



Building Healthy Desert Soils


Turn waste into resources and build healthy soils



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Learning Objectives

- Identify how soils contribute to a healthy watershed
- Recognize soil characteristics
- Implement soil rebuilding practices



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Traits of Healthy Soils

Reduce

- Flooding
- Drought
- Fire

Rebuild

- Agricultural land
- Carbon balance
- Self-sustaining systems



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What tools did you use to choose where to live?



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Did you check out the neighborhood?

The screenshot shows the Neighborhood Scout website interface. At the top, the logo reads "NEIGHBORHOOD SCOUT" with the tagline "Enterprise-grade data for every neighborhood and city in the U.S.". Navigation links include "My Places", "My Searches", and "Buy or Sell a Home". A search bar prompts users to "Get crime, school & real estate reports for any address:" with a "SCOUT NOW" button. Below this, the page title is "Scottsdale, AZ Public Schools". A sidebar on the left lists "Best Scottsdale Neighborhoods for Education" with a numbered list: 1. Torbilla Flat / Horse Mesa, 2. Desert Highlands, 3. N Pima Rd / E Dynamite Blvd, 4. E Carefree Hwy / Tom Darling Ln, 5. Rinata Pass, 6. Rio Verde, 7. Scottsdale Rd / E Morning Vista Ln. The main content area features a map with a blue-shaded region, tabs for "OVERVIEW", "PUBLIC SCHOOLS", "APPRECIATION RATES", and "CRIME RATES", and a "Scottsdale Homes for Sale" section with a "FIND HOMES" button.

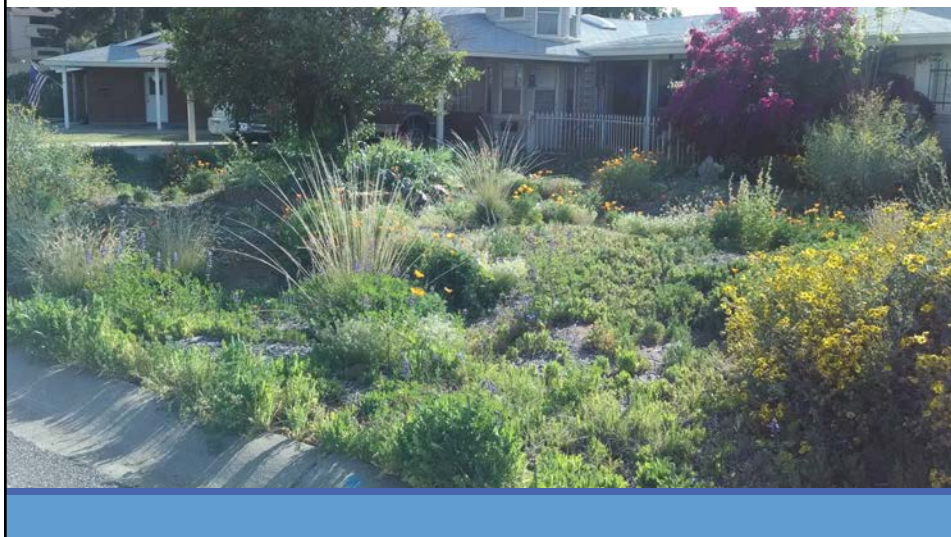
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Did you consider quality of life aspects?

The screenshot displays the Visit Phoenix website. The header includes the "VISIT PHOENIX" logo and navigation links for "Meeting Planners", "Travel Professionals", "Media", and "Members". A search bar is present with a "go" button. Below the header, a menu lists "ABOUT PHOENIX", "THINGS TO DO", "PLACES TO STAY", "WHERE TO EAT", "EVENTS", and "SPECIAL OFFERS". The main content area is titled "Phoenix Mountain Preserve" and includes a "Member Details" breadcrumb. It features a "SHARE" button, social media icons, and a "Like" button with a count of 17. A photograph shows two people hiking on a trail. To the right of the photo, the address "1431 E. Dunlap Ave. Phoenix, AZ 85020" is listed, along with a "Map It" button, the phone number "602 943-2656", and a "Visit website" link. A "+ My Trip Planner" button is also visible. A sidebar on the left lists "Things To Do" categories: ARTS & CULTURE, DOWNTOWN PHOENIX, ENTERTAINMENT, GOLF, OUTDOOR ACTIVITIES, SHOPPING, and SPAS & HEALTH. At the bottom, a paragraph states: "Phoenix Mountain Park and Recreation Area and Dreamy Draw Recreation Area is located just north of Glendale Ave and 24th Street in Phoenix. Although surrounded by civilization, Phoenix Mountain Park and Recreation..."

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Did you consider curb appeal?



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What about soil characteristics?

Eastern Maricopa and Northern Pinal Counties Area, Arizona

LaA—Laven loam, 0 to 1 percent slopes

Map Unit Setting
 National map unit symbol: 1q4d
 Elevation: 1,100 to 1,700 feet
 Mean annual precipitation: 6 to 9 inches
 Mean annual air temperature: 72 to 74 degrees F
 Frost-free period: 240 to 300 days
 Farmland classification: Prime farmland if irrigated

Map Unit Composition
 Laven and similar soils: 100 percent
 Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laven

Setting
 Landform: Alluvial fans, stream terraces
 Landform position (two-dimensional): Summit
 Landform position (three-dimensional): Tread
 Down-slope shape: Convex
 Across-slope shape: Convex
 Parent material: Mixed alluvium

Typical profile
 Ap - 0 to 14 inches: loam
 Bt - 14 to 60 inches: loam

Properties and qualities
 Slope: 0 to 1 percent
 Depth to restrictive feature: More than 80 inches
 Natural drainage class: Well drained
 Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 inches)
 Depth to water table: More than 80 inches
 Frequency of flooding: None
 Frequency of ponding: None
 Calcium carbonate, maximum in profile: 35 percent
 Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 meq/cent)
 Available water storage in profile: High (about 10.2 inches)

Interpretive groups
 Land capability classification (irrigated): 1
 Land capability classification (nonirrigated): 7c
 Hydrologic Soil Group: B
 Hydraulic soil rating: No

[HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV](http://websoilsurvey.sc.egov.usda.gov)

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This man did!



Don Breckenfeld, Retired soil scientist – now urban farmer along the Santa Cruz River historic floodplain

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Soil: Not just a home for microbes



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Most people don't...

However, there is hope to invest in your soil and begin transformation



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Get to know your soils

1. Soil survey

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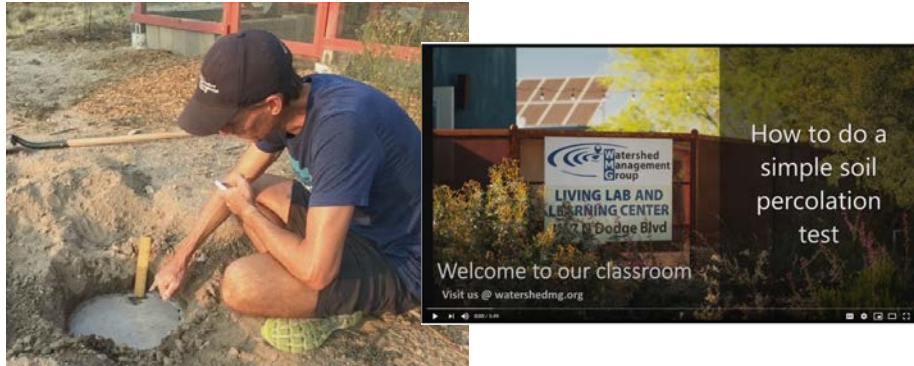
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[HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV](http://websoilsurvey.sc.egov.usda.gov)

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Get to know your soils

2. Percolation test



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Get to know your soils

3. Soil texture

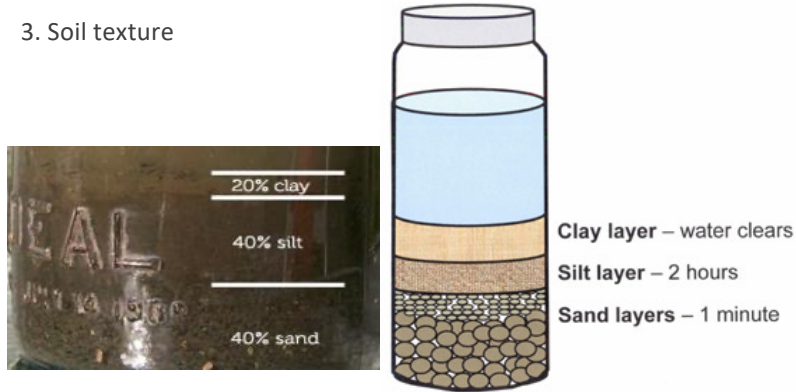


Image source: diy.org and ext.colostate.edu

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Common Traits of Urban Desert Soils

- Top fill during construction
- Compacted
- Generally alkaline
- Low organic matter
- Low nitrogen
- Caliche



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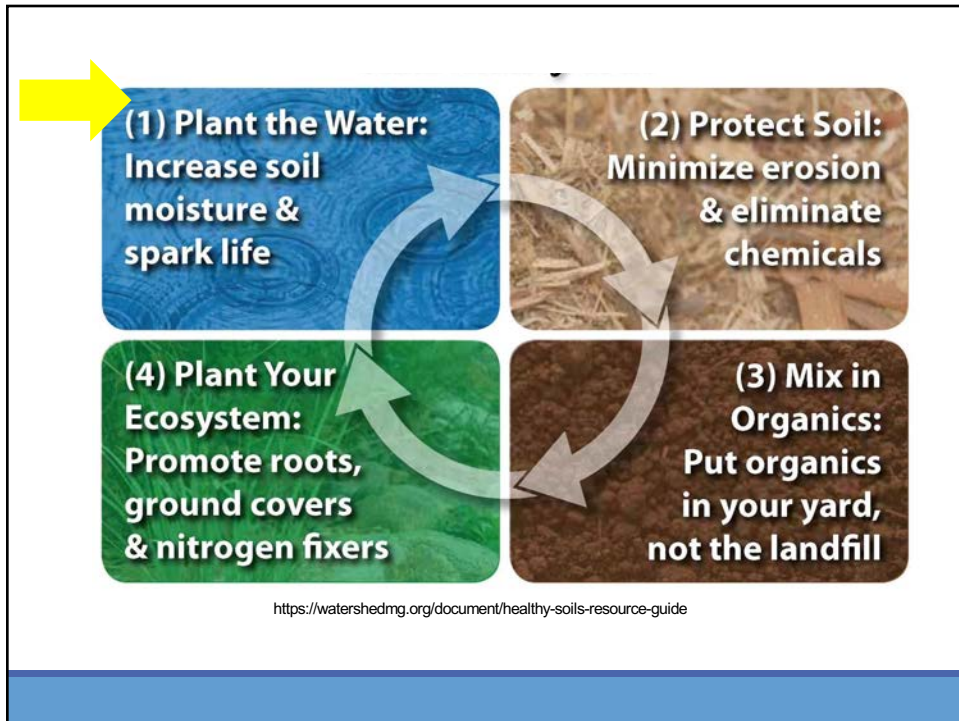
...Into a productive oasis?

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Our typical starting point: Hot or flooded
Lack of integration with water and landscape resources...

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Basins make a difference after rain!

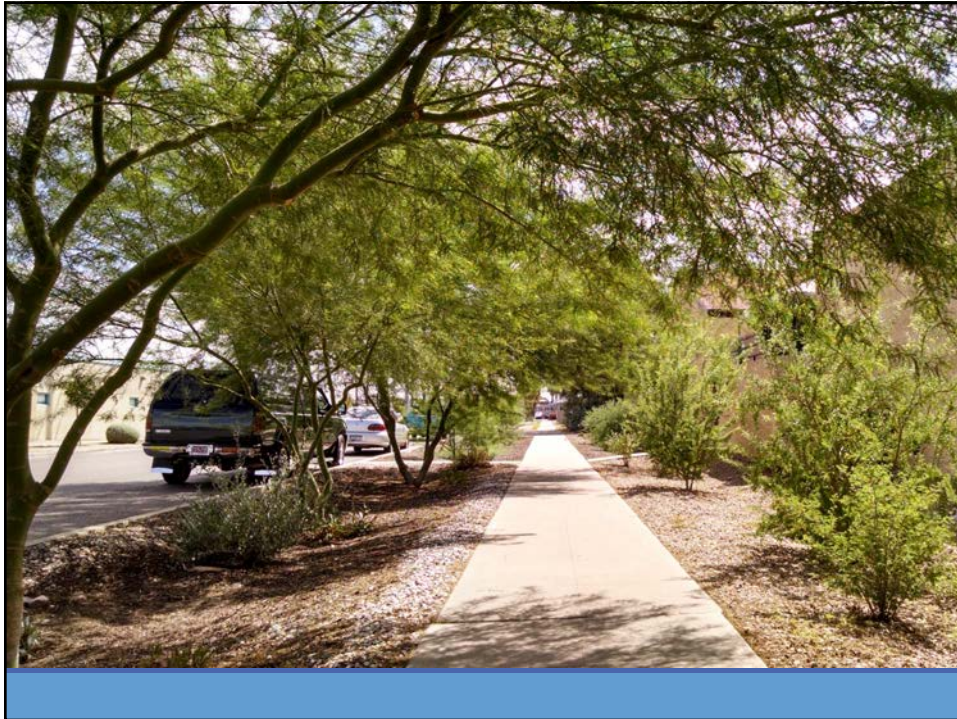


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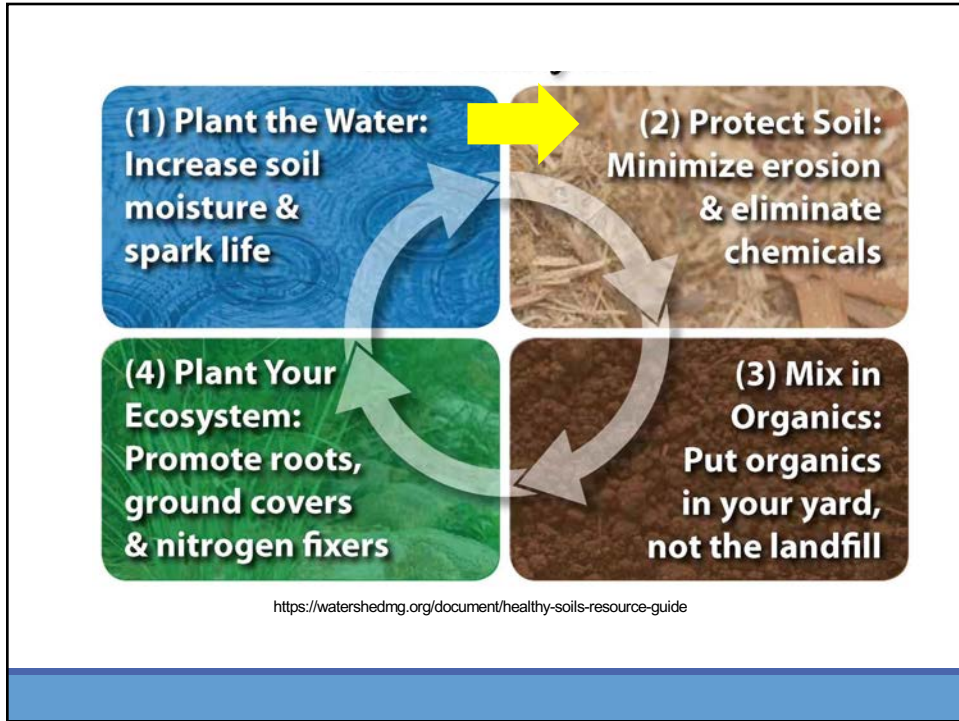
Soil microbes & native plants LOVE stormwater



