

HOW TO CARE FOR RAIN GARDENS

Watershed Management Group | Virtual Field Studies

Presenter: Madeline Ryder, Project Manager



Acknowledgements

AZ Department of Forestry and Fire Management



US Forest Service, Department of Agriculture



Topics for Today

Introduction

Rainwater Harvesting Principles

Seasonality

Essential Tools

Soil Health

Watering + Irrigation

Weeding

Plants

Q&A



Madeline Ryder

watershedmg.org/learn/classes/field-studies

Register for upcoming Living Lab Field Studies sessions

Virtual Field Studies Class: Composting Toilets

04/30/2020 - 5:00pm to 7:00pm

Virtual Field Studies Class: How to Care for Rain Gardens

05/09/2020 - 10:00am to 12:00pm

Virtual Field Studies Class: Irrigating with Cisterns: Planning and Design for Gravity Based Distribution

05/12/2020 - 5:00pm to 7:00pm

Virtual Field Studies Class: Irrigating with Cisterns: Planning and Design for Pump Based Distribution Irrigation Systems

05/21/2020 - 5:00pm to 7:00pm

Virtual Field Studies Class: How to Maintain and Prolong the Life of Your Rain Tank

05/23/2020 - 10:00am to 12:00pm

Virtual Field Studies Class: How to Install a Laundry-to-Landscape Greywater System

05/28/2020 - 5:00pm to 7:00pm

watershedmg.org/advocacy/steward-in-place



Steward In Place: The Tippy Tap



Steward In Place: How to Create Garden Soil from Sheet Mulching



Steward In Place: Trevor on Arundo Donax



Steward In Place: Trevor on Buffelgrass



Steward In Place: Trevor on the Stinknet Plant



Steward In Place: Pruning right-of-way trees in your neighborhood



Steward In Place: Composting Toilet Maintenance



Steward In Place: A Look At Large-Scale Green Infrastructure with Joaquin



Steward In Place: Earth Day 2020 -



Steward In Place: A Day in the Life of

Key Rainwater Harvesting Principles:

Long, thoughtful observation



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Small and simple

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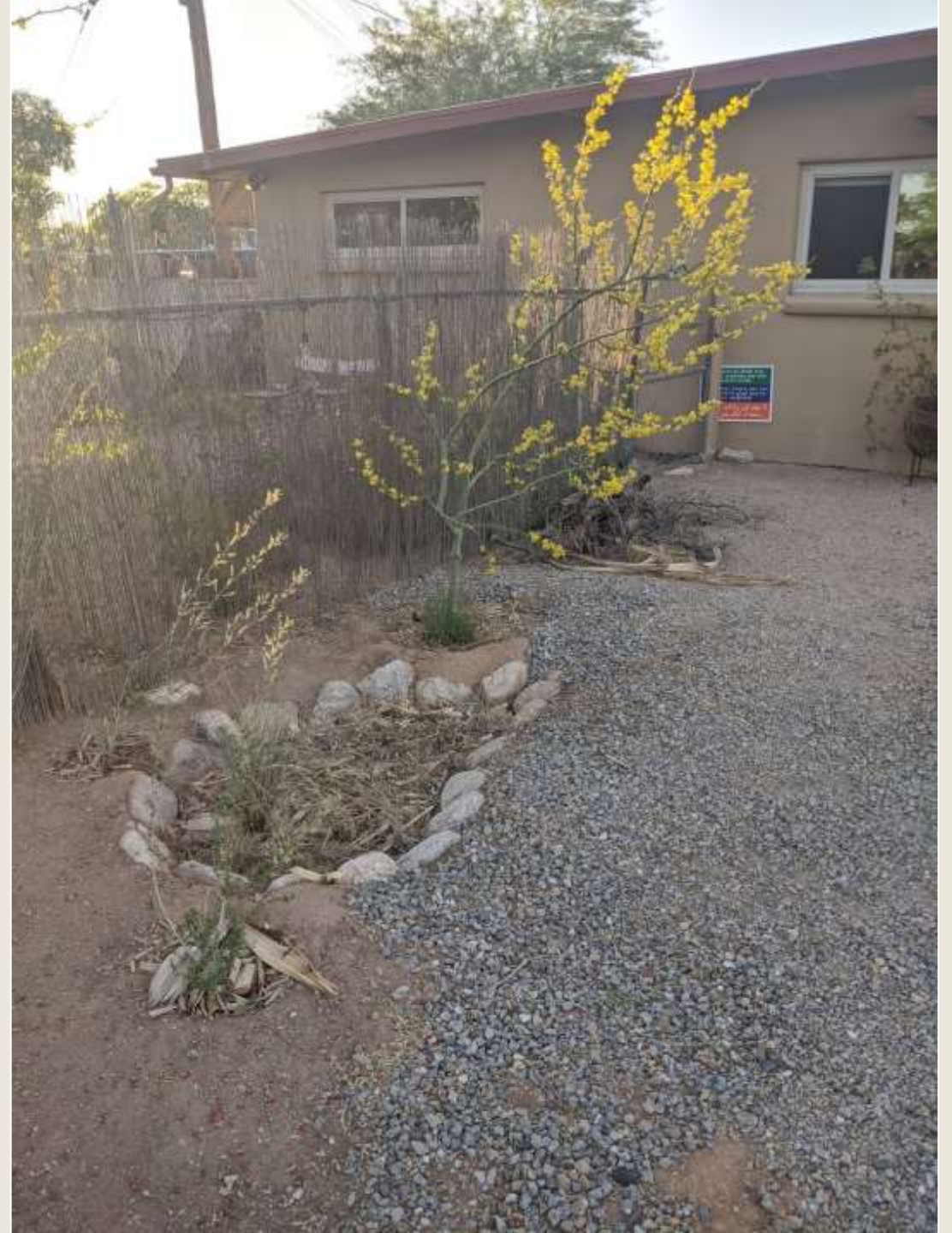
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Key Rainwater Harvesting Principles:

Long, thoughtful observation

Small and simple

Slow, spread, and sink the water

Use organic mulch when possible

Treat the overflow as a resource

Continually reassess



Five Sonoran Desert Seasons

- Winter (cold, wet)
- **Spring (warm, wet)**
- **Summer (hot, dry)**
- **Monsoon (hot, wet)**
- Fall (hot, dry)

Sonoran Spring (March – April)

New growth



Lincoln Perino

Flowering



Madeline Ryder

Sonoran Summer (May – mid July)

Fruiting



Lincoln Perino

Dormancy/Stress



Madeline Ryder

Sonoran Monsoon (mid July – August)

Intense Rains



Lincoln Perino

Annual Growth



Emma Stahl-Wert



Questions?

