CHLOROPICRIN AND 1,3-DICHLOROPROPENE FIELD FLUX STUDIES

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Methyl bromide alternative fumigants, such as chloropicrin (Pic) and 1,3-dichloropropene (1,3-D) have been affected by environmental regulations due to potential exposure risks and their contribution to the deterioration of air quality through VOC emissions. Buffer zones, township caps, and the requirement for low emission application methods are the measures taken to control emissions. Both federal and the state regulatory agencies continue to develop more stringent regulations on fumigants use. To increase the likelihood of fumigant availability for agricultural use, reducing emissions continues to be a critical factor. Management strategies that minimize emissions and improve pest control efficacy at the same time offer the best hope for maintaining the availability of fumigants to commodities in the prospective short and intermediate term future.

For the past five years, the main objective of our research has been to conduct field flux studies with chloropicrin and 1,3-D using a variety of application methods (broadcast, bed, and strip; shallow and deep injection) to develop management practices that reduce volatilization losses. All of these studies were conducted following the new fumigant application guidelines, called Good Application Practices (GAPs). The GAPs are specific guidelines that comprehensively address many application-related factors including proper soil conditions (tilth, temperature, soil moisture, etc.), observance of weather patterns, application methods and soil sealing techniques.

Over 30 field flux studies have been conducted in California, Florida, and Georgia. Figures 1 and 2 show that all of the new studies had a much lower fumigant flux rates than previous studies, including drip applications, which has a buffer zone distance of 100 feet or less. The use of totally impermeable film (TIF) resulted in the lowest flux rates. However, tarp cutting time for TIF has not been determined for most fumigants. Very recently, four field flux studies were conducted in CA to determine tarp duration of TIF to minimize total 1,3-D atmospheric emissions. Results from these studies will be presented.

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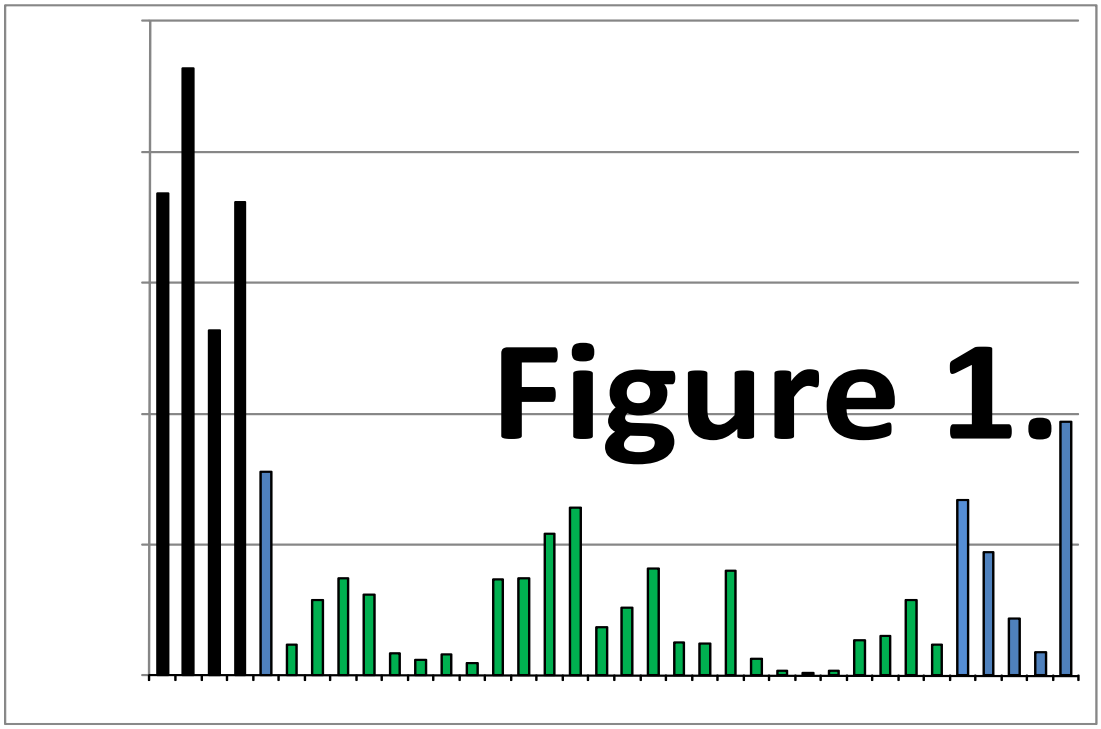

Figure 2. Chloropicrin Peak Flux Rates for Tarped Shallow Broadcast Applications (rates are normalized to 175 lbs/ac)