

References

1. Currie, J. A., J. W. Wolfe, and L. R. Swarner. *Irrigation Efficiency, Consumptive Use, Certain Soil Characteristics of the Deschutes Project*. Oregon Agricultural Experiment Station Miscellaneous Paper 72, May 1959.
2. Jensen, M. E., and H. R. Haise. "Estimating Evapotranspiration from Solar Radiation." *Jour. Irrig. and Drain. Div., American Society of Civil Engineers*, 89:15-41, 1963.
3. Marsh, A. W., A. G. Abd El-Samie, and J. W. Wolfe. *Irrigation Design and Operation* (Annual Report Covering Soil Moisture and Irrigation Efficiency). Oregon Agricultural Experiment Station, 1951.
4. Pruitt, W. O. Personal communication, 1965.
5. Tileston, F. M. *Irrigation, Infiltration, and Salinity Studies on the Owyhee Project, Oregon*. Annual Progress Reports, Oregon Agricultural Experiment Station, 1951 and 1953.
6. Tileston, F. M., and J. W. Wolfe. *Irrigation Requirements (Estimates for Oregon)*. Oregon Agricultural Experiment Station Bulletin 500, July 1951.
7. United States Department of Agriculture, Soil Conservation Service. *Irrigation Water Requirements*. Technical Release No. 21, 1964.

Table 1. DIVISIONS, AREAS, AND WEATHER STATIONS WITHIN EACH AREA

COASTAL	Lake Creek—Little Butte Creek:	Bend:
North coast:	30—Lake Creek	56—Bend
1—Astoria	31—Modoc Orchard	57—Fremont
2—Newport		Klamath:
3—Tillamook		58—Klamath Falls
South coast:	NORTH CENTRAL	59—Merrill
4—Bandon	Hood River Valley:	Lakeview:
5—Brookings	32—Hood River ES	60—Lakeview
6—Canary	33—Parkdale	61—Paisley
7—North Bend	Columbia River above Hood River:	62—Valley Falls
8—Port Orford	34—Arlington	Harney Valley:
	35—Big Eddy	63—Burns
	36—The Dalles	64—Squaw Butte ES
WILLAMETTE VALLEY	37—Umatilla	Dayville—Canyon City:
Columbia River below Hood River:	East slope Mt. Hood:	65—Canyon City
9—Bonneville Dam	38—Dufur	66—Dayville
10—Clatskanie	39—Friend	
11—Headworks	Columbia Basin wheat land:	NORTHEAST
12—Portland Airport	40—Antelope	Wallowa Valley:
Tualatin Valley:	41—Condon	67—Enterprise
13—Forest Grove	42—Kent	68—Wallowa
14—Hillsboro	43—Moro	Grande Ronde Valley:
Willamette Valley:	44—Wasco	69—Cove
15—Albany	Pendleton—Heppner:	70—La Grande
16—Corvallis—State University	45—Heppner	71—Union
17—Cottage Grove	46—Pendleton AP	Baker Valley
18—Dallas	47—Pilot Rock	72—Baker Airport
19—Eugene Airport	Hermiston:	73—Baker
20—McMinnville	48—Echo	Pine and Eagle valleys:
21—Salem	49—Hermiston	74—Halfway
	Milton—Freewater:	75—Richland
SOUTHWESTERN VALLEYS	50—Milton	
Umpqua River:	51—Weston	SOUTHEAST
22—Drain		Malheur:
23—Elkton		76—Adrian
24—Riddle		77—Malheur ES
25—Roseburg		78—Nyssa
		79—Vale
Medford—Grants Pass:	SOUTH CENTRAL	Jordan Valley:
26—Ashland	Madras—Redmond:	80—Danner
27—Grants Pass	52—Madras	81—Sheaville
28—Jacksonville	53—Prineville	
29—Talent	54—Redmond	
	55—Warm Springs Res.	

Table 2. WEATHER BUREAU STATIONS USED IN COMPUTING CONSUMPTIVE USE OF IRRIGATION WATER—LOCATION, ELEVATION, LATITUDE, AND YEARS OF RECORD USED

Station	Location on map	Elevation in feet	Latitude N.	Years of record used
Adrian	76	2,240	43° 44'	41
Albany	15	212	44° 38'	77
Antelope	40	2,690	44° 55'	35
Arlington	34	350	45° 43'	49
Ashland	26	1,750	42° 13'	77
Astoria	1	220	46° 11'	99
Baker Airport	72	3,369	44° 50'	17
Baker	73	3,444	44° 47'	63
Bandon	4	8	43° 07'	16
Bend	56	3,599	44° 04'	58
Big Eddy	35	125	45° 38'	39
Bonneville Dam	9	85	45° 38'	23
Brookings	5	80	42° 03'	44
Burns	63	4,140	43° 35'	23
Canary	6	100	43° 56'	28
Canyon City	65	3,194	44° 23'	21
Clatskanie	10	80	46° 06'	25
Condon	41	2,909	45° 14'	55
Corvallis, State University	16	205	44° 38'	70
Cottage Grove	17	650	43° 47'	44
Cove	69	3,100	45° 19'	42
Dallas	18	350	44° 56'	24
Danner	80	4,000	42° 56'	30
Dayville	66	2,434	44° 28'	61
Drain	22	302	43° 40'	51
Dufur	38	1,325	45° 27'	49
Echo	48	601	45° 45'	52
Elkton	23	125	43° 39'	22
Enterprise	67	3,760	45° 26'	27
Eugene Airport	19	361	44° 27'	19
Forest Grove	13	180	45° 32'	63
Fremont	57	4,300	43° 19'	36
Friend	39	2,430	45° 20'	16
Grants Pass	27	925	42° 26'	71
Halfway	74	2,675	44° 52'	17
Headworks	11	747	45° 27'	54
Heppner	45	1,950	45° 21'	68
Hermiston	49	624	45° 49'	54
Hillsboro	14	203	45° 31'	30
Hood River Exp. Sta.	32	500	45° 41'	71
Jacksonville	28	1,640	42° 18'	59
Kent	42	2,707	45° 12'	35
Klamath Falls	58	4,190	42° 15'	67
La Grande	70	2,786	45° 20'	72
Lake Creek	30	2,300	42° 25'	28
Lakeview	60	4,756	42° 11'	71
Madras	52	2,300	44° 38'	47
Malheur Exp. Sta.	77	2,251	43° 59'	18
McMinnville	20	150	45° 13'	67
Merrill	59	4,080	42° 03'	10
Milton	50	1,060	45° 56'	42
Modoc Orchard	31	1,270	42° 27'	46
Moro	43	1,858	45° 29'	30
Newport	2	136	44° 38'	69
North Bend	7	11	43° 25'	29
Nyssa	78	2,185	43° 52'	20
Paisley	61	4,371	42° 42'	34
Parkdale	33	1,740	45° 31'	49
Pendleton Airport	46	1,492	45° 41'	18
Pilot Rock	47	1,817	45° 29'	47
Portland Airport	12	21	45° 36'	22
Port Orford	8	300	42° 44'	51
Prineville	53	2,868	44° 19'	62
Redmond	54	2,994	44° 17'	29
Richland	75	2,215	44° 46'	38
Riddle	24	700	42° 58'	43

Table 2. WEATHER BUREAU STATIONS USED IN COMPUTING CONSUMPTIVE USE OF IRRIGATION WATER—LOCATION, ELEVATION, LATITUDE, AND YEARS OF RECORD USED—(Continued)

Station	Location on map	Elevation in feet	Latitude N.	Years of record used
Roseburg	25	508	43° 14'	65
Salem	21	195	44° 55'	57
Sheaville	81	4,600	43° 07'	10
Squaw Butte Exp. Sta.	64	4,675	43° 29'	22
Talent	29	1,550	42° 16'	47
The Dalles	36	102	45° 36'	98
Tillamook	3	15	45° 29'	50
Umatilla	37	285	45° 55'	64
Union	71	2,765	45° 13'	50
Vale	79	2,240	43° 59'	64
Valley Falls	62	4,326	42° 29'	44
Wallowa	68	2,935	45° 34'	52
Warm Springs Reservoir	55	3,332	43° 35'	28
Wasco	44	1,300	45° 36'	41
Weston	51	2,100	45° 48'	61

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (t) AND PRECIPITATION (r) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON

Month	Adrian		Albany		Antelope		Arlington		Ashland		Astoria	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	28.2	1.10	39.3	6.50	30.0	1.49	33.0	1.55	37.9	2.81	40.4	11.91
February	34.7	0.93	42.6	5.24	35.0	1.13	38.4	1.11	41.6	2.25	42.6	9.31
March	42.9	0.71	46.7	4.28	40.3	1.08	46.4	0.76	45.4	1.98	45.3	8.61
April	51.6	0.77	51.6	2.66	46.7	0.88	53.8	0.47	50.4	1.44	49.4	5.28
May	59.8	0.95	57.0	2.20	53.2	1.33	61.6	0.60	56.5	1.62	53.5	3.56
June	67.1	0.78	61.8	1.40	59.4	1.04	67.9	0.54	62.4	1.08	57.6	2.98
July	76.1	0.20	66.8	0.43	67.4	0.26	75.2	0.12	69.3	0.41	60.8	1.20
August	73.0	0.27	66.3	0.52	65.8	0.37	74.0	0.15	68.4	0.30	61.4	1.32
September	62.8	0.47	61.0	1.69	58.9	0.68	65.7	0.38	62.0	0.84	59.0	3.36
October	51.7	0.68	53.2	3.39	49.8	1.01	54.5	0.77	53.3	1.57	54.0	6.30
November	33.8	0.88	45.2	6.15	39.6	1.55	42.2	1.38	44.4	2.59	47.0	10.98
December	31.4	0.97	40.9	6.81	33.7	1.58	36.4	1.36	38.6	3.06	42.6	12.62
Total (r)		8.71		41.27		12.40		9.19		19.95		77.43

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (t) AND PRECIPITATION (r) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Baker Airport		Baker		Bandon		Bend		Big Eddy		Bonneville Dam	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	23.1	0.73	25.4	1.04	45.3	9.12	30.3	1.81	33.4	2.22	35.7	10.87
February	29.3	0.72	30.5	0.95	46.5	7.23	34.1	1.34	38.9	1.67	40.1	9.22
March	35.6	0.78	37.3	0.98	46.7	6.36	38.6	0.94	46.5	1.18	44.6	8.28
April	44.0	0.70	45.1	0.91	49.2	3.70	44.5	0.72	53.9	0.53	51.5	4.85
May	52.1	1.66	52.1	1.37	52.3	2.49	50.7	1.13	60.7	0.54	57.3	3.73
June	57.5	1.40	58.7	1.28	55.9	1.41	57.0	1.09	66.8	0.54	61.7	2.71
July	65.5	0.36	67.1	0.49	57.4	0.38	64.3	0.48	73.3	0.12	67.8	0.82
August	62.9	0.43	65.7	0.49	57.4	0.38	62.8	0.39	72.7	0.17	67.0	1.10
September	55.8	0.47	57.3	0.64	56.3	1.87	55.6	0.52	65.9	0.56	63.4	2.77
October	45.5	0.73	47.8	0.77	53.4	4.37	48.2	0.79	55.3	1.05	54.4	7.52
November	34.2	0.81	36.5	1.02	50.0	8.13	38.6	1.58	43.1	2.11	44.4	11.21
December	27.1	0.78	28.1	1.13	47.2	8.40	32.4	1.75	37.2	2.34	39.9	12.40
Total (r)		9.57		11.07		53.84		12.54		13.03		75.48

