

Fall Vegetable Gardening in Containers



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NC Cooperative Extension - Chatham County Center

Tonight's Webinar

- Principles of container gardening
- Cool season vs warm season veggies
- Growing cool season veggies
- References and resources



Additional Resources

<https://go.ncsu.edu/chathamveggies>

Why garden in containers?



Grow Food in Small Spaces



Flexibility & Accessibility



Avoid Soil Problems

Other Considerations

- More frequent watering
- More frequent fertilization
- Don't use native soil



Choosing Containers



Containers can be made of many different materials

Containers must be able to:

- 1) Hold soil media
- 2) Drain water



*Use state nitrogen
in place of nutrients*

Container Materials



Porous

- Clay
- Terracotta
- Unglazed ceramic



Semi-porous

- Wood
- Pressed fiber



Non-porous

- Plastic
- Metal
- Fiberglass
- Glazed ceramic

Container Materials

Heat Absorption

- Dark colors absorb more heat
- Metals better conduct heat

Weight

- Top-heaviness of crops
- Wind
- Need to move?



Dennis Amith

Container Size

- Need space for roots
- **Shallow rooted veg. crops:**
Min. 4-8 in. depth
- **Root or fruit crops:**
Min. 10-12 in. depth
- Larger = better moisture retention
- Penn State Extension Study
 - 14”- 20” diameter

Vegetable	Minimum Size Container	Spacing	Minimum Container Depth
Beans	2 gallon	2-3 inches	8-10 inches
Beets	2 quart	2-3 inches	8 inches
Bok choy	1 gallon	6 inches	20 inches
Carrots	2 quart	2-3 inches	10 inches
Collards	3 gallon	12 inches	12 inches
Cucumbers	1 gallon	1 plant per container or 12-16 inches	8 inches
Eggplant	5 gallon	1 plant per container	12-16 inches
Green garlic	2 quart	4 inches	4-6 inches
Kale	3 gallon	6 inches	8 inches
Lettuce	2 quart	4-5 inches	6-8 inches
Mustard greens	3 gallon	6 inches	4-6 inches
Peas	2 gallon	2-3 inches	12 inches
Peppers	2 gallon	1 plant per container or 14-18 inches	12-16 inches
Potatoes	30 gallon	5-6 inches	
Radishes	2 quart	2-3 inches	4-6 inches
Scallions	2 quart	2-3 inches	6 inches
Spinach	1 gallon	2-3 inches	4-6 inches
Squash	2 gallon	1 plant per container	12-24 inches
Swiss chard	2 quart	4-5 inches	8 inches
Tomatoes	5 gallon	1 plant per container	12-24 inches

Table 18.1 *NC Extension Gardener Handbook*

<https://content.ces.ncsu.edu/extension-gardener-handbook>

Potting Media (“Soil”)

- Don't use soil from the garden
- Poor drainage kills roots
 - Lack of O₂
 - Pathogens
- Instead, use soilless substrates a.k.a. potting mixes



Tiny, flat particles compact and repel moisture

Healthy

Nope!

Qualities of Good Container Media

Large particles

- Drainage of water
- Aeration for roots

Small particles & organic matter

- Water holding capacity
- Nutrient-holding capacity

Other Features

- Light weight
- Free of pests, pathogens, & weeds
- Contain or add nutrients

Common Container Media Components

- Forestry “waste” product
- Large particles great for drainage and aeration
- Moderate water retention
- Sustainably produced
- In mixes or purchased in bulk
- Generally favored for woody crops?



Aged Pine Bark

Common Container Media Components

- Excellent water and nutrient holding capacities
- Common ingredient in mixes
- Differ in extent of decomposition
- Not sustainably produced?
- Active research on more sustainable alternatives



Peat Moss

Common Container Media Components

- “Waste” product of coconut production
- Good alternative to peat moss
 - But lots of processing, shipping
- Excellent drainage, good N holding capacity
 - Less so other nutrients
- More expensive



Coconut Coir

Common Container Media Components

- Decomposed plant materials
- Good water and nutrient-holding capacities
- Quality depends on source material
- UMD studies suggest annuals & veggies in 50% compost perform well



Compost

<https://composting.ces.ncsu.edu/>

Common Container Media Components

- Heated igneous rock
- Improves drainage & aeration
- Chemically inert
- Does not hold water or nutrients



Perlite

Common Container Media Components

- Heated mica
- Improves water and nutrient retention
- Fine-grade used for propagation and seed starting mixes



Vermiculite

Common Container Media Components

- 'Waste' hulls from rice
- Unprocessed, excellent replacement for perlite
- Composting PBH improves water-holding capacity
- Lightweight



Parboiled Rice Hulls

Common Container Media Components

- Improves drainage
- Little nutrient or water holding capacity
- Heavy – can use as ballast
- Typically $\leq 10\%$ of media



Coarse Sand

Media Recipes

- 60% Peat or Coir 20% Perlite 20%, Vermiculite
- 60% Pine Bark, 20% Peat, 20% Sand
- 50% Compost, 50% soilless mix (peat, perlite, vermiculite)
- 50% Peat or Coir. 25% Pine Bark, 25% vermiculite
- 40% Pine Bark, 20% perlite, 40% vermiculite
- Etc.

Commercial Container Media

- Many variants available
- Combination of peat moss, perlite, vermiculite
- Easy to find and purchase
- Look for 'Mix' or 'Media'
- Avoid “topsoil”, “potting soil” “garden soil” etc.
- May contain fertilizers – not enough!



Tips for Adding Media to Pots

- 1) Moisten before potting, especially peat moss
- 2) Maintain the substrate line with transplants
- 3) Leave a reservoir for watering 1-3 inches
- 4) Do not pack media



Leave a reservoir for water

Adding Gravel to the Bottom of Pots?

- Does not improve drainage
- Creates a perched water table
- Fill entire container with uniform media



The wettest soil is at the bottom.



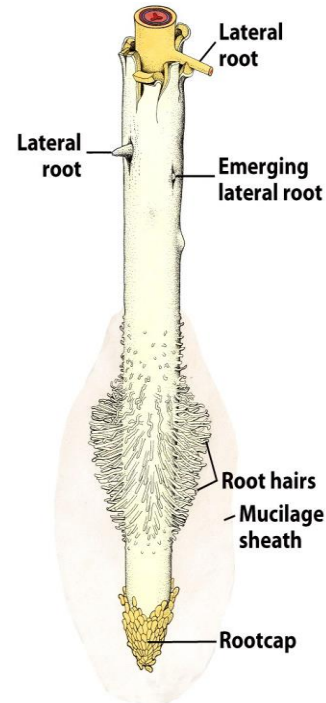
Gravel moves the wettest soil up in the pot, closer to the roots, which can lead to rot.

- What is “plant food” ?
- Nutrients are chemicals necessary for an organism's biochemistry
- Nutrients help a plant *make* food



How do Plants Absorb Nutrients?

