

CROSSSECTION



Fall

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LAKE SWCD, NURSERIES, AND WATER QUALITY CHAD EDGAR, URBAN STREAM SPECIALIST

Lake SWCD is partnering with local nurseries to monitor irrigation water quality and supply. These studies are our first effort to establish water quality values for water entering irrigation systems from adjacent land uses as well as water leaving agricultural operations. This study was funded by a grant from the Ohio Department of Natural Resources, as part of a larger effort to better understand irrigation issues in the Lake Erie basin. Field work was conducted by Lake SWCD and the Lake County Agricultural Water Coalition. Because of this work, reference data is now available to help understand current and future threats to the quality and quantity of irrigation water. It is the first step in developing water protection strategies for local implementation. Below is a summation of the findings.

Background

The nursery industries have formed the Lake County Agricultural Water Coalition to study water quality, improve water availability, and develop management practices to reduce excess water usage. High quality water is extremely important for the production of nursery and greenhouse crops; an 80-90 million dollar economic engine in Lake County. The need for high quality water requires careful planning and management to ensure that operations have adequate supplies for crop production. High quality irrigation water is especially important for greenhouse and nursery

production because impurities coat leaf surfaces, reduce plant growth and decrease the marketability of crops. Poor water quality may lead to excessively high salts and pH extremes in the substrate, nutritional problems, fouling of irrigation devices and algae growth. The Lake County Agricultural Water Coalition also felt the need to be proactive in determining if any water quality issues were being created downstream of these operations.

Sampling

Fourteen different nutrient and chemical values were sampled at ten locations on nursery operations in Perry and Madison Townships. Water samples were collected from irrigation ponds, streams, catch basins and drainage tile crocks; and were analyzed by a local water quality testing laboratory. The results were compared to published data on the recommended levels of nutrient and chemical ranges for nursery crops. The results were also

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POLLUTANTS THAT AFFECT THE NURSERY INDUSTRY:

Total Dissolved Salts (TDS) – a measure of the *concentration* of dissolved salts. Salt is not just the sodium chloride we know as table salt, but can also be dissolved calcium, magnesium, sulfate, and other compounds. Less than 1000 ppm of TDS is recommended in irrigation water and less than 1500ppm is recommended by OEPA, depending on other variables, for the protection of aquatic life.

Electrical Conductivity (EC) – the measure of the total dissolved salts in any solution. Recommended values for EC in irrigation water falls between 0.2 to 2.0 mmhos/cm (dS/m). High conductivity levels indicate a high concentration of salts which reduces water uptake and increases the uptake of unwanted ions by plants.

Sodium Adsorption Ratio (SAR) – the measure of sodium concentrations in water relative to calcium and magnesium. The recommended level of irrigation water is < 4 meq/l. Irrigation water having a SAR above 4 can result in sodium toxicity.

Sodium

Sodium toxicity is often expressed as marginal leaf burn on older foliage. It is a portion of the TDS measurement.

Chlorides

Though not usually considered an essential micronutrient, chlorides are needed in small quantities by plants. However, chloride levels greater than 100 ppm can become a problem. Too much chloride reduces the availability of water to plants and can lead to wilting.

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Tree Seedling Sale Details Inside

ANNUAL MEETING HELD

Lake County Soil and Water Conservation District held its 2010 Annual Meeting on October 21 at Grand River Cellars in Madison Township. Attendees enjoyed an appetizer and pizza bar, then settled in for a presentation by Lake SWCD staff on some of their recent accomplishments.

Awards were given to representatives of Madison Township and LeRoy Township. The townships have both passed riparian setback ordinances that assign different setbacks based on water quality. These ordinances will help protect the high quality headwater streams that maintain the health of larger streams and Lake Erie. Values were assigned based on research conducted by Lake SWCD over the last decade.

The Brown Family was also honored for the completion of their agricultural easement. The Browns have enrolled their North Perry Village farmland in the Farm and Ranchland Preservation Program. This will protect it as farmland, never to be developed.

Dick Baker, of North Perry, was reelected to the Lake SWCD Board of Supervisors.

