# COOPERATIVE DEVELOPMENT OF A POST HARVEST FUMIGANT – AN EXAMPLE

[1]J. Michael Hurley*, [2]Ed Hosoda, [3]Steve Lindsay, and [4]Brian Schneider

[1]DFA of California, 1855 S. Van Ness Avenue, Fresno, CA 93721
[2]Cardinal Professional Products, 1233 East Beamer St., Suite G1, Woodland, CA 95779
[3]Diamond Walnut Growers, Inc., 1050 South Diamond Street, Stockton, CA 95201
[4]Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46033

Few chemical pesticides have been developed as methyl bromide alternatives. The reasons are apparent to those groups and individuals working to develop these new or expanded-use pest control products. Simply stated, the costs are high and the challenges are significant to bring a post harvest pesticide, especially a fumigant, to the market. A major reason the costs are high and the success rate is low is the challenge of ever-increasing regulatory hurdles. Successful registrants will be those which team with interested groups and organizations to plan carefully and capitalize on each group's technical and practical expertise during the development process.

Within this scenario, Dow AgroSciences initiated development of sulfuryl fluoride for post harvest uses several years ago, after decades of successful use in structural fumigation controlling primarily drywood termites and wood infesting beetles. About the same time, DFA of California (DFA) and Diamond Walnut Growers, Inc. began to search in earnest for alternatives to methyl bromide for dried fruit and tree nut post harvest fumigation. With the help of Cardinal Professional Products, coordinating initial discussions among these parties, a cooperative development program was initiated.

Cooperation and teamwork is key to the regulatory success of any pesticide product, but especially for a fumigant being developed to meet the timeline for methyl bromide phaseout. Pesticide product development first involves gaining a detailed understanding of customer expectations and product use patterns in order to develop a product concept. This is not an easy task for methyl bromide alternatives considering methyl bromide's broad labeling and the unpredictable regulatory environment that any alternative product will face. Nevertheless, with product concept in hand, the next phase involves conducting appropriate residue, toxicology, quality effects, efficacy, and application research. All these trials are needed to prepare a label and data package for review by federal /state regulatory authorities. For sulfuryl fluoride, DFA, Diamond Walnut, Cardinal Professional Products, and the fumigators knew the market and use patterns while Dow AgroSciences was experienced in the overall process of preparing a regulatory submission and working with the regulatory agencies.

A practical challenge facing any group developing a fumigant in recent years has been the limited number of facilities and researchers available to conduct controlled fumigations for residue analysis and defining dosages. Fumigation facilities and

expertise are rare because until recently their was limited demand since most registered fumigants were developed decades ago. The DFA lab in Fresno is however, one of the few labs in the United States with both fumigation facilities and research expertise. They were able to expand their capabilities to meet the research demands of developing sulfuryl fluoride while maintaining their ongoing analytical support for the dried fruit and tree nut growers and processors. The USDA-ARS lab in Fresno also conducts quality fumigation research, and has helped to answer sulfuryl fluoride efficacy questions as well as investigate other fumigants being considered as methyl bromide alternatives.

Generally, an Experimental Use Permit (EUP) will be necessary to conduct the full range of field trials sufficient to demonstrate product viability and support a registration. A substantial number of safety questions and issues must be satisfactorily addressed prior to the EPA granting an EUP, followed by even more data requirements for full registration. The most efficient way to fulfill these requirements is to get agreement between the registrant and the federal/state regulatory agencies on what the questions are, and how they should be answered, prior to initiating expensive research. The dried fruit and tree nut industry, and DFA especially, was instrumental in expediting this regulatory step for sulfuryl fluoride by helping to educate regulatory officials in a series of meetings in both Washington D.C. and California.

Cooperation among users, support groups, government agencies, and development companies is key to successfully developing, registering, and making available practical and viable insect pest control tools as methyl bromide is phased out. The sulfuryl fluoride development program for post harvest pest control of dried fruits and tree nuts is an example of effective cooperation in developing a much needed post harvest fumigant.