Oregon State University
Western Oregon
Squash Irrigation Guide

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Total Seasonal Evapotranspiration [in]	18.2 (mean)
Peak Evapotranspiration Rate [in/day]	0.19
Maximum Allowable Depletion [percent]	35 (summer squash) 60 (winter squash)
Critical Moisture Deficit Period	Fruit sizing

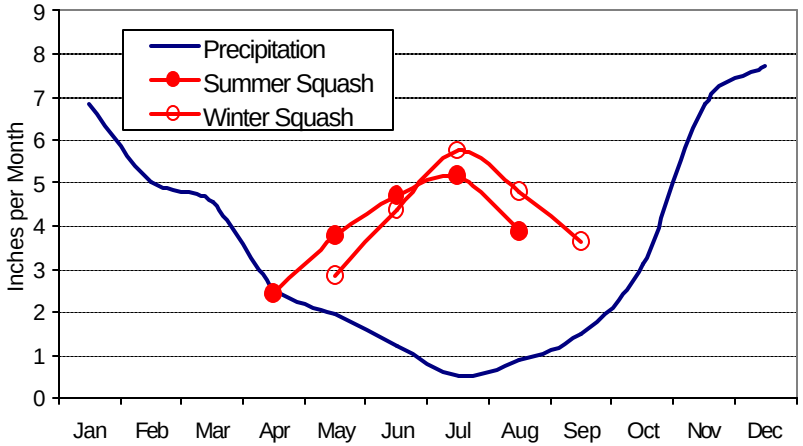

Figure 1: Typical precipitation and squash evapotranspiration (ET) in the Willamette Valley. Tabulated values of ET are provided on the back of this sheet.

Squash is sensitive to, and may be damaged by, excess moisture between seeding and emergence. Since summer squash root depth is relatively shallow, maintain soil moisture above 65% of the available soil water capacity in order to avoid detrimental moisture deficit. Winter squash requires uniform irrigation for optimum growth and yield. Reduce irrigation as fruit reaches the harvest stage. Irrigation requirements depend on the length of the harvest period, and need to be coordinated with picking crew schedules.

The peak water use for summer squash is approximately 0.17 inches per day and for winter squash 0.19 inches per day.

On the back side of this page is a worksheet to aid in calculating irrigation schedules for squash. 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 summer and winter squash are listed in the worksheet.

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: Squash

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

Otherwise use Table 1 below.

A. Determine Irrigation Interval

Available Water Capacity [in/in]	*a.*	
Maximum Allowable Depletion [percent]	*b.*	35[1] / 60[2]
Effective Rooting Depth [in]	*c.*	24[1] / 36[2]
Peak ET [in/day]	*d.*	0.19
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.

1:zucchini 2:winter squash

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

B. Determine Combined Efficiency

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

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

C. Determine Depth of Irrigation

		Planting	April	May	June	July	August	September
Monthly Evapotranspiration Rate [in/day]	*i.*	Apr.15 [1]	0.08	0.12	0.16	0.17	0.12	
		May 1 [2]		0.09	0.15	0.19	0.15	0.12
Depth of Irrigation per Set [in]	*j.*							
j = (i * f) / h.								

1:zucchini 2:winter squash

D. Determine Set Time

Application Rate [in/hr]	*k.*	

Measure or see Tables 3 and 4 below to determine your application rate.

		April	May	June	July	August	September
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

How to use these tables:

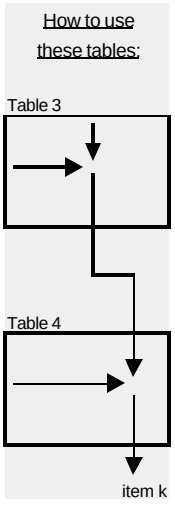

Table 4

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.