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Brookings		Burns		Canary		Canyon City		Clatskanie		Condon	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.
January	46.6	12.50	25.0	1.64	43.1	12.87	32.8	1.97	37.3	9.00	28.7	1.39
February	47.8	10.16	30.2	1.39	45.1	10.47	36.1	1.40	40.9	8.05	33.1	1.10
March	48.7	9.10	36.8	0.96	46.3	9.83	41.4	1.56	44.3	6.39	39.6	1.06
April	51.0	5.62	45.4	0.67	49.4	5.27	49.0	1.57	49.6	3.75	45.6	0.97
May	53.9	3.86	52.8	0.98	53.3	3.61	55.7	1.99	55.0	2.53	52.2	1.27
June	57.1	2.31	58.8	0.90	57.2	2.35	60.8	1.36	59.2	1.96	58.9	1.09
July	58.5	0.60	68.8	0.38	60.2	0.87	69.7	0.43	63.4	0.60	66.8	0.40
August	59.1	0.58	66.5	0.36	60.8	0.97	69.2	0.35	63.2	0.97	65.6	0.33
September	59.0	2.43	58.5	0.57	59.3	2.67	61.5	0.94	60.4	1.95	57.9	0.78
October	55.6	6.49	47.8	0.90	54.6	7.19	52.2	1.08	52.6	4.98	48.6	1.10
November	51.3	10.96	35.8	1.24	48.9	10.22	41.6	1.56	43.9	8.23	38.3	1.55
December	48.0	12.56	29.1	1.51	45.3	13.02	34.9	1.64	40.3	9.73	31.7	1.39
Total (<i>r</i>)	77.17		11.50		79.34		15.85		58.14		12.43	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Corvallis— State University		Cottage Grove		Cove		Dallas		Danner		Dayville	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.
January	39.2	6.58	39.5	6.77	28.9	2.16	37.5	8.87	25.6	1.21	33.5	1.22
February	42.4	5.15	42.6	5.61	33.4	1.89	41.3	7.33	30.7	1.07	38.0	1.10
March	46.0	4.18	45.6	5.11	39.1	2.26	44.3	5.50	37.7	1.03	42.8	1.00
April	50.8	2.42	49.9	3.35	46.3	2.33	49.6	2.86	46.0	0.99	49.5	1.06
May	55.9	1.85	54.8	2.44	53.0	2.45	55.4	2.10	53.5	1.36	55.3	1.38
June	60.9	1.17	59.8	1.53	59.2	2.33	59.8	1.30	60.1	1.06	62.1	1.20
July	66.1	0.29	64.8	0.25	67.2	0.55	65.1	0.28	69.1	0.29	69.3	0.42
August	66.0	0.40	64.6	0.51	65.2	0.80	64.2	0.54	66.6	0.15	67.2	0.46
September	61.2	1.51	60.0	1.73	57.9	1.38	61.5	1.34	57.9	0.61	59.5	0.60
October	53.5	3.13	53.4	3.90	48.8	2.05	53.0	3.87	48.0	0.90	50.7	0.83
November	45.3	6.25	45.6	6.60	38.5	2.57	44.3	7.36	36.2	1.06	41.4	1.12
December	40.9	6.60	41.1	7.20	32.1	2.52	40.7	8.37	30.1	1.32	35.3	1.27
Total (<i>r</i>)	39.53		45.00		23.29		49.72		11.05		11.66	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Drain		Dufur		Echo		Elkton		Enterprise		Eugene Airport	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.
January	40.8	7.47	29.8	2.05	32.1	1.37	41.1	8.73	23.5	0.89	38.0	6.99
February	44.4	5.89	34.9	1.46	38.4	1.09	45.0	8.02	28.1	0.84	42.7	5.14
March	47.4	5.06	41.7	1.01	46.4	0.92	47.8	6.01	34.9	1.10	45.1	4.51
April	51.8	2.97	47.9	0.66	53.7	0.78	52.0	3.17	43.5	1.20	50.7	2.22
May	56.3	2.35	54.5	0.78	61.3	0.73	57.3	2.38	50.3	1.75	55.9	2.06
June	61.2	1.42	60.4	0.77	68.4	0.76	61.9	1.46	55.9	2.19	60.7	1.35
July	66.4	0.34	66.9	0.21	75.3	0.20	67.2	0.29	63.0	0.62	66.4	0.30
August	65.8	0.39	65.8	0.17	72.7	0.26	66.6	0.39	60.5	0.60	65.5	0.42
September	61.3	1.56	59.5	0.68	64.3	0.56	63.4	1.25	54.4	1.02	61.7	1.07
October	54.5	3.76	50.1	0.94	54.0	0.86	55.6	4.63	45.7	1.13	52.9	4.20
November	46.9	7.08	39.1	1.87	41.9	1.27	47.1	7.28	33.8	1.02	45.0	6.14
December	41.8	7.56	33.1	1.93	35.6	1.27	43.7	9.12	27.4	0.99	41.2	6.73
Total (<i>r</i>)	45.85		12.53		10.07		52.73		13.35		41.13	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Forest Grove		Fremont		Friend		Grants Pass		Halfway		Headworks	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	37.3	7.46	25.9	1.29	27.2	2.64	39.1	5.61	22.3	3.05	36.7	11.00
February	40.9	6.07	30.3	0.96	33.1	2.03	43.1	4.46	28.7	2.65	40.1	8.60
March	45.1	4.75	35.5	0.66	37.4	1.32	47.5	3.00	36.9	1.68	44.1	8.83
April	50.3	2.54	40.6	0.65	44.1	0.70	52.5	1.74	46.8	1.61	49.5	5.98
May	56.2	1.92	47.2	0.92	50.4	1.00	58.3	1.49	54.1	1.90	54.8	5.26
June	61.2	1.29	53.6	0.91	55.5	0.81	63.7	0.86	59.7	1.45	59.5	4.09
July	66.2	0.41	60.8	0.43	63.9	0.13	70.2	0.20	67.8	0.34	64.9	1.19
August	66.3	0.55	58.5	0.29	62.6	0.17	69.3	0.20	65.8	0.33	64.4	1.54
September	61.1	1.64	51.6	0.50	57.9	0.57	63.0	0.84	58.7	0.78	59.8	3.98
October	52.6	3.51	43.7	0.69	47.4	1.32	54.1	2.35	47.7	1.28	52.7	6.88
November	44.2	7.39	34.4	1.08	36.1	2.32	44.6	4.19	35.8	2.35	44.3	11.28
December	39.6	8.18	27.7	1.40	31.5	2.75	39.7	5.20	27.9	3.23	39.3	11.33
Total (r)	45.71		9.78		15.76		30.14		20.65		79.96	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Heppner		Hermiston		Hillsboro		Hood River Exp. Sta.		Jacksonville		Kent	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	32.4	1.41	30.8	1.18	37.8	5.95	32.8	5.27	36.7	3.96	29.1	1.34
February	36.5	1.25	37.0	0.92	41.5	4.51	37.1	3.94	41.0	3.37	33.8	1.04
March	42.9	1.29	45.7	0.45	45.4	3.98	43.4	3.28	45.9	2.23	39.8	0.96
April	48.6	1.28	53.5	0.59	51.3	1.89	50.1	1.66	51.1	1.55	46.4	0.80
May	55.0	1.39	60.8	0.61	57.0	1.85	56.3	1.12	57.2	1.51	53.9	1.05
June	61.2	1.22	67.8	0.63	61.4	1.46	61.6	0.80	63.5	1.05	60.1	0.98
July	68.5	0.39	74.3	0.17	66.6	0.38	67.2	0.19	70.8	0.29	68.3	0.26
August	67.4	0.37	71.8	0.23	65.7	0.50	66.3	0.26	70.3	0.30	66.8	0.23
September	60.0	0.85	63.3	0.48	61.8	1.44	60.0	1.14	62.8	0.79	59.9	0.61
October	51.2	1.19	52.7	0.78	53.2	3.32	51.6	2.36	53.2	1.69	50.2	0.87
November	41.7	1.40	40.7	1.14	44.0	5.54	41.4	5.24	43.1	3.67	39.1	1.31
December	35.2	1.39	34.3	1.13	40.5	6.97	35.8	5.94	37.4	4.09	33.1	1.29
Total (r)	13.43		8.31		37.79		31.20		24.50		10.74	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Klamath Falls		La Grande		Lake Creek		Lakeview		Madras		Malheur Exp. Sta.	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	29.1	2.05	30.0	2.01	37.3	3.26	27.4	1.92	30.5	1.16	27.1	1.19
February	33.5	1.49	33.7	1.93	41.0	2.93	30.6	1.79	35.1	0.76	33.9	1.02
March	39.3	1.21	40.1	2.01	44.6	3.02	36.0	1.46	40.1	0.62	41.8	0.88
April	46.5	0.84	47.8	1.78	50.1	2.29	43.8	1.13	45.8	0.55	51.2	0.71
May	53.4	1.00	55.0	2.01	54.9	2.41	50.8	1.39	52.3	1.01	59.2	1.27
June	59.9	0.84	61.4	1.67	60.8	1.49	58.1	1.06	59.0	0.79	65.8	0.86
July	68.2	0.30	70.0	0.56	67.8	0.22	66.6	0.30	65.8	0.25	74.8	0.08
August	66.9	0.28	68.7	0.64	67.0	0.28	65.4	0.24	64.1	0.25	72.1	0.21
September	59.2	0.58	59.9	1.09	61.6	1.19	57.1	0.64	57.0	0.61	63.1	0.40
October	49.3	1.05	50.1	1.59	52.8	2.87	48.0	1.01	47.5	0.63	51.3	0.80
November	38.6	1.72	39.8	2.20	43.9	3.52	37.5	1.58	38.1	1.21	37.9	1.09
December	31.5	1.98	33.2	2.21	38.3	3.74	30.2	1.80	32.4	1.15	31.3	1.12
Total (r)	13.35		19.70		27.22		14.32		8.99		9.63	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	McMinnville		Merrill		Milton		Modoc Orchard		Moro		Newport	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	38.6	7.05	29.0	1.45	31.7	1.58	37.7	3.41	29.8	1.69	43.6	9.91
February	42.1	5.42	32.8	1.20	37.8	1.35	42.2	2.89	34.6	1.23	45.0	8.33
March	45.9	4.84	36.9	1.11	46.2	1.38	46.5	1.95	41.4	0.94	46.0	7.66
April	50.7	2.60	43.9	0.65	53.4	1.28	52.2	1.24	48.3	0.74	48.7	4.66
May	56.0	1.84	50.3	1.17	60.5	1.31	58.0	1.20	55.6	0.84	51.9	3.35
June	60.6	1.32	55.9	0.97	67.0	1.26	64.2	0.92	61.4	0.73	55.3	2.51
July	66.0	0.38	63.4	0.28	74.5	0.27	70.8	0.26	68.9	0.17	57.1	0.78
August	65.8	0.48	60.4	0.26	72.3	0.36	69.9	0.24	67.5	0.19	57.4	0.84
September	60.9	1.78	56.3	0.61	64.1	0.78	63.4	0.63	61.2	0.64	56.2	2.70
October	53.5	3.28	46.4	1.01	54.0	1.21	53.7	1.91	50.7	0.97	53.5	5.51
November	45.2	7.12	37.9	1.26	41.6	1.63	43.6	3.22	38.7	1.70	48.9	9.71
December	40.8	7.22	31.2	1.74	35.5	1.75	38.4	3.91	33.7	1.64	45.4	10.51
Total (r)	43.33		11.71		14.16		21.78		11.48		66.47	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	North Bend		Nyssa		Paisley		Parkdale		Pendleton Airport		Pilot Rock	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	45.3	10.29	28.7	1.19	30.3	1.07	29.6	7.43	31.1	1.54	32.3	1.43
February	46.5	8.36	34.7	1.15	35.4	0.89	34.4	5.24	37.6	1.10	36.7	1.26
March	47.6	7.63	42.3	0.94	40.1	0.85	40.4	4.51	43.0	1.14	44.2	1.26
April	50.0	3.87	51.7	0.73	46.5	0.74	46.6	2.27	51.2	1.09	50.8	1.35
May	53.6	2.77	60.1	1.08	53.1	1.18	52.7	1.70	58.7	1.32	57.9	1.42
June	57.0	1.69	66.7	0.83	59.5	1.04	58.2	1.11	64.8	1.08	64.9	1.32
July	59.1	0.43	75.8	0.08	68.2	0.43	63.6	0.26	73.3	0.23	72.2	0.31
August	59.6	0.50	72.8	0.27	66.4	0.22	62.7	0.34	70.8	0.31	70.6	0.46
September	58.2	1.73	62.8	0.57	59.1	0.42	56.9	1.28	64.2	0.67	62.5	0.79
October	55.1	5.57	51.3	0.86	49.6	0.69	48.6	3.23	52.7	1.22	52.2	1.12
November	50.1	8.57	38.7	1.11	39.0	0.91	38.8	6.77	40.7	1.40	41.3	1.47
December	47.1	10.47	32.6	1.23	33.0	1.13	33.2	7.76	35.3	1.46	35.0	1.51
Total (r)	61.88		10.04		9.57		41.90		12.56		13.70	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Portland Airport		Port Orford		Prineville		Redmond		Richland		Riddle		Roseburg	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.	°F	In.
January	38.4	5.58	46.3	11.89	31.0	0.99	31.8	1.06	27.8	1.20	41.3	5.15	41.2	5.07
February	42.5	4.79	46.9	9.05	35.5	0.84	36.2	0.75	34.5	1.04	44.6	3.93	44.3	4.14
March	46.1	3.90	48.0	8.36	40.0	0.66	40.7	0.57	41.5	0.77	47.7	2.90	47.4	3.15
April	51.9	2.07	50.1	5.12	46.0	0.70	46.8	0.51	49.1	0.83	52.1	1.93	52.0	2.05
May	57.7	2.04	52.8	3.60	52.2	1.09	53.0	0.94	56.8	1.33	56.6	1.39	57.0	1.76
June	61.9	1.57	56.1	2.01	57.8	0.99	58.0	1.07	64.2	0.85	62.7	1.03	62.4	1.26
July	67.8	0.49	58.9	0.58	64.5	0.30	65.8	0.32	72.3	0.25	68.2	0.24	68.2	0.24
August	66.9	0.56	59.4	0.59	62.6	0.31	63.7	0.24	70.6	0.33	67.5	0.28	67.8	0.30
September	65.8	1.70	58.0	2.53	56.0	0.57	58.1	0.45	60.8	0.58	62.3	0.94	62.6	1.12
October	56.9	3.72	54.7	5.83	48.1	0.78	49.6	0.68	50.0	0.74	54.3	2.52	54.7	2.67
November	45.4	5.40	50.2	9.12	43.3	1.10	39.7	0.87	39.4	1.16	46.8	4.38	46.8	4.71
December	41.6	5.75	47.9	11.40	33.3	1.04	35.0	1.03	30.6	1.36	42.0	5.13	42.2	5.15
Total (r)	37.57		70.08		9.37		8.49		10.44		29.82		31.62	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Salem		Sheaville		Squaw Butte Exp. Sta.		Talent		The Dalles		Tillamook		Umatilla	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.
January	39.1	5.84	26.1	1.45	24.9	1.31	37.5	2.44	32.9	2.89	42.0	13.76	32.2	1.15
February	42.5	4.98	30.9	0.97	29.7	1.07	41.5	1.93	38.4	1.96	44.1	11.91	38.0	0.83
March	45.2	4.08	35.5	1.31	35.3	1.00	45.8	1.61	46.1	1.37	45.3	10.73	46.5	0.67
April	51.2	2.28	43.4	1.07	43.3	0.72	51.6	1.28	53.6	0.63	48.4	6.35	54.3	0.57
May	56.4	1.88	51.7	1.20	50.4	1.44	57.7	1.42	60.7	0.62	52.2	4.75	61.7	0.61
June	61.6	1.29	59.5	0.99	56.5	1.24	64.3	1.05	66.8	0.56	55.9	3.49	68.8	0.54
July	66.9	0.37	67.8	0.32	67.0	0.25	70.9	0.34	72.9	0.16	58.7	1.27	75.8	0.16
August	66.6	0.43	66.0	0.16	65.1	0.47	69.6	0.22	71.7	0.18	58.8	1.48	73.4	0.24
September	61.7	1.57	58.5	0.37	58.2	0.54	62.8	0.78	63.9	0.69	56.7	3.88	64.8	0.49
October	54.0	3.32	46.9	0.74	47.6	1.05	52.9	1.69	53.9	1.08	52.8	7.64	53.6	0.73
November	45.5	6.59	35.8	0.85	35.4	1.10	43.5	2.40	42.6	2.38	47.7	13.17	42.0	1.03
December	41.0	6.50	29.3	1.31	29.0	1.33	38.2	2.77	36.1	2.80	44.1	14.62	35.1	1.04
Total (r)	39.13		10.74		11.52		17.93		15.32		93.05		8.06	