- Roots absorb water and nutrients dissolved in water
- Cannot absorb solid pellets!
- What happens when the soil is dry?
- Roots must be healthy to absorb nutrients



Raven et al. *Biology of Plants* 7th ed. 2005



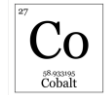
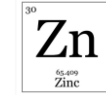
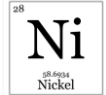
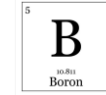
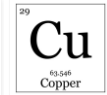
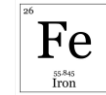
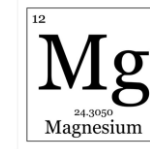
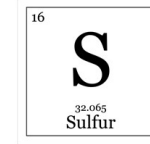
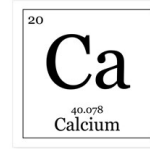
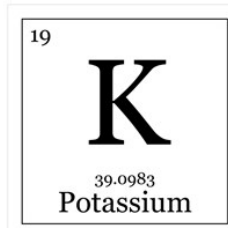
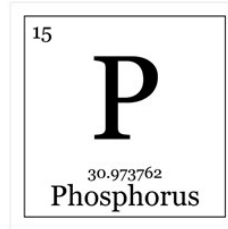
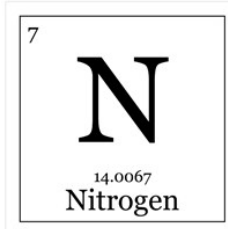
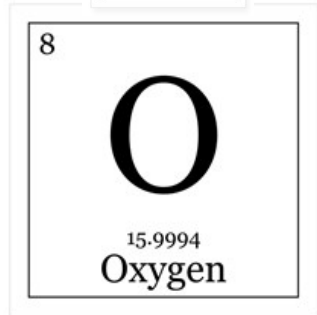
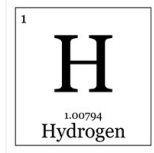
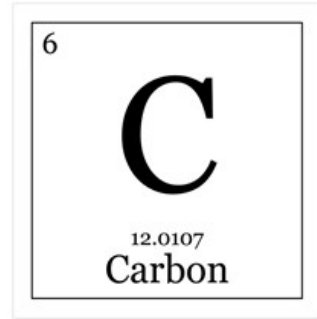
Univ. of Maryland



Utah State Univ.

The Macro- and Micronutrients

Obtained from
the atmosphere



Obtained from soil

Nutrient Deficiencies

Some nutrient deficiencies (and toxicities) are symptomatic in leaves

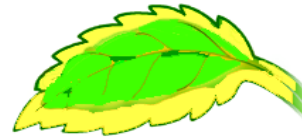
Symptoms

- Chlorosis or necrosis
- Entire leaf, margin, or interveinal
- Older vs. younger leaves

Requires tissue analysis for confirmation

- NCDA (\$3)
- <http://www.ncagr.gov/agronomi/uyrplant.htm>

Univ. of Arizona



Marginal Chlorosis



Interveinal Chlorosis



Immobile nutrient
Deficiency on younger leaves



Mobile nutrient
Deficiency on older leaves

Fertilizer Nutrient Analysis

Number on the bag represent % of:

N



Nitrogen

P



Phosphorus

K



Potassium

For a 100 pound bag of fertilizer:

10 – 5 – 15

= 10 lbs. N, + 5 lbs. P, + 15 lbs. K, + 70 lbs. filler

Fertilizers

Liquid (quick release)

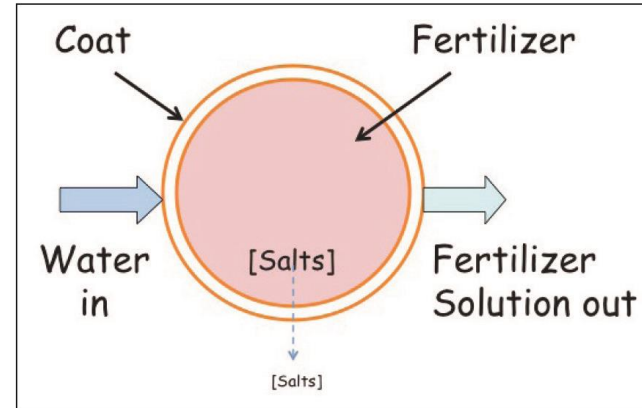
- Concentrated, immediate uptake
- Easily leach

Slow Release

- Less prone to leaching
- May be inadequate for fast-growing crops
- Affected by moisture, microbes, temperature, particle size

Controlled Release

- Coated in materials for steady release
- Release increases with temperature



Fertilizers for Container Veggies

Synthetic

Incorporate controlled release at labeled rate at planting

- Again in 8-10 weeks, or liquid half strength
- Penn State study for fruiting veggies:
 - Liquid 1-1.5-3 (N-P-K ratio) + micronutrients weekly

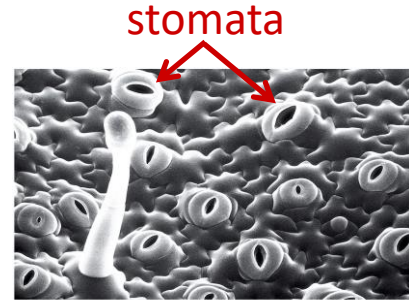
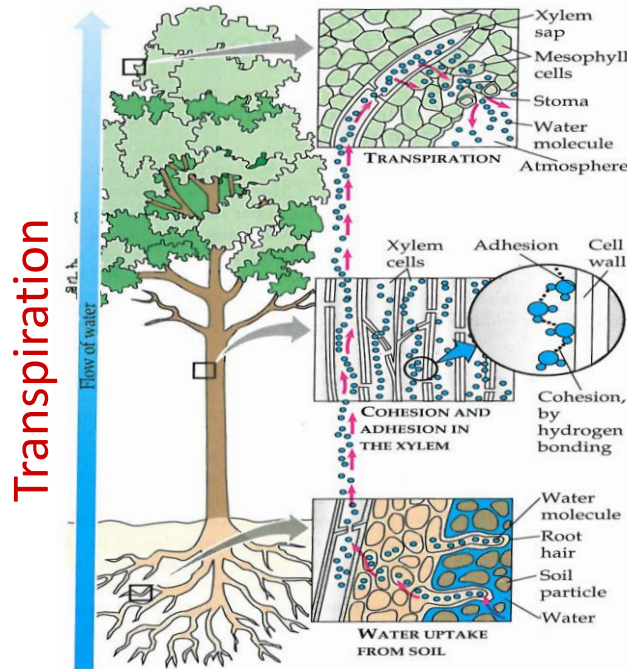
Organic

Incorporate at planting at labeled rate. Supplement:

- Transplants: 3 weeks after planting
- Seeds: after plants have first true leaves
- Penn State: fish emulsion, green sand, kelp meal, bone meal

What Factors Affect Watering Frequency?

- Light
- Temperature
- Humidity
- Container Size
- Media Composition



When do you water?

- When you need to!
- When top few inches of media are dry
- Water until water comes out of container
- Use mulch
 - 1 in deep, 1 in. away from plants
 - Reduce weeds



Container Watering Methods

Watering Can

- Cheap & Easy
- Heavy to carry
- Wets foliage

Garden Hose

- Cheap & Easy
- Lightweight-ish
- Wets Foliage

Drip Irrigation

- Convenient
- Lower volume reduces runoff
- Does not wet foliage
- More expensive
- Maintenance



Planting Seasons

Cool season

- Plant **July-Sept** for fall crop
- **Feb - April** for spring crop

Warm season

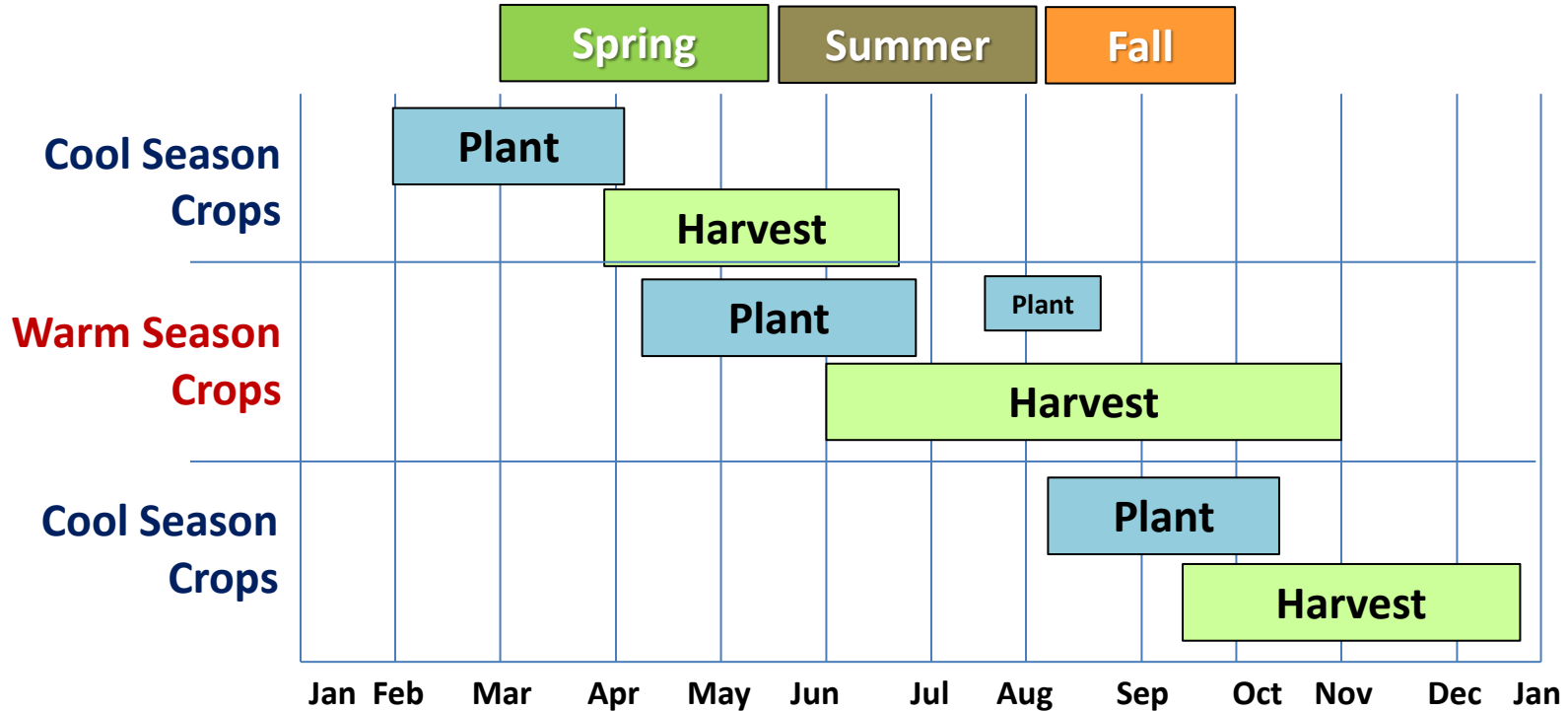
- Plant after average last spring frost date, April 15
- See “Central NC Planting Calendar” for specific dates



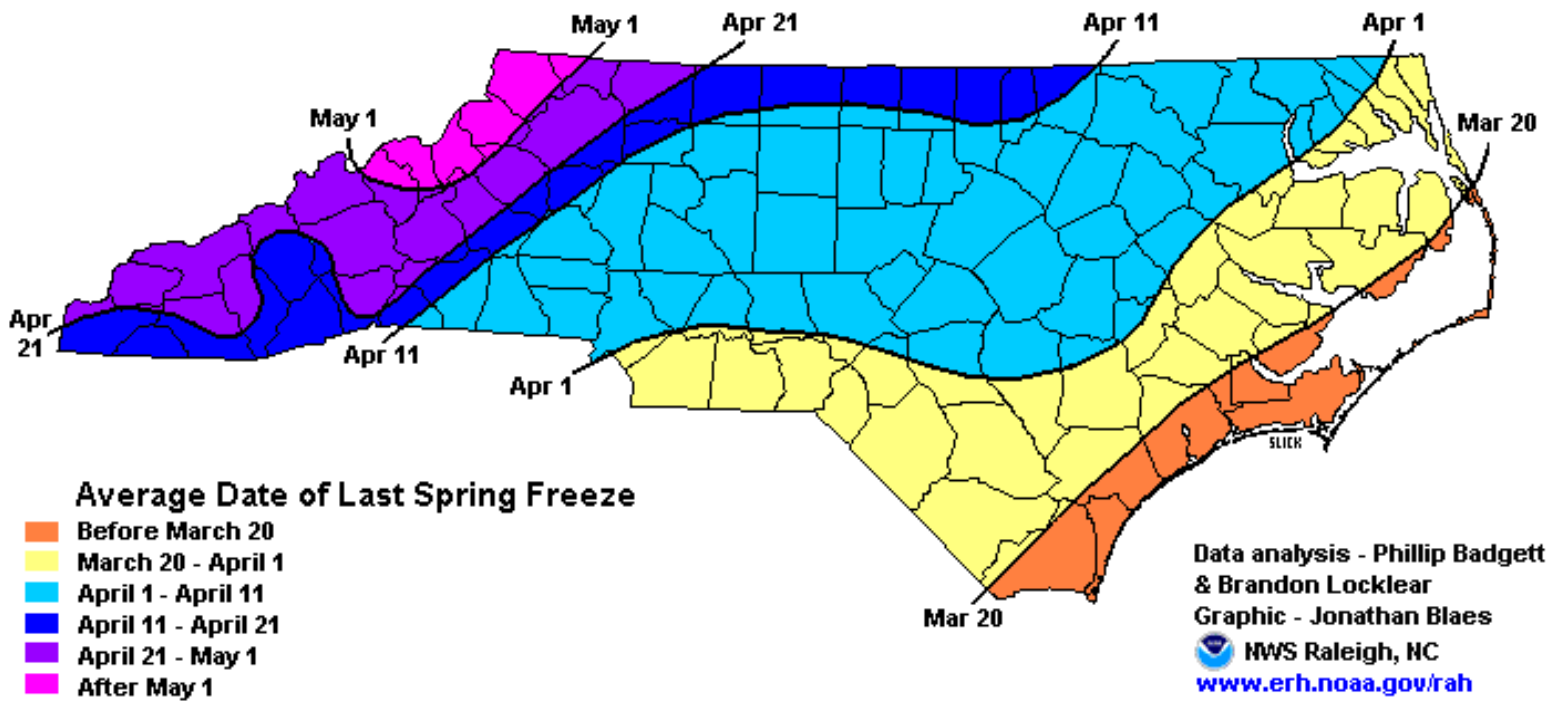
Dag Endresen
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Not the same as the produce aisle!

