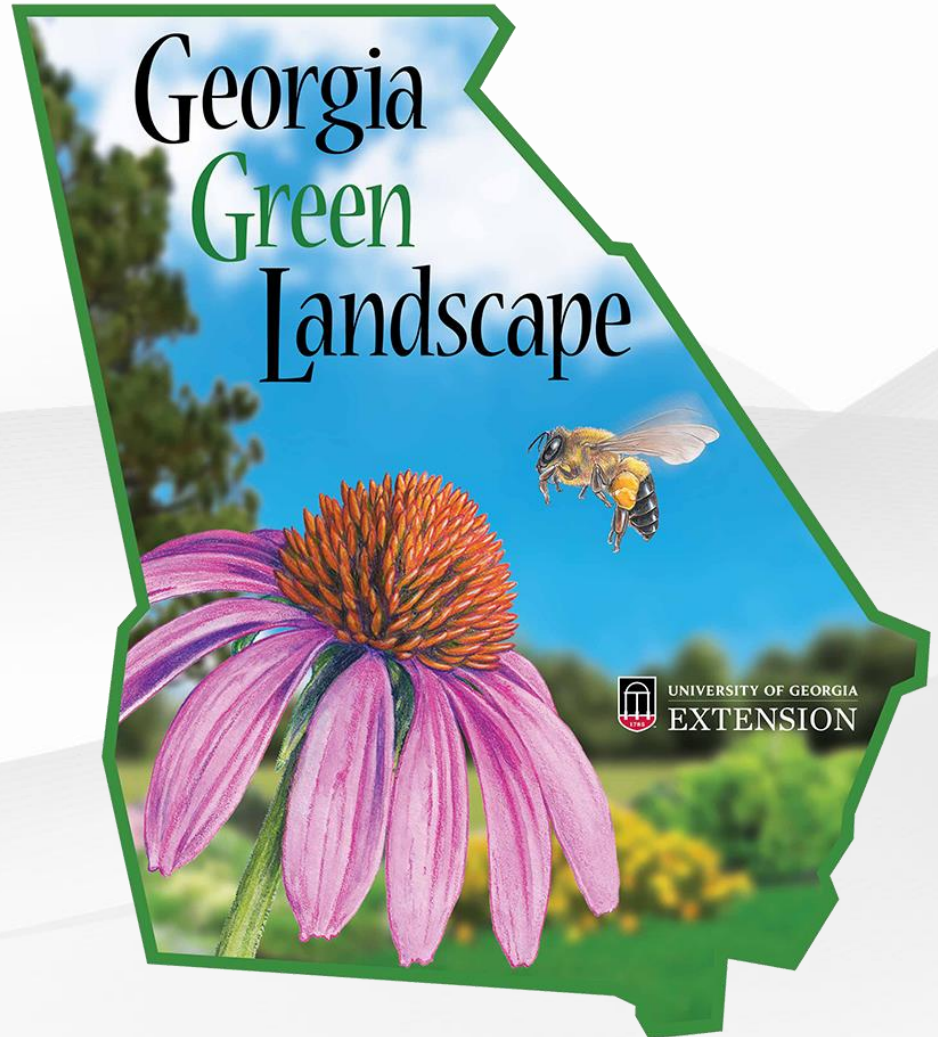



# Protecting Water Quality

Martin Wunderly, Water Agent  
UGA Extension Northeast District





The following presentation is part of the University of Georgia Extension service Georgia Green Landscapes program funded by the Center for Urban Agriculture. These guidance series will help Georgia residents create certified sustainable Georgia Landscapes, protecting our natural resources for future generations.

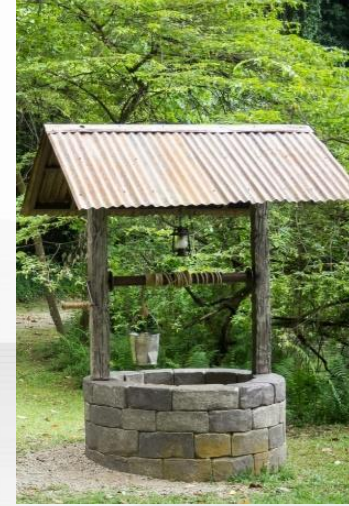


# Water Quality

1. Irrigating with Clean Water
  
2. Landscaping Practices
  - a. Chemical Applications
  - b. Property Management
  - c. Lawn and Garden Practices

# 1. Irrigating with Clean Water





- Water quality varies by source.
- Test your water as a baseline, and always test your soil!
- Poor quality water can lead to slow plant growth, poor aesthetics, or environmental damage.

