



# Fall Gardening

## I. When to Start a Fall Garden in Tucson.

### a. Late summer/early fall.

- i. Late August through mid-September is the start of the fall planting season. With protection, a few cool season plants can be planted at this time.
- ii. The best crops to plant during this period are those that are heat tolerant or those that require a long growing season



### b. Optimum fall planting period.

- i. The period from late September through the first few weeks of November is the best time to plant cool season vegetables, all cool season vegetables can be planted during this period.
- ii. The average date of first frost for Tucson is November 15<sup>th</sup>.
- iii. Lettuce, Garlic, Peas and Spinach do best when planted in October

### c. Late fall/early winter.

- i. After the winter break, the last chance to plant cool season crops is the period between New Years and mid-February.
- ii. Fast maturing crops, can be planted before the weather warms. Choose slow bolting varieties and harvest immature plants before they go to flower.

## II. What to plant in your fall garden.

### a. Leafy Greens

- i. Arugula, broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, dandelion, kale, kohlrabi, lettuce, mizuna, mustard greens, spinach, and Swiss chard.
- ii. Asian greens such as bok choy, Chinese cabbage, and komatsuna.
- iii. Light frost improves the flavor of many greens

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- iv. When choosing lettuce, avoid tight heading types such as “ice berg”, instead choose Romaine or leaf varieties. Bibb varieties also do well.

#### **b. Root crops**

- i. Beet, carrots garlic, leek, onions, radish and turnips.
- ii. Use thinnings in salads.
- iii. Root crops are most tender when young, harvest before they reach a diameter of 3”.
- iv. Garlic takes six months to mature, so plan accordingly.



#### **c. Cool season annual herbs**

- i. Chives, cilantro, dill, fennel, parsley.
- ii. Plants in the carrot family are the best for attracting beneficial insects, plant these herbs in the center of your garden and let them go to flower for the best control.
- iii. \*although not a root, green, or herb, **fava beans** and **Wheat** can also be planted now.

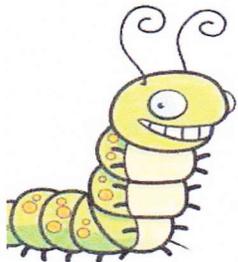
### **III. Protecting your fall garden.**

#### **a. Weather** –If frost is in the forecast, you can take precautions to limit the damage.

- i. Light frost = 32°-28° - Plants that can withstand a light frost include arugula, beets, bok choy, carrots, lettuce, peas, and Swiss chard.
- ii. Peas and leaf lettuce show the least tolerance for frost.
- iii. Hard Frost = 28°or lower. Plants that can withstand a hard frost include Broccoli, Brussels sprouts, Cabbage, Collards, Kale, Mustard, Onions, Spinach, and Turnip.
- iv. Mulch heavily to keep roots warm on cold nights.
- v. Water garden heavily the day before an expected frost, water acts as an insulator, keeping the root zone warmer than the surrounding air temperature. Misting also works to create an “igloo” effect.
- vi. Frost cloth is a thick transparent fabric that works like a blanket, trapping warm air near the growing plants. It is most effective when allowed to cover the entire plant to ground level. In a pinch, sheets can also be used, but they must be removed promptly the next morning. Never use plastic, as it can actually exacerbate a frost.

- vii. Christmas lights, especially older types with large bulbs, draped throughout the garden are great at generating heat, combine with other methods for added effect.

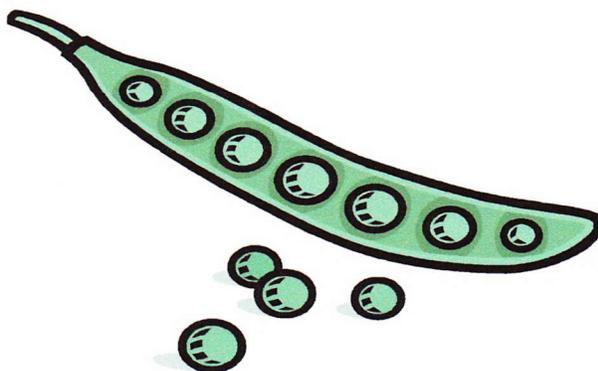
## b. Insects



- i. Cabbage Looper – Very common during the early fall and winter months. Use a BT product once a week once damage appears.
- ii. Cabbage Aphid – Usually appears in early fall and then again in spring. Stressed plants are most affected. Use insecticidal soap and a jet of water for control.

## c. Birds

- i. Pea and bean sprouts are a bird delicacy. Use row covers, or cloches to protect young sprouts. Once plants reach about 5", the birds do not bother them





**Tucson  
Organic  
Gardeners**

soiling our hands since 1971

# TUCSON ORGANIC GARDENERS PLANTING GUIDE

## FOR TUCSON AND THE LOW DESERT

**Jan 1 – Feb 15**

**FROM SEED**

Arugula, Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard Parsley, Bulb Onion (See Graphic), Potato

**FROM SEEDLING TRANSPLANT**

Artichoke, Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard, Parsley, Spinach, Swiss Chard.

**April 15 – May 31**

**FROM SEED**

Amaranth, Basil, Cantaloupe, Cowpea, Cucumber, Malabar Spinach, Melon, Okra, Sorghum, Sweet Potato Slips, Summer Squash, Watermelon

**FROM SEEDLING TRANSPLANT**

Basil, Eggplant, Pepper

**July 15 – August 31**

**FROM SEED**

Bush Beans, Pole Beans, Corn (all types), Cowpea, Cucumber, Cantaloupe, I'tois Onion (See Graphic), Pumpkin, Sorghum Summer and Winter Squash

**FROM SEEDLING TRANSPLANT**

Tomato (July 15 - Aug 15)

**Oct 15 - Nov 15**

**FROM SEED**

Beets, Carrots, Garlic, Greens, Lettuce, Mustard, Pea, Radish, Turnip, Wheat (December – January)

**FROM SEEDLING TRANSPLANT**

Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard Parsley, Spinach, Swiss Chard



**March 1 – April 15**

**FROM SEED**

Amaranth, Basil, Bush Bean, Corn (Sweet), Cucumber, Jerusalem Artichoke, Malabar Spinach, Melon, Pumpkin, Sesame, Sorghum, Summer and Winter Squash, Tobacco, Watermelon

**FROM SEEDLING TRANSPLANT**

Basil, Eggplant, Pepper, Tomato, Tomatillo

**June 1 – June 15**

**FROM SEED**

Pole Beans, Cantaloupe, Cowpea, Melon, Sweet Potato Slips

**Sep 1 – Oct 15**

**FROM SEED**

Arugula, Beet, Bok Choy, Broccoli, Brussels Sprouts, Cabbage, Carrot, Cauliflower, Celery, Chia, Chicory, Chinese Cabbage, Cilantro, Collards, Escarole, Fava, Garbanzo, Greens, Kale, Kohlrabi, Leek, Lentils, Lettuce, Mache, Mustard, Onion (See Graphic), Parsley, Parsnip, Pea, Radish, Rape, Rutabaga, Turnip, Spinach, Swiss Chard

**FROM SEEDLING TRANSPLANT**

Broccoli, Brussels Sprouts, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Dill, Fennel, Kale, Lettuce, Mustard, Parsley, Spinach, Swiss Chard

### ONIONS



**"SHORT-DAY" BULB ONION SETS**  
January 1 – February 15

**TOHONO O'ODHAM I'TOIS MULTIPLIER ONION**  
July 15 – February 1

**GREEN BUNCHING/SCALLION**  
August 15 – February 1



**Table II. Germination data for home garden vegetable seed.**

Crop	Minimum Percent Germination <sup>abc</sup>	Germination Temperature <sup>bc</sup>						Days to Germinate Under Optimum Temperature and Moisture Conditions <sup>bcd</sup>
		Minimum		Optimum		Maximum		
		°F	°C	°F	°C	°F	°C	
Asparagus	60	50	10	75	24	95	35	10
Bean, Lima	70	60	16	85	30	85	30	7
Bean, Snap	70	60	16	80	27	95	35	6
Beets	65	40	4	85	30	95	35	5
Broccoli	75	40	4	85	30	95	35	5
Brussels Sprouts	70			80	27			5
Cabbage	75	40	4	85	30	95	35	4
Carrot	55	40	4	80	27	95	35	5
Cauliflower	75	40	4	80	27	95	35	5
Celeriac	55			70	21			11
Celery	55	40	4	70	21	85	30	7
Chicory	65			80	27			6
Chinese Cabbage	75			80	27			4
Cucumber	80	60	16	95	35	105	41	2-5
Eggplant	60	60	16	85	30	95	35	6-8
Endive	70	32	0	75	24	75	24	6
Kale	75			80	27			4
Kohlrabi	75			80	27			4
Leek	60			70	21			7
Lettuce	80	35	2	75	24	75	24	2-3
Muskmelon	75	65	18	95	35	105	41	3-4
New Zealand Spinach	40			70	21			6
Okra	50	60	16	95	35	105	41	6
Onion	70	32	0	80	27	95	35	4-5
Parsley	60	40	4	75	24	90	32	13
Parsnip	60	35	2	65	18	85	30	14
Pea	80	40	4	75	24	85	30	6
Pepper	55	60	16	85	30	95	35	8
Pumpkin	75	65	18	90	32	105	41	4
Radish	75	40	4	80	27	95	35	4
Rutabaga	75			80	27			4
Salsify	75			70	21			6
Spinach	60	32	0	70	21	75	24	5
Squash	75	65	18	95	35	105	41	4
Sweet Corn	75	50	10	85	30	105	41	3
Swiss Chard	65	40	4	85	30	95	35	4
Tomato	75	50	10	80	27	95	35	6
Turnip	80	40	4	80	27	105	41	3
Watermelon Seeded	70	70	21	95	35	105	41	4-5
Watermelon Seedless		85	30	95	35	105	41	5-6

Minimum percent germination to federal standards.

<sup>a</sup>Handbook for Vegetable Growers. 1988. Knott, J.E. John Wiley & Sons, Inc.

<sup>b</sup>Vegetable Growing Handbook. 1979. Splittstoesser, W.E. AVI Publishing, Inc.

<sup>c</sup>Seeds, The Yearbook of Agriculture. 1961. Stefferud, A., Editor. The United States Government Printing Office

**Table I. Seed weight and longevity for home garden vegetables.**

<i>Crop</i>	<i>Seeds per Ounce<sup>a</sup></i>	<i>Seeds per Gram<sup>a</sup></i>	<i>Relative Longevity under Cool, Dry Condition (Years)<sup>ab</sup></i>
Asparagus	1,200	40	3
Bean, Lima	25-75	1-3	3
Bean, Snap	100-125	4	3
Beets	1,600	55	4
Broccoli	9,000	320	3
Brussels Sprouts	8,500	320	4
Cabbage	8,500	320	4
Carrot	23,000	820	3
Cauliflower	9,000	320	4
Celeriac	70,000	2,500	3
Celery	70,000	2,500	3
Chicory	26,000	900	4
Chinese Cabbage	18,000	650	3
Cucumber	1,100	40	5
Eggplant	6,000	200	4
Endive	26,000	900	5
Kale	9,000	320	4
Kohlrabi	9,000	320	3
Leek	11,000	400	6
Lettuce	25,000	900	5
Muskmelon	1,300	45	5
New Zealand Spinach	350	12	3
Okra	500	20	2
Onion	8,500	300	1
Parsley	18,500	660	1
Parsnip	12,000	430	1
Pea	90-175	3-6	3
Pepper	4,500	160	2
Pumpkin	100-300	4-11	4
Radish	2,500	90	5
Rutabaga	12,000	430	4
Salsify	1,900	70	1
Spinach	2,800	100	3
Squash	120-400	4-11	4
Sweet Corn	120-180	4-6	2
Swiss Chard	1,600	57	4
Tomato	700-1,200	250-430	3
Turnip	1,500	500	4
Watermelon	300-600	10-20	4

<sup>a</sup>Handbook for Vegetable Growers. 1988. Knott, Joe. John Wiley & Sons, Inc.

<sup>b</sup>Vegetable Growing Handbook. 1979. Splittstoesser, W.E. AVI Publishing, Inc.



## Cool season Vegetable and Herb Varieties for Tucson

- **Artichoke** – Imperial Star Globe.
- **Bean** – Fava – Broad Windsor.
- **Beet** – Detroit Dark Red, Early Wonder Tall Top, Chioggia.
- **Broccoli** – Arcadia, Waltham 29, Sprouting varieties.
- **Brussels Sprouts** – Jade Cross, Long Island Improved.
- **Cabbage** – Copenhagen Market, Early Jersey, Red Acre, Golden Acre.
- **Carrot\*** – Red Cored Chantenay, Danvers Half Long, Scarlet Nantes.
- **Cauliflower** – Snowball Early.
- **Cilantro\*** – Slow Bolting Types
- **Collard Greens** – Georgia Southern.
- **Dill\*** – Bouquet, Fern.
- **Garlic** – Softneck varieties.
- **Kale** – Blue Dwarf, Dwarf Siberian, Lancinato, Red Russian, Red Winter.
- **Kholrabi** – Purple or White Vienna.
- **Leek** – American Flag.
- **Lettuce** – Romaine and leaf lettuces do best. Black-Seeded Simpson, Buttercrunch, Cimarron, Nevada, Jericho, Parris Island Cos.
- **Mustard Green** – Southern Giant Curled.
- **Onion** – Bulbing – Southern Belle Red, Texas 1015Y, Texas Early White.  
Bunching – Evergreen Hardy, Ishikura  
  
Multiplying – Tohono O'odham I'toi.
- **Parsley\*** – Italian Flat Leaf.
- **Pea** – Dwarf Grey Sugar, Oregon Giant Sugar Pod II, San Luis, Wando.
- **Radish\*** – Cherry Belle, Champion, Daikon, French Breakfast, Icicle.
- **Spinach** – Bloomsdale Long Standing, Viroflay
- **Swiss Chard** – Rainbow, Ruby Red.
- **Turnip** – Purple Top White Globe, Seven Top

\*Let some of these plants go to flower to attract beneficial insects.



## Vegetable Crops for Beginning Seed Savers

Crop	Plant Type	Number of Plants	Plant Spacing	Isolation Distance
Bean	Annual	6 or more	6"	N/A
Lettuce	Annual	N/A	12"	20ft.
Pea	Annual	N/A	6"	50ft.
Pepper	Perennial	As many as possible	18"	50ft.
Tomato	Perennial	As many as possible	18-24"	10-100ft.

## Vegetable Crops for Intermediate Seed Savers

Crop	Plant Type	Number of Plants	Plant Spacing	Isolation Distance
Corn	Annual	200	12"	1000ft. – 1 Mile
Cucumber	Annual	6 cukes from 6 plants	12"	½ Mile or Hand Pollinate
Muskmelon	Annual	N/A	N/A	½ Mile or Hand Pollinate
Okra	Annual	12+	18"	1 Mile or Bag
Radish	Annual	As many as possible	6-9"	1 mile or alt. day cage
Spinach	Annual	1:2 Male/Female Ratio	6-12"	2-10 miles
Squash/Pumpkin	Annual	N/A	N/A	½ Mile

## Vegetable Crops for Advanced Seed Savers

Crop	Plant Type	Number of Plants	Plant Spacing	Isolation Distance
Beets/Swiss Chard	Biennial	At least 6	18"	½ - 5 Miles or Cage
Brassica oleracea*	Biennial	At least 6	24"	1 Mile or Cage
Carrots	Biennial	10 or more	24-30"	2 Miles or Cage
Chicories/Witloof	Perennial	N/A	8-12"	½ Mile
Escarole/Endive	Annual	N/A	12"	½ Mile
Onion	Biennial	At least 2	3-4"	½ Mile
Turnip/Chinese Cabbage	Biennial	6+	24"	1 Mile or Cage

\*Broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, and kohlrabi.



# Companion Planting



**Companion Planting:** Planting multiple crops in close proximity so that they may benefit the growth of one another. Companion planting is a form of *Polyculture*, which is a central principle of organic gardening.

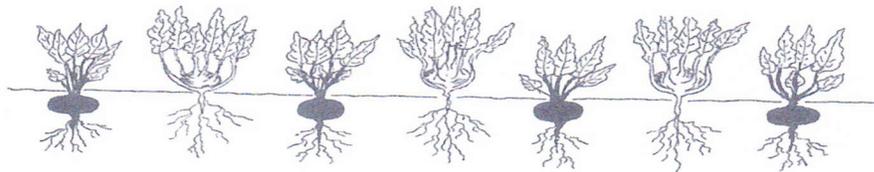
- **How can we use plant companions in our garden?**
  - **Fertilizers** – Plants in the legume family have the ability to take nitrogen from the atmosphere and fix it into the soil into a form that is useable by plants.
    - Warm season legume crops – Bush bean, pole bean, tepary bean, cowpeas, peanuts
    - Cool season legume crops – Peas, fava beans, vetches
  - **Repelling Pest Insects** – Plants with strong aromas are great at repelling garden pests. Annual and perennial herbs as well as plants in the onion (*Allium*) family work great. Plant herbs in pots and place all around the home and garden. Some of the best are:
    - Herbs – Basil, Catmint, Citronella, Lavender, Lemongrass, Rosemary, Rue (great for repelling cats), Sage, Thyme, Wormwood (*Artemisia*.)
    - Alliums – Chives, Garlic, Leeks, Onions, Shallots. Scatter plantings throughout garden or along edges of beds.
  - **Attracting Beneficial Insects** – Many annual, perennial and biennial vegetables and herbs also excell at attracting beneficial insects such as bees, lady bugs, lace wings, and predatory wasps.
    - Plants in the carrot family (*Apiaceae*) are the best. If possible, have a small section of your garden dedicated to these plants all year round. Use a bug mix such as “good bug blend” or make your own.
    - Carrots, Cilantro, Dill, Fennel, Parsley, Radish all do well. Keep fennel separate in small spaces as it is known to inhibit the growth of other plants. Not necessary in dedicated beneficial insect gardens. It is



important to have flowering plants at all time of the year.

- **More Companion Planting Principles**

- **Trap Cropping** – Using certain plants that are more attractive to pest insects to lure them away is a great example of companion planting. Trap crops should be planted away from the garden and pulled from the ground and destroyed once they are infested. Either burn the plant or freeze it and dispose of it in a plastic trash bag.
- **Nurse Cropping** – In home gardening, nurse cropping is when we use the physical properties of plants to aid in the growth of other crops.
  - Planting tall growing plants, such as corn, sunflowers, or trellised vining crops on the South and West sides of the garden to create shade for other plants.
  - Planting heavily with a cover crop such as alfalfa, or buckwheat to suppress weeds.
  - Using tall growing plants such as corn, okra, and sorghum to support vining plants such as cowpeas and pole beans
  - Using sprawling vining plants like squash to shade the soil
  - Planting intensively to suppress weeds or to create a micro climate.
- **Diversity For Pest Suppression** – Simply planting two different varieties of the same crop has been shown to reduce pest insect populations. Avoid Monocultures whenever possible and instead use “Intercropping” techniques.
- **Spacing Requirements** – Certain plants make good companions because of the way that they grow. The roots of beets and kohlrabi, for example, occupy different areas of the soil and therefore do not compete for space and nutrients.



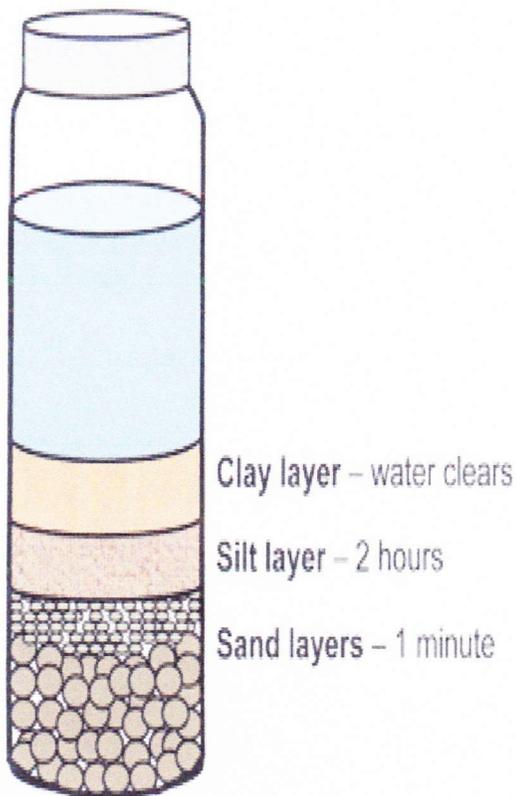
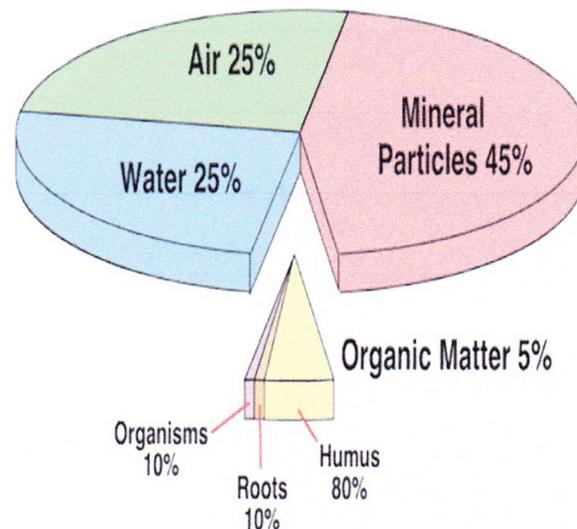


## Soil Fertility and Plant Nutrition



### USDA-SARE – Qualities of a Healthy Soil:

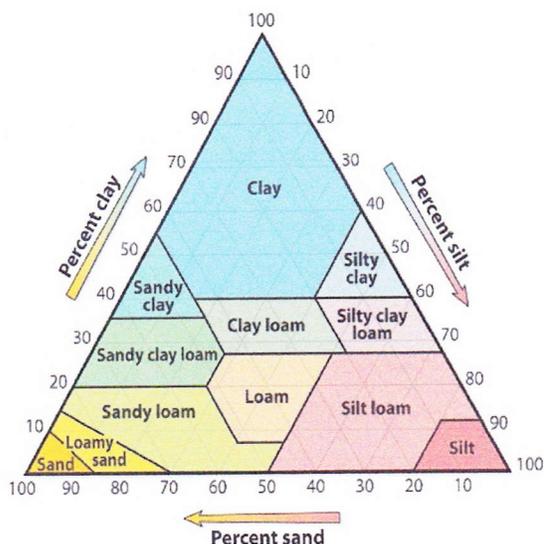
1. Accommodates active and diverse populations of beneficial organisms, with plant pest populations minimized by beneficials.
2. Contains high levels of relatively fresh residues that provide beneficials with food.
3. Includes high levels of decomposed organic matter, which help it retain both water and readily leachable nutrients.
4. Contains low levels of such toxic compounds as soluble aluminum and only low to moderate concentrations of salt.
5. Supports adequate levels of nutrients because excessive nutrients can make the crop more attractive to insect pests or can increase the threat of surface or subsurface water pollution.
6. Has a sufficiently porous surface, with many pores connected to subsoil to permit easy entry by rainfall or irrigation water.
7. Has good tilth that allows plant roots to easily penetrate large volumes of soil.



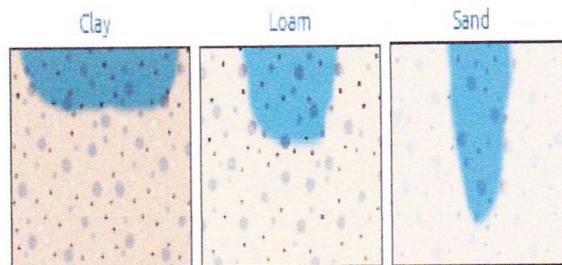
### Estimating Soil Texture Using the Jar Test:

1. Spread soil on a newspaper to dry. Remove all rocks, trash, roots, etc. Crush lumps and clods.
2. Finely pulverize the soil.
3. Fill a tall, slender jar (like a quart canning jar) one-quarter full of soil.
4. Add water until the jar is just three-quarters full.
5. Add a teaspoon of non-foaming dishwasher detergent.
6. Put on a tight fitting lid and shake hard for 10 to 15 minutes. This shaking breaks apart the soil aggregates and separates the soil into individual mineral particles.
7. Set the jar where it will not be disturbed for 2-3 days.
8. Soil particles will settle out according to size. After 1 minute, mark on the jar the depth of the sand.
9. After 2 hours, mark on the jar the depth of the silt.
10. When the water clears mark on the jar the clay level. This typically takes 1 to 3 days, but some soils may take weeks.
11. Measure the thickness of the sand, silt, and clay layers.
  - a. Thickness of sand deposit \_\_\_\_\_
  - b. Thickness of silt deposit \_\_\_\_\_
  - c. Thickness of clay deposit \_\_\_\_\_
  - d. Thickness of total deposit \_\_\_\_\_
12. Calculate the percentage of sand, silt, and clay.
  - a.  $[\text{clay thickness}] / [\text{total thickness}] = \text{___ percent clay}$
  - b.  $[\text{silt thickness}] / [\text{total thickness}] = \text{___ percent silt}$
  - c.  $[\text{sand thickness}] / [\text{total thickness}] = \text{___ percent sand}$
13. Turn to the soil texture triangle and look up the soil texture class.

### Soil Texture Triangle:



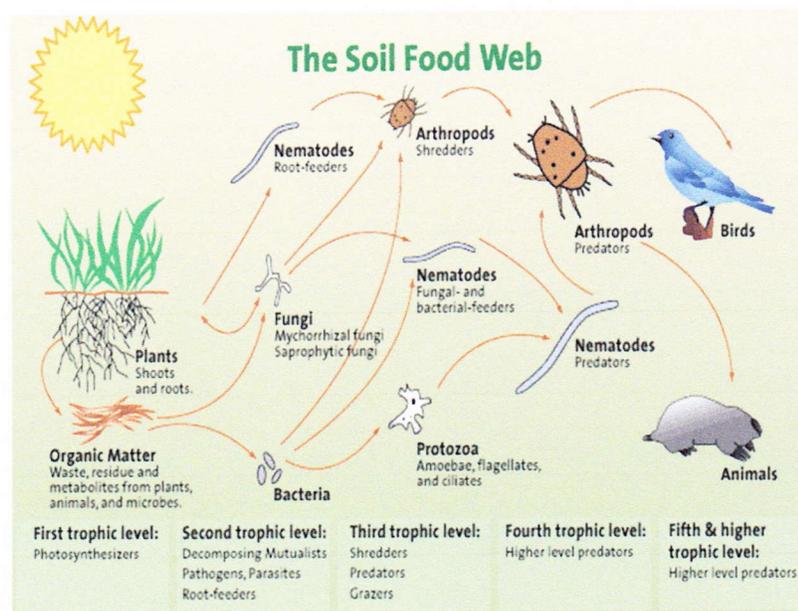
The *soil texture triangle* gives names associated with various combinations of sand, silt and clay. A *coarse-textured* or *sandy* soil is one comprised primarily of medium to coarse size sand particles. A *fine-textured* or *clayey* soil is one dominated by tiny clay particles. Due to the strong physical properties of clay, a soil with only 20% clay particles behaves as sticky, gummy clayey soil. The term *loam* refers to a soil with a combination of sand, silt, and clay sized particles. For example, a soil with 30% clay, 50% sand, and 20% silt is called a *sandy clay loam*.

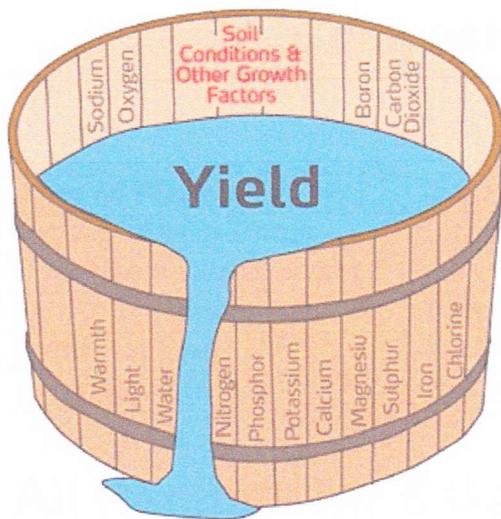


Soil Wetting Patterns

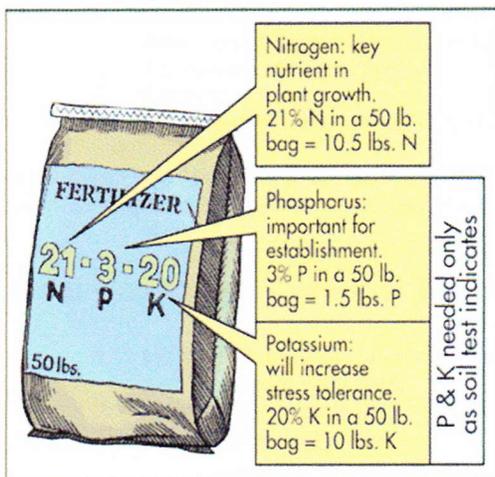
### Soil Food Web Gardening Rules:

1. Some plants prefer soils dominated by fungi; others prefer soils dominated by bacteria
2. Most vegetables, annuals, and grasses prefer their nitrogen in nitrate form, and do best in bacterially dominated soils
3. Most trees, shrubs, and perennials prefer their nitrogen in ammonium form and do best in fungally dominated soils.
4. Compost can be used to inoculate beneficial microbes and life into soils around your yard and introduce, maintain, or alter the soil food web in a particular area.
5. Adding compost and its soil food web to the surface of the soil will inoculate the soil with the same soil food web.
6. Aged, brown organic materials support fungi; fresh green organic materials support bacteria.
7. Mulch laid on the surface tends to support fungi; mulch worked into the soil tends to support bacteria.
8. If you wet and grind mulch thoroughly, it speeds up bacterial colonization.
9. Coarse dryer mulches support fungal activity.
10. Sugars help bacteria multiply and grow; kelp, humic, and fulvic acids and phosphate rock dust help fungi grow.
11. By choosing the compost you begin with and what nutrients you add to it, you can make teas that are heavily fungal, bacterially dominated, or balanced.
12. Compost teas are very sensitive to chlorine and preservatives in the brewing water and ingredients.
13. Applications of synthetic fertilizers kill off most or all of the soil food web microbes.
14. Stay away from additives that have high NPK numbers.
15. Follow any chemical spraying or soil drenching with an application of compost tea.
16. Most conifers and hardwood trees (birch, oak, beech, hickory) form mycorrhizae with ectomycorrhizal fungi.
17. Most vegetables, annuals, grasses, shrubs, softwood trees, and perennials form mycorrhizae with endomycorrhizal fungi.
18. Rototilling and excessive soil disturbance destroy or severely damage the soil food web.
19. Always mix endomycorrhizal fungi with the seeds of annuals and vegetables at planting time or apply them to roots at transplanting time.





The Capacity of the Barrel represents plant yield, which is limited by the height of the shortest stave of the barrel.



- Macronutrients
- Secondary Nutrients
- Micronutrients
- Non-Fertilizer Elements

Fertilizer	N-P-K	Cost Per Pound/Location	Yearly Application Rate 10 ft <sup>2</sup>
Alfalfa Meal	2-1-3	\$.40 at OK Feed	2.5/lbs
Bat Guano	10-10-1	\$4.67 at Mesquite Valley	0.5/lbs
Bat Guano	0-5-0	\$3.25 at EcoGro	---
Blood Meal	12-0-0	\$2.33 at Mesquite Valley	0.40/lbs
Bone Meal	3-15-0	\$1.35 at Mesquite Valley	1.66/lbs
Cotton Seed Meal	6-4-1.5	\$.40 at OK Feed	.85/lbs
Fish Emulsion	2-4-1	\$5.00 at ARBICO Organics	2.5/lbs
Fish Meal	10-6-2	\$.83 at OK Feed	0.5/lbs
Kelp Meal	1-0-4	\$1.60 at OK Feed	5/lbs
Dr. Earth Home Grown	5-7-3	\$2.08 at EcoGro	1/lb
Dr. Earth Natural Wonder	7-4-2	\$2.08 at EcoGro	.70/lbs
Happy Frog All Purpose	5-5-5	\$2.25 at Eco Gro	1/lb
Happy Frog Fruit and Flower	5-8-4	\$3.00 at Mesquite Valley	1/lb



# Creating Pollinator Habitat in Sonoran Landscapes

## Plants for Attracting Pollinators in Sonoran Landscapes:

From Tucson Audubon Society Guide to Food Rich Landscapes for Birds and People:

These plants support hummingbirds, butterflies, native solitary bees and other pollinators. Some provide food for the larval stage of butterflies and moths.

### Insect pollinated:

#### Small to Medium Shrubs

White-ball acacia *Acacia angustissima*

Sweet bush *Bebbia juncea*

Twin dropseed *Dicliptera resupinata*

Palmer mallow *Abutilon palmeri*

Fairy duster *Calliandra eriophylla*

Butterfly mist *Eupatorium greggii*

Fragrant bee brush *Aloysia gratissima*

Coursetia *Coursetia glandulosa*

Goodding's verbena  
*Glandularia gooddingii*  
(*Verbena gooddingii*)

Desert milkweed *Asclepias subulata*

Feather dalea *Dalea formosa*

Velvetpod mimosa *Mimosa dysocarpa*

Desert broom *Baccharis sarothroides*

Brush dalea *Dalea pulchra*

Desert senna *Senna covesii*

#### Vines

Queen's wreath *Antigonon leptopus*

Virgin's bower *Clematis drummondii*

Arizona passion flower  
*Passiflora arizonica*

Southwest pipevine  
*Aristolochia watsonii*

## Hummingbird pollinated:

### Trees

Desert willow *Chilopsis linearis*

### Large Shrubs

Wolfberries *Lycium* spp.

### Small to Medium Shrubs

Desert honeysuckle  
*Anisacanthus thurberi*

Flame anisacanthus  
*Anisacanthus quadrifidus*  
var. *wrightii*

Smooth bouvardia *Bouvardia*  
*glaberrima*

Fairy duster *Calliandra*  
*eriophylla*

Chuparosa *Justicia*  
*californica*

Red justicia *Justicia*  
*candicans*

Mexican honeysuckle  
*Justicia spicigera*

Parry penstemon *Penstemon*  
*parryii*

Firecracker penstemon  
*Penstemon eatonii*

Hummingbird trumpet  
*Zauschneria latifolia* (*Z.*  
*californica*)

### Cacti, Succulents, Yuccas, Other Accent Plants

Ocotillo *Fouquieria splendens*

### Vines

Snapdragon vine *Maurandya antirrhiniflora*

## Night pollinated:

### Small to Medium Shrubs

Sundrops *Calylophus*  
*hartwegii* (sphinx moth larval  
source)

Sacred datura *Datura wrightii*  
(sphinx moth)

Tufted evening primrose  
*Oenothera caespitosa*  
(sphinx moth)

### Cacti, Succulents, Yuccas, Other Accent Plants

Palmer agave *Agave palmeri*  
(bat)

Shin dagger *Agave schottii*  
(bat)

Saguaro *Carnegiea gigantea*  
(bat and bird)

Night-blooming cereus  
*Peniocereus greggii* (sphinx  
moth)



# Resources: Water Harvesting and Irrigation

## **Books and Publications and Websites:**

- Introduction to Permaculture – Bill Mollison
- Rainwater Harvesting for Drylands and Beyond Volumes 1 & 2 – Brad Lancaster
  - <http://www.harvestingrainwater.com/>
- The Sonoran Permaculture Guild
  - <http://www.sonoranpermaculture.org/>
- Harvesting Rain Water for Landscape Use
  - <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1344.pdf>
- City of Tucson Rain Water Harvesting Guide
  - [https://www.tucsonaz.gov/files/water/docs/Rainwater\\_Harvesting\\_Guide.pdf](https://www.tucsonaz.gov/files/water/docs/Rainwater_Harvesting_Guide.pdf)
- Landscape Watering by the Numbers
  - [http://www.chandleraz.gov/Content/WC\\_LandscapingWateringbyNumbers.pdf](http://www.chandleraz.gov/Content/WC_LandscapingWateringbyNumbers.pdf)
- Watering Trees and Shrubs
  - <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1298.pdf>
- Irrigating Citrus Trees
  - <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1151.pdf>
- Tucson Audubon Society Guide to Food Rich Landscapes for Birds and People
  - [http://www.tucsonaudubon.org/images/stories/urban\\_habitat/TAS-Landscaping-Guide-130728-web.pdf](http://www.tucsonaudubon.org/images/stories/urban_habitat/TAS-Landscaping-Guide-130728-web.pdf)
- City of Tucson Recommended Irrigation Tips
  - <https://www.tucsonaz.gov/water/irrigation-schedule-tips>
- Guidelines for Landscape Drip Irrigation Systems
  - [http://www.amwua.org/pdfs/drip\\_irrigation\\_guide.pdf](http://www.amwua.org/pdfs/drip_irrigation_guide.pdf)

## **Low Water Use Landscaping Plant Lists:**

- <http://www.amwua.org/plants/>
- <http://www.azwater.gov/azdwr/WaterManagement/AMAs/LowWaterUsePlantList.htm>