



# Vegetable Gardening 101

**PRESENTED BY**

JayDee Gunnell

USU Extension Horticulture Faculty

# USU Extension Fact Sheets...



Over 75 crop sheets

“In the Garden” series

Growing Tips:

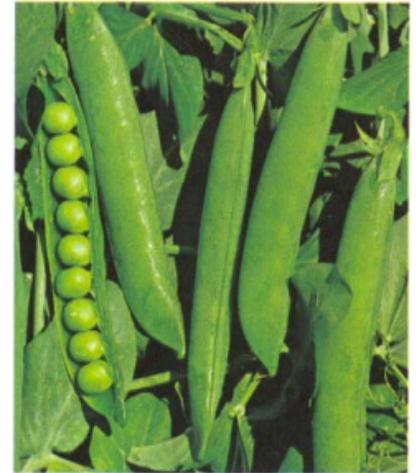
- spacing
- plants per person
- harvesting
- pests

## Peas in the Garden

*Dan Drost*

### Summary

Peas require full sun and fertile, well drained soil for maximum yield. Incorporate plenty of organic matter and a complete fertilizer into the area before planting. When soils are above 40°F, space rows 12-24 inches apart and plant seeds 1 inch deep and 1-2 inches apart in the row. Plant peas until April 1 in warm areas and until May 1 in the cooler areas of Utah. Peas require regular watering particularly at flowering, so maintain soils near field capacity during this time period. Hot temperatures and water stress will reduce yields and pod quality. Organic mulches help conserve water, supply extra nutrients, and reduce weeding. Control insects and diseases if they occur. Harvest snap peas when pods are plump and garden peas when the pods are full but before seeds mature. For dry peas wait until pods are yellow and the seeds are dry. Use fresh peas immediately for best quality.



### Recommended Varieties

There are many good pea varieties for sale in local gardening outlets and through seed catalogs. Most grow well in Utah. Pod shape and size vary among varieties. Here is a list of some potential varieties and plant types that have performed well in Utah.



# Site Selection...

## Full Sun

- 6 to 8 hours

## Soil

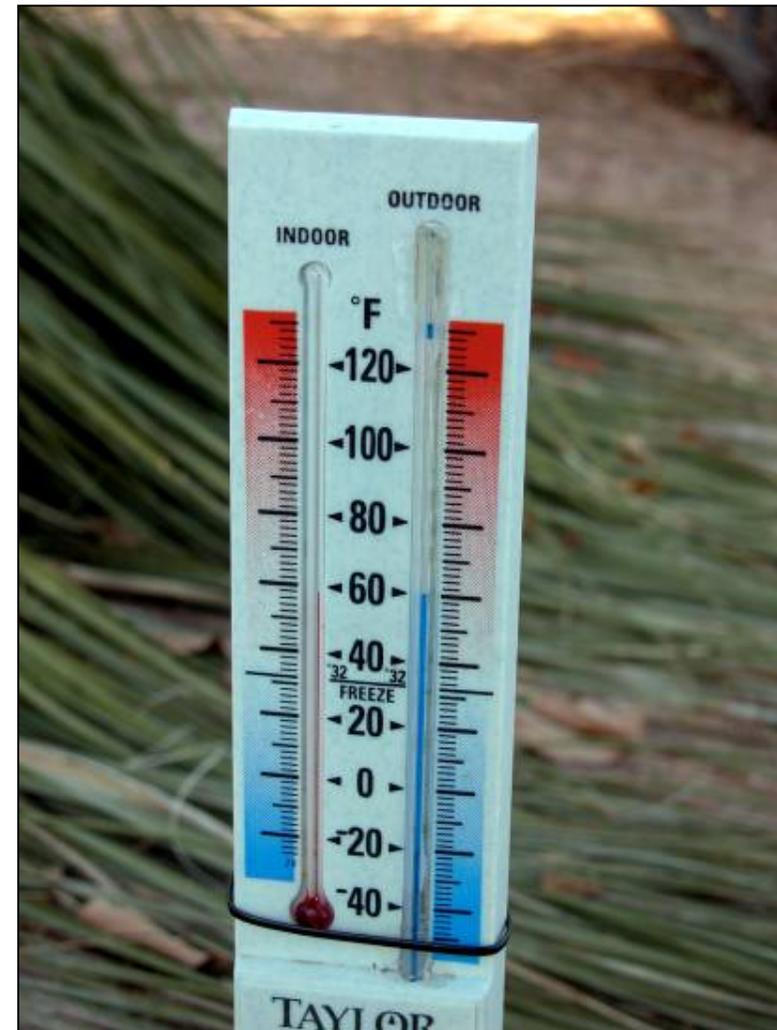
- well drained
- 6 – 8 inches deep
- organic matter
  - add 2 to 3” annually
- Water





# Weather Considerations...

- Average last frost date  
Cache Co. = May 15<sup>th</sup>
- Average first frost date  
Cache Co. = October 1<sup>st</sup>
- Frost free days  
95 (Amalga)  
160 (USU campus)



# Frost Dates – Frost Free Days



City	Average Spring	Late Spring	Average Fall	Frost Free Days
Amalga	June 8	–	September 23	96 days
Bear Lake	May 28	June 30	September 25	124 days
Brigham City	May 5	June 2	October 10	160 days
Hyrum City	May 11	–	October 4	146 days
Laketown	June 14	July 22	September 10	90 days
Logan (KVNU)	May 15	June 23	September 27	136 days
USU Campus	May 6	June 17	October 11	160 days
Randolph	June 27	July 22	August 21	55 days
Smithfield	May 17	June 3	September 19	126 days

# Direct Seeding



- Planting dates vary
  - cool season crops (55 – 75 °F)
  - warm season crops (70 – 90 °F)
- 3 x deeper than width
- Seed viability
  - germination rate (90% or higher)



# The Seed Packet...

- Follow seed packet instructions
- Spacing is important
- Germination tips
  - soil crusting = low organic matter
  - small seeds (carrots, onions, lettuce)
  - soak beforehand (celery, cucumbers, peas...)

## ONION

This extremely popular and versatile home garden vegetable grows easily from seed. High yielding plants produce uniform and solid onions with good keeping quality. The flesh is fine-grained, juicy, and the flavor is moderately strong. Enjoy raw, boiled, baked, pickled, or stir-fried.

Planting Depth	Seed Spacing	Spacing Between Rows	Days To Germination	Space After Thinning	Days to Maturity
1/4-1/2"/ 6-13 mm.	1/2"/ 13 mm.	12"/ 30 cm.	10-20	2-3"/ 5-8 cm.	110-115

**When and where to plant.** Select a sunny well drained location and sow seed in the spring as soon as the ground can be worked. For best results, loosen soil with spade or fork, fertilize with vegetable food and smooth with rake. Firm soil over seed and keep moist. For earlier crop start seeds indoors 8-10 weeks before last frost. In mild winter areas plant again in late summer.

**Care:** Keep soil moist, weed free and apply vegetable food every 6-8 weeks.

**Harvesting:** Pull small scallions as needed, thinning to final spacing. For mature onions, allow tops to die down before harvest.

**Health Note:** Contains Calcium, Iron, and Vitamins A, B<sub>1</sub>, Niacin and C.

# To seed... or not to seed...



## Cool season crops – direct seed

onions

carrots

radishes

peas

spinach / lettuce / chard

\*cauliflower / broccoli /

\*Brussel sprouts / cabbage





## Gardener's Almanac Provides Monthly Checklist

### Ask an Expert: USU Extension Gardener's Almanac Provides Monthly Checklist

April showers bring May flowers – as well as a plethora of gardening tasks. Utah State University Extension's Gardener's Almanac provides a checklist for each month as well as links for tips and further information. The May checklist follows.

- Plant [warm-season vegetables](#) and annual flowers once the threat of the last frost has passed. [Click here](#) for a listing of the average last and first frost dates.
- By [planting tomatoes](#) deeper, they are able to form more roots along the stem, creating a more vigorous plant.
- Consider planting [sweet corn in the garden](#) every other week (until early July) to extend the harvest.
- Consider the various types of fertilizers. [Click here](#) for information on traditional fertilizer options. [Click here](#) for information on organic fertilizers.
- Thin out overcrowded seedlings using a pair of scissors, trying to avoid disturbing the young roots.
- Protect fruit blossoms and tender garden plants from late freezing temperatures. [Click here](#) for information on critical temperatures in fruit.
- Plant summer-blooming bulbs including gladiola, begonia, dahlia and canna.
- Divide warm-season ornamental grasses when new growth begins to emerge.
- It's already time to take notice of weeds. [Click here](#) for information.
- Allow the foliage of spring blooming bulbs (tulips, daffodils and crocus) to die down before cutting the leaves off.
- [Click here](#) for information on planting a lawn.
- Turfgrass needs minimal irrigation each week. [Click here](#) to learn about irrigation needs in your area.
- In compacted sites, aerate with hollow core aerator when turfgrass is actively growing (April – June).
- Control broadleaf [weeds in the lawn](#) when temperatures are between 60 and 80 F. Follow the label and stop use of broadleaf herbicides once the temperature is above 85 F.
- Apply a slow-release [lawn fertilizer](#) to provide a long-lasting effect throughout the summer months

### Pests and Problems:

- Monitor newly planted vegetables for [cutworm](#) and [flea beetle](#) damage.
- Monitor for [cankervorm](#) damage on scrub oak and Box Elder trees along the foothills.
- Monitor for [aphids](#) on lush new spring growth on a variety of plants. Treat for aphids by using “softer” solutions such

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# To seed... or not to seed...



## Warm season crops - from transplants

tomatoes

peppers

beans

herbs

\*cucumbers

\*squash

\*melons

\*corn



# Transplants...



- Started indoors or greenhouses
  - 4 to 8 week head start
- Things to look for:
  - ✓ dark green color
  - ✓ 50 : 50 (soil : root)
  - ✓ NO flowers or fruit
  - ✓ 2 sets of true leaf
- Irrigation considerations:
  - young plants = frequent watering





# When to Start Transplants....



## Starting Seeds Indoors - Cache County

Vegetable crop	Days to maturity	Seeding to transplant (weeks)	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May
Broccoli	50 - 70	4 to 6						x		
Brussels Sprouts	90 - 100	4 to 6						x		
Cabbage	65 - 100	4 to 6						x		
Cantaloupe	70 - 90	4								
Cauliflower	50 - 70	4 to 6						x		
Celery	100 - 140	10 to 12						x		
Cucumber	50 - 70	4								
Eggplant	85 - 120	8 to 10								
Onion	100 - 120	6 to 8								
Pepper	60 - 100	6 to 10								
Pumpkin	90 - 120	4								
Summer squash	40 - 60	4								
Tomatoes	60 - 90	4 to 6								
Watermelon	85 - 95	4								
Winter squash	80 - 100	4								

..... Transplant into Garden .....

# Transplanting Tips



- Plant early evening
- Be careful of the stems
- Water regularly for 2 weeks
  - plant tomatoes deep
  - cucurbits (melons, cucumbers...) sensitive to transplant shock

# Frost Protection



- Think mini greenhouse...
- Place out 1 to 2 weeks prior
- 30 °F rule (for plastic)

Wall of water

- 3 to 5 °F protection

row covers

hot caps

cloches



# Fertilizers



- N - P - K
  - (%) Nitrogen = top
  - (%) Phosphorus = down
  - (%) Potassium = all around
- Get a USU soil test...
- Slow-release products
- Organic fertilizers (low analysis)



# Fertilizer Use and Vegetables



- **Low use:** 1 to 2 lbs nitrogen / 1,000 ft<sup>2</sup>  
1/4 cup 21-0-0 per 10 foot row  
peas, beans
- **Moderate use:** 2 to 3 lbs nitrogen / 1,000 ft<sup>2</sup>  
1/3 cup 21-0-0 per 10 foot row  
beets, carrots, radishes, lettuce, melons, squash, tomatoes,  
peppers, cucumbers, broccoli, cauliflower
- **High use:** 4 to 6 lbs nitrogen / 1,000 ft<sup>2</sup>  
1/2 cup 21-0-0 per 10 foot row  
corn, onions, potatoes



\*never apply more than 1 ½ lbs of nitrogen / 1,000 ft<sup>2</sup> at one time.

# The Scoop on Poop...



- Good, cheap organic matter
- Takes time to break down
- Can introduce weed seeds
- Can have high salts
- Not from meat eaters



# Consider Green Manures...



- Cover crops

vetch, clover, buckwheat, winter wheat, radish

- After vegetable harvest

- Adds to soil health

- Till under before seed



## Introduction to Cover Crops for Vegetable Production in Utah

*Tiffany Maughan*, Research Associate, and *Dan Drost*, Extension Vegetable Specialist

Crop plants have been used throughout history to improve soil fertility and crop productivity. Crops grown for these purposes are commonly called cover crops, green manures, or catch crops. The names are often used interchangeably which may be confusing. A cover crop is often grown to prevent erosion by protecting the soil with living plants and roots that stabilize the soil. A green manure is typically grown to help maintain soil organic matter and increase nitrogen availability. A catch crop is used to scavenge nutrients following the economic crop and prevent nutrient leaching during the winter. In this bulletin we will use the term, cover crop (CC), but it is important to remember the different benefits these crops provide and what goals for the farm you want to accomplish.

Vegetable production is intensive and often removes large amounts of biomass and nutrients without returning much to the soil. Additionally, adequate crop rotations are difficult to achieve and high tillage is often used. These factors contribute to a general decline in soil health and over time, vegetable vigor and yield may decrease if proactive practices like cover cropping are not used. Cover cropping is an excellent way to maintain and improve the soils used for vegetable production.