Table 3. SUMMARY OF AVERAGE MONTHLY TEMPERATURE (*t*) AND PRECIPITATION (*r*) FOR SELECTED WEATHER BUREAU STATIONS IN OREGON—(Continued)

Month	Union		Vale		Valley Falls		Wallowa		Warm Springs Reservoir		Wasco		Weston	
	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)	(t)	(r)
	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.	^{°F}	In.
January	29.1	1.07	26.9	1.22	30.8	1.24	24.1	1.73	26.3	1.06	30.5	1.69	31.3	2.39
February	33.8	1.00	32.7	0.92	34.1	1.26	29.1	1.56	31.9	0.89	35.9	1.29	35.3	2.15
March	39.9	1.25	41.9	0.80	38.8	1.05	37.8	1.52	40.0	0.65	43.2	0.98	42.4	2.31
April	47.0	1.39	50.2	0.72	45.1	1.05	45.6	1.43	48.6	0.57	49.8	0.69	49.8	1.99
May	53.4	1.69	57.9	0.99	51.6	1.42	52.1	1.75	56.0	0.88	56.4	0.74	56.3	2.01
June	59.2	1.66	64.8	0.78	58.1	1.16	58.4	1.75	63.0	1.04	62.9	0.67	61.9	1.55
July	66.4	0.48	73.0	0.20	66.1	0.39	65.3	0.63	72.7	0.31	70.5	0.18	70.3	0.42
August	64.7	0.61	70.2	0.23	64.4	0.32	63.2	0.67	70.4	0.21	69.5	0.20	69.4	0.53
September	57.1	0.87	60.3	0.44	56.7	0.59	56.1	1.12	62.0	0.43	61.6	0.60	61.1	1.13
October	48.4	1.19	49.7	0.70	47.9	0.94	46.8	1.53	50.8	0.66	51.4	1.02	51.4	1.84
November	39.0	1.20	37.4	0.93	38.1	1.18	35.5	2.03	37.5	0.68	40.0	1.78	42.2	2.57
December	32.4	1.21	29.3	1.06	32.3	1.34	27.8	1.84	30.9	0.95	33.8	1.75	34.0	2.44
Total (r)	13.62		8.99		11.94		17.56		8.33		11.59		21.33	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT

Month	Area: North Coast				Area: South Coast			
	Truck crops		Pasture grass		Truck crops		Pasture grass	
	CU	IR	CU	IR	CU	IR	CU	IR
	In.	In.	In.	In.	In.	In.	In.	In.
January	.....	.....	.....	.....	.....	.....	.....	.....
February	.....	.....	.....	.....	.....	.....	0.53	.....
March	.....	.....	1.32	.....	.....	.....	1.49	.....
April	.....	.....	2.00	.....	.....	.....	2.11	.....
May	.....	.....	2.91	.....	.....	.....	2.96	.....
June	1.04	.....	3.59	0.60	1.03	0.06	3.60	1.65
July	3.57	2.49	4.06	2.98	3.50	2.93	3.98	3.41
August	.....	.....	4.12	2.91	.....	.....	3.72	3.12
September	.....	.....	2.84	.....	.....	.....	2.95	0.70
October	.....	.....	1.95	.....	.....	.....	2.09	.....
November	.....	.....	1.06	.....	.....	.....	1.21	.....
December	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	4.61	2.49	23.85	6.49	4.53	2.99	24.64	8.88

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Columbia River Below Hood River