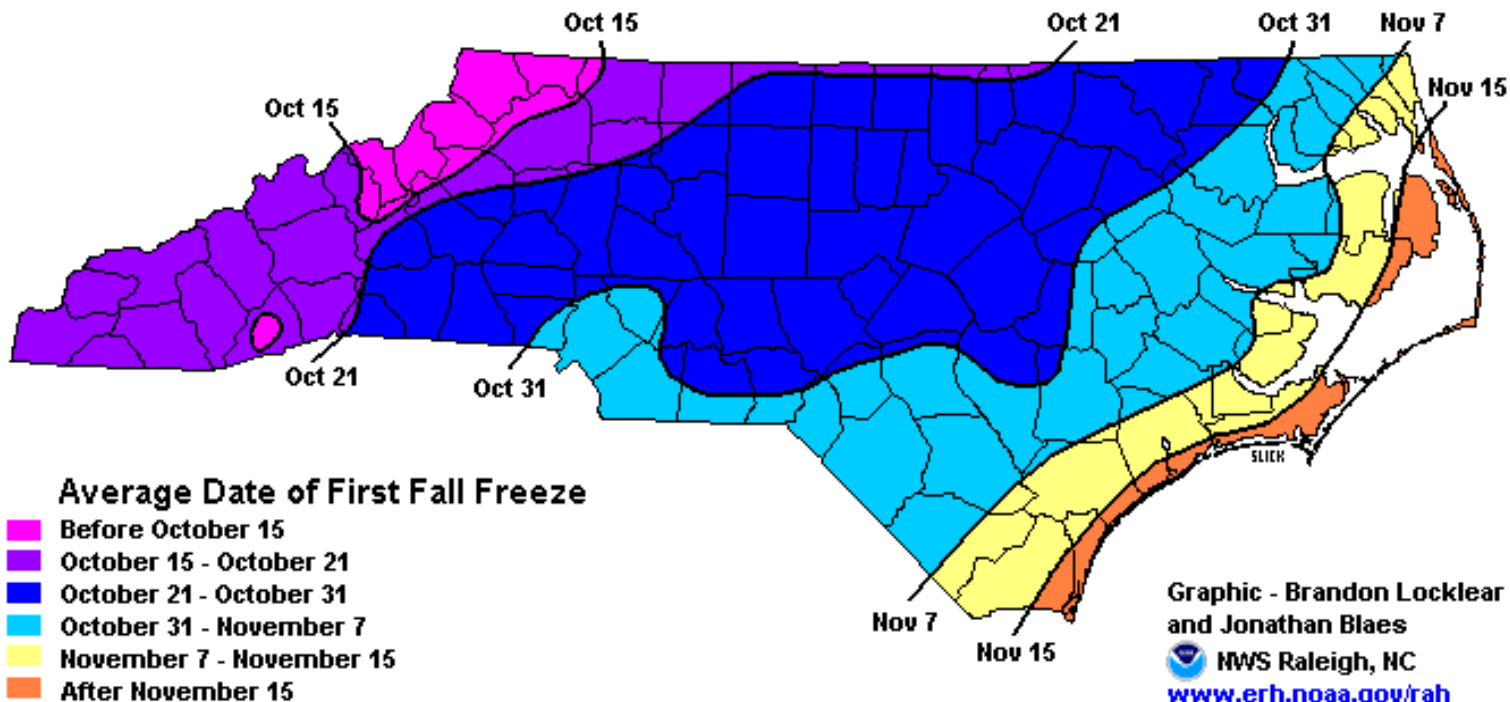
Planting Seasons



Average Last Frost Date



Average First Frost Date



Planting Calendars

- Use Extension planting calendars
- Do not rely on seed packets for regionally-accurate information!
- Refer to direct planting, not seed starting

<https://go.ncsu.edu/veggiecalendar>

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Central North Carolina Planting Calendar for Annual Vegetables, Fruits, and Herbs

Central North Carolina is a wonderful place to garden. Almost any type of vegetable or fruit can be grown successfully provided you choose appropriate varieties and plant at the right time. The climate, the season, and potential pests all affect the selection of what and when to plant.

Adapted to Climate

Freezing temperatures, high temperatures, humidity, and solar intensity, all common in central North Carolina, can stress plants. To successfully grow plants in this environment, select varieties that are tolerant of temperature extremes, plant at the appropriate times to avoid temperature extremes, or plan to protect the plants. It is possible to grow plants out of season by creating microclimates that differ from the overall climate by providing shade, humidity, or artificial heat.

Seasons

We have three optimal growing seasons: spring, summer, and fall. Both day length and temperature vary dramatically between seasons (short days and cool temperatures in spring and fall, long days and high temperatures in summer). Some plants are adapted to growing in the cool months of the year and will tolerate some frost (cool-season vegetables, [Figure 1](#)), while others do not tolerate frost and should be planted to grow outside only in frost-free months (warm-season plants, [Figure 2](#)). Even warm season plants have their limits and will temporarily stop bearing during heat waves (temperatures in mid 90s).




Figure 1. Cool-season vegetables can tolerate colder temperatures and some frost.




Figure 2. Warm-season vegetables don't tolerate frost and should only be planted outside when frost is no longer a threat.

RELATED PUBLICATIONS

- [Asparagus Crown Production](#)
- [Cucurbit Downy Mildew](#)
- [Gummy Stem Blight of Cucurbits](#)
- [Anthracnose of Cucurbits](#)
- [Sweetpotato Scurf](#)

There is a PDF version of this document for downloading and printing.



Table 1. Garden planting calendar for vegetables, fruits, and herbs in Central North Carolina.

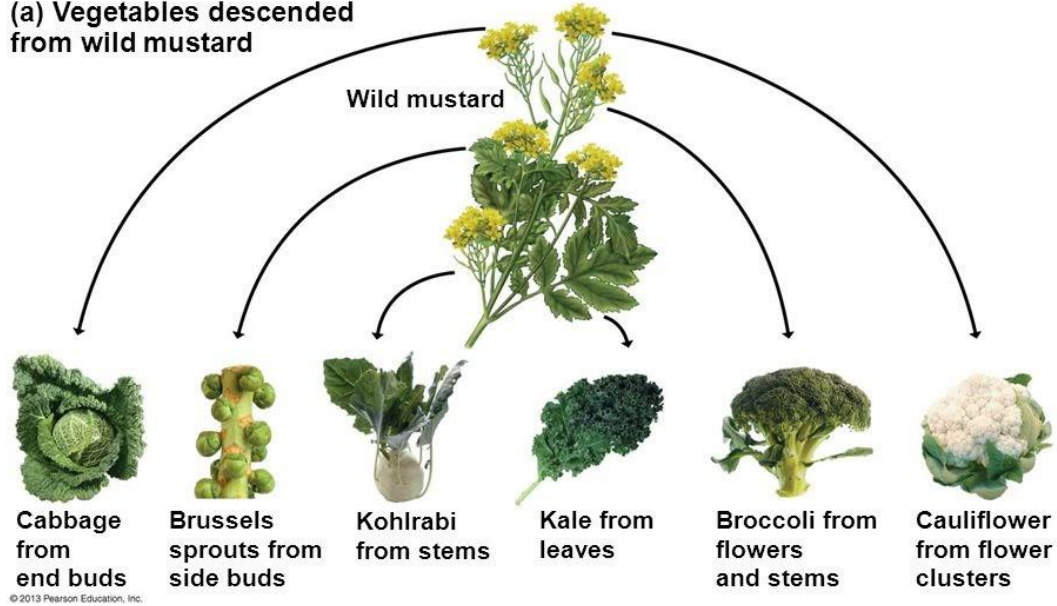
Fruit, Herb, or Vegetable	Days to Harvest (from seed unless otherwise noted)	Distance Between Plants (inches)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15	1 15
Artichokes, globe	T = 1 year	30			T	T	T							
Artichokes, Jerusalem*	Tu = 6–8 months	9–12			Tu	Tu	Tu							
Arugula	40–50	6–9		S	S	S	S			S	S	S	S	
Asparagus	C = 2 years	18		C	C	C								
Basil	T = 14–35 S = 50–75	2–8					S,T,S,T,S,T,S,T,S,T							
Beans, lima/bush	65–80	6				S	S	S	S	S	S			
Beans, lima/pole	75–95	6				S	S	S	S					
Beans, snap/bush	50–55	2			S	S	S	S	S	S	S	S	S	
Beans, snap/pole	65–70	6			S	S	S	S	S	S	S	S	S	
Beets	55–60	2		S	S	S			S	S	S	S		
Broccoli	T = 70–80	18		T	T	T	T			T	T	T		
Brussels sprouts	T = 40–50 S = 90–100**	14–18							T	T	T	T		
Cabbage	T = 63–75 S = 90–120**	12		T	T	T	T			T	T	T	T	
Cabbage, Chinese	T = 45–55 S = 75–85	12			S,T					S	S	T	T	

