



Rosa Emilia Raudales
rosa@uconn.edu

Volume 8 Number 20 April 2019

Watering: Communication Tips



Training new employees how to water is very difficult - greenhouse staff and owners concur. Many growers have told me that watering is their #1 training need.

Why is it so difficult to learn or teach how to water properly?

Many argue that there is art in this practice, and that art is *unteachable*. Teaching someone how to paint like Leonardo da Vinci is impossible. Yet, anyone can learn the basic skills of drawing and painting.

Watering is not an easy task. Individuals need to consider multiple factors before deciding whether to irrigate or not. Hence, teaching it is not simple either. I argue that when training new employees we need to communicate better and more. We need to emphasize the why's and the how's.

In this e-Gro Alert, I share with you five communication tips communication to train your staff on watering. These tips are based on a recollection of pointers that I've gathered from growers.

Tip #1. Define watering. New employees must understand that irrigating crops is not about pouring water or turning on a water valve. Watering is about maintaining AIR and WATER balance in the root-zone - that is the ultimate goal.

www.e-gro.org

2019 Sponsors



Funding Generations of Progress
Through Research and Scholarships

Ball®

fine



P.L. LIGHT SYSTEMS
THE LIGHTING KNOWLEDGE COMPANY



This work is supported by Critical Agricultural Research and Extension grant no. 11947449 from the USDA National Institute of Food and Agriculture.

United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author and do not necessarily reflect the view of the U.S. Department of Agriculture

Tip #2: Explain WHY watering is difficult.

The first step toward change is awareness.

Regardless of the operation size, all greenhouses producing ornamental plants are EXTREMELY diverse.

Walk with you team in the greenhouse, point the diversity and explain WHY watering everything with the same volume and frequency is not appropriate. For example, you can see a small greenhouse dedicated to retail and another greenhouse producing for wholesale (Figure 1). Both have the same "diversity problem".

For example, on the top scenario you can point the different materials of the hanging baskets (coconut fiber will allow the media to dry faster than plastic), small containers needs less volume per irrigation but higher frequency, hanging baskets receive direct light while plants on the bench are partially shaded, each container contains different mix of crops, and the canopies are dense or the crop is too high making it difficult to visually assess moisture.

Workers who are aware of the differences are more likely to pay attention while doing the task.



Figure 1. Ornamental greenhouses with diverse crops.

Explain how fluctuating weather patterns makes watering difficult. We tend to talk about seasons as a parameter, but the truth is that the oscillation of temperature and sunlight that we see within a week in spring and fall is broad. In Connecticut, we can go from a snowy-dark-cold day to a sunny-bright-warm day in less than 24 hours. Prepare your staff to respond to this unplanned changes.

The weather itself calls for a watering decision. On top of that, workers must decide what to do instead of watering. Workers may fear being perceived as if they are not working hard enough and the easiest way out is to grab a hose and that may be WHY some workers overwater. Head growers must communicate with their staff to make sure they all agree about how weather patterns will affect daily tasks. The photo below (Figure 2) shows an employee watering on a cold winter day in the Midwest. If the staff member's role is to water a section, but the crop doesn't need it, then the staff should have a clear directive about what alternative activities to conduct.



Figure 2. Staff watering plants.

Tip #3: Describe WHY water and air are important to plants.

Discuss WHY plants need water and WHY excessive or insufficient levels affect crops.

Photosynthesis is the process in which solar energy converts to chemical energy. For photosynthesis to occur, a water molecule must be broken down. Hence, without water, there is no photosynthesis; without photosynthesis, plants will not grow. Water also carries nutrients and helps maintain cell/plant turgidity. The take home message is that plants need water to maintain structural integrity and perform basic functions.

Plants also need oxygen in the root zone to maintain essential plant functions. That is WHY we cannot keep the substrate saturated.

Explain physical properties of the growing media. When we fill containers with growing media, there will be gaps between the media particles (Figure 3, left). If we cover the bottom of the container, so nothing comes out, and then add water - The water will fill those spaces, leaving no room for air (Figure 3, middle). If we then let the free water drain, a portion of the water will remain adhered to the media particles and there is also air space (Figure 3, right)- This is known as container capacity.