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Truck crops	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.26	.....	.....	.....	0.81	.....	0.78	.....	.....	.....	.....	.....	.....	.....
April	2.19	.....	1.61	.....	2.20	.....	2.20	.....	1.30	.....	3.88	.....	.....	.....
May	3.46	0.07	4.19	0.80	3.46	0.07	3.46	0.07	3.99	0.60	5.65	2.26	.....	.....
June	4.31	1.73	5.30	2.72	4.31	1.73	1.93	0.64	6.05	3.47	6.43	3.85	1.31	0.02
July	5.35	4.57	6.45	5.67	5.35	4.57	.....	.....	3.66	2.88	6.10	5.22	4.71	3.93
August	4.76	3.72	5.54	4.50	4.76	3.72	.....	.....	0.37	.....	.....	.....	.....	.....
September	3.50	0.90	3.98	1.38	2.03	0.73	.....	.....	.....	.....	.....	.....	.....	.....
October	2.03	.....	1.51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November	0.67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	27.53	10.99	28.58	15.07	22.92	10.82	8.37	0.71	15.37	6.95	22.06	11.33	6.02	3.95

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Columbia River Below Hood River—(Continued)

Month	Corn		Beans (bush)		Beans (pole)		Potatoes		Berries		Orchards (deciduous)		Orchards (deciduous with cover)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.81	.....	1.15	.....
May	1.96	.....	.....	.....	2.34	0.65	.....	.....	1.42	.....	3.34	.....	4.15	0.76
June	4.03	1.45	2.23	0.08	5.30	2.72	1.02	.....	2.91	0.33	4.50	1.92	5.30	2.72
July	6.28	5.50	4.77	3.99	6.45	5.67	5.00	4.22	4.48	3.70	5.29	4.51	6.45	5.67
August	4.97	3.93	1.66	1.14	4.70	3.83	7.16	6.12	4.29	3.25	4.34	3.30	5.54	4.50
September .....	.....	.....	.....	.....	.....	.....	.....	.....	3.13	0.53	2.13	.....	3.98	1.38
October .....	.....	.....	.....	.....	.....	.....	.....	.....	1.57	.....	0.55	.....	1.51	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	0.59	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	17.24	10.88	8.66	5.21	18.79	12.87	13.18	10.34	18.39	7.81	20.96	9.73	28.08	15.03

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Tualatin Valley																	
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Truck crops		Beans (bush)		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.31	.....	.....	.....	0.83	.....	0.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	2.22	.....	1.63	0.52	2.22	.....	2.22	.....	1.31	.....	3.93	1.71	.....	.....	.....	.....	.....
May	3.52	1.63	4.26	2.37	3.52	1.63	3.52	1.63	4.07	2.18	5.75	3.86	.....	.....	.....	.....	.....
June	4.43	3.05	5.45	4.07	4.43	3.15	1.99	1.30	6.21	4.83	6.60	5.22	1.34	0.65	2.29	1.14	.....
July	5.42	5.02	6.54	6.14	5.42	5.02	.....	.....	3.71	3.31	6.19	5.79	4.77	4.37	4.84	4.44	.....
August	4.86	4.33	5.67	5.14	4.86	4.33	.....	.....	0.38	0.20	.....	.....	.....	.....	1.69	1.42	.....
September	3.38	1.84	3.85	2.31	2.02	0.45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
October	1.90	.....	1.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November	0.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	27.68	15.87	28.84	20.55	23.30	14.58	8.53	2.93	15.68	10.52	22.47	16.58	6.11	4.02	8.82	7.00	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Tualatin Valley—(Continued)																	
Month	Beans (pole)		Potatoes		Berries		Onions		Peas		Orchards (deciduous)		Orchards (deciduous with cover)				
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR			
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	0.39	.....	.....	.....	.....	.....	.....	.....	.....
April .....	.....	.....	.....	.....	.....	.....	.....	0.55	.....	2.01	.....	0.83	0.09	1.17	0.43	.....	.....
May	2.40	1.45	.....	.....	1.45	.....	2.35	0.46	3.17	1.28	3.40	1.51	4.22	2.33	.....	.....	.....
June	5.45	4.07	1.04	0.35	2.99	1.61	3.80	2.42	1.20	0.51	4.63	3.25	5.45	4.07	.....	.....	.....
July	6.54	6.14	5.07	4.67	4.54	4.14	4.77	4.37	.....	.....	5.37	4.97	6.54	6.14	.....	.....	.....
August	4.81	4.37	7.33	6.80	4.39	3.86	3.21	2.68	.....	.....	4.44	3.91	5.67	5.14	.....	.....	.....
September .....	.....	.....	.....	.....	3.03	1.49	.....	.....	.....	.....	2.06	0.52	3.85	2.31	.....	.....	.....
October .....	.....	.....	.....	.....	1.47	.....	.....	.....	.....	.....	0.53	.....	1.44	.....	.....	.....	.....
November .....	.....	.....	.....	.....	0.57	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	19.20	16.03	13.44	11.82	18.44	11.10	14.68	9.93	6.77	1.79	21.26	14.25	28.34	20.42	.....	.....	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Willamette Valley*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Truck crops		Beans (pole)		Potatoes		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.34	.....	.....	.....	0.84	.....	0.81	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	2.22	.....	1.61	0.33	2.22	.....	2.22	.....	1.31	.....	3.93	1.37	.....	.....	.....	.....	.....	.....	.....
May	3.45	1.05	4.17	2.12	3.45	1.40	3.45	1.40	3.98	1.93	5.63	3.58	.....	.....	2.35	1.32	.....	.....	.....
June	4.35	2.98	5.34	3.97	4.35	2.98	1.94	1.26	6.09	4.72	6.47	5.10	1.32	0.64	5.37	4.00	1.03	0.34	.....
July	5.39	5.04	6.49	6.14	5.39	5.04	.....	.....	3.69	3.34	6.15	5.80	4.74	4.39	6.49	6.14	5.03	4.68	.....
August	4.82	4.34	5.61	5.13	4.82	4.34	.....	.....	0.38	0.20	.....	.....	.....	.....	4.76	4.36	7.25	6.77	.....
September	3.41	1.86	3.88	2.33	2.01	1.23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
October	2.26	.....	1.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November	0.67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	27.91	15.27	28.57	20.02	23.08	14.99	8.42	2.66	15.45	10.19	22.18	15.85	6.06	5.03	18.97	15.82	13.31	11.79	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Willamette Valley*—(Continued)

Month	Berries		Beans (bush)		Onions		Peas		Tomatoes		Orchards (deciduous)		Orchards (deciduous with cover)		Corn		Mint		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	0.39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.86	.....
April .....	.....	.....	.....	.....	0.54	.....	2.01	.....	.....	.....	0.81	.....	1.15	0.30	.....	.....	.....	2.26	.....
May	1.42	.....	.....	.....	2.30	0.25	3.10	1.05	1.76	.....	3.33	1.28	4.14	2.09	1.95	.....	3.44	1.39	.....
June	2.95	1.58	2.26	1.12	3.76	2.39	1.18	0.49	3.61	2.24	4.56	3.19	5.37	4.00	4.18	2.81	4.37	3.00	.....
July	4.51	4.16	4.79	4.44	4.74	4.39	.....	.....	5.85	5.50	5.32	4.97	6.49	6.14	6.31	5.96	5.42	5.07	.....
August	4.34	3.86	1.67	1.43	3.18	2.70	.....	.....	3.06	2.72	4.39	3.91	5.61	5.13	5.03	4.55	.....	.....	.....
September	3.05	1.50	.....	.....	.....	.....	.....	.....	.....	.....	2.07	0.52	3.87	2.32	.....	.....	.....	.....	.....
October	1.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.54	.....	1.47	.....	.....	.....	.....	.....	.....
November	0.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	18.40	11.10	8.72	6.99	14.52	9.73	6.68	1.54	14.28	10.46	21.02	13.87	28.10	19.98	17.47	13.32	16.35	9.46	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: <i>Umpqua River</i>													
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.49	.....	1.73	.....	0.91	.....	0.88	.....	.....	.....	.....	.....	.....
April	2.34	.....	2.73	0.20	2.34	.....	2.34	.....	1.38	.....	4.13	1.60	.....
May	3.49	1.52	4.23	2.26	3.49	1.52	3.49	1.52	4.04	2.07	5.71	3.84	.....
June	4.49	3.20	5.51	4.22	4.49	3.20	1.99	1.35	6.29	5.00	6.68	4.39	.....
July	5.55	5.27	6.69	6.41	5.55	5.27	.....	.....	3.80	3.52	6.33	6.05	.....
August	4.97	4.63	5.79	5.45	4.97	4.63	.....	.....	0.39	0.28	.....	.....	.....
September	3.50	2.28	3.98	2.76	2.07	2.46	.....	.....	.....	.....	.....	.....	.....
October	2.10	.....	1.54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November	0.81	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	28.74	16.90	32.20	21.30	23.82	17.08	8.70	2.87	15.90	10.87	22.85	15.88	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: <i>Umpqua River</i> —(Continued)													
Month	Truck crops		Beans (pole)		Beans (bush)		Tomatoes		Orchards (deciduous)		Orchards (deciduous with cover)		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April .....	.....	.....	1.63	0.36	.....	.....	.....	.....	0.84	.....	1.18	0.34	.....
May .....	.....	.....	4.23	2.26	0.25	.....	1.82	.....	3.38	1.41	4.19	2.22	.....
June	1.36	0.72	5.51	4.22	3.32	2.03	4.93	3.64	4.69	3.40	5.51	4.22	.....
July	4.89	4.61	5.44	5.21	4.70	4.42	3.26	3.06	5.49	5.21	6.69	6.41	.....
August .....	.....	.....	.....	.....	0.46	0.40	.....	.....	4.54	4.20	5.79	5.45	.....
September .....	.....	.....	.....	.....	.....	.....	.....	.....	2.13	0.91	3.98	2.76	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	0.56	.....	1.54	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	6.25	5.33	16.81	12.05	8.73	6.85	10.01	6.70	21.63	15.13	28.88	21.40	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Medford—Grants Pass*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Truck crops		Onions		Orchards (deciduous)		Orchards (deciduous with cover)			
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR		
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.38	.....	1.60	.....	0.86	.....	0.83	.....	.....	.....	.....	.....	.....	.....	0.36	.....	.....	.....	.....	.....	.....
April	2.26	0.76	2.63	1.13	2.26	0.76	2.26	0.76	1.33	.....	4.00	2.50	.....	.....	1.44	.....	0.84	0.34	1.19	0.69	.....
May	3.57	2.06	4.32	2.81	3.57	2.06	3.57	2.06	4.12	2.61	5.83	4.32	.....	.....	2.97	1.46	3.45	1.94	4.28	2.77	.....
June	4.71	3.70	5.78	4.77	4.71	3.70	2.06	1.56	6.60	5.59	7.01	6.00	1.46	0.96	4.20	3.19	4.92	3.91	5.78	4.77	.....
July	6.06	5.75	7.31	7.00	6.06	5.75	.....	.....	4.15	3.84	6.91	0.60	5.34	5.03	5.14	4.83	5.99	5.86	7.31	7.00	.....
August	5.40	5.14	6.29	6.03	5.40	5.14	.....	.....	0.42	0.34	.....	.....	.....	.....	3.32	3.06	4.92	4.66	6.29	6.03	.....
September ..	3.54	2.73	4.02	3.21	2.18	1.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.16	1.35	4.02	3.21	.....
October	1.98	0.15	1.50	0.59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.55	.....	1.50	0.58	.....
November ..	0.67
December
Seasonal totals	29.57	20.29	33.45	25.54	25.04	19.19	8.72	4.38	16.62	12.38	23.75	13.42	6.80	5.99	17.43	12.54	22.83	17.88	30.37	25.05

