

SUSTAINABLE GARDENING



SUSTAINABLE GARDENING

✦ PRINCIPLES

- + Naturalistic Design
- + Native Plants Hold Soil, Water
- + Right Plant – Right Place
- + Plant for the Long Term
- + Diversity
- + Energy Conservation
- + Storm Water Retention
- + Ecological Value



SUSTAINABLE GARDENING

✘ IMPLICATION OF TRADITIONAL LANDSCAPING

- + Air, noise, water pollution
- + Flood Damage/Erosion
- + Consumption of Natural Resources
- + Impacts to Public Health and Safety
- + Cost and Labor Intensive
- + Monotonous Landscapes



SUSTAINABLE GARDENING

× WHY SUSTAINABLE GARDENING?

+ Fertilizers and the Problems they Cause

- × Run-off from the use of fertilizers, especially the synthetic kind, is major cause of water pollution.
- × Production of synthetic fertilizer requires fossil fuels as inputs, then are shipped considerable distances to our gardens.
- × Increasingly, sustainability includes choosing organic fertilizers from **local sources**.

SUSTAINABLE GARDENING

✘ WHY SUSTAINABLE GARDENING?

- + Water – a Limited Resource: Not just in the arid West anymore, especially with the worsening droughts associated with climate change.
- + Pesticides – Not a Pretty Story: Pesticides kill beneficial insects too, and can even kill birds and other wildlife that feed on the affected insects. The use of pesticides turns our plants into pesticide-dependent junkies. “Plant Junkies”

SUSTAINABLE GARDENING

× “SUSTAINABLE” GARDENING 101

- + Encouraging predatory beneficial insects and beneficial microorganisms
- + Choosing disease-resistant varieties of plants
- + Rotating crops to different locations from year to year to interrupt pest reproduction cycles
- + And most importantly, just tolerating a certain amount of insect damage.

SUSTAINABLE GARDENING

× “SUSTAINABLE” GARDENING 101

- + It is a system that mimics nature and starts with building healthy soil because it produces healthy plants that are more apt to resist disease.
- + With prolonged use, synthetic nitrogen fertilizers can essentially destroy the soil.
- + Furthermore, it is not a sustainable product because it relies on finite fossil fuels not only for production but for transporting from the factory.
- + Sustainability implies a more holistic approach that considers the larger environment (storm water run-off, waterway pollution, water conservation) and conservation of labor.

SUSTAINABLE GARDENING

× PHILOSOPHY

- + Do No Harm
- + Tolerate Imperfection
- + Prevention is everything!!



SUSTAINABLE GARDENING

- ✘ Reduce/prevent pollution
- ✘ Conserve natural resources
- ✘ Maximize ecological function
- ✘ Look attractive



SUSTAINABLE GARDENING

✘ ONE MEASURE OF SUSTAINABILITY IS RESOURCE EFFICIENCY.

- + Gardens which use less water are more environmentally friendly, as are gardens with a small carbon footprint.
- + A gardener who goes to a nursery & buys a random assortment of plants may end up with plants shipped from remote locations, for example, which may have involved high water usage as well as fuel usage.
- + Gardeners who use local nurseries and focus on local plants raised in a sustainable way are acting in a way which contributes environmental benefits.

SUSTAINABLE GARDENING

- ✘ Some plants are considered more sustainable than others, and the same holds true for landscaping techniques.
- ✘ If landscaping helps retain topsoil, contributes to the heating and cooling of surrounding structures, provides shelter for wildlife, and includes native plants, it may be considered more sustainable, because the garden is benefiting the environment both directly and indirectly. Products used in the garden can also impact sustainability.

SUSTAINABLE GARDENING

✘ NATURALISTIC DESIGN

- + Requires less maintenance
- + Reduces environmental harm
- + Benefits wildlife
- + Provides seasonal interest



SUSTAINABLE GARDENING

✘ PRACTICES:

- + **Mulching** all uncovered soil for water retention, weed control, and to improve the soil's structure.
- + Choosing **Pest-resistant** plants
- + For disease & insect problems, use prevention first.
 - ✘ Take action only when a plant has been observed and found to be endangered. Then use least toxic method:
 - ★ Horticultural oil, Bt, Baking soda, Soaps. Biological or physical barrier controls, Removal by hand.