Bok choy

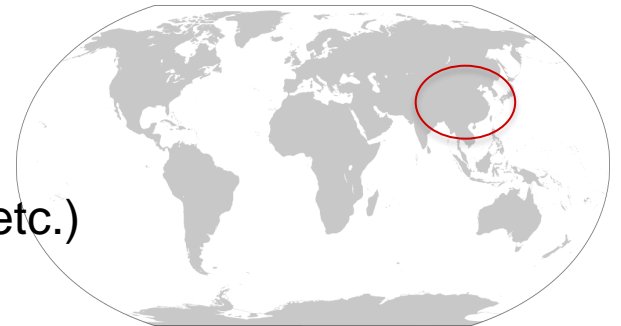
Brassica chinensis (Brassicaceae)

Figure 1.13a

(a) Vegetables descended from wild mustard



Martin LeBar
CC BY-NC 2.0



Relatives: Cruciferous crops (broccoli, turnip, mustard, etc.)

What you eat: Leaves and large terminal buds

Planting Bok Choy

Start Seeds Indoors or Direct Seed (Fall)

- ¼ in. deep
- Seed heating mat 45-85° F
- 6 weeks before planting
- <https://go.ncsu.edu/veggieseedresources>

Transplants (purchased or grown yourself)

- Feb to Mid-Apr, Mid-Jul to Mid-Sep
- Plant as deep as root ball or pot
- 18-24" between plants, 3' between rows



Harvesting Bok Choy

Harvest

- Can harvest a few leaves at a time
 - Pick outer, older leaves
- Or harvest whole head (6-12")
 - Oldest leaves still tender
- Harvest before bolting

Storage

- Does not store as well as cabbage
- Ferment into sauerkraut or kimchi



Cabbage Cultivars

Green

- 'Bravo'
- 'Blue Thunder'
- 'Early Jersey Wakefield'
- 'Platinum Dynasty'
- 'Thunderhead'

Red

- 'Cardinal'
- 'Red Dynasty'
- 'Red Rookie'
- 'Ruby Perfection'

Bok Choy

Brassica rapa subsp. (Brassicaceae)



'Joi Choi'



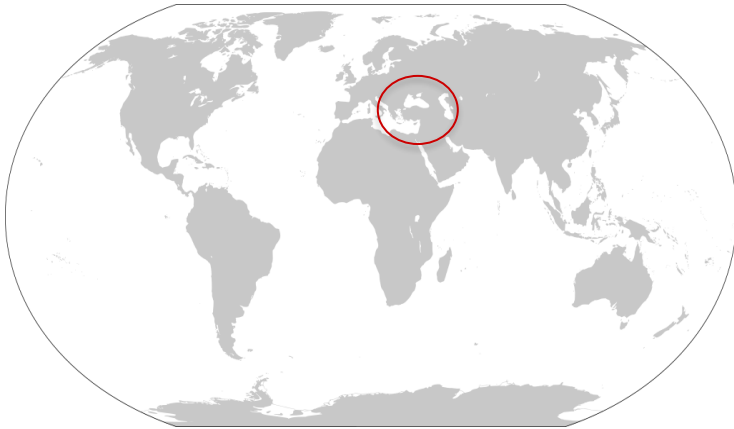
'Chin-Chiang'



'Mei Qing Choi'

Kale

Brassica oleracea vars. (Brassicaceae)



Relatives: Cruciferous crops (cabbage, mustard, etc.)

What you eat: Leaves

Growing and Harvesting Kale

Direct Seed or Transplant

- Mid Feb. to June, Late Aug to mid Oct.
- Seeds: 1-2" apart; ½" deep (or scatter!)
- Grow as baby green or to mature leaf size

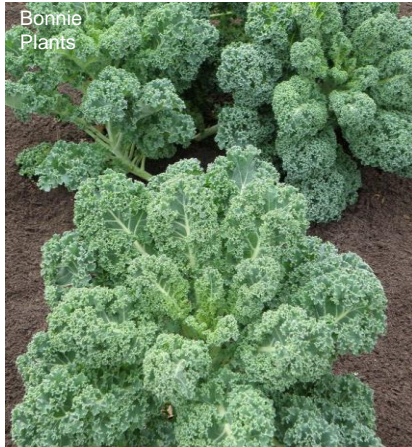
Harvest

- Seeds mature in 40-60 days
- Re-sow every 2-4 weeks
- Harvest when 4-6" tall



Types of Kale

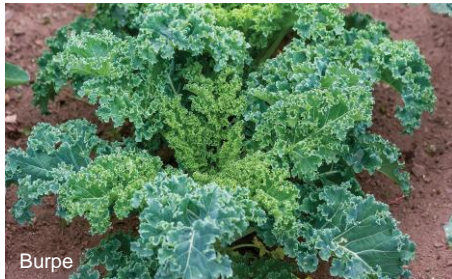
'Winterbor'



More flavorful but less cold-hardy varieties



Classic cold-hardy varieties



'Red Russian'

'Toscano'

'Dwarf Blue Curled Vates'

- Frost improves flavor in most varieties
- Leaves may be damaged in extreme cold, but plants recover

Caterpillar Pests of Cole Crops



Imported Cabbageworm
Pieris rapae



Cabbage Looper
Trichoplusia ni

Caterpillar Pests of Cole Crops



Clemson University Extension
Bugwood.org

Cross-striped Cabbageworm
Evergestis rimosalis



Russ Ottens
University of Georgia
Bugwood.org

David Riley
University of Georgia
Bugwood.org

Diamondback Moth
Plutella xylostella

Caterpillar Pests of Cole Crops

Hosts

- Cruciferous vegetables

Signs & Symptoms

- Windowpane chewing patterns on the undersides of leaves (young larvae)
- Chewing hole (older larvae)
- Frass (droppings)

Management

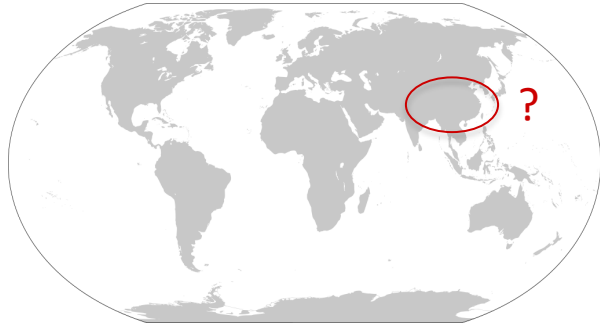
- Handpick
- Floating row covers
- *Bt kurstaki*



Charlotte Glen
NC State University Extension

Radish

Raphanus raphanistrum var. *sativus* (Brassicaceae)



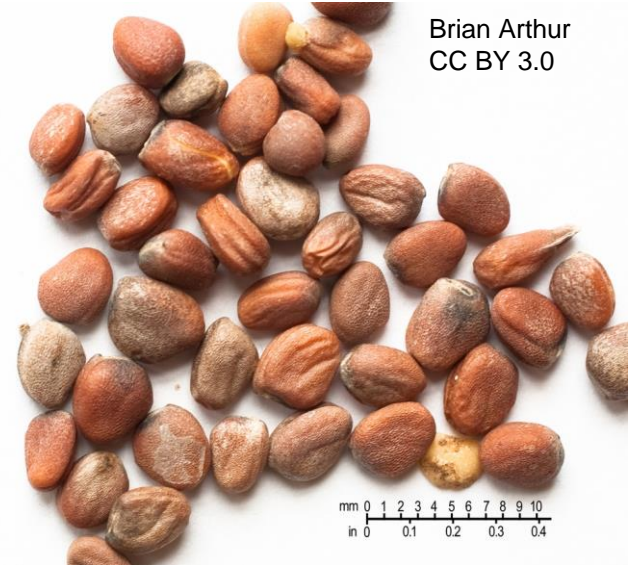
Relatives: Cruciferous crops (mustards, etc.)

What you eat: Storage roots, leaves

Planting Radish

Direct Seeding

- Feb. to June, Aug. to mid-Sept.
- ½ “ deep
- 1” between seeds, 1-2’ between rows
- Thin to 2-3” spacing when at two true leaf stage
- Germinate in a few days
 - Test for compost
- Plant every 7-10 days for continuous harvest



Brian Arthur
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Growing Radish

Watering

- Consistent moisture needed for root development
- Water stress: tough and poor flavor

Harvesting and Storage

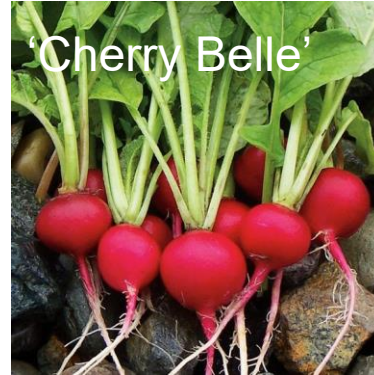
- Ready in 20-25 days
- $\frac{3}{4}$ - 1" diameter
- Remove leaves, refrigerate up to two weeks



Radish Cultivars

European or “Spring” Radishes

- ‘Bacchus’
- ‘Cherry Belle’
- ‘Red Flame’
- ‘Scarlet Globe’



Daikon and Storage Radishes

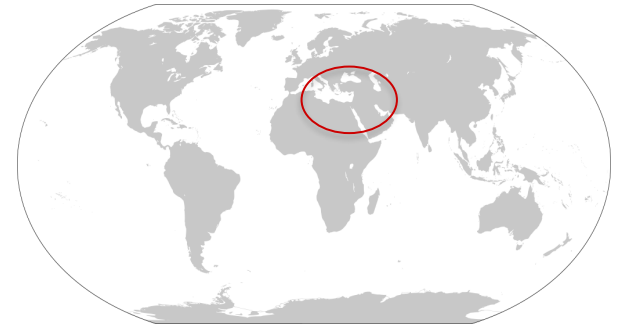
(Deep Container needed!)

- ‘April Cross’
- ‘Long Black Spanish’
- ‘Everest’



Garden (English) Peas

Pisum sativum vars. (Fabaceae)



Relatives: Austrian winter pea, beans, southern peas; redbud, *Baptisia* (distant)

What you eat: Immature pods, seeds

Planting Peas

Direct Seeding

- Jan. – Mar.
- Fall planting challenging
- 1' deep, 1-2" apart
 - Double rows
- Simple Trellis (3-4')
- Plant every 3 weeks
- Optional: soak 6-8 hours



Harvesting Peas

Harvest

- 55-80 days after planting
- Two-hands!
- **Garden:** pods plump, before seeds visible or pod is yellow.
- **Snap:** pods plump and 2-3" seeds small (<50%)
- **Snow:** pods flat, seeds tiny

Storage

- Eat, freeze, or can ASAP
- Fresh: 2-3 days in fridge
- Allow garden peas to dry on pod and shell



Pea Cultivars

Garden

- 'Alaska'
- 'Mr. Big'
- 'Maestro'
- 'Green Arrow'
- 'Novella'
- 'Wando'
- 'Lincoln'

Snap

- 'Sugar Super Snap'
- 'Sugar Bon'
- 'Early Snap'

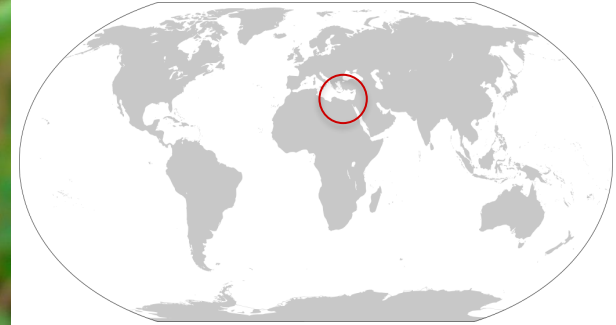
Snow

- 'Snowbird'
- 'Oregon Sugar Pod II'
- 'Dwarf Gray Sugar'

Lettuce

Lactuca sativa (Asteraceae)

pfaf.org



Relatives: Cruciferous crops (broccoli, turnip, mustard, etc.)

Types of Lettuce



Loose Leaf Varieties

- 'Simpson Elite'
- 'Red Sails'
- 'Prizeleaf'
- 'Oak Leaf'



Romaine a.k.a. Cos

- Upright, tighter heads
- Leaf bases more flavorful



Butterhead a.k.a. Bibb

- Attractive yellow-green leaves
- Good flavor
- 'Tom Thumb' miniature and grows quickly

Growing and Harvesting Lettuce

- Feb-Mar., Aug.-September; survives to 30 F
- Plant densely 2-3" apart in containers
 - Romaine and buttercrisp – 8" spacing
- Seed: ¼ in. deep
- Use fresh seed – does not store well
- Even watering critical

Loose Leaf Varieties

Cut with scissors (1" above soil) in about 30 days

- Should be about 5-6 in. tall
- 2-3 successive cuttings possible
- Plant every 2-3 weeks for continuous supply until frost



Lettuce Problems

- No tolerance for hot weather
- Poor competitor against weeds
- Tip burn

Insects:

- Cabbage looper and other caterpillars (B.t., hand pick)
- Aphids (insecticidal soap)

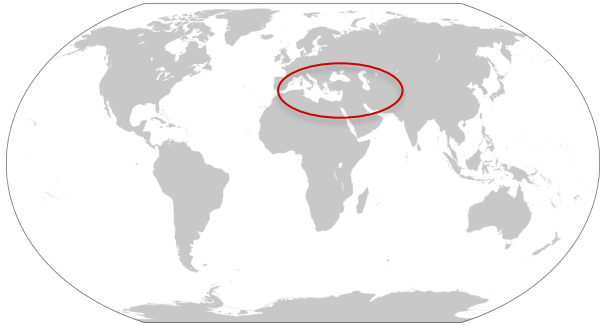
Diseases:

- Stem and root rots, leaf gray molds



Carrots

Daucus carota subsp. *sativa* (Apiaceae)



Relatives: Parsnip, parsley, coriander, dill, celery, fennel, cumin

What you eat: Storage roots

Planting Carrots

- Feb. to Mar., Mid-June – Mid-Sep.
- Plant ¼- ½” in rows, 12-18” between
- Thin to 2-3 in. by cutting when seedlings 2 in. tall



Growing Carrots

Watering

- Consistent moisture needed for root development
- **Reduce watering near harvest time**



Weed carefully!

