

Outline, Sustainability Training

“...assist the California gardening public to adopt more sustainable landscape practices. These sustainable landscape practices help to protect our water, soil, air and wildlife and also promote energy conservation. “

Sustainability and the Master Gardeners

- Master Gardener History
- California Master Gardeners
 - How many MG?
 - Volunteer Hours Reported
 - The Value of Volunteers in UCANR
 - Reported Contacts by MGs
 - UCANR Strategic Vision
 - The Strategic Initiatives by ANR into 2025
- What is Sustainable?
- What Are Sustainable Landscape Practices?
- Seven/Eight Best Practices:
 1. Landscape for the Local Climate
 2. Landscape for Less to the Landfill
 3. Nurture the Soil
 4. Conserve Water
 5. Conserve Energy
 6. Protect Water and Air Quality
 7. Create and Protect Wildlife Habitat
 8. Grow Food
- River-Friendly Landscape Example
 - With reference URL

Seven (EIGHT) Best Practices of Landscape Sustainability

1. Landscape for Your Local Climate

- Use landscape adapted natives, or climate appropriate plant materials such as Arboretum All-Stars. Match to your conditions of temperature, sun, wind and soil.
- Consider the potential for fire; modify landscape to defend your home against wildfire.
- Consider your proximity to wild land or canyon area. If nearby, emphasize San Diego natives in your plant palette.

2. Landscape for Less to the Landfill

- Yard wastes are the largest component of municipal waste; half is grass clippings. Reduce lawn area, choose alternative turf species, and grass cycle.
- Choose plants to reduce pruning. Water and fertilize judiciously.
- Design and Select Plants to Reduce Pruning
- Replace High Maintenance Plantings
- Avoid Invasive Species
- Reduce Lawn Areas
- Choose Alternative Turf Species
- Grass cycle
- Prune Selectively and Properly
- Water and Fertilize Judiciously
- Produce Mulch or Request from Tree Company (or use Miramar in San Diego!)

- Composting
 - Browns
 - Greens
 - Browns vs. Greens
 - Aerobic Composting
 - Is Shredding Necessary?
 - Many Types of Composters
- Reduce, Reuse, Recycle, and Rebuy
 - Reuse and Relocate Existing Plants
 - Reuse Construction Materials
 - Rebuy
- Resources

3. Protecting and Nurturing Soils

- Soil Texture and Structure
 - The Ideal Soil is Rare
 - Important Soil Characteristics
 - Soil Texture vs. Structure
 - Soil Texture
 - Particle Sizes
 - Soil Triangle
 - Soil Texture Affects Soil Moisture
 - Soil Structure
 - Texture and Structure Can Be Highly Variable Across Small Areas
- Hardpan and Compacted Soil
 - Soil Stratification
 - Hardpan
 - Cemented Hardpan
 - Effects of Grading
 - Soil Compaction
 - Dry and Compacted Soil
 - Poor Drainage, Anaerobic Conditions
 - Poor Root Health Leads to Poor Health and Stunting
 - Phytophthora Root Rot
- Protecting, Nurturing and Improving the Soil
 - Protect Soils: Compaction during Construction
 - Protect Soils: Prevent Erosion
 - Aerate Compacted Soils
 - Dealing with Compacted Soils and Cemented Hardpan
 - Drainage Systems: Carefully Design and Install
 - Maximize Soil Drainage to Minimize Offsite Drainage
 - Ripper
 - Drill or Trench Soil
 - Backhoe or Excavate
 - Or Break it Up Manually
 - Use Raised Beds
 - Or Raised Planters

