UPDATE ON THE DEVELOPMENT OF SULFURYL FLUORIDE AS AN ALTERNATIVE TO METHYL BROMIDE

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In response to industry requests, Dow AgroSciences is developing ProFume* gas fumigant (sulfuryl fluoride) as an alternative to methyl bromide for the control of stored product insect pests in food storage, processing, milling and warehousing. Sulfuryl fluoride has been sold in the United States for 39 years as Vikane* gas fumigant primarily for the control of drywood termites. Vikane* gas fumigant is also sold in Europe for the control of wood infesting insect pests in churches, museums and other structures of historical significance. Sulfuryl fluoride has proven to be an ideal fumigant for structural fumigation due to its low boiling point, excellent penetration qualities, low reactivity potential and rapid aeration.

Dow AgroSciences has been cooperating with government and university researchers, industry consultants, fumigators and members of the food industry both in the United States and Europe to develop ProFume* as an alternative to methyl bromide for food uses.

Biology research is underway both in the laboratory and in the field to define dosages and treatment practices to optimize the control of key stored product insect pests. Laboratory efficacy studies conducted in cooperation with the USDA-ARS in Fresno, CA, Central Science Laboratory in the UK and the Federal Biological Research Center for Agriculture and Forestry in Germany, continue to help define the dosages required to control all the life stages of these target pests.

Fumigations of wheat and rice mills have been conducted in multiple locations within the United States, Germany and the UK. These field trials have been designed to further refine fumigant dosages and to gain a better understanding of the inter-relationship between target fumigant dosages and real-world environmental and structural conditions to optimize fumigation practices.

Recommendations on methods to improve sealing techniques, gas confinement, HLT, fumigant introduction and monitoring techniques are all expected outcomes of this research. In addition, the relationship between effective fumigant dosages and temperature is being studied. Trials have been conducted to determine the impact of using heat sources to increase the temperature within the mill prior to fumigant introduction.

Food quality studies have been conducted on a variety of dried fruits and tree nuts in cooperation with the USDA-ARS and the California Dried Fruit And Tree Nut Association. Similar studies on cereal grains, which will include bakeability, taste and

other quality measures, are being initiated in cooperation with Kansas State University. Protocols have been developed to meet the requirements of the food production industry both in the United States and in key European countries.

Food residue studies have been conducted on key dried fruits and tree nuts and are currently in progress for three cereal grains: wheat, rice and corn. Food tolerances are expected on these commodities which will permit the fumigation of the raw commodity and all processed fractions.

In Summary, Dow AgroSciences is working in cooperation with researchers, food commodity groups, industry consultants and fumigators to develop sulfuryl fluoride as a viable alternative to methyl bromide in the food processing and storage markets in the United States and Europe. Research efforts are underway to define the dosages required to control all life stages of key stored product insect pests. In addition, research conducted by Dow AgroSciences field scientists will lead to improved industry practices and techniques for the safe and effective use of sulfuryl fluoride in the food processing industry.