Soil Basics for Home Gardeners

Sustainable Landscaping

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About Master Gardeners

Advice to Grow By … Ask Us!

OUR MISSION:

To extend research-based knowledge and information on home horticulture, pest management, and sustainable landscape practices to the residents of Alameda County

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Examples of beautiful, water-efficient sustainable landscapes. *Photos:* Martin Fletcher, California Gardens.com.

What is Sustainable Landscaping?

- Selecting plants that are adapted to your climate and microclimate
- Implementing maintenance practices that reduce water waste, protect water quality, nurture soil, recycle organic matter
- Incorporating integrated pest management (IPM),
- Protecting and encouraging desirable wildlife
- Conserve energy.

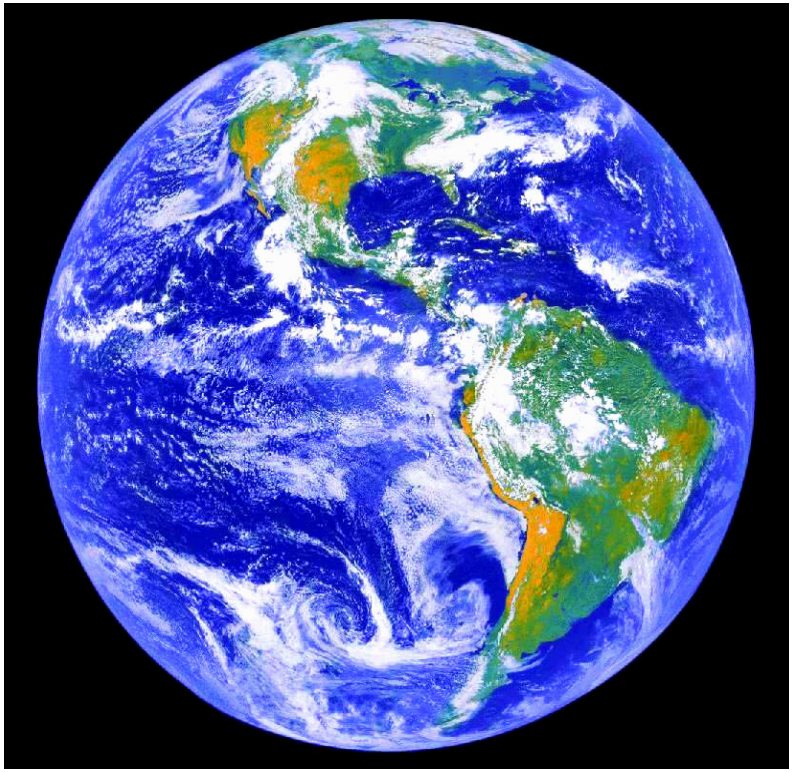
Soil Basics for Home Gardeners

- Why is soil important?
- What is soil?
- Properties of soil
- Characteristics of healthy soil
- How to build and maintain healthy soil
- Finding out about your soil
- Hands-on activity