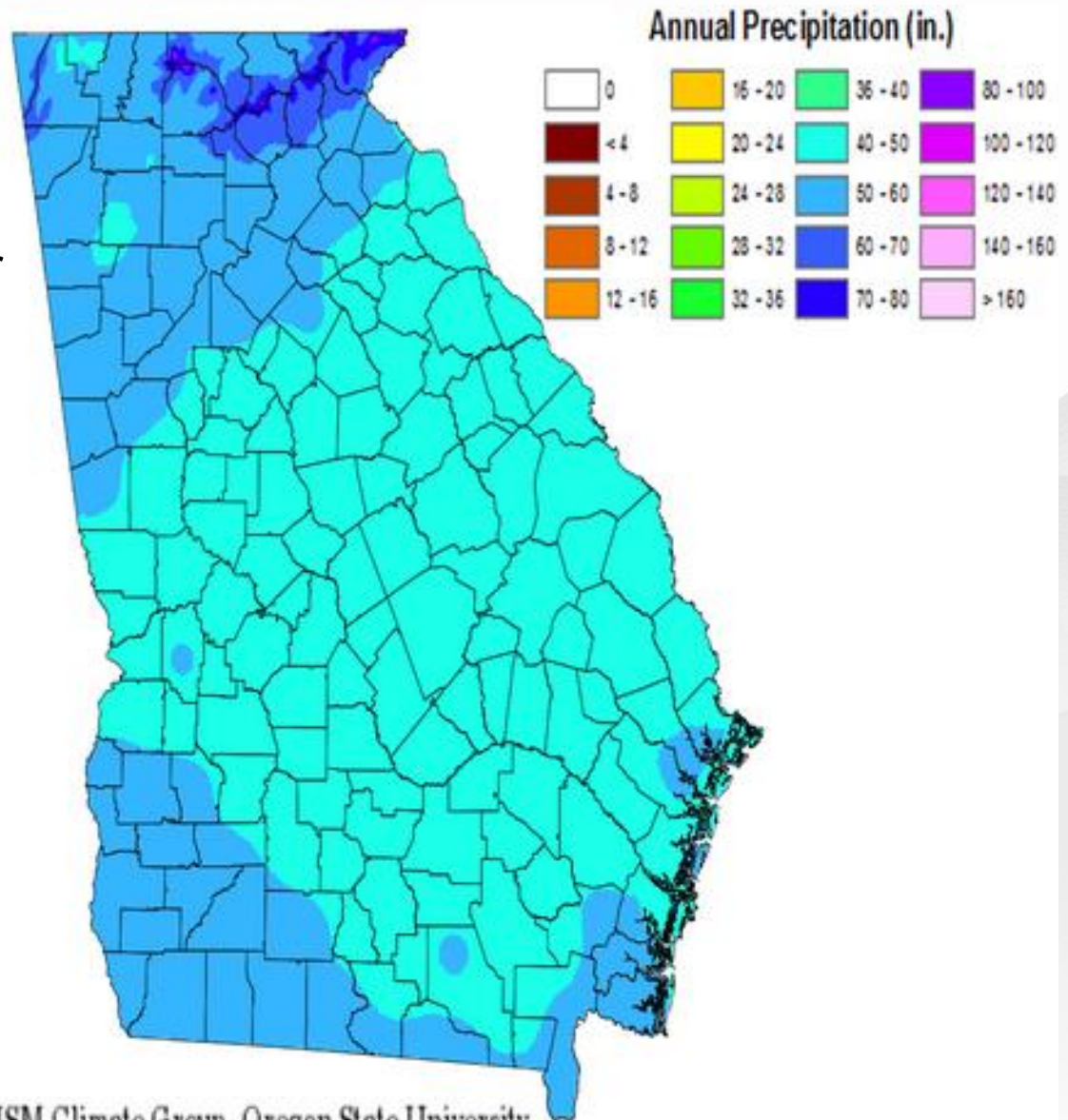
- Sometimes our water sources can be contaminated by land use activity in the upper watershed.
- Naturally occurring salts and minerals can also affect irrigation water quality.
- Municipal water supplies are frequently tested, but we should also check our well water for its quality.





- The University of Georgia Agriculture and Environmental Services Lab will test your water with the help of your local County Extension office.
- W33A is the test for irrigation water chemistry
  - Covers many elements of concern
  - Additional tests are available if warranted

- If some elements of your water are imbalanced, filter treatments or soil amendments may be necessary.
- Rainwater can help dilute some soluble salts, minerals, or alkaline elements.



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- Harvested rainwater can be contaminated by fecal coliform and E. coli from animal waste. Divert the first flush or treat with bleach (1 oz. household bleach to 55 gal of water, once per month or more if rain is more frequent).
- Avoid watering vegetables with this water.



# UGA Extension publications about water quality.

- Irrigation Water Quality for Agriculture UGA Ext.  
[https://secure.caes.uga.edu/extension/publications/files/pdf/B%201448\\_1.pdf](https://secure.caes.uga.edu/extension/publications/files/pdf/B%201448_1.pdf)
- Home Water Quality and Treatment UGA Ext.  
<http://aesl.ces.uga.edu/publications/watercirc/HomeWater.pdf?2>
- Water Quality and Common Treatments for Private Drinking Water Systems UGA Ext.  
<https://secure.caes.uga.edu/extension/publications/files/pdf/B%209393.PDF>

## 2. Landscaping Practices for Water Quality

- a. Chemical Applications
- b. Property Management
- c. Lawn and Garden Practices



# a. Chemical Applications



# Fertilizer Guidelines

- Test your soil! Find out what nutrients you already have or lack before designing a fertilizer plan.
- Walk around your yard at least weekly and observe your plants and lawn for early signs of problems.
- Fertilize only as needed to maintain the health of lawns and landscape plants.
- If plants show signs of stress, such as yellow leaves or stunted growth, identify the problem before applying fertilizer. For turfgrass, do not exceed the rate of 1 pound of nitrogen per 1,000 square feet per application (and follow municipal regulations).
- Use slow-release fertilizers. Buy fertilizers that contain 50% or more of the nitrogen in slow-release forms.
- Never fertilize during dry periods, it can dehydrate roots and will remain unavailable to your plants, washing away in the next rainfall.





- Most established, healthy trees and shrubs only need fertilizer once every two to three years.
- Most established herbaceous perennials perform well when fertilized every other year.
- If you do a good job of building up organic matter in the soil, plants can extract essential mineral elements they need from the soil and will not require annual fertilization. Annual flowers and roses are exceptions

- Properly store unused fertilizers and properly dispose of empty containers.
- Don't apply fertilizer before windy or heavy rain days. Provide 0.5 inches of water to “water it in”.
- Do not overwater; it carries away or leaches out fertilizers. Use a soaker hose.
- Fertilize ornamental plants in spring when growth begins. The rest of the year it just ends up in the water supply.
- Fall fertilization is recommended for cool-season grasses.
- Fill fertilizer spreaders on a hard surface so that any spills can be cleaned up.

- Avoid applying fertilizer and pesticides close to waterways. Phosphorous is limiting in freshwater, but Nitrogen (N) is limiting in saltwater. Our N can travel downstream all the way to the Atlantic Ocean and Gulf of Mexico, causing harmful algae blooms.



# Pesticides

- Follow pesticide labels, it's the law!
  - Brand, Trade, or Product Name
  - Ingredient Statement
  - Use Classification Statement
  - Type of Pesticide
  - Manufacturer
  - Emergency Telephone Number
  - EPA Registration and Establishment Numbers
  - Signal Words
  - Precautionary Statements
  - Statement of Practical Treatment
  - Environmental Hazards Statement
  - Physical or Chemical Hazards
  - Agricultural Use Requirements
  - Storage and Disposal Statement
  - Directions for Use

**Pesticide Company**

***Pest No More***  
**Herbicide**

Controls grasses and grassy weeds  
(crabgrass, foxtail, nutsedge, and others) in landscape areas

Active Ingredients:

Monosodium acid methanearsonate.....	9.81%
2,4-D, dimethylamine salt.....	3.18%
Mecoprop-p, dimethylamine salt.....	1.60%
Dicamba, dimethylamine salt.....	0.79%
Other ingredients.....	84.62%
Total 100.00%	

**Pesticide Company, Inc.**  
125 Pest Control Rd.  
Lincoln, NE 68583  
(402) 555-5555  
**EMERGENCY: 800-555-1234**

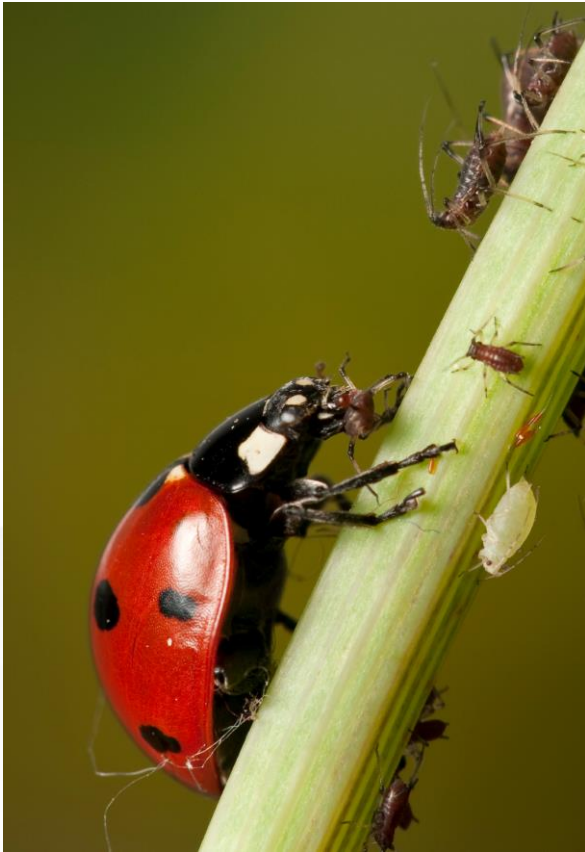


**KEEP OUT OF REACH OF CHILDREN**  
**CAUTION**  
*Net contents 1 gal*

EPA Reg. No.: 123-456-78901  
EPA Est. No.: 54321-WT-3

- New classes of pesticides are **less persistent** than DDT and other organochlorines but are generally **more water soluble** and are often **more acutely toxic**.
- Potentially contaminate surface and ground water.
- Do not dispose of unused product down the drain, sink or toilet.
- Do not store pesticides in areas where flooding is possible or near your drinking well.
- Do not mix or apply a pesticide near a well head
- Dispose of unused or unwanted pesticides properly

- Apply the correct dosage at the right time of year
- Apply only to crops (targets) identified on the label
- Keep detailed records of all pesticides used and the environmental conditions at the time of application
- Post all treated areas and follow re-entry directions
- Avoid application near water in the riparian buffer. Choose your riparian plants to be pest tolerant.
- Properly store in tightly closed, labeled and securely stored original containers



