

# Growing Roots, Tubers & Bulbs In Central Arizona



Presented by  
Kathy Watts  
Master Gardener



# University of Arizona Master Gardener Association Yavapai County Cooperative Extension

Prescott Office:  
840 Rodeo Drive Building C  
Prescott, AZ 86305  
(928) 445-6590 ext 222  
[prescottmg@gmail.com](mailto:prescottmg@gmail.com)

Verde Valley Office:  
2830 N. Commonwealth Drive Suite 103  
Camp Verde, AZ 86322  
(928) 554-8999  
[verdevalleymg@gmail.com](mailto:verdevalleymg@gmail.com)

Master Gardener Web: [extension.arizona.edu/yavapai](http://extension.arizona.edu/yavapai)

Speakers' Bureau Email: [ycmgspeakersbureau@gmail.com](mailto:ycmgspeakersbureau@gmail.com)

Facebook: [yavapaicountymastergardeners](https://www.facebook.com/yavapaicountymastergardeners)



# How to start, plant, grow and harvest these popular roots, tubers and bulbs:

- Sweet Potatoes
- Potatoes
- Jerusalem Artichokes
- Garlic



# Planting considerations:

- Choosing the best location
- Temperature
- Preparing the soil
- Varietal Selection
- Planting (slips, chits, cloves)
- Growing/Fertilizing/Watering
- Harvesting
- Curing and Storage
- Pests and Diseases



# Choosing a location

- Look for an area that has exposure to midday sun (10am-3pm).
- Protectable from the elements and animals.
- Rotation of plants from previous season.
- Soil quality
- Access to water

