Effect of Several Herbicides on Initial Growth of Highbush Blueberry

Thomas J. Monaco
North Carolina State University, Raleigh

Abstract. Dormant rooted cuttings of 6 cultivars of highbush blueberry (Vaccinium corymbosum L.) were treated one week after field planting with 6 preemergence herbicides. In all cultivars 2-chloro-4,6-bis(ethylamino)-s-triazine (simazine) significantly increased shoot growth and 2-(2,6-dichlorophenyl)-1,3-thiazinon-4 (TH4052) increased root growth.

All other herbicides examined did not affect crop growth.

This study was initiated to determine the safety of several herbicides on young highbush cultivars.

Dormant hardwood rooted cuttings of 'Angola', 'Bluecrop', 'Blueray', 'Croatan', 'Murphy' and 'Wolcott' blueberry were planted April 2, 1971 on a Rutledge loamy sand (Typic Humaquert, sandy, siliceous, thermic) "blueberry" soil having a pH of 4.4 and containing 8.4% organic matter. Individual plot size was 3 x 2 m, 1 plant of each cultivar was planted on 45 cm spacing in each plot. The test was laid out in a split plot design. The main plots were replicated 3 x in a randomized complete block with the cultivars randomized within each block.

One week after planting the bushes were pruned to 1 stem and herbicides were applied overttop, preemergence to the weeds. Herbicides and rates applied are included in Table 1. Herbicides with the exception of dichlobenil were applied with a CO2 pressurized knapsack sprayer calibrated to deliver 170 liters/ha. Dichlobenil was applied with a small centrifugal granular slightly slower than the berries in the other quart baskets. This difference presumably reflects the small size of the basket's ventilation slits (Fig. 1, darts). These openings were 1.1% of the surface area of the quart basket. In contrast, the open areas of the pulp and wooden quart baskets were 3.9 and 9.1%, respectively. The open area of the polystyrene, pulp, foam, and plastic pint baskets was 1.6, 6.1, 10.1 and 54.9%, respectively.

The marked superiority of forced-air precooling over room precooling (1, 3, 4) was confirmed (Figs. 2, 3). Berries cooled from about 19°C (67°F) to about 3°C (38°F) in 2 hr under forced-air cooling, but cooling to about 4°C (40°F) took 6 hours or more with room precooling. The cooling rates of this study are similar to those obtained under commercial conditions (1).

The excellent visibility afforded by the clear polystyrene baskets (Fig. 1) merits special note. Visibility of the product in containers will be increasingly important as "truth in packaging-labeling" laws become more widespread and strict. The relatively small storage space needed for empty baskets is an ancillary asset of the clear polystyrene containers. Stacks of 100 empty polystyrene, plastic mesh, or paper-pulp pint baskets measure 38, 81, and 137 cm, respectively.

Literature Cited

1Received for publication January 27, 1973. Paper No. 3946 of the Journal Series of the North Carolina State University Agricultural Experiment Station.
2Associate Professor of Horticultural Science.
Plots were maintained weed free through the growing season to eliminate weed competition. Plants were harvested on Sept. 8, 1971. Prior to weighing, current season’s shoot growth was oven dried and root systems were washed as thoroughly as possible and allowed to air dry.

A summary of growth data over all cultivars revealed that the herbicides and rates used were safe on highbush blueberry liners under the conditions of the study (Table 1). The cultivar x herbicide interaction was not significant.

TH 4052 significantly increased root growth (Table 1). TH 4052 is reported to be converted to dichlobenil in the soil at a fairly slow rate. Simazine significantly increased top growth but the increase in root growth was not significant. A number of studies have reported increased crop growth from simazine treatment (1, 2, 3). The stimulatory effect of simazine on growth is believed to be related to its effect on N metabolism. Ries et al. (4) reported that subtoxic levels of simazine accelerated rate of protein accumulation in rye and pea and caused an increase in nitrate reductase activity. Simazine stimulation of crop growth could be of practical value in blueberry as this herbicide in recommended for weed control.

**Table 1. Evaluation of herbicides on newly set highbush blueberry bushes.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical name</th>
<th>Rate (kg/ha)</th>
<th>Shoot</th>
<th>Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>dichlobenil 2,6-dichlorobenzonitrile</td>
<td>4.5</td>
<td>5.2</td>
<td>12.9</td>
</tr>
<tr>
<td>alachlor</td>
<td>2-chloro-2', 6'-diethyl-N- (methoxy methyl) acetanilide</td>
<td>6.7</td>
<td>6.1</td>
<td>12.6</td>
</tr>
<tr>
<td>terbacil</td>
<td>3-tert-butyl-5-chloro-6-methylanilic</td>
<td>0.6</td>
<td>8.6</td>
<td>16.6</td>
</tr>
<tr>
<td>simazine</td>
<td>2-chloro-4, 6-bis(ethylyamino)-s-triazine</td>
<td>1.12</td>
<td>6.5</td>
<td>11.3</td>
</tr>
<tr>
<td>flumeturon</td>
<td>1,1-dimethyl-3-(A, A, A-trifluoro-m-toly)urea</td>
<td>4.5</td>
<td>12.9</td>
<td>19.4</td>
</tr>
<tr>
<td>TH 4052</td>
<td>2-(2,6-dichlorophenyl)-1, 3-thiazin 4</td>
<td>6.7</td>
<td>8.7</td>
<td>24.2</td>
</tr>
<tr>
<td>LSD 5%</td>
<td></td>
<td></td>
<td>2.9</td>
<td>7.4</td>
</tr>
<tr>
<td>LSD 1%</td>
<td></td>
<td></td>
<td>3.9</td>
<td>9.8</td>
</tr>
</tbody>
</table>

3. Personal communication with James Taylor, Thompson Hayward Co.


### The Relationship of Detachment Characteristics of Highbush Blueberry Fruit to Mechanical Vibration Harvesting

Charles M. Mainland and Gene J. Galletta
North Carolina State University, Raleigh

**Abstract.** Fourteen highbush blueberry cultivars and selections differed greatly in percentage blue and green fruit removed during a 3 second vibration of individual fruiting shoots with a hand-held vibrator. With cultivars 'Croatan', 'Woodlot', 'Morrow', 'Murphy', and 'Collins' more than 90% of the blue fruit and less than 15% green fruit were removed. These cultivars have desirable detachment characteristics and required a force of less than 85 g to remove individual blue fruit.

Highbush blueberries were harvested by hand until a vibrating technique for

---

1. Received for publication March 23, 1973. Paper No. 4009 of the Journal Series of the North Carolina Agricultural Experiment Station.

2. Associate Professor of Horticultural Science, Horticultural Crops Research Station, Castle Hayne, N. C. 28429, and Professor of Horticultural Science, Horticultural Science Department, Raleigh, N. C. 27607, respectively.


