Organic Lawn Management

Nov 15th Green Gardening IPM Workshop

Graham Haroldson

So you have taken over a chemically managed lawn and wish to convert it to be organically maintained.

- Assumptions and observations (hypothetical)
  - The lawn is relatively free from weeds
  - The lawn is the color of deep, not from nature green but has a deep thatch layer from too many high nitrogen apps.
  - Due to the repeated use of pesticides, fungicides and herbicides, the lawn has a reduced population of beneficials.

Assumptions and observations (hypothetical) continued

- The lawn is maintained (mowed and watered) by the homeowner (or mowed by the homeowner and mowed/tidied by a neighborhood landscaping outfit).
- The soil is compacted
  - * no aerations
  - * clippings being hauled away
- The lawn is very short and a 2’ perimeter around the edges is extra short with moss taking over.
- Watering is being done at 10min durations every other day of the week.

Client Contact

- Of utmost importance. The client may have many reasons for switching to organic. Identifying these reasons will reinforce the decision
  - Client participation dictates success with every step
    - reach an understanding
    - reality check: coming from a chemically maintained landscape the homeowner may have unreal expectations about what the lawn will look like
  - Make a timeline
    - The lawn may go into shock from the lack of synthetics
    - The lawn may take at minimum, one year to come around with the slower release fertilizers and getting microbial activities functioning
    - Immediate timelines are needed to establish proper mowing and watering schedules.

Soils and soil chemistry

- Nutrient cycling:
  - All plants cycle nutrients, using and returning nutrients to the soil
  - The leaf uses elements from the soil and clippings and water.
  - All elements are exchanged for each other.
  - Many different life forms are utilized here.

Cation Exchange

- Ions; positive and negative molecules are held within the soil
  - micronutrients & macronutrients
  - Plant roots exchange molecules within the soil
  - Soils with higher organic material content have more available ions to exchange
pH
→ Stands for potential hydrogen
→ Directly impacts the availability of nutrients in the soil
→ Can be adversely affected by applications

<table>
<thead>
<tr>
<th>pH Level</th>
<th>Strong acid</th>
<th>Medium acid</th>
<th>Slightly acid</th>
<th>Very slightly acid</th>
<th>Moderately alkaline</th>
<th>Moderately acidic</th>
<th>Strongly alkaline</th>
<th>Strongly acidic</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0-4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6-5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1-5.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.6-6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1-6.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6-7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1-7.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.6-8.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1-8.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.6-9.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1-9.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.6-10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Soil Biology / Soil Food Web
- Bacteria
- Nematodes
- Fungi
- Arthropods
- Protozoa
- Earthworms

Beneficial Fungi
aka: mycorrhizae
- Mushroom "roots"
  - Greatly increase the plant’s root zone (100x). Able to exploit vastly more soil area and fit into smaller spaces roots can’t fit
  - Produces antibiotics for the host plant
  - Increased pathogen resistance
  - Carries nutrients to the plant
  - Creates usable nutrients through enzyme production

Beneficial Microorganisms
- Bacteria and microbes
  - Some bacteria are stimulated by mycorrhizae
  - Major players in the breakdown and re-mineralization of organic matter
  - Able to suppress soil-borne pathogens

Compost Tea
- Exponentially breeding soil microorganisms
- Fighting the good fight
- Adds humic acids
- Helping to jump start biological activities in the soil

Best Management Practices For Turf
- mowing
  - Frequency: every 4-7 days
  - Height: 2.5-3.0
  - Keep mower clean/sharp
  - Try to mow when it's dry to prevent fungal issues
Mower etiquette

- Mow with the outside tire as far as possible from the turf’s edge.
- Change patterns frequently to prevent ruts and striping.
- Never remove more than 1/3 the total grass blade.

Line Trimmers

- Fig. A- horizontal plane should not be used.
- Fig. B- vertical plane O.K.
  - Causes scalping/unnecessarily short areas of turf
  - Promotes moss and weak turf
  - Only possible reason, aesthetics

- Used to create clean edges around the turf edge.

B.M.P. cont.

- Mulch mowing
  - When done properly does not add to thatch.
  - The mower used must be able to adequately chop cut blades into small pieces.
  - Should only be done on a disease free lawn.
  - When done properly does not add to thatch.
  - When done properly does not add to thatch.
  - When done properly does not add to thatch.
  - When done properly does not add to thatch.

This is not adequate.

B.M.P. cont.

- Watering
  - The deeper the water penetrates, the deeper the roots.
  - One Inch of water per week during summer months.
  - Check your systems output.
  - Only one to two applications needed per week.
  - Never apply at 10 min. Every day/other day intervals.
  - Water in the a.m. just after dawn.

Aeration

- Loosens soil compaction
  - Improves air and water penetration.
  - Able to gradually improve soil structure and rooting depth.

- Seed selection
  - Location/exposure.
  - Timing:
    - Spring or Fall.
  - Aftercare:
    - Watering.
    - Top dress for success.

Over seed

- De-thatching
  - Only necessary, should be done after aeration and over seed.
  - Opens up soil surface to suit better plugs and for seed dispersal root adherence.
Fertilizer

- Slow release
- Balanced
- Contains water insoluble nitrogen
- 4 lbs of nitrogen per year per 1,000 sq ft
- N Applied 1 lb per 1,000 sq ft per application
- Synthetics sometimes contain more nutrients than the plant can use, leaching the rest into the ecosystem.

Weeds and weed grasses

- Tolerance
  - Cultural controls
    - Mowing prevents seeds from forming
    - Proper turf height shades out weeds and moss
    - Hand pulling
  - Herbicides
    - Mode of action
      - Selective and Non-selective
    - Cautions
      - NO WEED’N FEED!
      - W.N.F. unnecessarily covers the entire lawn and is persistent in the environment much longer
      - Dangerous to kids, pets, and wildlife

Carbon!!!

- An often overlooked and major component of soils
  - Over applications of synthetic nitrogen actually reduce soil’s carbon and the soil’s ability to hold nitrogen
- Top dressing with compost
  - Adds vital carbon containing organic matter
- Organic matter
  - Creates aggregates and pores that hold and exchange nutrients, water, and minerals with the plant’s roots
- Mulch mowing
  - Helps return nutrients, carbon and nitrogen to the soil

Moles and Crane fly

- Moles: Give up!
  - Use mounds as free top dressing
  - Rake hills in a radial outward pattern like bicycle spokes
  - Stomping down mole hills
  - Only causes new holes
  - Leave the holes alone, the moles may stop pushing new mound as once they change their runs
- Crane fly
  - A healthy lawn is able to withstand 25 larvae per sq ft.
  - Crane fly are typically a symptom of an underlying problem
  - If absolutely necessary!!!!!! As a last resort
    - A synthetic pyrethrin may be used to reduce the population

The Wrap Up

- It takes time to go organic and see results.
- Proper cultural practices reduce the need for inputs.
- Most soil organisms are good.
- Chemical regimens reduce beneficial populations and weaken the soil food web.
- Organic matter is vital for optimum nutrient availability.