Pollination — How Plants Reproduce

Discover how flowers are fertilized to produce seeds, learn to distinguish between faithful (self-pollinating) plants and those that like to travel (cross-pollinating), and understand the impact of high temperatures on cross-pollination.



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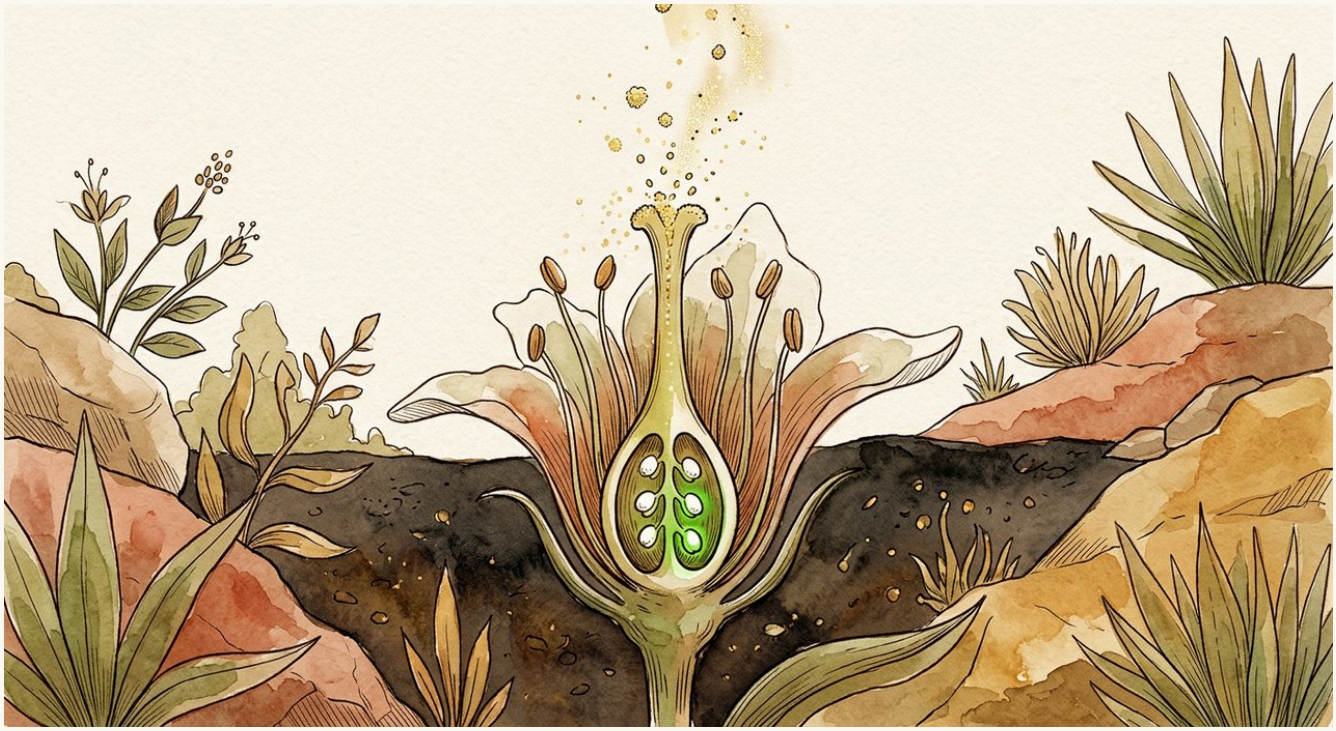


The Great Mystery of the Flower

Without a flower, no fruit. Without a fruit, no seed!

To become a good seed producer, you must understand how plants make babies.

In this module, we will take a close look at what happens inside flowers at sunrise.

