

Introduction

Well-informed landscaping practices are especially important for those of us who live in an environmentally sensitive area, like the watershed of a nutrient-sensitive lake, or a public water supply, or stream or river with valuable aquatic habitat. This guide is intended to accompany a set of ten excellent NEMO fact sheets that help homeowners reduce their contribution to "non-point source pollution" and thereby protect downgradient water quality. Connecticut's NEMO program (Non-point Education for Municipal Officials) has produced the series, which is called "Clean Waters - Starting in Your Home and Yard." **Fact sheets may be downloaded free from the NEMO web site, and are listed below.**

Clean Waters

#1: What's the Big Deal About Water Quality? 1999. (PDF - 99K)

#2: Managing Your Household Chemicals. 1999. (PDF - 85K)

 # 3: Caring for Your Septic System. 1999. (PDF - 76K)

#4: Integrated Pest Management for the Homeowner. 1999. (PDF - 102K)

#5: Conservation Landscaping for Water Quality. 1999. (PDF - 114K)

#6: Animal Waste and Water Quality. 1999. (PDF - 76K)

#7: Going Native - Rethinking Plant Selection for the Home Landscape. 1999. (PDF - 189K)

#8: Lawn Care the Environmentally-Friendly Way. 1999. (PDF - 92K)

#9: The Four Seasons of Water Quality protection. 1999. (PDF - 71K)

#10: Conserving Water at Home. 1999. (PDF - 64K)

#11: Environmentally Responsible Boating. 1999. (PDF - 66K)

Maybe be downloaded free from the end of the long publications section of the NEMO website.

http://nemo.uconn.edu/tools/publications.htm

Guidance during Lot Preparation and Turf Establishment

- **Retain Selected Trees.** Consider carefully where to establish lawn. Mark mature, attractive trees to be saved before grading. Hickories and oaks with taproots tolerate nearby grading better than ashes and maples. Partly shaded lawns need much less watering and suffer less heat stress, although deep shade can promote turf disease. Most groundcover alternatives to lawn, like pachysandra, sweet woodruff, ferns, & periwinkle, thrive in shady conditions.

- **Assess Existing Ground-layer Vegetation** and try to preserve what is suitable to incorporate into the home landscape. Forested portions of the lot may already have large areas of attractive, even groundcovers like princess pine, Virginia creeper, Pennsylvania sedge, huckleberry, or hay-scented fern, that can be favored by selective weeding. Native shrubs like the viburnums & hazelnut will bloom and fruit more heavily & grow denser in the increased light of a yard.

- **Minimize Topsoil Loss** during site preparation**,** so that the soil in the new lawn will have abundant, beneficial micro-organisms that *release bio-available nitrogen* and *resist turf diseases*. Biologically active topsoil will cut down future needs for fertilizer and fungicides.

- **Stockpile Topsoil** and re-spread after grading, but not for more than a few months. Many soil microorganisms don't survive extended storage.

- **Test the Soil** at the UConn Soils Lab (860 486 4274) to determine phosphorus and lime application rate. Request a phosphorus saturation test. 10 lbs/acre of available phosphorus is the target. *Phosphorus incorporated into the seed bed will be available to plant roots for many years to come, so phosphorus fertilizer won't be needed*, and phosphorus will *not* be washed off the lawn surface in runoff, towards downstream wetlands and streams.

- **Incorporate Phosphorus** (P_2O_5) into the top six inches of soil during seedbed preparation, as well as dolomitic limestone and potassium. Phosphate rock fertilizer is available from garden centers. One inexpensive, outstanding lawn starter, with trace minerals, phosphorus, nitrogen, & calcium, is available only in bulk from Agrigulf@bellsouth.net (601) 928 5837.

- **Low Maintenance Grass Mix.** UConn Extension (Home & Garden Section (860) 486 6271) recommends a grass mix with a high proportion of fine fescues, with low fertilizer and watering needs and good shade tolerance. See UConn Lawn Construction & Maintenance Fact Sheet # 58, which can be ordered on-line. Note that some grass varieties have actually been bred for high mowing and fertilizer needs, to better support the landscaping industry.

Example of a "forest preserve" yard in Avon Connecticut; it is mostly "walkable" woods, with leaf litter and scattered forest plants, and the lawn is small.

