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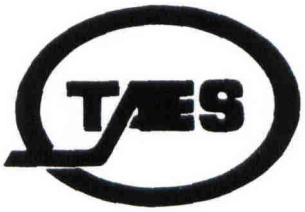

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THE TEXAS AGRICULTURAL EXPERIMENT STATION / Neville P. Clarke, Director / The Texas A&M University System / College Station, Texas

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. This is because rabbiteye blueberries lack root hairs and tend to have shallow fibrous roots which makes them very sensitive to drought stress. Previous research at Overton has shown that plant establishment without irrigation will result in failure. A study was initiated in 1983 to compare four irrigation application methods with and without mulching on early plant growth, and fruiting of three 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. There were three cultivars, ('Tifblue', 'Delite', and 'Climax') and four irrigation methods (one 2 gph emitter, two 1 gph emitter, or a 40° (5.4 gph) or a 360° (9.3 gph) low volume spray emitter per plant). In combination with the irrigation method, plants received either a mulch (composted sawdust) 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 by using soil tensiometers. Plants were irrigated when the soil moisture tension got above 20 centibars. In order to compensate for the larger wetting area under the low volume spray emitters, plants with the spray emitters received a greater volume of water than those under drip irrigation. During July and August peak irrigation, needs required the drip emitter and the 40° spray emitter treatments to run 2 hours every other day, while the 360° spray emitter treatment ran 4 hours every other day. Plots without mulch required about one-half hour extra irrigation every other day to maintain soil moisture tension under twenty centibars.

RESULTS AND DISCUSSION

The method of irrigation application had a significant effect on plant growth after two years in the field (Table 1). 'Tifblue', 'Delite' and 'Climax' all responded to the irrigation treatments similarly. Mulch plants were more vigorous and larger than non-mulched plants. There was no overall difference between a 2 gph and two 1 gph emitter except under conditions of no mulch, where plants with 2 emitters did not grow as well as those with 1 emitter. Plants with the spray emitters were larger than those the drip emitters, with the 360° spray emitter treatment resulting in the best plant size of all the irrigation treatments.

A rating of potential productivity of 'Tifblue' for the third growing season (number of flower buds per plant) resulted in similar findings (Table 2). The greatest potential yield occurred with the spray emitter compared with the drip emitters. The one 2 gph emitter was better than the two 1 gph emitter per plant. There was no overall beneficial effect of the mulch, except with two 1 gph emitter treatments.

The better performance of the one 2 gph emitter compared to the two 1 gph emitter per plant treatment was due to the placement of the two 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.

Because maintenance of the soil moisture tension between ten and twenty centibars required a greater volume of water to be applied with the spray compared to the drip emitters, it is difficult to directly compare these treatments. However, the 360° spray emitter resulted in the best overall plant performance. This performance is likely due to a greater volume of the soil being wetted.

The mulching treatment was also beneficial to plant performance. The greatest benefit of mulching occurred with drip emitters. With spray emitters, the mulching effect was not very noticeable. With mulching, less irrigation was required to maintain soil moisture tension under twenty centibars. However, mulching is really only feasible with smaller plantings of blueberries.

SUMMARY

An experiment on the method of application of irrigation water was conducted. After two years of growth, blueberry plants irrigated with spray emitters were larger and had more production potential than those irrigated with drip emitters. A 360° spray emitter was better than a 40° spray emitter and one 2 gph drip emitter was better than two 1 gph drip emitters per plant. Mulch was beneficial to plant growth, especially with the drip emitters, and reduced plant irrigation requirements.

Table 1. Blueberry Plant Vigor

Irrigation Treatment	Tifblue		Delite		Climax		Mean of all Cultivars
	Mulch	No Mulch	Mulch	No Mulch	Mulch	No Mulch	
one 2 gph emitter	4.1	3.2	3.7	3.5	3.8	3.1	3.5
two 1 gph emitters	4.3	2.7	3.8	3.1	3.9	2.8	3.4
one 40° spray emitter	4.2	4.1	3.7	3.7	3.4	3.8	3.8
one 360° spray emitter	4.8	4.5	4.6	4.4	4.6	4.2	4.5
Mean	4.3	3.6	3.9	3.6	4.0	3.5	

*Vigor Rating
1 = very small plant : height less than 1 foot
5 = very large plant : height greater than 5 feet

Table 2. Number of flower buds per plant*

Irrigation Treatment	'Tifblue'		Mean
	Mulch	No Mulch	
one 2 gph emitter	3.6	3.6	3.6
two 1 gph emitter	3.6	2.5	3.0
one 40° spray emitter	4.2	4.2	4.2
one 360° spray emitter	4.2	4.3	4.2
Mean	3.8	3.6	

*Visual rating
1 = No flower buds per plant
5 = Greater than 500 flower buds per plant