Harvesting Carrots

Harvest

- 75-80 days after planting
- $\frac{3}{4}$ in.-1 $\frac{1}{4}$ in. diameter at shoulder

Storage

- Remove greens!
- Refrigerator for several weeks
- In ground for 2 months



Peterson Garden Project

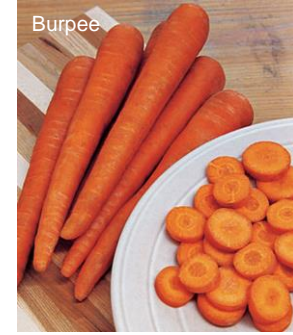
Carrot Cultivars



Imperator



Chantenay



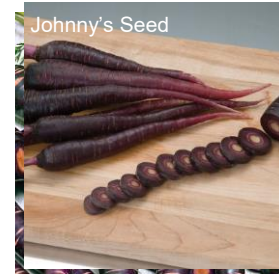
Danvers



Nantes



Oxheart



Deep Purple

Carrot Problems



Aster Yellows

Virus spread by leafhoppers

Kyle Kittelberger Bugguide.net



Macrostelus quadrilineatus



Root-Knot Nematodes

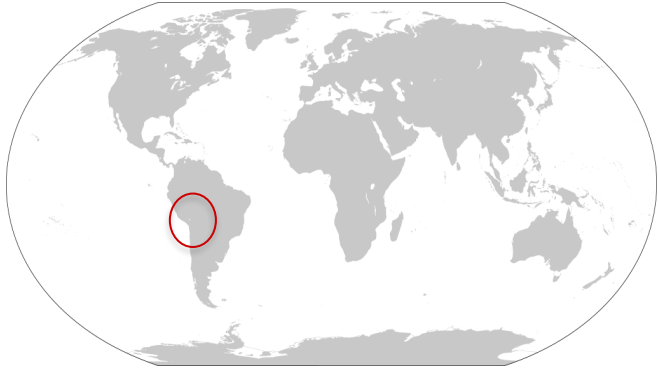


Parsley Worm

= Swallowtail
Leave it alone!

Irish (Andean) Potatoes

Solanum tuberosum (Solanaceae)



Relatives:

Tomatoes, peppers, eggplants

What you eat:

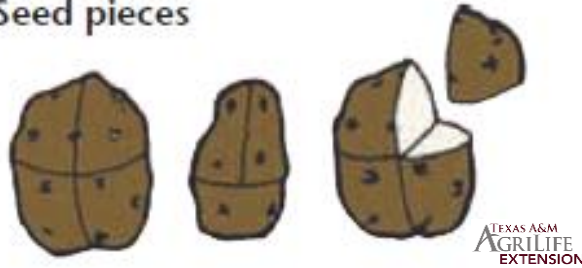
Underground storage stem (tuber)



Planting Potatoes

Plant Seed Potatoes

Seed pieces



In ground or raised beds

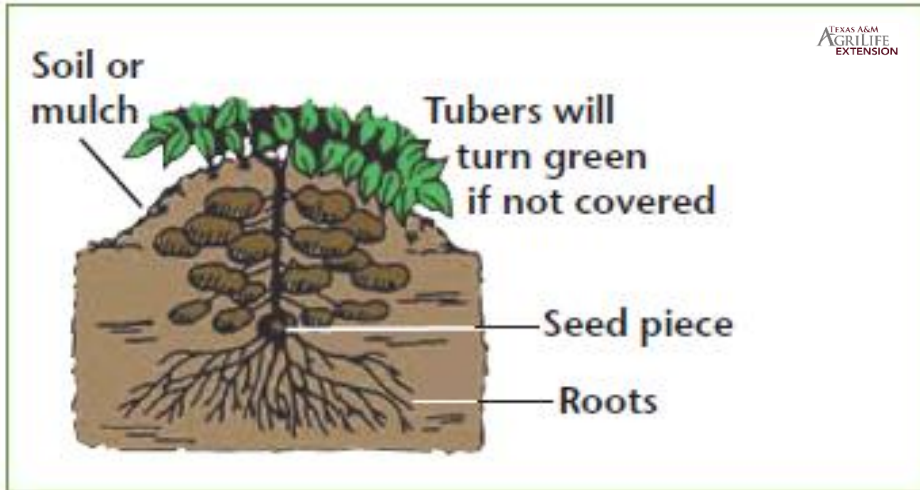
- Plant 6" deep, 10-12" x 3' spacing
- Cut side down, 1-3 'eyes' (stem nodes) each
- Mid Feb. to late March

Alternative Methods

- Plant 1" deep, cover in straw or pine needles
- In containers, leave 6-8" gap with top of container

Growing Taters

Need deep containers – 18-24”



- Put 4” of potting mix in the bottom of container
- Cover seed potatoes with 6” of potting mix
- Cover every 6” inches of stem growth with 3” of potting mix
- Cover any tubers that start to surface (prevent toxic greening)

Harvesting Taters

Harvest

- 6-8 weeks (June)
- When tops start to die back
- Use a garden fork
- Easier with straw method
- Harvest some new potatoes by hand

Storage

- Do not rinse off dirt!
- 45-50°F 6-8 months 90% RH (dark)
- Late harvested store better



Tater Cultivars

- ‘Kennebec’
- ‘Yukon Gold’
- ‘Red Pontiac’
- ‘French Fingerling’
- ‘Russian Banana’
- ‘Purple Majesty’



Colorado Potato Beetle

(Chrysomelidae: *Leptinotarsa decemlineata*)



Adults



Eggs



Larva

Colorado Potato Beetle

(Chrysomelidae: *Leptinotarsa decemlineata*)

Hosts

- Potatoes, Eggplant, Tomato, *Solanum* spp.

