

Developing a Simple, Low-Cost Approach for Evaluating Emission Reduction Methods

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Summary:

Soil fumigants have been used extensively to control plant pests in strawberry production. Atmospheric emissions are a major problem associated with fumigant use and many management practices have been developed to reduce emissions. Fumigant emissions increase the risk of stratospheric ozone depletion, bystander exposure, and may also contribute to the formation of near-surface tropospheric ozone. This has become a serious concern with the implementation of a new federal 8-hour ozone standard. These adverse impacts from fumigating soil can be ameliorated by reducing atmospheric emissions. Many methods have been developed to reduce emissions, but to date, no simple and cost-effective methodology is available to provide guidance to the regulatory community. This leads to the untenable situation where large-scale, time-consuming, costly, and complex experiments are required to provide a performance measure for each new emission-reduction methodology. Further, the experiments are conducted at a specific site and time, and are heavily influenced by the prevailing cultural practices and soil and environmental conditions. This makes it difficult to use the experimental information for other locations and situations. Given the large number of emission-reduction methods and other factors affecting fumigant emission from soil, vast investments of time and capital will be needed to study every possible combination unless new, and more efficient, methods are developed.

The goal of this presentation is to provide an update on a systematic investigation of several low-cost approaches to measure the reduction of emissions from soil fumigation that could be used to provide guidance for regulation. This involves the use of simulation modeling and laboratory studies, which are then compared to the results from large-scale experiments, such as one recently conducted near Bakersfield, CA. A comparison will be made between low-cost approaches and the currently accepted large-scale field studies. It is expected that through these types of comparison studies new approaches will be found that can be used to provide the regulatory community with needed information, more rapidly and at a far less cost.