

# Home Vegetable Gardening

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Beginning Vegetable Garden Committee  
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# Agenda

Planning your garden  
Planting your garden  
Pests and diseases



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# Planning Your Garden

**Liz Schmitt, Class of 2016**



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# Survey

1. Do you currently have a vegetable garden?
2. Have you had a vegetable garden in the past?
3. Are you planning on having a vegetable garden?
4. Rate your level of vegetable gardening knowledge:

low, medium, high

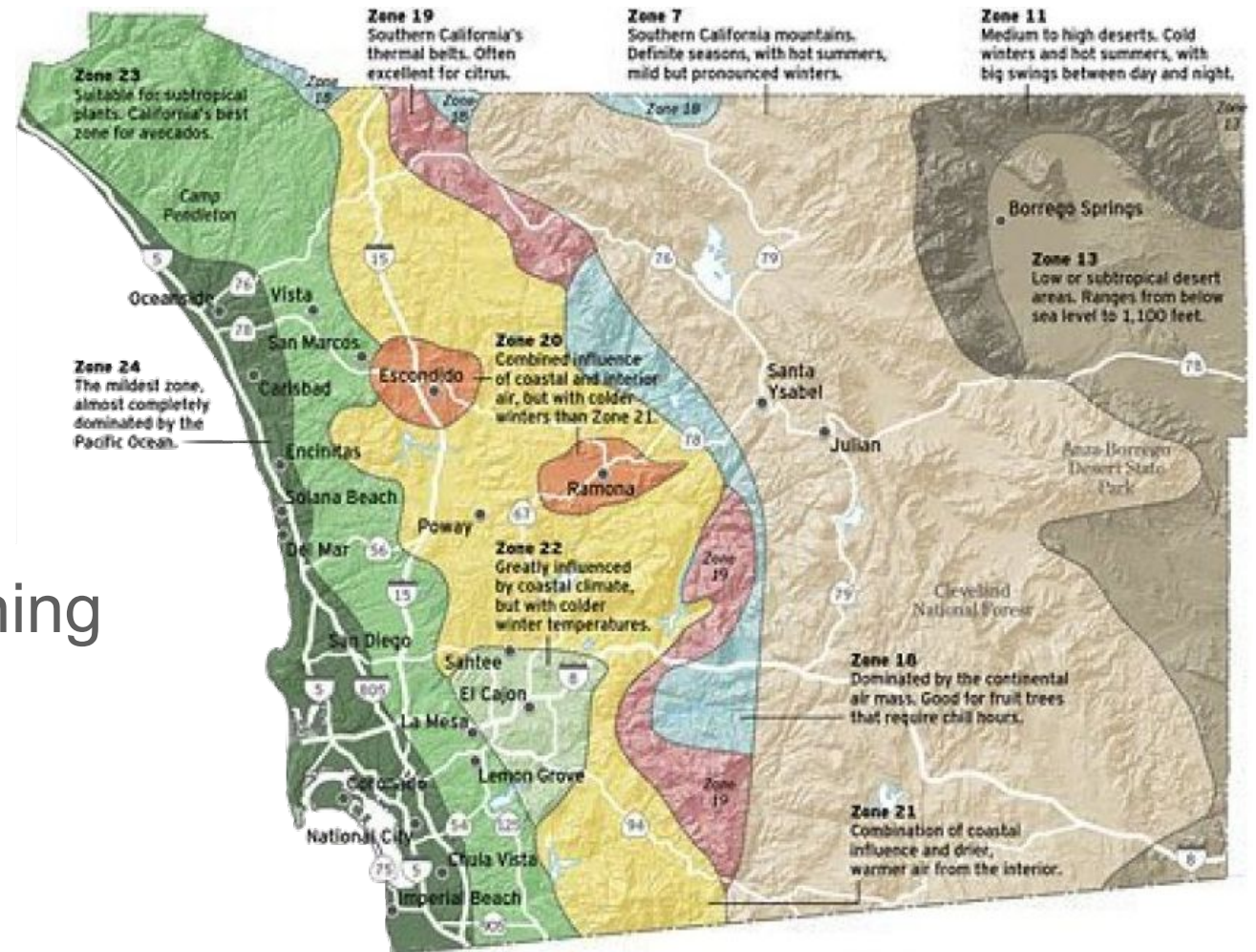


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# Sunset Climate Zones

- San Diego has 10 climate zones, meaning a varying range of growing conditions
- Zones within zones



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# Two Planting Seasons in San Diego

Warm: Plant March - Summer  
Average Temps 65°F - 95°F



Cool: Plant Oct - Feb  
Average Temps 55°F - 75°F



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# Growing Seasons

## Vegetable Planting Guide for San Diego County

### Coastal Region Subdivisions

- 1 – Maritime Zone/Inland Zones
- 2 – Hill & Mesa District
- 3 – Valley & Canyon District
- 4 – High Elevation Zone

### Coastal Region (1&2) Warm Season

Beans, Snap & Pole	Mid Mar - Aug
Beans, Lima	Mid Apr - Jul
Cantaloupe	Apr - Jun
Corn, Sweet	Mid Mar - Jul
Cucumbers	Mid Mar - Jul
Eggplant (plants)	Apr - Jun
Melons (Casaba, etc)	Apr - Jun
Okra	Apr - Jun
Pepper (plants)	Apr - Jul
Squash, summer	Mid Mar - Aug
Squash, winter	Apr - Jun
Sweet Potato (plants)	Apr - Jun
Tomato (plants)	Mar - Jul
Watermelons	Apr - Jun

### Cool Season

Beets	Sept - May
Broccoli (plants)	Sept - Feb
Broccoli (seeds)	Aug - Dec
Cabbage (plants)	Sept - Feb
Cabbage (seeds)	Aug - Dec
Carrots	Sept - Apr
Cauliflower (plants)	Sept - Feb
Cauliflower (seeds)	Aug - Dec
Chard	Sept - Jun
Endive	Sept - May
Kale	Sept - Apr
Kohlrabi	Sept - Mar
Head Lettuce	Sept - Mar
Leaf Lettuce	Sept - Apr
Onion (bulb)	
Short Day	Oct - Dec
Medium Day	Jan - Feb
Onion (green)	Sept - May
Peas (bush)	Sept - Mar
Potatoes (Irish)	Feb - Mar
	Mid Aug - Sept
Radish	Sept - May
Spinach	Sept - Apr
Turnips	Sept - May