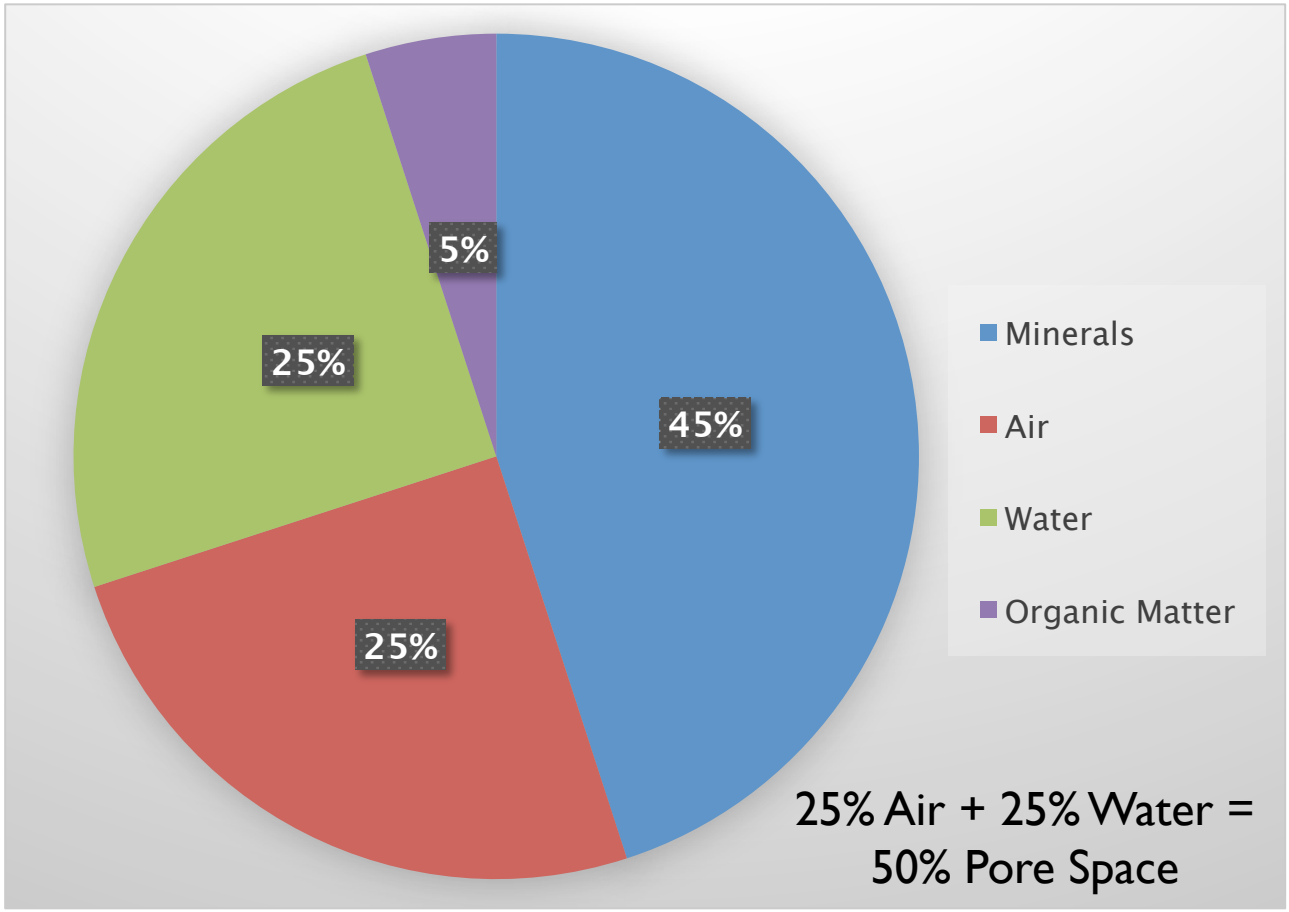
SOIL

Why is it important?

- Healthy soil is as vital as air and water
- No soil = no plants
- No plants…no animals…no us!



What is Soil?



