Organic Lawn Care and Lawn Alternatives

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

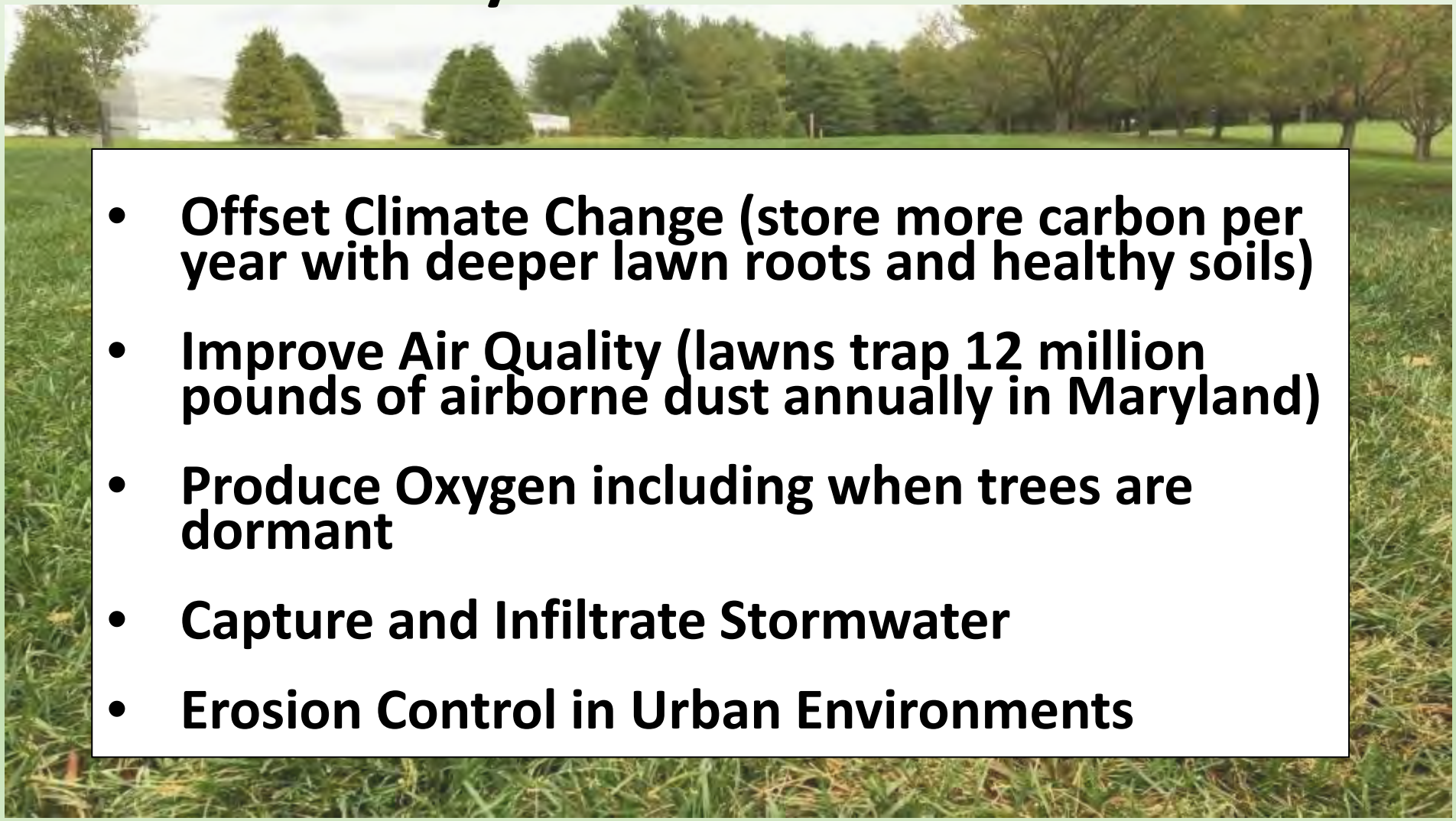
Why Does Organic Matter on our Lawns?