Container capacity (also known as water holding capacity) is volume of water that the media holds after the substrate is allowed to drain.

This may sound like a science class, but these are all important concepts that will help us expand the conversation and talk about how other activities affect these factors. For example, filling containers too compact or too loose, transplanting plugs or liners on time to avoid them drying up, mixing or placement of controlled-release fertilizers so the prills interact with the water, etc.

The take home message is that the staff needs to understand that insufficient or excessive water in the media will affect growth.

Overwatering also results on algae build-up on the top surface of the growing media (Figure 4). The algae dries up and forms an impermeable layer that makes watering difficult. Shore flies feed on algae and they can also vector *Pythium* spores from pot to pot. Wet media is a conducive environment for root rot which can be detrimental to root structure and overall plant health (Figure 4).



Figure 4. Algae on top surface of growing media and root-rot.

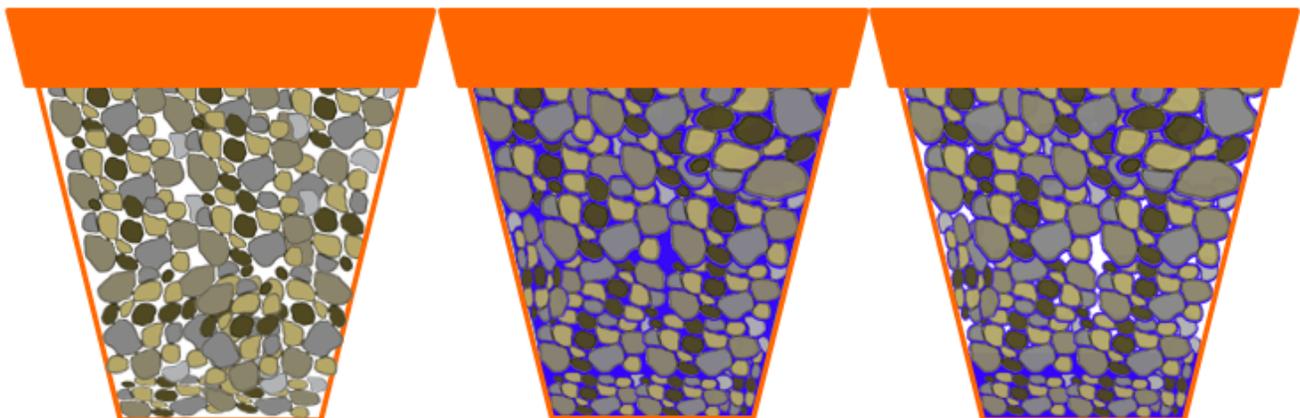


Figure 3. Cartoon representation of air and water space in containers. Left: Substrate with air-space empty, no water. Middle: Substrate saturated with water, no air space. Right: Substrate at container capacity.



Tip#4. Agree on HOW and WHEN to water.

*Tell me and I forget. Teach me and I remember.
Involve me and I learn.*

The instructions for most activities in the greenhouse are specific- hence easy to learn or teach. For example, dip the cuttings before transplant, after x number of days transplant # liners to an x size container, a given amount of product per area or container, spray every number of days, prune to a given height, etc. However, most operations don't communicate that specifically about watering.

I recommend that every operation develops clear guidelines for watering. I know it's not a simple task (that is why we started acknowledging the complexities), but it must be done. Everyone in the operation **MUST** agree on what is the criteria to irrigate or not to irrigate. Dry media does not always call for action (Figure 5) and growing on the dry side has many benefits for ornamental crops.



Figure 5. Example of petunias in a hanging basket with dry media that do not need watering immediately.

While the workers holding the hose or controlling the valves will have to make a decision, it is the head grower's job to provide clear instruction on how to make that decision. The instructions can include crop stage/container size (liners versus large containers), crop (poinsettia versus hostas), time of the day, visual assessment, a number (tensiometer or weight), leaching fraction, etc.

