Isolation Techniques

Learn how to protect your open-pollinated seed varieties from unwanted cross-pollination using 3 simple and practical techniques: spatial isolation, temporal isolation, and mechanical barriers with insect netting.



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Protecting the Purity of Our Seeds

In the village or on the market garden perimeter, many neighbors grow vegetables similar to yours.

If wind or bees carry pollen between two different varieties, your seeds will lose their qualities!

To keep a seed true-to-type, we must isolate it.

In this module, we will discover 3 very simple ways to prevent undesirable cross-pollination!

First method: Spatial isolation (distance)



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The most natural way to prevent cross-pollination is to separate plots!

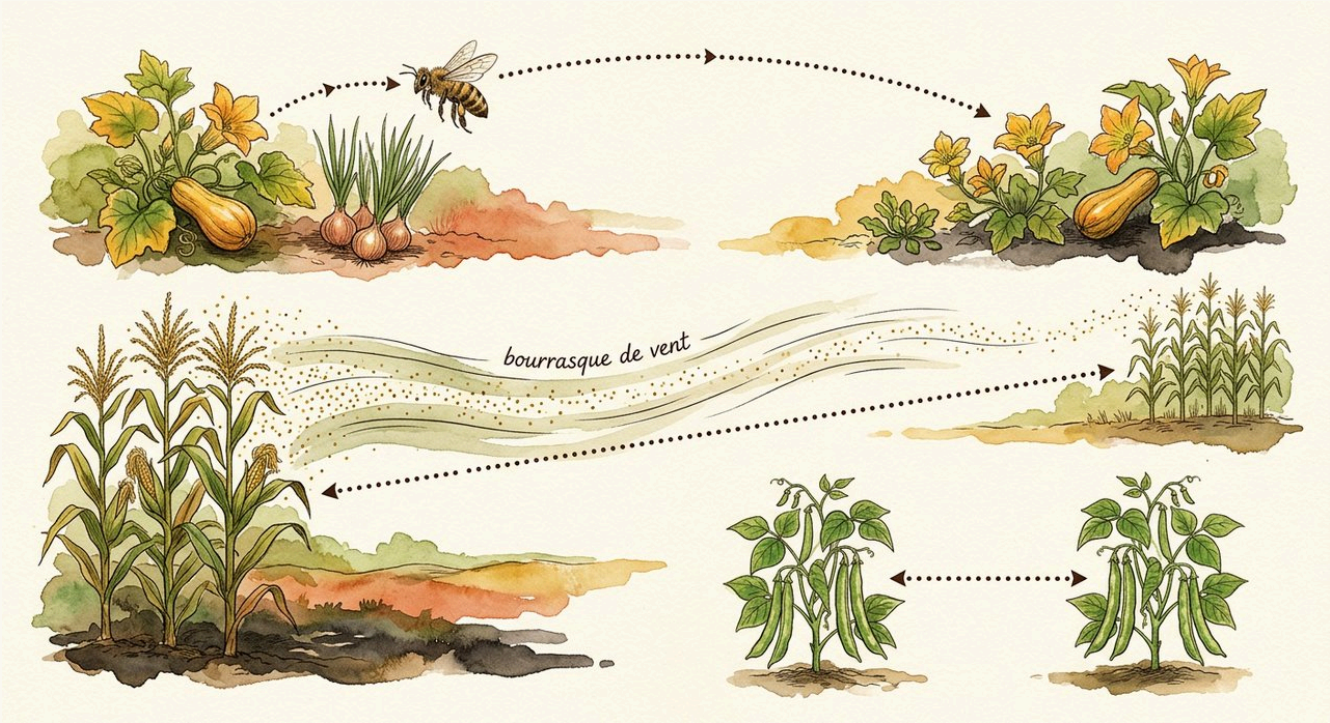
If two varieties of the same species are planted far enough apart, pollen from one will not be able to reach the other.

This is called **spatial isolation**.

But how far apart should they be separated?

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Distances for Insects and Wind



Distances for Insects and Wind

The distance depends on how the pollen travels:

- **Insects** (squash, onions, cabbage): separate plots by at least 300 to 500 meters.
- **Wind** (corn, spinach): pollen travels very far! At least 500 meters to 1 kilometer of separation is needed.
- **Flower faithful** (tomato, cowpea): a few tens of meters are sufficient in our climates, or a simple plant barrier.



Living Hedges: The Windbreak and Bee Trap

If your plot is too small to maintain a 500-meter distance:

- Plant a dense hedge of trees, tall grasses, or banana plants between your plots!

The hedge breaks the force of the wind and traps airborne pollen.

Furthermore, by sowing many **nectar-rich flowers** around the hedge, bees forage on site and don't travel further afield!

Second method: isolation in time (staggering)



Second method: isolation in time (staggering)

If you lack space to distance your plots:

Make your vegetables flower at different times!

This is called **isolation in time**.

If two varieties of the same species never flower at the same time, no cross-pollination is possible, even if they are planted side-by-side!



How to Practice Staggering in Practice

To successfully achieve isolation in time:

1. Sow your first variety early in the season.
2. Wait several weeks to sow the second variety.

When the first variety finishes flowering and starts drying its seeds, the second variety is only just opening its very first buds.

Pollen can never mix!



Third Method: Mechanical Isolation (Netting)

When you can neither distance in space nor stagger in time:

We place a physical barrier that insects cannot cross.

This is called **mechanical isolation**.

We use a very light and open-weave fabric: **insect netting** (insect mesh or fine tulle).

Bagging a Single Flower (for True-to-Type Plants)



Bagging a Single Flower (for True-to-Type Plants)

For a small seed harvest of **tomato**, **pepper**, or **eggplant**:

- You can protect a single flower or a single flower cluster!
- Take a small bag of **fine tulle**.
- Slip it over the flower **BEFORE** it opens, then gently tighten it to the stem with a string or elastic band.
- No insects will be able to deposit foreign pollen there!

Remove the bag as soon as fruit set occurs



Remove the bag as soon as fruit set occurs

As soon as the flower petals wilt and fall, you will see a small green fruit beginning to swell:

Fertilization has been successful!

Carefully remove the tulle bag so that the fruit can benefit from the sun and grow without constraint.

Immediately tie a colored ribbon to the peduncle so you don't forget it!

The Net Cage on a Full Bed



The Net Cage on a Full Bed

If you want to harvest a whole bowl of tomato or pepper seeds:

Build a cage or mini-tunnel over your bed!

- Plant bamboo or flexible rebar hoops over your plants.
- Cover the entire structure with a large mosquito net and bury the edges well in the soil so that no insects can get underneath.



The Challenge of Outcrossing Plants Under Cover

> ⚠️ Be careful with plants that NEED insects (like squash or cucumbers):

If you enclose them under a mosquito net, bees can no longer enter.

The female flower will not receive any pollen and the fruit will rot without producing seeds!

For these plants under cover, you must do the bee's work yourself: this is **hand pollination**!

The alternating tunnel opening technique



The alternating tunnel opening technique

Here's a remarkable trick for growing two varieties of squash or zucchini in the same garden:

Place Variety 1 under Tunnel A, and Variety 2 under Tunnel B.

- **Day 1**: You open Tunnel A at 6 AM for the bees, and you leave Tunnel B closed.
- **Day 2**: You do the opposite! You close Tunnel A and open Tunnel B.

The bees never mix the pollens from the two varieties!

Golden Rule of Alternate Opening: Timing



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If you are using the alternate tunnel method:

- **Imperatively open the tunnel very early in the morning (at sunrise)** because that's when the flowers open and bees are most active!
- **Close the tunnel at the end of the day** when the heat subsides and the flowers have wilted.
- **Check that no bees are trapped inside** before closing!



Common Mistakes to Absolutely Avoid

Beware of common pitfalls in the field:

❌ Using a net with mesh that is too wide, allowing small insects to pass through.