14% of the County is covered by impervious surfaces

but…

28% is covered by turfgrass!

How an ORGANIC lawn *could* better your environment.



- **Offset Climate Change (store more carbon per year with deeper lawn roots and healthy soils)**
- **Improve Air Quality (lawns trap 12 million pounds of airborne dust annually in Maryland)**
- **Produce Oxygen including when trees are dormant**
- **Capture and Infiltrate Stormwater**
- **Erosion Control in Urban Environments**

How to Care for a Lawn Organically

1. Stop Using Synthetic Chemicals

- Synthetic fertilizers only feed the plant, and many wash off if the plant cannot absorb them.
- They have high embodied energy, attract pests, and cause weaker plants.
- Synthetic pesticides harm humans, wildlife, pollinators, and pets.

2. Tolerate some “weeds”/change your expectations

- Diversity for pollinators
- Reduces impact from pesticides
- Species like clover benefit the soil
- Many are edible to humans and wildlife

3.Mow High and Sharp

- Taller grass shades out weeds, captures more sun to turn into energy, and transpires less water by keeping the ground cool.
- Sharp cut grass blades evaporate less water, require less plant energy to heal, and prevent attack from diseases.

4. Leave all grass clippings

- Grass clippings return 50-100% of the nitrogen needed on a lawns
- Major source of carbon-based food for microorganisms, and a carbon sink
- Also, chop up and “mulch” in as many leaves as possible

5. Understand your soil

Take a soil test:

- Measures levels of nutrients.
- Measures organic content.
- Ensures laws are followed for adding Phosphorus (compost).
- Special tests can measure living biology.
- Can help diagnose pest problems through nutrient measurements.

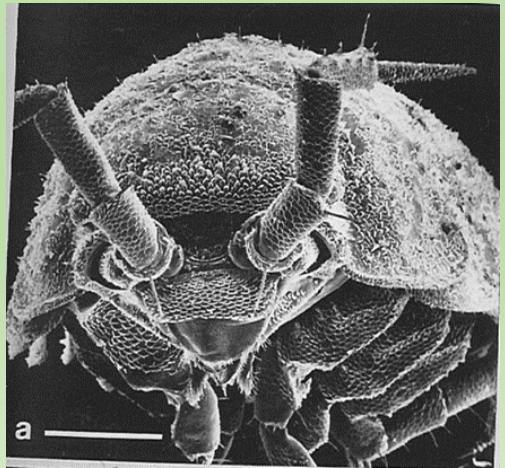
Maintaining a healthy lawn starts by supporting soil biology

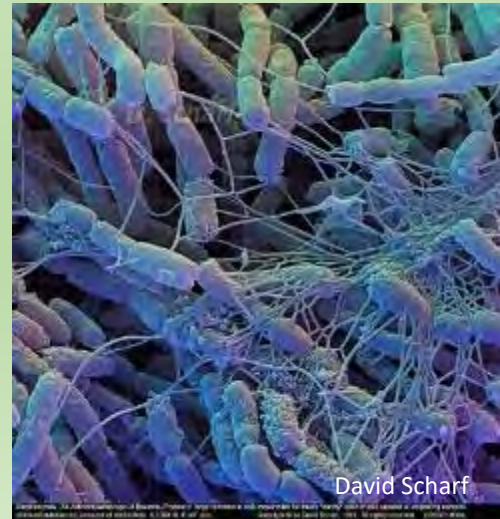
Soil Organisms Matter!

Up to 1 billion in one teaspoon of soil, 40 miles of fungal hyphae in a square foot

- Make nutrients soluble for plants
- Decompose organic matter in stable carbon
- Bind soil with secretions; increase infiltration & soil moisture
- Immobilize nutrients so they don't wash out
- Protect plant roots from disease
- Shape habitat, distribute fungi,

  and multiply bacteria





6. Core Aerate compacted soils

- Provides air for microorganisms.
- Opens areas for compost to mix into soil profile.
- Provides for water into soil profile.

