

Clove oil tested for weed control in organic Vidalia sweet onion

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Weed control is one of the most challenging aspects of organic crop production. Most growers of certified organic crops rely heavily on proven cultural and mechanical weed control methods while limiting the use of approved herbicides. A new study of herbicides derived from clove oil tested the natural products' effectiveness in controlling weeds in Vidalia® sweet onion crops.

"Cultivation with a tine weeder and hand weeding are the primary tools currently used for [weed control](#) in organic sweet onion (*Allium ceps*)," explained scientist W. Carroll Johnson, III. "However, conditions frequently arise that delay the initial cultivation; weeds that emerge during the delay are not effectively controlled by cultivation." Johnson tested herbicides derived from natural products as a way to control these emerged weeds in organic Vidalia sweet onion production. Johnson said that, although these types of herbicide have been studied previously, the majority of the studies were performed on warm-season crops and weeds. Vidalia® sweet onion is a dry bulb onion grown in Georgia as a cool-season (winter) crop.

To test the efficacy of the clove oil-derived herbicide, the researcher conducted irrigated field trials at the Vidalia Onion and Vegetable Research Center near Lyons, Georgia. One treatment factor was sprayer output volume, with the sprayer calibrated at 25 and 50 gallons/acre. Herbicide treatments were applied with a carbon dioxide-pressurized tractor-mounted plot sprayer using spray tips of differing sizes.

The other treatment factor in the trials was adjuvants used with clove oil. An OMRI-listed clove oil herbicide was evaluated and applied at 10% by volume spray solution. The adjuvants for clove oil evaluated were a petroleum oil adjuvant at 1.25% by volume, a commercial product containing 20% citric acid at a rate of 0.375% by volume, a commercial adjuvant containing 20% saponins extracted from *Yucca schidigera* at 0.03% by volume, an emulsified petroleum insecticide at a rate of 1% by volume, clove oil alone (no adjuvant), and a nontreated control.

"The field experiments showed that weed control was not consistently improved by applying clove oil (10% by volume) with a sprayer calibrated at 50 gallons/acre compared with sprayer calibrated at 25 gallons/acre," Johnson said, adding that occasional improvements in weed control did not affect onion yield, and that adjuvants provided minimal improvement in weed control from clove oil and did not consistently improve onion yield. "All clove oil herbicide treatments, regardless of adjuvant, had difficulty in maintaining an emulsion in the spray tank and needed near-constant agitation. This tendency proved to be very problematic and suggests another disadvantage to using clove oil for weed control in certified organic crop production," Johnson noted.

"Given the lack of weed response and onion yields to clove oil applied in higher sprayer output volumes and the corresponding increase in clove oil cost when increasing sprayer output volume, we cannot recommend clove oil in organic Vidalia® sweet onion production systems," Johnson said. The full report of the experiments was published in *HortTechnology*.

More information: [horttech.ashspublications.org/ ...nt/24/4/428.abstract](https://horttech.ashspublications.org/...nt/24/4/428.abstract)

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