### Inland Region (3&4) Warm Season

Beans, Snap & Pole	Apr - Mid Aug
Beans, Lima	Mid Apr - Jul
Cantaloupe	Apr - Jun
Corn, Sweet	Apr - Jul
Cucumbers	Apr - Jul
Eggplant (plants)	Apr - Jun
Melons (Casaba, etc)	Apr - Jun
Okra	Apr - Jun
Pepper (plants)	Apr - Jun
Squash, summer	Apr - Jul
Squash, winter	Apr - Jun
Sweet Potato (plants)	May - Jun
Tomato (plants)	Apr - Jun
Watermelons	Apr - Jun

### Cool Season

Beets	Sept - Mid Apr
Broccoli (plants)	Sept - Feb
Broccoli (seeds)	Aug - Oct
Cabbage (plants)	Sept - Feb
Cabbage (seeds)	Aug - Oct
Carrots	Sept - Mar
Cauliflower (plants)	Sept - Feb
Cauliflower (seeds)	Aug - Oct
Chard	Sept - Apr
Endive	Sept - Apr
Kale	Sept - Apr
Kohlrabi	Sept - Mar
Head Lettuce	Sept - Feb
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Peas (bush)	Jan - Mar
Potatoes (Irish)	Mid Feb - Apr
	Mid Aug - Sept
Radish	Sept - Mar
Spinach	Sept - Mar
Turnips	Mid Sept - Apr



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# Growing Herbs

## Perennial Herbs



Rosemary



Sage



Lavender



Lemon Grass



Lemon Balm



Bay Laurel



Basil



Sage

## Warm Season



Cilantro



Chervil



Parsley



Chives



Dill



Tarragon



Chamomile

## Cool Season



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# Planting Record

Season and Year

What I Want to Grow

Spacing

Height

Planting Date

Estimated Harvest Date

The Food Project

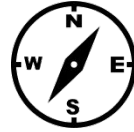
Planning Chart

	What I Want to Grow	Spacing (how many squares)	Height	Planting Date	Estimated Harvest Time
ambrosia	Cantaloupe	3	15-18 in	5/12	+ 86 days
Sweet Sun	Cucumbers	3	1-8 in	5/12	+ 58 days
Stonewall	Small Peppers	1	24 in	5/12	65-70 days
Druaba	Tomatoes	2	5 ft	5/12	80 days
	Radishes	44-1/2	6-8 in	5/12	3-4 weeks
	Green beans	10 in	18 in	5/12	50-60 days
	Butter lettuce	1/2	8-10 in	9/1	50-60 days
	Kale Red Russian	1	24-36 in	9/1	70 days
	Strawberries	1-2	12-16 in	planted	5/5
	herbs-				
	thyme	6-8 in	6-12 in	5/19	
	cilantro	12-15 in	18-24 in	5/19	
cmfelli	lemon grass	5	36-48	5/19	
Bundling	Scallions	4 in	10-12 in	9/1	60 days
Dwarf	sage	8-12 in	8-12 in	5/19	
	oregano	12-18 in	3-5 in	5/19	
	broccoli	40-45 in	30-36 in	9/1	55-60 days
	brussels sprouts	1	36 in	9/1	
ornal hybrid	celery	1	18-24 in	9/1	
Uch	carrots	3 in (1/4)	4-8 in	9/1	
Kale idespe	parsnips	8 in	10-15 in	9/1	
	Sweet Potatoes	36-48	6-10 in	5/12	90-120 days
Vardeans	avocado	12-18 in	12-18 in	5/12	
	Snap peas	3/4 (1 in)	60-72 in	5/12	6-8 weeks

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# Garden Site Selection

Location



Sunlight



Access to water



Space (not too big, not too small)