7. Overseed the lawn

- Rejuvenates aging grass
  - 7 years and 7,000 blades
- Weeds are just opportunists

8. Add Carbon-based materials

- Buffers pH.
- Increases CEC exchange for nutrients.
- Carbon feeds microorganisms!
- Supplies micronutrients.
- Fights diseases.

(Try compost tea!—cheaper, no P concerns, less labor intensive)

9. Limit Watering

- Only water during establishment or drought.
- When watering, water deeply. 1” or more.
- Frequent, shallow watering encourages weeds.
- Lawns need rest—allow summer dormancy.

10. Consult with a professional

- Not all are alike—seek out organic knowledge
- Be a source of wisdom yourself
- Use reputable suppliers—seek local experts, not the internet alone
- Demand quality

Soil Nutrients

How to keep soil nutrients high for grass

Nitrogen (N)

Used by plants to make chlorophyll, proteins, amino acids and hormones.

Nitrogen is 78% of our air. It is only made available to plants via two natural processes: lightning, or fixation by bacteria.

Grass uses up a lot of nitrogen to keep growing.

Organic Sources of Nitrogen

- **Grass clippings** return between 50-100% of the nitrogen needed. Leaves also return a hefty amount of nitrogen.
- **Compost and earthworm castings** provides nitrogen & bacteria to extract it.
- **Seaweed** and **coffee grounds**.
- **Non-GMO** corn gluten, soybean meal, or alfalfa meal.
- **Clover** plants contain bacteria that fix nitrogen from the atmosphere.

Phosphorus (P)

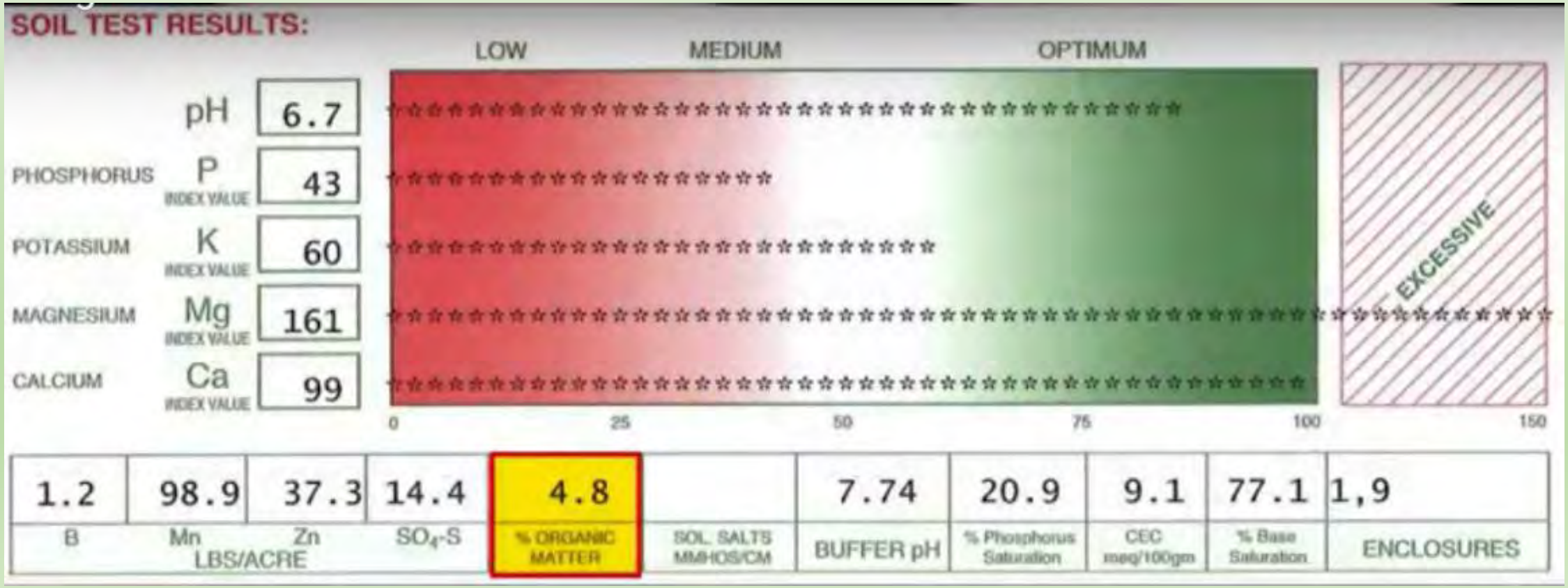
Phosphorus (P) is important for plants to generate energy and it improves growth.

Our soils have phosphorus that weathered from the parent rocks, but microorganisms help make phosphorus available to plants.

Most critical are mycorrhizal fungi, which convert phosphorus into forms that plant roots can absorb.

Phosphorus range—important in Maryland!

Organic Matter—ideally over 5%



Organic Sources of Phosphorus

- **Grass clippings** return 1.8 pounds of phosphorus per 1,000 square feet within one year.
- **Leaves** supply a hefty amount of phosphorus—chop up extra with mower.
- **Compost**
- **Endomycorrhizal fungi**

Potassium (K)

Potassium (K) is important for overall grass health, helping it become drought and cold resistant, resist pests, and grow faster.

Potassium is usually high, but often bound in insoluble forms in mineral soils, and can only be extracted by microorganisms, fungi, and slow weathering from the soil.

Aeration of soils is critical for potassium uptake by plant roots, for the bacteria and fungi that can convert potassium to a form that roots can absorb.

Organic Sources of Potassium

- Compost, particularly from fruits, vegetables, and banana peels.
- **Kelp meal** and **seaweed** are great sources of potassium, while also supplying micronutrients.
- **Wood ash** supplies potassium and micronutrients—be cautious as it can raise pH.

Sources of Microorganisms

- **Compost**, **earthworm castings**, and **compost tea**
- **Effective Microorganisms** (EM).
- **Endomycorrhizal fungi** boost soil fungi.
- **Azospirillum bacteria** boost nitrogen fixation.
- **Beneficial nematodes** attack and consume insect pests.
- Earthworms, spiders, and other soil invertebrates can be imported into lawns from **compost**, or a **handful a healthy garden or forest soil**.

Carbon/Organic Material

Carbon prevents soil compaction, stores nutrients and moisture, and provides food and habitat for microorganisms.

Carbon is released into the soil when plant roots and stems die, and when roots and fungi exude liquid carbon.

Humus is highly digested organic material that is no longer food for most organisms, can take years to accumulate, but is one of the best sources of carbon for soils.

Adding carbon sources to your lawn helps improve soil, while adding microorganisms or aerating your soil will help move carbon down into the soil.

Sources of Carbon

- Grass clippings and leaves
- Compost
- Dry seaweed
- Worm castings (humic acids)

- Sawdust, aged wood chips, or composted newspaper
- Straw (spread and mow)
- Blackstrap molasses

Organic Sources of Micronutrients

- **Sea minerals** contain all the elements on the periodic chart, including 76 minerals.
- **Wood ash tea** can supply molybdenum, manganese, copper, coron, zinc, and iron.
- **Black-strap molasses** contains trace elements including calcium, magnesium, manganese, potassium, copper, iron, phosphorous, chromium, and cobalt, and boosts soil bacteria.
- **Compost** micronutrients vary, depending on what was put in the compost pile.

Organic Sources of hydrogen…or what about pH?

