



# Fall Gardening Basics

September 2018



**University of California**  
Agriculture and Natural Resources




UCCE Master Gardener Program  
Monterey and Santa Cruz Counties

# What You Will Get

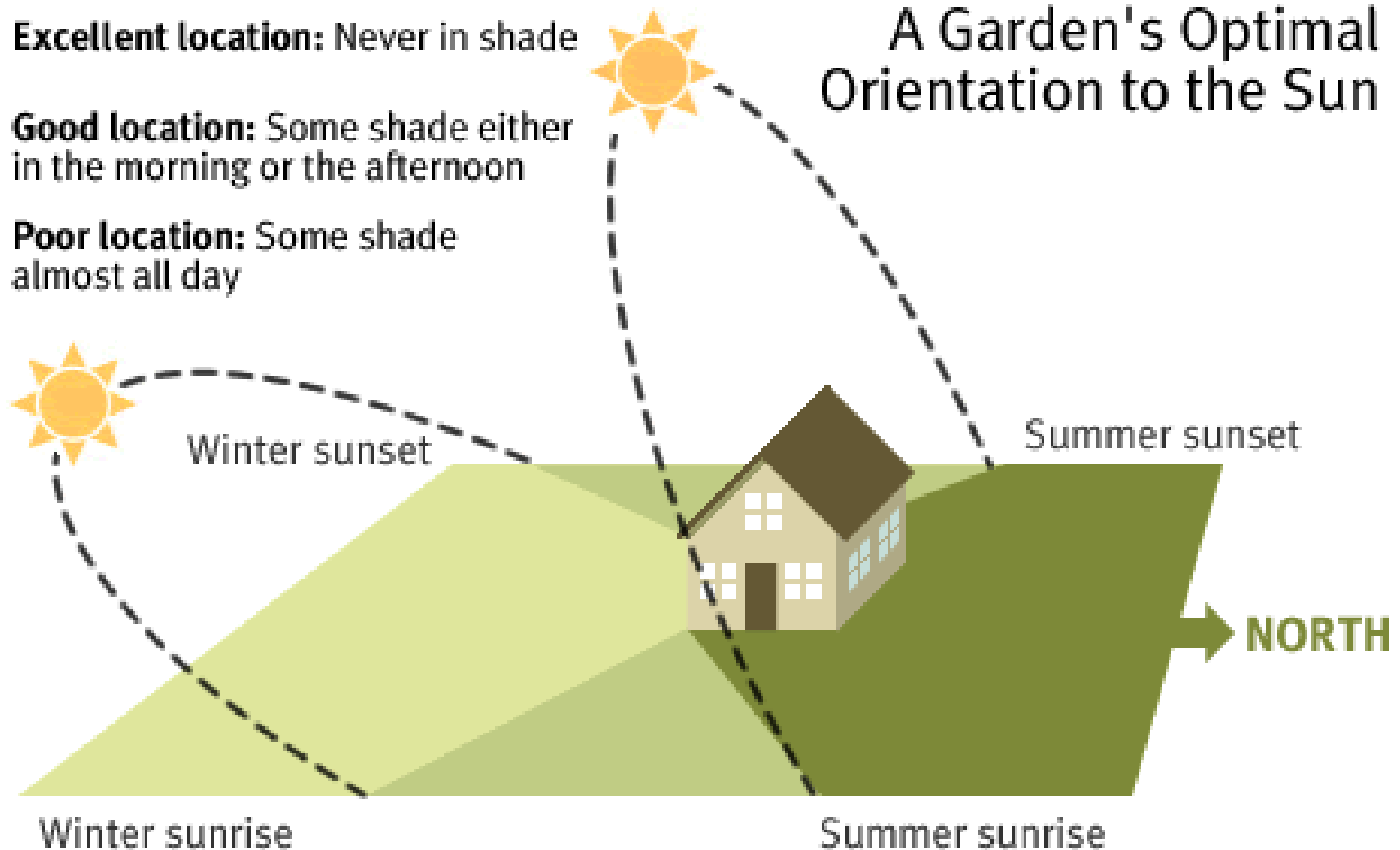
- Basic knowledge of how to begin with fall vegetable gardening
- How to succeed with what, when and how
- How to start now to get a jump on a spring garden
- Hands on soil prep and planting activities



# Site Selection – Let There Be Light

-  **Excellent location:** Never in shade
-  **Good location:** Some shade either in the morning or the afternoon
-  **Poor location:** Some shade almost all day

## A Garden's Optimal Orientation to the Sun



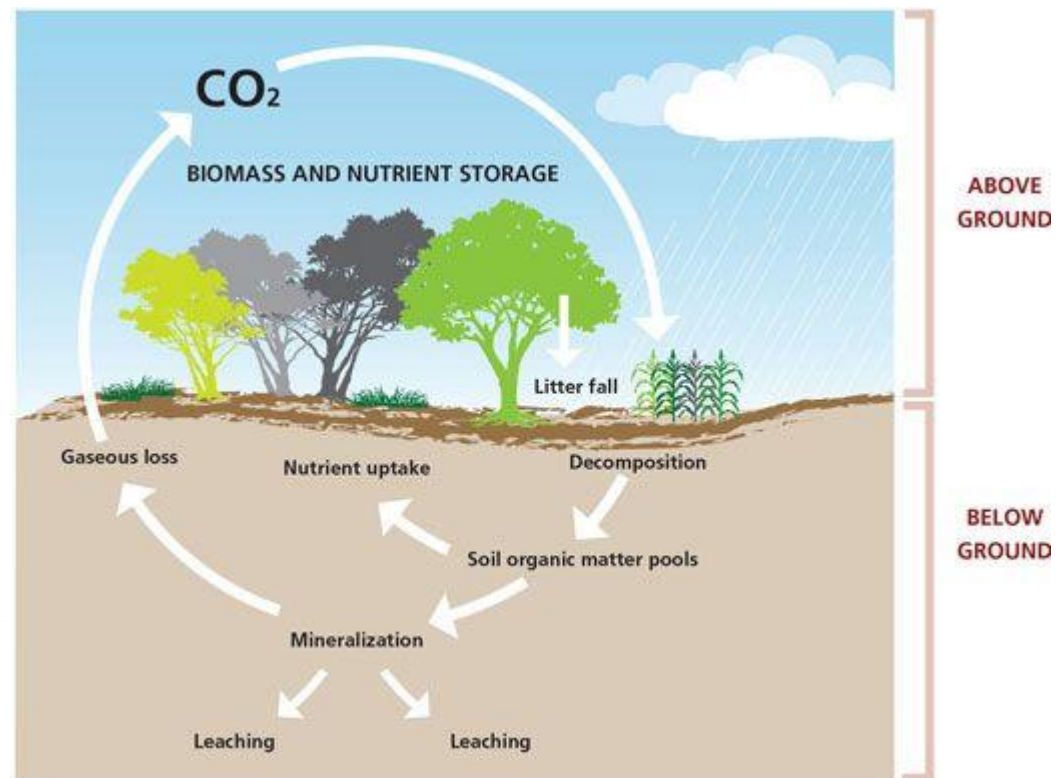
“Humankind  
owes its  
existence to a  
six-inch layer of  
topsoil and the  
fact that it  
rains.”