SUSTAINABLE GARDENING

✘ PRACTICES:

- + Avoiding broad spectrum insecticides
- + Weeding by hand



SUSTAINABLE GARDENING

✘ MAINTENANCE

- + Integrated Pest Management (IPM)
- + Careful Application of Nutrients
- + Water Conservation
- + Energy Conservation
- + Composting/Mulching



SUSTAINABLE GARDENING

× PREVENTION

- + It starts with putting the **right plant in the right place**. Features like right cold-hardiness, right sun, and enough space, choosing pest-resistant or pest-tolerant plant.
- + Create and maintain **healthy soil**, most importantly achieved by adding organic matter.
- + **Mulch, mulch, mulch**



SUSTAINABLE GARDENING

× PREVENTION

- + Keep the **garden clean** by removing weeds and plant debris that could promote and shelter pests.
- + Any diseased or badly infested plant parts should be removed as soon as you notice them.
- + Keeping tools clean can help prevent the spread of disease.
- + Attract **Beneficial insects**
- + Keep an eye on your plants so you'll notice problems soon. Walk your garden!!!!

SUSTAINABLE GARDENING

✘ RIGHT PLANT – RIGHT PLACE

- + Assess site conditions
- + Select plants that thrive under those conditions
- + Select plants whose ultimate size, shape fits needs
- + Compatible plants/plant communities
- + Avoid invasive plants



SUSTAINABLE GARDENING

× DIVERSITY

- + Use greatest diversity of plants
 - × More seasonal interest
 - × Less noticeable damage from pests and disease
 - × More wildlife habitat
- + Plant sites more densely, in layers
 - × Better water retention
 - × Greater air quality benefits
 - × More cooling ability



SUSTAINABLE GARDENING

✘ PLANT FOR THE LONG TERM

- + Perennials vs. annual
- + Longer lived over shorter
- + Reduce cost and transportation impacts from replacement



SUSTAINABLE GARDENING

✘ SUSTAINABLE PLANTS

- + **Drought-Tolerant** – for most situations and increasingly with global warming, drought-tolerance is key to sustainability.
- + **Resistant** to disease and severe insect damage
 - ✘ Minor insect damage – **GET OVER IT!**



SUSTAINABLE GARDENING

✘ NATIVE PLANTS (Native to Where ?)

- + Best adapted to local conditions/thrive with least care
- + Great variety of species for all conditions
- + Won't harm natural areas
- + High habitat value
- + Provide “sense of place”



SUSTAINABLE GARDENING

× GOTTA BE NATIVE?

- + Native plants is a term usually interpreted to mean **Locally native**.
- + Many plants are adaptive to our soil and climate conditions and thus are included in many lists of sustainable plants.



SUSTAINABLE GARDENING

× MYTH-BUSTING

- + Even the most drought-tolerant plants typically require careful watering during their first year, and sometimes longer.
- + So don't assume a plant is drought-tolerant until at least its second full season.
- + This is especially true of any plant installed in the spring (which is why fall planting is usually best)

SUSTAINABLE GARDENING

✦ COMPOSTING/MULCHING

- + Compost organic matter on site
- + Save on disposal fees, landfill space, transportation impacts
- + Create free compost for soil amendment



SUSTAINABLE GARDENING

✘ ENERGY CONSERVATION

+ Where feasible:

- ✘ Use hand tools rather than power tools
- ✘ Electric tools rather than gas tools
- ✘ 4-cycle engines rather than 2-cycle
- ✘ Keep power tools well-tuned
- ✘ Consider indirect impacts



SUSTAINABLE GARDENING

✘ CAREFUL NUTRIENT APPLICATION

- + Test soil to determine appropriate fertilizer
- + Use organics and slow-release
- + Apply sparingly and at correct time, according to directions
- + Little to none needed for natives



SUSTAINABLE GARDENING

✘ WATERING

- + Getting water down to the roots is the single most important thing you can do to keep your plants alive.
- + Perennials should be watered with care the first year after planting. But after that, if the soil is in good shape and the plantings are well-selected for the site, the plants can usually get along on their own.
- + Annuals do fine if they are cared for every few days by an attentive gardener with a hose whose nozzle slows the flow to a gentle shower.