<u>pH is a measurement of Hydrogen (H^+) atoms fixed to the soil.</u>

- **Hydrogen is not a nutrient!**
- Low pH: 4 is full saturation of H^+, no nutrients
- High pH: 7 is no H^+, all nutrients)

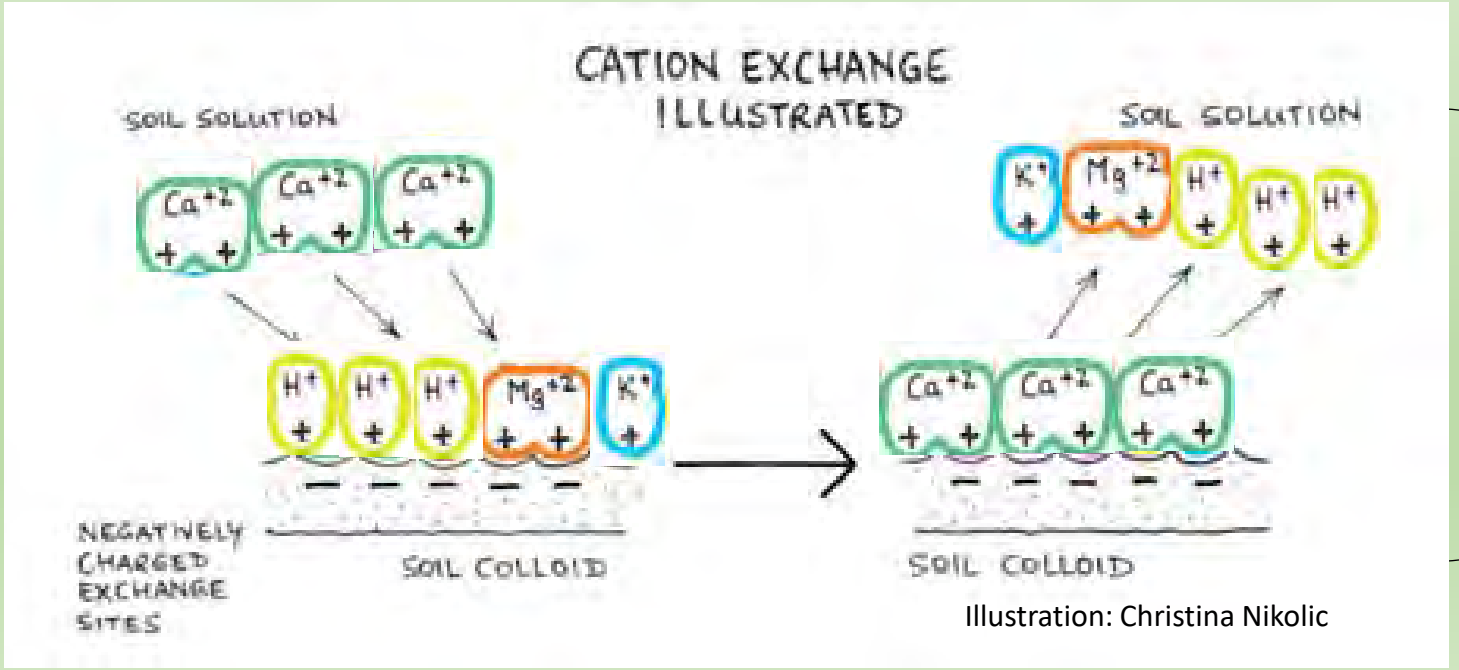


Illustration: Christina Nikolic

What happens when we adjust pH (limestone)– *The calcium in large amounts replaces the extra hydrogen, but also knocks off other important plant nutrients, which then get washed out when it rains!*

