

Blueberry fruit quality and control of blueberry maggot (*Rhagoletis mendax* Curran) larvae after fumigation with sulfur dioxide

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Abstract

Postharvest fumigation of fruits and vegetables is an important tool for managing pests and diseases that can cause devastating loss if not properly controlled. Sulfur dioxide (SO₂) may have promise as replacement for methyl bromide, which is expected to be phased out. However, SO₂ is known to cause injury to small fruit such as table grapes (*Vitis vinifera* L.). We extend previous research on SO₂ fumigation by focusing on an economically important fruit pest genus and through quantitative and qualitative measurements of highbush blueberry (*Vaccinium corymbosum* L.) fruit bleaching. This study assesses fruit damage due to SO₂ fumigation at concentrations ranging 0–2.2% (v/v) as well as the effectiveness of SO₂ as a fumigant prior to cold storage for control of blueberry maggot, *Rhagoletis mendax* Curran. We show that fruit quality traits such as firmness, total soluble solid content, and titratable acidity are largely unaffected except at the highest SO₂ concentration (2.2%). SO₂ caused bleaching and discoloration of blueberry fruit in a dose-dependent manner. Damage was also cultivar-dependent, with cv ‘Bluecrop’, and ‘Jersey’ more susceptible than ‘Draper’, ‘Elliott’, and ‘Liberty’. We show that *R. mendax* can be effectively controlled using a short-term (2 h), high concentration (22,000 μL L⁻¹) SO₂ fumigation followed by >14 d of cold storage at 0.5 °C. However, this treatment for control of *R. mendax* would likely result in damage, affecting fruit marketability.