SUSTAINABLE GARDENING

× WATERING

+ Basic Rules:

- × Use mulch to keep the soil moist.
- × Make watering convenient. Don't hide the faucet behind a prickly hedge, or plant your ferns and azaleas six hose lengths away.
- × Anything you plant, even if it's allegedly drought-tolerant, needs a lot of water at planting time and frequent watering through the first season. Don't plant and walk away praying for rain.
- × Finally, a shortcut for the distracted: if you water thoroughly once a week through the summer and into early fall, you and your green things will be okay.



SUSTAINABLE GARDENING

✘ WATER QUALITY AND CONSERVATION

- + **Deciduous trees** south of the home to create shade, evergreens on the north to stop winter winds
- + **Watering smart** – directly to the root zone by hand, soaker or drip irrigation, preferably in morning.
- + **Grouping plants** with similar water needs.
- + Reducing **Storm water run-off** using rain barrels and rain garden techniques.

SUSTAINABLE GARDENING

✘ WATER QUALITY AND CONSERVATION

- + Minimizing bare soil – use **ground covers**
- + Reducing or elimination **lawns**
- + Minimizing use of **impervious surfaces** so rainwater can be filtered before reaching storm water system
- + Choose **drought – tolerant plants**, except in wet spots
- + Weeding regularly because weeds compete for water with the plants we want

SUSTAINABLE GARDENING

✘ WATER CONSERVATION

+ Use less water

✘ Assess need

✘ Use water saving devices

✘ Water early in the day

✘ Use drought tolerant plants

+ Retain water

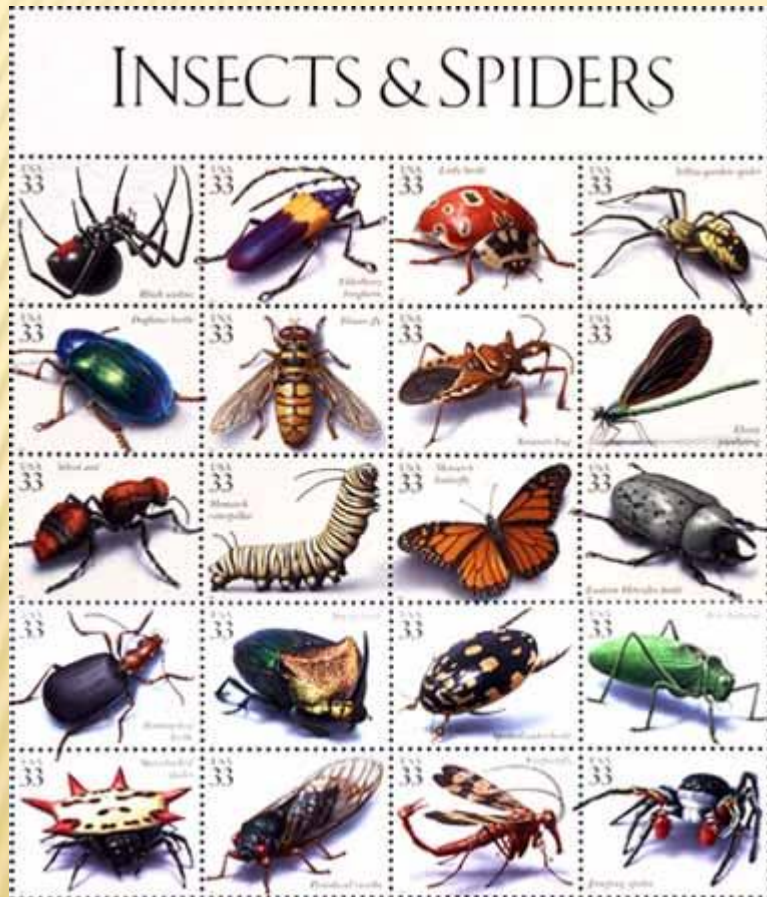
✘ Use mulch

✘ Capture runoff (rain barrels/gardens)

SUSTAINABLE GARDENING

- ✘ **BUGS & DISEASE – PHYSICAL & BIOLOGICAL CONTROLS**
 - + If you suspect bug damage, first figure out which insect is eating your plant. Don't panic if you just notice a few insects in or near your plants. Most are beneficial, harmless, or they are harmful only in large numbers.
 - + If the damage is minor and clearly not life-threatening, maybe “Live and let Live” is a real option.

SUSTAINABLE GARDENING



SUSTAINABLE GARDENING

✘ BUGS & DISEASE – PHYSICAL & BIOLOGICAL CONTROLS

+ First Plan of Attack – Physical Controls

✘ Hand-Picking

- ✘ Repellents – hard water spray, abrasive material like diatomaceous earth or eggshells around plants will keep soft-bellied insects like slugs away, unbrewed coffee, flowers like marigolds.



SUSTAINABLE GARDENING

- ✘ **BUGS & DISEASE – PHYSICAL & BIOLOGICAL CONTROLS**
 - + Disease: Once disease is present, there aren't many cures available and the best alternative is often getting rid of the diseased plant altogether.
That is why Prevention is so important.
 - + Ask yourself: Is treatment really needed? Mildews, for example, are unsightly but rarely fatal.

SUSTAINABLE GARDENING

× PESTICIDES

- + Homeowners use 10X more per acre than farmers
- + 67 million lbs applied on lawns each year
- + 2/3 users dispose of excess in trash, remainder down drains
- + Detectable limits found in 5-10% of wells



SUSTAINABLE GARDENING

✗ INTEGRATED PEST MANAGEMENT (IPM)

+ Practice IPM

- ✗ Monitor and assess
- ✗ Cultural controls first
- ✗ Least toxic chemicals
- ✗ Follow label directions carefully
- ✗ Spot treat rather than broadcast



SUSTAINABLE GARDENING

✘ INTEGRATED PEST MANAGEMENT (IPM)

+ Organics are Okay, Right?

✘ Turns out, that's not necessarily true.

✘ Some naturally occurring (organic) pesticides are actually worse than their artificial or synthetic competitors.

✘ "Organic" products get really good press but the Sustainable Gardener needs more information than that easy but misleading label.

SUSTAINABLE GARDENING

× BIOLOGICAL CONTROLS FOR INSECTS & DISEASE

+ Attract beneficial animals

- × Grow a diversity of plants, including some that are native to provide food and shelter and keep your garden free of chemicals.
- × Providing water also helps attract beneficial animals
- × Don't try to get rid of *all* the “bad” insects because if you succeeded in doing so, the “good” insects would then leave to find better feeding grounds.



SUSTAINABLE GARDENING

✘ BIOLOGICAL CONTROLS FOR INSECTS & DISEASE

- + Beneficial nematodes are microscopic worms that enter and kill a wide range of insects in the soil.
- + Bacterium thuringiensis (Bt) acts as a parasite to kill certain insects but can kill wanted insects, even the caterpillars of the beloved Monarchs.



SUSTAINABLE GARDENING

Not Zero Scaping !!!!

× 7 PRINCIPLES OF XERISCAPING

- + **Design and Planning** – Planning is key to a successful landscape. Design is a process of problem solving.
- + **Soil Improvement** – Plants must have organic material available in the soil in order to have healthy growth.
- + **Zoning of Plants** – Group plants with similar cultural needs together. Plants with similar needs for light, water, and nutrients should be grouped together in beds. This will make irrigation and maintenance easier and more efficient.

SUSTAINABLE GARDENING

✘ 7 PRINCIPLES OF XERISCAPING

- + **Turf Alternatives** – Traditional turf grasses require plenty of water, chemicals and time, and should be reserved for areas where the attributes of turf grass are most needed. Consider ground covers in alternate areas.
- + **Efficient Irrigation** – Apply water at rate that allows it to percolate into the root zone of the plants, without letting the water run off or evaporate on the surface of the soil.

SUSTAINABLE GARDENING

✘ 7 PRINCIPLES OF XERISCAPING

- + **Mulches** – Mulches help slow moisture evaporation, moderate soil temperatures, and help keep weed seeds from germinating. Apply mulches 3-4” deep, keeping away from the stem of the plant.
- + **Appropriate Maintenance** – One important aspect to consider when choosing plants for the landscape and garden is what type of maintenance will be required for the years to come. The largest single factor in the effort required to maintain that landscape is the **appropriateness of the plants to that specific site**. The farther a plant is brought out of it’s original natural environment, the more effort and expense will be required to maintain that plant.

THE END!