- Use **Integrated Pest Management** (IPM) A way of thinking about pest management that values:
  - Using knowledge about the pest's habits, life cycle, needs and dislikes
  - Using the least toxic methods first, up to and including pesticides
  - Monitoring the pest's activity and adjusting methods over time
  - Tolerating harmless pests, and
  - Setting a threshold to decide when it's time to act

<https://extension.uga.edu/programs-services/integrated-pest-management.html>

## b. Property Management





- Pick up after pets. Properly dispose of waste in the trash.
- Create an at-home chemical spill kit. Empty household chemical containers should be properly disposed of and not put out at the curb.
- Change car oil on an absorbent mat or paper to catch spills. Dispose of oil properly.
- Maintain your lawn mowers and other power equipment to prevent leaks.

- Sweep grass clippings, fertilizer and soil from driveways and streets back onto the lawn.
- Use yard waste, grass clippings and leaves, in mulch or compost for your garden.
- Or prepare clippings and leaves for community composting or paper bags for disposal to keep them from washing into streams with stormwater.



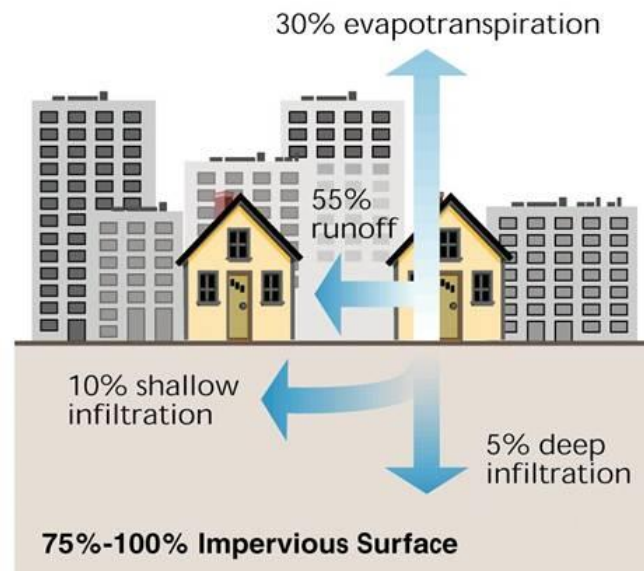
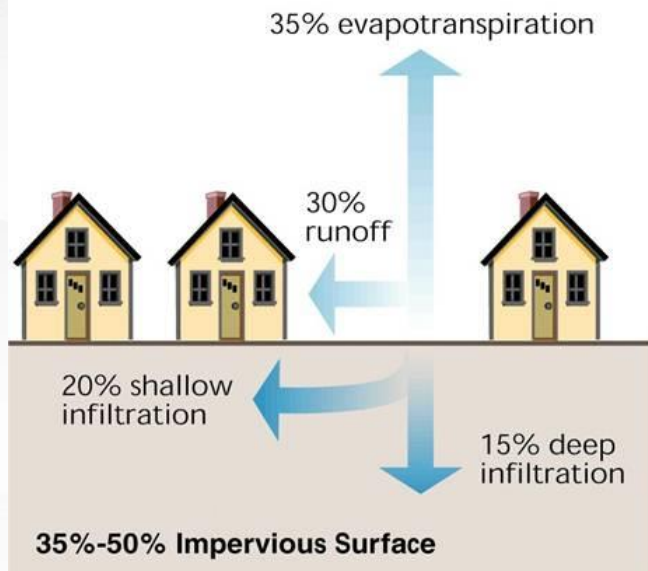
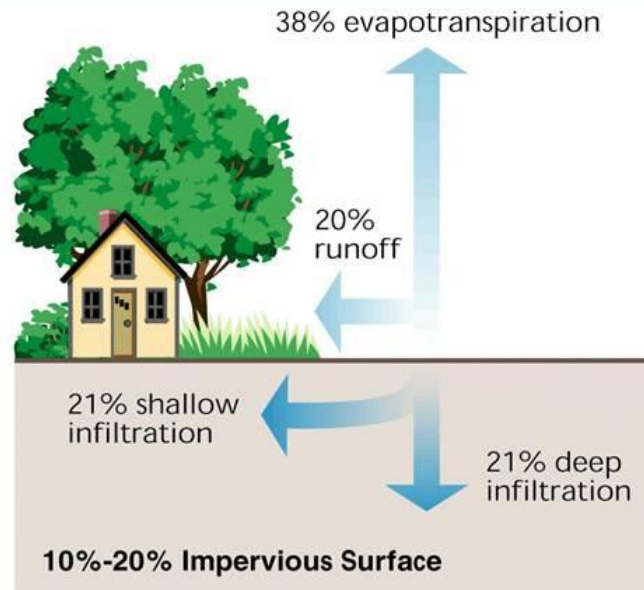
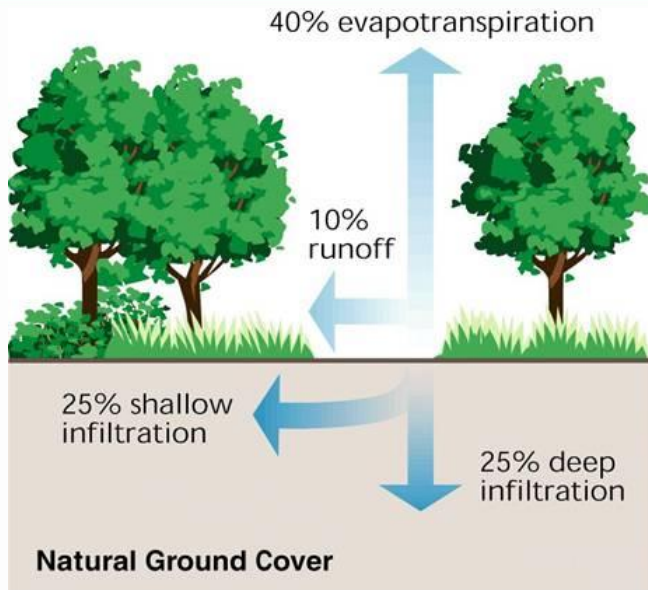