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Lake Creek—Little Butte Creek*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Truck crops		Orchards (deciduous)		Orchards (deciduous with cover)				
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR			
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>		
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	1.33	.....	1.55	.....	0.85	.....	0.81	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	2.24	0.47	2.61	0.84	2.24	0.47	2.24	0.47	1.32	.....	3.96	2.19	.....	.....	0.81	0.22	1.15	0.56	.....	.....
May	3.43	1.62	4.16	2.35	3.43	1.62	3.43	1.62	3.97	2.16	5.61	3.80	.....	.....	3.32	1.51	4.12	2.31	.....	.....
June	4.53	3.32	5.56	4.35	4.53	3.32	1.98	1.38	6.35	5.14	6.74	5.53	1.40	0.80	4.72	3.51	5.56	4.35	.....	.....
July	5.86	5.62	7.07	6.83	5.86	5.62	.....	.....	4.02	3.78	6.69	6.45	5.16	4.92	5.80	5.56	7.07	6.83	.....	.....
August	5.23	4.97	6.09	5.83	5.23	4.97	.....	.....	0.41	0.33	.....	.....	.....	.....	4.77	4.51	6.09	5.83	.....	.....
September ..	3.50	2.59	3.98	3.07	2.13	2.68	.....	.....	.....	.....	.....	.....	.....	.....	2.14	1.23	3.98	3.07	.....	.....
October	1.97	.....	1.49	0.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.55	.....	1.49	0.29	.....	.....
November	0.66
December
Seasonal totals	28.75	18.59	32.51	23.57	24.27	18.68	8.46	3.47	16.07	11.41	23.00	17.97	6.56	5.72	22.11	16.54	29.46	23.24	.....	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Columbia River Above Hood River*

Month	Pasture grass		Alfalfa		Grass seed		Spring grains		Fall seeded grains		Berries		Orchards (deciduous)		Orchards (deciduous with cover)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.67	1.39	1.94	1.66	2.59	2.04	1.53	0.98	4.57	4.02	.....	.....	1.49	1.16	2.21	1.88
May	4.27	3.68	5.16	4.57	4.27	3.68	4.93	4.34	6.92	6.33	0.94	0.63	4.12	3.53	5.12	4.53
June	5.61	5.06	6.89	6.34	2.45	2.18	7.86	7.31	8.17	7.62	3.29	2.74	5.85	5.30	6.89	6.34
July	7.06	6.92	8.53	8.39	.....	.....	4.84	4.70	4.47	4.29	5.69	5.55	6.99	6.85	8.53	8.39
August	6.18	5.99	7.19	7.00	.....	.....	0.49	0.43	.....	.....	5.56	5.37	5.63	5.44	7.19	7.00
September	3.87	3.34	4.41	3.88	.....	.....	.....	.....	.....	.....	3.56	3.03	2.36	1.83	4.41	3.88
October	1.41	0.96	1.18	0.88	.....	.....	.....	.....	.....	1.43	1.60	0.69	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.46	0.21	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	30.07	27.34	35.30	32.72	9.31	7.90	19.65	17.76	24.13	24.15	20.85	18.01	26.44	24.11	34.35	32.02

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Hood River Valley*

Month	Pasture grass		Alfalfa		Grass seed		Spring grains		Fall seeded grains		Berries		Orchards (deciduous)		Orchards (deciduous with cover)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.23	0.24	1.46	0.53	1.96	.....	1.16	.....	3.46	1.49	.....	.....	.....	.....	.....	.....
May	3.20	1.79	3.88	2.47	3.20	1.79	3.70	1.29	5.20	3.79	0.45	.....	.....	.....	3.84	2.43
June	4.19	3.23	5.15	4.19	1.84	1.36	5.87	4.91	6.10	5.14	2.01	1.05	3.10	1.69	5.15	4.19
July	5.23	5.00	6.31	6.08	.....	.....	3.58	3.35	3.33	3.19	4.15	3.92	4.37	3.41	6.31	6.08
August	4.61	4.31	5.36	5.06	.....	.....	0.36	0.26	.....	.....	4.15	3.85	5.17	4.94	5.36	5.06
September	2.99	1.78	3.41	2.20	.....	.....	.....	.....	.....	.....	2.68	1.47	4.20	3.90	3.41	2.20
October	1.11	.....	2.32	1.39	.....	.....	.....	.....	.....	.....	1.18	.....	1.82	0.61	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	22.56	16.35	27.89	21.92	7.00	3.15	14.67	9.81	18.09	13.61	14.62	10.29	18.66	14.55	24.07	19.96

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *East Slope of Mt. Hood*

Month	Pasture grass		Alfalfa		Grass seed		Spring grains		Fall seeded grains		Berries		Orchards (deciduous)		Orchards (deciduous with cover)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.13	0.79	1.31	0.97	1.72	1.04	1.01	0.33	3.03	2.35	.....	.....	1.06	0.61	1.59	1.14
May	2.91	2.02	3.52	2.63	2.91	2.02	3.36	2.47	4.72	3.83	0.41	0.11	2.81	1.92	3.49	2.60
June	3.86	3.07	4.74	3.95	1.69	1.30	5.41	4.62	5.62	4.83	2.02	1.23	4.03	3.24	4.74	3.95
July	5.22	5.05	6.29	6.12	.....	.....	3.57	3.40	3.23	3.13	4.14	3.97	5.16	4.99	6.29	6.12
August	5.01	4.84	5.84	5.67	.....	.....	0.37	0.31	.....	.....	4.52	4.35	4.57	4.40	5.84	5.67
September	3.02	2.39	3.43	2.80	.....	.....	.....	.....	.....	.....	2.71	2.08	1.84	1.21	3.43	2.80
October	1.09	0.52	0.91	0.53	.....	.....	.....	.....	.....	.....	1.12	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	22.24	18.68	26.04	22.67	6.32	4.36	13.72	11.13	16.60	14.14	14.92	11.74	19.47	16.37	25.38	22.28

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Columbia Basin Wheat Land*

Month	Pasture grass		Alfalfa		Grass seed		Spring grains		Fall seeded grains		Berries		Orchards (deciduous)		Orchards (deciduous with cover)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.22	0.75	1.42	1.01	1.85	1.03	1.09	0.27	3.27	2.45	.....	.....	1.16	0.61	1.73	1.18
May	3.17	2.12	3.83	2.78	3.17	2.12	3.66	2.61	5.14	4.09	0.66	0.10	3.06	2.01	3.80	2.75
June	4.28	3.38	5.26	4.36	1.85	1.40	6.01	5.11	6.24	5.34	2.51	1.61	4.47	3.57	5.26	4.36
July	5.80	5.55	7.01	6.76	.....	.....	3.97	3.72	3.60	3.44	4.67	4.42	5.74	5.49	7.01	6.76
August	5.55	5.29	6.47	6.21	.....	.....	0.41	0.33	.....	.....	5.00	4.74	5.06	4.80	6.47	6.21
September	3.17	2.51	3.60	2.94	.....	.....	.....	.....	.....	.....	2.91	2.25	1.93	1.27	3.60	2.94
October	1.15	0.66	0.96	0.63	.....	.....	.....	.....	.....	.....	1.30	0.31	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.17	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	24.34	20.26	28.55	24.69	6.87	4.55	15.14	12.04	18.25	15.32	17.22	13.43	21.42	17.75	27.87	24.20

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Pendleton—Heppner*

Month	Pasture grass		Alfalfa		Grass seed		Spring grains		Fall seeded grains		Corn		Berries		Orchards (deciduous)		Orchards (deciduous with cover)		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January
February
March
April	1.40	0.78	1.63	1.01	2.15	0.91	1.27	0.03	3.80	2.56	.....	.....	.....	.....	1.33	0.50	1.98	1.15
May	3.61	2.23	4.37	2.99	3.61	2.23	4.17	2.79	5.85	4.47	1.10	0.41	0.75	0.01	3.49	2.11	4.33	2.95	
June	4.83	3.62	5.93	4.72	2.09	1.44	6.77	5.56	7.03	5.82	3.89	2.68	2.83	1.62	5.04	3.83	5.93	4.72	
July	6.39	6.08	7.71	7.40	.....	.....	4.38	4.07	3.98	3.78	7.51	7.20	5.14	4.83	6.32	6.01	7.71	7.40
August	6.08	5.70	7.07	6.69	.....	.....	0.46	0.33	.....	.....	4.24	4.00	5.48	5.10	5.54	5.16	7.07	6.69
September	3.47	2.70	3.95	3.18	.....	.....	.....	.....	.....	.....	.....	.....	3.20	2.43	2.12	1.35	3.95	3.18
October	1.26	0.67	1.05	0.66	.....	.....	.....	.....	.....	.....	.....	.....	1.43	0.25	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.19	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	27.04	21.78	31.71	26.65	7.85	4.58	17.05	12.78	20.66	16.63	16.74	14.29	19.02	14.24	23.84	18.96	30.97	26.09	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Hermiston*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	0.92	0.58	.....	.....	.....	.....	.....	.....
April	2.58	1.89	1.92	1.58	2.55	1.86	2.55	1.86	1.50	0.81	4.50	3.81
May	4.25	3.58	5.14	4.47	4.25	3.58	4.25	3.58	4.91	4.24	6.89	6.22
June	5.71	5.01	7.01	6.31	5.71	5.01	5.71	5.01	8.01	7.31	8.31	7.61
July	7.18	6.99	8.66	8.47	7.18	6.99	3.22	3.13	4.91	4.72	4.54	4.42
August	6.04	5.79	7.03	6.78	6.04	5.79	.....	.....	0.49	0.41	.....	.....
September	3.69	3.17	4.20	3.68	2.36	2.10	.....	.....	.....	.....	.....	.....
October	1.95	1.13	1.00	0.76	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	31.40	27.56	34.96	32.05	29.01	25.91	15.73	13.58	19.82	17.49	24.24	22.06

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Hermiston*—(Continued)

