

Three Sisters Planting Method: An Indigenous Agricultural Tradition

Riya Pandey, Swagat Ranjan Behera and Richa Thapliyal

Department of Vegetable Science, G. B. Pant University of Agriculture & Technology, Pantnagar – 263 145, Uttarakhand, India

*Corresponding Author: pandeyriya510@gmail.com

The Three Sisters planting method is a time-honoured agricultural technique that has been practiced by the indigenous people of North America for centuries. It involves the interplanting of three main crops, viz. corn (maize), beans and squash. This traditional agricultural system is not only a practical method for enhancing crop yields but also embodies deep cultural and ecological significance. This article delves into the history, principles, procedure, benefits and modern applications of the Three Sisters planting method.

Historical background

The Three Sisters planting method has its roots in the agricultural practices of various indigenous tribes, particularly those in the Eastern Woodlands and Great Plains regions of North America. Some of the tribes that practiced this method include the Haudenosaunee (Iroquois), Lenape, Cherokee and others.

The name, “Three Sisters”, reflects the interdependent relationship among corn, beans and squash in this agricultural system. These crops were considered sacred by many indigenous cultures, and the planting method itself was often accompanied by ceremonial rituals and storytelling.

Principles of the Three Sisters planting method

The Three Sisters planting method is characterized by several key principles, viz.

- i. **Companion planting:** Corn, beans and squash are planted together in close proximity. Each plant serves a specific purpose within the system, and they support each other's growth.
- ii. **Complementary roles:**
 - **Corn (Maize):** Corn serves as the “big or elder sister” in the trio, providing a tall, strong support for the beans to climb. It also creates a natural trellis for the bean vines.

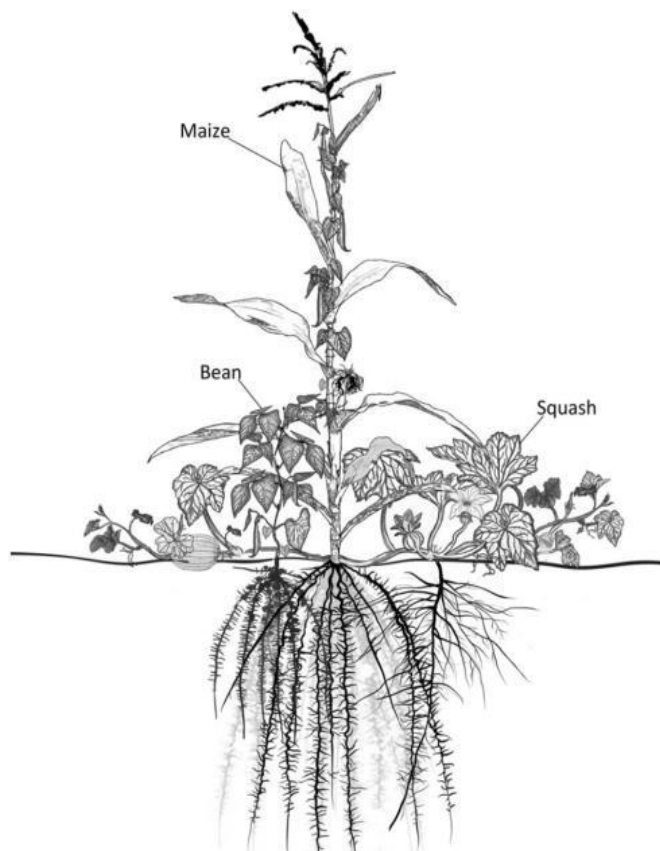


Fig. 1: An illustration of the three sisters – corn, beans and squash

- **Beans:** Beans are the “giving sisters” that fix atmospheric nitrogen in the soil through their root nodules. This nitrogen enrichment benefits both corn and squash, enhancing their growth.
- **Squash:** Squash plants, with their large leaves and sprawling growth habits, serve as the “little sisters”. They create a living mulch (ground cover) that shades the soil, keeping it cool; reduces weed competition and conserves moisture.
- iii. **Polyculture:** The Three Sisters method embraces polyculture or multiple cropping, where multiple crop species are grown together in a single plot. This diversity provides resilience against pests, diseases and environmental fluctuations.