- Direct downspouts to lawn areas for water infiltration instead of sidewalk runoff.
- Install a green roof on low sloping portions of your home or business to slow rain runoff.
- Install rain barrels or large cisterns to collect irrigation water and reduce runoff.



- Use mulch, permeable pavers, stone, gravel or other porous surfaces for walkways, patios and driveways.
- Reduce and remove impervious surfaces to slow, spread, and sink stormwater before it carries nutrients and contaminants into local waters.



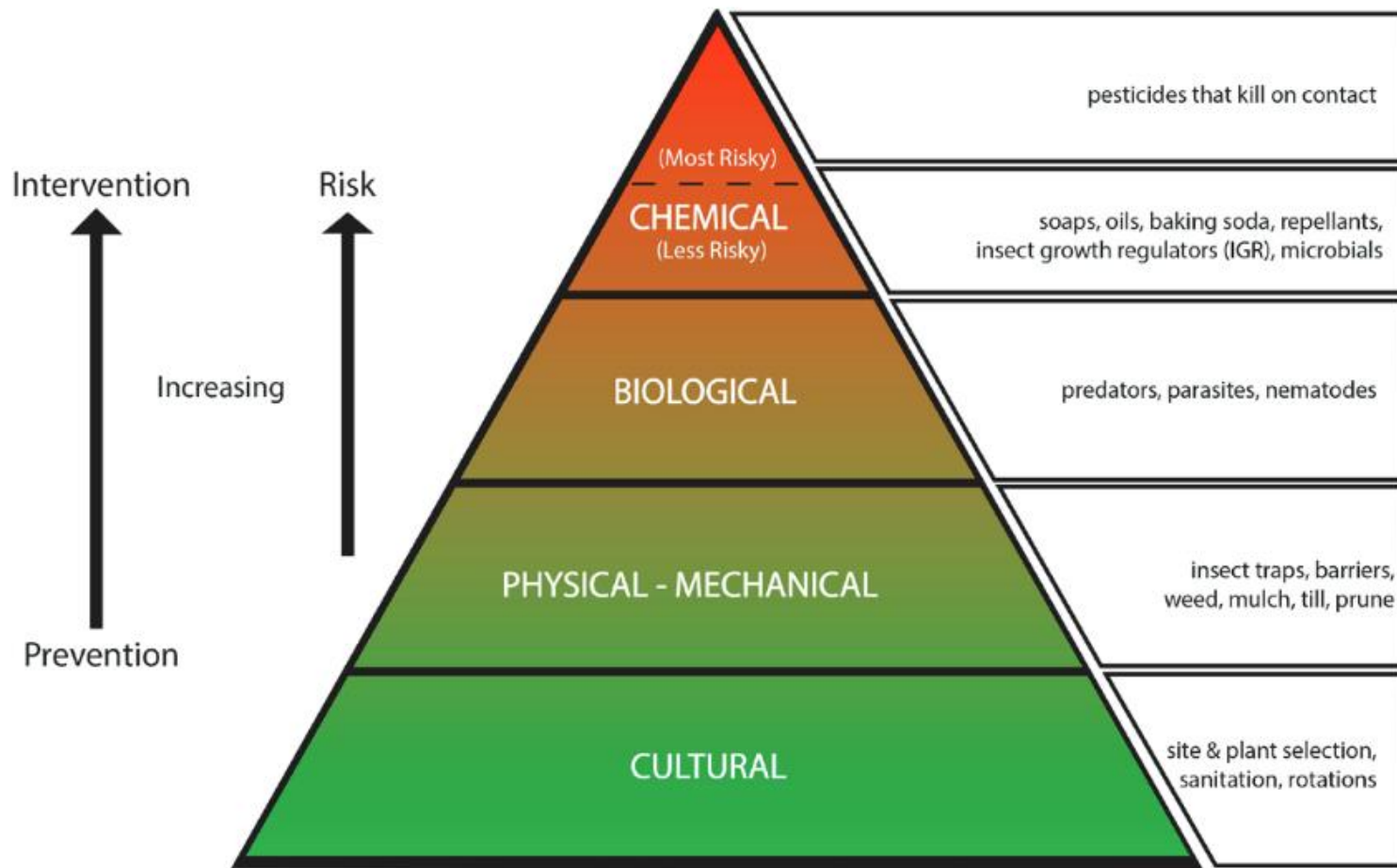


## c. Lawn and Garden Practices



<https://www.mscwmo.org>

- Integrated Pest Management (IPM)



