

# GROWING GUIDE

*For*  
The **Three Sisters** Garden



An Ancient Intercropping Strategy

### The Story of the Three Sisters

**Corn**, the oldest sister, was said to grow strong and proud. **Squash**, the youngest sister, crouched at the feet of the other two, keeping them protected from predators. **Beans**, the middle sister leaned on her older sister for support and twined the three together.

### How this growing strategy works:

The naturally sturdy stalks corn plants provide a natural trellis for the beans to grown on. Proper planting of corn requires that it be planted some distance apart for better pollination (*hand pollination is a good idea*). Squash is planted in the spaces, the squash leaves shade the soil, assist in preventing weed growth, reduces moisture loss and deter animal pests. Beans have the remarkable ability to fix atmospheric nitrogen due to a bacteria living on their roots and make it available not only to itself, but the other two. Since both corn and squash are heavy feeders, the beans help keep them supplied with food. Legend has it that some native North American cultures buried fish in the mounts as a method of fertilization.

### Nutritional Benefits:

#### Corn

Generic Values
Serving: <i>small (5-6')</i>
Calories 63
Fat <0.9 g
Cholesterol 0 mg
Sodium 11 mg
Carbohydrates 13.9 g
Fiber 2 g
Protein 2.4 g
Calcium 1.5 mg
Potassium 197 mg

#### Beans

Generic Values
Serving: <i>½ Cup</i>
Calories 15
Dietary fiber 1.6 g
Protein 1 g
Carbohydrates 3.5 mg
Vitamin A 340 IU
Vitamin C 7.5 mg
Folic Acid 21 mg
Calcium 31.5 mg
Iron .4 mg
Potassium 94.5 mg

#### Squash

Generic Values
Serving: <i>Cup cubed</i>
Calories 63
Fat 0.1 g
Cholesterol 0 mg
Sodium 6 mg
Carbohydrates 16.4 g
Fiber 2.8 g
Protein 1.4 g
Calcium 67.2 mg
Potassium 492.8 mg

In reviewing the nutritional benefits of the Three Sisters you will find corn supplies carbohydrates and a variety of important amino acids; beans have protein, including two essential amino acids that corn lacks, and squash contributes vitamin A. Squash seeds also contain quality fats that corn and beans lack.

### Creating your Three Sisters Mound

**Sun:** These three varieties all require full sun, 6 to 8 hours a day, so confirm you receive sufficient sun. Make sure that your area past any potential for frost.

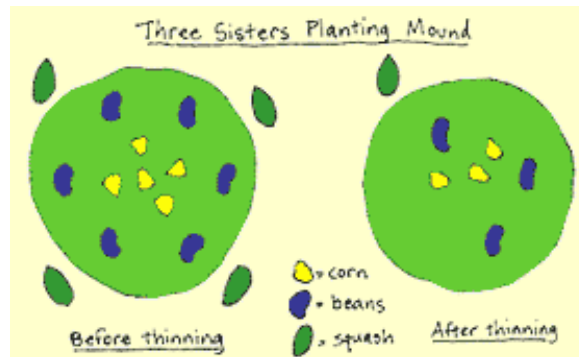
**Soil:** Make sure you prepare the soil as you would for any gardening effort. Build a mound a minimum of 12” high, preferably 18” and approximately three feet in diameter. (You can decide if you want to include the “fish” option in one or all of your mounds.) If you are in a dry area flatten the top of the mound, with a slight depression, to prevent run-off and allow for better capture of water. If you are creating multiple mounds make sure you have three to four feet between mounds in all directions.

#### Planting Directions:

**Corn** – start by soaking seven or eight seeds (for each mound) overnight prior to planting them the following day; plant approximately six inches apart in the center of each mound. You will thin to three or four seedlings – *tradition states that the Native people would honor the “Four Directions” by orienting the corn seeds to the north, south, east and west.*

**Beans** – after a week or two the corn should be at least four inches high. Soak six of your pole beans overnight and plant the next day in a circle approximately six inches away from the corn. Again you will thin your bean seedlings to three or four.

**Squash** – about the time you are thinning your bean seedlings plant four squash or pumpkin seeds at the base of the mound. Typically it is recommended to thin the squash plant to a single plant.



FUN FOR KIDS TO DO!

#### Experimenting with additional plants:

Some plant sunflowers, Jerusalem artichokes, or Bee Plant surrounding the mound. Other indigenous plants that have been planted nearby by Native Americans include: melon, tobacco, chili pepper, cotton, blueberry, wild rice, hazelnuts, potatoes, and sweet potatoes.

