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Best Management Practices for Boom Spraying

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1 Purpose and Scope

1.1 Purpose of this standard is to identify Best Management Practices (BMPs) to enhance responsible stewardship of pest control products associated with the spray application process, with emphasis on equipment selection, setup, and use for efficient application with minimal off-target spray drift and to comply with the pest control product label. The standard codifies basic BMPs for boom spraying in a step-by-step procedure for a wide audience ranging from those with little familiarity with sprayers to seasoned professionals and researchers. Specific steps apply to many boom spray applications, and the concepts presented will apply to most boom spray applications. Applicators must be well informed about the specific recommendations for a given pesticide, and must follow federal, state, and local government laws and regulations on pesticide application. Ordinances should be consulted to ensure compliance with codes that are more restrictive than those presented in this standard.

1.2 Scope of the standard is inclusive of ground-operated horizontal boom sprayers, which are typically used but not restricted to deposit spraying of production fields, pastures, turf and lawns. Boom sprayers with deposition aides such as air-assistance, shields, foils, or other devices and atomizers that use pneumatic, rotary, electrostatic, or other alternatives – each may require additional steps and considerations beyond the minimum basics outlined by this standard to ensure full application benefit of that technology. Similarly, technologies subjected and approved to validation tests of U.S. EPA Drift Reduction Technology program may complement the minimum basics outlined by this BMP. The scope excludes aerial and orchard/vineyard air blast spray applications.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2.1 ASAE S.27, Terminology and Definitions for Applications of Crop or Forestry Production and Protective Agents

2.2 ASAE EP367, Guide for Preparing Field Sprayer Calibration Procedures

2.3 ASAE S572, Spray Nozzle Classification by Droplet Spectra

2.4 FAO Guidelines on Good Practice for Ground Application of Pesticides, FAO, 2001, ISBN 92-5-104718-9

2.5 ISO 22368:2004, Crop Protection equipment — Test methods for the evaluation of cleaning systems

— Part 1: Internal cleaning of complete sprayers

— Part 2: External cleaning of sprayers

— Part 3: Internal cleaning of tank

3 Overview

3.1 Pest control products must be applied accurately and uniformly to targeted foliage or soil. Too little pesticide results in poor pest control and reduced yields, and/or the potential for pesticide resistance, while too much injures the crop, wastes chemicals and money, and increases the risk of contaminating the environment. Achieving satisfactory results from pesticides depends heavily on pest identification, pesticide selection, spray equipment selection, spray application timing, and sprayer calibration and maintenance.

3.2 BMPs for boom spraying provide guidance to apply pest control products accurately and uniformly. Step-by-step, sequential BMP categories of this standard are outlined in Table 1. All BMP categories should be addressed to ensure accurate and safe application. Omitting and not following any BMP category could jeopardize the application.

3.3 Hydraulic sprayer technology forms the basis for many boom sprayers and this basic system has ever-increasing levels of advanced technologies available to control spray uniformity or to handle and apply specific amounts of product to targeted portions of the field. Advanced technologies include, but are not limited to, sprayer controllers, variable-rate technology, direct injection systems, pulse-width modulation control of spray nozzles, and other technologies. In terms of BMPs, general impacts of advanced technologies on BMPs are noted herein when applicable.

3.4 Alternative technologies are additional technologies often considered beyond hydraulic sprayers. In addition to the widely recognized and understood basic variables of nozzle selection, pressure, boom height and application speed, there are other physical and chemical means to alter the spray application that may singly or in combination, increase spray efficacy and/or reduce drift.

The effectiveness of alternative technologies is often complex and at best inadequately defined. Data gaps or lack of conclusive documentation often exist regarding the effectiveness of alternative technologies under a wide range of spray conditions. Alternative technologies are mentioned in this Best Management Practice document to reduce the risk of them being marginalized. Please refer to Annex A for further descriptions.

4 Best Management Practices (BMPs) for Boom Spraying

4.1 Read product label for specific recommendations/requirements. Pest control product labels should be first consulted for application-specific language. Product labels have legal implications so adherence to application-specific language takes precedence. Product labels may contain, but are not limited to, the following areas as recommendations or requirements:

4.1.1 Equipment selection and setup. Identify any specification of sprayer, nozzle, nozzle spacing, nozzle pattern angle, travel speed, spray release height, or other sprayer equipment factors listed on the label.

4.1.2 Spray application rates (l/ha, gal/ac). This information helps determine nozzle flow rate and thereby influences nozzle type, size, operating pressure, and potentially number of nozzles per row or unit width.