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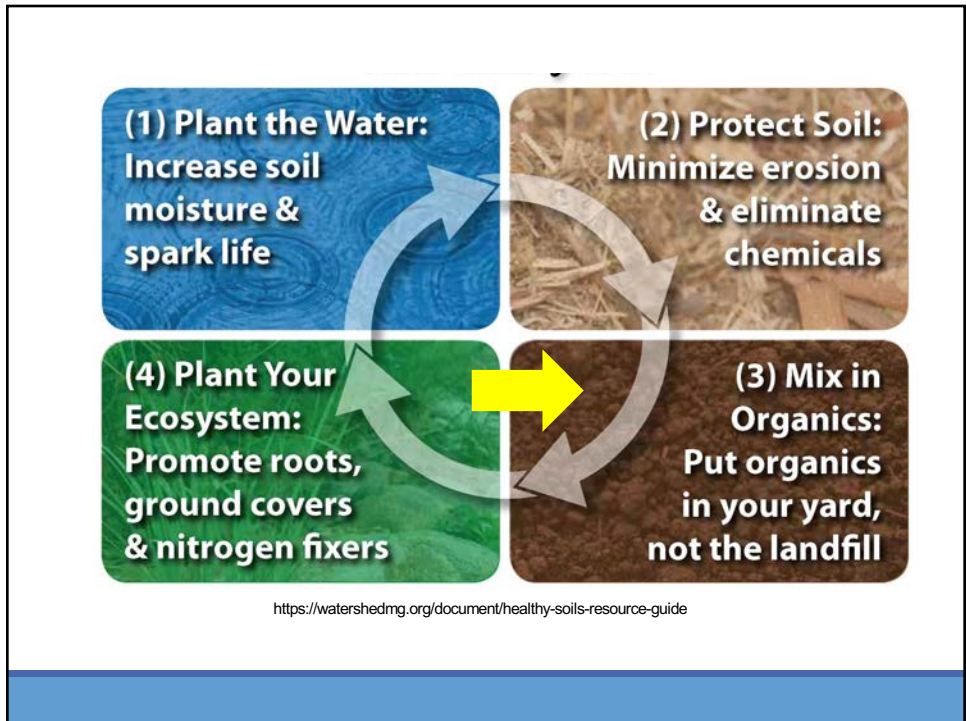


...some maintenance practices do more harm than good

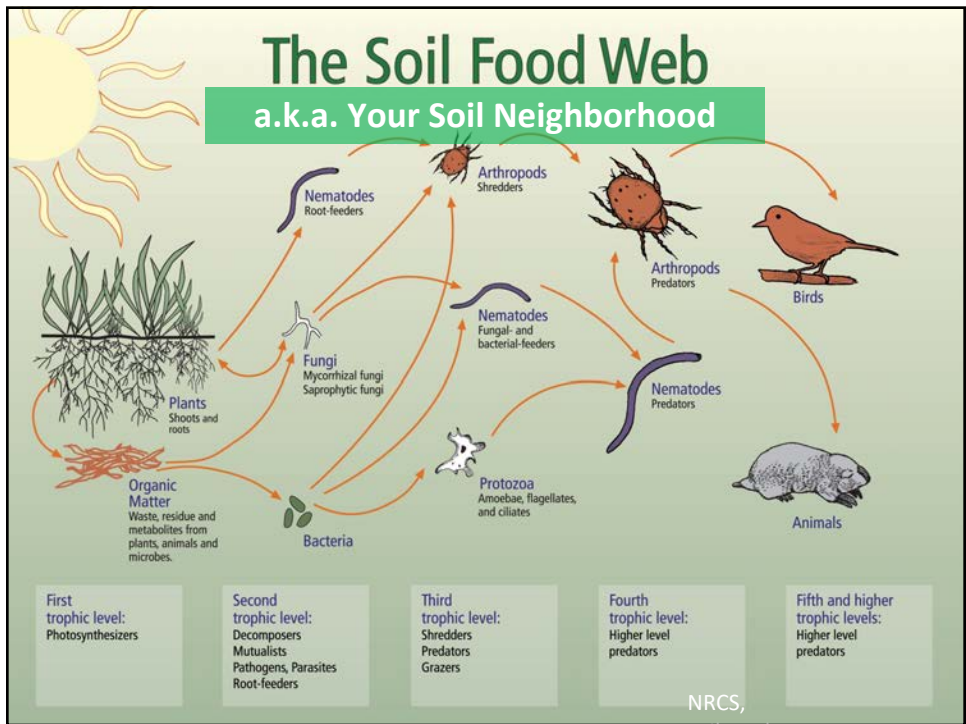
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Always Integrate Organic Material
– Prune, Mulch, and Harvest

Fresh Tree Trimmings

A close-up photograph of a hand holding a handful of fresh tree trimmings, including wood chips and leaves. The background is a large pile of similar material.

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Promote fungi for perennial plants



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Integration of mulch into topsoil!



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Promote bacteria for vegetables and annuals.



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The shredders!



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Compost

Food scraps and smaller plant trimmings:

- Can provide residential needs for soil compost amendments
- Average person generates ~1.35 pounds of organic waste per day. That equals ~500 pounds per person every year!

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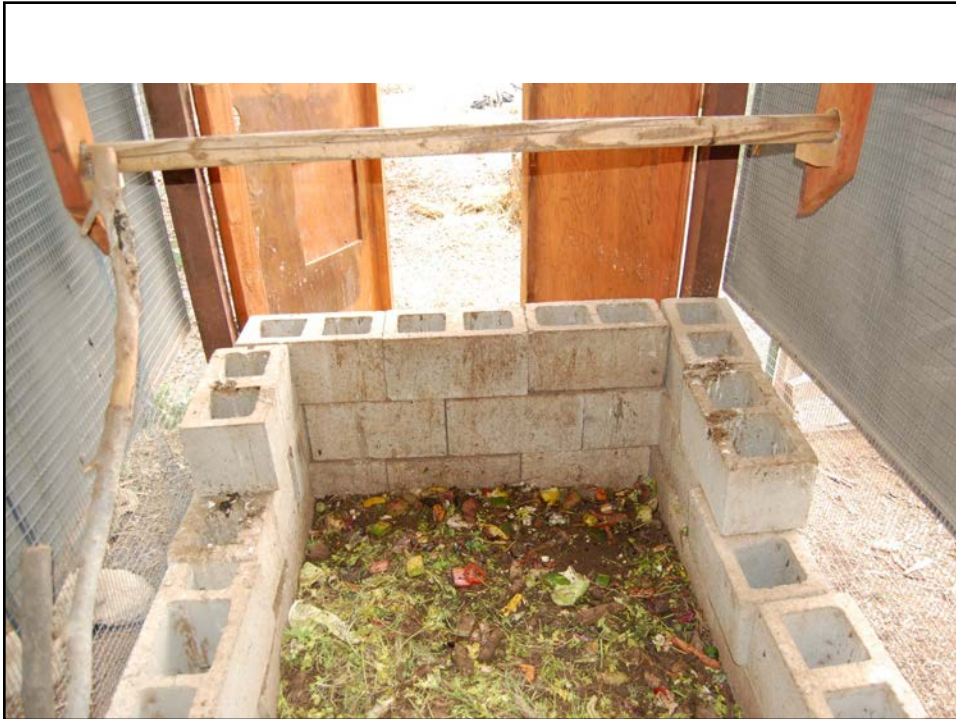
Backyard
compost pile
integrated into
chicken coop

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Hens hard at work



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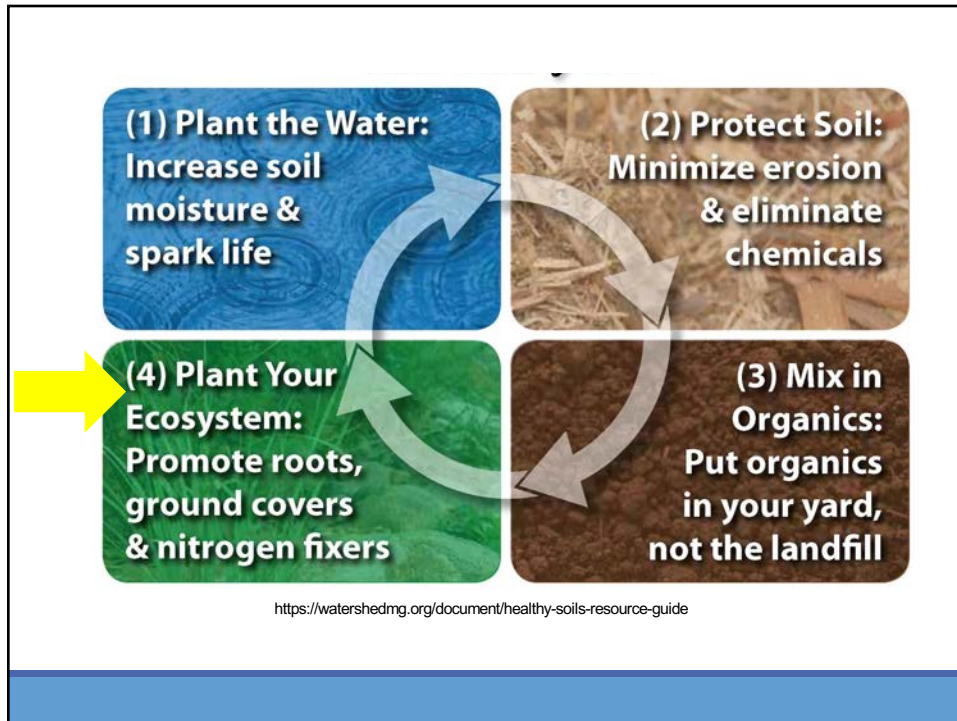
Amazing compost for vegetables!



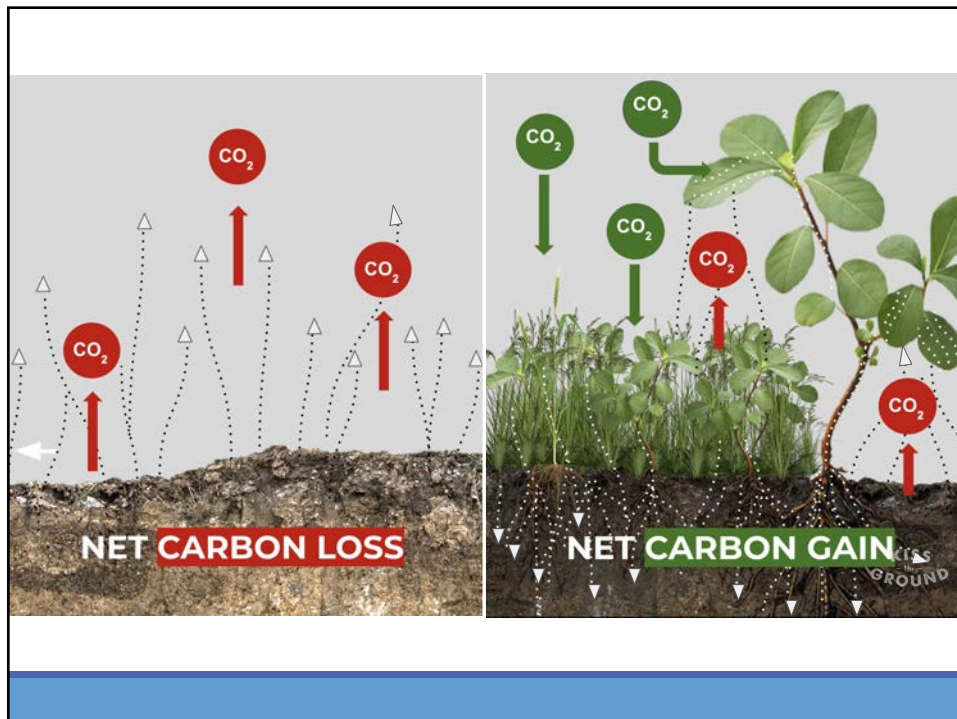
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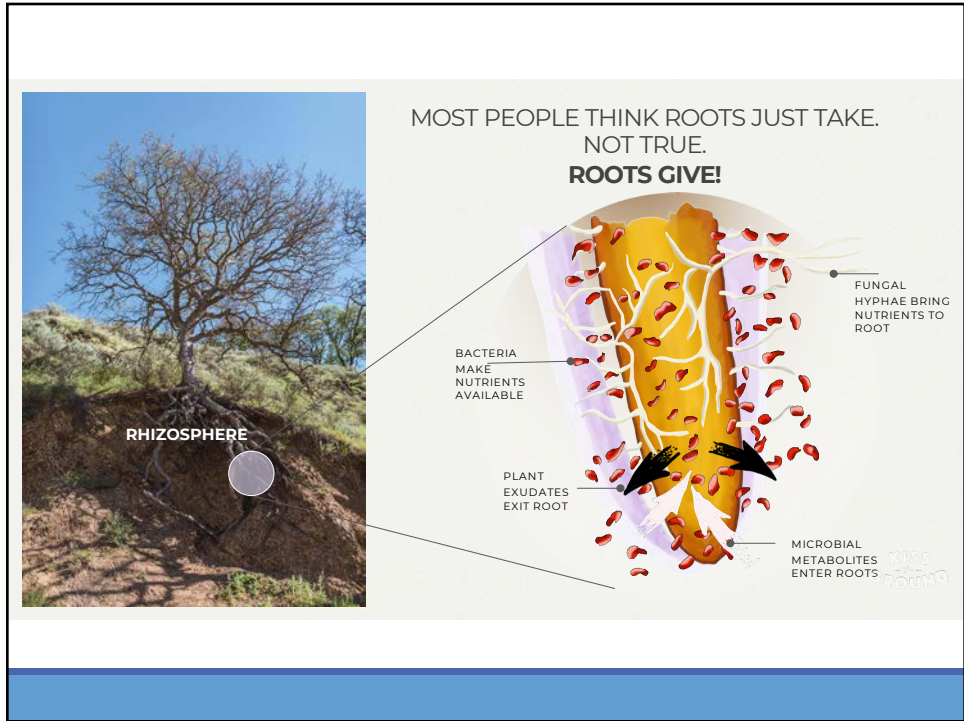
44



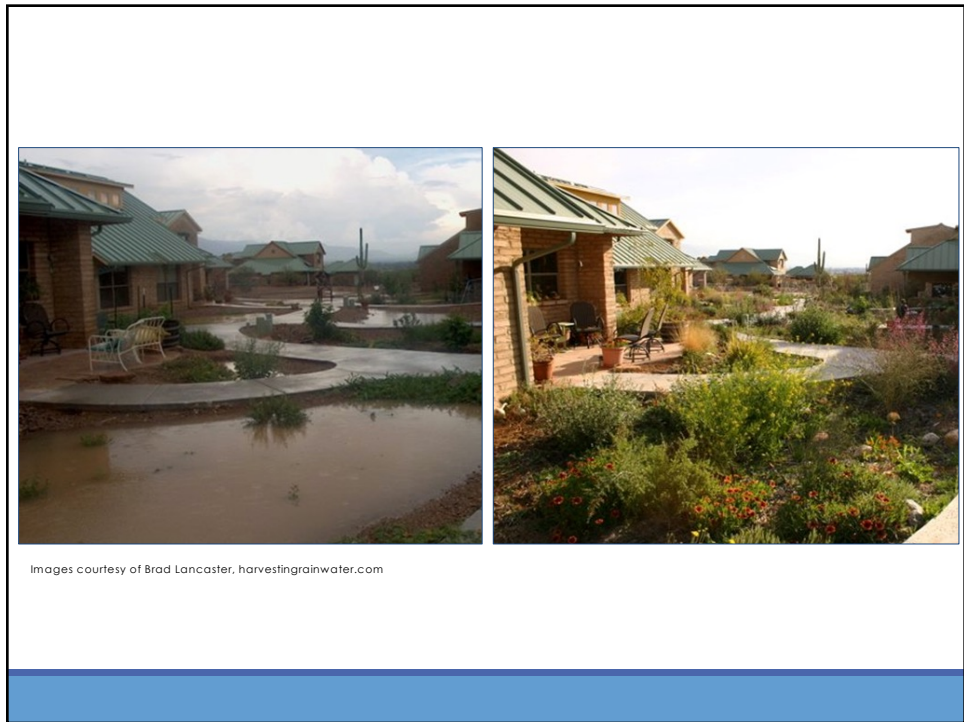
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Guide to Healthy Desert Soils

1. Observe landscape and site interactions regarding use, water flow, and soil
2. Promote infiltration and absorption of water
3. Integrate living and dead organic material
4. Minimize soil disturbing maintenance practices
5. Make appropriate use of on-site and local “waste” streams as soil building resources
6. Continue to promote soil building processes

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What resources do you produce to build your soil fertility?



List your resources:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

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Can you add any more resources to your list to build your soil fertility?



- Rainwater
- Greywater
- Stormwater
- Tree trimmings
- Native plants
- Food scraps
- Chicken manure
- Earthworm castings

...And your creative capacity!

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Instructions for soils activity

What Soil Resources do you have?

- Review Soil Resources List, page 1 of handout

Soil Enhancement Planning

- Handout on page 1
- Areas
- Needs
- Best practices to employ

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Questions?

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Thank You!!!



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