

News & Views

for New Hampshire's Green Industry

January-March, 2004

Bank Accounts and Fertilizer Management

In greenhouse and nursery production, you can quantify nutrient status of the growing medium in two ways. First, you can send a soil sample in to a laboratory to quantify the parts per million of each nutrient. Second, you can measure the electrical conductivity (EC) of the medium on-site using an EC meter (cost is around \$100 for an accurate meter). We recommend both types of testing.

Ions are salts (such as table salt, sodium chloride, or a fertilizer such as calcium nitrate) dissolved in the nutrient solution. EC meters measure the concentration of dissolved ions in solution. The higher the concentration of ions, the more effectively the solution conducts electricity, and the higher the EC. A high EC indicates a high concentration of ions (and therefore high fertilizer concentration unless the water also contains “junk” ions not used for growth, such as sodium). Alternatively, the closer the EC is to zero, the lower the concentration of fertilizer and other ions. The optimum range for EC varies depending on the way a sample is prepared, but is around 0.4 to 1.2 dS/m for a 2 water:1 soil preparation or 1.2 to 2.5 with an extract of the soil at saturation.

By measuring and managing the EC in a growing medium during the production season, you can make sure that adequate fertilizer is provided for plant growth. If the EC is too low, lack of nutrients may limit healthy growth and deficiencies occur. If the EC is too high, the plant may show nutrient toxicity symptoms, nutrients

may leach into and pollute the environment, and money is wasted on fertilizer.

Cash flow budgeting for your agricultural business has important parallels to understanding management of the EC, or supply of dissolved nutrients, that is needed in crop production. We will use this analogy to explain how to avoid under- or over-fertilizing container-grown plants. The same concept can be applied for all horticultural crops.

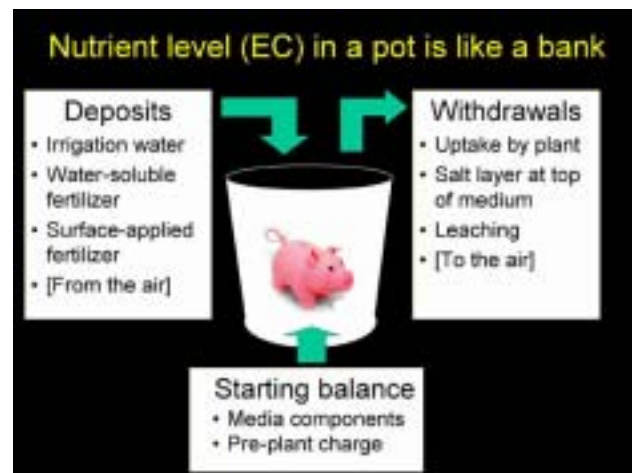


Figure 1.

Figure 1 shows a container, where the EC of the growing medium is represented by a piggy bank. This growing medium contains a running balance that we can measure with an EC meter before planting or any time through the season.

The initial balance on our “account” of nutrients is provided by the pre-plant nutrient charge, which will include lime (providing calcium and magnesium), and other incorporated fertilizers such as superphosphate. Most medium components, such as peat, bark, or

perlite supply a small amount of nutrients, but compost can supply significant nutrients as it decomposes and release nutrients.

Some of the initial nutrient sources are immediately available for withdrawal (i.e. become soluble quickly), whereas other “long-term deposits” are tied up with the soil or are in a slow-release form (e.g. resin-coated fertilizers). Only when the long-term deposits are soluble do they increase the EC of the growing medium and can be taken up by plant roots. The challenge of using compost in container production is the difficulty in predicting how quickly decomposition will occur, and whether the deposit of nutrients into the soil solution over time matches the rate of withdrawal through plant growth.

Because of differences in the growing medium each year, even from commercially-blended media, it is important to know what your starting balance is, and get a complete soil test at a laboratory. NH growers have an excellent UNH lab service featuring expert interpretation of results, rapid sample turnaround, and affordable rates (tel.603-862-3210), and in these day of limited budgets unless the laboratory receives your business we may lose this resource. It is also important to deposit the correct type of fertilizer for your needs. The UNH lab can help make recommendations based on your crop type and irrigation water.

After planting, the goal is to balance deposits and withdrawals, and maintain EC in the optimum range, so that you are only applying fertilizer needed for crop growth. This is measured during the season by regular on-site testing of media-EC.

We can increase the account balance by making deposits (Figure 1) through impurities in the irrigation water (usually low for NH water sources), and in water-soluble fertilizer, or by surface-applying nutrients. Other nutrients, notably carbon and nitrogen can be fixed from the air, but they do not contribute to soil EC because they are not free ions in the soil solution.

