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Standard Guide for Assessing the Health Hazard of Pesticides to Applicators and Others with Potential Exposure¹

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1. Scope

1.1 This guide covers a stepwise process for using information concerning biological, chemical, physical, and toxicological properties of a pesticide or other chemical(s), or of a formulation to identify adverse effects that may occur to pesticide applicators or others with potential exposure.

1.2 The health hazard assessment process is complex and requires decisions at a number of points; thus, the validity of the assessment depends on the soundness of those decisions, as well as the soundness of the information used. All decisions should be based on carefully documented analyses so that an appropriate assessment can be completed, at the least cost, which is consistent with scientific validity.

1.3 This guide assumes that the reader is knowledgeable in animal toxicology and related pertinent areas, and relies heavily on the judgment of the evaluator, particularly in the area of chronic hazards.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 609 Definition of Terms Relating to Pesticides²

E 943 Terminology Relating to Biological Effects and Environmental Fate²

2.2 OSHA Standard:

29 CFR 1910.1200 Hazard Communication Standard³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *health hazard assessment*—the identification and evaluation of the adverse effects likely to result from specified release(s) of a material. The estimate is only semi-quantitative.

3.1.2 *hazard identification*—the process of determining whether exposure to an agent can cause an increase in the

incidence of a particular adverse health effect and whether the adverse health effect is likely to occur in humans.

3.1.3 *human exposure concentration (HEC)*—the concentration in the human environment based on application rate or distribution, persistence in the environment, the chemical form of the material, and location of the pesticide or formulation in the air, on surfaces, in vegetation, or in soil.

3.1.4 *maximum safe concentration for humans (MSCH)*—a prediction of the highest concentration of a material that would have no unacceptable adverse effect on humans based on toxicity testing in animals, clinical studies, and field experience.

4. Summary of Guide

4.1 This guide describes a stepwise process for assessing the risk of a pesticide, chemical, or formulation to applicators and other individuals susceptible to exposure of pesticides by considering the relationship between the material's measured or estimated human exposure concentration(s) and the adverse effects likely to result. Unavailable necessary information concerning human exposure concentrations and adverse effects is obtained through a stepwise program that starts with inexpensive information and progresses to expensive information if necessary. At the end of each iteration, the estimated or measured human exposure concentration(s) is compared with information on possible adverse effects to determine the adequacy of the available data for assessing the health hazard. If it is not possible to conclude that the health hazard is either minimal or potentially excessive, the available data are judged inadequate to characterize the health hazard. If desired, appropriate additional information is identified and obtained, so that the health hazard can be reassessed. The process is repeated until the health hazard is characterized adequately.

5. Significance and Use

5.1 Concern over the toxic effects observed in tests on animals has demonstrated the need to assess hazards of many new, and some presently used, materials. The process described herein will help producers, regulatory agencies, and others to compare alternative materials efficiently and adequately, completely assess a final candidate material, or reassess the health hazard of a material already in use. The process is not intended for pesticide registration; this guide provides techniques for health hazard assessment.

¹ This guide is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.26 on Safety to Man. Current edition approved July 15, 1991. Published September 1991.

² *Annual Book of ASTM Standards*, Vol 11.05.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.