Month	Corn		Berries		Peas		Orchards (deciduous)		Orchards (deciduous with cover)		Mint	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	0.22	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	1.18	0.49	.....	.....	.....	.....	.....	.....
April .....	.....	.....	.....	.....	2.43	1.74	1.57	1.11	2.35	1.89	2.59	1.90
May	1.30	0.97	0.95	0.59	3.59	2.92	4.10	3.43	5.09	4.42	4.25	3.58
June	4.59	3.89	3.35	2.65	1.23	0.88	5.95	5.25	7.01	6.31	5.67	4.97
July	8.42	8.23	5.77	5.58	.....	.....	7.10	6.91	8.66	8.47	7.24	7.05
August	4.39	4.23	5.44	5.19	.....	.....	5.51	5.26	7.03	6.78	2.24	2.11
September .....	.....	.....	3.39	2.87	.....	.....	2.25	1.73	4.20	3.68	.....	.....
October .....	.....	.....	1.53	0.71	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	18.70	17.32	20.63	17.59	8.65	6.03	26.48	23.69	34.34	31.55	21.99	19.61

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Milton-Freewater*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Falls seeded grains	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	0.83	.....	.....	.....	.....	.....	.....	.....
April	2.35	0.71	1.73	0.91	2.32	0.68	2.32	0.68	1.37	.....	4.09	2.45
May	3.80	2.14	4.61	2.95	3.80	2.14	3.80	2.14	4.39	2.73	6.17	4.51
June	5.02	3.61	6.16	4.75	5.02	4.61	5.02	3.61	7.04	5.63	7.31	5.90
July	6.65	6.30	8.02	7.67	6.65	6.30	2.91	2.73	4.56	4.21	4.14	3.90
August	5.77	5.32	6.72	6.27	5.77	5.32	.....	.....	0.46	0.31	.....	.....
September	3.53	2.57	4.01	3.05	2.25	1.77	.....	.....	.....	.....	.....	.....
October	1.88	0.35	1.08	0.57	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	29.00	21.00	32.33	26.17	26.64	20.82	14.05	9.16	17.82	12.88	21.71	16.76

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Milton-Freewater*—(Continued)

Month	Corn		Berries		Peas		Tomatoes		Orchards (deciduous) with cover		Orchards (deciduous)	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	0.20	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	1.06	.....	.....	.....	.....	.....	.....	.....
April .....	.....	.....	.....	.....	2.21	0.57	.....	.....	2.12	1.03	1.42	0.33
May	1.16	0.33	0.84	.....	3.21	1.55	1.98	0.32	4.56	2.90	3.68	2.02
June	4.03	2.62	2.94	1.53	1.09	0.38	5.51	4.10	6.16	4.75	5.24	3.83
July	7.81	7.46	5.35	5.00	.....	.....	3.83	3.58	8.02	7.67	6.58	6.23
August	4.16	3.86	5.20	4.75	.....	.....	.....	.....	6.72	6.27	5.26	4.81
September .....	.....	.....	3.24	2.28	.....	.....	.....	.....	4.01	3.05	2.15	1.19
October .....	.....	.....	1.48	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	17.16	14.27	19.25	13.56	7.77	2.50	11.32	8.00	31.59	25.67	24.33	18.41

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Madras—Redmond*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Potatoes		Mint	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.81	1.23	1.35	1.06	1.14	0.85	1.16	0.87	0.51	0.22	3.15	2.57	.....	.....	1.78	1.20
May	3.02	2.04	3.66	2.68	3.02	2.04	3.02	2.04	3.05	2.07	4.90	3.92	0.20	0.07	3.03	2.05
June	4.08	3.11	5.01	4.04	4.08	3.11	1.77	1.28	5.41	4.44	5.94	4.97	2.22	1.25	4.09	3.12
July	5.53	5.23	6.67	6.37	5.53	5.23	.....	.....	5.17	4.87	3.42	3.22	7.21	6.91	5.59	5.29
August	4.70	4.45	5.47	5.22	4.70	4.45	.....	.....	0.73	0.57	.....	.....	6.92	6.67	1.72	1.59
September	2.97	2.45	3.38	2.86	1.87	1.61	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	22.11	18.51	25.54	22.23	20.34	17.29	5.95	4.19	14.87	12.17	17.41	14.68	16.55	14.90	16.21	13.25

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Bend													
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Potatoes		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.41	0.72	1.07	0.73	0.90	0.56	0.92	0.58	0.40	0.06	.....	.....	.....
May	2.42	1.39	2.93	1.90	2.42	1.39	2.42	1.39	2.44	1.41	0.16	0.02	.....
June	3.40	2.40	4.17	3.17	3.40	2.40	1.44	0.94	4.50	3.50	1.85	0.85	.....
July	4.64	4.18	5.61	4.15	4.64	4.18	.....	.....	4.34	3.88	6.06	5.60	.....
August	3.95	3.61	4.59	4.25	3.95	3.61	.....	.....	0.61	0.39	5.81	5.47	.....
September	2.40	1.89	2.74	2.23	1.54	1.29	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	18.22	14.19	21.11	16.43	16.85	13.43	4.78	2.91	12.29	9.24	13.88	11.94	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Klamath													
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Potatoes		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.64	0.89	1.24	0.88	1.04	0.66	1.07	0.74	0.47	0.09	.....	.....	.....
May	2.78	1.69	3.36	2.27	2.78	1.69	2.78	1.69	2.80	1.71	0.18	0.03	.....
June	3.76	2.85	4.62	3.71	3.76	2.85	1.63	1.18	4.98	4.07	2.04	1.13	.....
July	5.18	4.89	6.26	5.97	5.18	4.89	.....	.....	4.85	4.56	6.76	6.47	.....
August	4.40	4.13	5.13	4.86	4.40	4.13	.....	.....	0.68	0.52	6.48	6.21	.....
September	2.90	2.30	3.30	2.70	1.78	1.48	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	20.66	16.75	23.91	20.39	18.94	15.70	5.48	3.61	13.78	10.95	15.46	13.84	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: <i>Lakeview</i>													
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.63	0.66	1.23	0.74	1.04	0.55	1.06	0.58	0.47	.....	2.84	1.87
May	2.76	1.43	3.34	2.01	2.76	1.43	2.76	1.43	2.79	1.46	4.48	3.15	
June	3.87	2.78	4.75	3.66	3.87	2.78	1.64	1.10	5.13	4.04	5.64	4.55	
July	5.41	5.04	6.53	6.16	5.41	5.04	.....	.....	5.06	4.69	3.32	3.08
August	4.68	4.42	5.46	5.20	4.68	4.42	.....	.....	0.72	0.54	.....	.....
September	2.87	2.32	3.27	2.72	1.83	1.56	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	21.22	16.65	24.58	20.49	19.59	15.78	5.46	3.11	14.17	10.73	16.28	12.65	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: <i>Harney Valley</i>											
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.57	0.87	1.21	0.86	1.02	0.67	1.04	0.69	0.45	0.10	
May	2.76	1.55	3.34	2.13	2.76	1.55	2.76	1.55	2.79	1.58	
June	3.77	2.70	4.63	3.56	3.77	2.70	1.62	1.09	5.00	3.93	
July	5.64	5.32	6.81	6.49	5.64	5.32	.....	.....	5.27	4.95
August	4.79	4.37	5.57	5.15	4.79	4.37	.....	.....	0.74	0.46
September	2.98	2.42	3.38	2.82	1.88	1.60	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	21.51	17.23	24.94	21.01	19.86	16.21	5.42	3.33	14.25	11.02	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Dayville—Canyon City*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	2.07	0.75	1.52	0.86	1.28	0.62	1.31	0.65	0.57	.....	.....
May	3.32	1.63	4.03	2.34	3.32	1.63	3.32	1.63	3.36	1.67	.....
June	4.42	3.14	5.44	4.16	4.42	3.14	1.92	1.28	5.87	4.59	.....
July	5.98	5.55	7.22	6.79	5.98	5.55	.....	.....	5.59	5.16	.....
August	5.23	4.82	6.10	5.69	5.23	4.82	.....	.....	0.80	0.50	.....
September	3.25	2.48	3.70	2.93	2.06	1.68	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	24.27	18.37	28.01	22.77	22.29	17.44	6.55	3.56	16.19	11.92	.....

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Wallowa Valley*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.69	0.37	1.21	0.55	.....	.....	1.04	0.38	0.46	.....	2.79	1.47
May	2.73	0.98	3.30	2.55	2.73	0.98	2.73	0.98	2.76	1.01	4.46	2.71
June	3.74	1.77	4.59	2.62	3.74	1.77	1.61	0.63	4.96	2.99	5.57	3.60
July	4.99	4.36	6.03	5.40	4.99	4.36	.....	.....	4.66	4.03	5.70	5.07
August	4.60	3.96	5.35	4.71	4.60	3.96	.....	.....	0.69	0.28	.....	.....
September	2.60	1.53	2.97	1.90	1.73	1.20	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	20.35	12.97	23.45	17.73	17.79	12.27	5.38	1.99	13.53	8.31	18.52	12.85

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Grand Ronde Valley*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Potatoes		Peas		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January
February
March
April	1.84	0.01	1.38	0.47	1.16	0.25	1.19	0.28	0.52	.....	3.21	1.38	.....	.....	.....	.....
May	3.09	1.04	3.75	1.70	3.09	1.04	3.09	1.04	3.12	1.07	5.05	3.00	0.90	.....	0.83	.....
June	4.18	2.29	5.13	3.24	4.18	2.29	1.81	0.87	5.54	3.65	6.22	4.33	3.31	1.42	3.68	1.79	
July	5.70	5.17	6.88	6.35	5.70	5.17	.....	.....	5.33	4.80	6.51	5.98	8.00	7.47	1.68	1.41
August	5.39	4.71	6.28	5.60	5.39	4.71	.....	.....	0.80	0.35	.....	.....	7.88	7.20	.....	.....
September	2.97	1.86	3.38	2.27	2.01	1.46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	23.17	15.08	26.80	19.63	21.53	14.92	6.09	2.19	15.31	9.87	20.99	14.69	20.09	16.09	6.19	3.20	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Baker Valley*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Potatoes	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.60	0.79	1.24	0.84	1.05	0.65	1.07	0.67	0.47	.....	2.78	1.97	.....	.....
May	2.84	1.32	3.44	1.92	2.84	1.32	2.84	1.32	2.87	1.35	4.64	3.12	0.83	.....
June	3.86	2.52	4.74	3.40	3.86	2.52	1.67	1.00	5.12	3.78	5.75	4.41	3.06	1.72
July	5.37	4.94	6.48	6.05	5.37	4.94	.....	.....	5.02	4.59	6.13	5.70	7.54	7.11
August	4.55	4.09	5.30	4.94	4.55	4.09	.....	.....	0.70	0.40	.....	.....	6.65	6.19
September	2.76	2.20	3.13	2.57	1.77	1.49	.....	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	20.98	15.86	24.33	19.72	19.44	15.01	5.58	2.99	14.18	10.12	19.30	15.20	18.08	15.02