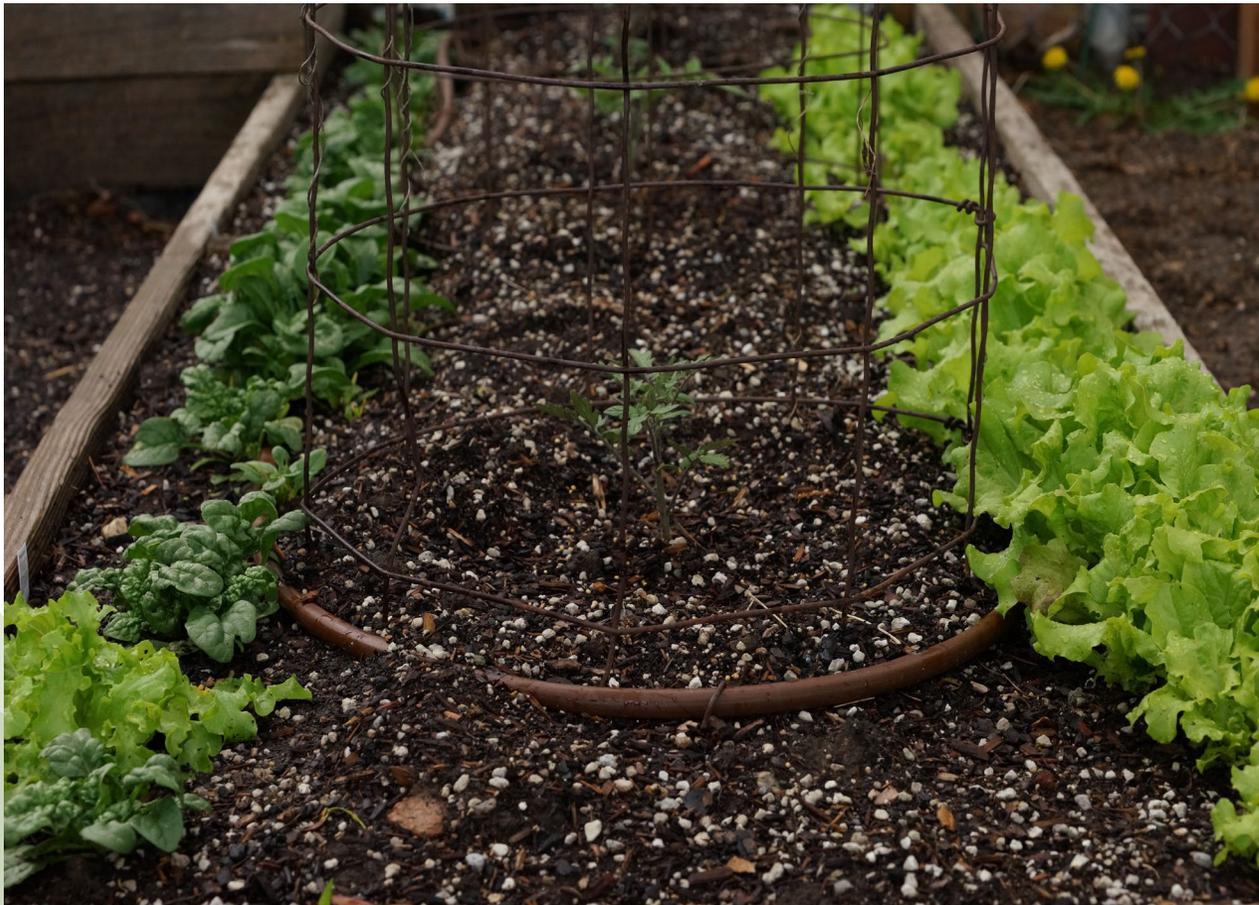
help growers interested in figuring out what CCs will work best for their unique situations.

Deciding what CC will work best can be challenging. You need to determine which CC to plant, at what time of year, in which fields, and how often the CC should be worked into the farm rotation. You need to figure out the specific cultural considerations of the CC such as seeding rates, irrigation requirements, how long to grow the CC, and how to incorporate it. Begin by identifying your farm's specific needs. What is the primary reason you are considering planting a CC? Some possible reasons include:

- Cut fertilizer costs by adding nitrogen and decreasing nutrient losses
- Increase soil organic matter
- Suppress weeds or pathogens and reduce the need for herbicides
- Improve water infiltration and conserve soil moisture
- Reduce compaction
- Prevent erosion

Although your farm may benefit from all of these, choose a primary and secondary goal to focus on. Since some CC do some things better than others

# Watering the Garden

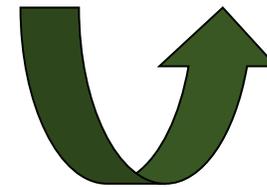
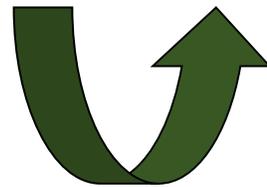
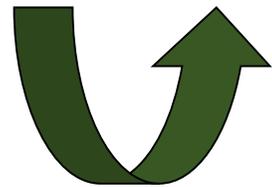


- Timing and amount depends on:
  - 1) Soil type
  - 2) Season
  - 3) Crop
- Deep rooted crops:
  - tomatoes, corn, vines, potatoes
  - 5 to 7 day intervals
- Shallow rooted crops
  - lettuce, cabbage, onions, radish
  - 3 to 4 day intervals