Massed aromatic bayberry as a backdrop for perennial native prairie grasses (Little Blue Stem) along a mowed trail, free of ticks.

Tips To Keep Nutrients from Downstream Waters

- **NEMO Clean Waters Fact sheet on Lawn Care** provides excellent guidance on caring for your lawn to maximize turf health, tips like the time of day to water and optimal grass length. Aside from choosing a low/no phosphorus organic, slow-release fertilizer, the following are a few highlights important for protecting downstream waters.

- **Test Soil regularly.** Instructions and form are included.

- **Apply Phosphorus Fertilizer after Aeration.**
  In the unlikely event that a soil test does shows a need for Phosphorus (0-10 ppm using the Bray Phosphorus test), the best way to get phosphate to plant roots where it is needed is to apply fertilizer immediately after core aeration, and then wash it into the holes. An innovative way to aerate is walking around yard with 1.5 -inch spikes strapped onto shoes (order from Gardeners' Supply, on-line).

- **Recycle Grass Clippings.** They are a slow release fertilizer, and reduce fertilization needs. If they are very thick, they can be composted, mixed with leaves or wood chips, and applied back onto lawn in a very thin layer (a quarter inch) as a topdressing.

- **Sweep** Grass Clippings, Weeds, Leaves, and Spilled Fertilizer from Pavement by your lawn and your Driveway. This nutrient-rich debris will wash into catch basins and storm sewers towards downstream waters.

- **Pet Waste** - don't let it wash into catch basins. Pet waste is also a source of water-polluting nutrients, as explained in the NEMO Clean Waters Fact sheets. Picking up after your dog along the sidewalk and street keeps nutrients from the storm drainage system. Waste may simply be picked up with a scoop and carried a short distance to a natural area (not a private, landscaped yard) where it will wash into natural terrain, not storm drains. Or walk your dog well away from the street or any stream, where droppings will only fertilize the natural vegetation.

Pesticide Risks

Pesticides are certainly effectively screened for strong carcinogenicity and a variety of health impacts. However, public health data is also mounting regarding human health risks from pesticides that did pass EPA safety screening protocols. Several like diazinon were finally taken off the market, several years after health risks were proven. Public mainstream concern is growing, based on epidemiological data (higher incidences of certain disease problems among pesticide users), although risks may often be overstated by pesticide opponents. Some pesticides' active ingredient(s) are highly mobile in soils or highly soluble in water; others are less so. Watch out for warnings on pesticide labels regarding wells and streams. Human metabolism is highly complex and it is not practical to test pesticide interactions or all pesticide breakdown products. Individuals also vary in their sensitivity to different chemicals. Evidence is also mounting that children are typically more sensitive to pesticides than adults.

The Connecticut legislature weighed a large body of evidence, and finally passed a bill in 2005 banning pesticide use on lawns at daycare centers and elementary schools.

There are admittedly health risks from tick-borne disease and from a few kinds of mosquitoes. Consider mowing and maintaining relatively *broad paths through natural areas as an alternative to spraying* for ticks. Children can be taught to recognize and avoid poison ivy, which can be pulled out (if one wears gloves and protective cloths) and/or or spot treated rather than broad-cast sprayed. Tick checks before bed are also effective. Family physicians reassure those with bites that a tick must be well embedded for many hours before disease can be transmitted.

When planning their yard care strategy, homeowners can consider risks to….

- ❖ downstream waters and wetlands
- ❖ potential impacts to the health of their families and pets
- ❖ wells and the drinking water supply
- ❖ and impacts on backyard and local wildlife.

NEMO Clean Waters Fact sheets # 5 and # 7 provide advice on **alternative landscaping approaches to lawn** that reduce nutrient loading, have low susceptibility to pests, and also provide beauty and attract wildlife.

Landscape a significant portion of the yard with alternatives to turf. This approach can also be used during initial landscaping in consultation with the new homeowner. Many of the groundcovers suggested below need very little maintenance or fertilizer – and no mowing. Another lawn alternative, more labor intensive but very attractive, is the bed of ornamental perennials, mulched with woodchips. See the appended illustrations.