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Pine and Eagle Valleys*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.94	0.72	1.48	0.87	.....	.....	1.27	0.66	0.55	.....	3.37	2.15
May	3.12	1.50	4.03	2.41	3.33	1.71	3.33	1.71	3.37	1.75	5.44	3.82
June	4.52	3.37	5.56	4.41	4.52	3.37	1.96	1.39	6.00	4.85	6.74	5.59
July	6.13	5.83	7.40	7.10	6.13	5.83	.....	.....	5.73	5.43	7.00	6.70
August	5.24	4.91	6.10	5.87	5.24	4.91	.....	.....	0.81	0.59	.....	.....
September	3.16	2.48	3.60	2.92	2.03	1.69	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	24.11	18.81	28.17	23.58	21.25	17.51	6.56	3.76	16.46	12.62	22.55	18.26

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: *Malheur*

Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Fall seeded grains		Corn		Potatoes		Onions		
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.32
April	2.28	1.55	2.62	1.89	1.46	1.10	1.49	1.13	1.32	0.59	3.97	3.24	.....	.....	.....	.....	.....	1.43	0.70
May	3.90	2.83	4.72	3.65	3.90	2.83	3.90	2.83	4.50	3.43	6.37	5.30	1.20	0.67	1.86	0.79	3.25	2.18	
June	5.24	4.43	6.43	5.62	5.24	4.43	2.27	1.87	7.35	6.54	7.80	6.99	4.21	3.40	5.64	4.83	4.67	3.86	
July	7.10	6.96	8.49	8.35	7.10	6.96	.....	.....	4.87	4.73	8.10	7.96	8.34	8.20	10.65	10.54	6.02	5.88	
August	5.92	5.67	6.90	6.65	5.92	5.67	.....	.....	0.71	0.55	.....	.....	4.33	4.17	6.25	6.06	3.64	3.39	
September	3.48	3.01	3.96	3.49	2.27	2.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
October	1.24	0.86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	29.16	25.31	33.12	29.65	25.89	23.03	7.66	5.83	18.75	15.84	26.24	23.49	18.08	16.44	24.39	22.22	19.33	16.01	

Table 4. COMPUTED AVERAGE CONSUMPTIVE USE AND NET IRRIGATION REQUIREMENT—(Continued)

Area: Jordan Valley												
Month	Pasture grass		Alfalfa		Legume seed		Grass seed		Spring grains		Potatoes	
	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR	CU	IR
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
January .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	1.60	0.57	1.83	0.80	1.06	0.55	1.08	0.57	0.93	.....	.....	.....
May	2.88	1.60	3.50	2.22	2.88	1.60	2.88	1.60	3.34	2.06	0.19	0.02
June	4.10	3.07	5.04	4.01	4.10	3.07	1.73	1.22	5.75	4.72	2.23	1.20
July	5.74	5.43	6.87	6.56	5.74	5.43	.....	.....	3.94	3.63	7.49	7.18
August	4.87	4.71	5.67	5.51	4.87	4.71	.....	.....	0.58	0.50	7.16	7.00
September	2.95	2.46	3.35	2.86	1.90	1.66	.....	.....	.....	.....	.....	.....
October	1.05	0.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
November .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seasonal totals	23.19	18.48	26.26	21.96	20.55	17.02	5.69	3.39	14.54	10.91	17.07	15.40

Table 5. GROWING SEASONS USED IN COMPUTING CONSUMPTIVE USE AND IRRIGATION REQUIREMENTS

Area	Fall seeded grains	Alfalfa	Grass and legume pasture and hay	Beans (bush)	Beans (pole)	Spring grains	Peas	Onions	Corn (sweet)
COASTAL									
1 North coast			3/1 -12/1						
2 South coast			2/15-12/1						
WILLAMETTE VALLEY									
3 Columbia River below Hood River	4/1-7/31	4/15-10/15	3/1 -11/15	6/5 -8/15	5/15-8/25	4/1 -8/10			5/1 -8/30
4 Tualatin Valley	4/1-7/31	4/15-10/15	3/1 -11/15	6/5 -8/15	5/15-8/25	4/1 -8/10	3/15-6/15	4/15-9/1	
5 Willamette Valley	4/1-7/31	4/15-10/15	3/1 -11/15	6/5 -8/15	5/15-8/25	4/1 -8/10	3/15-6/15	4/15-9/1	5/1 -8/30
SOUTHWESTERN VALLEYS									
6 Umpqua River	4/1-7/31	3/1 -10/15	3/1 -11/15	5/25-8/5	4/15-7/25	4/1 -8/10			
7 Medford—Grants Pass	4/1-7/31	3/1 -10/15	3/1 -11/15			4/1 -8/10		3/15-9/1	
8 Lake Creek—Little Butte Creek	4/1-7/31	3/1 -10/15	3/1 -11/15			4/1 -8/10			
NORTH CENTRAL									
9 Hood River Valley	4/1-7/20	4/15-10/10	4/15-10/15			4/1 -8/10			
10 Columbia River above Hood River	4/1-7/20	4/15-10/10	4/15-10/15			4/1 -8/10			
11 East Slope of Mt. Hood	4/1-7/20	4/15-10/10	4/15-10/15			4/1 -8/10			
12 Columbia Basin wheat land	4/1-7/20	4/15-10/10	4/15-10/15			4/1 -8/10			
13 Pendleton—Heppner	4/1-7/20	4/15-10/10	4/15-10/15			4/1 -8/10			5/15-8/20
14 Hermiston	4/1-7/20	4/15-10/10	4/1 -11/1			4/1 -8/10	2/15-6/15		5/15-8/20
15 Milton-Freewater	4/1-7/20	4/15-10/10	4/1 -11/1			4/1 -8/10	2/15-6/15		5/15-8/20

Table 5. GROWING SEASONS USED IN COMPUTING CONSUMPTIVE USE AND IRRIGATION REQUIREMENTS—(Continued)

Area	Fall seeded grains	Alfalfa	Grass and pasture legume and hay	Beans (bush)	Beans (pole)	Spring grains	Peas	Onions	Corn (sweet)
SOUTH CENTRAL									
16 Madras—Redmond	4/1-7/20	4/15-10/1	4/1 -10/1			4/15-8/20			
17 Bend		4/15-10/1	4/1 -10/1			4/15-8/20			
18 Klamath		4/15-10/1	4/1 -10/1			4/15-8/20			
19 Lakeview	4/1-7/20	4/15-10/1	4/1 -10/1			4/15-8/20			
20 Harney Valley		4/15-10/1	4/1 -10/1			4/15-8/20			
21 Dayville—Canyon City		4/15-10/1	4/1 -10/1			4/15-8/20			
NORTHEAST									
22 Wallowa Valley	4/1-7/31	4/15-10/1	4/1 -10/1			4/15-8/20			
23 Grande Ronde Valley	4/1-7/31	4/15-10/1	4/1 -10/1			4/15-8/20	5/15-7/15		
24 Baker Valley	4/1-7/31	4/15-10/1	4/1 -10/1			4/15-8/20			
25 Pine and Eagle valleys	4/1-7/31	4/15-10/1	4/1 -10/1			4/15-8/20			
SOUTHEAST									
26 Malheur	4/1-7/31	4/1 -10/1	4/1 -10/15			4/1 -8/15		3/15-8/30	5/15-8/20
27 Jordan Valley		4/1 -10/1	4/1 -10/15			4/1 -8/15			

Table 5. GROWING SEASONS USED IN COMPUTING CONSUMPTIVE USE AND IRRIGATION REQUIREMENTS—(Continued)

Area	Truck crops	Mint	Tomatoes	Legume seed	Grass seed	Berries	Potatoes	Orchards (deciduous with cover)	Orchards (deciduous without cover)
COASTAL									
1 North coast	6/15-7/30								
2 South coast	6/15-7/30								
WILLAMETTE VALLEY									
3 Columbia River below Hood River	6/15-7/30			3/15-9/15	3/15-6/15	4/30-11/23	6/15-9/1	4/20-10/15	4/20-10/15
4 Tualatin Valley	6/15-7/30			3/15-9/15	3/15-6/15	4/30-11/23	6/15-9/1	4/20-10/15	4/20-10/15
5 Willamette Valley	6/15-7/30	3/15-7/30	5/1-8/21	3/15-9/15	3/15-6/15	4/30-11/23	6/15-9/1	4/20-10/15	4/20-10/15
SOUTHWESTERN VALLEYS									
6 Umpqua River	6/15-7/30		5/1-7/21	3/15-9/15	3/15-6/15			4/20-10/15	4/20-10/15
7 Medford—Grants Pass	6/15-7/30			3/15-9/15	3/15-6/15			4/20-10/15	4/20-10/15
8 Lake Creek—Little Butte Creek	6/15-7/30			3/15-9/15	3/15-6/15			4/20-10/15	4/20-10/15

Table 5. GROWING SEASONS USED IN COMPUTING CONSUMPTIVE USE AND IRRIGATION REQUIREMENTS—(Continued)

Area	Truck crops	Mint	Tomatoes	Legume seed	Grass seed	Berries	Potatoes	Orchards (deciduous) with cover)	Orchards (deciduous) without cover)
NORTH CENTRAL									
9 Hood River Valley					4/1 -6/15	5/21-10/31		5/1 -10/1	5/1 -10/1
10 Columbia River above Hood River					4/1 -6/15	5/14-11/7		4/12-10/1	4/12-10/1
11 East Slope of Mt. Hood					4/1 -6/15	5/21-10/31		4/10-10/1	4/10-10/1
12 Columbia Basin wheat land					4/1 -6/15	5/14-11/7		4/10-10/1	4/10-10/1
13 Pendleton—Heppner					4/1 -6/15	5/14-11/7		4/10-10/1	4/10-10/1
14 Hermiston		3/30-8/10		3/15-9/15	4/1 -7/15	5/14-11/7		4/10-10/1	4/10-10/1
15 Milton-Freewater			5/1-7/21	3/15-9/15	4/1 -7/15	5/14-11/7		4/10-10/1	4/10-10/1
SOUTH CENTRAL									
16 Madras—Redmond		3/30-8/10		4/15-9/15	4/15-6/15		5/27-9/1		
17 Bend				4/15-9/15	4/15-6/15		5/27-9/1		
18 Klamath				4/15-9/15	4/15-6/15		5/27-9/1		
19 Lakeview				4/15-9/15	4/15-6/15				
20 Harney Valley				4/15-9/15	4/15-6/15				
21 Dayville—Canyon City				4/15-9/15	4/15-6/15				
NORTHEAST									
22 Wallowa Valley				5/1 -9/15	4/15-6/15				
23 Grand Ronde Valley				4/15-9/15	4/15-6/15		5/12-9/1		
24 Baker Valley				4/15-9/15	4/15-6/15		5/12-9/1		
25 Pine and Eagle valleys				5/1 -9/15	4/15-6/15				
SOUTHEAST									
26 Malheur				4/15-9/15	4/15-6/15		5/1 -8/21		
27 Jordan Valley				4/15-9/15	4/15-6/15		5/27-9/1		

