7: Strategies to reduce supra-optimal temperatures during field and containerized production of highbush blueberry in warm climates

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The roots of highbush blueberry are sensitive to high temperatures and tend to grow poorly in warm soils or warm soilless media. Three experiments were conducted to evaluate strategies for reducing temperatures in the root zone in Évora, Portugal, where soil can reach temperatures > 45 °C. The first experiment was conducted in a small planting of ‘Ozarkblue’ blueberry. Treatments included bare soil, a 10-cm-deep layer of aged pine bark mulch, and black, green, and white geotextile landscape fabric. Bark mulch and green landscape fabric resulted in the lowest mid-day soil temperatures among the treatments, which improved canopy development and survival of the plants during establishment. White geotextile fabric also reduced soil temperature but resulted in a considerable amount of weed growth under the fabric. The second experiment was likewise conducted on ‘Ozarkblue’, but, in this case, the plants were grown in 40-L pots filled with a soilless mix of three parts peat, two parts pine bark, and one part humus, by volume. Treatments included black pots and black pots covered with white geotextile landscape fabric. After a year, canopy volume of the plants was greater in black pots than in white pots; however, yield was not affected by pot color. The third experiment was conducted in a 2-year-old planting of ‘Legacy’ blueberry. Treatments included no shade and 60% green shade netting. The netting had no effect on soil temperature in the root zone as a result of the fact that 1) the canopy of plants intercepted the majority of the radiation at midday and 2) frequent irrigation mitigated changes in soil temperature. On the basis of these results, bark mulch and green landscape fabric appear to be the best options for reducing temperatures in the root zone of blueberry in warm climates.

Keywords: Vaccinium corymbosum, maximal soil temperature, weed mat, shade net, container color.

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