## Pyramid of IPM Tactics for Crops, Lawn & Garden



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College of Agricultural Sciences



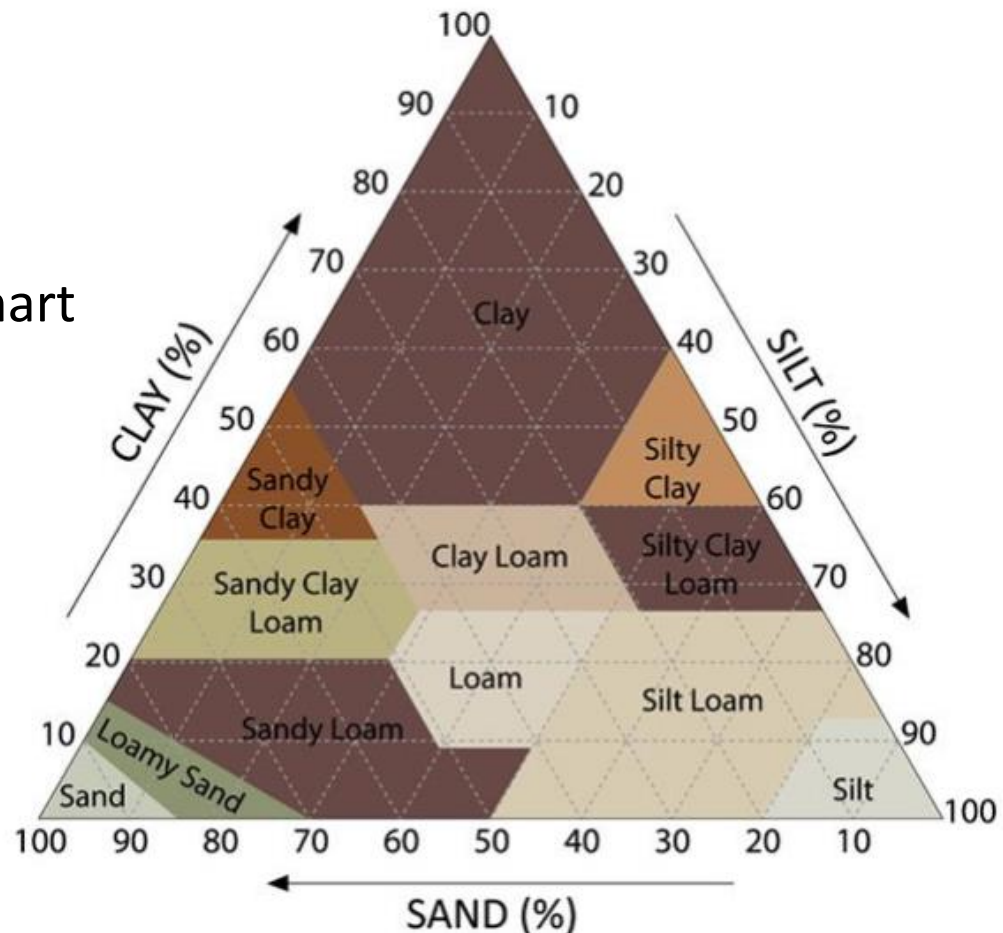
Pennsylvania Department of AGRICULTURE

- Plant the right plants in the right place. This reduces the need for extra irrigation, fertilizer or pesticide use.
- Follow planting suggestions for shade, sun, water needs, and soil drainage.



- Test your soil for nutrient deficiencies and for % composition of silt/sand/clay, water drainage ability.
- Georgia Piedmont soils generally have a moderate infiltration rate (0.2 inches/hour for sandy clay loam), and they hold water better than sandier soils.