❌ Leaving a hole or an unburied gap at the bottom of the mosquito net.

❌ Forgetting to remove already open flowers before bagging (they may have already been visited by a bee!).

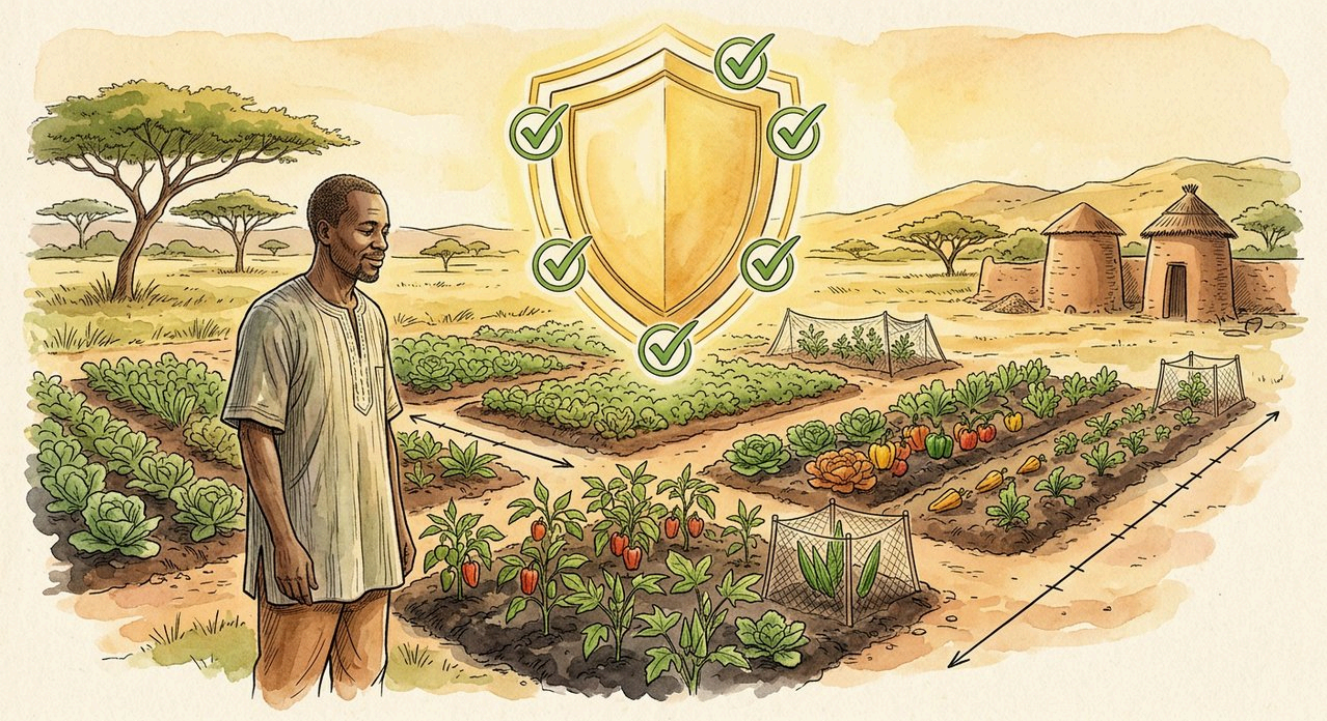


Choosing the Right Technique for Your Situation

How to choose your solution?

- **Large open field**: focus on distance (spatial isolation) ✅.
- **Small village plot**: combine staggered sowing dates and living fences/hedges ✅.
- **Intensive market gardening in close proximity**: use tulle bags or veiled mini-tunnels ✅.

To each garden its practical solution!



Congratulations! Your Varieties Are Perfectly Safe

Well done! You have mastered the techniques for isolating seed crops:

✅ You know how to calculate distances for wind and insects

✅ You know how to use staggered planting times

✅ You know how to protect a flower or an entire row with netting

Next module: harvesting, extraction, drying, and storing seeds!