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Measuring Pesticides More Accurately

Pesticides are used in greenhouse operations to control insects, mites, diseases and weeds. Proper mixing and application of pesticides are essential for getting good results. Measuring pesticides accurately is a critical but sometimes overlooked step in this process.

Pesticides work best when they are properly mixed and applied. Mixing the proper amount or concentration is a critical step in getting the right pesticide rate applied to the crop to control the target pest. Errors in measuring can lead to overapplication of pesticides, which wastes money, increases environmental impacts, and may even cause crop damage. Measurement errors can also lead to underapplication of pesticides, which may waste time, money, and lead to control failures.

Measuring smaller amounts

Frequently, greenhouse operators are finding that they need to measure smaller amounts of pesticides. Many newer pesticide products are formulated for lower application rates than in the past. IPM, biocontrol and resistance management strategies may call for spot spraying for a pest rather than applying a pesticide to an entire crop or area. Accurately measuring smaller amounts of pesticides is a little more challenging, but is absolutely worth the effort.

Measuring containers are available in many sizes.

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Tips for measuring liquids accurately

- Make sure that the measuring containers you are using are accurate. Use a graduated cylinder to check the accuracy of your measuring containers
- Measuring containers should have easy-to-read gradations or scales. If these start to wear off after use, don't re-mark the measuring container with a marker. Dispose of it properly and get a new measuring container.
- Tall and narrow measuring containers will tend to be more accurate than wide containers.
- When reading the level of a liquid in a container, always place it on a flat, level surface. Bring your eye level with the top of the liquid in the measuring container for an accurate read.
- A very easy and accurate way to measure smaller amounts of liquids, in the range of one or two fluid ounces or less, is to use plastic syringes. You can purchase plastic syringes without the injection needles in a variety of sizes. Check the units of measure on the syringes. Larger ones may show fluid ounces but smaller syringes will measure in milliliters (or cc's, which are equivalent to mililiters).
- Clearly label all measuring containers with "for pesticide use only" and never use them for any other purpose.

Plastic syringes are a useful tool when measuring very small amounts of liquid pesticides.

Digital scales are accurate, convenient, and relatively inexpensive.

Tips for measuring dry flowables accurately

- Our English system of measurement introduces another source of measurement error by using "ounces" as a unit of both volume and weight. A fluid ounce is a measure of volume and is used to measure liquid formulations. An ounce by weight is used to measure weights of dry flowable formulations. Make sure you know which one you are measuring!
- The most accurate way to measure dry flowable formulations is with a digital scale. Good quality, high precision scales are now easy to find for under $200.
- Some dry flowable pesticide products are packaged with plastic volumetric measuring tubes so that you can measure the dry product with reasonable accuracy without using a scale. Since different dry materials occupy different volumes per unit of weight (i.e. differ in density), you should only use volumetric measuring tubes for the product they are intended for.

Information sources for this article include *Measuring Pesticide: Overlooked Steps to Getting the Correct Rate*, Purdue University PPP-96; and the Penn State Pesticide Education Program.

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