Essential Tools

Shovels:

- flat (shaping) and spade (digging)



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Rakes:

- hard (shaping, sifting) and leaf (dressing)



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- loppers (new tree/old shrub growth)
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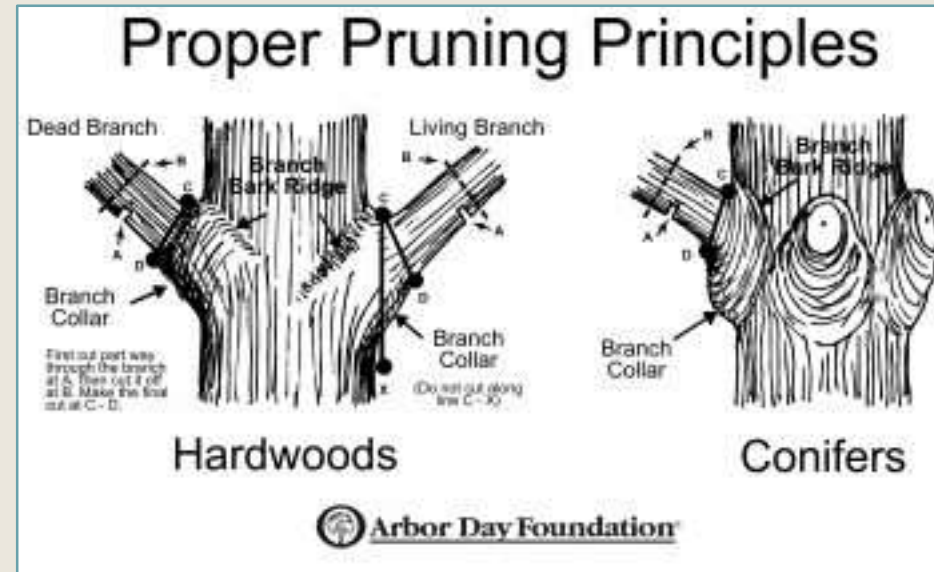
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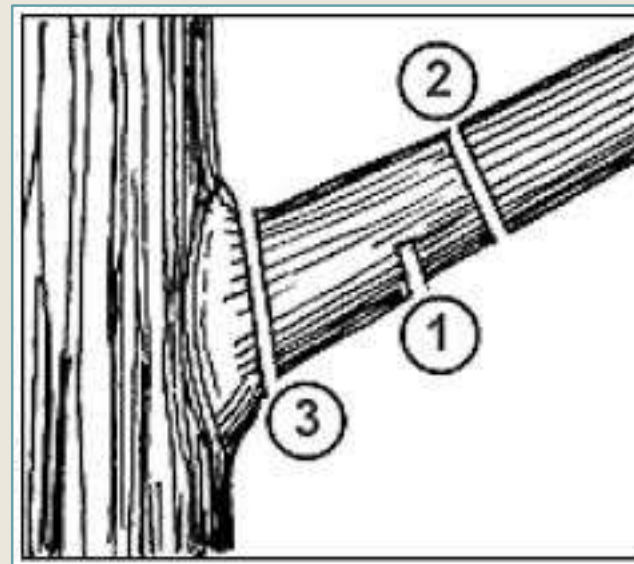
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Three Cut Method:



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Weeding:

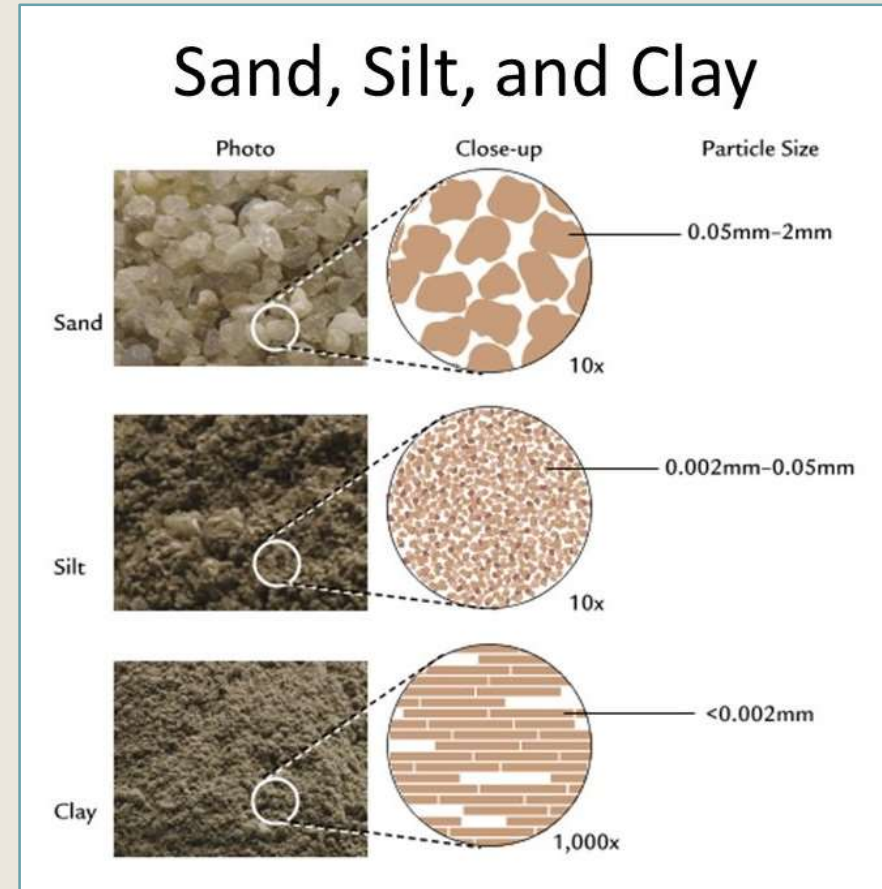
- stirrup/hula hoe (annuals, shaping)
- hand pick (tough, thorough weeding)



