

Santa Cruz County Farm Bureau Ask Laura Newsletter Column
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Q: What is one simple idea to improve the efficiency of water use in a container nursery?

A: A grower knows that a wilting plant is a sure sign of a need for water. But a grower also intuitively knows that wilting is bad for the plant. So at what point before wilting occurs should the grower water plants? To figure out how that process might be improved, think about what a grower normally does to evaluate a plant's need for water. The grower intuitively picks up the pot and feels its weight! The grower is sensing how much water is in the potting soil, then how much water has been removed by the plant, and then might even estimate how much water needs to be added back to refill the pot.

This process could be improved by actually measuring the weight of the plant container. The weight change in grams, with no intervening irrigation, represents the milliliters of water lost from the container during that time (1 milliliter of water weighs 1 gram). It is important to select representative plants when measuring water use. Large plants tend to use more water than small ones, and those on the borders of fields, benches, or nursery blocks tend to use more than those in the interior. Since accurate scales can be purchased for less than \$100, this method provides a fast, accurate, inexpensive way to monitor plant water use.

Not all the water in the soil is available for use by the plant. After the pot has been fully watered, the water is readily available to the plant. But as the plant uses water and the soil dries, the water held by the soil is less available. Eventually the plant wilts. To determine the total amount of water that is available to the plant, first measure the weight of a representative plant just after it is fully watered and drains. Then measure the weight daily until the plant just starts to wilt. The difference between the beginning and end weights in grams (and milliliters) is the available water.

Q: So when should water be applied and how much?

A: Generally, irrigation is initiated when one-half of the available water is used. So if there are 300 milliliters of available water in a pot, then an irrigation should be made when 150 milliliters of water has been used (so that occurs when 150 grams are lost as you are measuring with your gram scale). How much water to apply to each plant in this case? The plant needs at least 150 milliliters. A good target is to apply about 10 or 15% more water to "leach" accumulating salts out the bottom of the pot. (Otherwise, salts can accumulate in the soil and cause harm to the plant). Another factor is the efficiency of the irrigation system. Sprinkler irrigation is relatively inefficient and drip irrigation is relatively efficient in distributing the water to plants in a field. For sprinkler systems another 10 to 60 % more water might be needed, while a drip system might only need up to 10% more water.