

If You Don't Have It, You Can't Use It: Water Issues at Prides Corner Farm®

Michael R. Emmons

Prides Corner Farms, 122 Waterman Rd., Lebanon, Connecticut 06249 U.S.A.

With the advent of container nursery production and the importance of having sufficient drainage and porosity within these containers the necessity for having larger amounts of water became essential to the quality and survival of these crops. Knowing how much will be needed can be a crapshoot because different years vary in temperature and natural rainfall. Most nurseries should consider their worst-case scenario that is if it didn't rain a drop for June, July, and August, traditionally the three most intense watering months, what would you need. The reality is many of us don't do that and some years we find ourselves wondering, hoping, praying, and commiserating over whether there will be enough water to go around or will this finally be the year it all catches up to you. The bottom line is we do what we have to do because death is not an option and there are already far too many people standing in unemployment lines.

Yearly statistics are one way to determine water needs. Yet I heard on ESPN's sports center a number of weeks ago that there are lies, there are damn lies, and then there are statistics. In 2002, Alex Rodriguez, the highest paid baseball player in the history of the game, led the American league in home runs. His team, the Texas Rangers led the league in futility finishing dead last in their division. The Boston Red Sox starting pitchers lead the entire American league in earned run average that same year. They didn't even make the playoffs. The New York Yankees, highest payroll in baseball finished the 2002 season with the best record in the American league. What did that get them? An early exit by the Anaheim Angels, with a payroll less than half that of the Yankees. They, of course won the World Series. What am I getting at? Statistically, the Hartford area in 2002 recorded near normal rainfall amounts. On paper we should have been fine. The reality is most nursery managers in this area aged considerably that year. Statistics need to be taken with a grain of salt. Statistics should be looked at historically because when you break them down they become less meaningful. As an example, although 2002 averaged normal rainfall, the months of January, February, March, and April were 33% below average. Through into the fall of 2001 leading up to and including these months the average rainfall amount was a staggering 50% below average. Throw in one of the warmest stretches since temperatures were kept and you had a recipe for disaster. Enough wining. The question is what did we do about it. Here is my story.

The New England area is not exempt from drought from time to time. Certainly our neighbors in the mid-Atlantic states have had even greater hardships concerning water issues. But take heart. There is one place that has been in such a prolonged drought that even the old timers can't remember when it started. For more than 80 years Boston has experienced one of the most excruciating droughts imaginable. From Boylston Avenue to Yawkey Way the drought continued unabated. How could a civilized people live this way? Then in 1986 there was a ray of hope and it appeared that the drought would end but cruelly, sadistically, as if by some menacing magical curse, a power greater than can be humanly imaginable, their hearts ripped from them and despair returned where until this very day, their drought continues.

At Prides Corner Farms we handle drought situations a little differently. Meeting with the irrigation department and figuring out a basic strategy is key to our success. Once we have figured out the direction we want to move in our goals become easier to attain. Our water needs are somewhere between 150 and 175 million gal of water per year. Our water storage capacity is somewhere around 100 million gal. So how do we deal with this shortfall? First and foremost we recycle our water — every drop of it. Whether it's a small trickle or a roaring torrent all of the runoff gets redirected and re-used. Depending on the crop being grown and spacing of the plants 50% to as much as 70% of the water being pumped to the plants never gets into the soil system using standard overhead irrigation such as this. The water is collected and sediment allowed to settle out where it is then pumped back into the irrigation ponds to be reused. Leaks have to be accounted for and repaired at once. Water pressure is essential to even coverage so that plants do not have to be watered any more than necessary. Sometimes accidents do happen and having the irrigation guy's jump on it immediately keeps the waist to a minimum. Sometimes, however the guys are busy keeping up on current events and become preoccupied with the issues of the day.