Soil



Microclimates

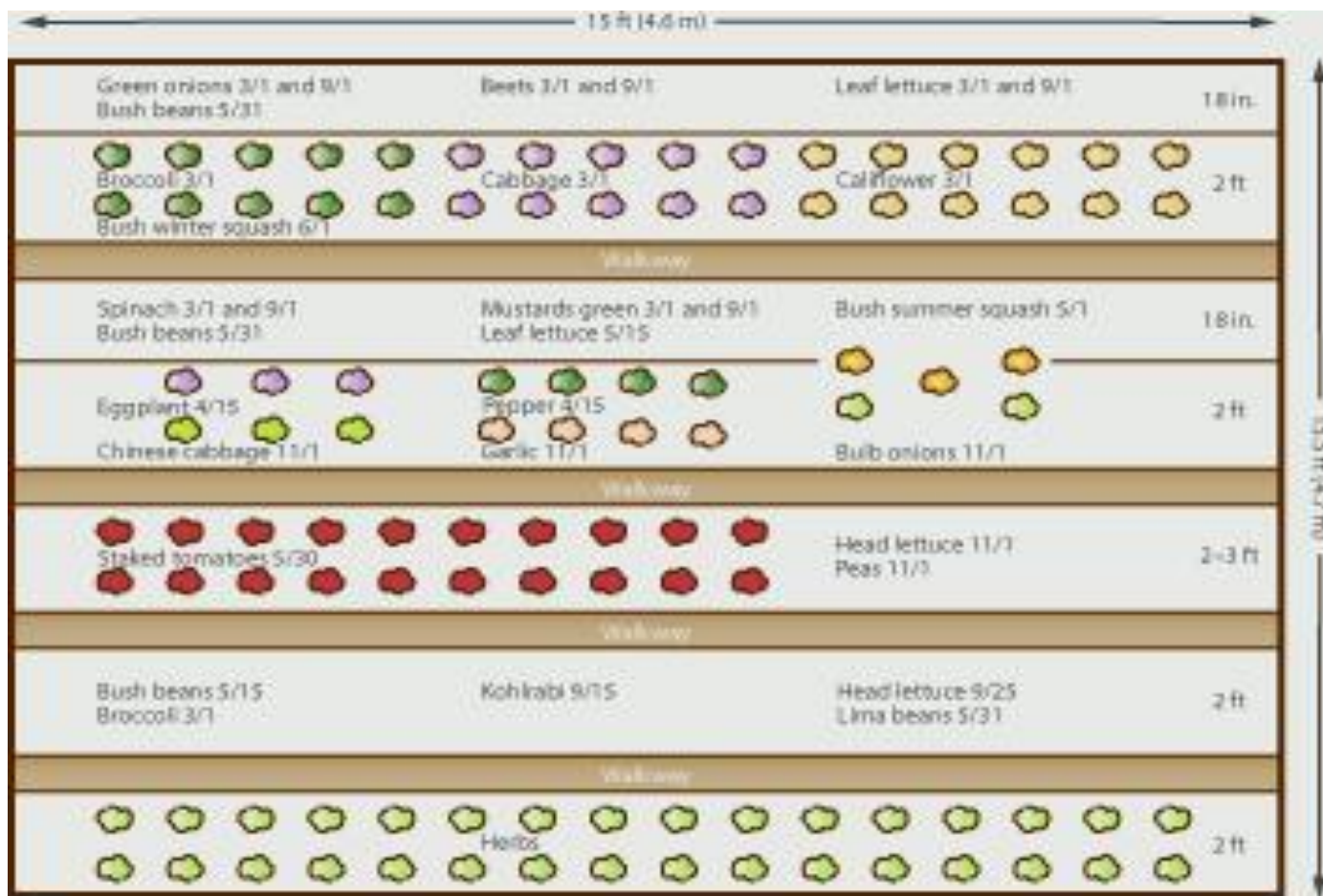


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# Planning Your Garden



# Sunlight



Partial shade, indirect sunlight 4-6 hours daily



Lettuce



Carrot



Beets



Radish



Herbs



Most vegetable need 6-8 hours of direct sun daily



Need 8 hours or more of direct sun daily



Tomato



Eggplant



All Squash

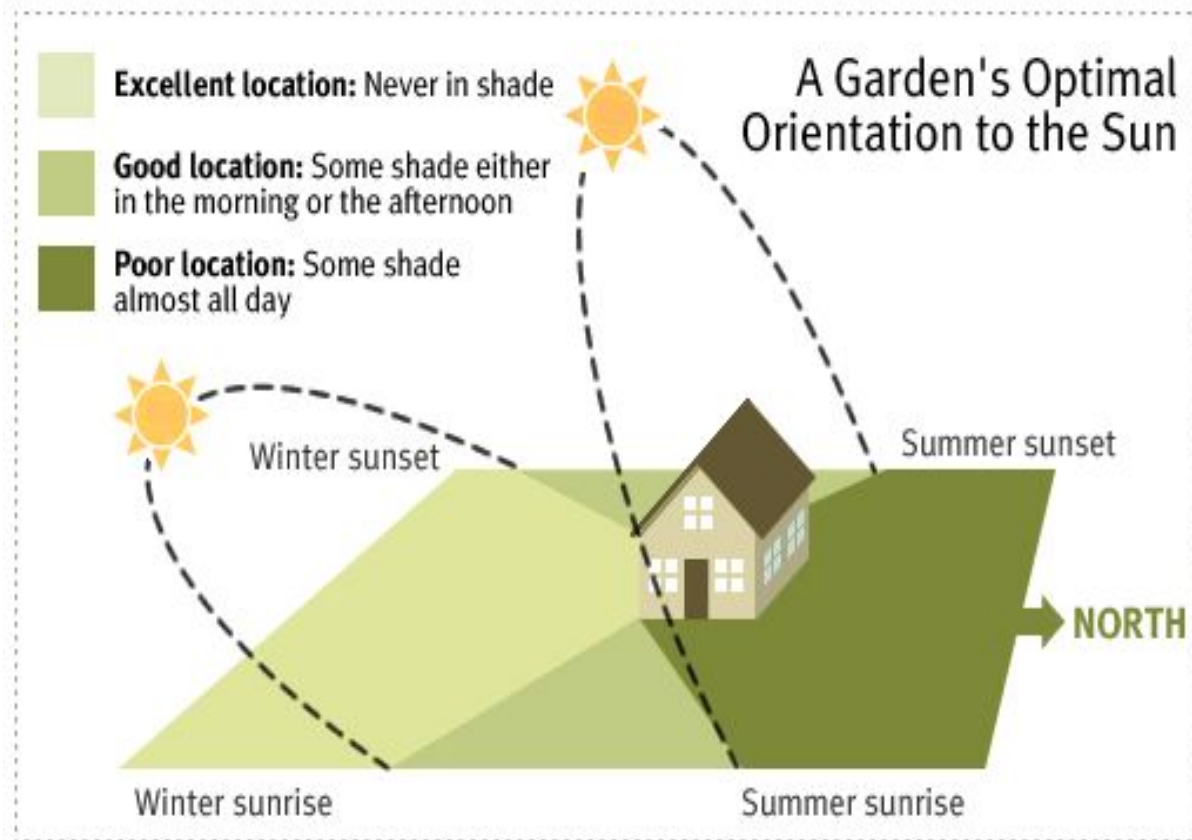


Pepper





# Sunlight



Raised bed orient garden rows North to South



Planting in sunlight



Grow Light



# Soil



Amended soil is dark,  
earthy and pliable  
with nutrients and microorganisms



Hard, sandy or rocky is  
not supportive for veggies



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# Soil Triangle

To Assess your Soil  
Soil Jar Test  
Ribbon Test



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# Amendments



- Soil amendment: 20%
  - Amendment could include compost, worm castings, fertilizer and *composted chicken manure*.
- Bagged potting soil: 80%
  - Mix well and fill soil to top of container
  - Water well before planting
  - Plan to amend soil annually



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# Water and Irrigation

Veggies are not drought tolerant!

Keep root ball moist, but not too wet; Water deeply

Inline drip irrigation provides reliable irrigation and is most successful

Avoid wetting the leaves

Water in the morning

Moisture meters take out the guesswork

Estimate how much water your veggies need:

<https://ucanr.edu/sites/scmg/files/185639.pdf>



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# Raised Bed Irrigation



**Vegetables thrive when given a consistent, reliable source of water.**

In sunny raised beds during growing season:

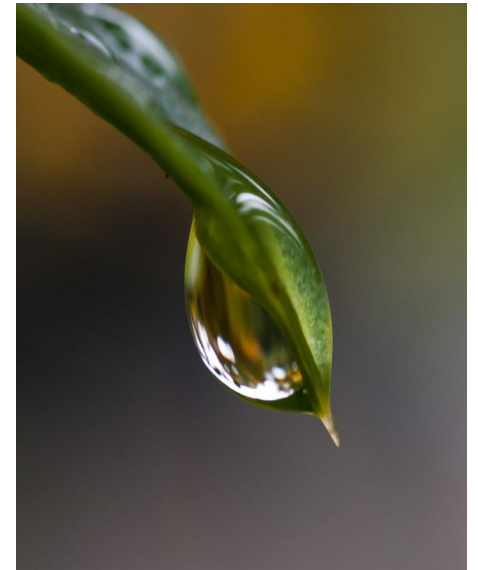
Sown seeds likely need watering twice daily

Young plants daily

Most established vegetables every other day

Turn off irrigation in the rain

Do not water empty beds



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# Inline Irrigation

1/4 inch tubes  
emit water  
every 6 inches



Inline drip irrigation provides reliable irrigation and is most successful

It wets the soil not the leaves, which abates disease

Use with a battery operated controller



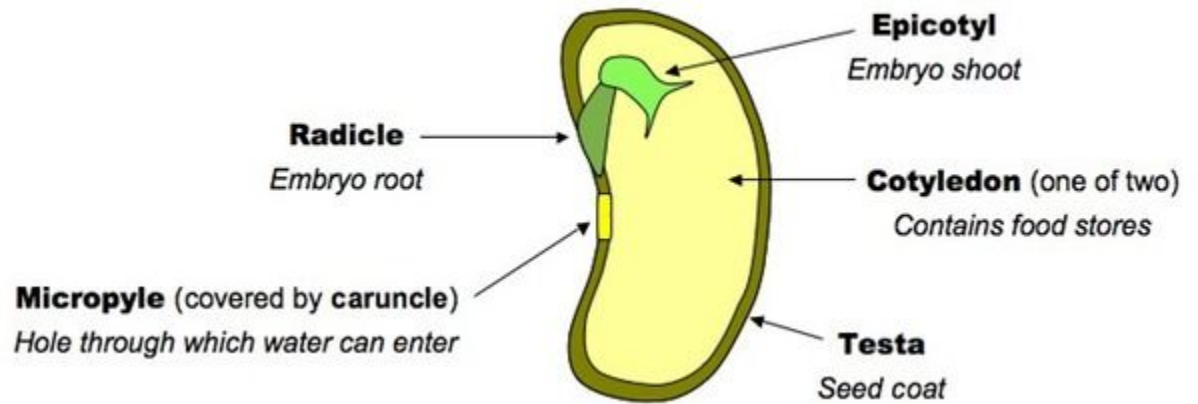
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# Seed Care (until you plant them)

- Seeds are alive – they are plant embryos.
- Seed companies date their seed packets. Best to use as soon as possible as germination diminishes with age.
- Store in a cool, dry place, 40°F like your refrigerator. Do not freeze.
- Paper packets are best. Plastic bags retain moisture which could rot.
- If it sinks, it is good. If it floats, it is not viable.





# Reading a Seed Packet



## Packets should tell you:

- Characteristics of plant
- When to plant
- Spacing
- Sun/shade
- Watering needs
- Germination
- Days to Harvest
- Packing Date



COLD WINTERS	MILD WINTERS	SUN/SHADE	SOW SEEDS	DAYS TO GERMINATE	DAYS TO HARVEST
May - June	April - June	Full sun	Rows: 1 1/2 feet apart Hills: 6 inches apart	7 - 10 days	Approx. 48



# Growing from Seed

## Direct Sow

Corn, melon, squash, beans, beets, carrots, radish, cucumbers, scallions,



- Depth
- Cover to keep moist
- Use Sluggo Plus
- Liquid fertilize
- Thinning

Patience! Most seeds germinate within 10-14 days but some take 21 days



# Growing from Seed



Use a good quality seed starting mix

## Control over conditions:

- Depth
- Quantity of light
- Cover to keep moist
- Heat mat to force summer crops
- Easier to thin if needed
- Able to share seedlings
- Not good for root crops

# Hardening Off Seedlings



The process of adapting inside seedlings to outside conditions.





# Buying Transplants



Choose young plants



Root bound seedlings are less healthy in the long run



Some pots can be put right into the ground



# Seed Germination: What Went Wrong?



## Sudden Collapse

Problem	Solution
Soil Fungus = Dampening off	Use sterile seedling soil mix and good air circulation



## Spindly and Weak

Problem	Solution
Too little light	Add more sunlight
Too warm	Remove from heat
Too much fertilizer	Irrigate



## Moldy

Problem	Solution
Too Wet	Let dry slightly before watering





# Planting Your Garden

**Marsha Cook, Class of 2018**



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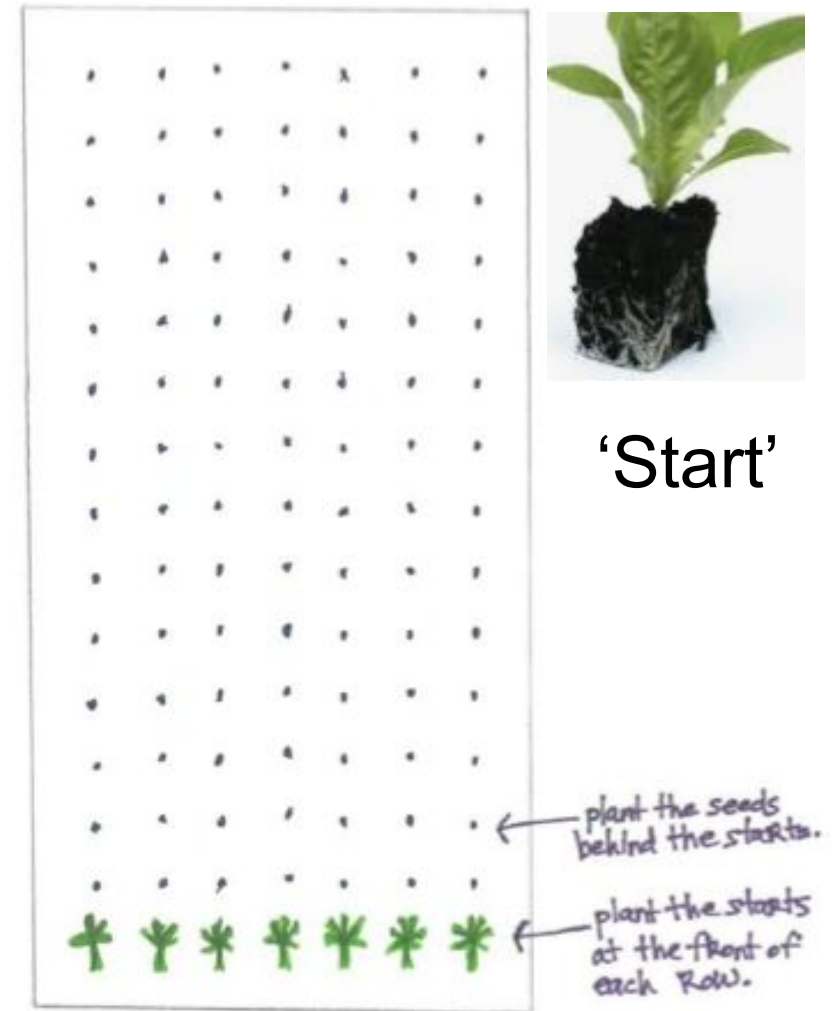
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# How to Plant

- Amend soil
- Moisten the soil before planting
- Plant at same depth as current soil
- Gently water
- To extend the harvest, plant a plant and sow the same seed behind it
- Starts are 1-2 months older than seeds
- Label plant in pencil with name of variety and plant date





# 7 Steps from Seed to Garden

1. Get the timing right
2. Find the right containers
3. Prepare the soil
4. Start sowing
5. Water, feed, repeat
6. Light, light, light!
7. Move seedlings outdoors



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# Do I Need Fertilizer?



**Nitrogen (N)**  
Makes Leaves  
Green  
“UP”



**Phosphorus (P)**  
Root Development  
“DOWN”



**Potassium (K)**  
Fight off Diseases  
“ALL AROUND”



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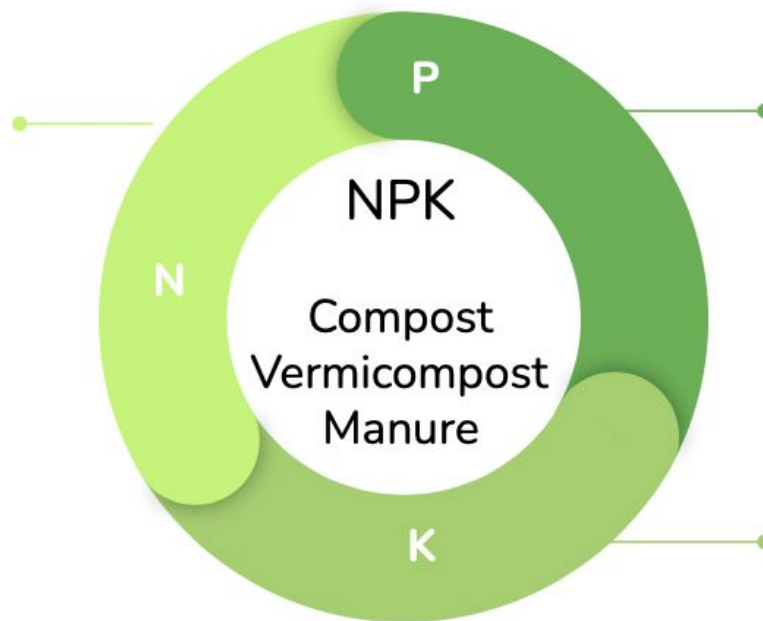
# What NPK Provides for Vegetables

## Nitrogen Fertilizers N

Blood Meal, Fish meal, Nitrate of Soda, Urea.

Helps promote plant foliage, photosynthesis, plant metabolism and enhances crop yield.

Nitrogen deficiency indicators: Slow growth, pale, yellowing skin, tips and margins of older leaves turning brown and dying.



## Phosphorus/ Phosphate Fertilizer P

Bone Meal. Chicken Manure

Helps with seed formation, blooming, root strength

Abnormally dark green, purple or bronze foliage is a symptom of phosphorus deficiency

## Potassium/ Potash Fertilizers K

Wood Ash, steer, Blood Meal, Vermicompost

Helps with disease resistance, crop quality: size, shape, color, taste

Potassium deficiency causes leaf tips to and margins to curl upwards and eventually brown & die starting with older leaves.



# Harvesting and Storage



What do your vegetables look like when they are ripe?

Depending on the produce, storage will vary.





# Pests and Diseases

**Teri Sprecco, Class of 2020**



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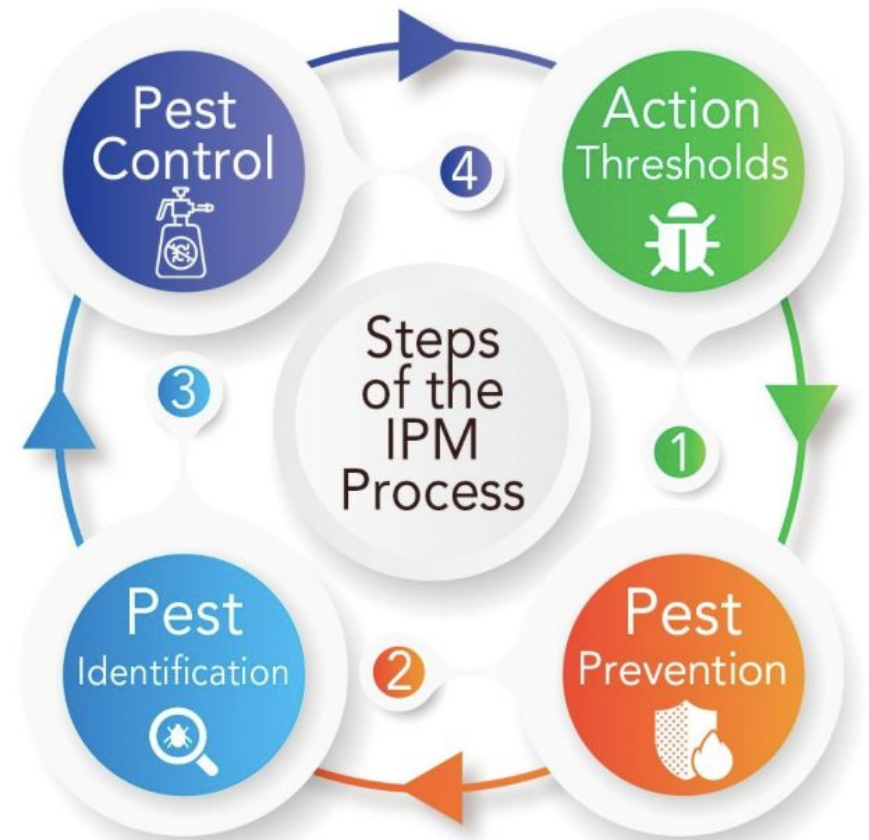


# Integrated Pest Management - IPM

IPM is a way to manage insects, diseases, weeds, animals and other “pests” that cause damage by combining biological, cultural, mechanical and chemical practices.

## What is a Pest?

Any organism that spreads disease, destroys property, competes with people for resources such as food, or is just a nuisance.



# Integrated Pest Management - IPM

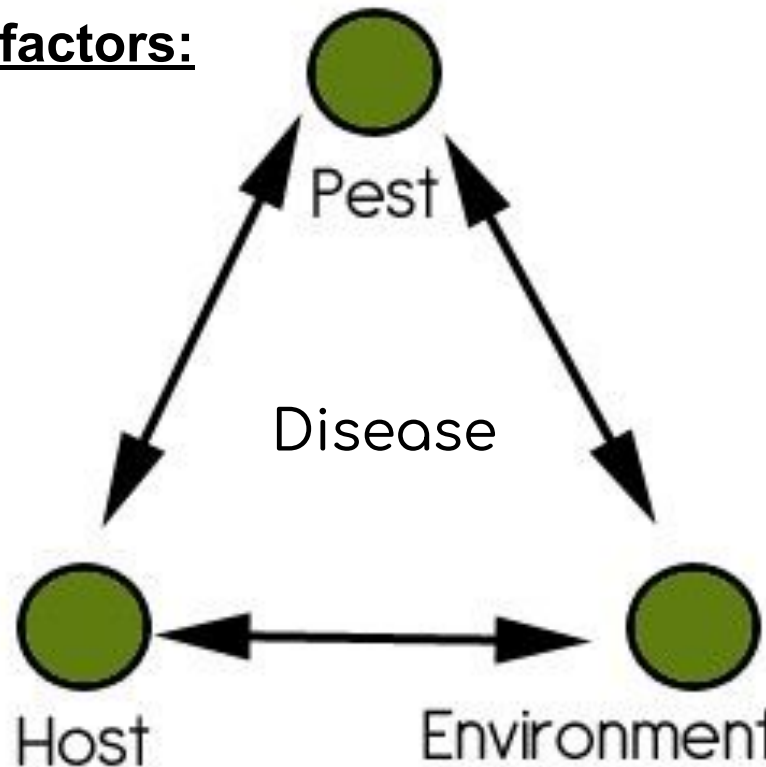
Right plant in the right environment will help control the pests, which will in turn minimize the potential for diseases.

## Pests/Pathogen factors:

- Type
- Range
- Life cycle

## Host (Plant) factors:

- Resistance level
- Age
- Seasonal development
- Uniformity (monoculture vs diversity)



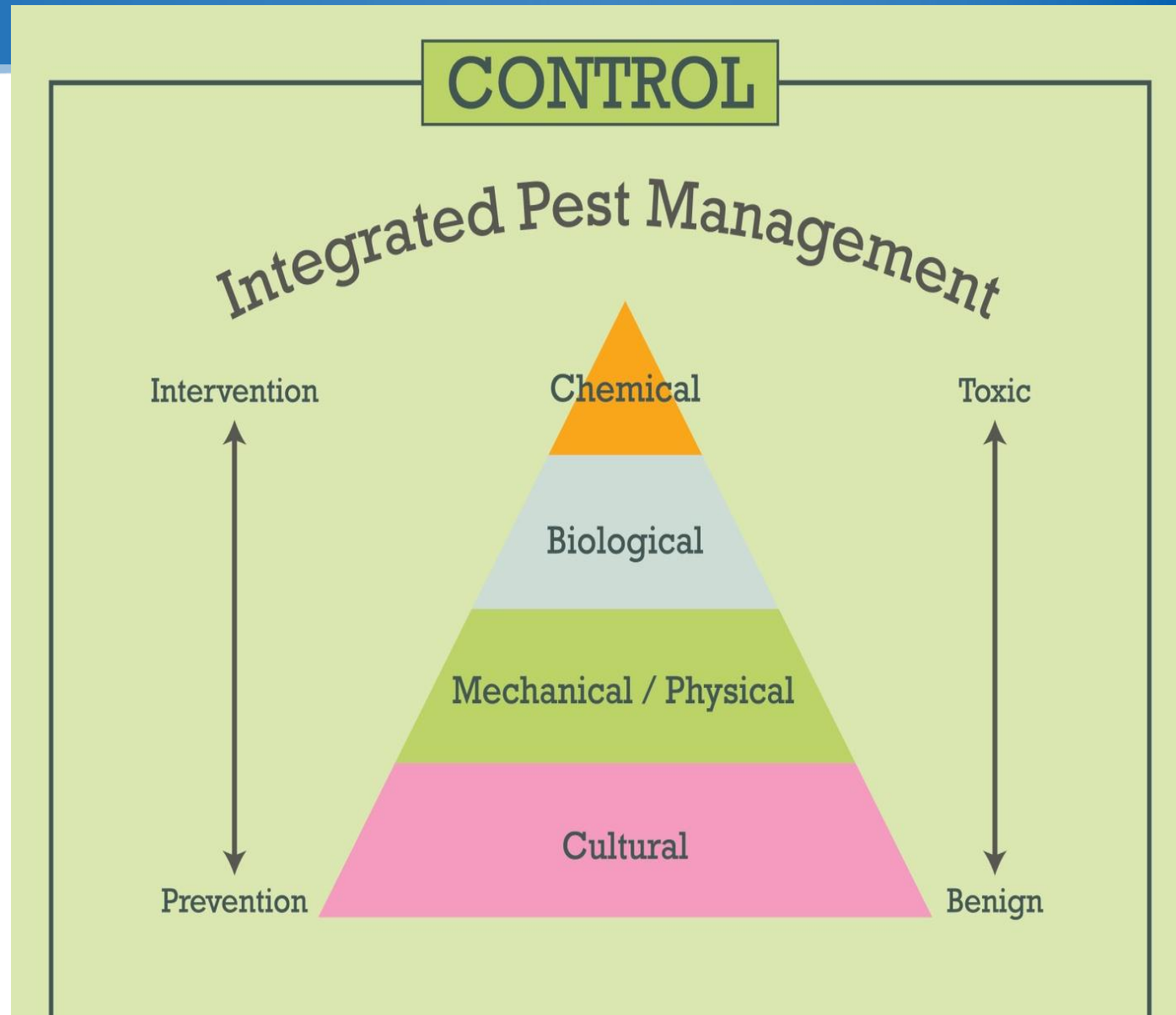
## Environmental factors:

- Sun
- Humidity
- Temperature
- Frost
- Air flow
- Watering consistency
- Soil nutrients
- Competition



# Integrated Pest Management

**Think  
Ecosystem!**





What are the three IPM categories that have methods to prevent pests from damaging plants?

### **Biological**

- Beneficial Bugs
- Predatory Bugs
- Plants that bring beneficial bugs

### **Mechanical**








- Jet water spray
- Sticky tape
- Tanglefoot
- Cages
- Traps
- Sensors

### **Chemical**

- Sprays: Neem Oil
- Soap: Insecticidal soap
- Bait



# Beneficial Insects for Pest Control

INSECTS	PREYS ON	ATTRACTED BY	INSECTS	PREYS ON	ATTRACTED BY
 <b>LADYBUGS</b>	<ul style="list-style-type: none"> <li>• APHIDS</li> <li>• WHITEFLIES</li> <li>• CHINCH BUGS</li> <li>• COLORADO POTATO BEETLES</li> </ul>	<ul style="list-style-type: none"> <li>• DILL</li> <li>• DANDELION</li> <li>• FERN-LEAF YELLOW</li> <li>• BASKET OF GOLD</li> </ul>	 <b>APHID MIDGES</b>	<ul style="list-style-type: none"> <li>• APHIDS</li> </ul>	<ul style="list-style-type: none"> <li>• DILL</li> <li>• PLANTS WITH PLENTY OF NECTAR AND POLLEN</li> </ul>
 <b>GROUND BEETLES</b>	<ul style="list-style-type: none"> <li>• SLUGS</li> <li>• CATERPILLARS</li> <li>• COLORADO POTATO BEETLES</li> <li>• CUTWORMS</li> </ul>	<ul style="list-style-type: none"> <li>• EVENING PRIMROSE</li> <li>• AMARANTHUS</li> <li>• CLOVER</li> </ul>	 <b>DAMSEL BUGS</b>	<ul style="list-style-type: none"> <li>• CATERPILLARS</li> <li>• MITES</li> <li>• APHIDS</li> <li>• CABBAGE WORMS</li> </ul>	<ul style="list-style-type: none"> <li>• CARAWAY</li> <li>• PETER PAN GOLDENROD</li> <li>• SPEARMINT</li> <li>• FENNEL</li> </ul>
 <b>MINUTE PIRATE BUGS</b>	<ul style="list-style-type: none"> <li>• SPIDER MITES</li> <li>• APHIDS</li> <li>• THRIPS</li> <li>• CATERPILLARS</li> </ul>	<ul style="list-style-type: none"> <li>• CARAWAY</li> <li>• FENNEL</li> <li>• ALFALFA</li> <li>• SPEARMINT</li> </ul>	 <b>BRACONID WASPS</b>	<ul style="list-style-type: none"> <li>• TOBACCO HORNWORMS</li> <li>• CATERPILLARS</li> <li>• APHIDS</li> <li>• TOMATO HORNWORMS</li> </ul>	<ul style="list-style-type: none"> <li>• FERN-LEAF YARROW</li> <li>• LEMON BALM</li> <li>• PARSLEY</li> <li>• COMMON YARROW</li> </ul>
 <b>GREEN LACEWINGS</b>	<ul style="list-style-type: none"> <li>• APHIDS</li> <li>• WHITEFLIES</li> <li>• LEAFHOPPERS</li> <li>• MEALYBUGS</li> </ul>	<ul style="list-style-type: none"> <li>• DILL</li> <li>• ANGELICA</li> <li>• GOLDEN MARGUERITE</li> <li>• CORIANDER</li> </ul>	VISIT <a href="https://www.organiclesson.com">ORGANICLESSON.COM</a> FOR THE EXTENDED LIST		

[https://ipm.ucanr.edu/IPMPROJECT/ADS/poster\\_naturalenemies.html](https://ipm.ucanr.edu/IPMPROJECT/ADS/poster_naturalenemies.html)



# Meet the Beneficials:

## Natural Enemies of Garden Pests

**Predators** hunt, attack, and kill their prey. Encourage these natural enemies by avoiding pesticides that kill them; choosing plants that provide them pollen, nectar, and shelter; and keeping ants out of pest-infested plants. Common predators that eat garden pests are pictured below.



**Convergent lady beetles** prefer to eat aphids but sometimes eat whiteflies and other soft-bodied insects. Shown here are the adult (left), larva (center), and cluster of eggs (right).



**Green lacewing adults** eat insects and pollen. Some species also eat insects.



**Green lacewing larvae** feed on insects, eggs, and small insects, especially aphids.



**Green lacewing eggs** are laid on slender stalks in groups (as shown here) or individually.



**Predaceous ground beetle adults** eat soil-dwelling insects, such as cutworms and root maggots.



**Predaceous ground beetle larvae** live on soil and in litter, feeding on almost any invertebrate.



**Assassin bugs** attack almost any insect.



**Pirate bugs** attack insects and any tiny insects, especially thrips.



**Damsel bugs** eat predaceous on a wide variety of small insects.



**Soldier beetle adults** eat mostly aphids; their larvae eat soil-dwelling.



**Spiders**, including the small spider, attack all types of insects.



**Syrphid fly (flower fly, hover fly)** adults eat pollen and nectar.



**Syrphid fly larvae** eat mostly aphids but also soft-bodied insects.



**Lacewing larvae** eat mostly insects.



**Western predatory mites** eat all pest mites.



**Adults of predatory wasps**, such as the paper wasp, prey on caterpillars and other insects.



**Praying mantids** don't control pests, because they eat both beneficials and pests.

**Parasites** live and feed in or on a larger animal (host). Nearly all insect pests have at least one parasite that attacks them.

Insects that parasitize other invertebrates (sometimes called parasitoids) are parasites only in their immature stages and kill their host just as they reach maturity. Most insect parasites are host-specific: wasps or flies, and many are so small that often you won't see them. An adult parasite can lay eggs in hundreds of host individuals with a resulting quick reduction in pest numbers.



Some parasites attack insect eggs, such as the braconid species wasp.



Parasitoid aphids die and turn into sticky "mummies" that can be black or beige. The hole in the mummy on left indicates a parasite has emerged. The aphid on the right is healthy.



The blackish scale insects have wasp larvae developing within.



**Aphid parasite life cycle:** The adult lays an egg in an aphid. The egg hatches into a larva that feeds inside. After killing the aphid, the new larva pupates then emerges as a wasp.



Caterpillar parasites include the ichneumonid wasp.

PHOTO: L. A. CLARK

Visit the Natural Enemies Gallery at [www.ipsn.ucdavis.edu](http://www.ipsn.ucdavis.edu) for more information!



University of California Agriculture and Natural Resources  
Statewide Integrated Pest Management Program

Beneficial Garden Bugs  
Various Stages  
Download Print and Post  
To help you learn to ID Good Bugs  
So you don't kill them

POSTER FOR DOWNLOAD



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# Mechanical Control



Aphids

## Aphids and pests stuck on plants

- Pluck the infected portion if infestation is very heavy
- Jet spray with water



Sticky Traps



Row Covers

## Various other pests

- Place sticky traps for flying insects
- Ants on fruit trees - Tanglefoot
- Sluggo for Snails
- Copper tape for snails on trees
- Diatomaceous earth (DE) barrier for snails and ants



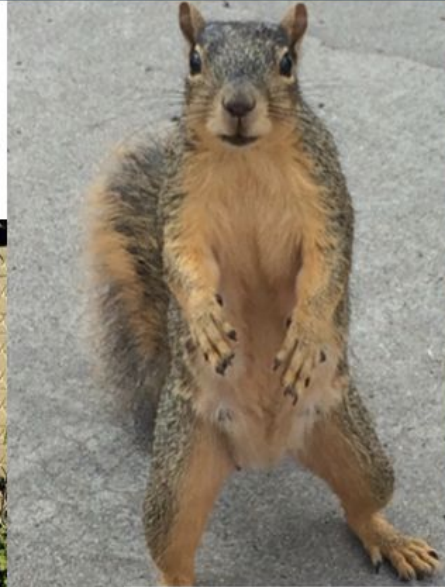
Tanglefoot





# Exclusion to Abate Critters

To control pests modify their food supply, water and habitat and understand their lifecycle



# How Did That Happen?



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# What is It?



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# Try to Identify?



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# Friend or Foe?



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# More Beneficials



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# Beginning Vegetable Gardening *Resources*

- UCCE Master Gardeners of San Diego  
County Hotline

- ☐ Phone: (858)822-6910

- ☐ Email: [help@mastergardenerssandiego.org](mailto:help@mastergardenerssandiego.org)

- Pest Management

- ☐ University of California Integrated Pest Management

- <http://ipm.ucanr.edu/>

- Beginning Vegetable Gardening Workshop

- ☐ <http://www.mastergardenersd.org/beginning-vegetable-gardening/>

- Vegetable Gardening

- ☐ Joyce Gemmell's Vegetable Planting Guide

- <http://www.mastergardenersd.org/vegetable-planting-guide/>

- ☐ UCCE San Diego Master Gardeners Growing Guides

- <http://www.mastergardenersd.org/growing-guides/>



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# Home Vegetable Gardening

# Questions?



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