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Properties of Soil

- Soil Texture
- Organic Matter
- Soil Structure
- Soil pH

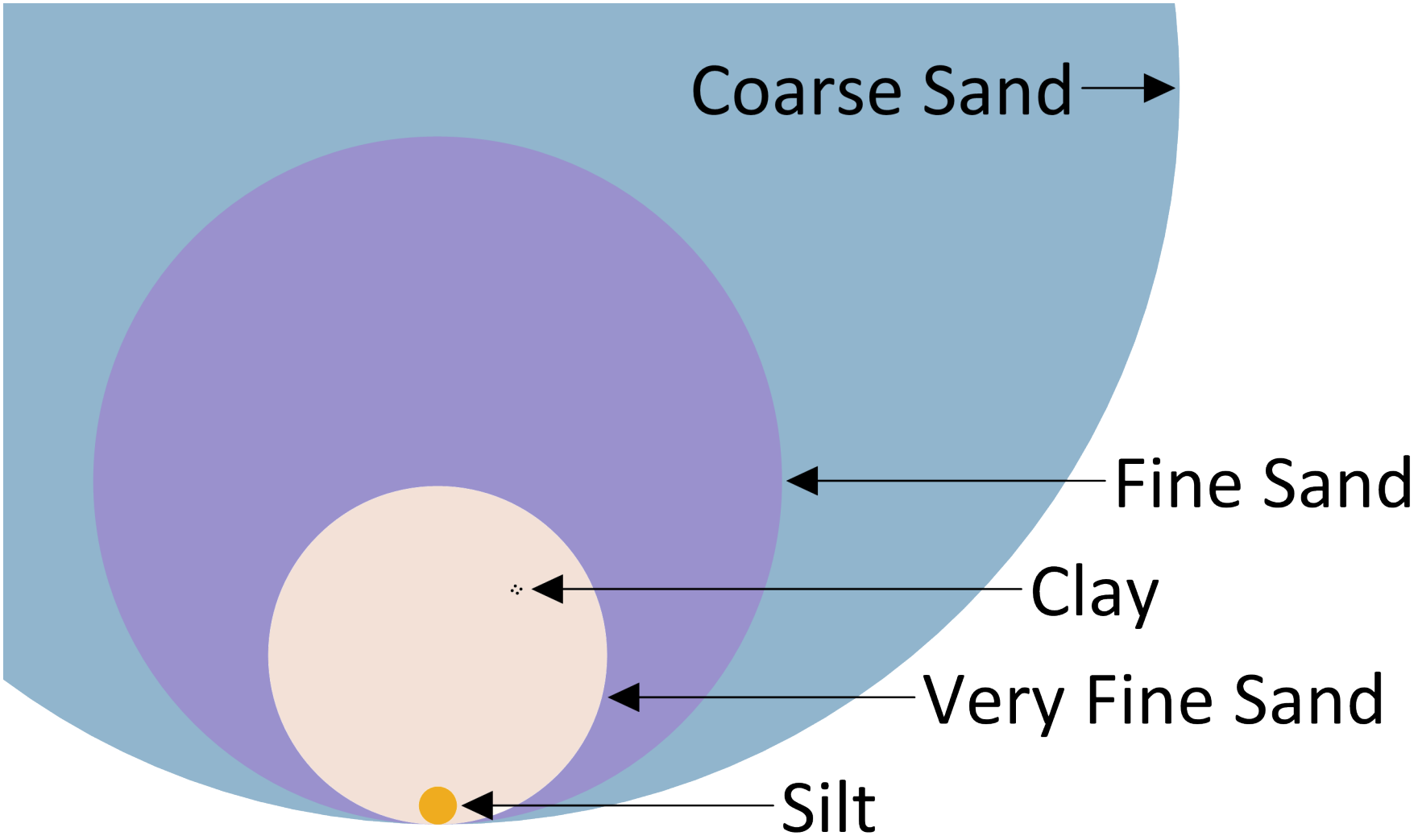
Properties of Soil

Soil Texture

Sandy Soil

Clay Soil

Soil Particles—Size Comparisons



Properties of Soil

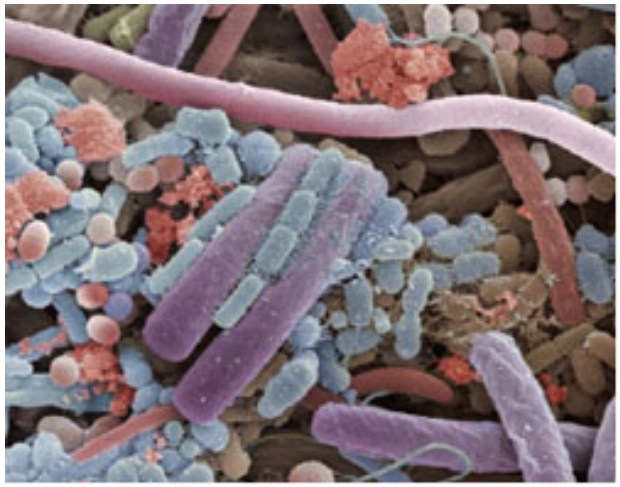
Soil Organic Matter—What Is It?

- Living organisms … plant roots, fungi, bacteria, invertebrates
- Decomposing/decomposed organisms … plants, soil microbes, animals

Properties of Soil

Soil Organisms—Who Are They?

- Bacteria to burrowers to birds, a living web
  - Microbes are fundamental:



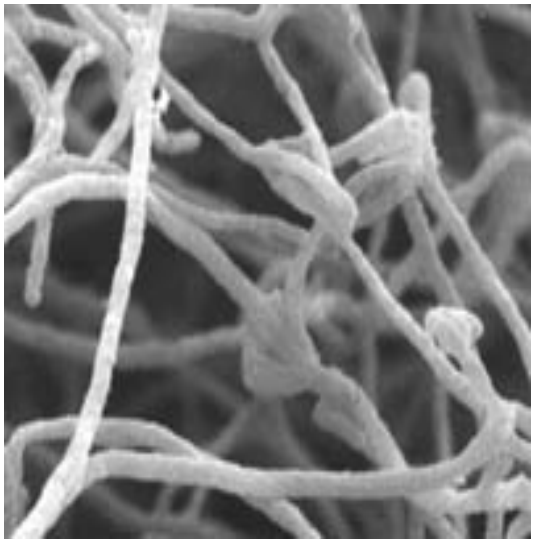
Bacteria
Fungi
Algae
Protozoa
and more

Properties of Soil

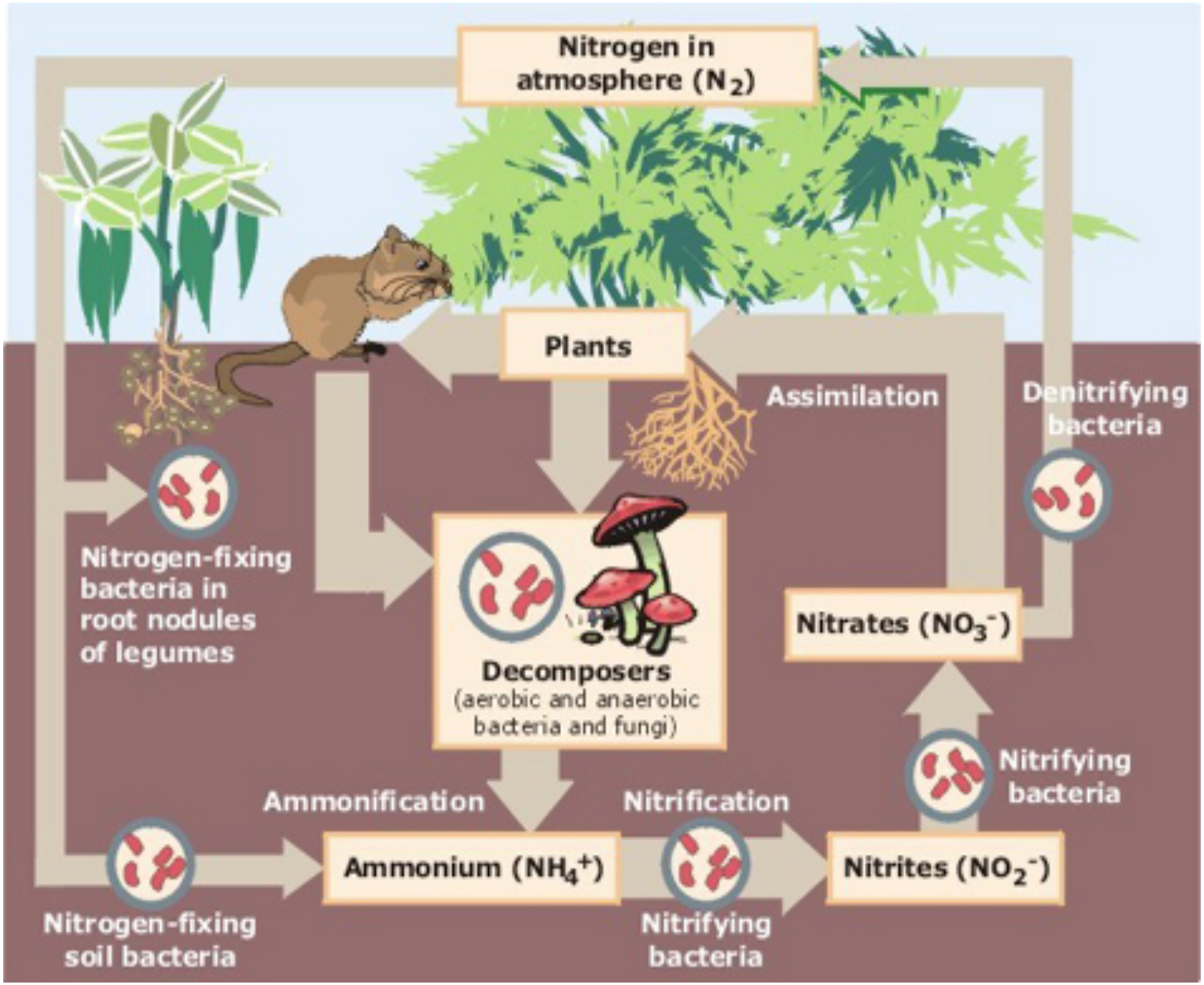
Soil Organisms

One Gram of Soil Contains =

- 1 billion+ bacteria
- Yards to miles of fungi
- 100,000s of algae
- 1000s to 100,000s of protozoa



Life in the Soil→Nutrient Cycling



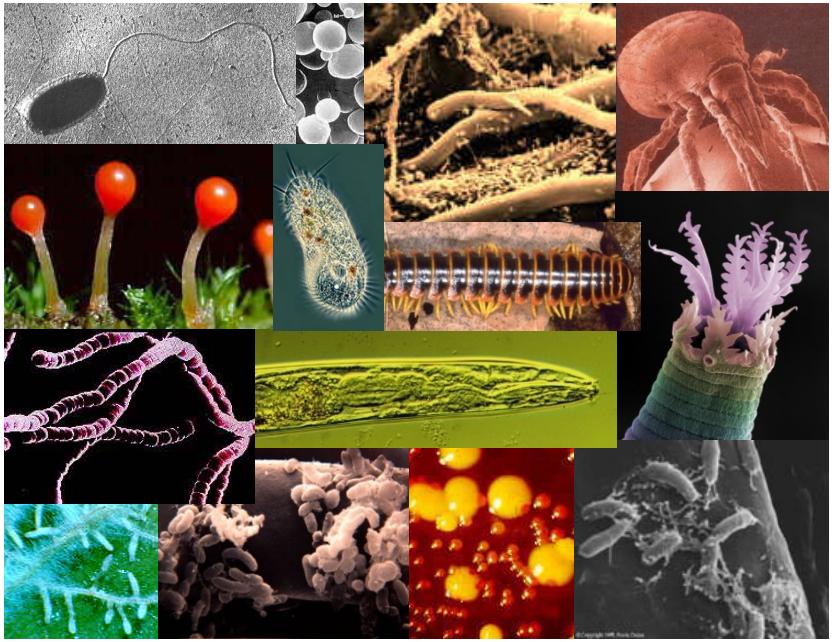
Properties of Soil
Soil Structure

Ideal soil has a granular structure or “crumb”

Properties of the Soil

What Creates Soil Structure?