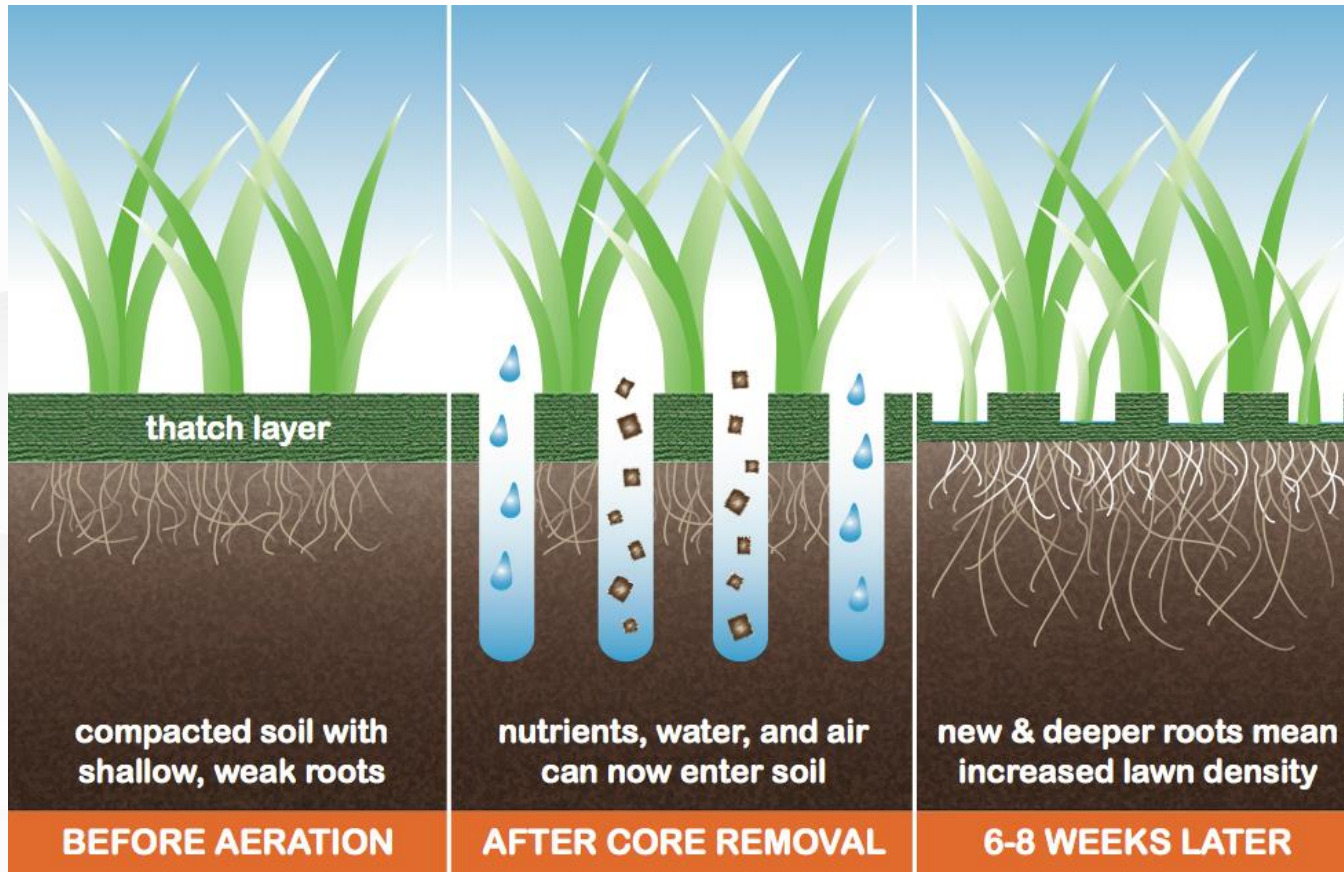
Soil texture chart



- Don't overwater or oversaturate soils. It leaches nutrients into the water table away from your plants and creates excess runoff during irrigation or rainfall events.
- For shrubs and beds, use drip irrigation, soaker hoses, spray gun, or handheld container to control water runoff.



- Aerate lawns at least once a year. This improves percolation and movement of nutrients into the soil, decreases run-off, and encourages roots to grow deeper and become more drought tolerant.



- Incorporate drought tolerant, biome appropriate, or native plants to avoid extra irrigation and potential runoff.  
(<https://extension.uga.edu/publications.html> search “native plants”).  
Remember, not all native plants are drought tolerant. e.g. wetland plants)



- Use trees and shrubs to intercept and slow rainwater





- Weeds compete with plants for moisture and nutrients. Keep weeds at bay by using mulch. This reduces the need for fertilizer and herbicide.
- Landscape fabrics can serve as an added barrier to weeds and reduce soil erosion into waterways.



- Leave grass clippings to work their way back into the grass. They act like mulch, helping to reduce moisture loss. Also recycles up to 30 percent of the nitrogen applied to the lawn, reducing fertilizer needs. Mow often enough so the clippings remain small.

- During spring planting, leave a cover crop between vegetable garden rows to prevent soil erosion off your property.
- Minimize tilling and bare soil exposure by adding mulched material and seeding or transplanting into last years residue.