~Anonymous



# Why Should I Care About My Soil?

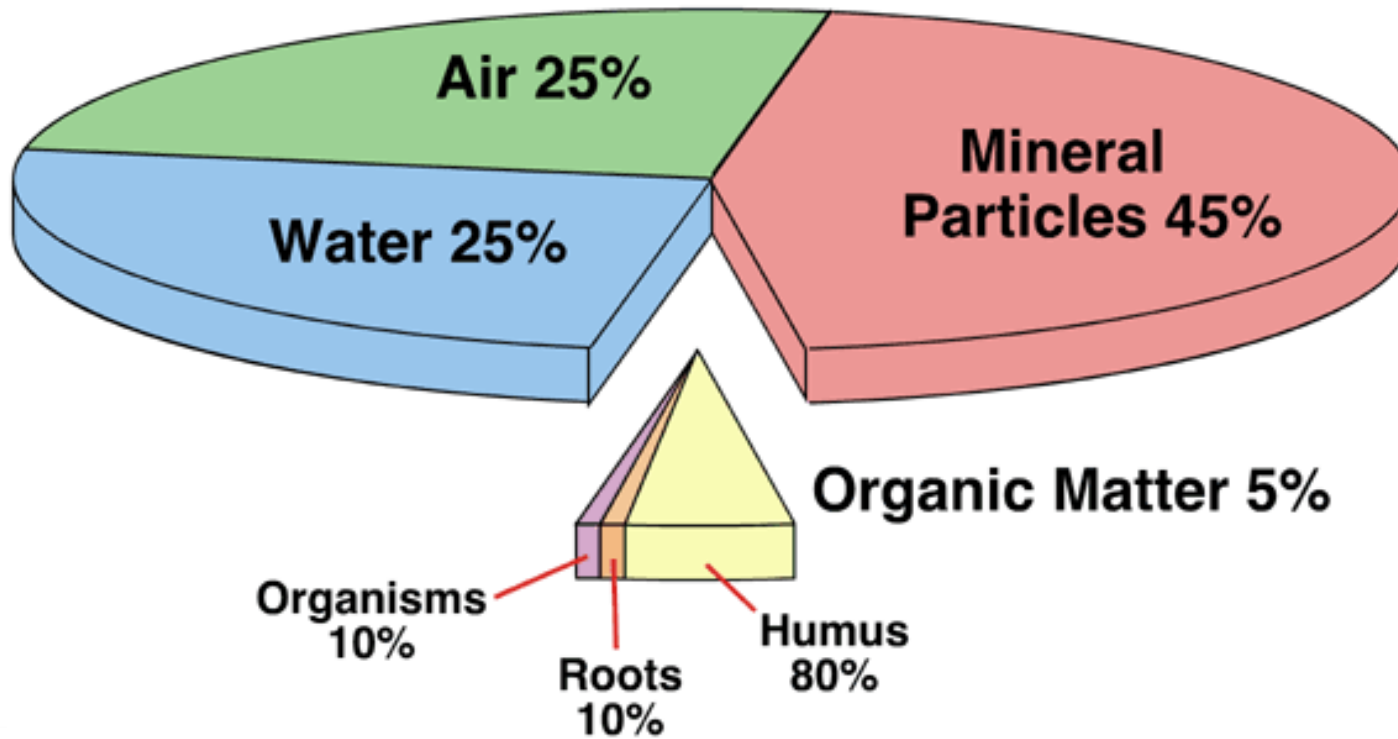
- Your life depends on it
- It's the second largest carbon sink (3%)
- Sustainably higher yields
- Easy to work
- Conserves water
- Fewer weeds
- Diverts landfill



# Soil Science in a Nutshell - Physical



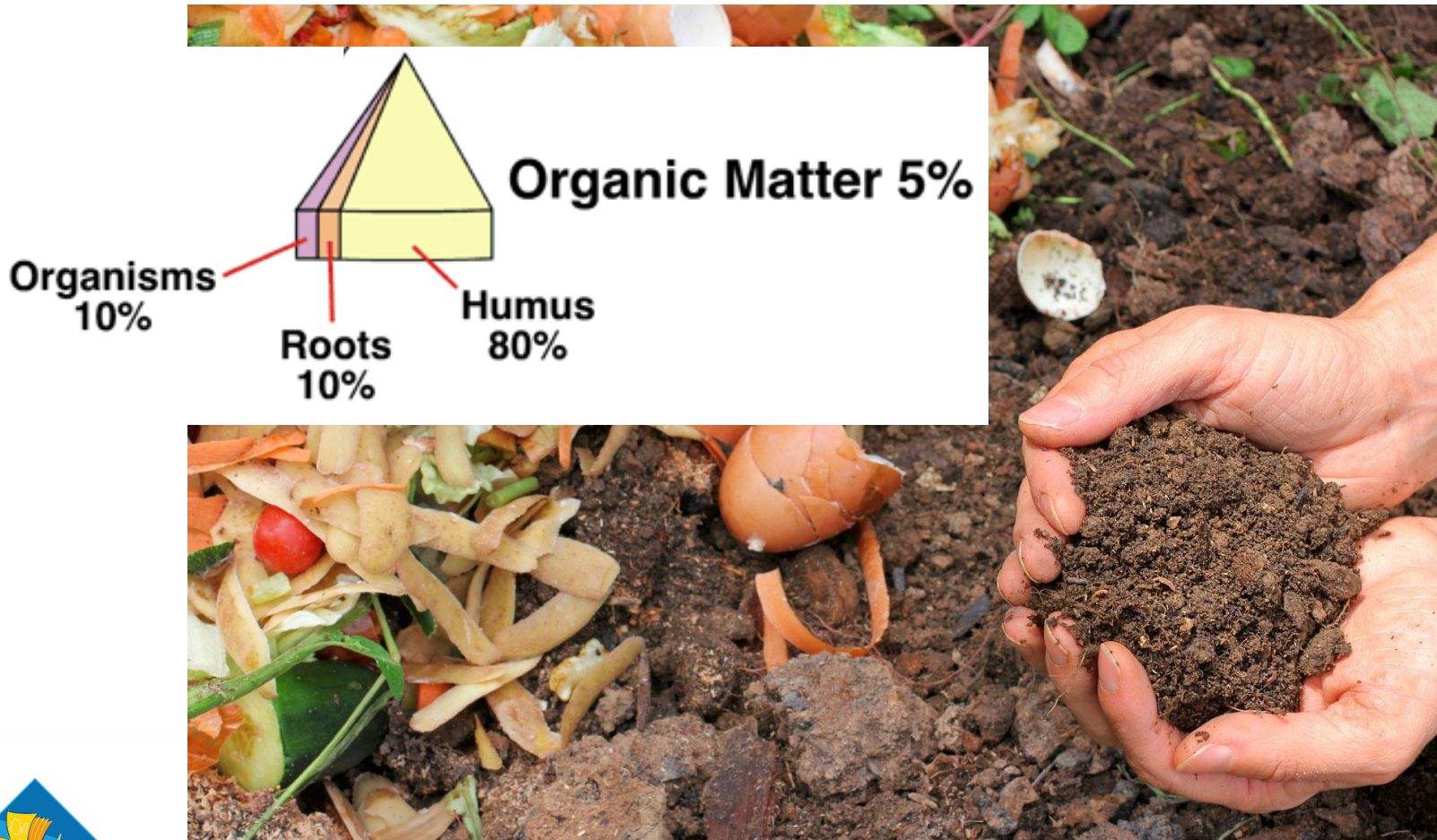
What is soil? Components



# Soil Science in a Nutshell - OM



So what matters about organic matter?



