

WHEN AIR TEMPERATURES EXCEEDED 90°F... Growth and Flower Bud Formation of Three Rhododendron Cultivars Grown with and without Overhead Irrigation

Overhead irrigation is applied by some rhododendron growers when the air temperature exceeds 90°F to cool the leaves to prevent sunburn. Ideally, a high pressure fog application would do this, but standard irrigation nozzles are currently used for summer cooling. In an extended hot period, the large amounts of water applied for foliage cooling keep the soil saturated providing an ideal environment for root pathogens and development of root rot diseases. **IS OVERHEAD SPRINKLING NECESSARY TO PREVENT SUNBURNED FOLIAGE?** Will maintaining adequate soil moisture at all times without overhead sprinkling prevent sunburn?

To test the hypothesis, an experiment was initiated May 28, 1986. Three irrigation treatments were included: 1) Subirrigation on a sand bed with overhead leaching of excess fertilizer once a month; 2) Overhead irrigation applied before 8 a.m. and again after 5 p.m. with the amount of water varying with the temperature and wind; 3) Overhead irrigation before 8 a.m. and after 5 p.m. plus 15 minutes per hour when the temperature was above 90°F.

Two rhododendron cultivars particularly susceptible to sunburn, 'President Roosevelt' and 'Virginia Richards', and one less susceptible cultivar, 'Blue Ensign', were in the experiment. Sunburn usually shows in the center of the leaves and in the light colored areas on variegated leaves like those of 'President Roosevelt'. The plants were 1-yearold liners potted into 1 gallon mesh bottom pots with dibbled Osmocote 18-6-12 to supply 2 lbs nitrogen per cubic yard.

There were 21 days when the temperature was above 90°F at the 5.0 foot level at the NOAA observation location at the North Willamette Experiment Station. The first 90°F day was on May 30th, and the last was on September 7th. The highest temperature was 98°F. The average temperature during the May-September period was 93 F.

Air temperatures were also measured at the 6 inch height which corresponds closely to the height of the containers. At 6 inch height, there were 43 days above 90°F, a maximum high of 105°F and an average temperature during the period from May-September of 96°F.

There was no foliage injury caused by sunburn on any of the three cultivars in any of the three irrigation treatments even though temperatures were high during the experimental period.

Plant growth was affected by the irrigation treatments (Table 1). The largest plants with the most flower buds grew on the capillary bed. Plants growing with the low delivery nozzles plus summer cooling (irrigation treatment 3) were taller and wider than those on regular overhead irrigation treatment 2.

Conclusion: Maintaining adequate soil moisture at all times will prevent sunburned foliage. Irrigation to cool the leaves is not necessary to prevent sunburn and may cause leaching of fertilizers from the root zone.

Table 1: Average growth of rhododendrons with different irrigation systems

Application method	Height (cm)	Width (cm)	Vegetative Branches (#)	Flowerig Branches (#)	Plts w/flw buds (%)
'Blue Ensign'					
Capillary bed	32.1	25.6	7.0	3.6	90
Overhead	20.1	11.1	7.5	0.04	2
Overhead + HTC*	23.5	14.3	7.9	0.1	6
LSD 5%	2.2	1.6	N.S.	1.1	
LSD 1%	3.2	2.4	N.S.	1.5	
President Roosevelt'					
Capillary Bed	23.5	18.1	4.9	1.7	70
Overhead	20.2	14.2	5.6	0.2	12
Overhead + HTC	21.7	15.7	5.1	0.3	10
LSD 5%	2.6	2.4	N.S.	0.6	
LSD 1%	3.8	3.5	N.S.	0.8	
'Virginia Richards'					
Capillary Bed	23.7	20.9	5.3	0.44	28
Overhead	17.8	13.9	4.9	0.04	4
Overhead + HTC	20.1	15.9	4.8	0.20	12
LSD 5%	1.6	1.7	N.S.	0.24	
LSD 1%	2.3	2.5	N.S.	0.36	

*HTC = High Temperature Cooling

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