Signs & Symptoms

- Chewing damage on leaves
- Defoliation
- Larvae and adults

Management

- Handpicking
- Spinosad
- Azadirachtin
- Bt *tenebrionis*

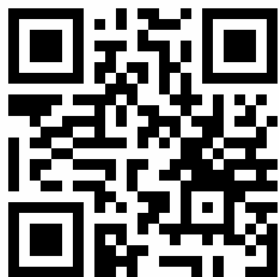


NC STATE

EXTENSION

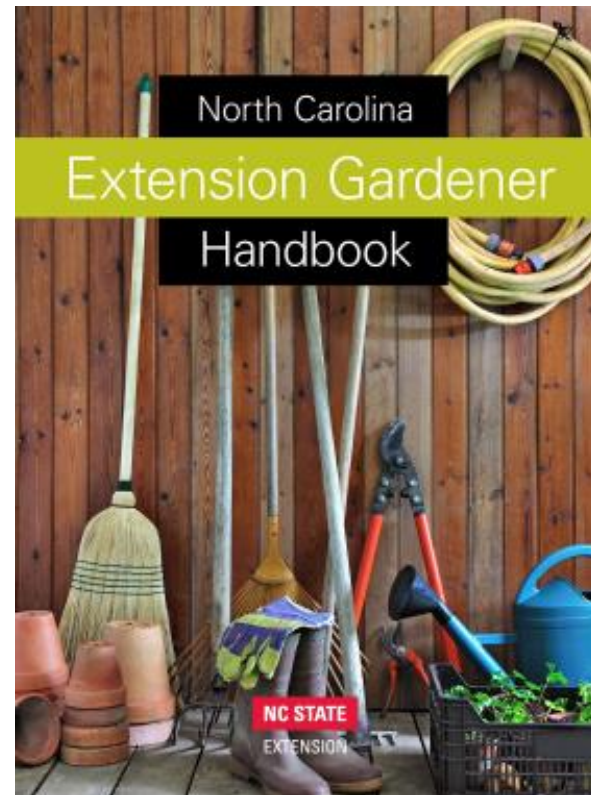
NC Extension Gardener Handbook

<https://go.ncsu.edu/eg-handbook>



**Chapter 18 – Container Gardens
Free Online!**

Hard copy – UNC Press (\$60)



**NC STATE
UNIVERSITY**

How to Create a Container Garden for Edibles in the North Carolina Piedmont

<https://go.ncsu.edu/container-veggies>



How to Create a Container Garden for Edibles in the North Carolina Piedmont

Edibles can be grown in containers in a variety of outdoor spaces: a small apartment balcony, a large deck space, or even a front stoop. People grow edibles for a variety of reasons. You may want to grow tomatoes for a sandwich or lettuce for a salad, or you might be providing herbs, vegetables, and fruit for a family. Regardless of the scope or size of your container garden, selecting the right containers, planting media, and plant combinations are the first steps on the road to success. In this publication you will find ideas to get you started growing your own edibles. Included are simple designs and potential settings for a single container, a small group of containers, and a larger grouping of containers. The benefits and challenges of various planting options will also be explored.

Selecting a Container

Edible plants can be grown in containers that you purchase, build, or recycle. Almost anything will work as long as it has drainage holes, such as a reclaimed galvanized metal bucket, a discarded wooden dresser drawer, or a bright glazed pot whose color contrasts with the plant's foliage, flowers, or fruit. Wood, clay, and unglazed ceramic containers will lose moisture more quickly and will therefore require more frequent watering than plastic, metal, fiberglass, or glazed pots. This is also true for small or dark-colored containers. The temperature of the planting media in a metal pot can fluctuate by as much as 30°F between day and night. However, roots can be protected from extremes of heat and cold by lining the pot with bubble wrap or 1-inch-thick foam. Plastic and wood containers can safely remain outside year round, and cedar and redwood containers will last around 10 years without staining or painting.

Select a container to provide adequate space for roots. Container size should match the plant's growth requirements to prevent restricted root growth, which

can result in decreased plant growth (for more information on container size requirements for certain edibles, refer to publication AG-748, "Container Garden Planting Calendar for Edibles in the N.C. Piedmont"). The larger the pot, the less frequently it will need to be watered. If larger plants need to be moved indoors for overwintering, it may be best to have them on a rolling platform; a 20-inch-diameter container filled with growing media and lots of water can weigh up to 100 pounds. When plants become larger, they can be more difficult to move.

Selecting Planting Media

Container planting media can be purchased or homemade, but careful consideration must go into its composition. Otherwise, the media may be too dense and compacted to allow the plants to thrive. Garden soil should not be used because some soils do not drain well (i.e., red piedmont clay), which limits plant roots' access to air. In addition, garden soils may contain many pests, such as weed seed, disease, or insects. Many soilless mixes

Extension Gardener

Plant Toolbox



<https://plants.ces.ncsu.edu/>

Select

‘Find a Plant’ -> ‘Resistance to Challenges’ -> Deer

The screenshot shows the homepage of the NC State Extension Gardener Plant Toolbox. The header features the NC State Extension logo and a banner for the North Carolina Extension Gardener Plant Toolbox. The main navigation includes Home, Find a Plant, Identify a Plant, Design Gallery, Help, Give Now, and Contact. A search bar is located in the top right corner. The content area is divided into several sections:

- Home:** A brief introduction stating that the toolbox contains detailed descriptions and photographs of 4,522 plants that grow in and around North Carolina.
- Here are some tips to get you started:** This section provides instructions on how to use the toolbox. It includes a search bar and two buttons: "Find a Plant" (to select the perfect plant for a specific location) and "Identify a Plant" (to determine the name of a plant based on leaf and flower characteristics).
- Looking for help?:** This section directs users to the "Help" page for tips on using the toolbox and to the "Glossary" for plant identification terms.
- Our Partners:** A list of partners including the College of Natural Resources, Forestry & Environmental Resources, Herbarium, Horticultural Science, JC Raulston Arboretum, Master Gardener Volunteers, The Natural Learning Initiative, NC Sea Grant, NC State Extension, Plant Disease and Insect Clinic, and NC Forest Service.
- Additional Partners:** A list of additional partners including NC's Champion Big Tree Database.

The bottom of the page features a footer with a copyright notice and a list of partners.

Need Help with Vegetable Problems?

NC STATE EXTENSION

Master Gardener | Chatham County

Plant Clinic: MW 1:00-4:00, F 9:00-12:00

chathamemgv@gmail.com

919-545-2715

(Except during COVID-19, email is preferred)

Send us your problems!

Questions we may ask:

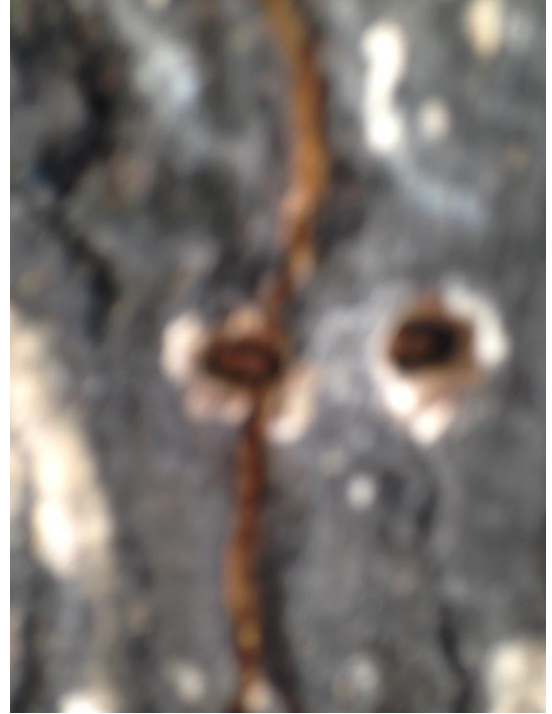
- Crop and cultivar
- Describe signs and symptoms
 - Include photos!
- When you started noticing problems
- Cultural conditions
 - Light, soil, water, planting time etc.



Send Us *Good* Photos!

Photos should:

- Include healthy and unhealthy parts
- Have a scale object
- Be in focus
- Show an up-close image
- Show the whole plant
- The more, the better



Diagnosis: cataracts?

Thank you!

matt_jones@ncsu.edu