# Soil Science in a Nutshell - OM



## Microbe jobs

### Decomposers

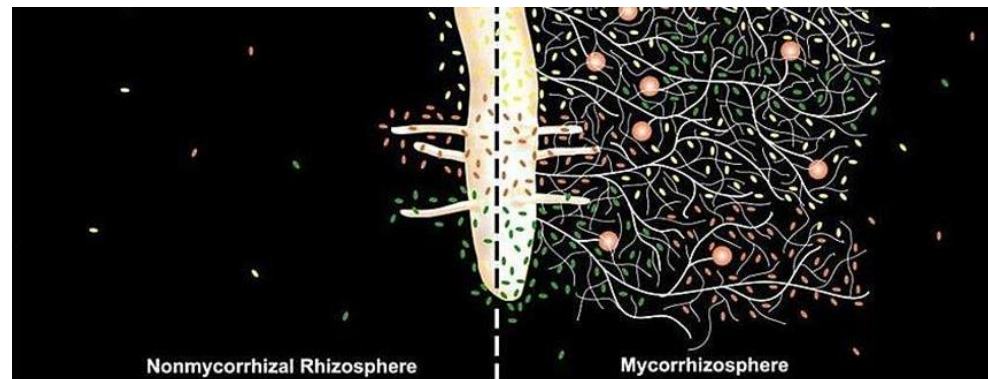
Worms and macro-fauna eat plant residue, aerate soil, excrete nutrient rich casts

### Saprophytes

Bacteria and fungi eat decaying plant material, recycle into nutrients and humus, make nutrients available to plants

### Symbionts

Form beneficial associations with plants such as nitrogen fixing bacteria and mycorrhizae root extensions





# Soil Science in a Nutshell - OM



What lives in 1 Gram of healthy soil?



Bacteria	3,000,000 to 500,000,000
Actinomycetes	1,000,000 to 20,000,000
Fungi	5,000 to 1,000,000
Yeast	1,000 to 1,000,000
Protozoa	1,000 to 500,000
Algae	1,000 to 500,000
Nematodes	10 to 5,000



# Soil Science in a Nutshell - OM



## Review: Benefits of Organic Matter

<b>Chunky</b>	makes space for air and water
<b>Delicious</b>	provides food for decomposers
<b>Sticky</b>	produces compounds that improve particle aggregation which improves soil structure
<b>Balance</b>	corrects soil pH towards neutral
<b>Nutritious</b>	makes nutrients in solution available to the plant
<b>Retain</b>	aggregate structure holds pockets of water, like a sponge
<b>Drain</b>	chunky spaces help water ultimately drain through
<b>Store</b>	puts a little carbon back in the soil (aka sequestration)
<b>Resist</b>	diverse biome improves immunity to certain soil borne diseases
<b>Reduce Loss</b>	mulching helps retain water, protect soil surface and reduce weeds



A vibrant garden scene featuring a trellis structure covered in green climbing vines against a grey wall. In the foreground, there are various leafy green plants and a stone planter filled with colorful flowers. The garden is set on a lawn with a brick path leading through it.

# PRACTICAL APPLICATION

# Fertilizer vs. Soil Amendment?

First it helps to know the difference between soil amendments and fertilizer.

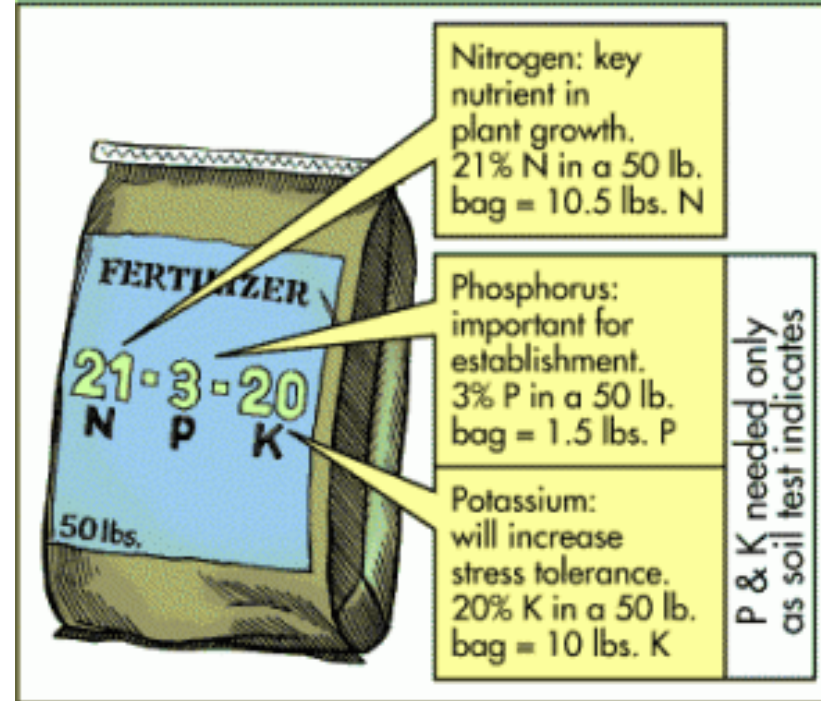
Fertilizer	Soil Amendment
DIRECTLY affects the plant through the growth stage through nutrients	INDIRECTLY affects the plant by improving soil physical and chemical properties
Bone meal	Manure
Fish Emulsion	Compost
Cottonseed meal	Worm Castings
Kelp meal	Leaves and grass clippings
<i>Chemical fertilizer</i>	Peat moss
Etc.	Etc.

\* Not organic



# About Fertilizer

- Not too much in fall!
- Slow release powder at soil prep



For Nitrogen	For Phosphorus	For Potassium
<p>-Fish emulsion or liquid fish fertilizer (Brands include Brown's Fish Fertilizer, Neptune's Harvest)</p> <p>-Organic granular fertilizers favor nitrogen, and some brands make blends that are N heavy (try Symphony, McGeary's and Harmony brands)</p> <p>-Feather meal, blood meal</p>	<p>-Rock Phosphate</p> <p>-Bone Meal</p>	<p>-Azomite is mined from marine deposits, and is rich in potassium.</p> <p>-Greensand</p>



# How Can I Get Some Organic Material?

## Sources

- Make your own compost
- Garden supply and landscape stores (bagged or bulk)
- Municipal green waste compost (the dump)
- Horse stables
- Worm castings
- Coffee grounds

## Materials for your compost pile

- Get some chickens or rabbits
- Compostable produce scraps at grocery stores
- Spent brewers grain at micro breweries
- Organic materials exchange

<http://www.omexchange.org/listings>



# How Much Amendment?

Never Enough

- It takes years
- Add more 1-2 times a year
- 6 inch layer is a good start

example: 6 inches over 100 Sq. ft. = 25 two cubic ft. bags or 1.85 cubic yards

Coverage calculator:

<http://www.harvestpower.com/products/landscape-calculator/>



Type of soil I have	Amount of composted organic material
Limited organic matter	4-6 inches each planting season
Lots of organic matter	1-3 inches each planting season



# Basic Tools





# Nice to Have Tools



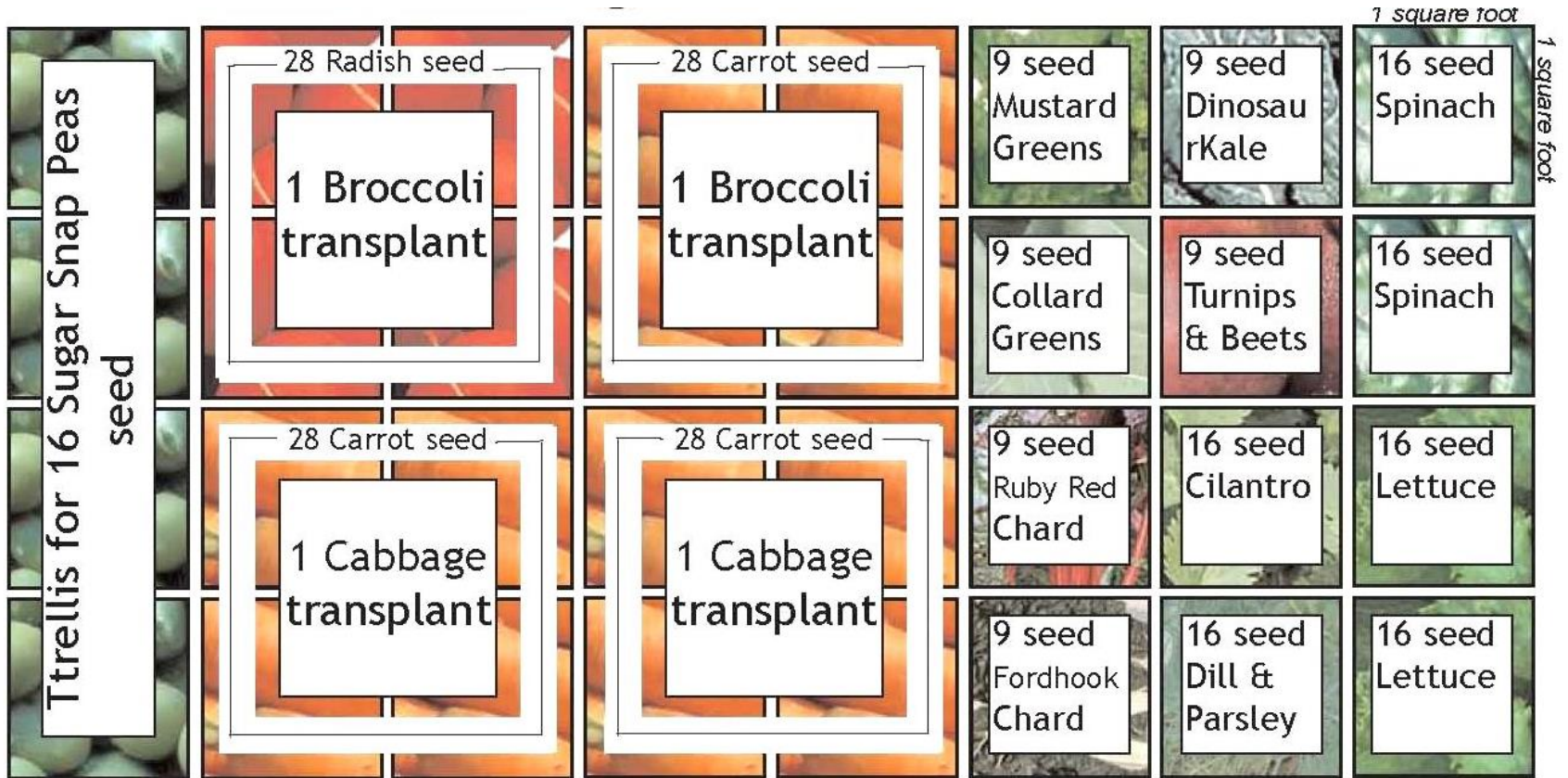
# Start SMALL!



100 square  
feet or less



# Sample Starter Small Fall Garden Plan



# Soil Improvement Strategies

Trade off Time – Money - Effort

## ***The Sweat Equity***

1 week

- Collect/invest in composted organic materials
- Double Dig
- Plant

## ***The Low Effort***

1-3 month

No-Dig plans

- [Lasagna garden](#)
- [Straw bale garden](#)

## ***The Long View***

6-9 month

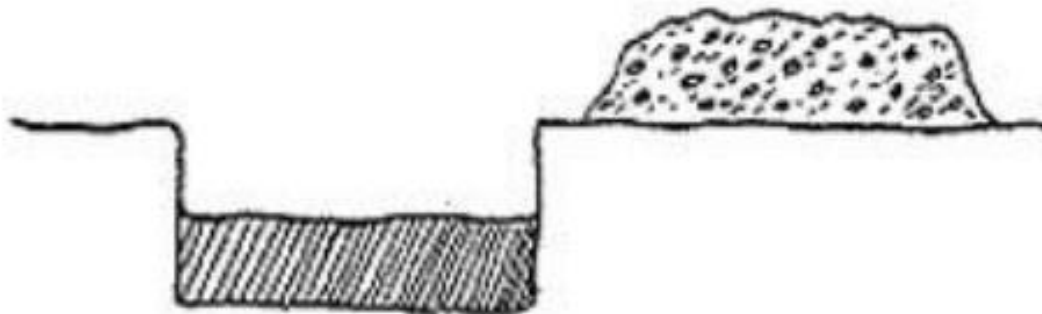
- Plant a **cover crop**, water & let it grow
- Chop it down, turn it under, wait 3 weeks
- Plant



[Detailed video on double digging](#)

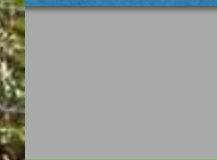
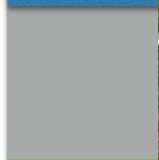
## Double Digging

- Also known as "French intensive" or "deep bed" method,
- Performed only one time,
- Loosens soil to depth of about 2 feet,
- Requires shovel, garden fork and a lot of muscle.



La

ers



# Straw Bale Garden



# Soil Steward Tips

## Maintain soil structure

- Cultivate (dig) when soil is moist but NOT soaking wet or bone dry
- Till or turn only when required to incorporate organic material, plant or weed – once per season
- Don't compact the soil – i.e. walk on it
- Keep soil covered – planted, mulched or both
- Add compost 1-2 x year
- Rotate crops
- Minimize use of chemical herbicides, fungicides, fertilizers





A photograph of a garden bed with various plants. In the foreground, there are several leafy green plants with prominent red stems and veins, likely Swiss chard or similar. To the right, there are some basil plants. The background is filled with more green foliage, including what appears to be a yellow hydrangea. The scene is brightly lit, suggesting a sunny day. A semi-transparent dark green banner is overlaid across the middle of the image, containing the text "WHAT TO PLANT" in white, bold, uppercase letters.