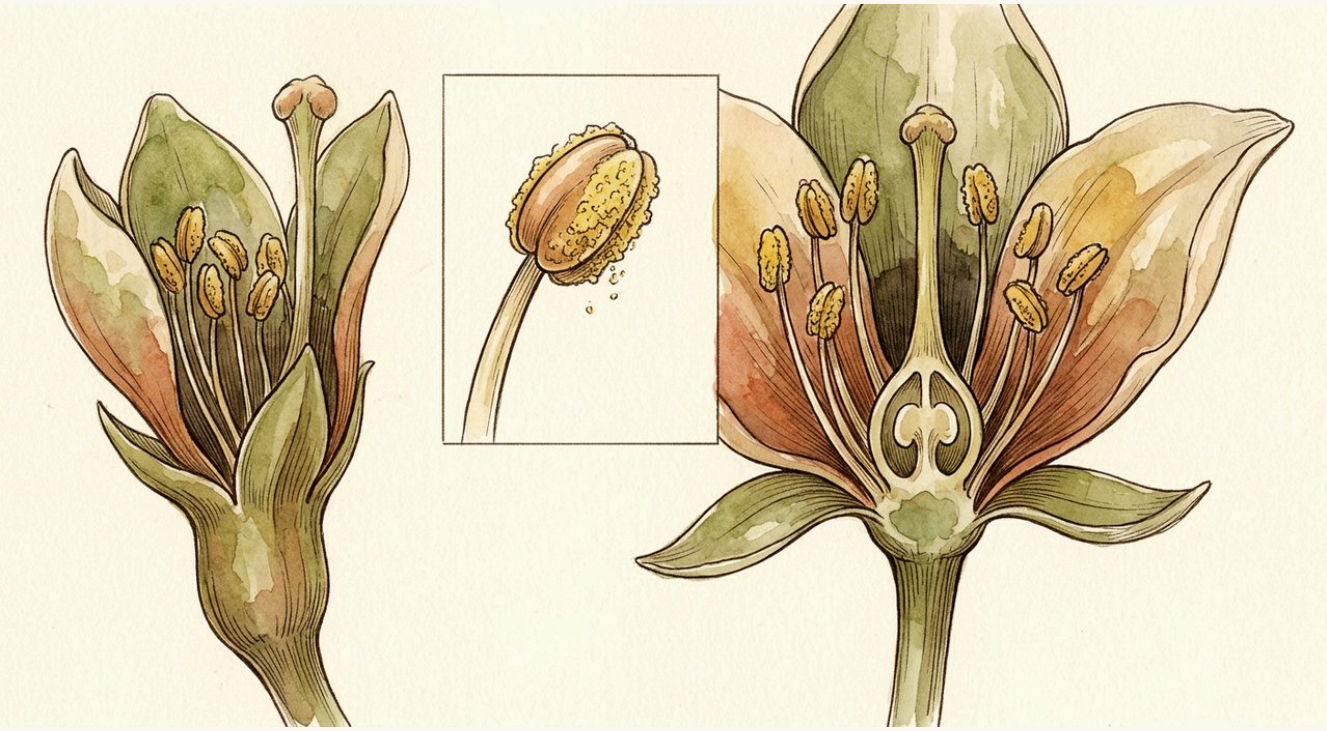


The Golden Dust and the Baby Seed

To create a living seed, two essential elements must meet:

1. A fine golden dust: this is the **pollen** produced by the male part of the flower.
2. A tiny egg hidden in the heart of the flower: this is the **ovule** in the female part.

When the pollen touches the female part, the ovule is fertilized and begins to grow!



The Male Organs: The Stamens

Look into the heart of the flower:

Do you see those small stalks crowned with powdery yellow heads?

These are the **stamens**.

They are the male organs of the plant that produce and release pollen to the wind or insects.

The Female Organ: The Pistil



The Female Organ: The Pistil

At the exact center of the flower stands an often thicker stalk, with a sticky or gooey head.

This is the **pistil**.

It is the female organ: its sticky head catches pollen, which then travels down to the base to fertilize the seeds in the ovary.



“Two-in-one” flowers (hermaphroditic)

Most vegetables have flowers that bear both male and female organs under the same petals.

These are called **hermaphroditic** flowers.

This is the case for tomatoes, eggplants, peppers, beans, and lettuce.

Faithful Flowers: Self-Pollination



Faithful Flowers: Self-Pollination

In some flowers with both organs, pollen falls onto its own pistil without leaving the flower.

The flower fertilizes itself!

This is called an **autogamous** plant (such as beans, peas, or lettuce).

These plants are easy to multiply because they cross very little with their neighbors.

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Traveling Flowers: Allogamy



Traveling Flowers: Allogamy

In other plants, the flower's own pollen cannot fertilize its pistil.

The flower requires pollen from another flower or a nearby plant!

This is called an **allogamous** plant (such as cabbage, onion, or corn).

Pollen must imperatively travel from one plant to another.



Separate Flowers: The Case of Squash

Some plants bear distinct male and female flowers on the same plant:

- The male flower has only a thin stem and pollen.
- The female flower bears a mini-swollen fruit just below its petals!

This is the case for squash, cucumber, melon, and watermelon.

The female flower will produce nothing if no one brings it male pollen!



The Two Major Factors of Travel: Wind

How does traveling pollen travel?

The first major factor: **wind**.

Plants like corn, sorghum, or spinach have very light and invisible pollen that flies for hundreds of meters.

If your neighbor grows a different corn 200 meters away, the wind will mix your seeds!

The Second Factor: Pollinating Insects



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The second great messenger: **insects** (bees, bumblebees, wasps, small beetles).

Attracted by the bright colors and sweet nectar of flowers, they unknowingly cover themselves in golden powder.

By foraging from flower to flower, they ensure the reproduction of your squash, peppers, and onions!

Beware of Hot Climates: Flowers Change Their Behavior!



Beware of Hot Climates: Flowers Change Their Behavior!

> ⚠️ **Warning!** What is true in temperate climates changes under the tropical sun!

Under intense heat:

1. Flowers open wider.
2. In tomatoes, the pistil grows and extends beyond the petals.
3. Insects are much more numerous and active.

A tomato variety reputed to be "true-to-type" can cross very easily under the hot sun!

What happens in case of undesirable cross-pollination?



What happens in case of undesirable cross-pollination?

If a female flower of a sweet squash receives pollen from a wild bitter squash:

- The fruit harvested this year will look normal.
- But the seeds inside will produce hard, tasteless, or inedible squashes next year!
- The result of a pollination error is only visible in the next generation!

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Observing Activity at Sunrise



Observing Activity at Sunrise

To understand how your plants are behaving:

- Take a walk in the garden at sunrise (between 6 and 8 AM).
- See which flowers are wide open.
- Observe which insects are visiting your plots and from which flower to which flower they fly!

When and how to intervene?



When and how to intervene?

Once you understand how the plant is pollinated, you know what to do:

- **Self-pollinating plant** (autogamous): you can grow several varieties with simple spacing.
- **Wind-pollinated plant** (corn): separate varieties by long distances or windbreak hedges.
- **Insect-pollinated plant** (squash): isolate or protect flowers before they open!



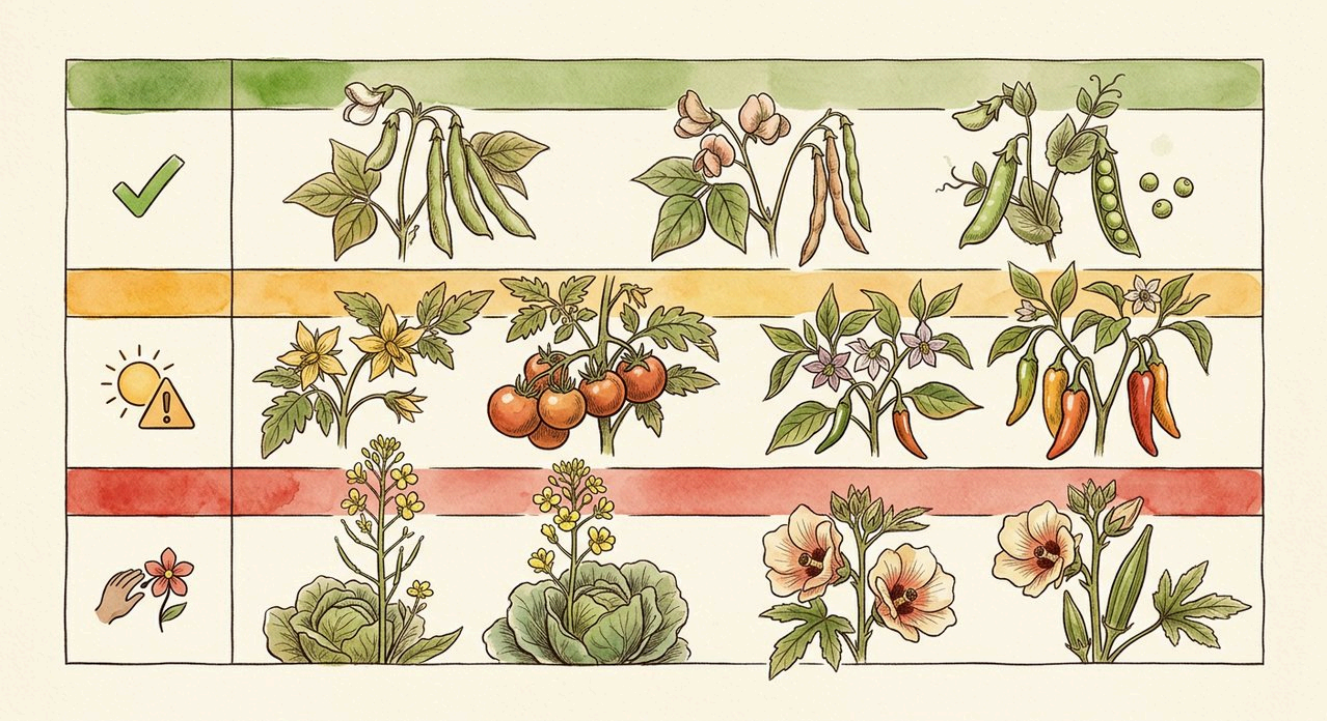
Respecting and Cherishing Garden Insects

Pollinating insects are essential for abundant and well-formed seeds.

If you spray chemical insecticides on your plots, you kill your precious workers!

Sow strips of mixed flowers and offer a shaded water source to attract bees.

Summary of Pollination Modes



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Easy to remember:

- **Beans, cowpeas, peas**: Closed flowers, very true-to-type, easy for beginners ✅.
- **Tomatoes, peppers**: True-to-type in theory, but caution under high heat ⚠️.
- **Cabbages, onions, corn, squash**: Passionate travelers, require distance or protection ⚠️!

Congratulations! You understand the secret of flowering



Congratulations! You understand the secret of flowering

Bravo! You have unlocked the intimate secret of your garden's flowers:

✅ You recognize pollen-bearing stamens and the receptive pistil

✅ You know that the sun's warmth increases cross-pollination

✅ You distinguish easy-to-grow plants from traveling plants

Next module: how to select the best seed-bearing plants in your plot!