A big “Thanks” to all of our door prize donors:

APR Tool, Aqua Ohio, Arcola Creek Nursery, Brotzman’s Nursery, CM Brown Nurseries, Cottage Gardens, Gilson Gardens, Grand River Cellars, Hellriegel’s Inn, Joey’s Italian Grill, Klyn Nursery, Lakehouse Inn, Sabo’s Woodside Nursery, Secor Nursery, Shreve Nursery, The Holden Arboretum, Lakeland Community College, Mackenzie Nursery Supply, ME Enterprises, April & John Niedzialek, Ohio Wine Producers Association, and Remi-Teas

Lake SWCD would like to thank the following donors for their contributions to the Conservation Auction:

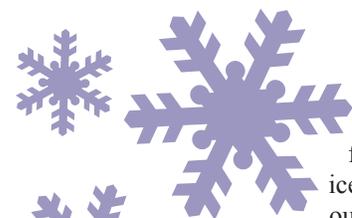
Rainbow Farms.....	Produce Basket
Mark Makee.....	Conservation Air Tour
Lake Metroparks.....	Birding Day Trip for 2
Quail Hollow Golf Course.....	Golf Foursome
Lake County Nursery.....	Four Ornamental trees
The Nature Conservancy.....	Tour of Morgan Swamp for Four
The Lodge at Geneva-on-the-Lake.....	Overnight Stay and Breakfast
Western Reserve Land Conservancy.....	Steelhead Fishing for Two

Award recipients were (clockwise from left): Ann, Kendra and Ken Brown (our apologies to Ken for the quality of the photograph) with Maurine Orndorff; Matt Scharver with Max Anderson and Larry Advy of Madison Township; and Matt Scharver with Chuck Klco of LeRoy Township. The Browns received a descendent of a Johnny Appleseed apple tree in honor of the closing of their FRPP easement and Madison and LeRoy townships were recognized for riparian protection ordinances enacted this year.



A FEW FACTS ABOUT SALT

BETH LANDERS, EDUCATION COORDINATOR



❄ The most environmentally-friendly way to manage snow and ice is to remove it manually - break out the shovel, plow, or snowblower.

❄ Rock salt does not work below 10° F. Adding more salt won't help. Sand will provide traction at any temperature.

❄ Get ahead to stay ahead. Applying salt (especially liquid brine) before the snow falls is more effective than waiting until it is piling up. You may have noticed local road departments have started brining the road before the snow falls - it reduces the amount of salt they use overall, and improves road safety.

❄ Warmer weather means less salt is necessary to melt the same amount of snow. If it is close to 32° F, you might only need to salt shaded areas

❄ Salt is not easily removed from water by natural processes. This means that it will move through ditches and streams to reach Lake Erie, or move through the soil into groundwater resources. This can affect the safety of drinking water supplies.

❄ Use of salt on public streets is driven largely by public demand for perfectly clear, dry roads almost immediately after a snow event.

❄ The increase in salt use negatively affects salting equipment, your car's undercarriage, roadside vegetation, groundwater, and surface water. Salty soils along the road also attract wild animals, increasing the risk of collision.

❄ High amounts of sodium in drinking water can harm individuals with heart or kidney conditions.

❄ Studies conducted in Wisconsin have suggested that half of the salt applied in a watershed comes from private plowing services. If you have a snow removal contract, talk with the operator about reducing the amount of salt he or she is using on your driveway.

❄ Check your tire pressure and tread wear. You will be safer on the roads if your car is well maintained.



NURSERY (Continued from page 1)

shared with Ohio EPA scientists to compare with surface water criteria.

Results

The results of the water quality sampling show generally acceptable values for irrigation uses, although some factors varied between sample sites. Most of the nurseries show similar trends in values, with most showing elevated levels of hardness, pH, salt and salinity. These parameters exceeded the recommended limit for irrigation water at most of the sample locations. The hardness and pH values are functions of the natural features of our local soils. High iron content in the groundwater along North Ridge Road is the likely culprit for the high hardness values. The salt issue is certainly complex. Multiple sources of salt are likely involved; however salt pollution from road de-icing activities are receiving extra attention in the scientific community. Proper siting of irrigation water sources; especially in areas that receive heavy salt applications; is prudent. Further research is needed to determine the source of high salt values, and the method by which this salt is being conducted to the irrigation sources.

Of the fourteen different tests run at each of the ten locations; none were found to be above the OEPA criteria for the protection of aquatic life in surface water. When the samples were shared with scientists from the OEPA; all of the values were determined to be "as expected" and no alarming issues were found.

While testing of additional water quality standards; sampling sites, and seasons is necessary; the initial data suggests that the nursery operations in Lake County are not a source of water chemistry problems. In fact, the trend of lower levels in the stream and higher in the irrigation ponds would suggest that the nurseries could be a "sink" for pollutants rather than a source. Additionally, the high salt levels found in the irrigation water on many of the nurseries would suggest that the nurseries could be at risk from adjacent land uses rather than vice-versa.

POTENTIAL (Continued from page 1)

pH – a measure of the acidity of a solution. The generally accepted pH range is 5.4 to 6.8 for irrigation water and 5.2 to 6.3 for the substrate solution, but can vary by crop. Ohio EPA water quality criteria for this area is 6.5 to 9.0. Availability of micronutrients such as iron, manganese, zinc, copper and boron can be severely reduced by pH above 6.8.