- Low-maintenance, spreading groundcovers such as low juniper, periwinkle, pachysandra, violets, sweet woodruff, mayapple, Lunaria, daylilies, and bee balm. Groundcovers can be higher in less used, outer portions of the yard.

- massed low shrubs, such as junipers, bayberries, azalea, womged sumac, or gray dogwood

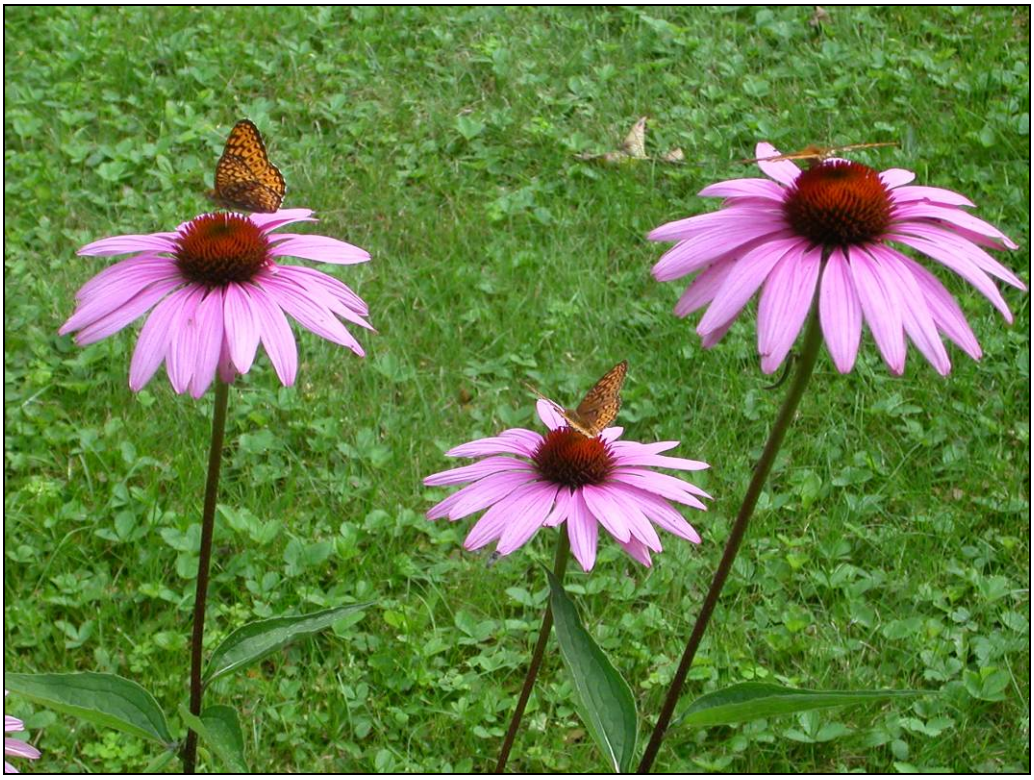
- formal perennial flower beds, with bark mulch, with horticultural and/or native perennials. Native ferns and warm season grasses like Indian grass, Switchgrass, and Little Bluestem make attractive accent plants with very low fertilizer needs.

- “hayfield” (the tall golden grass look) in side or rear yards or in front yards of large lots; appearance is enhanced by a post and rail fence, which also separates tall grass area from mowed play areas

- wildflower meadow, from a native wildflower seed mix or naturalized.

A streetside wooded buffer provides privacy and filters noise and air pollution from care exhaust.

Cranberry viburnum, a native with ornamental value. Over a dozen shrubs native to the northeastern U.S. are shapely with fine displays of fruit and/or flowers or tasty nuts. These include the dogwoods, the viburnums, the native azaleas, and chokeberries (*Aronia*). The red twigs of silky dogwood are bright year-round, and high bush blueberry and winged sumac are also colorful in autumn. Mountain laurel, hawthorns, viburnums, and hazelnut form dense privacy screens. Bayberry and spicebush are aromatic, with oil-rich fruits for birds. Steeplebush and sweet fern are low groundcover shrubs, the former for moist soils, the latter for dry slopes. Most of these shrubs are now available from in-state nurseries; photos and information on heights, growth preferences can readily be found on the internet, though google.