Segregation of specific crops is also vital to efficient water management. Plants such as *Euonymus fortunei* 'Emerald 'n' Gold' and 'Emerald Gaiety' should never be placed in the same water environment as *Syringa vulgaris* and cultivars. During their most rapid growth lilacs require twice the amount of water to maintain healthy, vigorous growth. Also, keeping small or young plants separate from older, bigger plants is just another common sense approach to good basic water management.

Probably the greatest savings of this precious natural resource is with microirrigation. When our container tree farm was developed a concerted effort was made to install the best microirrigation system we could find. Nearly all of our 50,000 container trees are on drip irrigation. The delivery system is a JS 52 Bowsmith Jet Stake. Because it is not a traditional drip emitter, it won't create a water channel through the container therefore it is not necessary to move the stick around. The emitter is set to produce 4.3 gal/h at 15 psi allowing for rapid saturation of the root ball with a minimal amount of runoff. Don't go to the expense of purchasing state-of-the-art microirrigation equipment and skimp on the water filtration system. These are two stainless-steel media filters, which are used to eliminate nearly all the particles in the water and are self cleaning. Because the field is over 1000 ft long, the valves that open and close each zone are hydraulically, not electrically controlled. That way electrical storms will not have an impact on the water tubes attached to the valves the way a 24-volt, bell-wire system might have if struck by lightning. Each zone is attached in the pump house to a submersible pump that keeps the hydraulic lines under constant pressure.

In spite of our best efforts it sometimes still becomes inevitable to become creative with a dwindling water supply. The first and most important step is to recognize that you have a rapidly increasing supply problem long before you run out. This allows you to take important measures to stretch the water supply that is still available. The time of year, temperature, and the types of plants are the three most important factors in determining reduced water use. The very first thing we do when we are faced with water cutting decisions are to water at night. We found that night watering can reduce consumption on many crops by up to 33%. Because it is cooler with much less evaporation going on, the plants absorb water quicker and more efficiently than during the daylight hours. We also recover more of our runoff because, again,

less evaporation allows more of the water to get back into the system. Watering at night is not without its risks. Diseases have the potential to be a greater problem because the foliage stays wet for a longer period of time. From an operational stand point the people coming in to do the watering are not used to getting up at 3 AM in the morning and are therefore more prone to accidents and mistakes. Also, problems with the irrigation system are not as easily detected at night.

Yet another way to reduce consumption is to pulse water. That is, instead of watering an area once for a specified length of time watering it three or four times for short durations can prove to have excellent results while still reducing the overall time that the plants are actually being watered. This is a more viable alternative if your irrigation system is automated. It can be physically demanding in a labor-intensive system.

One very important consideration when it becomes necessary to reduce water consumption is to have the ability to check soluble salts on a quick and regular basis. Most nurseries use some form of slow- or controlled-release fertilizer on their plant material. Because water is the carrier for delivering these nutrients into and through the soil profile it is absolutely vital that they do not be allowed to accumulate to dangerous levels. When you reduce your water consumption, it is necessary to be even more diligent in knowing your fertility, as occasional leaching of the soil profile will become necessary from time to time. Our in-house lab allows us to take quick readings of soluble salts and react to any spikes in these levels. There are kits available through many laboratories that will allow similar results to be obtained without large outputs of cash. Another factor is our water pH, which usually is around 7 but tends to climb as our water levels drop. Although it hasn't presented very much of a problem we are well aware that certain vital elements such as iron and aluminum become much less available to our plants at these elevated levels. Iron chlorosis can occur on many broadleaf evergreens if not available and aluminum is a key element to ensure that blue hydrangeas are indeed blue and not pink.

The Year 2003 has been a much easier year to manage our water recourses. Sleeping at night becomes considerably less difficult than a year such as we had in 2002. It still becomes extremely important not to forget the past and to constantly look at ways to manage one of our most precious natural recourses. As an industry I think we tend to waste water until we are forced to make difficult choices. Water conservation should be a driving force not just in the dry times but all the time. The reality of drought is that it will happen and it is better to be prepared for it than to react to it. Just ask Boston how painful drought can be.