Alkalinity – ability of water to neutralize acids or buffer water from a change in pH. The recommended value for irrigation water is <100 ppm. Elevated levels of alkalinity contribute to increases in pH to unacceptable levels for plant growth.

Hardness – the measure of dissolved calcium and magnesium in water. The recommended level of irrigation water hardness is <150 ppm. Excessive hardness can damage watering equipment.

Calcium, Magnesium, Sulfur (Macro Elements) Concentrations of calcium, magnesium, and sulfur should be analyzed for fertilizer requirements and proper balance of the calcium-magnesium ratio in substrate solution. An elevated sulfur level is a common symptom of fertilization issues.

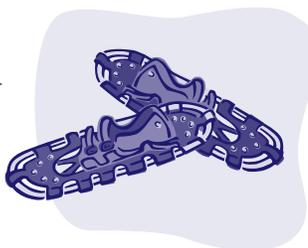
Nitrogen, Phosphorus, Potassium (Macro Elements)

The concentration of nitrogen, phosphorus, and potassium should be evaluated as a potential contaminant to irrigation water. Concentrations of nitrogen or potassium greater than 10 ppm and/or phosphorus that is greater than 1 ppm suggests contamination. Likely sources are fertilizers, failing septic systems, manure runoff or other organic sources.



WHO WANTS TO BE A CONSERVATIONIST?

Winter is upon us, and in Lake County that means snow. Lots of snow. While you are out shoveling, snowshoeing, skiing, or sledding, take a few minutes to apply these words that describe snow.



Terms:

- | | | |
|--------------|---------------|------------------|
| 1. corn snow | 7. hoarfrost | 13. snowpack |
| 2. crust | 8. powder | 14. snow pellets |
| 3. dendrite | 9. slush | 15. suncups |
| 4. glaze ice | 10. snowdrift | 16. windpack |
| 5. graupel | 11. snowflake | |
| 6. hardpack | 12. snowman | |

Definitions:

- A. hard cohesive layer overtop of softer snow
- B. new fallen snow that hasn't sintered or metamorphosed
- C. larger than snow grains but smaller than graupel; formed the same way.
- D. depressions in the snow caused by sun melting
- E. the total snow and ice on the ground, including both new snow and the previous snow and ice which has not melted
- F. crust of snow formed by the action of wind
- G. frost that grows outward from its substrate
- H. snow that has partly melted and refrozen and acts like ball-bearings
- I. rain that falls on supercooled objects and immediately turns to ice
- J. wet snow
- K. hexagonal ice crystals with complex and often fernlike branches.
- L. snow that collects in a ridge due to wind
- M. large balls of snow piled on top of one another to resemble a person
- N. a cluster of ice crystals that falls from a cloud
- O. snowflakes that become rounded pellets due to riming.
- P. snow that has been packed to the point where it does not yield to body weight

Answers:

LAKE COUNTY SOIL & WATER CONSERVATION DISTRICT

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 1-800-899-LAKE ext 2730

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WEB SITE: WWW.LAKECOUNTYOHIO.GOV/SOIL

DAN DONALDSON, District Administrator	350-2030
CHAD EDGAR, Urban Stream Specialist	350-2032
BETH LANDERS, Education/Information Coordinator	350-2033
MAURINE ORNDORFF, Agricultural Programs Technician	350-5863
AL BONNIS, District Conservationist, NRCS	437-5888
JOHN NIEDZIALEK, Western Reserve RC&D Coordinator	350-2034

BOARD OF SUPERVISORS

DICK BAKER (1998-2006, 2008), NORTH PERRY, VICE CHAIR
BILLIE KAMIS (2006), WILLOUGHBY HILLS, CHAIR
BRUCE LANDEG (2007), MENTOR, FISCAL AGENT
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MEMBER OF:

- American Farmland Trust
- Lake County Farm Bureau
- Nursery Growers of Lake County Ohio
- National Association of Conservation Districts
- Ohio Federation of Soil & Water Conservation Districts

AN EQUAL OPPORTUNITY EMPLOYER: All Lake SWCD and USDA programs and services are available without regard to race, age, gender, national origin, political beliefs, color, religion, disability, sexual orientation, or marital or family status.

The public is invited to attend Lake SWCD's monthly Board meetings, held the fourth Tuesday of the month at 3:00 pm at 125 East Erie St., Painesville. Meeting announcements appear under the public agenda in the News-Herald and on the Lake SWCD website. Please call in advance to let us know you will be attending.