RESULTS OF THE USDA STUDY: COMMERCIALIZATION OF ENHANCED WATER SEALING METHODS

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This paper presents the results of USDA sponsored research (conducted in July 2005) aimed at commercializing the enhanced water sealing method, which has been referred to as intermittent water sealing. Past research has shown that the application of multiple one hour seals (two on the night of application and two on the following evening) is effective in reducing off-gassing (Shad, N., Ajwa, H., Sullivan, D.; 2002, 2003, 2004; Merricks, L; 2001, 2002). Modeling analysis based on these findings also shows substantial reductions in expected buffer zones if intermittent water sealing is used. The purpose of this research was to adapt these methods to: (1) better meet the needs of commercial agriculture to maintain larger application blocks per day on an environmentally sound basis, and (2) to reduce the number of separate seals, as feasible, while maintaining effective control. Two steps were tested in Phase I--based on using Metam-Sodium as the example fumigant. First, the number of water seals was reduced from the intermittent sealing approach (standard 2 hour water seal after application plus four additional and separate seals), down to just one additional seal, i.e. a two-hour water seal starting before sunset on the day of application only. Secondly, the concept of using every other line and then switching the lines to provide overlap was tested to demonstrate that larger areas could be managed in terms of off-gassing suppression, if needed, thereby supporting the scaling of results up to 40 acre sets.

The field study reported in this paper included two 1.6-acre plots applied with metam-sodium by shank injection on a nearly concurrent basis, one by intermittent water sealing with five separate seals, and the other by using just two seal and every other line sealing. The monitoring was comprehensive, including the operation of a 24 station air quality monitoring network to compare off-gassing rates, in-field soils analysis of liquid-phase MITC concentrations and assessment of soil moisture and temperature throughout the trials, and comparison of efficacy between the two methods. The results of these analyses will be available for presentation at the MBAO conference, with the exception of the comparison of yield and quality, which will be completed in December 2005 and added to the project report as a supplement.