The best example so far is the 1-5 moisture scale developed by William Healey (Figure 6). The method is nicely summarized (English and Spanish) in [Back Pocket Grower](#). Note that this method includes very specific language about the visual and feel characteristics of each moisture level. This example works well because the instructions can be as specific and simple as "Let the plants dry to Level 2, before irrigating them to Level 4". With a clear guideline, everyone in the operation can agree when and when not to irrigate.



Figure 6. Example of 1-5 moisture scale poster used in a commercial greenhouse. This operation had posters near the doors to remind employees of the scale.

Some growers are also using sensors or weighing the containers as a more specific and quantitative assessment. This information has been covered by many trade-magazines.

There is not a single way to do this. The take home message is that within a company everyone should have the same language when it comes to watering. For too long, we have told one worker to train the other. It's not a bad system, but it would be better to have a more systematic way to communicate.

Tip #5. Retrain

Retrain so make sure the staff has not deviated from the original guideline (Figure 6).

Additional References:

Healey, W. How to effectively water by weight
<https://www.greenhousecanada.com/structures-equipment/water-and-irrigation/taking-in-the-weight-of-the-water-32859>

Back Pocket Grower

https://www.backpocketgrower.com/m325_8.htm

e-GRO Alert

www.e-gro.org

CONTRIBUTORS

Dr. Nora Catlin
Floriculture Specialist
Cornell Cooperative Extension
Suffolk County
nora.catlin@cornell.edu

Dr. Chris Currey
Assistant Professor of Floriculture
Iowa State University
ccurrey@iastate.edu

Dr. Ryan Dickson
Greenhouse Horticulture and
Controlled-Environment Agriculture
University of Arkansas
ryand@uark.edu

Nick Flax
Commercial Horticulture Educator
Penn State Extension
nzf123@psu.edu

Thomas Ford
Commercial Horticulture Educator
Penn State Extension
tgf2@psu.edu

Dan Gilrein
Entomology Specialist
Cornell Cooperative Extension
Suffolk County
dog1@cornell.edu

Dr. Joyce Latimer
Floriculture Extension & Research
Virginia Tech
jlatime@vt.edu

Heidi Lindberg
Floriculture Extension Educator
Michigan State University
wolleage@anr.msu.edu

Dr. Roberto Lopez
Floriculture Extension & Research
Michigan State University
rglopez@msu.edu

Dr. Neil Mattson
Greenhouse Research & Extension
Cornell University
neil_mattson@cornell.edu

Dr. W. Garrett Owen
Floriculture Outreach Specialist
Michigan State University
wgowen@msu.edu

Dr. Rosa E. Raudales
Greenhouse Extension Specialist
University of Connecticut
rosa.raudales@uconn.edu

Dr. Beth Scheckelhoff
Extension Educator - Greenhouse Systems
The Ohio State University
scheckelhoff.11@osu.edu

Dr. Paul Thomas
Floriculture Extension & Research
University of Georgia
pthomas@uga.edu

Dr. Ariana Torres-Bravo
Horticulture/ Ag. Economics
Purdue University
torres2@purdue.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Dr. Jean Williams-Woodward
Ornamental Extension Plant Pathologist
University of Georgia
jwoodwar@uga.edu

Copyright © 2019

Where trade names, proprietary products, or specific equipment are listed, no discrimination is intended and no endorsement, guarantee or warranty is implied by the authors, universities or associations.

Cooperating Universities



Cornell University IOWA STATE UNIVERSITY



University of New Hampshire
Cooperative Extension



PennState Extension



VIRGINIA TECH

MICHIGAN STATE UNIVERSITY

UConn

PURDUE UNIVERSITY



The University of Georgia



THE OHIO STATE UNIVERSITY

NC STATE UNIVERSITY

UofA DIVISION OF AGRICULTURE RESEARCH & EXTENSION
University of Arkansas System

In cooperation with our local and state greenhouse organizations

MAUMEE VALLEY GROWERS
Choose the Very Best.



Metro Detroit Flower Growers Association



Indiana Flower Growers Association



Michigan Floriculture Growers Council