These coneflowers have attracted three fritillaries. Landscaping without chemical herbicides and insecticides protects butterflies, and many other beneficial or harmless insects. Note the clover intermixed with grass in this photo. Clover and other members of the pea family take nitrogen out of the air and "fertilize" the soils. A mimosa tree will Fertilize your lawn.

Guidance for Fertilizer Selection

Organic Fertilizers foster your **soil's microbial community**, which stores and slowly releases nutrients, and helps the soil resist diseases. A wide range of organic fertilizers are available, with variable phosphorus content. These range from composted cow manure hauled from a farm … to home compost … to sophisticated products derived from fish and kelp, bloodmeal, bonemeal, crab and shrimp shells, chicken feathers, chicken byproducts, soybeans and sewage sludge. Coated Urea is a synthetic, manufactured "organic" compound which does slowly release nitrogen, but *without* the soil benefits of natural organic fertilizers. Life forms in healthy soil include earthworms, fungi, bacteria, micro-arthopods, bacteria, nematodes etc.

No-Phosphorus or Low Phosphorus Fertilizers protect downstream waters from the key nutrient that causes algal blooms and eutrophication. Most Connecticut soils do not need **ANY** additional phosphorus, especially if it was incorporated during turf establishment. Compare with annual loading from Scott's Turf Builder of 20 lbs /yr. **Warning:** Most, but not all organic fertilizers are low in phosphorus. For example, phosphorus content in organic fertilizer products made from chicken meat meal (Bradford) and chicken manure (Chick-Chick) is quite high, and will **not** protect sensitive downstream waters. Before buying a new type, do a simple calculation to find out the actual rate of phosphorus application per acre per year; a worksheet and instructions are included in this section of your binder.

Recommended Fertilizer Products

- **RENAISSANCE**

  6-0-6 Lawn Food (a soy and grain product) **No Phosphorus.**
  5-5-5 Garden fertilizer (from chicken feathers)
  9-0-0 Corn Gluten Meal (also a preemergent herbicide). Slow release, organic fertilizers.
  Rennaisance and other organic landscaping products are distributed by OMRI and NOFA East Cost distributer: PJC Ecological Landscaping, @pjcecological@aol.com, 252 Dodge Rd, Rowley, Mass. 01969, attn. Pam and Fred Newcombe. Phone: 978 432 1019; manufactured & delivered by a mill in Manchester, CT; Phone: 9678 432 1019. May also be picked up there. (2 pallets or more). Discounts for Larger orders (homeowners or condominium associations).

  Rennaissance Fertilizers, Inc: Phone: 952 472 6042, 2300 Totem Trail, Minnetonka, Minnesota 55305. e-mail ajh@organicfertilizer.com ; Fax 952 472 6044. Best procured through the one of the accredited organic landcare professionals in Connecticut, listed on-line at http://www.organiclandcare.net/ organiclandcare.net.

- **AGGRAND** 4-3-3, liquid product derived from Kelp and fish meal (order on-line). Applied several times a year at very low rate (less than five pounds phosphorus per acre per year and assimilated very quickly by grass blades (foliar uptake). Used by golf courses, odor free, this product is well suited to those seeking a manicured look. Comes in quart bottles, at a reasonable cost due to low application rate (about $8/1000 square feet/year) Available on-line with discounts for groups of neighbors or retail stores. Only **1.6 pounds phosphorus per year**, applied at rate for a fescue lawn.

- **Arbico's Organi-Grow** 4-2-4 is another liquid organic fertilizer available on line with 2% phosphorus.

Add Other Fertilizer Products that you have located:

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Availability

Certain garden centers carry organic fertilizer products. Some, mostly fish-derived fertilizers, are available retail. MILORGANITE is available at Lowes. Composted cow manure is a great soil conditioner (with low nutrient levels) available from garden centers or farms.

They can also often be procured from one of the accredited organic landcare professionals listed on-line at http://www.organiclandcare.net , even if the homeowner wishes to take care of most of their landscaping without professional help.

Internet availability is widespread, although shipping costs add to the price. Neighbors can arrange for group mail order discounts, for AGGRAND (liquid kelp fertilizer) for example, or request that their local hardware store carry the product, or guarantee a market for a bulk fertilizer shipment.