Calcium-Magnesium ratio

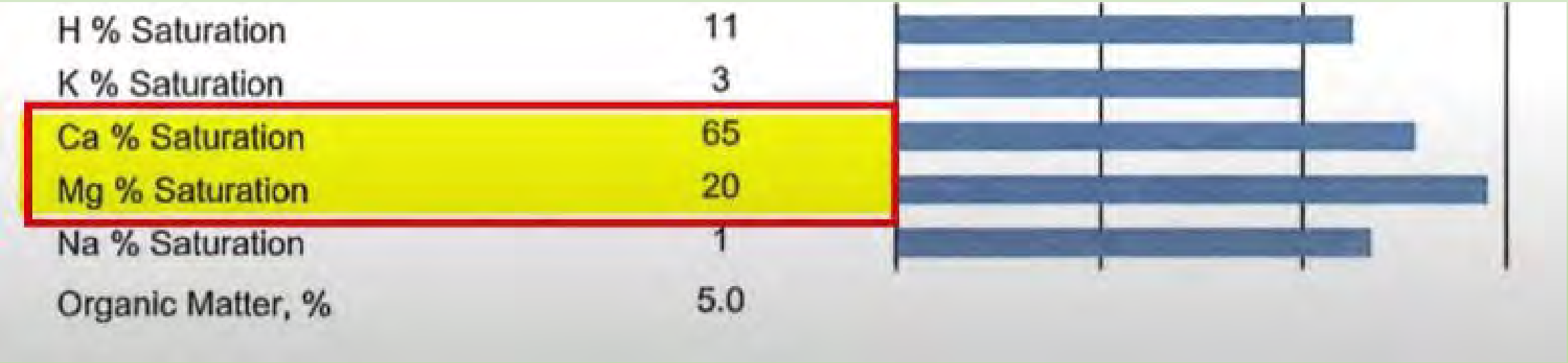
Calcium strengthens plants cells, maintains soil pH, stimulates plant metabolism, and improves soil structure

Magnesium is important for production of chlorophyll

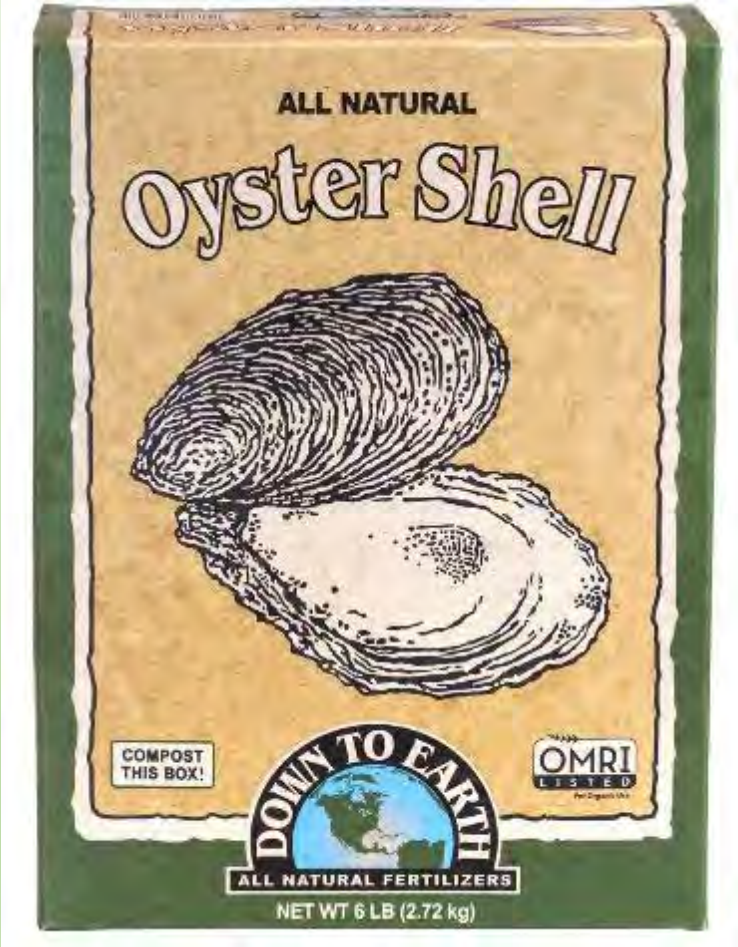
A deficiency of one can cause compacted soils or weak grass.

Calcium to Magnesium Ratio

5-8 parts calcium (60-85%) to 1 part magnesium (10-13%)
and under 80% of the total CEC



Sources of Calcium (not mined)



- Oyster Shells
- Wood Ash

Leave the leaves!

How many leaves would a woodchuck leave
if a woodchuck could chuck leaves?

Option 1:

- Give them back to the plants and critters

TREE MULCH

GARDEN MULCH

VEGGIE GARDENS

Option 2:

- Give them back to the soil

CHOP ‘EM UP

Option 3:

- Compost at home

GET A FREE BIN

Option 4:

- Send them away to compost

Lose the Lawn!