- Evaluate Soils and Soil Moisture
- Organic Matter, Compost, and Mulches
 - Soil Organic Matter
 - Compost
 - Amending Soil with Compost: How does it help?
 - Uses and Amounts
 - Lawns and Potting Mixes
 - Compost vs. Mulch
 - Mulches: Potential Benefits
 - Mulches Serve Many Purposes and Add Beauty
 - Mulch Reduces Evaporation but not Transpiration
 - Wood Chip Mulch Reduces Weeds if Deep Enough
 - Potential Problems
 - Wood Chip Mulch: Application Basics
 - Do Wood Chips Affect Soil Nutrients?
 - Don't Mound Mulch around Trunks
 - Landscape Fabric Mulch
 - Plastic or Fabric Underneath?
- Synthetic vs. Natural Fertilizers
 - Synthetic Quick Release
 - Synthetic Slow Release
 - Organic
- Add organic matter and compost to build soil.
- Mulch heavily to reduce water evaporation and weeds, cool the soil, and improve appearance.
- Determine Fertilizer Needs, Feed Naturally Where Possible and When Needed. Avoid over-fertilization.
- Gypsum: helps if soil is impermeable due to excess Na. or low Ca:Mg ratio. Otherwise no

4. Water Conservation ("Water Conservation in the Landscape")

- Manage irrigation scheduling to water deeply and infrequently.
- Hydro zone: match species to microclimate and to water delivery area.
- Water Needs Vary with Microclimate; Shade vs. Full Sun
- Water when soil is dry or use Smart Controller.
- Fix leaks and distribution problems.
- Use drip delivery.
- Use compost and mulch.
- Irrigation Scheduling
 - Plant Water Use
 - ET Definition
 - ETO
 - Factors that Determine ETO
 - CIMIS
 - Average Monthly Irrigation
 - Average (Mean) ETO
 - Lawn Watering Guide
- Leaks and Irrigation Problems
- Distribution Uniformity
- Water Cycling
- Fruit Tree Water Requirements
- Converting Inches to Gallons
- Research-Based Plant Requirements

- Water Needs Vary with Microclimate
- Shade vs. Full Sun
- Hydro zone
- Plant Density Affects Water Requirement
- Multi- vs. Single-Tier Canopy
- Low Density Planting
- DWR Water Budget
- (EXAMPLE): Maximum Applied Water Allowance (MAWA)
- Determine When to Irrigate
 - Factors Affecting Frequency of Irrigation
 - Determine Soil Water Holding Capacity
 - Use the Feel Test
 - Depth to Irrigate
- Monitor Soil Moisture
- Smart or “Weather Based” Controllers
 - Choosing a Smart Controller
- Other Methods to Conserve Water
 - Reduce and Remove Unnecessary Turf grass
 - Add Infiltration Basins
 - Creating an Infiltration Basin
- Other Considerations
 - Using Drip Irrigation
 - Minimize Using Water to Clean Sidewalks
 - Never Use Water to Clean up Chemical Spills
 - Remove Competing Weeds
 - Increase Mowing Height to Encourage Deep Roots
 - Match Species to Climate and Microclimate
 - Irrigate Established Plants Deeply and Infrequently
 - Use Compost to Increase Water Holding Capacity of Soils
 - Apply Mulch around Plants
 - Avoid Over-Fertilizing
 - Add infiltration basins to deep-water and re-charge our aquifer.
- Sources of Information

5. Conserve Energy

- Reducing water use reduces energy use (x% of CA. energy goes to water delivery).
- Buy a push mower if you have turf.
- Low voltage and solar lighting/water pumping can lower electricity use.

6. Protect Water and Air Quality

Sources of Air Pollutants from Urban Landscapes

- Types of Air Pollutants
- Impacts of Air Pollutants
- Impacts of Plants on Air Quality
- Biogenic VOCs Emitted by Plants
- Comparison of Isoprene Emission of Sweet Gum to Spilled Gasoline

Minimizing Anthropogenic Sources of Air Pollutants

Benefits of plants

PROTECTING WATER QUALITY

Impacts of Conventional Landscaping on Water Quality.

- More Impervious Surfaces Cause Rainwater Runoff, not retention.
- Disturbed & Paved Soils cannot filter pollutants.
- More Fertilizers & Pesticides needed to maintain esthetics.