Homeowners can get together and order larger quantities or in bulk.

Strawberry is a groundcover with flowers as well as homegrown food. Straw mulch controls weeds. Note that pesticide usage with this particular crop is particularly high by most commercial growers, due to its susceptibility to several fungus pests. Moving strawberry beds to a new part of one's yard every few years, is often a satisfactory solution.

Virginia Creeper is an excellent groundcover and vine that does not harm trees; it turns bright red in autumn.

Bittersweet, by contrast is a very troublesome and persistent invasive vine that does kill trees. One can control it without broadcasting herbicides by cutting vines in late summer to early fall and carefully painting the cut vine stump with herbicide: full-strength Brush-B-Gon. Triclopyr, the active ingredient, is not known to have harmful health effects, except from splashing in eyes. Goggles & gloves are recommended.

Run the Numbers – Calculate the Phosphorus Application Rate… Some Organic Fertilizers Have High Phosphorus Content.

Before you buy, compare both costs and nutrient-loading hazards of different fertilizers. Consider the **application rate per year**, as well as the **percentage phosphorus**. An organic product may seem expensive and may not appear to be a low phosphorus fertilizer, based on the N-P-K percentages (nitrogen, phosphorus, and potassium). But the product may in fact protect downstream waters, and be inexpensive, if little phosphorus is applied to a given area of lawn, *because the application rate is low* (e.g. Aggrand 4-3-3)**.**

Three Examples of Phosphorus Loading Calculations:

Aggrand 4-3-3 Fish Emulsion and Kelp Liquid Ferilizer is applied at a rate of 1 quart (**2.5** pounds) / **8,000** square feet to a fescue lawn (1 quart /3000 sq. feet for a blue grass lawn), **4** X a year. 43,560 square feet are in an acre.
43,560 square feet / 8000 square feet= **5.4**.
Total fertilizer applied per year, per acre = **2.5 lbs X 4 X 5.4 = 54 lbs.**
Amount phosphorus applied per acre per year **=** 3 % of total (54 pounds) **=** **1.6 lbs/acre/yr.** This is very low.

Gardener's Supply All-Purpose 5-5-5 is applied at a rate of **5** pounds per **200** square feet, once a year. There are 43,560 square feet in an acre.
43,560 / 200 = **217.8**.
Total fertilizer applied per year, per acre **= 5 lbs X 1 X 217.8. = 1089 lbs.**
Phosphorus applied = **5%** of total (1089 pounds) = **54.45 lbs/acre/yr.** This is high, though slow release, and good for soil.

Scott Turf Builder Fertilizer 29-3-4 is applied at the rate of **15.52** lbs/ 5,000 square feet, **5** times per year. There are 43,560 square feet in an acre.
43,560 / 5000 = **8.71**.
Total fertilizer applied per year, per acre **15.52 lbs X 5 X 8.71 = 676 lbs.**
Phosphorus applied = **3%** of total (676 lbs) = **20.28 lbs/acre/yr.**
This loading rate is too high, and the product is not organic.

For Rennaissance 6-0-6 , calculations are unnecessary, since it has NO phosphorus!

PHOSPHORUS LOADING WORKSHEET (set up like a tax form).

1. No. of pounds of fertilizer in container _____

2. Recommended coverage (sq. feet) for a container _____

3. No. of applications per year _____

4 = No lbs /acre/application.
Divide 43560 (square ft./acre) by #2 _____

5. = Percentage by weight of phosphorus in fertilizer: ____%

6. = No lbs fertilizer applied/acre/year.
Multiply #1 X #3 X #4. ____

7. **=** No lbs **phosphorus** applied/acre/year. Multiply #6 X #5)

COST WORKSHEET

8. **=** Cost per container**.** _____

9. **=** Cost per pound. Divide #8 by # 1 _____

10. = Cost per year. Multiply #9 X #3 X #4 _____

Yard Stewardship Guide was written by Sigrun N. Gadwa, Carya Ecological Services, LLC, of Cheshire, Connecticut. It was initially produced by REMA Ecological Services, LLC, Manchester, Connecticut for Rand Construction, Inc., and continues to be updated. Layout is by DCL Creative, Greenfield, Massachusetts. 3-19-09