Conservation landscapes, rain gardens, or trees

RainScapes Conservation Landscapes and Rain Gardens

Intercept and manage stormwater runoff from impervious surfaces

Use native plants to replace lawn, bare ground or areas infested with non-native invasive species

Add beauty while creating a more resilient, ecologically diverse landscape

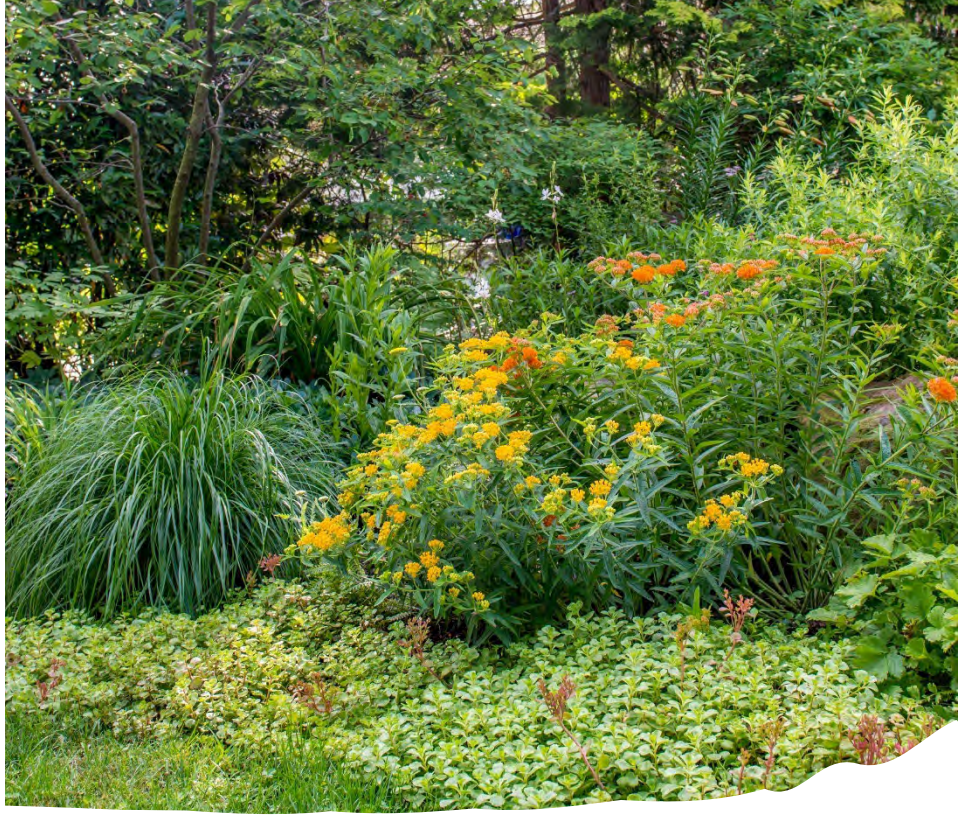
Native Plants in RainScapes Rain Gardens and Conservation Landscapes

Why native plants?

- More ecosystem benefits
- Support our local pollinators and birds
- Do not require watering after establishment
- Deeper root systems that help infiltrate water and improve soil quality
- Require no fertilizer because they are adapted to our soils
- Require little or no pesticides

Lose the Lawn:

