Oregon State University
Western Oregon
Leafy Green Irrigation Guide

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Total Seasonal Evapotranspiration [in]	6.2 (mean)
Peak Evapotranspiration Rate [in/day]	0.16
Maximum Allowable Depletion [percent]	40
Critical Moisture Deficit Period	Head expansion

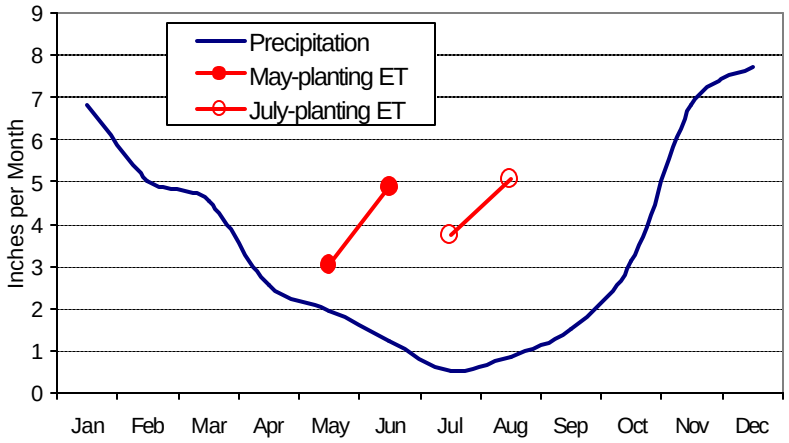

Figure 1: Typical precipitation and leafy green evapotranspiration (ET) in the Willamette Valley. Tabulated values of ET are provi ded on the back of this sheet.

Lettuces, spinach and other small-seeded, leafy green vegetables are sensitive to soil crusting. Since they must be planted shallow, maintaining uniform soil moisture at the soil surface during germination is important for establishing a good stand. These crops are shallow-rooted, and unless moisture supply is constant, they may be stunted and production may be reduced. Germination of a number of types of leaf lettuce is also inhibited by heat-induced dormancy if soil temperatures go above 90 degree F at planting. As these crops reach maturity, time irrigation to allow leaves to dry before nightfall to reduce problems with foliar diseases.

The peak water use for leafy greens is approximately 0.16 inches per day for both the early May and the early July planting dates.

On the back side of this page is a worksheet to aid in calculating irrigation schedules for leafy greens. These calculations are most straightforward for those using side-roll, hand-move, or solid set sprinkler irrigation. For those with linear move or center pivot systems, all information applies except for the set time, which must be gauged to the tower travel speed. For basic schedule information, sprinkler nozzle diameters, operating pressures, and spacing and soil type must be known. To more accurately describe individual systems, the uniformity coefficient of the system and available water capacity of your soil is also needed. This worksheet was designed to be progressed through sequentially starting with item *a*). Equations listed under item headings use item letters for reference. Although the rooting depth is already supplied in the worksheet, if you have reason to believe your site is an exception (e.g. shallow restrictive layer), this may be altered. Evapotranspiration rate estimates for both the early May and the early July plantings are listed in the worksheet. Use estimates from the closest planting date.

References

1. Sanders, D.C. 1993. Vegetable Crop Irrigation, Leaflet No: 33-E (North Carolina State University, Raleigh).

Note: For additional background information and references, see "Western Oregon Irrigation Guides: Background and References."

Irrigation Schedule Worksheet: Leafy Green

Use values for your specific soil and depth range from the Appendix, if available.

Otherwise use Table 1 below.

Table 1

Soil Texture	AWC [in/in]
Sandy	0.07 to 0.10
Sandy Loam	0.09 to 0.15
Loam	0.14 to 0.19
Clay Loam	0.17 to 0.22
Clay	0.20 to 0.25

A. Determine Irrigation Interval

Available Water Capacity [in/in]	***a.***	
Maximum Allowable Depletion [percent]	***b.***	40
Effective Rooting Depth [in]	***c.***	18
Peak ET [in/day]	***d.***	0.16
Maximum Irrigation Interval [days]	***e.***	
e = (a * b * c) / (d * 100)		
Your Irrigation Interval [days]	***f.***	

Note: f should be equal to or shorter than e.

Table 2

Irrigation System	Uniformity Coefficient (*)	
Solid set	70	63
Hand move or Side-roll	82	74
Pivot or Linear Move	90	81
Offset Managed Handm.	90	81

B. Determine Combined Efficiency

Uniformity Coefficient	***g.***	
Combined Efficiency	***h.***	
h = (0.01583 * g) - 0.6327		

C. Determine Depth of Irrigation

		Planting	May	June	July	August
Monthly Evapotranspiration Rate [in/day]	***i.***	*May 1*	0.10	0.16		
		July 1			0.12	0.16
Depth of Irrigation per Set [in]	***j.***					
j = (i * f) / h.						

D. Determine Set Time

Application Rate [in/hr]	***k.***				
Measure or see Tables 3 and 4 below to determine your application rate.					
		May	June	July	August
Irrigation Set Time [hrs]	***l.***				
l = j / k					

Table 3

Pressure [psi]	Discharge [gpm] Standard Tapered Nozzle Diameter [in] 3/32	1/8	9/64	5/32	11/64	3/16	13/64	7/32
35	1.5	2.7	3.40	4.16	5.02	5.97	7.08	8.26
40	1.6	2.9	3.63	4.45	5.37	6.41	7.60	8.87
45	1.7	3.2	3.84	4.72	5.70	6.81	8.07	9.41
50	1.8	3.1	4.04	4.98	6.01	7.18	8.49	9.88
55	1.9	3.3	4.22	5.22	6.30	7.51	8.87	10.30

Table 4

Sprinkler Spacing [ft] -by- [ft]	Application Rate [in/hr] Discharge per Nozzle [gpm] 2	3	4	5	6	8	10
20 20	0.48	0.72	0.96	1.20	1.44	1.93	2.41
20 40	0.24	0.36	0.48	0.60	0.72	0.96	1.20
30 30	0.21	0.32	0.43	0.54	0.64	0.86	1.07
30 40	0.16	0.24	0.32	0.40	0.48	0.64	0.80
30 50	0.13	0.19	0.26	0.32	0.39	0.51	0.64
40 40	0.12	0.18	0.24	0.30	0.36	0.48	0.60
40 50	0.10	0.14	0.19	0.24	0.29	0.39	0.48
40 60	0.08	0.12	0.16	0.20	0.24	0.32	0.40

(*) If your sprinkler spacing/discharge combination falls into gray-shaded area, use uniformity coefficient from the right, also gray-shaded column. Otherwise use values from the left column.

How to use these tables: