

Make Your Vegetable Plants The Happiest They Can Be  
With These Helpful Tips

- **Beans (Fabaceae Family)**
  - Beans prefer full sun, but tend to not be fussy about their soil. I sow seeds directly well after danger of last frost. Plant pole beans on the same trellis as peas after the spring harvest is done. Plant bush beans with potatoes (see image 3).
  - Feeding – To increase yields of legumes use an inoculant when planting. Your local nursery should have this in supply. Otherwise, beans don't need much as far as fertilizers.
  - Plant Spacing – 5-6” apart
  - Mulching – Not necessary.
  - Friends in the Garden – See images 1 & 2 for 3 sisters planting with corn & squash. See image 3 for planting bush beans in the potato patch. Pole beans & peas are happy to share the trellis space in each other's off season. Plant peas in early spring several weeks before last frost. When the last pea harvest is being collected, plant pole beans. Start the fall crop of peas when the beans are finishing up for the season. Never a dull moment on the pea & pole bean trellis!
  
- **Beets (Chenopodiaceae Family)**
  - Beets are one of our cold weather friends. They can be started early in the spring in your cold frames or row covers with other cold weather roots such as carrots, kohlrabi, and onions (see images 4 & 5). Beets are a great whole food with edible leaves & root!
  - Feeding – not necessary
  - Plant Space – 3-4” apart
  - Mulch – Keep the roots cool with some straw mulch. Beets don't want to get hot, so give them a shade cloth on hot days.
  - Friends in the Garden – Beets like all their cold weather friends like carrots, onions, & kohlrabi. They are family with leafy greens such as spinach, lettuce & chard. Avoid planting with pole beans. See image 4 & 5 for a helpful guide to planting beets.
  
- **Broccoli (Brassica Family)**
  - Broccoli is one of those great cold weather plants that you can get 2 crops out of, one in spring & one in the fall. For Fall harvest, sow seeds indoors 12 weeks before 1<sup>st</sup> frost & transplant outdoors 8 weeks before first frost.
  - Feeding - Broccoli is a heavy feeder, so dress with a good compost a few weeks before planting. If yellowing of the leaves occurs fertilize with a nitrogen rich fish emulsion.
  - Plant Space – 15” apart in all directions.
  - Mulch baby broccoli with straw.
  - Friends in the Garden – Try aromatic plants such as dill, celery, chamomile, sage, peppermint parsley, & rosemary. Broccoli also like potatoes, beets & onions. Add beneficial flowers to your broccoli patch including members of the Aster family (zinnias, asters, & marigolds). Avoid planting with tomatoes, pole beans, and strawberries.
  
- **Cabbage (Brassica Family)**
  - Cabbage is another of those great cold weather plants that you can get 2 crops out of, one in spring & one in the fall. For Fall harvest, sow seeds indoors 8 weeks before 1<sup>st</sup> frost & transplant outdoors when 4 weeks old.
  - Feeding – Enrich soil with a good aged manure before planting. One month after planting, spray the plants with fish solution. Mix solution a little weaker than recommended on the bottle.
  - Plant Space – 10-12” apart
  - Mulch with straw to prevent weeds.
  - Friends in the Garden - Try aromatic plants such as dill, celery, chamomile, sage, peppermint parsley, & rosemary. Cabbage also like potatoes, & onions. Hyssop repels the white cabbage butterfly & attracts beneficial pollinators increasing yields in the garden. Avoid planting with tomatoes, pole beans, and strawberries.

- ***Carrots (Apiaceae Family)***
  - Carrots are another cold weather plant. They suffer if their soil is too warm. Carrots can also have 2 plantings, one in the spring & one in the fall. Here in Colorado, try planting carrots from seed in the garden around August 1<sup>st</sup>. Plant in a sunny winter spot and protect plants with a row cover and straw mulch after 1<sup>st</sup> frost. The carrots store themselves in the ground & wait patiently to be picked all winter long.
  - Feeding – Carrots are light eaters & it is not recommended to fertilize carrots. For best soil conditions, add some sand to the soil, so carrots don't have to work so hard to produce their root underground.
  - Plant Spacing – Thin Plants to 2-3” apart.
  - Mulch – After seeds have been sprouted & thinned, cover lightly with grass clippings. Straw can be too heavy & unnecessary for the hardy carrot.
  - Friends in the Garden – Carrots love their other root buddies such as beets & onions (see image 5). Onions also help to repel carrot fly. Plant carrots with tomatoes, too (see image 8). Other friends are leaf lettuce (works in the cold frame), chives, leeks, radishes (another cold frame friend), rosemary, sage, parsley, asparagus, marigolds & nasturtiums. Peas love carrot, too, because carrot root contains an exudate beneficial to the growth of the peas.
- ***Cucumbers (Cucurbitaceae Family)***
  - Cukes need full sun & warm well drained (almost sandy) soil. Plant out a couple weeks after last frost. In Colorado, be safe & plan for June 1<sup>st</sup>. Snip the vines when they are 3' long so the plant puts energy into fruits & not leaves.
  - Feeding – When vines reach 1 foot long, fertilize with fish emulsion. Repeat once a month there after.
  - Plant Spacing – Save space with trellises & plant cukes 18” apart. If you let them run around, space them 30” apart.
  - Mulch – Use a generous amount of straw.
  - Friends in the Garden - Put cukes in your squash patch either trellised or running loose on the ground. Cukes also like beans, peas, radishes & sunflowers. Try to plant a few radishes in with the cukes & don't pull them up. Leave the radishes so they can flower & go to seed because they will repel the cucumber beetle. Nasturtiums also look pretty in the cucumber patch while attracting beneficial pollinators who will increase your yield. Keep your cucumbers separated from potatoes & aromatic herbs.
- ***Eggplant (Solanaceae Family)***
  - Plant Eggplants outside 2 weeks after last frost. Plan on June 1<sup>st</sup>. They like full sun & a well drained soil. Give each plant a good shovelful of compost in the hole before planting.
  - Feeding – Fish emulsion spray monthly.
  - Plant Spacing – 15” apart
  - Mulch – Scatter grass clippings for nitrogen at the base of the plant, then cover with several layers of newspaper or cardboard.
  - Friends in the Garden – Eggplant likes to hang out with other members of their family such as tomatoes & peppers. Plant eggplant with aromatic herbs & marigolds.
- ***Kale (Brassica Family)***
  - Kale is one of the easiest & most nutritious plants you can grow. Grow year round in your cold frames & row covers.
  - Feeding – Kale is a heavy feeder. Foliar feed monthly with fish emulsion.
  - Plant Spacing – 7-8” apart
  - Mulch – Straw to keep roots warm when growing in the cold season.
  - Friends in the Garden – Kale grows well with all the other cold weather plants in your cold frames & row covers including carrots, beets, spinach, greens, and garlic.

- ***Lettuce & Greens (Asteraceae Family)***
  - Give your lettuce a little shade for a happy plant. Plant seeds several weeks before last frost & protect them in your well ventilated cold frame or row cover. See image 6 for tips on harvesting.
  - Feeding – not necessary
  - Plant Spacing – Scatter & thin 3-7” according to specifications.
  - Mulch – Mulch to protect leaves from touching the soil when forming. If you have slugs, though, don't bother.
  - Friends in the Garden – Lettuce likes strawberries, cukes, carrots & radishes (a couple cold weather friends). Plant lettuce on the north side of its friends to give as much shade as possible on those hot afternoons under the sun. When I plant garlic in the fall, I sprinkle lettuce seed over my garlic bed. In spring, the lettuce comes up with the garlic and these are my first tender spring greens.
- ***Melons (Cucurbitaceae Family)***
  - Watermelon, cantaloupe, honeydew, & muskmelon are fun, but difficult food to grow. They like a nice long growing season & sandy well drained soil. Do not plant outside until soil temperatures are at 70\* F. Put a piece of wax paper under melons to keep worms from eating the fruit from the bottom. Melon leaves are rich in calcium, so use them in your compost. One month before 1<sup>st</sup> frost snip off tiny green melons & buds to channel energy into the more mature melons.
  - Feeding – Melons are heavy feeders, so fertilize with bone meal or rock phosphate when planting. Fish fertilize every 2 weeks thereafter.
  - Plant Spacing – Plant 3 seedlings at least a foot apart per hill. Plant hills 3 feet apart. Melons will run all over this area.
  - Mulch - Plant dwarf white clover as a ground cover, melons will be their own mulch in no time.
  - Friends in the Garden – Melons like to hang out with their viny family members including squash, cukes, & pumpkins. All these family members have the same pests, so crop rotate them together every year. They also like sunflowers, which can grow tall enough to survive the rugged melon patch. Avoid planting near potatoes.
- ***Onions (Liliaceae Family)***
  - Onions to the rescue. Plant them wherever you want because its beneficial to have a few in each bed for pest control. Go with sets of onions instead of seeds for easy & assured success. Make sure soil is loose & comfortable for the little underground onions to form properly. Onions are another cold weather friend, so start them early in your row covers 7 cold frames.
  - Feeding – When onion tops reach 8” tall the bulbs are just getting moving under the soil, so fertilize with fish emulsion.
  - Plant Spacing – 2-3” apart
  - Mulch – not necessary, but keep the area well weeded.
  - Friends in the Garden – Almost everyone loves onions, plant them all over. Avoid planting them with peas & beans, though. Onions love their cold weather friends, so put them in your cold frames & root covers to harvest onions year round. An old school companion planting move is to put onions in with your rose beds. See image 5 for a helpful guide on onions & their friends in the garden.
- ***Peas (Fabaceae Family)***
  - Peas are cold weather friends, so get them in the soil as soon as you can work it. Try planting them several weeks before last frost. They are also a great candidate for spring & fall planting with pole beans on the trellis in the summer. Never a dull moment on the trellis with peas & beans alternating. Always put pea vines in the compost for their nitrogen.
  - Feeding – Not necessary, but use a legume inoculator on all peas & beans seeds. Ask your local nursery for supplies because it should be easy to find.
  - Plant Spacing – Climbing peas should be 2-4” apart.
  - Mulch – a few inches of straw to keep your soil temps cool.

- Friends in the Garden – Pole Beans & Peas are old friends because they have similar soil needs & climbing requirements. When spring harvest of peas is done, beans are ready to go in. When pole beans are finishing up, it's time for your fall planting of peas. Peas also like carrots, turnips, radishes, cukes, corn, potatoes, & aromatic herbs. Avoid grouping with onions, garlic & gladiolas.
- **Peppers (*Solanaceae*)**
  - Peppers like it hot. Make sure soil & night air temps are above 55\* F. Peppers like warm, fertile, well drained soil. See image 7 for how to keep peppers warm on troublesome cool nights.
  - Feeding – When planting young pepper plants, they benefit from a slightly acidic soil, so try an old trick of scattering ½ a pack of matches in the whole where you intend to put your young pepper plant. Cover the matches with 2“ of soil & then put the pepper plant in. The sulfur from the matches helps to lower the ph a little. When flowers start coming in fertilize with fish emulsion. Also, apply an Epsom Salt mixture (1 teaspoon to 1 Qt of water) to the leaves. The Epsom provides some extra magnesium which encourages fruit set.
  - Plant Spacing – 10-12” apart.
  - Mulch – Straw
  - Friends in the Garden – Peppers like other members of their family like tomatoes & eggplant. Peppers also like basil, which makes for a nice bed for all your Italian dishes. Okra is another plant that gets along well with peppers. Okra can act as a windbreak for the fragile pepper plants.
- **Potatoes (*Solanaceae Family*)**
  - See image 3 for suggested planting method. Plant seed potatoes 4-6 weeks before last frost in the spring. Potatoes are another great cold weather food that can be enjoyed & stored all winter. Avoid light exposure. Light encourages the potato to turn green & release a poisonous alkaloid known as solanine. Do not eat green potatoes.
  - Feeding – Not necessary
  - Plant Spacing – Space seed potatoes 1' apart in 1' deep trenches.
  - Mulch – Mulch with straw as plants grow to provide a bigger hill for potatoes to fruit in.
  - Friends of Potatoes – Bush Beans, bush beans, bush beans. See image 3. Beans & potatoes are known to repel each other's pests. Potatoes also like beans, cabbage, horseradish, eggplant & marigold. Avoid combining with pumpkins/squash, onions, tomatoes, raspberries, cucumbers, & sunflowers.
- **Winter Squash & Pumpkins (*Cucurbitaceae Family*)**
  - These guys need a lot of room in the garden. Winter squash are great for winter storage, though. Keeping squash from perishing quickly requires some attentiveness. When harvesting squash it is easy to accidentally twist off the stem. Be mindful when harvesting to leave 2-3 inches of stem by carefully harvesting with pruners. Bring in all squash before the first frost & lay them out to dry for a couple weeks in a warm place. Make sure that they are not touching when they are in this drying period.
  - Feeding – Winter Squash are greedy feeders, so mix in some good compost where you are planning to plant before sowing seeds or transplanting. Fertilize monthly with fish emulsion.
  - Plant Spacing – Similar to the melons, give them a lot of space. Plant 3 seedlings at least a foot apart per hill. Plant hills 3-6' apart. Squash will run all over this area.
  - Mulch – Mulching in between the plants is important to prevent weed growth. Do a nice ground cover of dwarf white clover which can be tilled in for extra nitrogen in the fall. Another beneficial ground cover is buckwheat which attracts the essential pollinators to the pumpkin patch.
  - Friends in the Garden – Because of the rampant rambling vine growth of the squash, it doesn't have much company besides others in its family such as melons & cucumbers. See images 1 & 2 for the ancient wisdom of 3 sisters planting in your garden which combines squash, corn & beans in one healthy bed. Try planting a couple of radishes & let them go to seed in the squash patch to repel insects.

- ***Spinach (Chenopodiaceae Family)***
  - Another hardy cold weather plant for your cold frames & row covers. Our spinach survives the winter with almost no protection from the tough Colorado conditions. See image 6 for tips on harvesting.
  - Feeding – Not necessary. Fish emulsion if you feel inclined.
  - Plant Spacing – Thin to 4” apart.
  - Mulch – Straw to keep roots cool.
  - Friends in the garden – Spinach goes great in the cold frame with its other cold weather friends. To keep the crop going all summer, plant it in the shady spots with other leafy greens & lettuces.
- ***Summer Squash (Cucurbitaceae Family)***
  - More compact & not for winter storage, zucchini, yellow crook neck, & scallop squash are heavy producers all season. Zucchini especially does not know when to quit, so don't plant more than 1 or 2. Wait until all chance of frost is over & soil is about 75\* F before planting out.
  - Feeding – Work in a good amount of compost before planting & these summer squash should be fine. I do tend to fertilize them anyway every month with fish emulsion.
  - Plant Spacing – Plant 2-3' apart.
  - Mulch – Straw
  - Friends in the Garden – Summer squash like to hang out with their viny family members including squash, cukes, & pumpkins. All these family members have the same pests, so crop rotate them together every year. See images 1 & 2 for the ancient wisdom of 3 sisters planting in your garden which combines squash, corn & beans in one healthy bed. Try planting a couple of radishes & let them go to seed in the squash patch to repel insects.
- ***Swiss Chard (Chenopodiaceae Family)***
  - Too beautiful not to plant. Another cold weather friend who can be planted in season extending techniques such as cold frames & row covers. Can grow in a shady spot, but needs at least 5 hours of sun a day. Chard can give you two crops, one in the spring & one in the fall. In the spring sow seeds 2-4 weeks before last frost. For fall crop, sow seeds 6 weeks before first frost. See image 6 for tips on harvesting.
  - Feeding – Not necessary. To maintain plants for all season, fertilize with fish emulsion.
  - Plant Spacing – 4” about. Use thinned baby chard for salad greens.
  - Mulch – Grass clippings
  - Friends in the Garden – Plant with its other cold season friends in the cold frame & row covers. Plant all over the garden for extra color.
- ***Tomatoes (Solanaceae Family)***
  - Last but not least...The one we all want...Tomatoes! Nothing at the grocery store even comes close to a fresh picked tomato. As coveted as the tomato is its one of the more challenging to grow successfully. They are susceptible to numerous diseases, bugs love 'em, and their nutrients & temperature requirements need monitoring throughout the season. With all that said, they're still worth every bit of effort when you harvest that first heirloom tomato...or go out and pick that bowl full of cherry tomatoes for a snack...or, a favorite around our house, the first tomato sandwich.
  - Tomatoes need fertile, well drained soil with a ph from 6.0-7.0, and require at least 8 hours of sun light. Don't plan on transplanting baby tomato plants out until June 1<sup>st</sup>. There are some early hardy Colorado climate varieties such as Stupices, but otherwise it is best to wait until soil & air temps are consistently above 55\* F. Tomato plants can grow roots all up & down their stem, so plant them deep. Take of the lowest set or two of leaves & plant them up to their necks in the dirt. Some people recommend lying the tomatoes down in the whole to get the best root production, but I will leave this technique up to you.
  - Feeding – Tomatoes are greedy feeders. Make sure that they are planted in soil with a good amount of aged manure & then foliar feeding with fish emulsion every two weeks is recommended.

