DEVELOPING NON-FUMIGANT BASED STRAWBERRY PRODUCTION SYSTEM FOR CALIFORNIA.

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The California Strawberry Commission (CSC) has been actively involved in the development of methyl bromide alternatives since the 1990s. This work originally focused on alternative fumigants and application methods. Unfortunately, the development of new fumigants for strawberry production has been challenging from both a technical and regulatory perspective. In the 2000s, it became apparent that the most promising alternatives were ones that were already registered. These included chloropicrin, telone and the MITC products. The development formulations of these fumigants that allowed them to be applied through the drip irrigation system enabled strawberry growers in California to reduce their use of methyl bromide.

In 2004, emerging Federal and California fumigant regulations made it apparent that it would also be difficult to use alternative fumigants in the future, unless methods were developed to reduce their emissions. In 2005, the CSC launched a research initiative focused on reducing fumigant emissions through the use of high barrier films (VIF and TIF), and the use of water or potassium thiosulfate applications to "seal" the surface of alley-ways during drip applications. The most expensive aspect of this work was the requirement by regulators for air monitoring data to prove the effectiveness of the emission reduction methods. Fortunately, this research demonstrated that high barrier films and water/thiosulfate seals dramatically reduce fumigant emissions, and these results are being incorporated into new fumigant labels as a means of reducing the size of buffer zones.

In California, and the rest of the United States, it is highly likely that additional restrictions on the use of fumigants will continue to be developed by regulators. In California, new label restrictions are being developed for chloropicrin, and every time there is an accident where workers or neighbors are exposed to fumigants from a preplant soil fumigation, local permit conditions become more restrictive. When Midas was registered in California in 2011, the label had buffer zones that would prevent its use on 1/3 of the current strawberry acreage. Buffer zones for the other fumigants are also increasing in size, resulting in significant acreage not being able to be treated with fumigants. Even in areas where growers are allowed to use fumigants, there has been an increase in soilborne disease problems. Drip application of fumigants has not been as effective as broadcast treatments in controlling soilborne disease.

In response to the continuing challenges California strawberry growers are facing with using fumigants, the CSC launched its Farming without Fumigants initiative in 2008. This research initiative is focused on the development of an annual strawberry production system not dependent upon the use of highly regulated fumigants. This initiative has two main program areas: 1) Developing a production system based on substrate or substrate/soil mixtures, and 2) managing soilborne strawberry diseases in non-fumigated ground.

The results of this research have produced some promising results in both program areas. The substrate based approach has lead to the development of a raised-bed trough (RaBeT) production system that is currently as productive as our current fumigant-based production system, but not economically competitive due primarily to the high cost and limited availability of the substrates (peat and coconut coir). The soilborne disease management program has shown promising results with anaerobic soil disinfestations, and the research team is looking at combining different strategies to improve the efficacy of the method.