- iv. **Sustainable agriculture:** The interplanting of these three crops is sustainable and minimizes the need for synthetic fertilizers and pesticides. It also promotes soil health and fertility.

Which seeds or varieties to plant?

- i. **Pole beans** (not bush beans): Common pole beans, such as Scarlet Runner or Italian Snap, should work. There are some very vigorous hybrid pole beans which may climb up the thin hybrid corn stalks and pull them down. So, it is better to go for less vigorous climbers to be on the safer side.
- ii. **Corn** such as sweet corn, dent corn, popcorn, or a combination. The modern sweet corn varieties will do, although native American gardeners traditionally used a heartier corn with shorter stalks or many-stalked varieties so that the beans did not pull down the corn.
- iii. **Small-leaved squash**, such as summer squash (zucchini) or winter squash (Hubbard).

(Note: Pumpkins are too vigorous and heavy, therefore, they need to be planted in a separate bed.)

Sometimes, a fourth sister is included, such as a sunflower or amaranth, which attracts pollinators and lures birds away from the seeds. Sunflowers can be planted at the cross-section of the spaces between the corn hills and harvested for seeds. Amaranth could come up among the squash and could be harvested both for greens and for seeds.

How to plant the Three Sisters?

The Three Sisters method has some modifications, but the basic idea is to plant the sisters in clusters on low, wide mounds as opposed to the conventional single row.

- i. The three sisters require plenty of space to grow to their highest potential, and therefore, a sunny area that receives at least 6 to 8 hours of direct sunlight each day should be selected for planting the crops. It is better to visualise a small field as this method of planting does not require rows. With four to six maize plants per hill, each hill will be around 4 ft × 4 ft (120 cm × 120 cm), therefore, the required space should

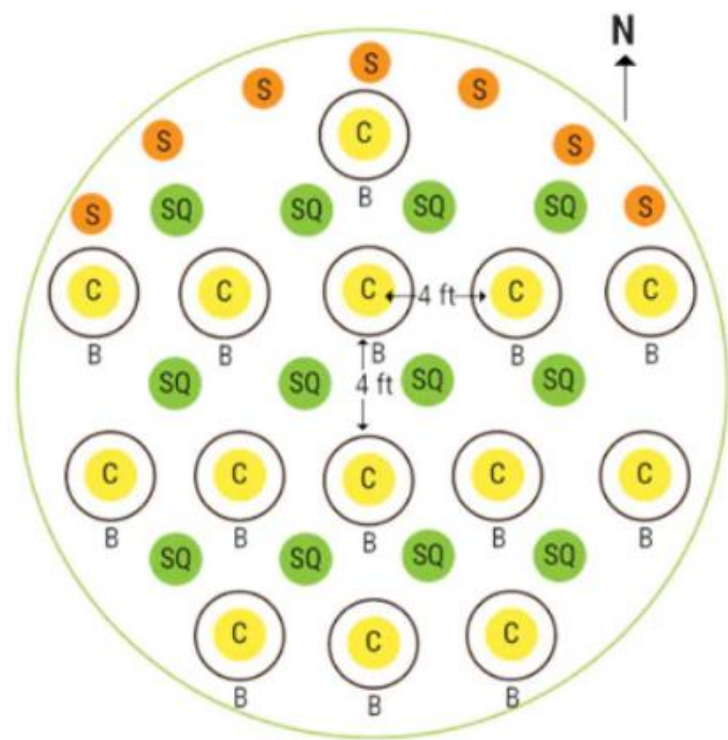


Fig. 2: Garden layout for the Three Sisters planting, (C = Corn, B = Bean, SQ = Squash and S = Sunflower)

be calculated based on this consideration. The plot should not be near any tree, wall or other shaded areas.