The life in the soil!



- Decomposition produces humus, highly resistant to further breakdown
- Soil organisms produce "glues" that bind tiny mineral particles and humus together
- Worms and other burrowers continuously open pathways for roots, air and water

Properties of the Soil

Benefits of Good Soil Structure

- Holds water better
- Holds air better
- Drains well
- Reduces erosion
- Filters pollutants
- Improves habitat for soil organisms

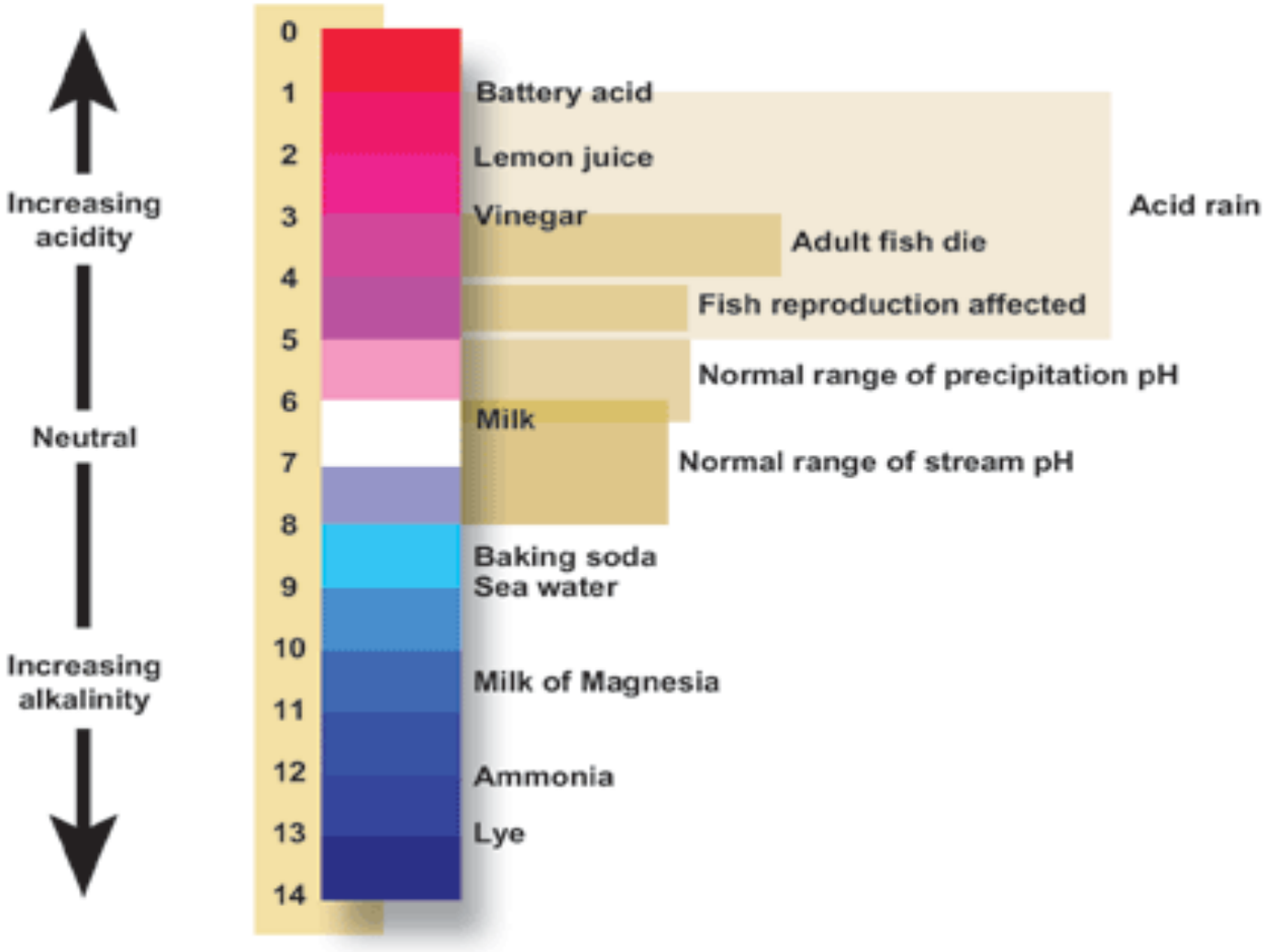
Properties of Soil

What is pH?