- Water generously. About 1 ½ inches per week should work & never ever let transplants dry out. Many problems can be avoided by having a strong well watered & fed plant.
  - Plant Spacing – I suggest using cages or trellises. Last year my tomatoes got so heavy on the vine that the cages were just being pulled down & we went to trellises for extra support. If you are planning on supporting them 2-3' of space is usually fine. If you let them run on the ground (not recommended) then give them at least 4 feet around.
  - Mulch – Straw works.
  - Friends in the Garden – Tomatoes go well with most others in their family such as peppers & eggplant. Basil also goes great both as a friend to this garden bed & also for culinary reasons. See image 8 for guidance in planting tomatoes with their good old friends, carrots. Do not plant with potatoes & any members of the Brassica family such as cabbage, broccoli, kohlrabi, etc.
  - Tobacco can transmit diseases to tomato plants, so always wash your hands before working in the garden.
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- A quick plug for Borage. It is a beautiful beneficial plant/herb for the garden. Borage is an excellent provider of the good organic nutrients the garden loves such as potassium & calcium to name a few. Borage has beautiful pink, purple, & blue edible star shaped flowers that are a refreshing candy treat when working in the garden. These flowers are not only a tempting treat for me, but the honeybees & beneficial pollinators we all love will flock to your garden (try borage in the squash patch with pumpkins & cukes, its tough enough for that crowd & offers a nice contrast to the yellow squash flowers). It is a hardy perennial that needs no attention except water. Give it a try all over your garden or orchard & I'm sure you won't be disappointed.

## Three Sisters Methods of Planting Corn, Beans, & Squash

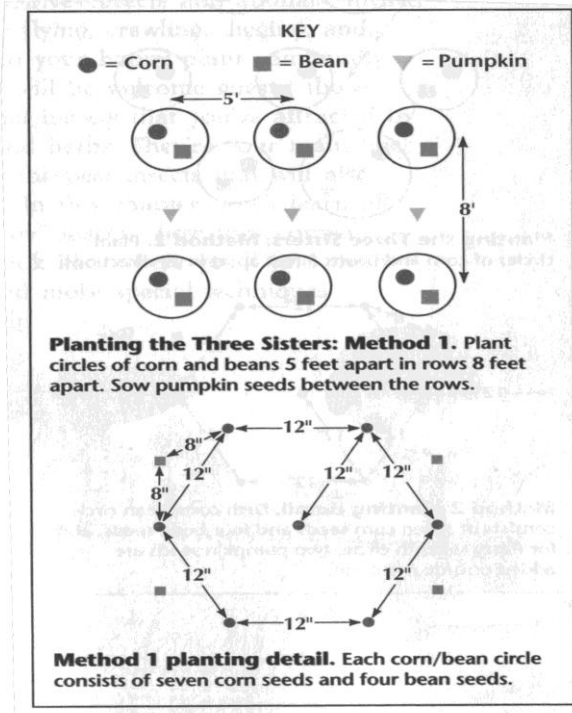


Image 1

### Method 1

(Source *Great Garden Companions*)

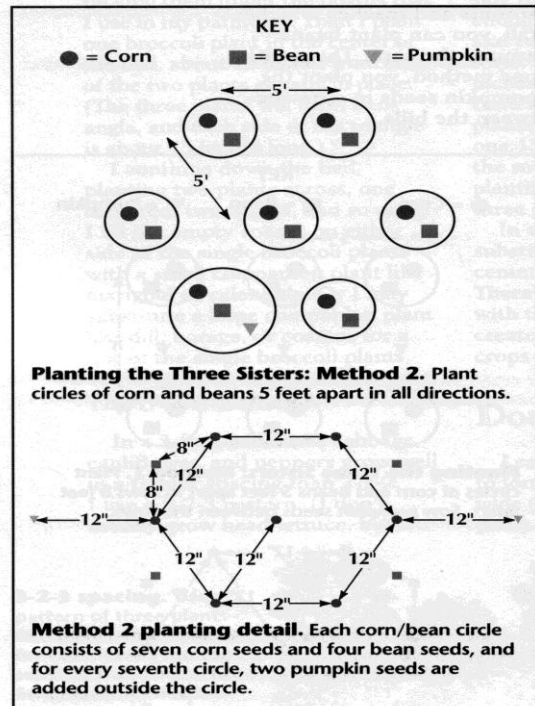


Image 2

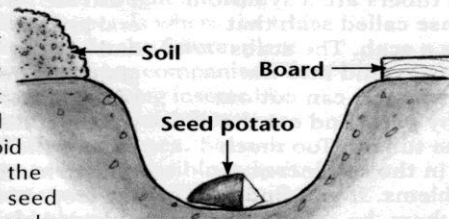
### Method 2

(Source *Great Garden Companions*)

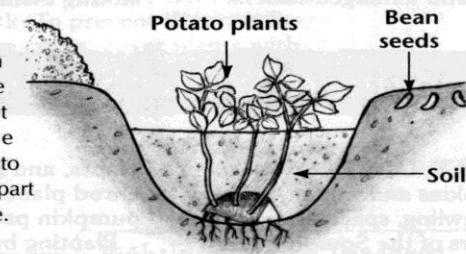
### The Potato-Bean Duo

Potatoes and beans are my favorite set of insect-discouraging companions. After trying several planting arrangements, I've found the most logical method is planting potatoes side by side with bush beans.

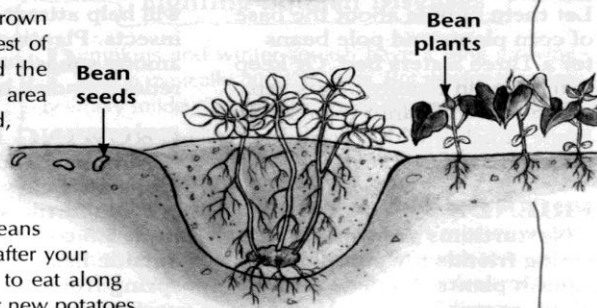
**1** Dig 12-inch-deep trenches 3 feet apart for the amount of potatoes you want to grow (my rule of thumb is 20 to 30 feet of row per potato eater). Stand on a board as you work to avoid compacting the soil. When the trenches are finished, put seed pieces cut side down in the trenches, 12 inches apart, and then cover them with several inches of soil.



**2** Once the potatoes have grown up through the soil in the trench, it will be time to plant beans along one side of the trench. I just push the beans into the loose soil about 4 inches apart in a band about 12 inches wide.



**3** When the potatoes have grown 4 more inches, push the rest of the loose soil up around the potato plants. Level off the area when the soil was heaped, and plant bean seeds there as you did before.



Your second planting of beans should be ready to pick soon after your first crop finishes, just in time to eat along with your first harvest of tender new potatoes.

Image 3  
Companion Planting Potatoes & Beans  
(Source *Great Garden Companions*)

Beets and kohlrabi make good companions. Both take the same kind of culture too, and they take soil nourishment at different levels.

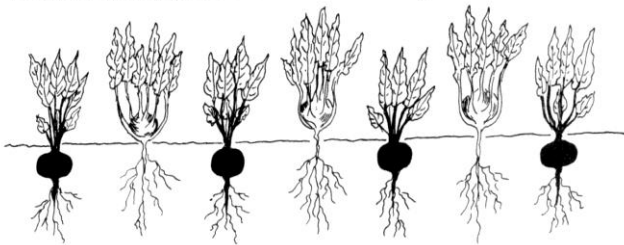
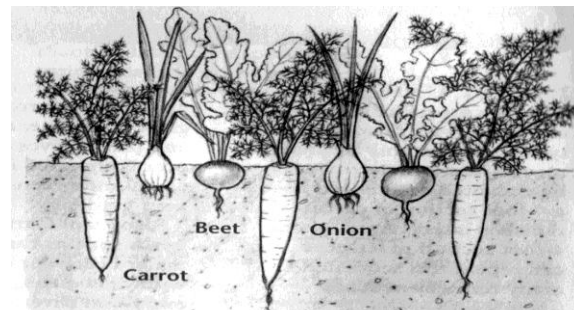


Image 4  
Companion Planting Beets & Kohlrabi  
(Source *Carrots Love Tomatoes*)

Image 5  
Companion Planting Roots  
(Source *Great Garden Companions*)



**Interplanting root crops.** To really mix up the crops in a bed, try interplanting onions, carrots, and beets in each crop row. Space the plants 3 to 4 inches apart in the row, and space rows 3 to 4 inches apart as well.