- ii. The soil should be prepared with a lot of organic materials, e.g., well-rotten manure or weed-free compost in the spring, since corn is a heavy feeder and the nitrogen from the beans will not be available to the corn during the first year. A near-neutral pH (5.5-7.0) is ideal for growing corn, beans and squash. If necessary, the soil may be amended with lime, gypsum/sulphur and wood ash to get the soil to the right pH.
- iii. A soil mound that is 3 to 4 ft (90 to 120 cm) wide and about a foot (30 cm) high in the centre is created. The centre of the mound should be flat and approximately 10 inches (25 cm) in diameter. The mounds are placed 4 ft (120 cm) apart, if there are several of them. The corn will grow in the mound with beans around the corn, and squash around the beans.

- iv. Once the risk of frost has passed and nightly temperatures reach 13°C (55°F), corn is planted first. About 5-7 seeds are sown in each mound and each seed is evenly spaced about 6 inches (15 cm) apart. The seeds are sown at a depth of about 1 to 1.5 inches (2.5 to 4 cm) and covered with soil afterwards.
- v. Once the corn seedlings are 15-30 cm tall, 3 or 4 larger and stronger seedlings are kept and the others, discarded. The beans and squash should not be planted until the corn plants are 6 inches to 1 ft (15 to 30 cm) tall. This ensures that the corn stalks will be strong and sturdy enough to support the beans.
- vi. The patch should be weeded before planting the beans. Four bean seeds are sown in a circle around the corn at a spacing of 6 inches (15 cm) from the stalk. The depth of sowing may vary depending on the variety chosen.

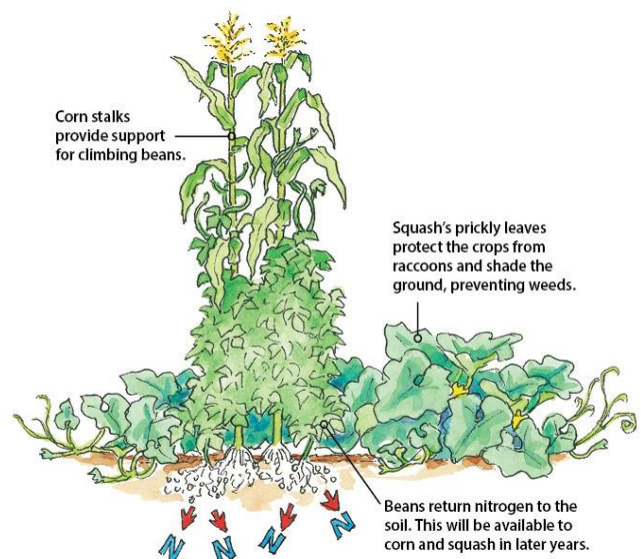
(**Tip:** Coating the bean seeds with *Rhizobium* culture before sowing aids in nitrogen fixation in the soil and benefits all the plants.)

- vii. When little sprouts appear from the bean seeds, about 1 week later, 6 squash (or pumpkin) seeds are sown. The squash needs the maximum sunlight among the three sisters; therefore, care has to be taken that they are not in the shade. The squash seeds are sown about 1 ft (30 cm) away from the beans. If pumpkin is planted in place of squash and there are more than one mound, the pumpkin should be planted in every alternate mound. This will prevent overcrowding of the garden by pumpkin vines.
- viii. The plot is watered about 1 inch (2.5 cm) a week, which is roughly 0.6 gallons (2.3 L) for every 1 ft (30 cm) of the garden.

Benefits of the Three Sisters planting method

The Three Sisters planting method offers a range of benefits, making it an effective and sustainable approach to vegetable farming:

- i. **Enhanced yields:** By planting these three crops together, each plant benefits from the strengths



of the others. Corn provides support for beans, beans enrich the soil with nitrogen and squash

Fig. 3: An illustration of the complementary roles of the three sister plants

shades the soil, reducing weed competition. This symbiotic relationship often results in higher crop yields.