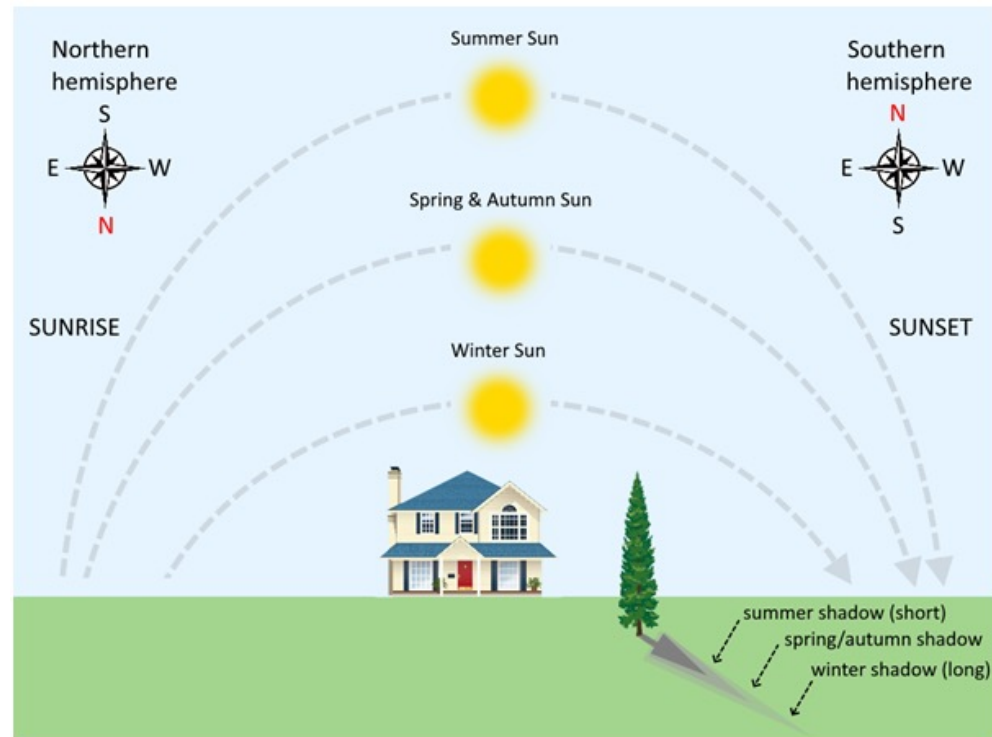
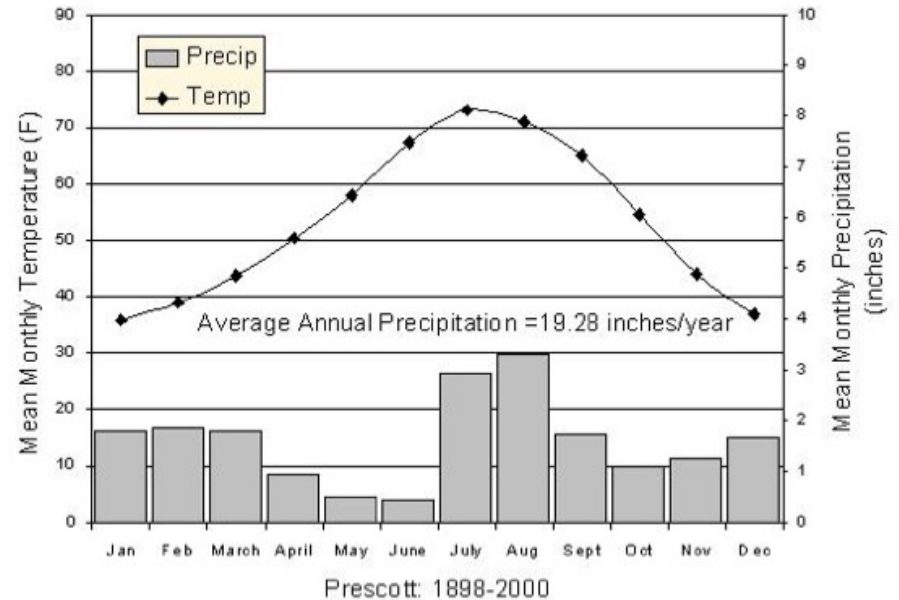
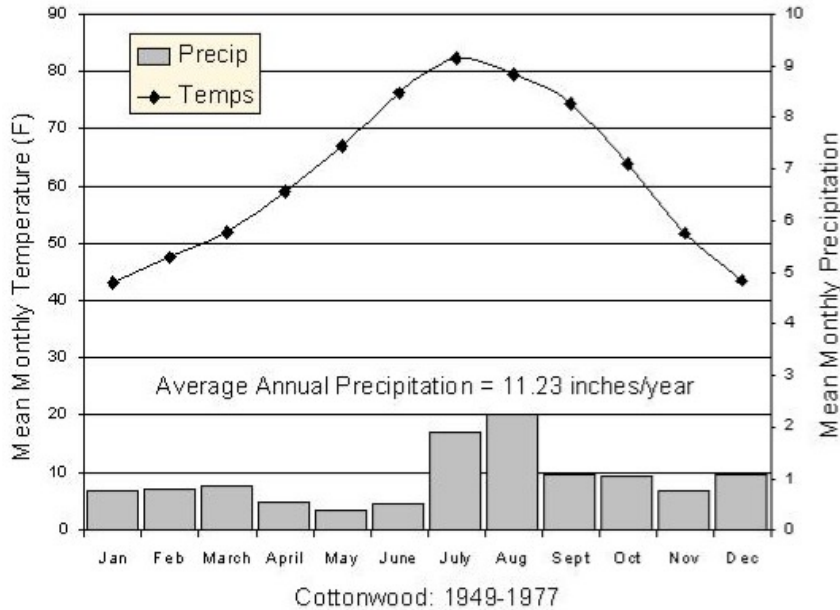


Image Credit: Deep Green Permaculture

<https://deepgreenpermaculture.com/2020/03/24/emergency-survival-prepper-vegetable-gardening-part-1-selecting-a-location-for-a-food-garden/>



# Temperature is a Factor



Graph Credit: [University of Arizona Cooperative Extension](#)



# Sweet Potato

*Ipomoea batatas*

- Start with slips (vine) from a mature root
- Prefers fluffy deeply amended soil
- Plant after night time temperatures are above 55 F
- Plant rooted slips 12" apart allowing 3' for vines
- Fertilize with higher phosphorous fertilizers
- Water regularly and deep water on hot/dry days
- Time to maturity – expect at least 100 days
- Harvest before first fall frost
- Curing – the secret to the sweetest potatoes!