- Measure of acid or basic soil, water or any solution
  - Amount of H+ or OH–
  - Expressed in logarithmic units

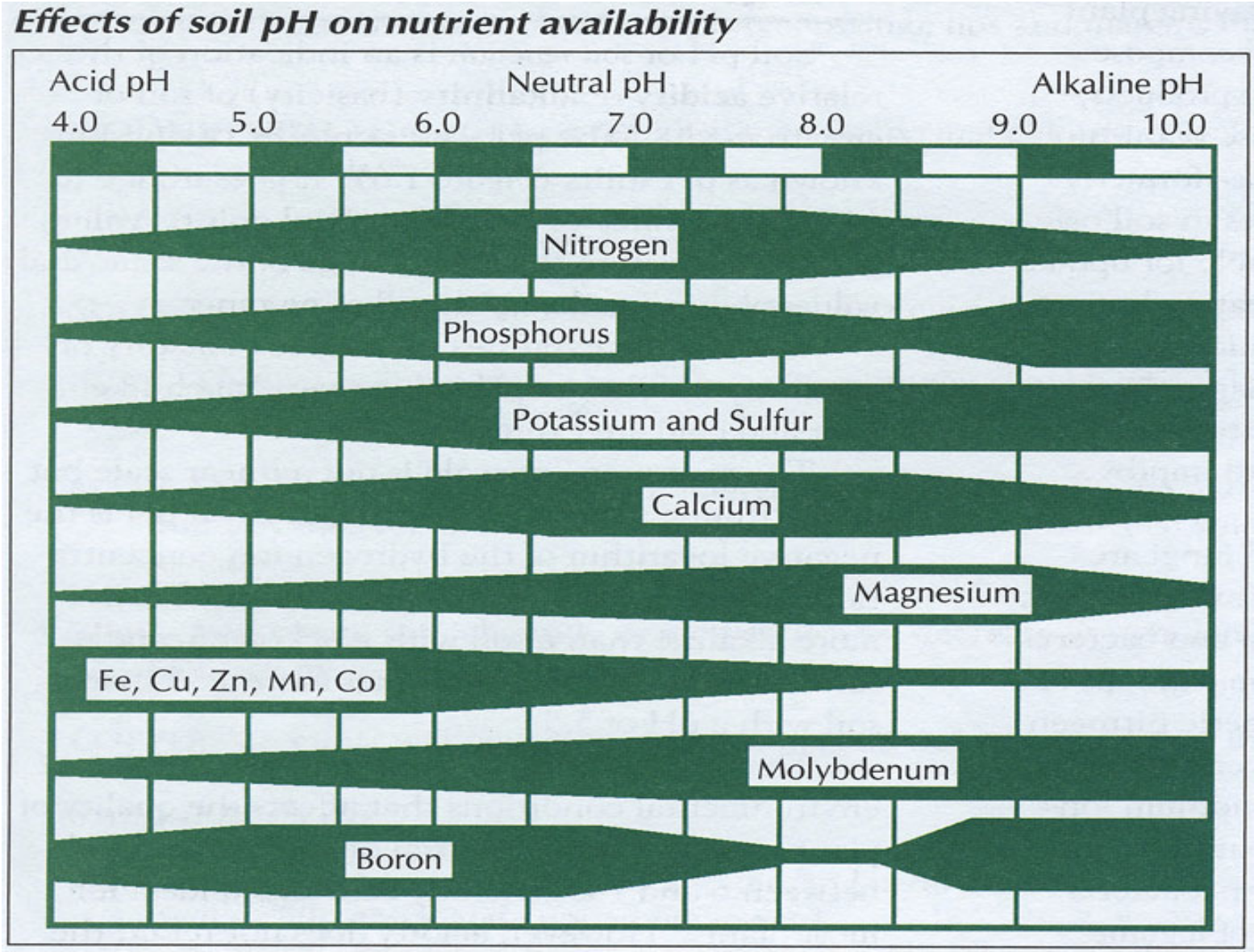
Properties of Soil

What is pH?



Properties of Soil

Why is pH Important?



How to Build and Maintain Healthy Soil

How to Build & Maintain Healthy Soil

Characteristics of Healthy Soil

Self-balancing ecosystem:

- ± 5% organisms & organic matter
- Continuous nutrient cycling
- Strong "crumb" structure
- Slightly acidic pH → keeps plant nutrients bio-available

How to Build & Maintain Healthy Soil

Sustainable Gardening

- Add Compost
- Keep Soil Covered
- Avoid compaction
- Avoid disturbance, especially rototilling
- Consider a cover crop

How to Build & Maintain Healthy Soil

What is Compost?

Compost is …

Decomposed organic matterproduced from a managed process

How to Build & Maintain Healthy Soil

Why Use Compost?