- ii. **Nutritional balance:** Corn, beans and squash complement each other nutritionally. Corn provides carbohydrates, beans supply protein and squash offers vitamins and minerals. This combination creates a balanced and nutritious diet.
- iii. **Soil health:** The rotation of these crops and the nitrogen-fixing ability of beans improve soil fertility over time. This reduces the need for chemical fertilizers, promotes microbial diversity in the soil and enhances soil structure.
- iv. **Pest and weed management:** The Three Sisters system naturally deters some pests because of the interplanting of different crops. Additionally, the mulching effect of squash helps suppress weeds by blocking sunlight from reaching weed seeds.
- v. **Water use efficiency:** The broad leaves of squash act as a natural (living) mulch, reducing water evaporation from the soil as well as its loss through surface runoff. This promotes

water conservation and helps maintain soil moisture.

- vi.* **Resilience to environmental factors:** The combination of these three crops can help buffer against environmental stressors. For example, corn provides some wind protection, while the beans can stabilize the soil.
- vii.* **Cultural significance:** The Three Sisters method is deeply rooted in indigenous cultures and traditions. Its practice serves as a connection to ancestral knowledge and a way to preserve cultural heritage.

Modern applications and adaptations

The Three Sisters planting method is not limited to historical or indigenous contexts. It has gained recognition and adoption in modern agriculture for its sustainable and ecological benefits. Here are some ways in which this traditional method is applied today:

- i.* **Sustainable farming:** Many small-scale farmers and community-supported agriculture (CSA) initiatives embrace the Three Sisters method as part of their commitment to sustainable and regenerative farming practices.
- ii.* **School and community gardens:** Educational programmes and community gardens often use the Three Sisters planting method to teach children and community members about sustainable agriculture, indigenous culture and the importance of local food production.
- iii.* **Restoration agriculture:** Some ecological restoration projects use the Three Sisters method to reintroduce native plant species and promote biodiversity in disturbed ecosystems.
- iv.* **Crop rotation:** Crop rotation schemes that incorporate corn, beans and squash can help conventional farmers improve soil fertility, reduce the need for synthetic inputs and gain additional income from a limited space.
- v.* **Home gardening:** Home gardeners and enthusiasts have also adopted the Three Sisters



Fig. 4: Three Sisters planting adopted in a home garden for maximizing small spaces

method as a way to maximize space and promote sustainable gardening practices.

Challenges and considerations

While the Three Sisters planting method offers numerous advantages, it also presents some challenges and considerations, some of which are listed below:

- i.* **Crop compatibility:** Not all varieties of corn, beans and squash are compatible for the Three Sisters method. Some experimentation may be needed to find the most suitable combinations for specific climates and soil types.
- ii.* **Spacing and layout:** Proper spacing and arrangement of the three crops are essential for success of this method of planting. Overcrowding can lead to competition for resources (nutrients, sunlight and water) and reduced yields.
- iii.* **Pest and disease management:** While the Three Sisters method can deter certain pests, it may not be entirely pest-proof. Integrated pest management practices may still be necessary.
- iv.* **Cultural sensitivity:** When adopting this method outside of indigenous contexts, it is crucial to do so with cultural sensitivity and respect for its origins. It is important to

acknowledge and honour the cultural significance of this tradition.

Conclusion

The Three Sisters planting method is a remarkable example of sustainable and companion planting that has deep cultural roots and enduring ecological benefits. Its principles of interdependence, diversity and soil health offer valuable lessons for modern agriculture and ecological restoration efforts. Whether practiced in small-scale gardens, community farms, or as part of a broader commitment to sustainability, the Three Sisters method reminds us of

the wisdom embedded in indigenous agricultural traditions and their relevance in addressing contemporary challenges in agriculture and food security.

References

- <https://www.groworganic.com/blogs/articles/three-sisters-companion-planting-method>
- <https://www.almanac.com/plant/corn>
- Boeckmann, C. (2023). How to Plant a Three Sisters Garden.<https://www.almanac.com/content/three-sisters-corn-bean-and-squash>

* * * * *