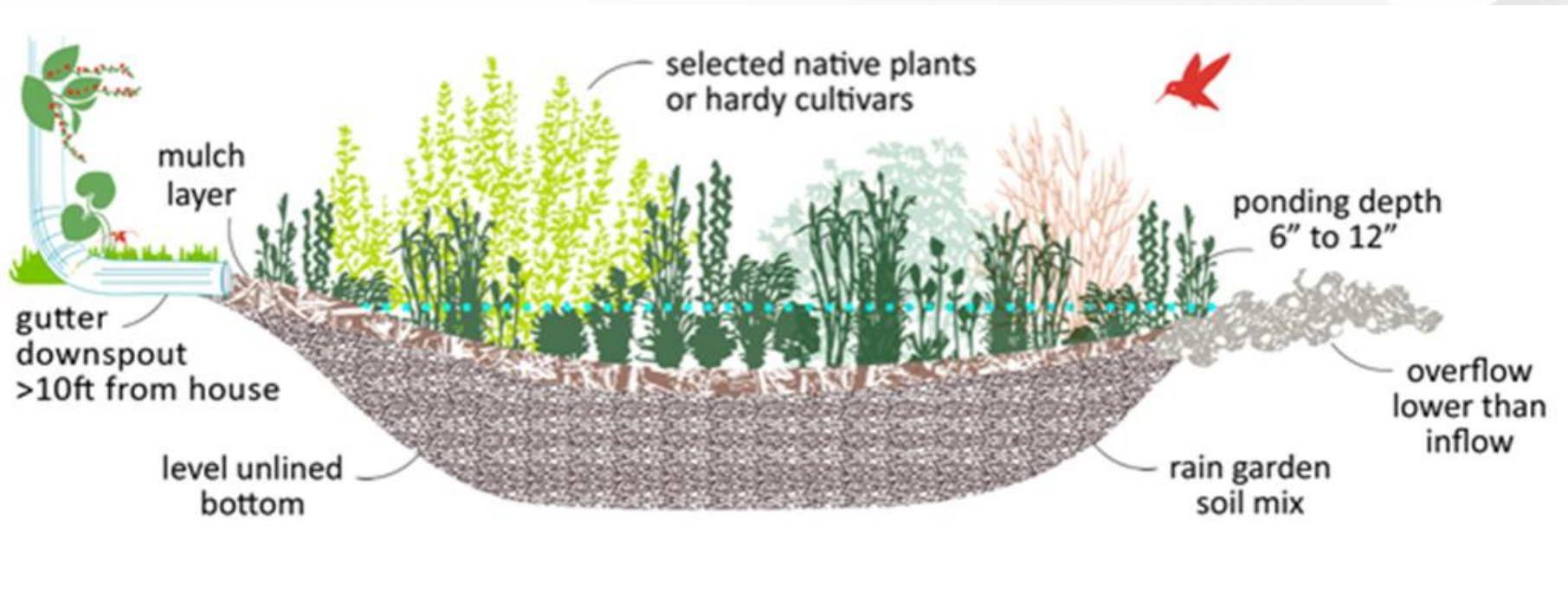


Photo credit: Peter, [www.chicocanyonranch.com](http://www.chicocanyonranch.com)



- Add a 4-inch layer of organic matter to increase the infiltration and effectiveness of water.
- Good mulch, compost, and loam topsoil can store water. Water runs off dense clay soils.
- This allows the root system to spread out and stabilize soil.
- Avoid soil compaction ! It prevents rainwater infiltration.

- Create a rain garden in wet, low, or downspout locations to catch, hold, and filter stormwater.
- This captures the first flush from lawns and paved areas to help trap sediment and contaminants.
- Rain gardens allow stormwater to infiltrate into the ground.



- Adopt landscaping and building techniques with plants, soils, and materials that mimic natural hydrologic processes to manage stormwater. (Green Infrastructure)
- Incorporate grassed swales, filter strips, or buffer strips to control and temporarily store stormwater runoff.



Photo credit: <https://www.chapelvalley.com>

- In sloped areas, create small bedded terraces along contour lines, not perpendicular to them.
- This slows the speed of stormwater runoff, reducing erosion.



Photo credit: Will Bonsall, Maine Organic Farmers and Gardeners Assoc.



<https://treeyopermacultureedu.com>

- Contour terraces allow water to infiltrate soils, replenishing the surface aquifer and increasing soil moisture.
- Vegetated swales in harmony with topography divert stormwater, preventing soil erosion or flooding on your landscape.

Stormwater...

Slow it.

Spread it.

Sink it !



Photo: [www.montgomerycountymd.gov](http://www.montgomerycountymd.gov)



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- Ground cover plants prevent erosion of your soils.



- Back away from streams and rivers, allowing a riparian buffer of vegetation to stabilize the stream bank and prevent erosion during high flow.
- This protects downstream water quality from contaminated surface runoff and sedimentation.
- Choose pest resistant plants for riparian buffers to reduce pesticide needs.



- Riparian buffers of 35 to 100+ feet are recommended to reduce dissolved pollutants and eroded soils from entering waterways.
- The width needed depends on pollutant load, field slope, type and density of vegetation, soil structure, subsurface drainage patterns, and the frequency and force of storm events.
- Riparian buffers are the last line of defense for protecting our water!



## Certification Checklist Items:

- Test your water source for irrigation quality.
- If you use fertilizers, use slow release types and avoid over-fertilization
- Use **integrated pest management** and reduce your dependence on pesticides.
- Avoid pesticide and fertilizer use in the riparian buffer.
- Create an at-home kit for chemical spills and leaks.
- Sweep grass clippings, fertilizer and soil from driveways and streets back onto the lawn.
- Remove yard debris and trash from street gutters so it will not get washed into storm drains.
- Pick up after pets. Properly dispose of waste in the trash. This will help prevent bacteria pollution.
- Direct downspouts and gutters to your rain garden or plant beds where rain will soak into the ground rather than run off your yard.
- Reduce impervious surface coverage by using mulch, stone, or grass paths and parking areas.
- Prevent soil erosion by using ground cover vegetation and planting beds along land contours.
- Leave a vegetated riparian buffer between your lawn and streams or ponds.

# Questions?

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[https://site.extension.uga.edu/  
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