Whole Yard Conversion Examples



Conservation Landscapes

Rain Gardens

Slope treatments with native Packera

Lawn Be Gone

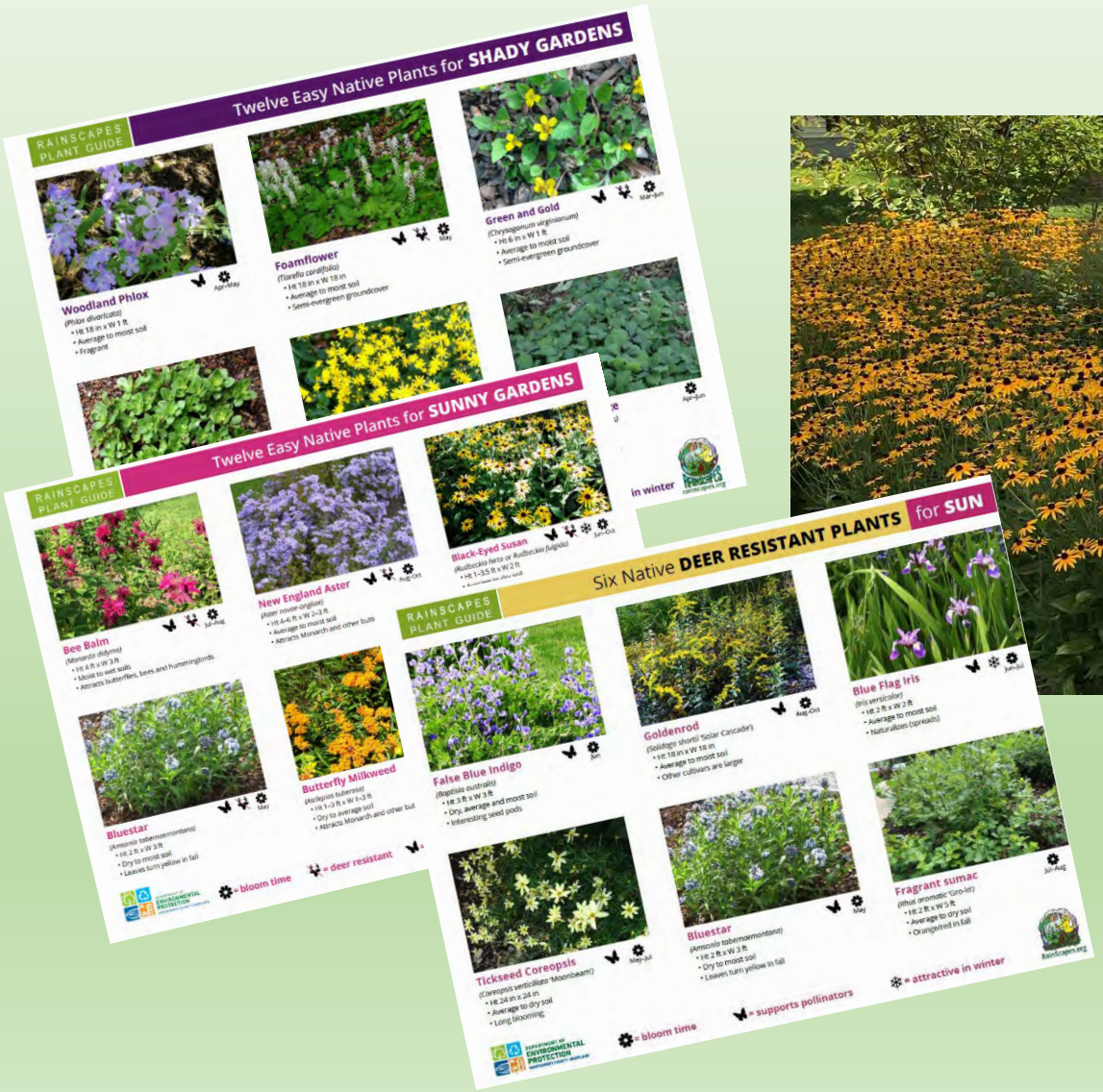
An example of project success!

Rain Garden and Conservation Landscape Templates

Don’t know where to start?
Try a template!

- Plant combinations for each zone already figured out
- Plant quantities determined
- No previous design experience
- Multiple options
- Benefit from others’ efforts

Lots of great information on native plants and the RainScapes Program on the website:



www.rainscapes.org

Tree Montgomery Shade Tree Program

- Free shade trees—planted!

tree MONTGOMERY

More information and to apply:

www.treemontgomery.org

Questions?

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www.MontgomeryCountyMD.gov/Lawns