#### Babysitting your Sisters:

**Corn** – As your corn grows gently weed around them and mound the soil around the base of each stem for additional support. When the corn is knee-high it's time for adding additional high nitrogen fertilizer (aged manure or fish emulsion) on the soil surface near each plant.

**Bean** – make sure the tendrils are finding their way to the corn stocks, gently direct them if necessary.

**Squash** – make sure the corn and beans have room to grow by gently directing squash vines into adjacent walkways, garden edges, or between mounds. When you see young fruits fertilize with aged manure or compost. Tip: pinch off tips of squash runners after several fruit starts so the plant will put more energy into producing squash.

Below we have included a generic planting guide for the Three Sisters should you decide to plant them in a traditional garden.

**GENERIC BEAN PLANTING GUIDE**

Planting Depth	Seed Spacing	Row Spacing	Germination Temperature	Germination Time In days	Average Planting Dates	Number of Seeds per foot row	Spacing after thinning	Days to maturity
1 to 1½ “	3”	18-24”	55-75°	7-10	4/5 to 6/10	9	8-12”	65

**GENERIC CORN PLANTING GUIDE**

Planting Depth	Seed Spacing	Row Spacing	Germination Temperature	Germination Time In days	Average Planting Dates	Number of Seeds per foot row	Spacing after thinning	Days to maturity
1 to 1½ “	4-6”	30-36”	50-85°	7-10	5/5 to 7/1	1	8-12”	82

**GENERIC SQUASH PLANTING GUIDE**

Planting Depth	Seed Spacing	Row Spacing	Germination Temperature	Germination Time In days	Average Planting Dates	Number of Seeds per foot row	Spacing after thinning	Days to maturity
½ to 1 “	6-8”	36-48”	60-95°	10-14	5/5 to 7/20	1	2-3” in hill	62

*Your seeds look similar those shown below*



**Corn**



**Bean**



**Squash**

**Should you want to save seeds from your produce**

**Corn**

Female corn flowers are primarily pollinated by wind rather than insects. Because this pollen is light it can be carried great distances, consequently for purity you would need to plant at least a mile apart. Reasonable results can be accomplished with separation of 1,000 feet.

Corn produces both male and female flowers on each plant. Male flowers appear as tassels on the top of the corn stalks and female flowers are pollinated via the silk emerging from each ear.

Corn is susceptible to intense inbreeding depression. If seed is saved from too few plants, subsequent plants may be short, mature late and produce few ears. When growing for seed, grow at least 200 plants and save the seeds from at least 100 of the best. (This is another variety that benefits from archiving seeds processed for long-term storage.)

Corn is typically ready for harvest in 4-6 weeks after eating stage. If the growing season is not long enough, pick ears after husks turn brown. Pull back husks and complete drying in a cool, dry location.

Grip dried ears by hand and twist allowing kernels to fall into a container, any remaining silk and chaff can be winnowed.

## **Bean**

Cross-pollination is possible but is rare so the ideal separation of 150 feet for different varieties is typically not observed. As noted above, beans produce perfect self-pollinating flowers.

Allow pods to dry brown before harvesting, typically this is about six weeks after the eating stage. If frost is a concern, pull the entire plant, root first, and hang it in a cool, dry location until the pods turn brown. Small amounts of pods can be opened by hand. Flail larger amounts removing large chaff by hand or fork winnowing the remaining particles.

## **Squash & Pumpkin**

Squashes from different species can be grown next to each other. Home seed savers grow more than one variety in a single garden by using hand-pollinating techniques. Squash flowers are large and relatively easy to handle pollinate.

Squash contain both male and female flowers on each plant. Female flowers can be identified by locating the ovary (a small looking squash) at the base of the flower. (Some female flowers have stamens)

Squash must be fully mature before being harvested for seed production. This means that summer squashes must be left on the vine until the shell hardens. Allow to 3-4 additional weeks after harvest to ensure further seed ripening.

Chop open the hard-shelled fruits and scoop out the seeds. Rinse and clean in wire strainer with warm running water. Dry with a towel and spread on a board or cookie sheet to complete the drying.

This is a great project for kids to learn about gardening and a bit of our history. A great resource <http://www.kidsgardening.com/growingideas/projects/march02/mar02-pg1.htm>

AATROC'S  
**ESSENTIAL SEEDS**  
*Your Seed Guys*

YOUR NOTES: