

Fall / Winter Gardening

In the Low Desert



Presented By: Laura Ward
Arizona Master Gardener
Contact: lajward@gmail.com

We can plant and harvest something fresh to eat every month in the low desert!



Winter



Summer

The Master Gardener provides educational leadership in home gardening, landscaping, irrigation and related topics.

University of Arizona trained gardeners who complete a Cooperative Extension semester-long course in gardening/horticulture.

What is an Arizona Master Gardener?

A non-paid volunteer who completes a specified number of volunteer hours and continuing education each year to remain certified.

We may not be experts or “masters” at all horticulture topics, but we are trained to help you find **science- and research-based** information

County-specific and local. Each Extension office has their own program. Maricopa/ Pinal Counties focus on conditions in the low desert.



Tenth Generation Farm

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Casa Grande, Ariz

What is a Master Gardener?

Gardening Presentations

Plant Help Desk (Free)

Resources & Contacts

tenthgenerationfarm.com



Fall / Winter Gardening Overview: What can I plant?

- Root crops: Potatoes, turnips, carrots, beets
- Broccoli, cauliflower, cabbage, brussel sprouts, cucumbers
- Garlic, onions, leeks
- Peas, snap beans
- Summer and winter squash
- Greens, greens, greens!

What can I continue from Summer?

- If you have a summer garden, you'll still be harvesting when it is time to plant winter crops.
- Examples:
 - Tomatoes, if they survived the summer, will fruit again once temperatures decrease
 - Peppers, melons, etc., will often produce until they get a hard frost or freeze
 - If you don't have the space, it's a tough decision



Publications

Search

Enter one or more items including Title, Author, Description and Keyword

Pub Number

Enter the publication number without the "AZ" prefix. To search for publication AZ1234, enter only 1234.

Date

E.g., 07/16/2021
Starting from

Date

E.g., 07/16/2021
Going to

- Animal Systems
- Consumer Education
- Farm Management and Safety
- Food Safety, Nutrition and Health
- Gardening and Horticulture
- Insects and Pest Management
- Marketing and Retailing
- Microbiology
- Natural Resources and Environment
- Plant Diseases
- Plant Production and Crops
- Water
- Youth, Family and Home Management
- Other



AZ1435

Ten Steps to a Successful Vegetable Garden

Gardening with vegetables can be fun and can provide delicious and highly nutritious fresh food. Watching and working with plants can add a new dimension of enjoyment to life. Bring an awareness of the wonderful world of nature in the backyard. The marvels of nature will have special personal meaning when nurturing a small seed into a colorful productive plant with your own hands. These

accomplishments can be obtained regardless of the size of garden. A few plants or a large plot will give rewarding experiences for both young and old. The path to a successful vegetable garden is not difficult or long. Ten carefully taken steps will produce many enjoyable moments and an abundant harvest of fresh vegetables during much of the year.

Step 1

Select a good location

Choose an area with plenty of morning sunlight and some afternoon shade. Most vegetables, especially fruiting types,

with alkali salts or infested with hard to control weeds such as Bermudagrass, nutgrass, Johnson grass or bindweed.



Your Fall / Winter Garden

Sun

Soil

Compost

Fertilizer

Mulch

Amendments

The Importance of Sun

- Photosynthesis turns water and nutrients into growth
- Low sun =
 - low photosynthesis
 - low growth
 - low produce

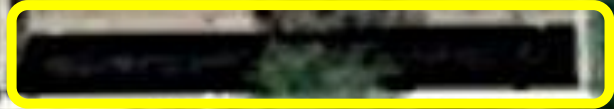
Select a Sunny Location

We can make shade, but not sunlight

- Assess your yard & garden throughout the year and throughout the day
 - Deciduous trees, buildings, walls cast long shadows in winter, even at noon
- What areas receive sun and for how long?
- From sunrise to sunset on the Winter Solstice in Valley, we receive less than 10 hours of light.

Microclimates

- Every yard has microclimates
- Cold Traps: Low-lying areas with poor circulation; collect cold air and dampness. Tend to be the first to frost.
- Heat Sinks: Pavement, stone, and buildings can absorb heat and radiate it out.



**NOVEMBER: LONG SHADOWS
CAST EVEN AT "HIGH" NOON**

Soil at the Location

- For new or established gardens, add compost before rotating to fall and winter crops
- Work compost into the soil
- What's wrong with clay? Nothing!
- Add a layer of mulch to help protect roots against cold temps and frost
- Have you had your soil tested?

Soil Sampling & Analysis

- Enables the gardener to fertilize or amend accordingly; no wasted money.
- Collect and store samples with stainless steel or clean plastic. Using brass, bronze, or copper could contaminate the sample.
- Remove large pieces of organic material and stones



IAS Laboratories

2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248

Grower Raised Beds
Submitted By K
Send To K
Report Number 6656641
Date Received 07/11/2017

Soil Analysis Report

VL = Very Low
L = Low
M = Medium
H = High
VH = Very High

Sender	Lab	pH	Calcium (Ca) ppm	Magnesium (Mg) ppm	Sodium (Na) ppm	Potash (K) ppm	Iron (Fe) ppm	Zinc (Zn) ppm	Manganese (Mn) ppm	Copper (Cu) ppm	Salinity (EC x 2) dS/m	Nitrate (NO3-N) ppm	Phosphate (PO4-P) ppm	Computed %Sodium (esp)	Sulfur (SO4-S) ppm	Boron (B) ppm	Free Lime Level	Molybdenum (Mo) ppm
Raised Beds	279	6.43	8800 VH	1100 VH	850 VH	900 VH	170.0 VH	27.00 H	33.0 H	6.10 VH	6.9	62.0 VH	360.0 VH	6.2	3300.0 VH	5.80 VH	High	0.25

This potting mix is nutrient rich. As a result you may see a reduction in seed germination, stunting, and yellowing. Here are some goals to keep in mind (I don't typically write it out but I believe this will help you since you are trying to learn as much information as you can):

- Sodium: <300 ppm
- Potassium: <900 ppm
- Salinity: <3 dS/m
- Zinc: <30 ppm
- Manganese: <50 ppm (40 is my comfort zone)
- Copper: <10 ppm (Copper is used as a herbicide and will kill plants)
- Nitrate: <80 ppm
- Sulfur: <300 ppm
- Boron: <4 ppm
- Calcium to Magnesium: 10:1 to 20:1
- Iron to Copper: 10:1
- Phosphorus to Zinc: 18:1



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There are two ways to go:

(1) Dilute the raised beds with another organic material such as perlite, vermiculite, or pumas. Depending upon the material you wish to dilute the potting mix with I would start by cutting the material by 1 third; possibly 2/3 potting mix and 1/3 something else because of the very high magnesium and potassium. As the organic material in the potting mix breaks down more nutrients will be released and the concentrations will increase. Then irrigate (flood) with extra water to flush the salts out of the root zone. This leaching process may need to occur a couple times a week for a couple of weeks until the white crust around the irrigation and bottom of the planter is gone. The white residue is a sign of high salts.

(2) Mix 1/4 cup of lime (calcium carbonate) per garden bed to raise the soil pH. This will reduce the availability of the all the nutrients. Then over the next few years as your garden needs the nutrients you can slowly lower the soil pH. After everything is mixed and placed into containers flood the heck out of them with water to flush the excess potassium, sulfur, magnesium, and sodium out of the soil. This leaching process will need to occur once a day for 3-4 days and then once every other week for several months. As the organic matter breaks down more nutrients and salts will become more available to the plants.

In about six weeks apply 0.1 lbs of nitrogen per 100 sqft to replenish the nitrogen that was consumed and leached away. If you use an organic source of nitrogen that contains 10% nitrogen, you will need to use 1 lbs of that product to obtain 0.1 lbs of nitrogen.

Also your garden is placed between the side of your home and a brick wall. This area may trap a great deal of heat, which will be great for the winter but you may be limited on what you can grow in the summer. This location may also create a great deal of shade. If your vegetables are tall and thin, they are reaching for the sunlight. Crops that can handle low sunlight are carrots, onions, and potatoes (maybe tomatoes).

Container Gardening

- While very challenging in the summer, works well in winter; soil can be controlled.
- At least 1 foot deep, 18-24 inches across, well drained and on wheels if possible
- Choose a soil mix specific for container vegetable gardening... or...
- make your own with a mix of compost, natural soil and container potting soil

Fertilizer vs. Compost vs. Mulch

- Fertilizer is a feed for plants
- Compost is food for the soil. It builds healthy, living soil which supports roots. It is an organic material that is naturally lacking in the desert. It has a minimum amount of natural fertilizer.
- Mulch is a top dressing used to moderate soil temperatures and retain moisture. Mulch made of organic matter will break down (compost in place) and feed the soil.

Fertilizers

- Fertilizers are “vitamins and minerals” for plants.
- Macro nutrients: N-P-K
 - Nitrogen - green and leafy, volatile
 - Phosphorous - flowers, roots
 - Potassium - fruits, flowering, stems
- Store in a cool, dry place, sealed, use quickly
- Synthetic or organic

Fertilizer: Guaranteed Analysis

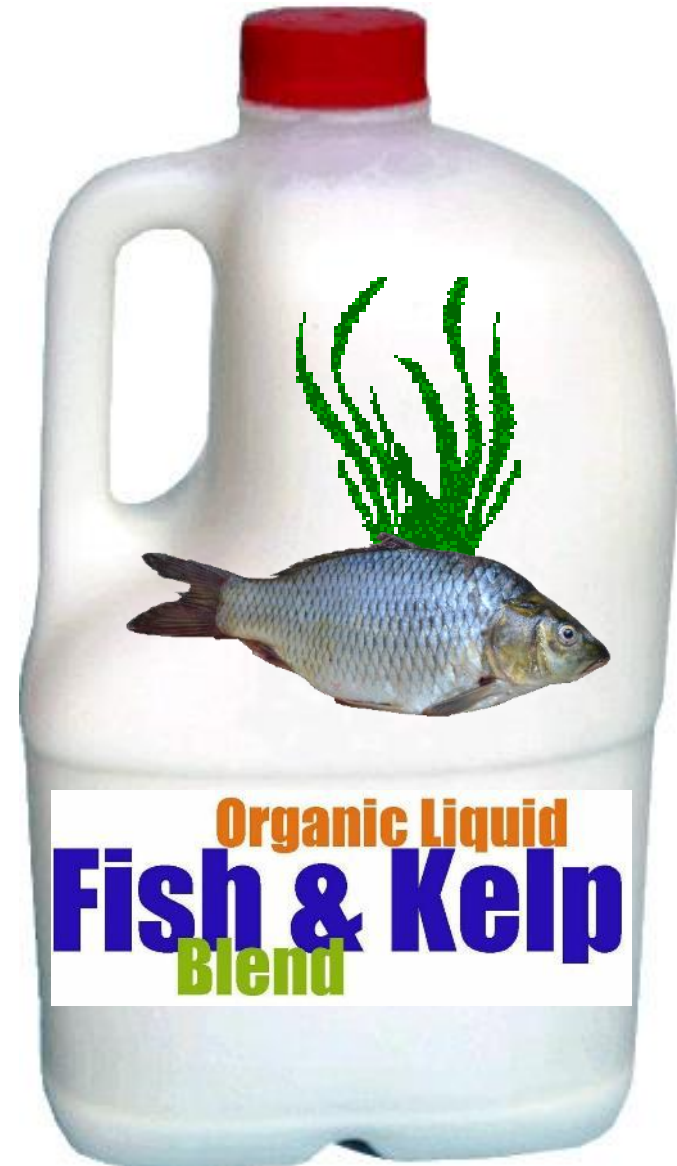
- NPK is arithmetically described:
 - 21-3-0, 16-20-5
- Powder
- Granular
- Liquid concentrate
- Water soluble



Organic Options

Animal or vegetative based

- Urea
- Blood meal
- Bone meal
- Worm castings
- Seaweed/kelp
- Fish-based
- Compost

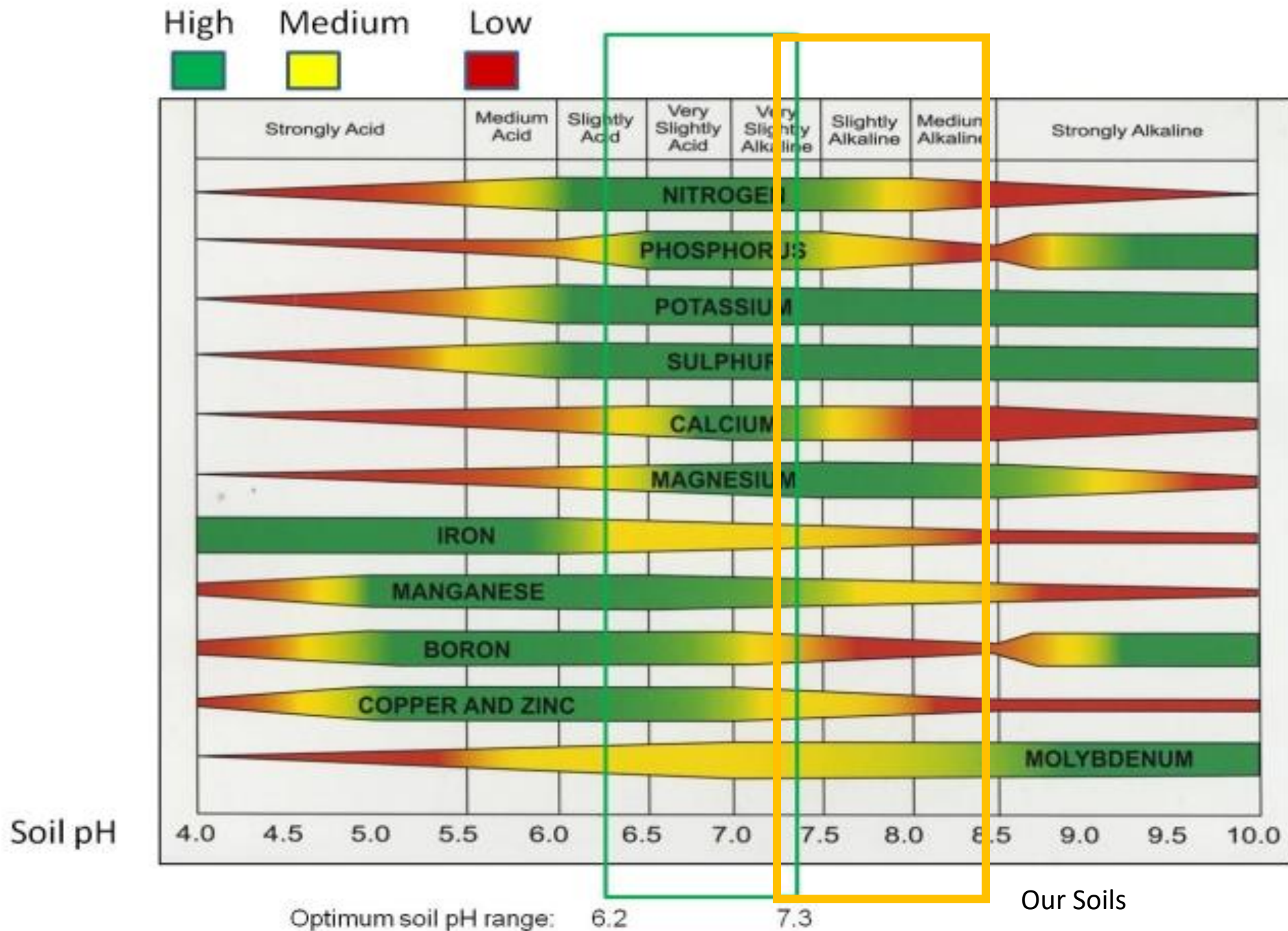


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Why Fertilize?

- To supplement nutrients in short supply or depleted by repeated crops
- To provide extra nutrients when plants require them
- To make nutrients more available in our alkaline soils
- To compensate for climatic conditions which inhibit nutrient absorption

How soil pH affects availability of plant nutrients



Other Garden Amendments

- Soil sulfur - to mitigate alkalinity
- Gypsum - counteract excessive salt build-up (Publication AZ1413)

Do Not Use As Soil Amendments

- Peat moss - no nutrients, hard to re-wet, not sustainable
- Lime - a common east coast component **NEVER** recommended for desert soils
- Wood or BBQ ashes - highly alkaline
- Sand - adding sand to clay can result in further compaction of soil. Alternative is pumice - a rock that helps change soil structure

Your Fall / Winter Garden

Herbicides,
Pesticides

Plant
Varieties

When to
Plant

Transplants

Rotation

Irrigation

Herbicides and Pesticides

- A personal choice; many gardeners don't use them because they can harm beneficial insects including bees. Pests such as caterpillars and aphids can be removed with a hose or by hand.
- There are organic pest control options: neem oil, BT (*Bacillus thuringiensis*, look for the organic variety), Diatomaceous Earth (DE) and Spinosad are a few options

Selecting Varieties

- Use Seed Catalogs or Seed Packets. Read the information.
- Low days to maturity: we have multiple short seasons, unlike most of the country
- What sort of soil have they been selected for? Cool or heat tolerant?

Grow Recommended Varieties

- Short time to maturity is best because we have more but shorter growing seasons than most of the US.
- Pest and disease resistance
- Local seed sources
 - nativeseedsearch.com
 - Local nurseries and garden centers

Seed Packet Variation

The leaves of this attractive herb have a spicy flavor which makes green salads, tomato and cheese dishes, soups and omelets extra delicious.

Online Code 7333



CARE & MAINTENANCE		CUIDADO Y MANTENIMIENTO	
DAYS TO GERM 5 - 10		DIAS A GERMINAR 5 - 10	
DEPTH 1/4 in.		PROFUNDIDAD 6 mm	
SPACING 10 in.		ESPACIO 25 cm	
HEIGHT 18 - 24 in.		ALTURA 45 - 61 cm	



May - June | Mayo - Junio
 April - July | Abril - Julio
 March - June | Marzo - Junio
 February - May | Febrero - Mayo

Start seeds indoors, 6 to 8 weeks before the last frost. Sow in open ground well exposed when soil is warm. Thin when plants are a few inches tall. Transplant to garden after frost. Harden off before transplanting.

Comience a sembrar en interiores, 6 a 8 semanas antes de la helada. Siembre en terreno abierto bien expuesto cuando el terreno esté cálido. Reduzca cuando las plantas tienen unas cuantas pulgadas de alto. Transplante al jardín después de la helada. Aclimátele antes de transplantar.

PACKED FOR 18 SELL BY 12/18 R1



Plantation Products LLC.,
 202 S. Washington St.
 Norton, MA 02766
 plantationproducts.com

Native
 TS516. True Greek Oregano
 Seed/SEARCH

Taste the best strain of any oregano we have found! Deep, genuine, oregano flavor! Pinkish-white flowers decorate this herb that doubles as a perfect ground cover with soft gray-green leaves. 12-18" tall. Contents: ± 200 seeds (0.1 g).

Herb

Origanum vulgare hirtum. Most herbs are easy to grow and are quite happy in poor, gravelly soils. Besides being essential to fine cuisine, herbs are used medicinally and are effective insect repellents.

Culture: Plant in fall through early spring in the low desert, spring through summer in colder climates.

Seed Saving: Herbs are insect pollinated and members of the same species will cross. Harvest dried seed stalks, and hang upside down for complete drying. Crush to remove seeds, and winnow off chaff.

Germ Date: 02-28-2018 Sell By: 02-28-2019 id.13734
 3061 N Campbell Ave, Tucson, AZ 85719

Acceptance of these seeds is an agreement that they will not be used for commercial breeding purposes with a patent outcome unless there are written agreements with the originators of the seeds in Native Seeds/SEARCH's collection



Sustainable Seed Company

Organic Early Wonder Beet

33-60 days, 2 g SKU 16168

Early Wonder beet has roots that are smooth, half-flat, bright red and about 3" in diameter. Seems to do a bit better in Southern climates than other beets, but remember beets are a cool weather crop. One of the best beet varieties for greens, the tops are fast growing, sweet, flavorful, and grow upwards of 18".

PLANTING TIPS (for more info: www.SustainableSeedCo.com)

Can be planted in the early spring or midsummer. Soak seeds overnight in damp towels before planting for good germination. Plant seeds 1" apart and thin weakest seedlings to desired spacing. Keep soil evenly moist to prevent roots from getting woody. For longer harvest, stagger plantings every 2-3 weeks.

Lot:95100 Packed for: 2017

Determine When to Plant

- Refer to the Publication *AZ1005: Vegetable Planting Calendar for Maricopa County*
- Select from your list crops
- Make your layout
- Note planting dates, days to maturity
- Read the instructions
- If starting from transplants, sow seed indoors or a greenhouse 6-8 weeks before planting date

Determine When to Plant

Evaluate soil temperature

- If we are having warmer or cooler than normal weather, soil temp is more important than the calendar.
- The calendar is based on “average” weather and temperatures.
- Use a soil thermometer and measure 1-2 inches (about the level the seed will be planted)

SOIL TEMPERATURE CONDITIONS FOR VEGETABLE SEED GERMINATION

Alphabetical				By Temperature			
Crop	Minimum (°F)	Optimum(°F)	Maximum (°F)	Crop	Minimum (°F)	Optimum(°F)	Maximum (°F)
Asparagus	50	75-85	95	Garlic	32	65-85	95
Beans, Lima	60	75-85	85	Leeks	32	65-85	95
Beans, Snap	60	75-85	95	Lettuce	32	60-75	85
Beets	40	65-85	95	Onions	32	65-85	95
Broccoli	40	60-85	95	Parsnips	32	65-75	85
Cabbage	40	60-85	95	Spinach	32	65-75	75
Carrots	40	65-85	95	Beets	40	65-85	95
Cauliflower	40	65-85	95	Broccoli	40	60-85	95
Celery	40	*	*	Cabbage	40	60-85	95
Chard, Swiss	40	65-85	95	Carrots	40	65-85	95
Com	50	65-95	105	Cauliflower	40	65-85	95
Cucumbers	60	65-95	105	Celery	40	*	*
Eggplant	60	75-85	95	Chard, Swiss	40	65-85	95
Garlic	32	65-85	95	Parsley	40	65-85	95
Leeks	32	65-85	95	Peas	40	65-75	85
Lettuce	32	60-75	85	Radishes	40	65-85	95
Melons	60	75-85	105	Turnips	40	60-95	105
Okra	60	85-95	105	Asparagus	50	75-85	95
Onions	32	65-85	95	Com	50	65-95	105
Parsley	40	65-85	95	Tomatoes	50	65-85	95
Parsnips	32	65-75	85	Beans, Lima	60	75-85	85
Peas	40	65-75	85	Beans, Snap	60	75-85	95
Peppers	60	65-75	95	Cucumbers	60	65-95	105
Pumpkins	60	85-95	105	Eggplant	60	75-85	95
Radishes	40	65-85	95	Melons	60	75-85	105
Spinach	32	65-75	75	Okra	60	85-95	105
Squash	60	85-95	105	Peppers	60	65-75	95
Tomatoes	50	65-85	95	Pumpkins	60	85-95	105
Turnips	40	60-95	105	Squash	60	85-95	105
Watermelons	60	75-95	105	Watermelons	60	75-95	105

Cooperative Extension-Sacramento County

<http://sacmg.ucanr.edu/files/164220.pdf>

1st Season: Fall

- Soils cool
- Worms come up from deep underground
- Days get shorter
- Plant short season, cool tolerant crops
- If seed packet says “plant as soon as the soil can be worked in the spring” remember that works for the rest of the country, not here. That plant can very well be a fall crop here.

2nd Season: Winter/Early Spring

- Days get longer after solstice, nights shorter
- Air temperatures and soils get warmer
- What is the first and last frost date for where you live?
- Mid-December is typical first frost date in Phoenix (around 1100' ft in elevation)
- Mid February is typical last frost date

Starting Fall Transplants

- Plants grown in containers, in a climate-controlled environment, to be transplanted into the garden later
- Some plants can use 6-8 weeks head start to bear a crop
 - Broccoli, cauliflower, cabbage, brussels sprouts...

Purchased Plants: Pros

- Less work & quicker to see 'the garden'
- 3-8 weeks faster harvest
- No uncertainty about germination
- If you have missed the seed-starting window, purchase plants to "catch up"

Purchased Plants: Cons

- Restricted to varieties available
- Plants may not be optimal for our area
- Plants may not be available at optimal time for planting
- Labeling may prove disappointing
- More expensive

Rotate your Crops

- “Roots-shoots-beans-fruits”
- Rotating prevents depletion of nutrients.
- Planting the same crop in one place multiple seasons increases the possibility of disease
 - For example, don't plant winter peas where you planted summer peas & beans.
- Beans/legumes fix nitrogen in the soil, helping future crops.

Irrigation Information

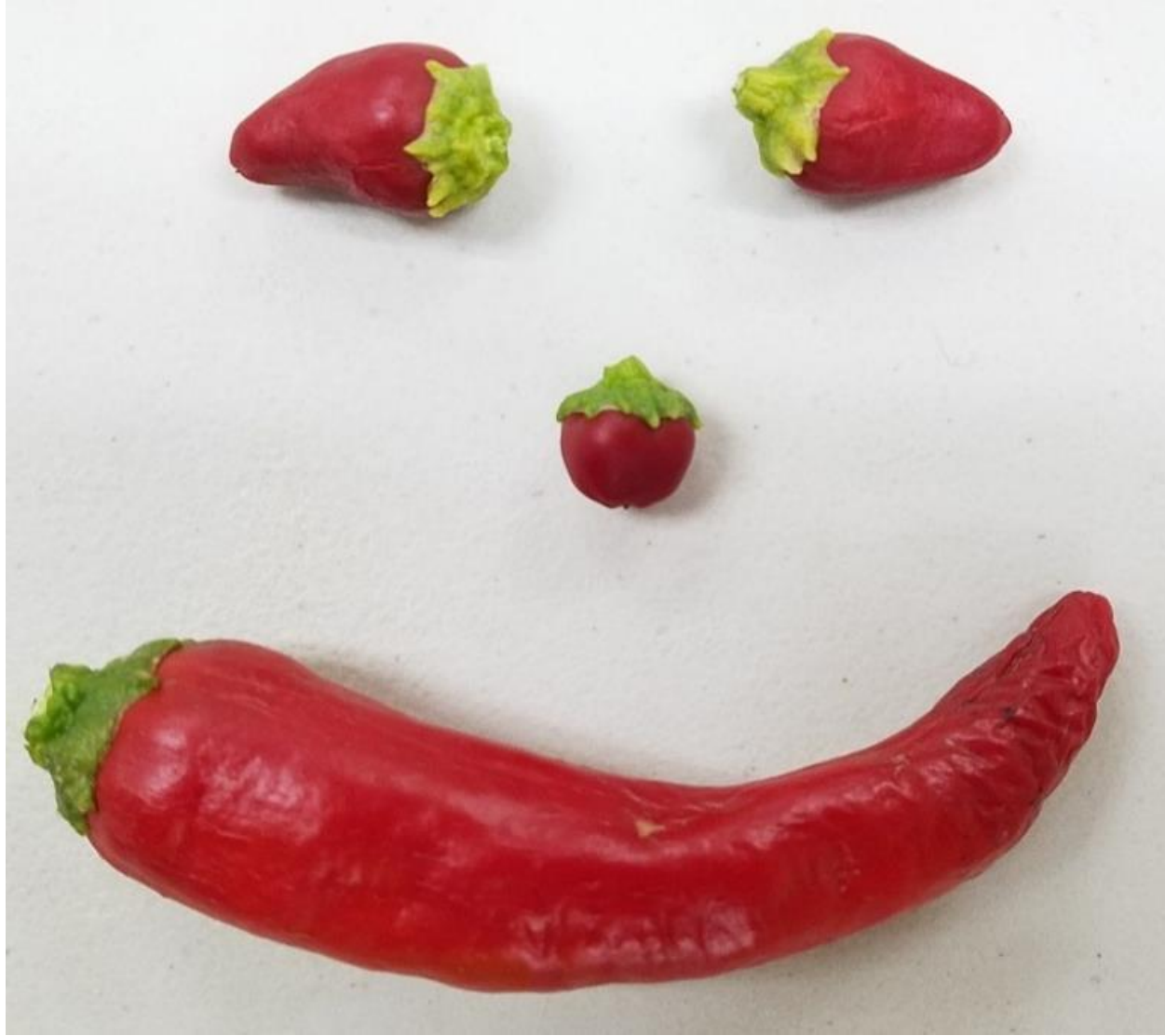
- Arizona Municipal Water Users Association
 - Smartscape
- City water departments
- Cooperative Extension
 - Inspect several options in garden
- Desert Botanical Garden

Irrigation: How Often

- 1 gal. of water wets 1 cubic foot of soil
- Vegetable plants need higher soil saturation than desert adapted plants
- Plants use more water on warm, dry, windy days, less in cool weather.
- Mature, bearing plants use more water than seedlings, but seeds and seedlings need more frequent water (to stay moist)

Irrigation

- Learn how long to run water to achieve desired depths, adjust frequency and *not length of run time*
- To keep down alkalinity and salts, use rainwater as much as possible. Our tap water is alkaline and high in Total Dissolved Solids (TDS) which includes salts
- Salts include not only sodium, but potassium, calcium, magnesium, chloride, sulphate, bicarbonate and carbonate



Maricopa County Extension Master Gardener Plant Help Desk

- The Maricopa County Extension Plant Help Desk provides research-based information to assist you with plant and pest problems.
- Email: maricopacountyplanthotline@gmail.com. Responses will generally be within a week
- Visit: 4341 E. Broadway Rd Phoenix, AZ 85040. Bring in a plant or pest sample. Location is in Southeast Phoenix, near Tempe.
- If a master gardener cannot answer your question, they will refer the question to University expert staff members.

Resources

- University of Arizona Extension Publications
<https://extension.arizona.edu/pubs>
 - AZ 1005: Vegetable Planting Calendar
 - AZ1435: 10 Steps to a Successful Vegetable Garden
 - And may, many more free gardening publications
- California Extension Publication GN154: Soil Temperature Conditions for Vegetable Seed Germination. sacmg.ucanr.edu/files/164220.pdf