- Return nutrients to the soil
- Replenish soil organism populations
- Create soil structure
- Reduce soil erosion
- Improve air exchange
- Keep water on site
- Improve drainage

How to Build & Maintain Healthy Soil

Using Compost

- Use fine textured, mature compost
- Topdress beds or incorporate
- Topdress lawn—core lawn before applying

- Potting mix— no more than 1/3 compost

How to Build & Maintain Healthy Soil

What is Mulch?

- Mulch = anything used to cover the soil
- Organic mulches like wood chips, straw, pine needles, etc. slowly decompose and feed the soil

How to Build & Maintain Healthy Soil

Benefits of Mulching

- Avoid erosion
- Prevent compaction
- Reduce weeds
- Insulate roots
- Conserve moisture

Mulching—Application Basics

Medium size mulch spread 2”– 4” deep
in beds and under trees out to drip line

Mulch Volcano ☹

Proper Mulching ☺

Cover Crops

What are they?

- Usually grains grasses, and legumes
- Planted in fall & winter
- Til under before spring planting or add to compost

COVER CROPS

ADVANTAGES

- Suppress weeds
- Builds soil's organic matter – improve structure
- Reduce soil compaction & crusting
- Increase soil fertility
- Loosen heavy soil and extract nutrients from subsoil

Cover Crops

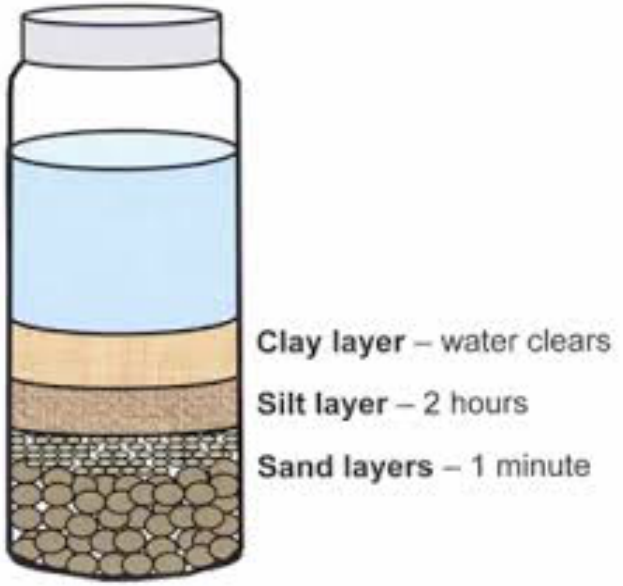
How to get started

- For home gardener – mixes are recommended
- Plant usually September to mid-late October
- Cut down in spring just as they begin to flower
- Til in or add to compost

Your Soil

How to find out More

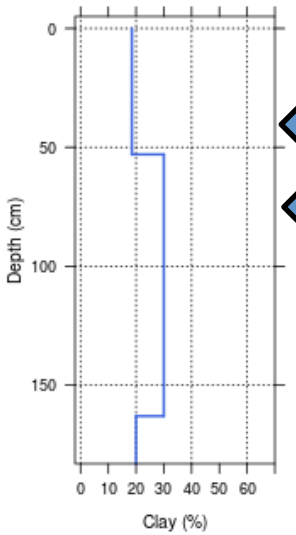
- Texture:
  - Ribbon Test
  - Jar Text
  - On line Soil Web Survey



Map Unit Name: ***Pleasanton gravelly loam, 0 to 3 percent slopes*** Symbol: ***PgA***
Component Name: ***Pleasanton***
Component Key: 11420978
Soil Data Explorer | Series Extent Explorer
Official Series Description

▲ Soil Profiles

Typical Profile
Org. Matter
Clay ? >
Sand | Ksat
pH | Kf Factor
EC | SAR
CaCO3 | Gypsum
CEC @ pH7
Linear Ext.