# Crop Families... Rotation



<u>Fruit Crop</u>	<u>Grass Crop</u>	<u>Legume Crop</u>	<u>Salad Crop</u>
tomatoes	corn	peas	lettuce
peppers		beans	radishes
potatoes			carrots
squash / melons			onions



# Salad Crops



- lettuce, chard, spinach, kale, cabbage

Cool season

- avoid hot weather (bitter / bolting)

Shallow rooted

- do not water stress

Harvest anytime

Fall cropping

- late July - early August



# Salad “Toppers”



- radishes, carrots, cauliflower, broccoli, cabbage

Cool season

- avoid hot weather (hot / bolting)

Shallow rooted

- do not water stress

Transplant (cabbage, broccoli, cauliflower)

Harvest Tips:

root crops – bulging tops

cole crops – full heads



# Onions and Garlic



Cool season

- Good growth up to 90°F

Shallow rooted

- do not water stress

Onion sets or seed

Plant garlic in the fall (Oct-Nov)

Harvest Tips:

- once the tops are yellow
- dig and let cure (dry) for 1-2 weeks





# Fruiting Crops

Tomatoes, peppers, eggplant, tomatillos

Warm season

- avoid cold weather (50 °F or below)

Deep rooted

- provide even water

Split set / flower abortion (>90°F)

Fertilizers:

- too much N = large vines but no fruit
- stop applications once they flower



# Tomato Tantrums...



## Blossom end rot

- Calcium deficiency
- dark, sunken tissue under fruit
- irregular irrigation (mulches)

## Shoulder cracking

- variety dependent
- overhead irrigation

## Diseases

- hybrid vs. heirloom
- V.F.N.A. & TMV & TSWV



# Potatoes



Cool season:

- avoid cold soils

Buy certified seed potatoes

- 2 eyes per piece
- Plant 4 to 6" deep

Hill up as they grow

Avoid fertilizers after July

Harvest Tips:

- new potatoes (after flowering)
- storage (cure for 1-2 weeks)



# Vining Crops



- squash, melons, cucumbers

Warm season:

- avoid cold soils

Transplants or seed

Overwatering causes:

- poor flavor, pithy texture

Harvest Tips:

watermelon (tendrils)  
cantaloupe (slip)  
winter squash (fingernail)





# Legumes



- **Peas and beans**

- fix nitrogen from atmosphere

Cool and Warm season crops

Bush and vine types

Trellising

Water is crucial during flowering

Harvest Tips:

- pick when young but filled
- allow dry beans to dry on the vine



# Sweet Corn



Warm season:

- avoid planting in cold soils
- Seed every 2 weeks (until June)
  - 1' between plants
  - 2' between rows

High nitrogen user (seeding, 2', tassel)

Plant in blocks (no single rows)

Harvest Tips:

- 15-25 days from silk to mature
- dry silk, full tip



# Asparagus



Perennial crop

Plant bare root (or seed)

dig an 8” deep trench  
fill in 2” at a time

Doesn't like to sit wet

Fertilize after harvest (June)

Allow ferns to grow, die down naturally

Harvest Tips:

<b>Year</b>	2	3	4	5
<b>Weeks</b>	2	4	6	8



# Weed and Pest Control...



- Several approaches...

- Cultural (mulches)
- Mechanical (hoe, pull, squish)
- Biological (chickens)
- Chemical (pesticides)

<http://utahpests.usu.edu>

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A photograph of a vegetable garden with several rows of plants. On the left, there are rows of leafy green plants, possibly spinach or chard. In the center, there is a row of young carrot plants with their characteristic feathery leaves. On the right, there is a row of beets with their large, rounded leaves and some reddish stems. The soil is dark and appears to be well-maintained. The word "Questions?" is overlaid in the center of the image in a white, serif font.

Questions?