PUBLICATIONS

1987

Horticulture Research, 1987 – Overton

Research Center Technical Report 87-1

Texas A&M University Agriculture Research &
Extension Center at Overton

Texas Agricultural Experiment Station
Texas Agricultural Extension Service

Overton, Texas

1987

COMPARISON OF DRIP EMITTERS, LOW VOLUME SPRAY EMITTERS, AND MULCHING ON PLANT ESTABLISHMENT OF RABBITEYE BLUEBERRIES

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INTRODUCTION

One of the most critical aspects of blueberry growing is plant establishment, and in Texas irrigation is essential. The objective of this study was to determine the efficacy of four irrigation application methods, with and without mulching, on early plant growth and fruiting of two cultivars of rabbiteye blueberries.

MATERIALS AND METHODS

A planting was begun in 1983 using 1 gallon containerized plants. A 1/2 bushel of peat moss was incorporated into each planting hole. The treatments consisted of two cultivars - 'Tifblue' and 'Delite', and four irrigation methods - one 2 gph emitter, two 1 gph emitters, or a 40° (5.4 gph) or a 360° (9.3 gph) low volume spray (LVS) emitter per plant. In combination with the irrigation method, plants received either a sawdust mulch or a no mulch treatment. For each cultivar, there were three plants per replication and six replications per treatment.

Irrigation rates were based on soil moisture tension which was determined by using soil tensiometers. Plants were irrigated to maintain the soil moisture tension between 10 and 20 centibars. In order to compensate for the larger wetting area under the LVS emitters, plants with the spray emitters received a greater volume of water than those under drip irrigations. During July and August, the period having peak irrigation requirements, the drip emitter and the irrigation treatments were run 1 hour/day in 1984, and 1.5 hours/day in 1985 and 1986, while the 40 LVS and 360 LVS treatments ran 1.5 and 2 hours every other day in 1984 and 1985, respectively, and 1 hour/day in 1986. Plots without mulch required 15, 20 and 30 minutes extra irrigation every other day in 1984, 1985, and 1986, respectively, to maintain soil moisture tension under 20 centibars.

RESULTS AND DISCUSSION

For all years and both cultivars plant size, as measured by total canopy volume, was greater with the 360 LVS treatment than the 40 LVS or either drip emitter treatment (Table 1). For 'Tifblue' in all 3 years mulch increased growth of drip irrigated plants compared to no mulch, especially the 2 emitter per plant treatment. Mulch did not affect the growth of 'Delite' or 'Tifblue' plants irrigated with LVS emitters. 'Tifblue' plants were consistently larger than 'Delite' plants. Overall best plant performance occurred with the 360 LVS treatment. This was likely due to a greater volume of soil being wetted than with the other treatments. The better performance of the one - 2 gph emitter treatment compared to the two - 1 gph emitters per plant treatment was probably due to the placement of the 2 emitters too far apart at the start of the experiment. At this spacing, there was not enough water moving towards the initial root mass; with mulch this effect was lessened. In addition, with 2 emitters per plant, harmful salts from the irrigation water tend to accumulate at the base of the plant rather than away from the plant.

Mulch improved yield across most irrigation treatments, even though it mainly increased plant size only within the two - 1 gph emitter per plant treatment. The benefits of mulch is likely due to modification of soil moisture, distribution of salt in the soil and/or soil temperature.

The better performance of 'Tifblue' compared to 'Delite' can be explained on the basis of greater vigor and that 'Delite' had slightly more frost damage than 'Tifblue' in 1986.

CONCLUSIONS

From a practical perspective, improved long term plant performance may be achieved by using sawdust mulch and by irrigating with LVS emitters. However, both of these practices will cost more in the short term.

In situations where mild drought stress occurs, such as a lack of lateral movement of water from the emitter to the plant root-ball, or where poor quality water is used for irrigation, mulch appears to be especially beneficial.

Table 1. Effect of Irrigation Method and Mulching on Plant Volume of 'Tifblue' and 'Delite' Bluberries in 1986

	Plant Volume (meter^3)				
	1 - 2 gph	2 - 1 gph	40°	360°	Average
	'Tifblue'				
Mulch	.32	.33	.41	.32	.35
No Mulch	.22	.14	.44	.31	.27
Average	.27	.23	.43	.32	.31
	'Delite'				
Mulch	.16	.21	.33	.17	.22
No Mulch	.18	.17	.27	.19	.20
Average	.17	.19	.30	.18	.21

Table 2. Effect of Irrigation Method and Mulching on Yield of 'Tifblue' and 'Delite' Blueberries in 1986

	Yield/Plant (lbs)				
	1 - 2 gph	2 - 1 gph	40°	360°	Average
	'Tifblue'				
Mulch	4.9	4.4	5.5	5.9	5.2
No Mulch	4.2	2.2	4.6	5.5	4.1
Average	4.6	3.3	5.1	5.7	4.7
	'Delite'				
Mulch	3.1	3.2	3.2	4.9	3.6
No Mulch	2.7	2.7	3.0	3.3	3.0
Average	2.9	3.0	3.1	4.1	3.3