### Cut-and-Come-Again Lettuce

It always surprises me to learn that some gardeners wait patiently for lettuces to be all grown up before they make a salad! Perhaps I'm impatient, but I only let my lettuce grow for a few weeks before I harvest my first salads. I use the cut-and-come-again method, which encourages lettuce to keep sending out tender new leaves. I just use sharp garden shears or sharp scissors to shear off the leaves 1 to 2 inches above the soil level. This technique works for lettuces, spinach, endive, Swiss chard, and all their relatives! If you harvest

frequently, you can stop these leafy greens from setting seed and even *thinking* about quitting for the season.

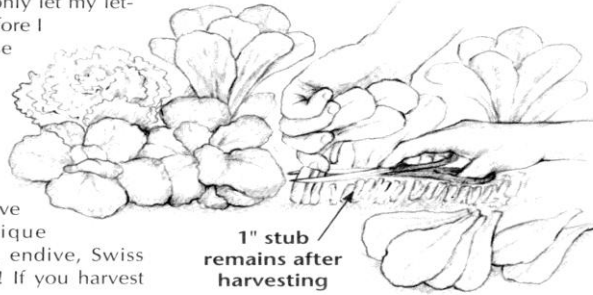


Image 6  
Harvesting Greens  
(Source Great Garden Companions)

Image 7  
Keeping the Plants Warm  
(Source Great Garden Companions)

### Ring Around the Peppers

I make my own plant shelters for peppers using empty plastic 2-liter soda bottles. It takes 12 bottles to make one shelter (ask your friends to save bottles for you). I set up the bottles in a ring and tape the bottles together with duct tape, taping around both the outside and the inside of the ring. After planting pepper transplants, I place a ring around each plant and fill the bottles with water. The water absorbs heat during the day and releases it at night, helping protect the plants on cold spring nights. Eggplants and tomatoes appreciate these plant shelters, too!

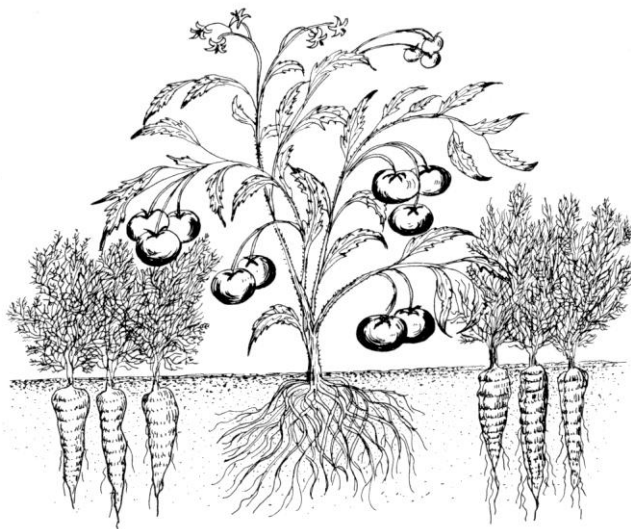
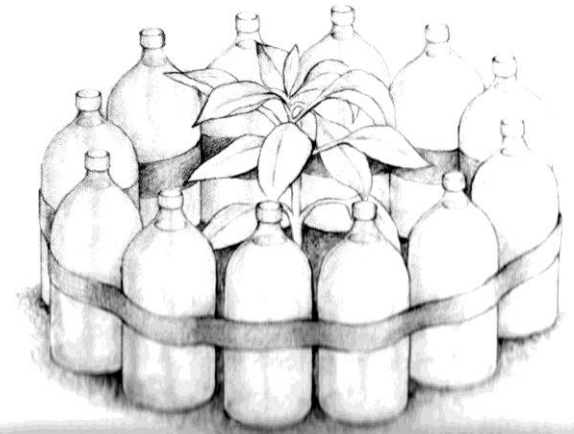


Image 8  
Companion Planting Carrots & Tomatoes  
(Source Carrots Love Tomatoes)

## Works Cited

Ashworth, Suzanne. Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners.

Decorah: Seed Savers Exchange, 2002.

Coleman, Eliot. Four Season Harvest: Organic Vegetables From Your Garden All Year Long. White

River Junction: Chelsea Green Company, 1992.

Cunningham, Sally Jean. Great Garden Companions: a Companion Planting System for a Beautiful,

Chemical Free Vegetable Garden. Emmaus: Rodale P, 1998.

Pleasant, Barbara. "America's Favorite Tomatoes." Mother Earth News Feb.-Mar. 2008: 62-66.

Riotte, Louise. Carrots Love Tomatoes: Secrets of Companion Planting for Successful Gardens.

Charlotte: Garden Way, 1975.