# Sweet Potatoes

## Starting your Slips



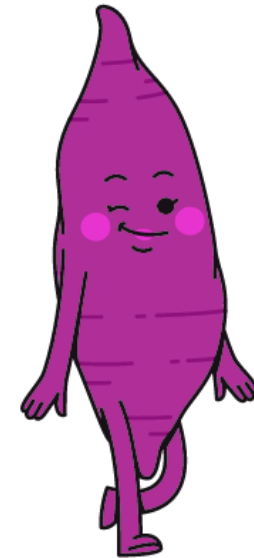
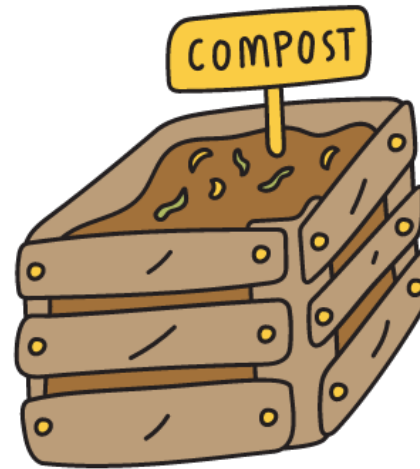


# Sweet Potatoes

## Soil, Sun and Water



# Sweet Potatoes Fertilizer



# Sweet Potatoes

## Harvesting & Curing



Photo Credit: [Mother Earth News](#)



Photo Credit: [Joe Gardner](#)



# Potato

*Solanum tuberosum*

- Choosing the variety
  - Early, Mid or Late Season Varieties
  - Determinate or Indeterminate
- Start with chits from seed potatoes
- Prefers deep, fluffy deeply amended soil
- Plant after soil temperatures are above 50 F
  - Plant chits 4" deep and 12" apart and hill 6" high
  - Plant chits 7-8" deep and 12" apart – no hilling
- Fertilize with higher phosphorous fertilizers
- Time to maturity – generally 90-135 days
- Curing – in ground or root cellar



Potatoes

# Choosing the Type and Varieties

Cool Days = number of days from last frost in your area to soil temperatures in your garden over 70 degrees Fahrenheit



**Early Season – Best Choice for Southern Climates**

60-100 cool days to reach harvest

**Mid Season - Can grow in most climates**

101-135 cool days to reach harvest

**Late Season – Best Choice for Northern Climates**

135-150 cool days to reach harvest



# Potatoes

## Choosing the Varieties

| Potato Type   | Description   | Best Uses                                 | Varieties   |
|---------------|---|---|---|
| Russet        | These potatoes have a thick skin that's light to medium brown. The interior is white to yellow with a fluffy texture when cooked.   | Baking<br>Mashing<br>Roasting             | Goldrush<br>Burbank<br>Pioneer                            |
| Red           | A thin red skin and white interior characterize this group. The firm texture holds up well to cooking.  | Soups<br>Salads<br>Roasting<br>Mashing    | Norland Red,<br>Strawberry<br>Paw,<br>Adirondack Red      |
| Yellow        | Thin light tan to golden skin with a yellow interior. It's a waxy potato with a creamy, slightly buttery flavor.  | Grilling<br>Roasting<br>Mashing<br>Salads | Yukon Gold,<br>Natascha,<br>Yellow Finn                   |
| Blue / Purple | Some have blue or purple skin and flesh, others have colorful skin with a white interior. Blues and purples have slightly earthy taste and hold on to the pretty color when they're cooked. | Roasting<br>Grilling<br>Salads            | Elmer's Blue,<br>Magic Molly,<br>Purple Majesty<br>Caribe |



# Potatoes

## 'Chitting' Your Seed Potatoes



Photo Credit: [The Guardian](#)



Photo Credit: [Garden Gate Magazine](#)



# Potatoes

## Planting Your Seed Potatoes



Photo Credit: [Gardening Know How](#)

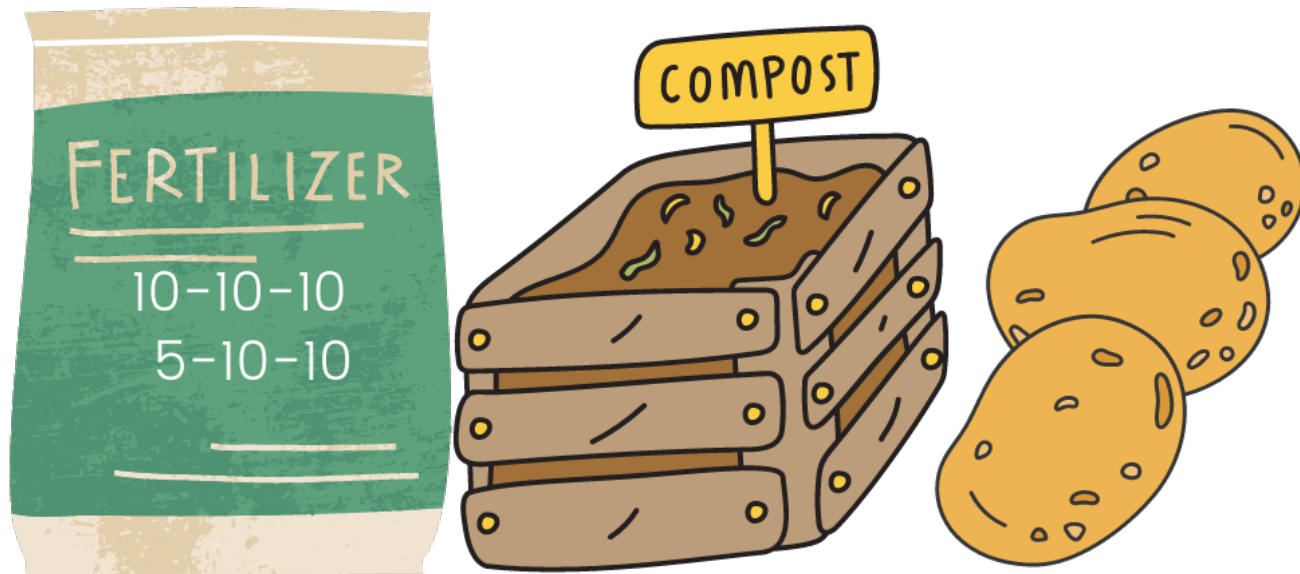


Photo Credit: Kathy Watts





# Potatoes Fertilizer



# Potatoes

## Harvesting & Curing



Photo Credit: Kathy Watts



Photo Credit: [Clemson Cooperative Extension](#)



Photo Credit: [ThisIsMyGarden.com](#)



# Jerusalem Artichoke

*Helianthus tuberosus*

- Choosing the variety – 25 varieties
- Start with tubers, cut into sections.
- Grows best in well-draining, slightly alkaline soil
- Fertilize with 6-12-6
- The plants/stalks have 28% protein
  - Excellent feed for goats, sheep, pigs, cows
- People enjoy the tubers either raw or cooked
- Time to maturity – generally 130 days
- Curing – in ground or root cellar ~ 32 degrees F



# Jerusalem Artichoke

## Choosing the Varieties

### Stampede

- Early yielding 90 days

### Red Fuseau

- Mid-sized tuber with dark red skins

### White Fuseau

- Tall white tubers, easy to peel

### Jerusalem

- Hybrid variety 96-120" tall



Photo Credit: [Insteading.com](http://Insteading.com)



# Jerusalem Artichokes

## Planting Your Tubers



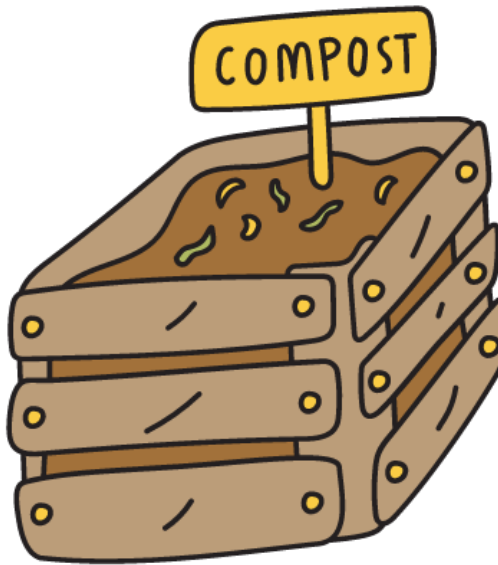
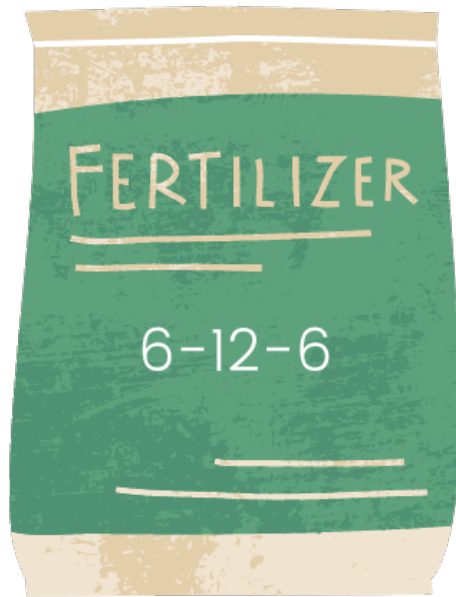
Photo Credit: [GardenBetty.com](https://www.gardenbetty.com)



Photo Credit: [GardenBetty.com](https://www.gardenbetty.com)



# Jerusalem Artichokes Fertilizer



# Jerusalem Artichokes

## Harvesting & Curing



Photo Credit: [HarvestToTable.com](https://www.harvesttotable.com)



Photo Credit: [Nature-and-Garden.com](https://www.nature-and-garden.com)



# Garlic

*Hardneck: Allium Sativum Ophioscorodon*

*Softneck: Allium Sativum Sativum*

- Choosing the horticultural group and cultivar:
  - Hardneck or Softneck?
  - Cultivar (hundreds to choose from!)
- Start with cloves
- Prefers sandy loam or clay loam soil pH 6.0-8.0
- Plant in fall when soil temperatures are about 50 F
- Fertilize with 10-10-10 and compost
  - Banding with high phosphate fertilizer
- Time to maturity – generally 250-270 days
- Curing – hanging for 2-3 weeks in a dry, airy space





# Garlic

## Choosing the Horticultural Group

**Garlic Vernalization:** Over the winter, the garlic goes through a process called vernalization, whereby the cold temperatures stress the seed and divide it into separate cloves. The more time garlic has to grow **before** forming bulbs, the larger the heads will be.

**Hardneck** – Requires longer/colder vernalization period. Has more symmetrical cloves and they grow scapes (flower shoots). Requires greater cold exposure to make bulbs. Usually best suited to northern climates.

**Horticultural Groups (8):** Porcelain, Rocambole, Purple Stripe, Glazed Purple Strip, Asiatic, Turban and Creole.

**Softneck** – Not as affected by vernalization as the hardneck types. Less symmetrical (cloves in assorted sizes) but more tolerant of warmer temperatures and better suited to southern climates.

**Horticultural Groups (3):** Silverskin, Artichoke, and Middle Eastern



# Garlic

## Choosing the Cultivars



Photo Credit: [HelloHomestead.com](http://HelloHomestead.com)



Photo Credit: [New Jersey Agricultural Experiment Station](http://New Jersey Agricultural Experiment Station)



## Garlic

# Hardneck vs Softneck Characteristics

**Table 1: Hardneck vs. Softneck Group Characteristics**

(provided with assistance from Leslie Pameas, Morris County Park Commission)

| Desired Characteristic    | Category | Group                               |
|---------------------------|----------|-------------------------------------|
| Longer Storage            | Softneck | Silverskin                          |
| Braided Bulbs             | Softneck | Silverskin                          |
| High # of cloves per bulb | Softneck | Artichoke                           |
| Largest cloves            | Hardneck | Porcelain                           |
| Uniform clove size        | Hardneck | Rocambole, Porcelain, Purple Stripe |
| Has a scape*              | Hardneck | Rocambole, Porcelain, Purple Stripe |
| Cloves peel easily        | Hardneck | Rocambole, Porcelain, Purple Stripe |
| Heat tolerant             | Softneck | Artichoke                           |
| Cold tolerant             | Hardneck | Rocambole, Porcelain, Purple Stripe |
| Milder flavor             | Hardneck | Rocambole                           |
| Easiest to grow           | Softneck | Artichoke                           |

Photo Credit: [New Jersey Agricultural Experiment Station](#)



# Garlic

## Planting Your Cloves



Photo Credit: [GardenNursery.com](https://www.gardennursery.com)



Photo Credit: [Seedwise.com](https://www.seedwise.com)



# Garlic Straw Mulch vs Wood Chips



Photo Credit: Kathy Watts



Photo Credit: Kathy Watts



# Garlic

## Fertilizing Garlic

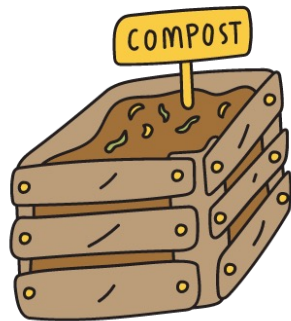
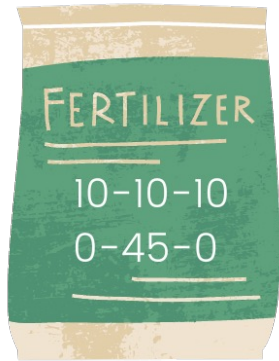


Photo Credit: Kathy Watts



# Garlic

## Harvesting Garlic



Photo Credit: [TheSpruce.com](https://www.thespruce.com)



Photo Credit: Kathy Watts



# Garlic

## Curing Garlic



Photo Credit: [ThisIsMyGarden.com](https://www.thisismygarden.com)



Photo Credit: [ThePrudentGarden.com](https://www.theprudentgarden.com)





# Pests and Diseases



Whitefly

Photo Credit: [NewYorkTimes.com](http://NewYorkTimes.com)



Aphid

Photo Credit: [BustlingNest.com](http://BustlingNest.com)



Tomato Hornworm

Photo Credit: [Washington Post](http://Washington Post)



Figure 1.

Figure 2.

Figure 3.

Potato Scab Photo Credit: [Vegetables.Cornell.edu](http://Vegetables.Cornell.edu)



# Questions?



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Cooperative Extension

Yavapai County

# Image Credit Web Links

Image Credit: Deep Green Permaculture

<https://deepgreenpermaculture.com/2020/03/24/emergency-survival-prepper-vegetable-gardening-part-1-selecting-a-location-for-a-food-garden/>

Temperature Graph Credit: [University of Arizona Cooperative Extension](https://cals.arizona.edu/yavapai/anr/hort/mastergardener/mgcourseresources/soilsandclimateofyavapaico.pdf)

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Potato Chit Photo Credit: [The Guardian](https://www.theguardian.com/lifeandstyle/2019/mar/02/how-to-chit-sprout-seed-potatoes-aly-fowler)

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Cutting Seed Potato Photo Credit: [Garden Gate Magazine](https://www.gardengatemagazine.com/articles/vegetables/edible-plant-guide/how-to-grow-potatoes-you-can-harvest-from-summer-to-fall/)

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Planting Seed Potato Photo Credit: [Gardening Know How](https://www.gardeningknowhow.com/edible/vegetables/potato/how-deep-to-plant-potatoes.htm)

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When to Harvest Potatoes Photo Credit: [Clemson Cooperative Extension](https://hgic.clemson.edu/factsheet/potato/)

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Planting Garlic Cloves Photo Credit: [Seedwise.com](https://www.seedwise.com/resources/garlic-growing-guide/)

<https://www.seedwise.com/resources/garlic-growing-guide/>

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<https://www.thespruce.com/harvesting-garlic-1402402>

Curing Garlic Photo Credit: [ThisIsMyGarden.com](https://thisismygarden.com/2019/07/harvest-cure-garlic/)

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Braided Garlic Photo Credit: [ThePrudentGarden.com](https://theprudentgarden.com/how-to-cure-and-braid-fresh-garlic/)

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Whitefly Photo Credit: [NewYorkTimes.com](https://www.nytimes.com/2011/04/12/science/12obbacteria.html)

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[https://www.washingtonpost.com/lifestyle/home/shining-light-on-the-tomato-hornworm/2013/08/06/de1168d8-f7e8-11e2-a954-358d90d5d72d\\_story.html](https://www.washingtonpost.com/lifestyle/home/shining-light-on-the-tomato-hornworm/2013/08/06/de1168d8-f7e8-11e2-a954-358d90d5d72d_story.html)

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