

Side-by-Side Field Comparison of Fumigant Emission-Reduction Methodology

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Abstract

Ozone, a principal component of smog, can lead to reduced lung function, respiratory inflammation in humans and, thus, creates a significant health hazard. Ozone is formed from the photochemical oxidation of nitrogen oxides and VOCs, such as fumigant chemicals. Research is needed to accurately determine the true level of VOC emissions from fumigation and to develop methods to reduce emissions to low levels. Failure to do this may cause agricultural producers to face potentially restrictive control strategies, which may cause a reduction in profit or force farmers to cease food production.

The proposed research project will measure the cumulative and period-averaged (e.g., hourly) emission rates for standard broadcast-shank fumigation and compare the emission measurements to a reduced –emission strategy. The test chemical will be Tolene II (1,3-dichloropropene, 1, 3-D).

A variety of useful information will be obtained from this project and includes: 1,3-D concentration in the air surrounding treated fields during the experiment, measurements of the emission rate vs. time, emission ratios, micrometeorological measurements, and a variety of measurements of the soil physical and environmental conditions.

The duration of this research project is 3 – 4 weeks and will provide information that can be used to determine if proposed low-cost methods to control VOC emissions are adequate to achieve required reductions. This information may also be useful as a starting point in the development of new cost effective methods to further reduce emissions.