# WHAT TO PLANT

# Cool Season Crops

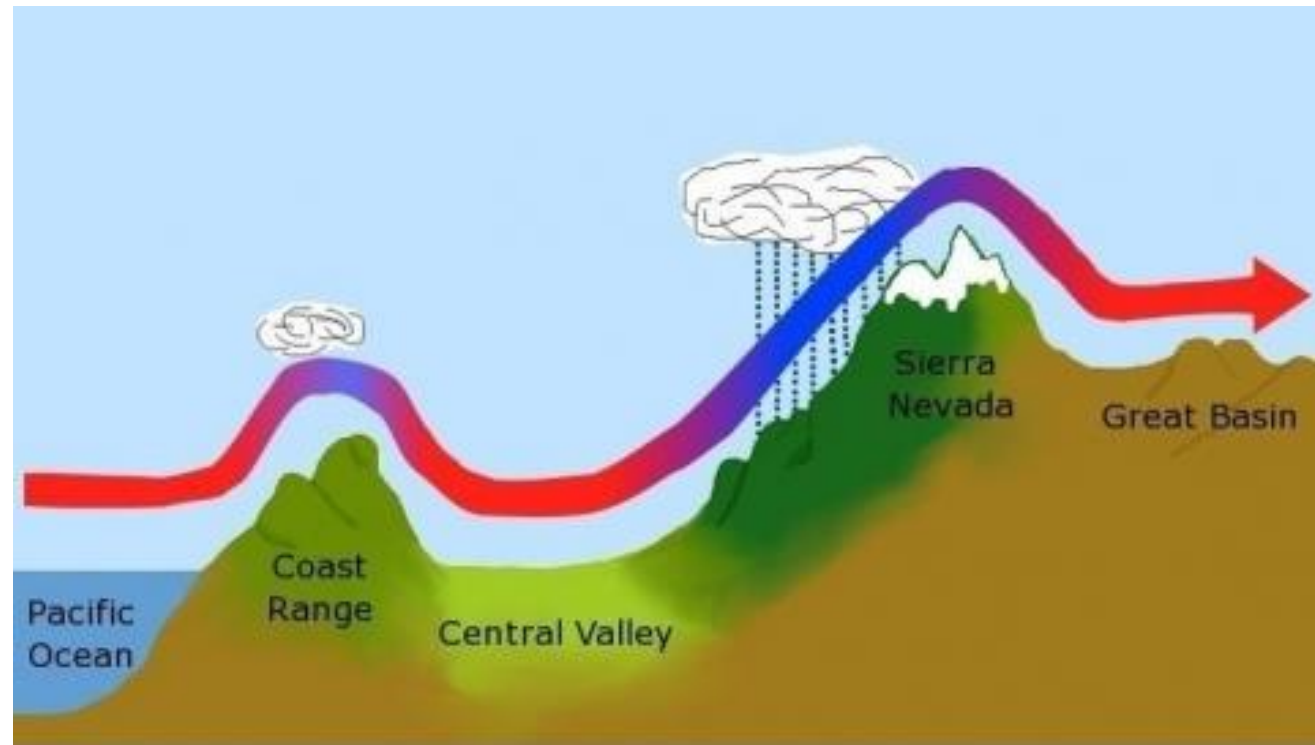
	<b>Hardy Crops</b>	<b>Semi-hardy Crops</b>
<b>Trans-plant</b>	Broccoli * Brussels Sprouts Cabbage * Collards Onions * Rutabaga	Artichoke (globe) * Cilantro Cauliflower * Celery * Parsley Chervil * Dill * Chives
<b>Direct seed</b>	Kale * Kohlrabi * Peas Radishes * Spinach Turnips	Arugula * Asian Greens * Beets Carrots * Endive * Lettuce Potatoes * Swiss Chard



# Microclimates

[USDA Zone Map](#)

- Solar Exposure
- Wind
- Humidity
- Slope
- Rainfall
- Temp



Temperature changes as air flows west to east across California. This is largely a result of orographic effects (i.e. effects of change in elevation) as air passes first over the Coast Range and later over the Sierra Nevada.



Transplanting  
Direct Seeding  
Thinning



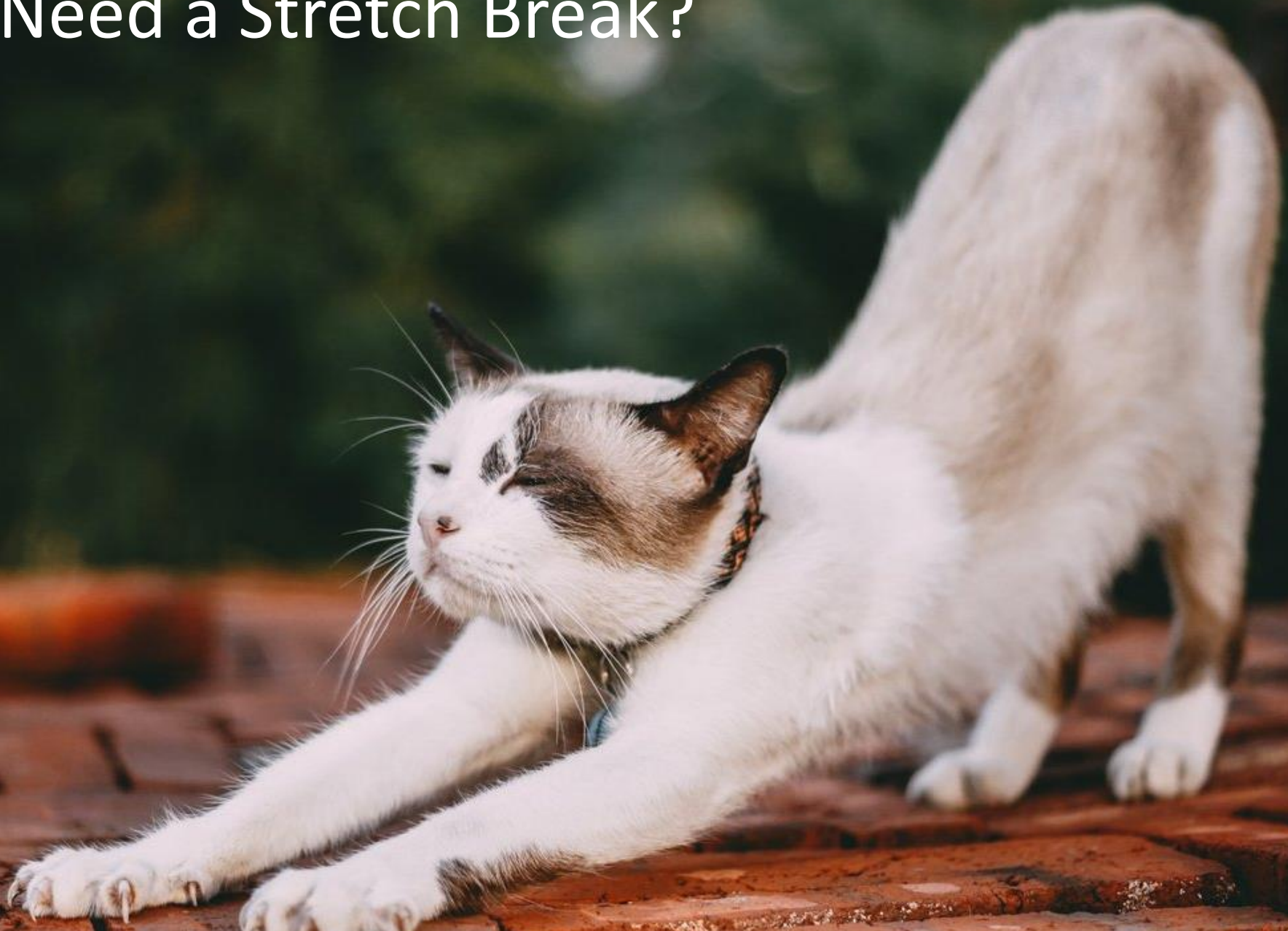
See  
Handout

# About Watering

- Morning is best
- No sprinklers
- Can be dry, even if it's cold out
- How much is enough?
  
- “Leaky pipe” soaker hose  
low investment drip  
for first garden



Need a Stretch Break?