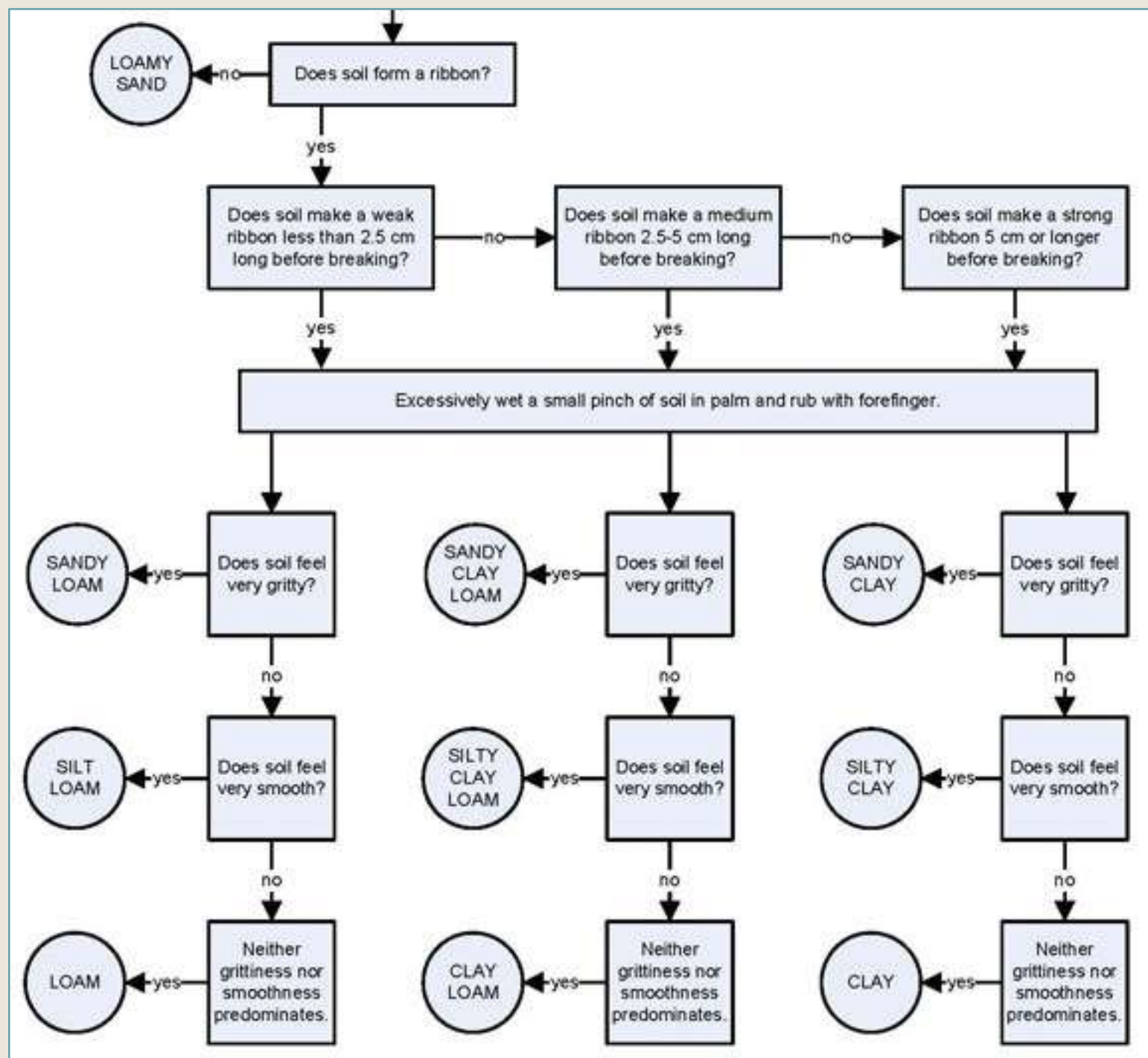
Determining Soil Composition

Ball + Ribbon Test

- Soil sample (3-4" deep)
- Break down aggregates
- Wet
- Form a ball (no ball = sand)
- Form a ribbon (no ribbon = loamy sand)
 - *Weak* = <1in
 - *Medium* = 1-2"
 - *Strong* = >2"
- Wet and rub against palm



support.rainmachine.com



USDA Soil Texture by Feel Key

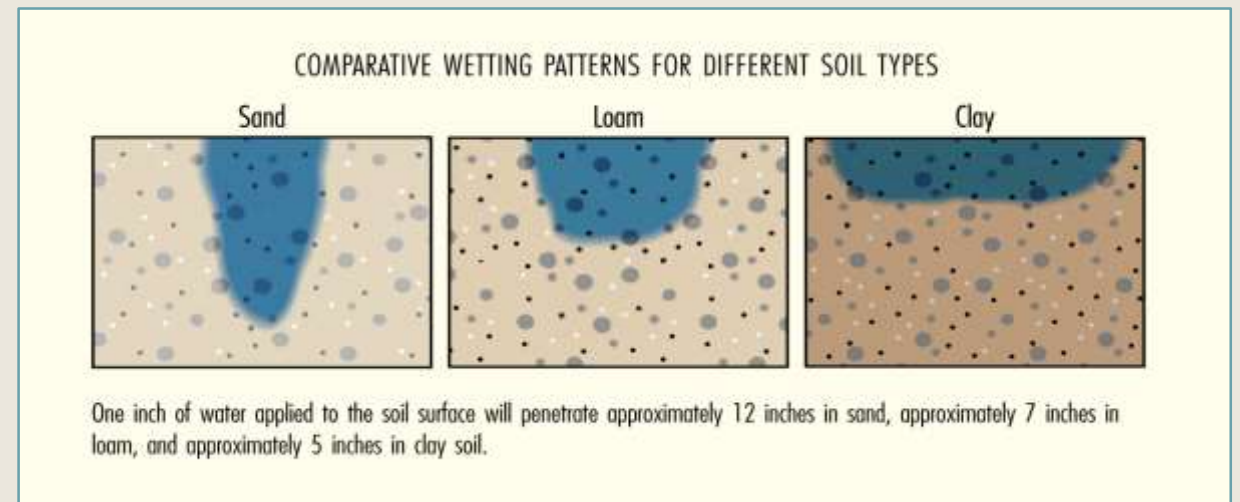
Determining Soil Composition

Jar Test

- Soil sample (1 cup; 3-4" deep)
- Add to 1qt mason jar with 1tsp Borax
- Shake vigorously for 5 minutes
- Let sit 24 to 48 hours



SoCal Yard Transformation

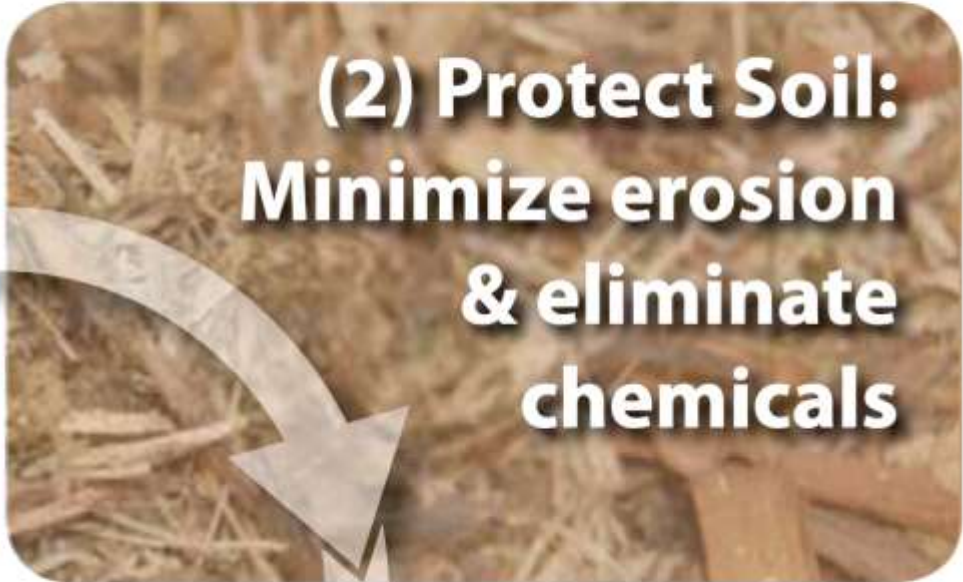


*Follow these four steps and you can
build healthy soil!*

(1) Plant the Water:
Increase soil
moisture &
spark life



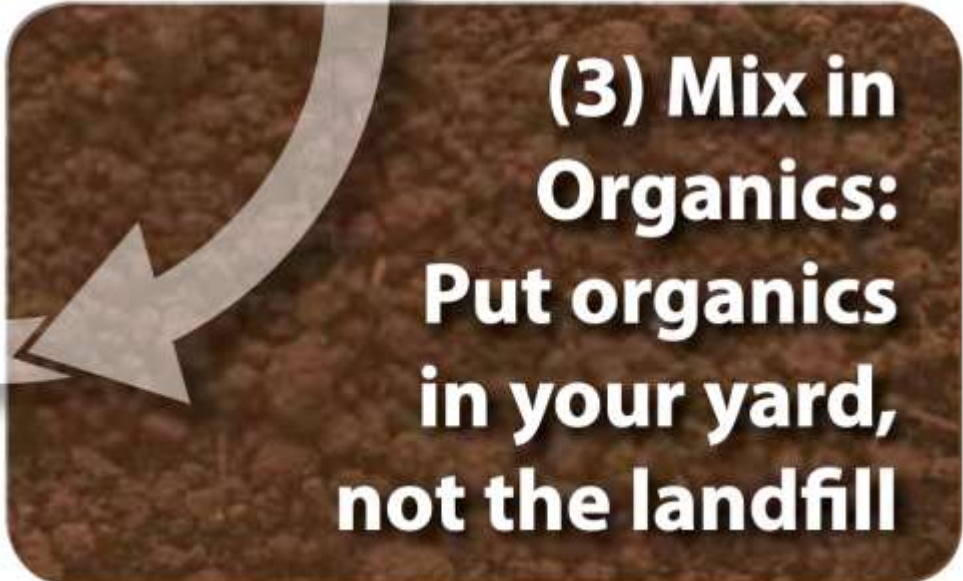
(2) Protect Soil:
Minimize erosion
& eliminate
chemicals



**(4) Plant Your
Ecosystem:**
Promote roots,
ground covers
& nitrogen fixers



**(3) Mix in
Organics:**
Put organics
in your yard,
not the landfill



Stabilize slopes



Reduce erosion



Photos by
Lincoln Perino



Lincoln Perino

Fresh tree trimmings applied to a rain basin.



