Green Grass, Clear Water: Can We Move Lawn Care Behaviors Toward More Water Quality-friendly Practices?

Julia Peterson
N.H. Sea Grant Extension Program Leader and Specialist, Marine and Water Resources

ME-NH Beaches Conference
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Eutrophication

Nitrogen

Phosphorus

These nutrients cause an increase in phytoplankton.

Sediments from land block sunlight.

SAV Die

Phytoplankton grow on the leaves of SAV.

Algal Bloom

Algae Die

Decay

Oxygen

Lose: Food, Habitat & Oxygen Production

Nitrogen Sources

Illustration: sccwrp.org

Photo: K. Guillard
Nitrogen in Great Bay

Total Nitrogen
1,225 tons/yr

Total Nitrogen Loads to the Great Bay Estuary from Different Sources in 2009–2011
(Total: 1,225 tons/yr)

Sources of Non-Point Source Pollution:

- Lawn Fertilizer
- Animal Waste
- Atmospheric Depo.
- Septic Systems
Today:

1. Introduce a regional, integrated lawn care-water quality project
2. Identify a few key social science findings about lawn care and WQ
3. Introduce some outreach products that integrate natural and social research
4. Share lessons learned
Changing Homeowner’s Lawn Care Behavior to Reduce Nutrient Losses

USDA/NIFA 2006-51130-03656
What We Had to Work With

• USDA Regional Water Program
  • multiple land grant institutions
  • multiple discipline experts
  • collaborative relationship
  • regional funding; *got project funding*
  • shared problem and *shared objectives*
  • strong relationships with partners – *advisory team*
Primary Challenges for Outreach/Extension

• Variable fertilizer recommendations across states
• No site specific nitrogen soil test for turf
• Uncertainty about drivers of homeowner’s (DIY) yard care practices
• Uncertainty about willingness and ability to change practices
Crossing Disciplines

Natural Sciences

New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations For Lawns Based on Water Quality Considerations

Social Science

Respondents' Mean Levels of Willingness to Engage in Practices to Reduce Nutrient Leaching and Runoff from Their Lawn (1=Not willing; 5=Very Willing)
Cross Research, Education and Extension

**Research**

**RESULTS**

**Relationship Between Soil Nitrate-N and Turf Reflectance**

Significant ($p < 0.01$) LRP and QRP models were obtained for the CM1000 and NDVI reflectance meters for Kentucky bluegrass and tall fescue when data were pooled across three years. The responses suggest that Kentucky bluegrass color is optimum when soil nitrate-N is between 11 to 16 mg kg$^{-1}$. For tall fescue, color is optimum when soil nitrate-N is between 5 to 10 mg kg$^{-1}$. Beyond the optimum soil nitrate concentration range for either grass, there is a linear relationship; however, there will be an increased risk of chloride leaching. Between meters with respective plateau models for Kentucky bluegrass are less N than Kentucky bluegrass for maximum chlorophyll content.

**Extension**

![Banner: Bangor Area Storm Water Group]

**Most of your neighbors don't use lawn chemicals, such as fertilizers and pesticides, on their lawns.**

Join your neighbors in helping to protect our families and community by reducing your use of lawn chemicals.

We Sell Ducky Approved Products. Look for the Ducky! For more information visit www.BASWG.org!
Augmented TPB (Ajzen and Fishbein) Theoretical Model of Hypothesized Relationships Influencing Lawn Care Behavior
Water Quality Friendly Lawn Care Recommendations

New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations
For Lawns Based on Water Quality Considerations

Compiled and edited by Karl Guillard, PhD, University of Connecticut, Plant Science

USDA CSREES (now NIFA) project # 2006-51130-03565
Social Science Results and Recommendations for Outreach

Brian Eisenhauer, PhD
Plymouth State University

From Report of Social Science findings from Changing Homeowner’s Lawn Care Behavior to Reduce Nutrient Losses in New England’s Urbanizing Watersheds
Green Grass & Clear Water

Water quality friendly lawn care and fertilizer recommendations for northern New England

According to a recent survey, it is likely that you and your neighbors believe having a lawn that is safe for the environment is very important. However, some lawn care practices can create water quality problems. Excess nutrients including nitrogen and phosphorus found in fertilizers, that run off into streams and other bodies of water, can cause problems for aquatic life and kill fish and other aquatic life.

In order to have the environment we are protecting, we need to stop doing things that are harmful. This page includes tips on how to have a green grass and a clear water.

Simple Recommendations for Every Lawn

1. Choose the Right Grass Seed
   - Consider selecting lawn areas to locations where grass will grow easily and will also be used for outdoor activities.
   - Choose grass varieties that require less maintenance. For northern New England, choose seed mixes with higher percentages of turf type fescue, creeping type fescue and/or bluegrass. Choose mixes with lower percentages of Kentucky bluegrass and/or perennial ryegrass.
   - In shaded areas, select shade tolerant turf grasses like fine-leaf fescue and tall fescue.

2. Don't Overwater
   - Avoid using one inch of water per week to the point of runoff. Overwatering can lead to a loss of nutrients and disease in lawns.

3. Test Your Soil
   - Homeowners applying the soil on a regular basis need to determine the amounts needed for lawns. A soil test is the only test needed to determine the amounts needed to improve lawn. The soil test should be completed every three years.

4. Mow Smart
   - Mow grass no higher than 2.5 inches. If grass is cut more than 3.0 inches, it is more likely to be cut off, which increases the chances of a disease. If grass is cut lower than 2.5 inches, it is more likely to be cut off, which increases the chances of a disease.

5. Choose the Right Fertilizer
   - Do not apply any fertilizers within 25 feet of water bodies in their homes.

For more information:
www.extension.unh.edu/Sustainable-Landscapes-and-Turf

Julia McEwen
Water and Marine Resources Extension Specialist
603.862.1070

Maryann Hogan
Food and Agricultural Extension Field Specialist
New Hampshire Cooperative Extension
mahan@unh.edu
603.862.1000

Sea Grant New Hampshire Outreach Program
This program is supported by the National Sea Grant College Program, National Oceanic and Atmospheric Administration, and the University of New Hampshire.

For additional resources, please visit:
www.extension.unh.edu/Sustainable-Landscapes-and-Turf
Outreach products – CT, MA, NH, RI, VT

• Workshops, trainings, skills clinics, library programs
• Community festivals, booths, press releases, SD stenciling, doorhangers,
• Flyers, fact sheets, newsletters, articles, book marks, sticky labels, brochures, guides, manuals
• Video clips, commercials, TV spots
• Websites, social media
• Prompt kits
Social Research Methods

• Stage I
  • Qualitative = In depth interviews of opinion leaders (N=52)

• Stage II
  • Quantitative = random sample survey in five purposively selected urbanizing watershed communities (1/state) (N >1100)
  • 40.8% response rate
Qualitative Results: Sample Key Findings

• OL believe there is a lack of recognition that home lawn fertilization techniques are linked to water quality.

• Concerns that DIYers inaccurately identify organic fertilizers as a solution to nutrient leaching.

• Many OL felt that alternative fertilizing methods would achieve results that satisfy most DIYers.

• It is perceived that the acceptance of prescribed lawn care practices will hinge on levels of time, money, and labor needed to carry out the recommendation.
What Matters to People in New England Regarding Lawns?
What Are Respondents Currently Doing?
Number of Hours per Week Respondent Spends on Lawn Care

- 0-1 Hour: 30%
- 2-3 Hours: 51%
- 4-5 Hours: 14%
- 6-7 Hours: 2%
- 8 Hours or More: 2%
Respondent's Level of Agreement that they Enjoy Spending Time on Lawn Care

- Strongly Disagree: 8%
- Disagree: 17%
- Neutral: 27%
- Agree: 38%
- Strongly Agree: 10%
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What Does Respondent do with Left-Over Fertilizer?

- Use up all Fertilizer to Avoid Surplus: 41.2%
- Store it for Later Use: 38.7%
- Lawn Service Applies Fertilizer: 19.1%
- Other: 1.9%
- Throw Away: 1.1%
What Do They Want? (Values and Attitudes)
Respondent's Level of Agreement that they Want their Lawn to Look Good Enough to Fit in With the Community

- Strongly Disagree: 2.1%
- Disagree: 8.6%
- Neutral: 20.0%
- Agree: 54.4%
- Strongly Agree: 15.3%
- Missing: 2.3%
What Are Their Specific Information Needs?
Agreement that Using Organic Fertilizers Adresses Water Quality Issues Related to Fertilizer Use.

- Strongly Disagree: 1.6%
- Disagree: 9.7%
- Neutral: 38.9%
- Agree: 37.4%
- Strongly Agree: 12.4%
Bangor Area Pilot

• Following the principles of CBSM, findings from the research, and partnering with the BASWG a multifaceted approach was developed:
  • Doorhangers
  • Storm drain stenciling
  • Website
  • Business partnerships
Evaluation Results to Date (~2009-2010)

1. Did behavior of target audience change?
   - Surveys indicate 55% of respondents experiencing Extension programs use less “lawn chemicals”, but only 25% were being reached by Extension in past 3 years regarding lawn care. Need more dissemination.

2. Which message framing is most effective?
   - Normative framing was most effective at stimulating behavior change.

3. What is the assessment of project overall by key stakeholders?
   - Project consistently viewed as high quality and producing valuable environmental and social science. Needs more dissemination!
Where are we now?

https://extension.unh.edu/tags/landscaping-water-quality

https://extension.unh.edu/tags/home-lawn-care
Lessons learned

• Working across disciplines (natural and social science, agriculture and water quality) improves message content, framing, delivery and acceptance.
  • Find willing, enthusiastic partners
  • Plan more time, money and effort than you think you’ll need
  • Invest in co-learning
  • Use the investment for the long haul, evolve and keep testing