Chemicals mobilized by rain and irrigation water

- Pesticides
- Current Sources of Organophosphates from Urban Landscapes
- Current Sources of Synthetic Pyrethroids from Urban Landscapes
- Current Sources of Fipronil from Urban Landscapes
- Pesticide Detection Frequency (2)
- Microorganisms by Site

Fertilizer Activities Contributing to Water Quality Issues

- Fertilizer Application Equipment
- Fertilizer Calibration Steps
- Benefits of Organic Sources of Nutrients
- Fertilizer Application Tips

Responsible Pest Control: Integrated Pest Management

Components of an IPM Program

Characteristics of Least-Toxic Pesticides

Types of Least-Toxic Pesticides

Drawbacks Utilizing Least-Toxic Pesticides

Ant Control

Liquid/Gel Ant Control

Placement of Bait Stations

- Sure-fire Ways to Reduce the Effectiveness of Least-Toxic Pesticides
- Responsible Fertilizer Use
- Benefits of Using Organic Compost and Mulch.

Control Runoff: Store, use in landscape, and return to aquifer.

Downspouts direct roof water: to store, to use, and to return

Paving canted toward landscape, directs rainwater to use or return

Porous paving allows infiltration. DG + binder works

Driveway interceptor and slot drains direct water

On slopes, leave bios wale at bottom to infiltrate; turf can exacerbate runoff problem

Drywells, French Drains, and Rain Gardens all help retain and percolate.

Well-chosen Vegetation increases storage and percolation.

Role of Plants in Improving Runoff Water Quality

Increased soil biological activity increases water infiltration.

-Success depends on system maintenance and good plant choices.

-Don't forget about laws, ordinances, and local codes.

7. Creating a Backyard Wildlife Habitat

-How Many Lawns are in the U.S.?

-What Can We Do? -Landscape to protect local flora and fauna.

WHY? It's good for wildlife, saves energy, protects soil, and improves water and air quality.

-Benefits of Enhancing a Backyard Habitat

-Habitat Basics

-Importance of Balance

-Upsetting the Balance- Exotics

-Establishing Balance in Your Yard

-Let the wildlife eat the wildlife: fewer pesticides, more birds.

-Many of our food plants are also their food plants.

-Exotic species may not sustain native fauna.

-The Four Basic Wildlife Needs: Food, Water, Cover, and Space

Providing Food for Wildlife

Plants as Food

Food in All Seasons

The Role of Predators

Supplemental Feeders

Best Seed for Feeders

Bird Feeding

Bird Feeding Tips

Nectar Feeders

Nectar Recipe

Nectar Safety

Other Bird Feeders

Butterfly Feeders

Keeping Squirrels out of Bird Feeders

Squirrel Feeders

Feeding Other Wildlife

Providing Water for Wildlife

Birdbaths

Design a Puddling Station

Maintaining Your Water Features

Providing Cover for Wildlife

Restoring Cover

Plant Species Diversity

Plant Structural Diversity

Providing Space for Wildlife

Natural Nesting Places

Houses for Critters

Bird Houses

Bats

Bat Box

Butterfly House

Amphibian and Reptile House

Toad Abode

Bee Nesting House

-Don't forget the butterflies.

-Or Predators: spiders, insects, amphibians, reptiles, bats, and owls.

A bathhouse will attract these insect-eaters

-Try NOT to feed squirrels, skunks, raccoons, deer, and coyotes.

-If you provide water, keep it clean and out in the open. No mosquitoes please!

-Best cover a variety of natives at different heights.

-Space: for those territorial ones and plan to meet their needs.

Birdhouses are cute, but must be species-specific

-Ten Tips for Landscaping for Wildlife

-Designing Your Wildlife Habitat

-Voluntary Programs Promoting Wildlife Enhancements

-Resources

8. Grow Food

-Freshest food you'll ever eat.

- Reduce transportation costs and overheads.
- Reduce energy needed to feed the world.
- Reduce pesticide use and with it, air and water pollution.
- Build your soil as you grow your crops.

END OF PRESENTATION WE SAW, BUT GOOD MATERIAL FOLLOWS IN PPT FILE

- Sustainable Use of Natural Resources-Water
- What is Sustainable?
- Why Adopt Sustainable Landscape Practices?
- What are Sustainable Landscape Practices?
- Reduce Pesticide Use: MGs Teach IPM
- Soil Quality
- Waste Management
- Invasive Species
- Wild land Fire