After a good soaking rain the fungal organisms send up fruiting bodies - MUSHROOMS! - a good sign that decomposition is occurring!



**SEE HOW
MULCH TURNS
INTO SOIL!**



With the right moisture conditions present in a rain basin the tree trimmings quickly start to create a thin organic layer at the soil surface which helps re-build healthy soil.



See the white substance? It's fungal hyphae beginning to decompose the mulch and transport nutrients into the soil.

Don't forget!

- Compost
- Compost tea
- Chicken manure
- Earthworm castings



Watch out for buried root flares/root balls!

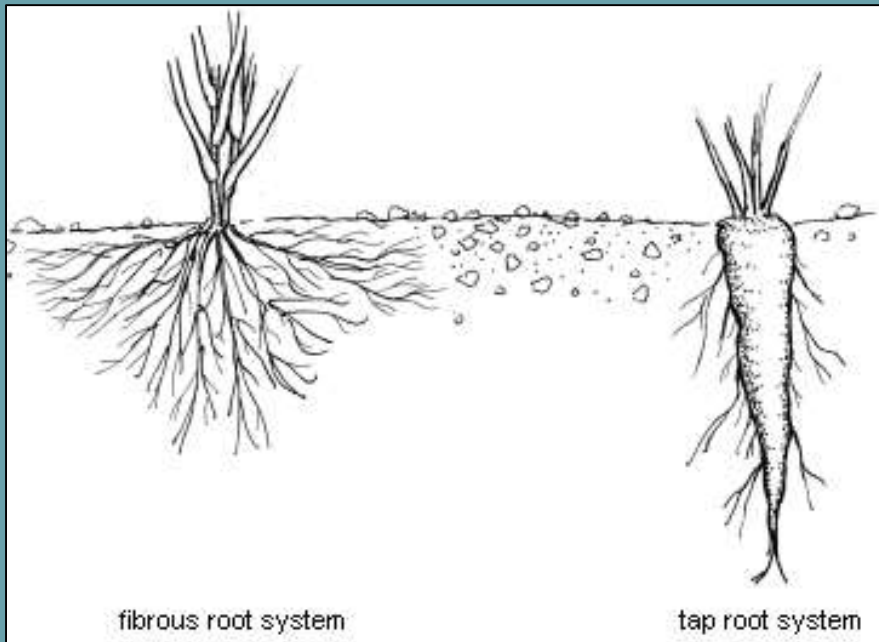
Heartwood Tree
Company

Lincoln Perino

Root Structures

Fibrous **monocots** → same size

Tap root **dicots** → diameter increases



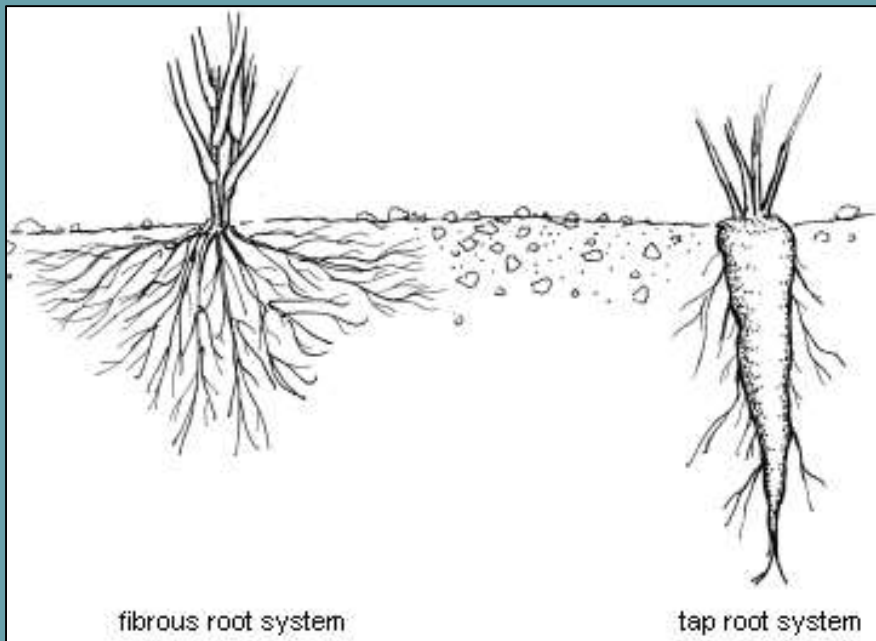
[pngio.com](https://www.pngio.com)

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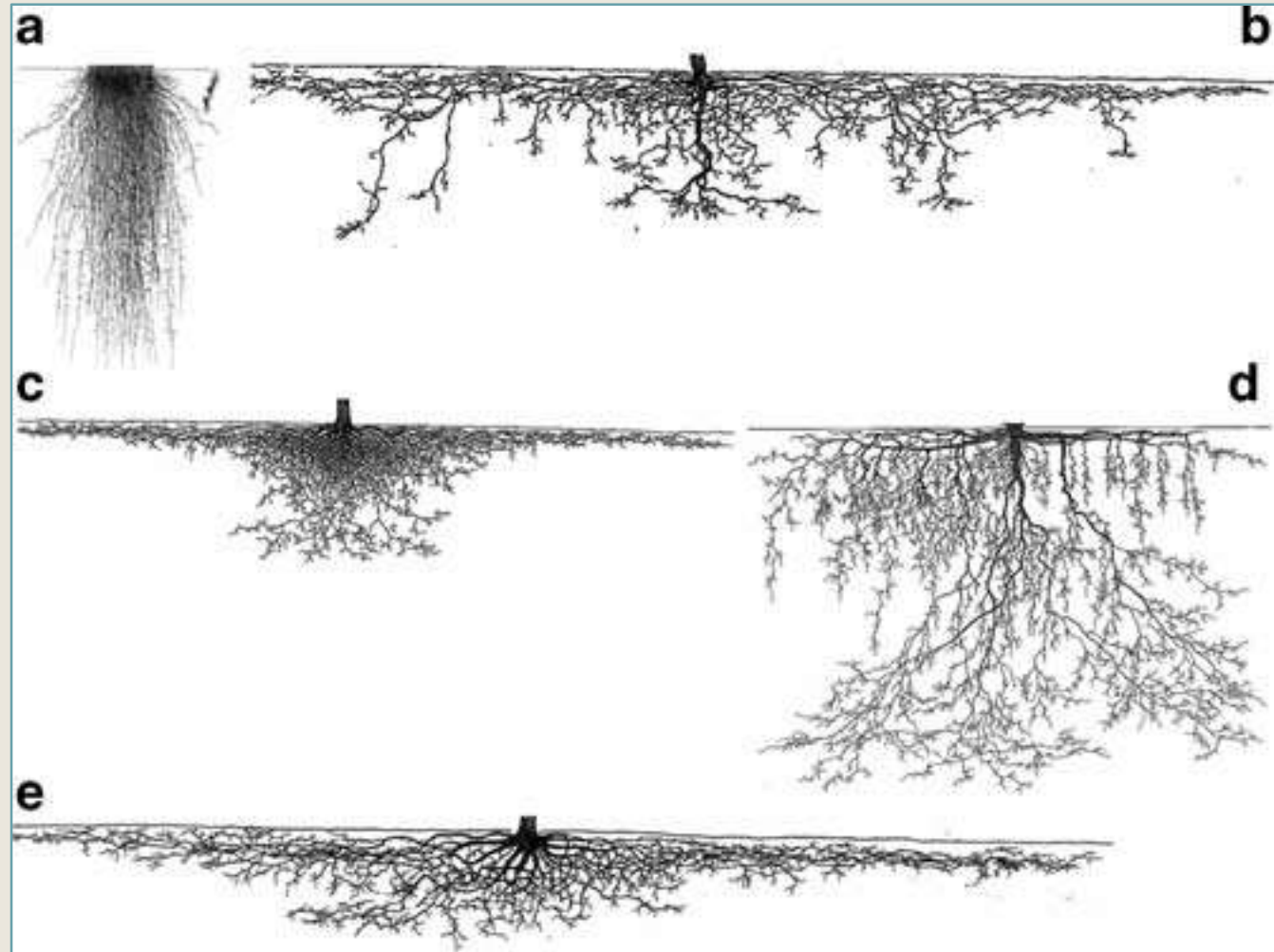
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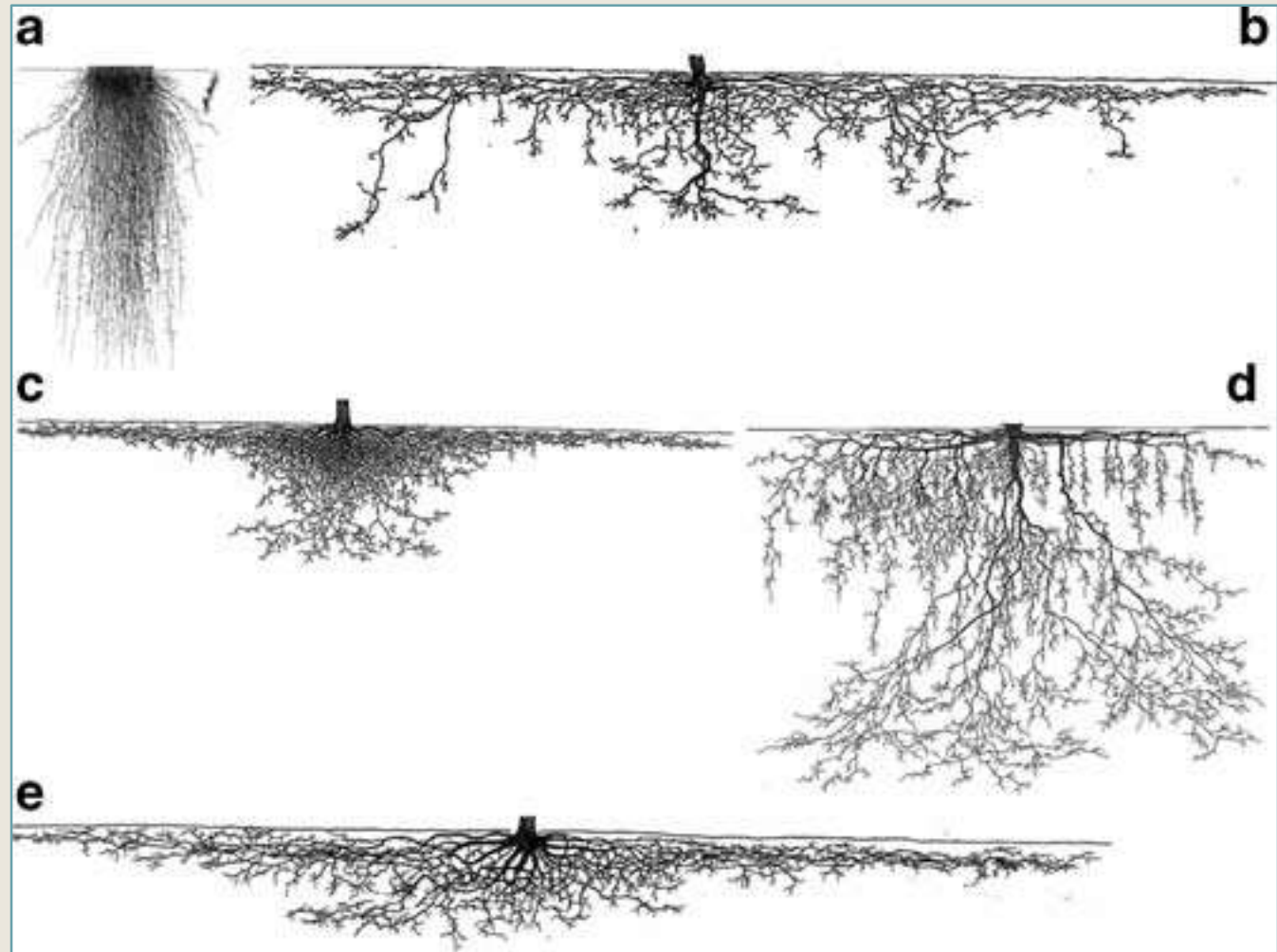
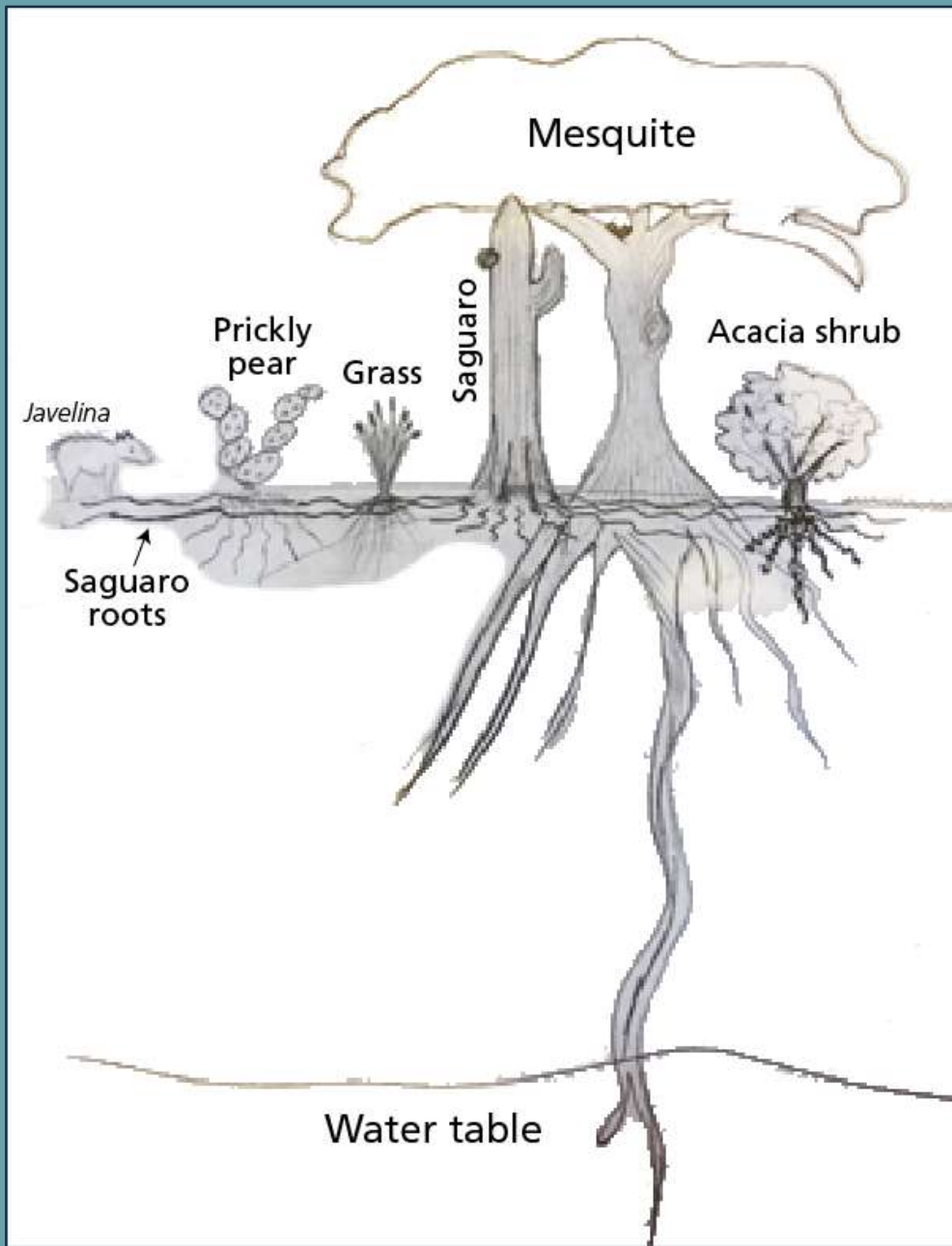
But so much more!!



pngio.com



Ghestem, Murielle & Sidle, Roy. (2011). The Influence of Plant Root Systems on Subsurface Flow: Implications for Slope Stability. *BioScience*. 61. 869-879. [10.1525/bio.2011.61.11.6](https://doi.org/10.1525/bio.2011.61.11.6).



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When should I water? Check leaves, base and surroundings

- Too little water → leaves turn brown, thin, crispy, drop
- Too much water → leaves may turn yellow, droop; trunk is soft, always wet
- Dormancy → check branches for flexibility
- Diagnose!

Watering + Irrigation Techniques

Timer + irrigation

- Provides slow/shallow watering
- Convenient (after installation)
- Higher \$\$/maintenance costs
- Planned obsolescence



Lincoln Perino

Watering + Irrigation Techniques

Hose + bucket method

- Provides moderate/subsurface watering and . . .
- Moderate labor, low cost, aesthetically debatable
- Allows for consistent presence

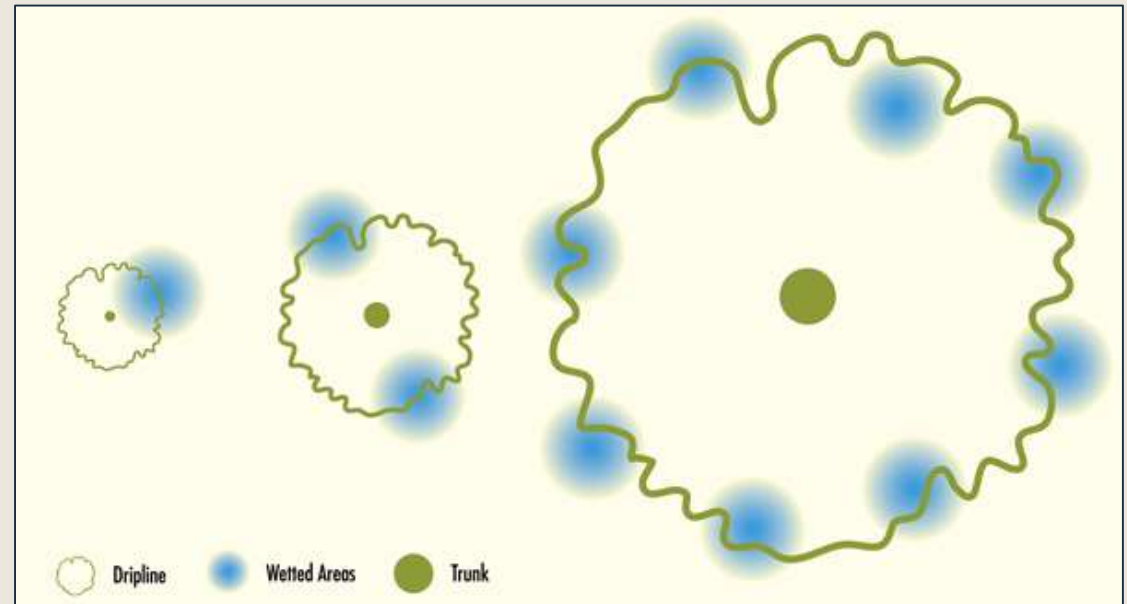


Lincoln Perino

Watering + Irrigation Techniques

Hand watering

- Provides deep watering
- High labor, low cost, more time



AMWUA

Plant Establishment + Phasing

- Always pair with earthworks!
- Earthworks → plant the water, then plant the plant
- Seasonal watering changes
- Only 3 years of supplemental irrigation with earthworks



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What is a weed?

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An unwanted plant

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Native

- A plant that is endemic (or, originated) in a specific place

Non-native

- A plant that is *not* endemic, or, migrated to a new place

What is a weed?

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Native

- A plant that is endemic (or, originated) in a specific place

Invasive

- A plant that has few ecological checks (i.e., herbivores, climate constraints) or particular biological qualities (i.e., growth/reproductive schemes) to allow for unimpeded growth on a landscape scale

Non-native

- A plant that is *not* endemic, or, migrated to a new place

Ornamental

- A plant, usually non-native, that is valued for its aesthetic features

Buffelgrass

Highly invasive
Major fire hazard
Bunch grass



iNaturalist.org



Bermuda grass

Highly invasive
Dominates urban landscapes
Groundcover
Rhizome, stem and seed growth

Arundo

Highly invasive
Dominates riparian landscapes
Rhizome/seed growth



calflora.org

Chop + Drop!

What is the growth method?

Seed: Bag seed heads and chop remaining organics (1-3" pieces) to leave as mulch

Rhizome: Remove entirely, compost if system is active and well-maintained

Use as a resource

Chop and drop to build up organics and reduce weed numbers over seasons

As plants establish, they provide new organic material



Madeline Ryder



Cheeseweed

London rocket



Red brome



Goat's head

Mesquite/Palo Verde seedlings



Frank Rose



African sumac seedlings



Questions?

PLANTS!

Types (trees; shrubs; perennials; grasses; succulents)

Pruning needs

Examples (common native; uncommon native and/or replacement native)

Common name, *scientific name*

TREES

Pruning is unnecessary in nature



Methuselah, *Livescience.com*

TREES

Pruning is unnecessary in nature

“Right plant, right place”



Madeline Ryder

TREES

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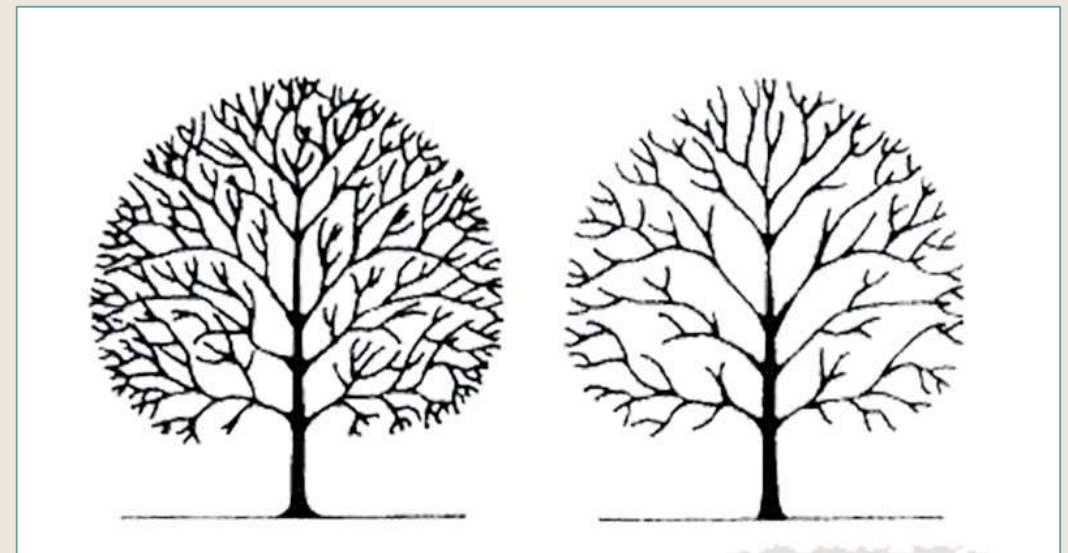
Crown cleaning/thinning/remedial pruning