The account balance is decreased by several types of withdrawal. These obviously include nutrients taken up by roots for plant growth. The faster the crop is growing, the more nutrients are withdrawn from the crop and the more fertilizer that needs to be deposited. Through capillary action and evaporation, a high-salt layer forms near the surface of the medium, which is not available for plant growth because few roots grow in that zone, and roots do not function efficiently where salt concentration is very high. This salt layer occurs as part of the normal wetting and drying process.

Leaching is a very important type of withdrawal, because nutrients leaving the container can enter the environment. Many growers leach as part of routine practice, which is not needed if irrigation water contains few junk ions such as sodium and chloride. Leaching washes nutrients from the pot, and leaching with clear water is therefore the main management practice to reduce EC when nutrient concentration becomes excessively high. However, the greater the rate of withdrawal through leaching on a routine basis, the higher the applied fertilizer concentration that is needed as a deposit. In other words, lower fertilizer concentration with low leaching can have the same

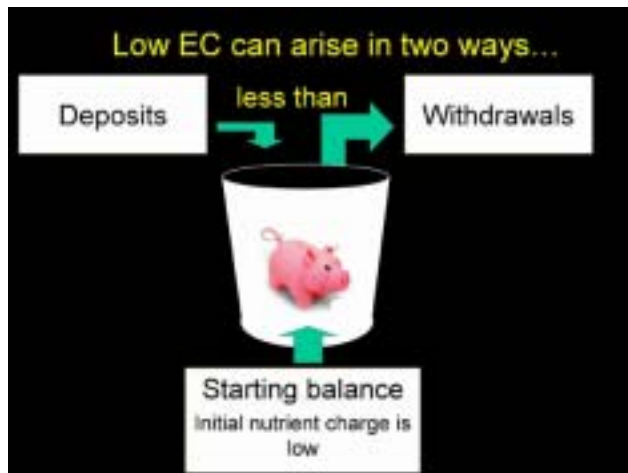


Figure 2a.

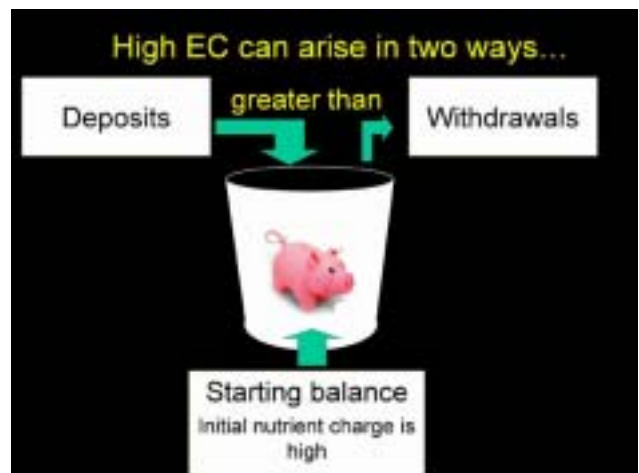


Figure 2b.

effect on the EC account balance, with less cost in terms of fertilizer and pollution, as a high-leach/high-concentration approach.

An excessively low EC means that the crop can become bankrupt, i.e. there is inadequate nutrient level for healthy growth and plant stress occurs. You then need to go into Chapter 11 and take special care to return to healthy growth, including increased deposit of fertilizer. Figure 2a shows that a low EC may occur if the starting balance is low, or if the withdrawals are occurring more rapidly than deposits.

If the starting balance is very high, or deposits are occurring faster than withdrawals, the EC balance can become too high and you

can “tax” your plants through excess fertilizer. Nutrients are not food—there is an ideal range in nutrients needed for healthy growth. High EC (and ion concentration) makes it harder for roots to take up nutrients—it is like trying to grow plants in sea water, and can result in “salt burn” (damage to sensitive root tips) and toxicity symptoms in foliage.

You wouldn’t try to run a business without keeping tabs on costs and revenue. Don’t bankrupt your crop by supplying insufficient fertilizer, or “tax” your plants and the environment through excess fertilizer! UNH Extension is running two courses for greenhouse and nursery growers that will help you set up an overall nutrition program and understand details of crop nutrition.

Paul Fisher

Insurance Options for Nursery and Greenhouse Operations

Nursery crop insurance allows growers to protect against losses due to adverse weather conditions, fire, uncontrollable diseases, wildlife, failure of irrigation water supply, and reduced plant values due to a delay in marketing plants. Unlike many standard greenhouse insurance policies, nursery crop insurance covers loss of plants in the greenhouse as well as in the field.

Nursery crop insurance is available for an extensive list of containerized and field-grown plants produced in New Hampshire. Growers elect to insure from 50% to 75% of their plant inventory value. If the market value falls below the insured plant inventory value, then the grower is paid for the loss. Growers must wholesale at least 50% of their product to qualify for this insurance.

The nursery crop insurance year runs from October 1st through September 30th. New applications for the coming year may be accepted until May 31st with coverage beginning 30 days after receipt of a signed application. The policy renews automatically each year. An inventory valuation is required upon initial application and by September 11th of each year thereafter.

Revenue protection is available to nursery and greenhouse growers under two whole-farm insurance programs, AGR and AGR-Lite. AGR (Adjusted Gross Revenue) provides protection

against low revenue due to unavoidable causes. Losses may arise from production or market risks. Eligible farm revenue includes income from most crops and plants, with a limited amount from livestock products. A grower elects a coverage level from 65% to 80% of average annual farm revenue and a loss payment rate of 75% or 90%. Insurance begins January 1st for calendar year filers. The sales closing date is January 31st. If a grower qualifies for the Nursery crop insurance program and a substantial part of sales result from covered trees and plants, the grower may be required to purchase a nursery policy before participating in the AGR program.

AGR-Lite is a new pilot program available this year. AGR-Lite is a streamlined version of AGR with fewer application and record keeping requirements. In addition, AGR-Lite has no limitation on the eligible amount of income from livestock or livestock products, and there is no requirement to purchase the nursery crop insurance policy. A drawback of AGR-Lite is the maximum policy liability is capped at \$250,000.

Revenue and nursery crop insurance policies are available from private insurance agents. For a list of crop insurance agents in your area, contact your local USDA Farm Service Agency office or log on to the Risk Management Agency website: www3.rma.usda.gov/tools/agents/.

Recently developed educational materials on revenue and nursery crop insurance are available from UNH Cooperative Extension. Contact the author at 862-3234 for more information.

Michael Sciabarrasi

Late Winter Events

- Feb 6-7** **Farm and Forest Expo**, Manchester, NH. Info: Call 603-271-3788 or www.nhfarmandforestexpo.org.
- Feb 5-7** **New England Grows!**
Hynes Convention Center, Boston.
Info: www.NEGrows.org.
- Feb 19** **Introductory Plant Nutrition** and
Feb 26 **Advanced Plant Nutrition**
(flyer enclosed)
- Feb 27-28** **"Balancing the Systems". 2004 Winter Conference**—Ecological Landscaping Assoc., Boxborough, MA.
Info: www.ecolandscaping.org.
- March 1-4** **N.E. Reg. Turf Conference & Show**, Providence, RI. Info: 401-848-0004 or www.NERTF.org
- March 3-4** **Spring Kickoff for Landscapers** 
- March 10** **Perennial Plant Conference**, Univ. of Conn., Storrs.
Info: www.hort.uconn.edu/garden
- March 13-21** **New England Spring Flower Show**, Boston. Info. www.massshort.org
- March 17** **NH Landscape Association Spring Conference**, Auburn.
Info: www.nhlaonline.org
- April 2-3** **UNH Greenhouse Open House**, Durham. Info: Cheryl Estabrooke at 603-862-3200

Spring Kick Off for Landscapers!!

March 3 (Boscawen)
March 4 (Rochester)

9:30 a.m. - 3:30 p.m.

Free

For more info or to preregister, call:

David Seavey (Merrimack Co. Extension, 603-225-5505) -or- Geoffrey Njue (Strafford & Carroll Co. Extension, 603-749-4445)

Topics and speakers include:


- Weeds in Turf** - John Roberts, UNHCE
Woody Plant Diseases and Diagnosis - Cheryl Smith, UNHCE
Great Perennials - Jane Millon, van Berkum Nurseries (March 4 only)
Dwarf Conifers - Jon Lyons, Lyons Family Nursery (March 3 only)
Basics of Pond Construction - Hands on! - Chris Zimmer, Laguna Water Gardens

and a Jeopardy game, complete with prizes!!

Retirements

UNH Cooperative Extension is saying good-bye to four veteran Extension Educators this spring. **Nancy Adams** (Rockingham Co.) and **Bill Lord** officially retired December 31, 2003. **David Seavey** (Merrimack Co.) and **Bruce Clement** (current Ag. Program Leader) leave in April '04. David and Bill are planning a party in Concord on March 20—if you'd like to help them celebrate, contact Lynn Thurber at 225-5505 for details.

This newsletter is a cooperative effort of the Ornamentals Extension Educators and Specialists at the University of New Hampshire. It is published quarterly. It's purpose is to inform and update industry members on issues and research relevant to the production, use and maintenance of ornamentals and turf in New Hampshire. Contributors for this issue:

Paul Fisher, Extension Specialist, Greenhouse Management
Cathy Neal, Extension Specialist, Ornamental Horticulture 
Michael Sciabarrasi, Extension Specialist, Agricultural Business Management

Comments and questions are welcome...please call Cathy Neal at 603-862-3208. Address corrections, additions, and deletions should be faxed to 603-862-2717 or phoned in to Cheryl Estabrooke at 603-862-3200.