Table 6. NET MONTHLY IRRIGATION REQUIREMENT FOR ALFALFA WHICH WOULD
LIKELY BE ADEQUATE FOR THE PERIOD SPECIFIED

BAKER					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.39	3.13	3.46	3.81	3.99
June	3.80	4.49	4.82	5.26	5.55
July	6.54	6.80	6.93	7.06	7.25
August	5.25	5.46	5.82	6.19	6.35
September	2.35	2.92	3.27	3.69	3.93
Annual total	20.79	22.87	23.49	24.32	24.94

BEND					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.22	2.62	2.91	3.35	3.75
June	3.58	4.28	4.52	4.94	5.33
July	3.58	4.28	4.52	4.94	5.33
August	4.32	5.07	5.42	5.76	5.98
September	0.47	1.79	2.14	2.57	3.06
Annual total	17.07	19.37	21.01	22.82	24.30

BURNS					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.49	3.11	3.50	4.01	4.45
June	4.15	4.76	5.17	5.74	6.19
July	6.80	7.13	7.33	7.46	7.66
August	5.40	5.79	6.06	6.54	6.92
September	2.17	2.87	3.23	3.67	4.03
Annual total	21.91	23.47	24.57	25.88	26.98

THE DALLES					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	4.66	5.16	5.44	5.95	6.41
June	6.58	6.90	7.16	7.48	7.80
July	8.39	8.72	8.97	9.30	9.63
August	7.05	7.19	7.40	7.68	8.10
September	4.10	4.45	4.61	4.77	4.89
Annual total	34.82	36.21	36.91	38.30	39.35

DAYVILLE					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.53	3.15	3.52	4.02	4.49
June	4.53	5.11	5.38	5.78	6.14
July	6.97	7.38	7.52	7.86	8.13
August	5.49	5.93	6.14	6.47	6.69
September	2.24	2.73	3.04	3.47	3.81
Annual total	23.48	24.63	25.09	26.24	27.16

HERMISTON					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	4.47	4.87	5.13	5.49	5.80
June	6.39	6.84	7.03	7.28	7.54
July	8.54	8.87	9.04	9.37	9.46
August	6.82	7.09	7.36	7.64	7.96
September	3.74	4.10	4.28	4.46	4.64
Annual total	33.71	34.38	35.04	36.04	36.71

Table 6. NET MONTHLY IRRIGATION REQUIREMENT FOR ALFALFA WHICH WOULD
 LIKELY BE ADEQUATE FOR THE PERIOD SPECIFIED—(Continued)

HILLSBORO					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.58	3.37	3.69	4.10	4.34
June	3.99	4.75	5.17	5.80	6.22
July	5.95	6.39	6.76	7.25	7.69
August	4.93	5.35	5.65	6.17	6.63
September	2.98	3.41	3.58	3.84	4.05
Annual total	22.32	23.88	25.00	26.56	28.12
HOOD RIVER					
May	3.07	3.74	4.12	4.57	4.89
June	5.02	4.92	5.55	5.94	6.33
July	6.51	6.64	6.90	7.16	7.55
August	5.49	5.71	5.92	6.14	6.30
September	3.00	3.40	3.62	3.85	4.02
Annual total	24.90	26.39	26.88	27.87	29.10
KLAMATH FALLS					
May	2.68	3.19	3.54	4.12	4.68
June	4.45	5.08	5.43	5.92	6.37
July	6.82	7.08	7.22	7.48	7.68
August	5.58	6.05	6.26	6.47	6.68
September	2.59	3.19	3.50	3.86	4.10
Annual total	22.88	24.24	25.37	26.73	27.87
KENT					
May	2.46	3.19	3.59	4.07	4.35
June	4.06	4.70	5.10	5.62	6.06
July	6.71	7.02	7.26	7.51	7.81
August	6.29	6.83	7.20	7.51	7.81
September	2.90	3.43	3.82	4.39	4.90
Annual total	23.12	24.70	25.38	26.74	27.65
LA GRANDE					
May	2.00	2.80	3.37	4.21	5.01
June	4.14	4.86	5.26	5.86	6.33
July	7.11	7.67	7.95	8.22	8.50
August	5.79	6.30	6.52	6.75	6.92
September	2.52	3.02	3.35	3.80	4.13
Annual total	22.00	23.76	24.64	26.62	28.16
LAKEVIEW					
May	1.58	2.22	2.66	3.35	3.93
June	3.83	4.50	4.86	5.29	5.61
July	6.35	6.67	6.92	7.10	7.35
August	5.06	5.36	5.56	5.85	6.10
September	2.00	2.64	3.05	3.53	3.74
Annual total	19.24	21.13	22.07	23.01	23.58

Table 6. NET MONTHLY IRRIGATION REQUIREMENT FOR ALFALFA WHICH WOULD
 LIKELY BE ADEQUATE FOR THE PERIOD SPECIFIED—(Continued)

MEDFORD					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
May	2.95	3.48	3.77	4.06	4.30
June	5.23	5.66	6.08	6.56	6.89
July	6.85	7.06	7.34	7.75	8.03
August	5.75	6.15	6.38	6.78	7.07
September	3.37	3.76	3.99	4.29	4.55
Annual total	25.55	27.08	27.84	29.12	30.14

NORTH BEND					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May	0.56	1.62	2.11	2.28	2.42
June	2.08	3.13	3.23	3.37	3.51
July	3.72	3.88	3.97	4.08	4.23
August	3.49	3.69	3.82	3.96	4.06
September	2.01	2.27	2.40	2.60	2.77
Annual total	12.31	13.41	14.14	14.75	15.60

REDMOND					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May	2.65	3.06	3.28	3.74	4.07
June	3.88	4.53	4.80	5.30	5.61
July	6.03	6.32	6.50	6.85	7.02
August	4.85	5.27	5.55	5.74	6.07
September	2.15	2.65	3.01	3.45	3.93
Annual total	20.87	22.69	23.50	24.72	25.53

ROSEBURG					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May	2.60	3.23	3.56	3.99	4.27
June	4.60	5.23	5.54	6.03	6.35
July	6.82	7.15	7.35	7.55	7.68
August	5.87	6.15	6.33	6.50	6.61
September	3.18	3.53	3.74	4.09	4.34
Annual total	24.99	26.46	26.95	27.69	28.67

SALEM					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May	2.55	3.02	3.35	3.84	4.32
June	4.34	4.94	5.32	5.92	6.43
July	6.33	6.71	6.96	7.34	7.66
August	5.46	5.79	6.06	6.33	6.65
September	2.74	3.15	3.42	3.85	4.28
Annual total	23.25	24.38	25.28	26.41	27.09

TILLAMOOK					
Month	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May .....	.....	.....	.56	1.41	2.13
June .....	.68	1.87	2.35	2.75	2.88
July	2.89	3.40	3.68	4.03	4.30
August	2.64	3.07	3.25	3.43	3.56
September	1.09	1.74	1.92	2.19	2.44
Annual total	7.95	9.15	9.90	11.02	12.00

Table 6. NET MONTHLY IRRIGATION REQUIREMENT FOR ALFALFA WHICH WOULD LIKELY BE ADEQUATE FOR THE PERIOD SPECIFIED—(Continued)

Month	VALE				
	5 out of 10 years	7 out of 10 years	8 out of 10 years	9 out of 10 years	19 out of 20 years
May	3.63	4.16	4.51	5.01	5.44
June	5.57	6.12	6.45	6.94	7.32
July	8.04	8.44	8.68	8.99	9.40
August	6.25	6.55	6.80	7.16	7.40
September	2.69	3.28	3.59	3.95	4.23
Annual total	28.55	29.95	30.79	32.19	33.58

Table 7. AVERAGE PEAK DAILY CONSUMPTIVE USE OF ALFALFA AT HERMISTON (Calculated by M. E. Jensen for Short Periods)

Length of period	1954	1955	1956	1957	1958	1959	1960	1961	1962	Mean
<i>Days</i>										
1	.411	.420	.411	.400	.398	.423	.428	.426	.373	.410
5	.329	.364	.399	.348	.362	.366	.384	.381	.350	.365
10	.318	.338	.378	.327	.349	.338	.372	.364	.323	.345
20	.303	.319	.342	.311	.341	.314	.332	.350	.294	.323

Table 8. PEAK PERIOD AVERAGE DAILY CONSUMPTIVE USE RATES (u_p) AS RELATED TO ESTIMATED ACTUAL MONTHLY USE (u_m)

Net irrigation application (I) inches	Computed peak monthly consumptive use rate (u_m) in inches ¹																
	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
	Peak period daily use rate (u_p) in inches per day																
1.0	.15	.18	.20	.22	.24	.26	.28	.31	.33	.35	.37	.40	.42	.44	.46	.49	.51
1.5	.15	.17	.19	.21	.23	.25	.27	.29	.32	.34	.36	.38	.41	.43	.45	.47	.50
2.0	.15	.16	.18	.20	.23	.25	.27	.29	.31	.33	.35	.37	.39	.41	.44	.46	.48
2.5	.14	.16	.18	.20	.22	.24	.26	.28	.30	.32	.34	.36	.39	.41	.43	.45	.47
3.0	.14	.16	.18	.20	.22	.24	.26	.28	.30	.32	.34	.36	.38	.40	.42	.44	.46
3.5	.14	.16	.18	.19	.21	.23	.25	.27	.29	.31	.33	.35	.37	.39	.41	.44	.46
4.0	.14	.15	.17	.19	.21	.23	.25	.27	.29	.31	.33	.35	.37	.39	.41	.43	.45
4.5	.14	.15	.17	.19	.21	.23	.25	.27	.29	.31	.33	.35	.37	.39	.41	.43	.45
5.0	.13	.15	.17	.19	.21	.23	.25	.26	.28	.30	.32	.34	.36	.38	.40	.42	.44
5.5	.13	.15	.17	.19	.21	.22	.24	.26	.28	.30	.32	.34	.36	.38	.40	.42	.44
6.0	.13	.15	.17	.19	.20	.22	.24	.26	.28	.30	.32	.34	.36	.38	.40	.41	.43

¹ Based on the formula $u_p = 0.034 u_m^{1.09} I^{-0.09}$ where
 u_p = Average daily peak period consumptive use in inches,
 u_m = Average consumptive use for the peak month in inches,
 I = Net irrigation application in inches.

Source: Technical Release 21, Soil Conservation Service, U. S. Department of Agriculture, April 1967.