Madeline Ryder



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terrehauttreeservice.com

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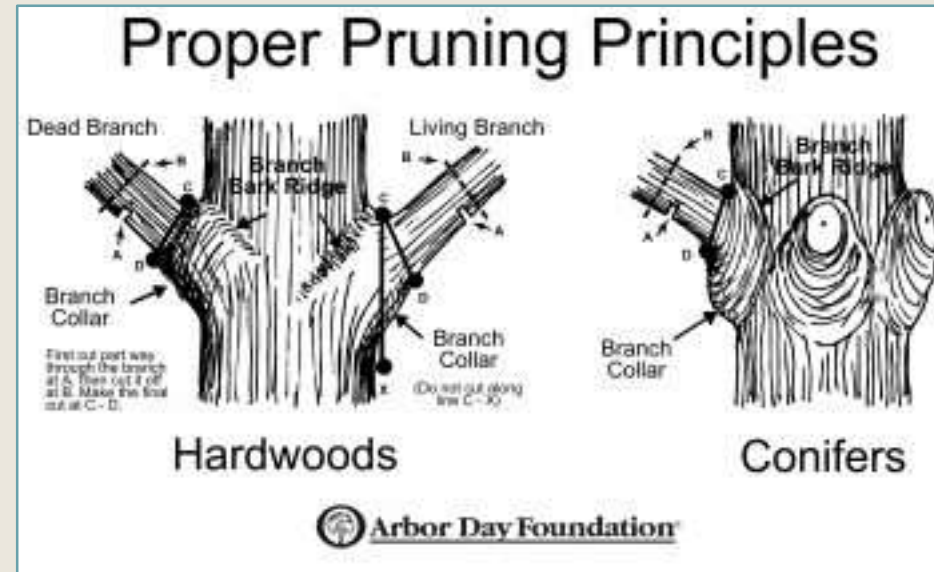
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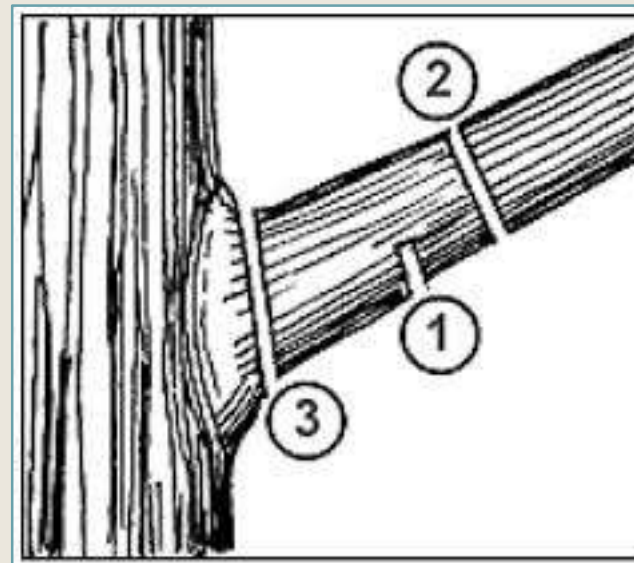
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Three Cut Method:



University of Missouri Extension

TREES

Pruning is unnecessary in nature

“Right plant, right place”

Crown cleaning/thinning/remedial pruning

NO “lion-tailing” or topping



sonorantreesvc.com



mydailytribune.com

TREES

Velvet Mesquite, *Prosopis velutina*, and
Screwbean Mesquite, *Prosopis pubescens*

- Pollinator (and human) food source
- Mistletoe as food source
- **Hybridization:** Chilean mesquite



saguaro-juniper.com



fireflyforest.com



horticultureunlimited.com

Palo Blanco, *Acacia willardiana*

Sonoran Desert native

Slow-moderate growth (20'H x 10'W)



aridzonetrees.com

Eucalyptus spp.

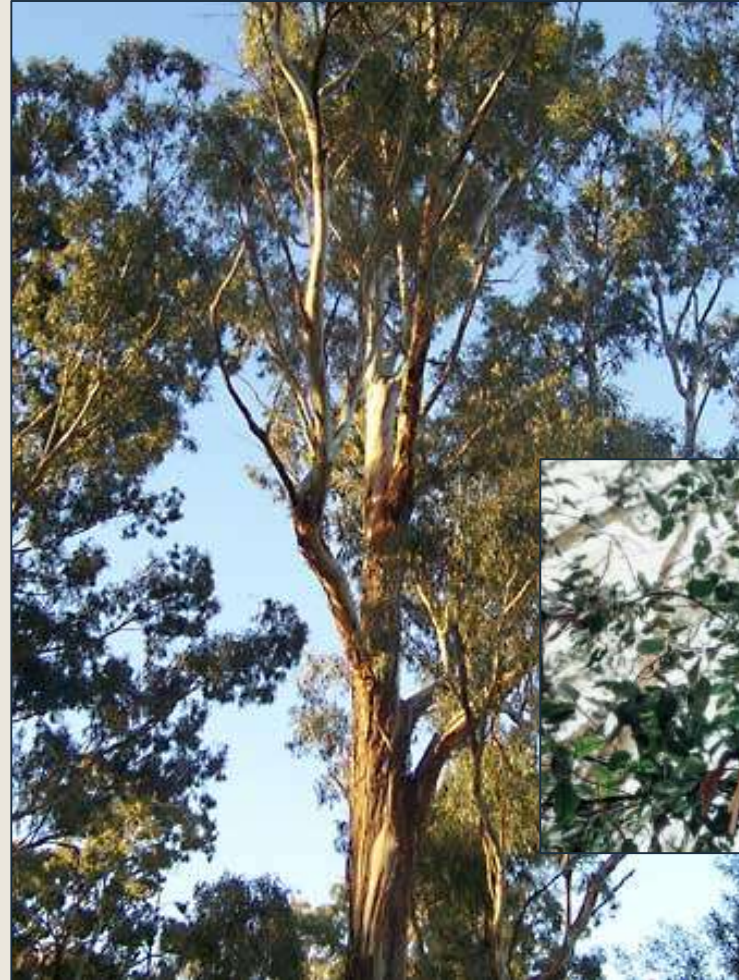
Native to Australia (700+ species)

Fast growing (20-40'H)

Messy, brittle habit

Dense hardwood

Toxic to mammals, potentially plants



Kqed.org
britannica.com

SHRUBS

Jojoba, *Simmondsia chinensis*

- Animal habitat and food source
- “Meatballing”/hedge pruning
- **Dioecious**



Houzz.com



feedipedia.org



sciencedirect.com

AZ Rosewood, *Vauquelinia californica*

Sonoran Desert native

Slow growth (10-20'H x 10'W)

Non-toxic



Pinterest

Oleander, *Nerium oleander*

Native to Mediterranean

Fast growth (5-20'H)

Toxic



plantmaster.com

PERENNIALS

Penstemon, *Penstemon sp.* and
Globemallow, *Sphaeralcea ambigua*

- Deadheading
- Seed collection



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taptealnativeplants.com

Gooding's Verbena, *Verbena gooddingii*

Native to Southwestern US
Non-toxic
Readily reseeds



bloomingatacademyvillage.org

Lantana spp.

Native to tropical Americas
Highly invasive in Oceania, Southern Africa
Poisonous leaves

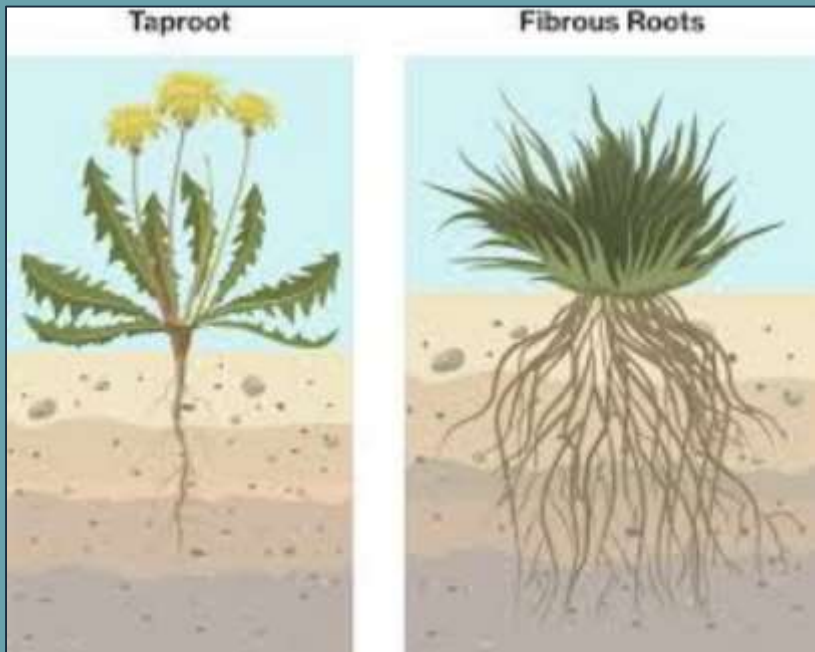


Mountain States Wholesale Nursery

GRASSES

Bamboo Muhly, *Muhlenbergia dumosa*

- Native bunch grass
- Skipper larval food plant
- Fibrous roots → basin infiltration



VivaDifferences.com



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Giant Sacaton, *Sporobolus wrightii*

Sonoran Desert native, historic grasslands
Grows 3-8'H
Bird, mammal, rodent habitat



Fountain Grass, *Pennisetum setaceum*

Non-native ornamental
Highly invasive in riparian areas
Fire hazard



National Park Service

SUCCULENT

Prickly Pear, *Opuntia spp.*

- Tortoise, mammal food source
- Pollinator food source
- Cochineal infestations
 - Treat as early as possible
 - Remove heavily infested pads
 - Spray with high pressure hose (and dish soap/water mixture)
 - Predated on by ladybugs

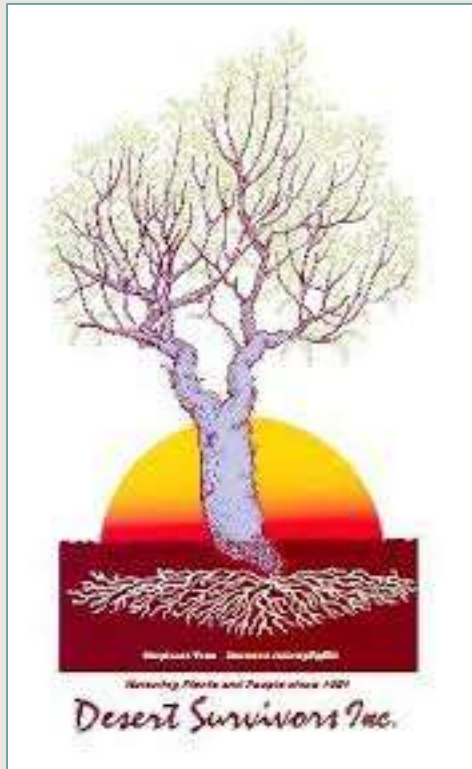
chinlecactusclub.com



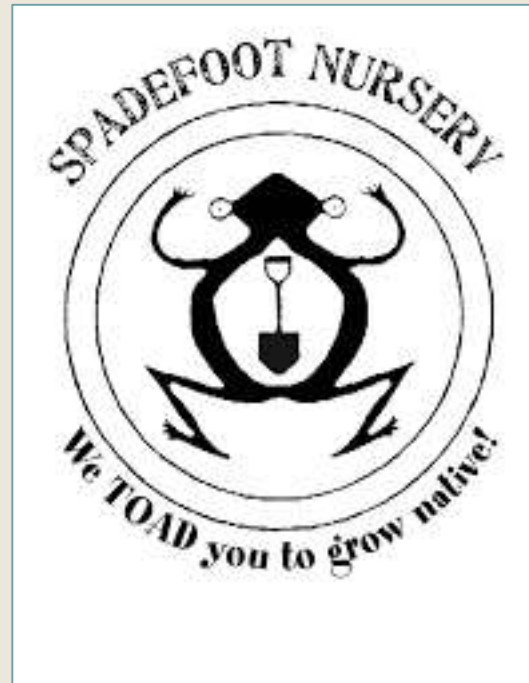
ucnrs.org

davesgarden.com

Community Resources



Desertsurvivors.org
[@desertsurvivors](https://twitter.com/desertsurvivors)

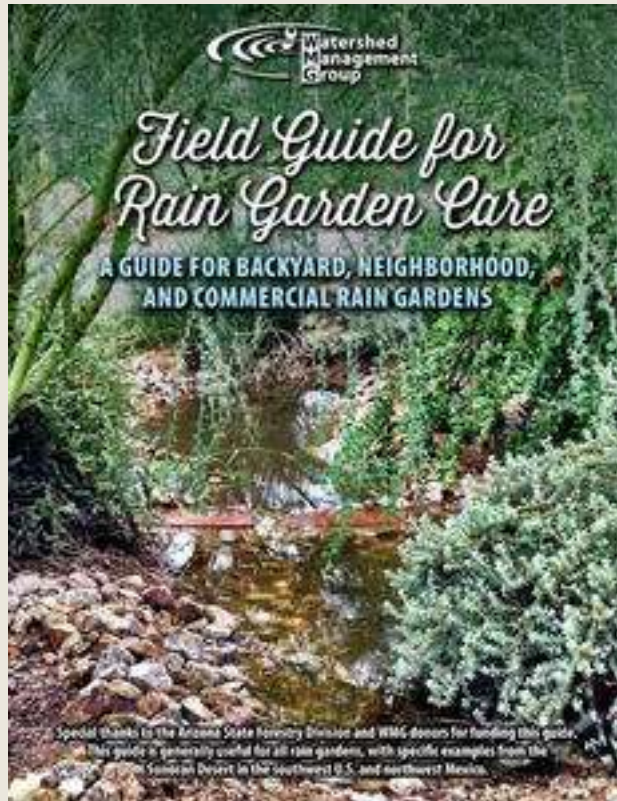


Spadefootnursery.com
[@spadefootnursery](https://twitter.com/spadefootnursery)



Extension.arizona.edu

WMG Resources



[watershedmg.org/learn/resource-library](https://www.watershedmg.org/learn/resource-library)

Questions?