# Defending Your Garden



## Fall Assaults

- Snails
- Slugs
- Earwigs
- Caterpillars
- Gophers
- Birds
- Deer

# IPM Process

1. Inspect regularly
2. Know your host plant
3. Prevent problems before they become problems
4. Identify the pests
5. Analyze the situation
6. Strategize the solution(s) and apply
7. Monitor success over time





# Cultural

## Environmental Control

- Garden hygiene
- Solarize soil
- Sterilize tools
- Plant Selection



HOW TO **Sanitize Your Pruners**

Image: Youtube.com



# Physical

## Exclusion Barriers

- Netting
- Row covers
- Collars
- Sticky barriers
- Fencing
- Underwire
- Bagging fruit







# Physical

## Mechanical Control

- Hand picking
- Washing
- Trapping
- Weeding






# Invertebrate Pests

	Type	Host	Damage stage
	<u>Slugs &amp; Snails</u>	Range of plants	Adult
	<u>Earwig</u>	Range of vegetable plants and weeds	Adult
	<u>Cabbageworm</u>	Leafy vegetable plants, especially brassicas	Larvae
	<u>Sow bug &amp; Pill bug</u>	<b><i>Not a pest! Eats decaying vegetation</i></b>	



# Burrowing Mammals

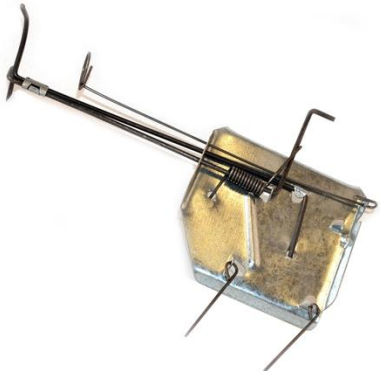
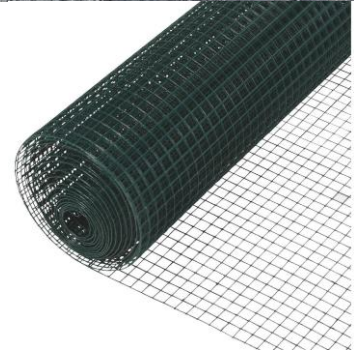


	Type	Damage	Management
	<a href="#"><u>Gopher</u></a>	Eats roots or takes whole plant	Trap, exclude, bait
	<a href="#"><u>Mole</u></a>	Eats grubs, disturbs soil surface	Trap, bait, ignore
	<a href="#"><u>Vole</u></a> (aka field mouse)	Eats flowers, leaves and fruit	Trap, exclude, bait

# Gopher Management

## Low Impact Management

- Cultural – gopher resistant plants?
- Physical Exclusion – underwire beds, baskets, underground fence (not chicken wire)
- Traps – cinch, box, pincher
- Biological Control - owls, snakes, , and coyotes

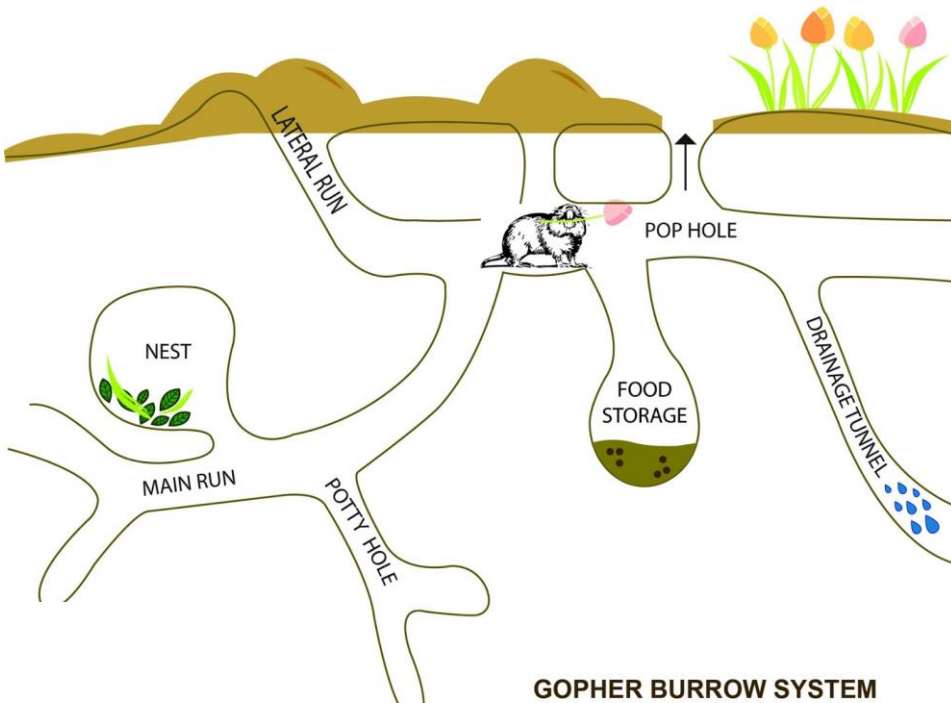


# Gopher Trapping Tips

## Find the Run

- Probe between 2 mounds to feel run
- Use post hold digger to get to run
- Set & stake traps both directions
- Cover and check every 12 hours

[How to find the tunnel](#)



## Traps

- Macbee
- Cinch
- Box
- **Gophinator**

[How to set a gophinator](#)







# Birds – Know Your Pest

- Need to identify species?
- Each has different tastes
- They also eat insects and snails/slugs; weight pros and cons
- Most are protected from harm



More info at

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74152.html>



# Birds – Physical Controls

## Keep them out:

- Frame and netting over seed beds and crops
- Inverted wire baskets on individual plants
- Grid of string
- Paper bags over fruit/veggies



# Birds – Physical Controls

## Scare them away:

- Scarecrows
- Shiny things
- Moving things
- Balloons with eyes
- Noisemakers
- Best used only when most needed
- Move OFTEN!



# Deer in your Garden?

In their natural habitat



In your garden



# Deer Behavior - Know your Pest

- Travel in familial groups for generations
- Range of 3-5 miles, bed down within 1 mile of water
- Eat 5 pounds of vegetation per day
  - 90% leaves and stems of woody and herbaceous plants, vines, fruits, berries, acorns, nuts and garden vegetables
  - 10% grass
- Drink 2-4 quarts of water per day
- Feed in early morning or late evening
- Heavy feeding in spring and summer-metabolism slows in late fall and winter

More info at

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74117.html>



# Cultural and Physical Controls

- **Frighten them away**
  - Dog in the yard
  - Main predator is the mountain lion
  - Startling devices rarely work--deer habituate
    - Water cannons
    - Lights and sounds
- **Repellants** - Require frequent application, home remedies not scientifically proven



# Physical Barriers - Fences

## The most effective intervention

- Effective but costly
- Need to be 7-8 feet high
- Tight to the ground
- Fence extensions with smooth wire or plastic mesh
- Wire cages work for small areas
- Double fencing or slanted fencing on hillsides



Ana

Study

[http:](http://)

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UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES

# UC IPM

Statewide Integrated Pest Management Program

What is IPM? Identify & Manage Pests Research Publications Training & Events Links About Us Contact Us Subscribe

HOME

ON THIS SITE

- What is IPM?
- Home & landscape pests
- Agricultural pests
- Natural environment pests
- Exotic & invasive pests
- Weed gallery
- Natural enemies gallery
- Weather, models & degree-days
- Pesticide information
- Research
- Publications
- Events & workshops
- Online training
- Links
- About us
- Contact us

MAKE A GIFT

f t You Tube

## Home, garden, turf, and landscape pests

University of California's official guidelines for managing pests with environmentally sound methods. (More...)

### Pests of homes, structures, people, and pets

Household pests

- Pests that sting, bite, or injure
- Wood-destroying, food, fabric, and nuisance pests
- Vertebrate pests: birds, mammals, and reptiles

### Pests in gardens and landscapes

Choose a plant to find the most likely source of your pest problem

- Fruit trees, nuts, berries, and grapes/vines
- Lawn insects (including comprehensive lawn guide)
- Trees and shrubs (including roses and other ornamentals)
- Vegetables and melons

### Some common pests

- Birds, mammals, and reptiles: vertebrate pests
- Insects, mites, mollusks, and nematodes: invertebrate pests
- Plant diseases
- Weeds

### Pesticides and alternatives

- Pesticides in homes and landscapes
- Alternatives to pesticides
- Biological control

### More information

- Plant problem diagnostic tool (NEW)
- Seasonal Landscape IPM Checklist
- UC IPM Kiosks

QUICK LINKS

- Pest Notes library
- Quick Tips library
- Video library
- Seasonal Landscape IPM Checklist
- Pests in the Urban Landscape

## DIAGNOSTIC TOOL



UC Statewide IPM Program  
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SPECIAL RESOURCES FOR...  
Landscape professionals  
Retail nurseries & garden centers

# IPM





# Stumped? Ask a Master Gardener

Ask the Master Gardener Hotline

<http://mbmg.ucanr.edu/hotline/>

A screenshot of the UC Master Gardeners of Monterey & Santa Cruz Counties website. The page title is "Submit a Ticket". The navigation bar includes "Home", "My Area", "Submit a Ticket", and "Knowledge Base". The form fields are: "Contact Name" (text input), "Email" (text input), "Subject" (text input), "Descrip..." (rich text editor with a toolbar), "Type of Question" (dropdown menu with "-None-" selected), "Type of Plant" (dropdown menu with "-None-" selected), and "Phone Number" (text input). The top right corner has "Sign Up" and "Sign In" links.

# PLANNING FOR SPRING



# Winter Cover Crops

## Why cover crop?

- Protect soil
- Fix nitrogen
- Encourage soil microbes
- Break up hard soil
- Suppress weeds
- Add biomass

## Which cover crops?

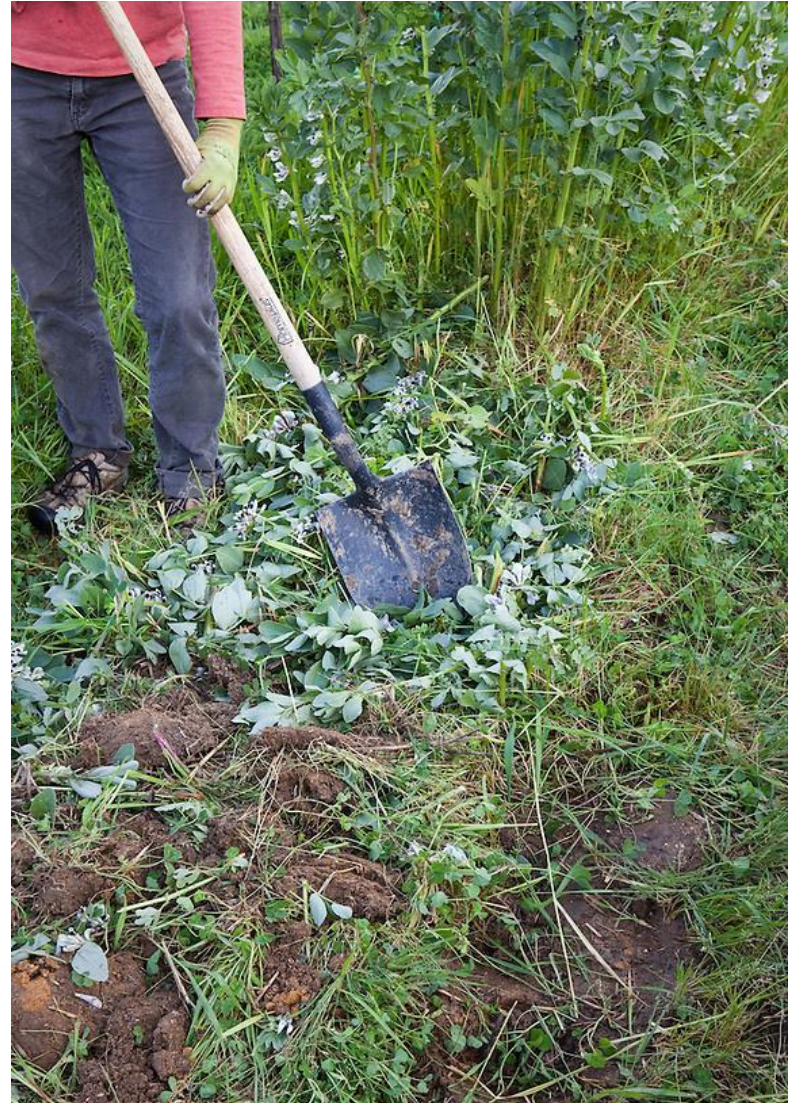
- Fava Beans
- Bell Beans
- Hairy Vetch
- Austrian Peas
- Winter Rye
- Kodiak Mustard
- Soil Builder Mix

# Cover Crop Process

## *The Long View*

6-9 month

- Plant a **cover crop**, water & let it grow
- Chop it down, turn it under and wait 3 weeks
- OR compost the greens
- Plant



# Winter Dreaming, Garden Planning



# Questions?



# Raffle Prizes!

**WIN a Starter Basket!**



**WIN some Alpaca Manure!**



# Help Us Improve!

Our follow-up survey provides the tools we need to improve the quality of our program.

Please respond to the short survey you will receive in a few weeks.



**University of California**  
Agriculture and Natural Resources

UCCE Master Gardener Program  
Monterey and Santa Cruz Counties



# OUTDOOR EXERCISE

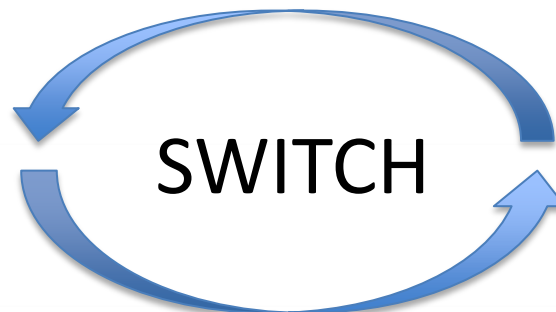
Split the class, ½ go with Bridget and ½ go with Delise

## Double Dig Demo – Bridget

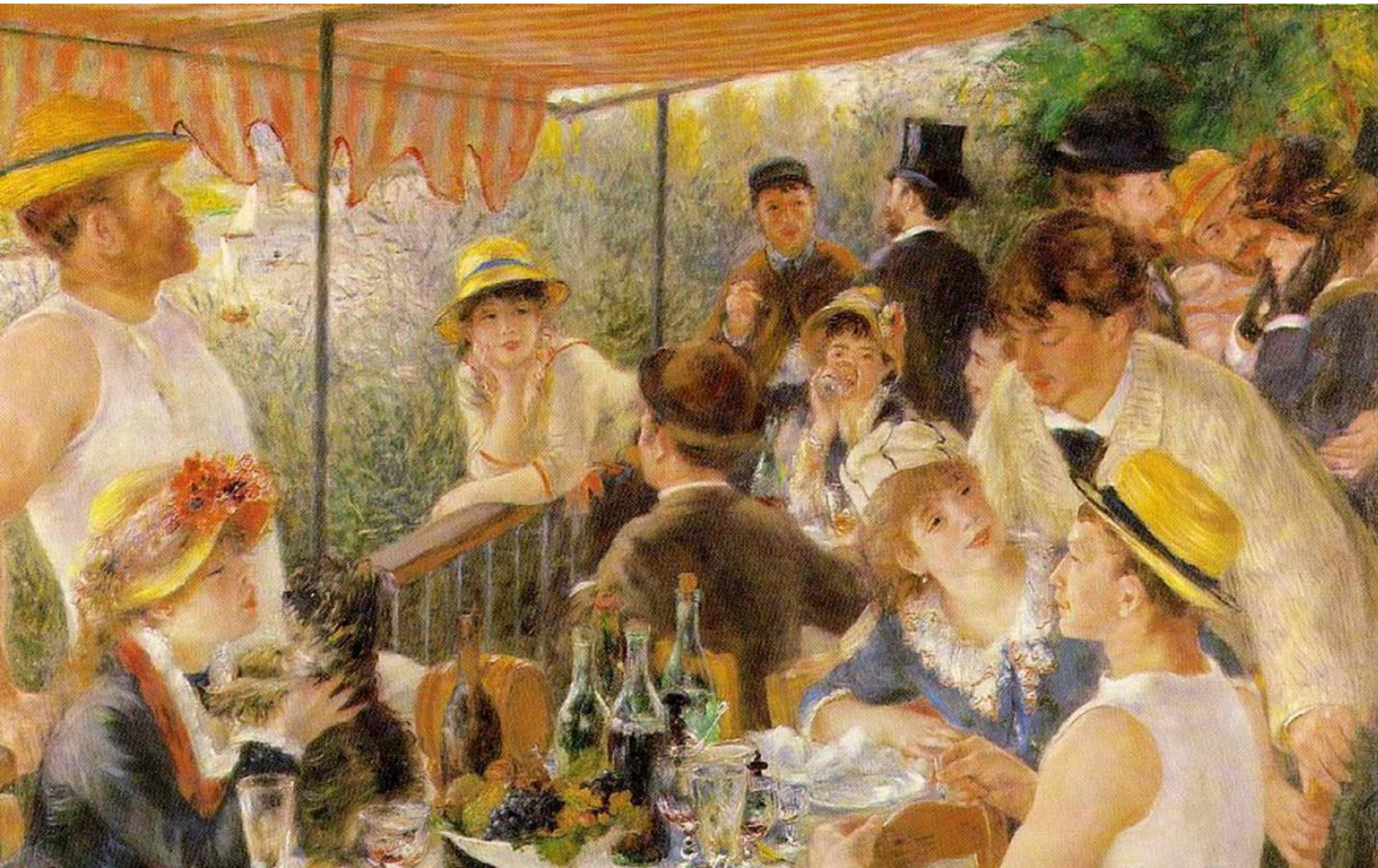
- Dig a trench
- Loosen soil beneath
- Add compost
- Move soil from next area into trench
- Rinse. Repeat

## Lasagna Garden Demo - Delise

- Layer materials
- Water in between
- Topsoil on top
- Plant Broccoli, carrots and radishes



# Q&A Mixer



SAMPLE NO.	NAME	LOCATION/NOTES
1	Beta	Millhamburg Pk backyard
2	Alix	Bedstuy (H2A) Bkwy
3	Nery	Fort Trgm Pk.
4	Nery	INWOOD Pk.
5	Lee	Kensington, Bk
6	Ellie	Maria H. Bushwick
7	Ellie	CCNY
8	Ellie	Tradeschool



# APPENDIX











































# Resource Links

Fall Gardening class presentation	<a href="http://mbmg.ucanr.edu/Read_An_Article/Class_Handouts/">http://mbmg.ucanr.edu/Read_An_Article/Class_Handouts/</a>
Organic Materials Exchange	<a href="http://www.omexchange.org/listings">http://www.omexchange.org/listings</a>
Amendment Calculator	<a href="http://www.harvestpower.com/products/landscape-calculator/">http://www.harvestpower.com/products/landscape-calculator/</a>
Lasagna Garden How-to	<a href="https://www.thespruce.com/how-to-make-a-lasagna-garden-2539877">https://www.thespruce.com/how-to-make-a-lasagna-garden-2539877</a>
Straw bale How-to	<a href="https://modernfarmer.com/2013/07/straw-bale-gardening/">https://modernfarmer.com/2013/07/straw-bale-gardening/</a>
Double digging video	<a href="https://www.youtube.com/watch?v=tNiuWCp9QpY">https://www.youtube.com/watch?v=tNiuWCp9QpY</a>
USDA Zone Map	<a href="http://planthardiness.ars.usda.gov/PHZMWeb/">http://planthardiness.ars.usda.gov/PHZMWeb/</a>
How to set a gophinator	<a href="https://youtu.be/aqMzKAty5Lw">https://youtu.be/aqMzKAty5Lw</a>
IPM Website	<a href="http://ipm.ucanr.edu/">http://ipm.ucanr.edu/</a>
Square foot spacing guide	<a href="https://gardentherapy.ca/wp-content/uploads/2013/04/Square-Foot-Planting-Guide.jpg">https://gardentherapy.ca/wp-content/uploads/2013/04/Square-Foot-Planting-Guide.jpg</a>
Master Gardener Hotline	<a href="http://mbmg.ucanr.edu/hotline/">http://mbmg.ucanr.edu/hotline/</a>



# Square Foot Garden Planting Guide

 Tomatoes 1	 Peppers 1	 Onions 9	 Head Lettuce 4	 Carrots 16	 Leaf Lettuce 16	 Cucumbers 2	 Cabbage 1
 Hot Peppers 1	 Winter Squash 1	 Sweet Potatoes 1	 Potatoes 2	 Pumpkins 1	 Cauliflower 1	 Corn 2	 Peas 8
 Beets 9	 Eggplant 1	 Spinach 9	 Garlic 4	 Radishes 16	 Melons 1	 Celery 2	 Turnips 9
 Brussel Sprouts 1	 Kale 2	 Summer Squash 1	 Rosemary 1	 Cilantro 9	 Sage 1	 Chives 1	 Parsley 2
 Bush Beans 4	 Pole Beans 4	 Basil 2	 Bok Choy 1	 Parsnips 9	 Dill 9	 Oregano 1	 Thyme 2

Numbers represent the number of plantings per square foot

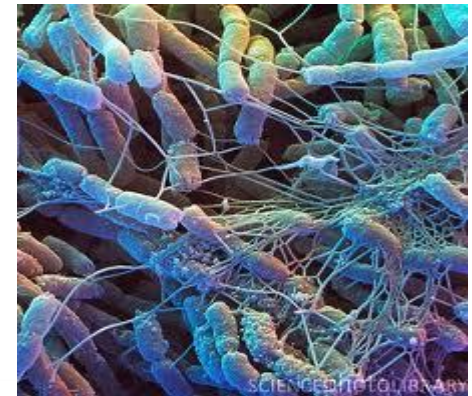


# Fun Fact!

At least one soil microbe acts as an anti depressant.



*Mycobacterium*  
*vaccae*



# What About MY Backyard? Outside!

Try these ideas things out

- Dig in some cover crops
- Build a lasagna garden bed
- Question and Answer

Remember! You can always address questions to the

**Master Gardener Hotline**

<http://mbmg.ucanr.edu/hotline/>

831.763.8007



# Deer Resistant Plants

- **Pungent Plants**

- Herbs
- Lavenders
- Salvias (many, not all)
- Alliums-Society Garlic

- **Fuzzy Plants**

- Woolly Lamb's Ear
- Jerusalem Sage
- Lugwort
- Brunnera

- **Poisonous Plants**

- Foxglove, digitalis
- Euphorbias
- Oleander
- Daffodils

- **Fibrous, Spiky,  
Distasteful Plants**

- Cactus
- Succulents
- Gravelia
- Manzanita

