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Standard Guide for Preparing Field Sprayer Calibration Procedures[1]

This standard is issued under the fixed designation E549; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide is for those who prepare field sprayer calibration procedures. The purpose is to encourage methods that will improve uniformity, accuracy, and safety of pesticide application with field sprayers.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements see Section 4.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Significance and Use

2.1 This guide provides information on the calibration of boom-type field sprayers used for broadcast, band, or row applications. It is easily adapted to boomless and air-carrier type sprayers for broadcast applications and to rotary atomizers such as spinning disks. A single calibration procedure that is applicable in all situations is not feasible because of the nature of the variables involved in pesticide application. Electronic controllers and other aids should be calibrated by one of these methods.

3. Apparatus

3.1 Apparatus needed will depend on the method of calibration. Common items include the following:

3.1.1 *Measuring Device*—Tape of at least 25 m (50 ft) in length, or other suitable measuring devices.

3.1.2 *Marking Devices*—Stakes or flags for marking a measured course.

3.1.3 *Container,* large enough to collect nozzle output for 30 s, and graduated to allow accuracy within 1 %.

3.1.4 *Pressure Gage,* accurate and of the proper range.

3.1.5 *Timing Device*—A watch with a sweep second hand, or a stop watch.

4. Hazards

4.1 A cautionary statement for the safe handling, storage, and disposal of agricultural chemicals shall be included with applicator calibration procedures.

4.2 Use water alone to calibrate the sprayer unless the flow rate of the actual spray mixture varies more than 5 % from the flow rate of water. (See 5.1.1.2.)

4.3 *Calibration with Actual Spray Mixture:*

4.3.1 Wear suitable approved safety equipment and protective clothing. Avoid contact with the spray.

4.3.2 Avoid contamination of the area. Collect all nozzle output. Calibrate only when the wind speed is below 8 km/h (5 mph).

5. Recommendations

5.1 The volume of spray material applied to a given area depends on three variables. Each variable must be determined when developing a specific calibration procedure.

5.1.1 *Nozzle Flow Rate*—The nozzle flow rate varies with the following:

5.1.1.1 *Nozzle Capacity*—Select the orifice size that will best fit the requirements of application, volume, pressure, and ground speed.

5.1.1.2 *Nature of Fluid*—If the spray mixture will be altered considerably by the addition of adjuvants, compare the flow rate of the mixture to that of water. If the rate difference is 5 % or more, use the actual spray mixture in the calibration.

5.1.1.3 *Fluid Pressure*—A constant pressure should be maintained to achieve uniform application. Flow rate is generally proportional to the square root of the pressure drop across the nozzle.

[1] This guide is under the jurisdiction of ASTM Committee E35 on Pesticides, Antimicrobials, and Alternative Control Agentsand is the direct responsibility of Subcommittee E35.22 on Pesticide Formulations and Delivery Systems.

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