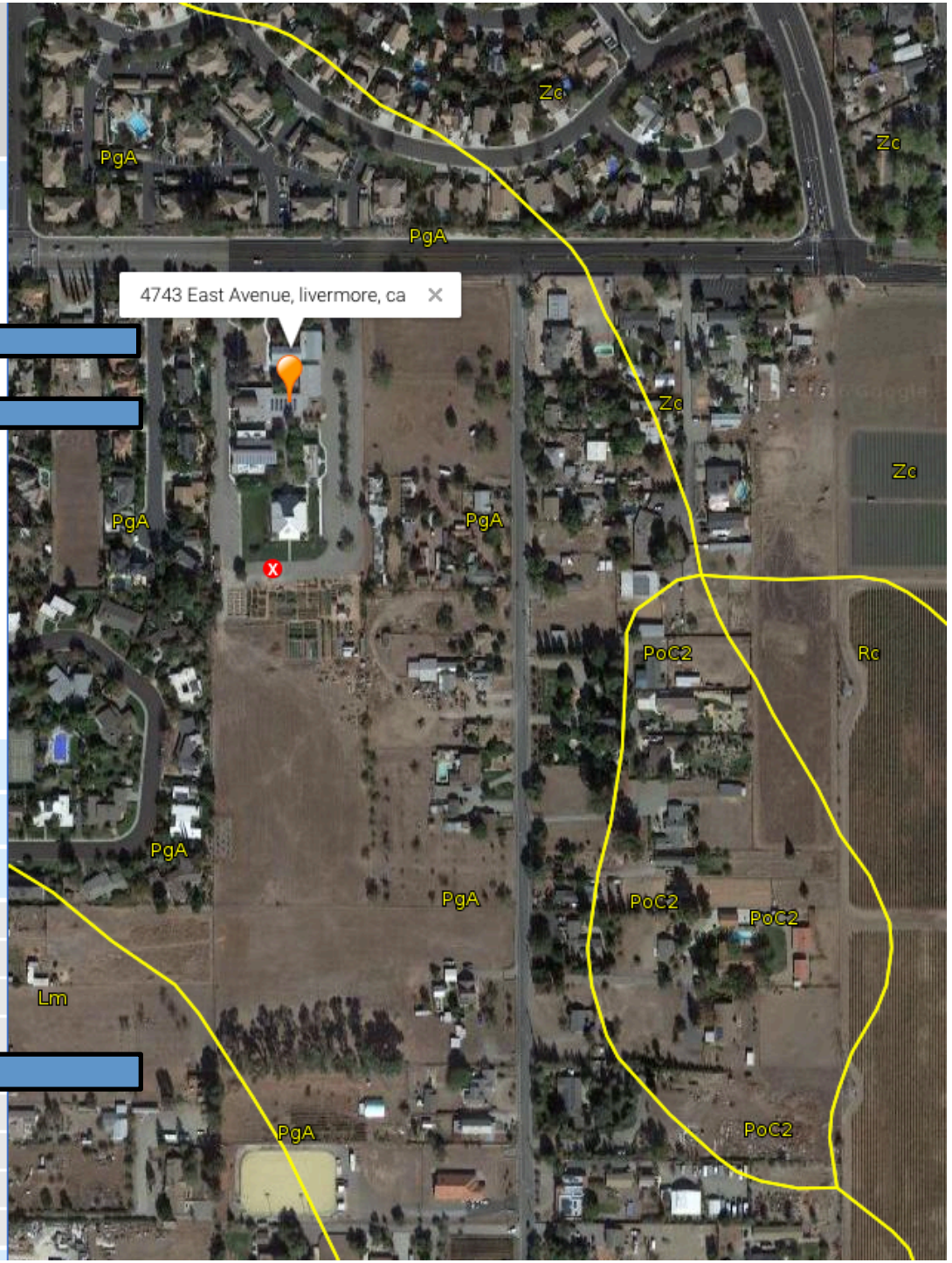
View Source Data

▼ Soil Taxonomy

▼ Land Classification

▲ Hydraulic and Erosion Ratings

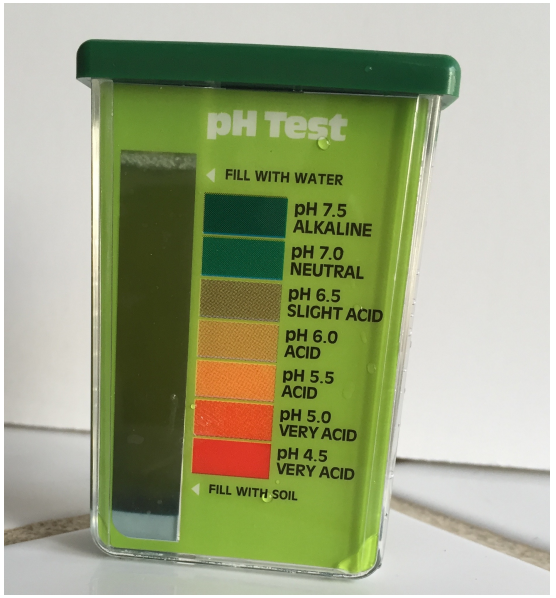
Wind Erodibility Group: *6* ?
Wind Erodibility Index: *48* ?
T Erosion Factor: *5* ?
Runoff: *Low*
Drainage: *Well drained*
Hydric Rating: *No* ?
Hydrologic Group: *Group C* ?
Parent Material: *alluvium derived from sandstone and shale*
Total Plant Available Water (cm): *26.39*



Your Soil

How to find out More

- Nutrition and pH
  - Home Test Kits
  - Soil Labs
  - On line Soil Web Survey



Things to Take from Today's Talk:

- Soil is critically important to gardening success
- Take time to get to know your soil
- You can't change soil texture but you can change soil structure + or –
- Take care of your soil
- Compost and mulch are your secret tools

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QUESTIONS?

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