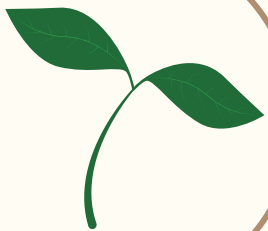




THE PROCESS OF DEVELOPING NEW PLANT VARIETIES

AND BRINGING THEM TO THE MARKET





WHAT IS A PLANT VARIETY?

A plant variety is a clearly defined group of plants within a species that all have a set of common characteristics.

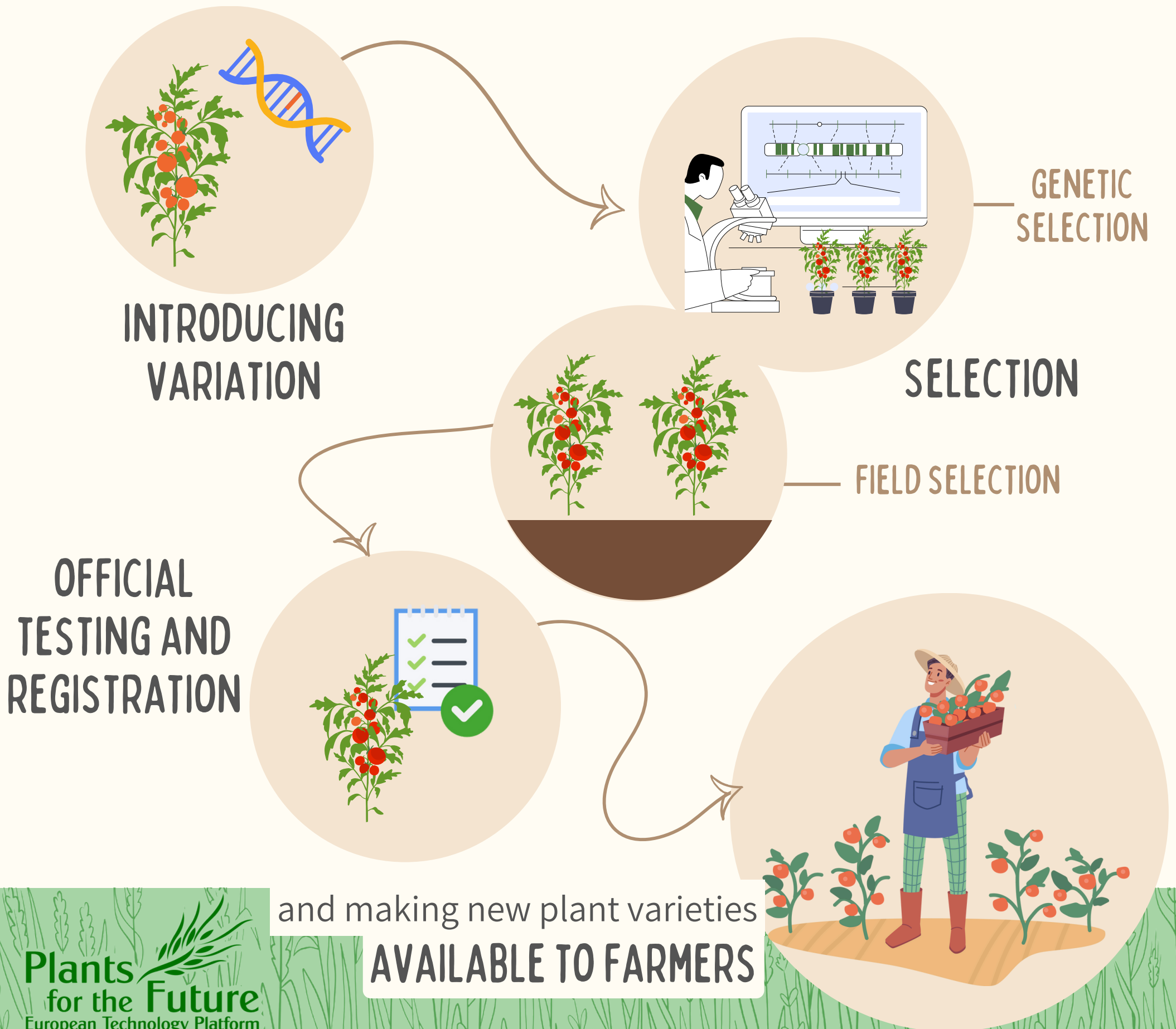
Plant varieties are the result of plant breeding efforts, which make use of genetic diversity to develop plants with more desirable characteristics, like being more nutritious, tolerant to drought, or resistant to disease.

Plant breeding begins by introducing genetic variations, using different breeding methods, and selecting the plants that perform the best and combine all the desired characteristics.

The plant variety is then put through official testing and registration, so that it can be approved and listed in the National Catalogue of Varieties, as well as the EU's Common Catalogue of Varieties and made available for commercial use.

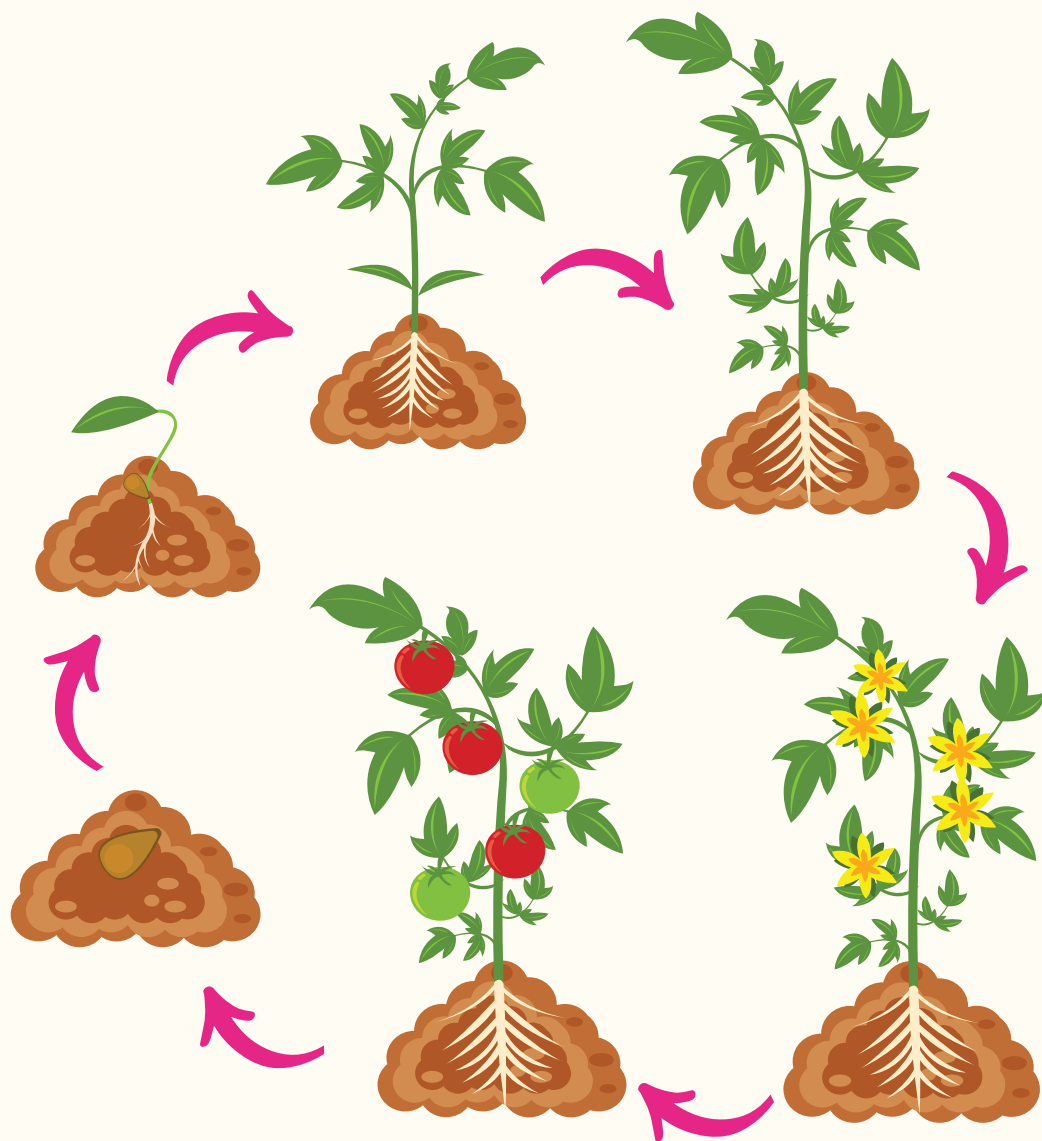


RECIPE TO BRING A NEW VARIETY TO THE MARKET



BUT HOW LONG DOES IT TAKE TO BRING A NEW VARIETY TO THE MARKET?

In the context of plant breeding, we usually talk about how long things take in terms of generations.



GENERATION

A generation refers to the complete life cycle of a plant from seed to seed.

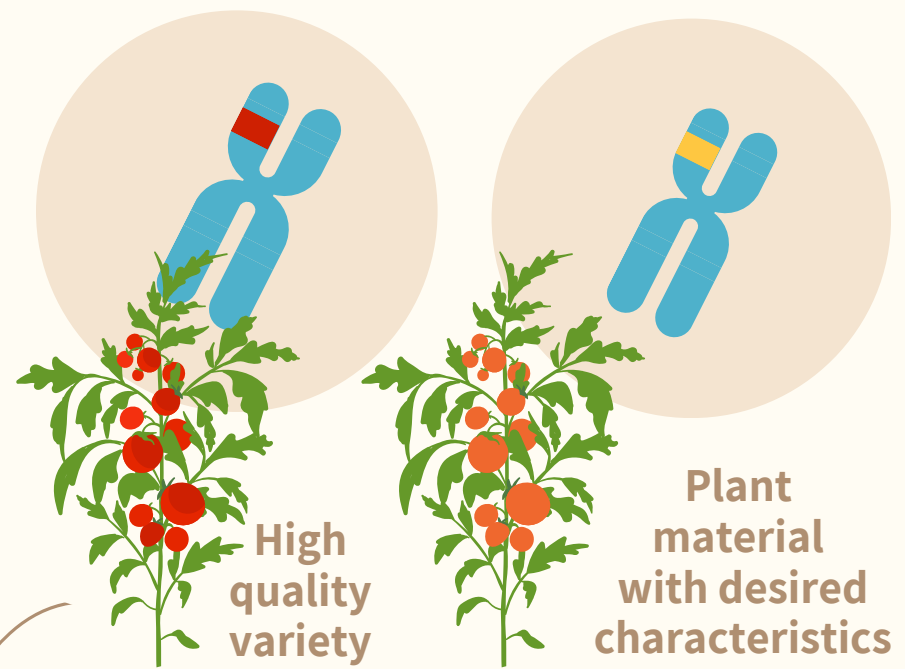
However, this varies for plants that do not reproduce by seeds.



It can take 5 to 12 generations - depending on the breeding methods used and the plant species - **before a variety is ready for official testing and registration**, and all in all, **years** before a new variety hits the market.

1 INTRODUCING VARIATION

Firstly, breeders introduce genetic variations into a plant of interest (usually an existing variety). Genetic diversity usually comes from plant genetic resources, germplasms, wild relatives or other plant varieties.



Then breeders grow the seeds that result from the first step, and let the plant **self-reproduce**.

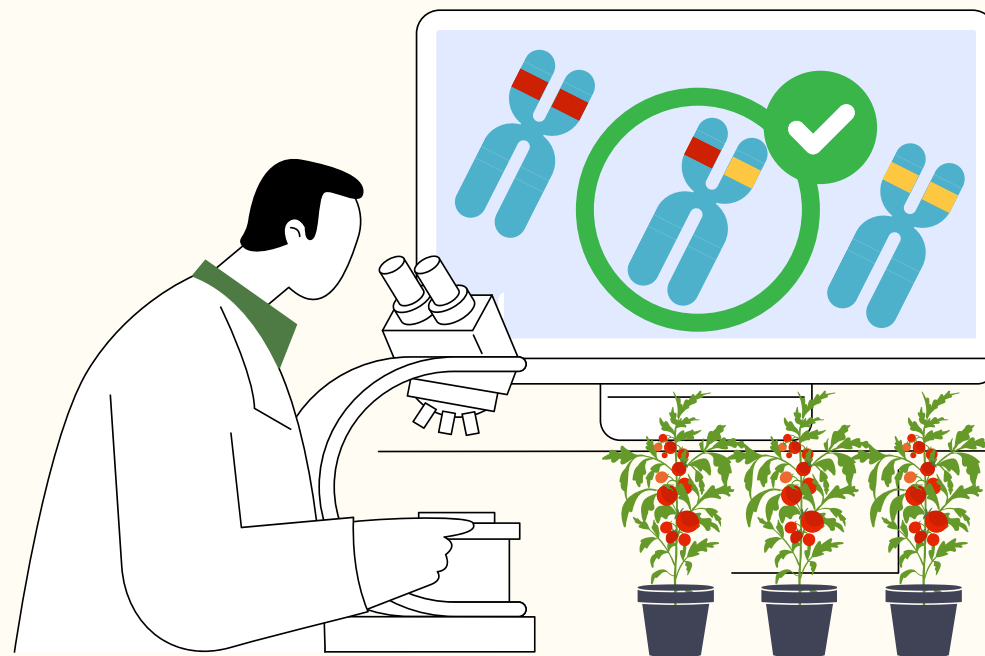


This produces seeds, known as second-generation seeds. Then these seeds are harvested.



2 SELECTION PHASE | GENETIC SELECTION

The next step is genetic selection. The seeds harvested from the step before, result in plants which then are checked for the desirable genetic variations. The plants without them are discarded. This process is known as **genotyping**.



The selected plants are then checked to see if they display the desired characteristics. The ones that do, are then selected. This process is known as **phenotyping**.

These plants are then either back crossed with the original parent plant (plant of interest) over a few generations, or left to self-reproduce for a few generations.

This process takes several **generations**, until the desirable characteristics, and underlying genetic variations, show up consistently across generations.

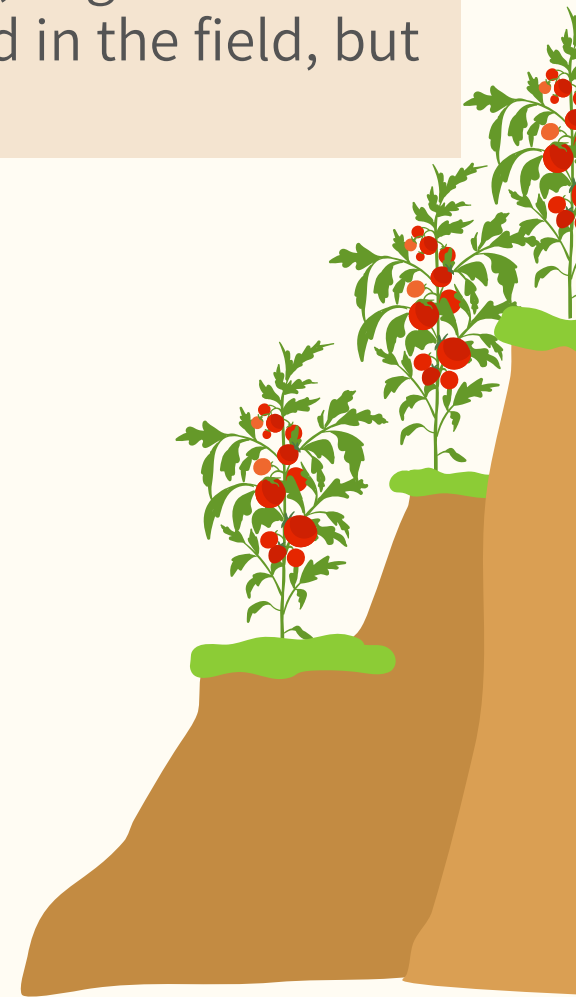
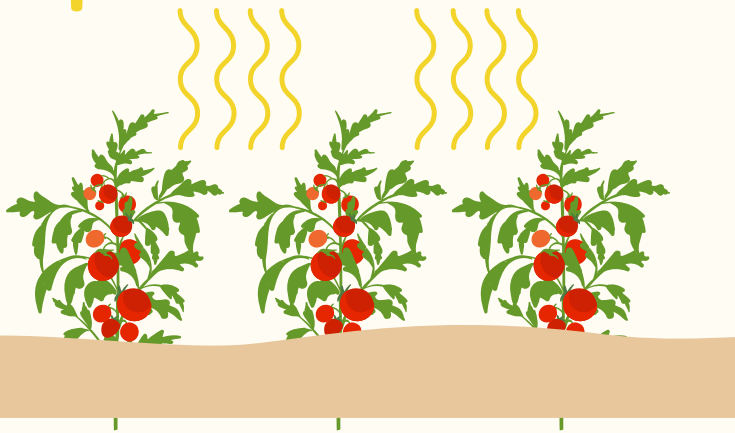


2 SELECTION PHASE | FIELD SELECTION

Then, the promising plants are tested for their performance in field trials, with the aim to see how well they perform under real-world conditions. This enables further selection of the final variety.



Note that this will depend on the type of plant and how it will be grown by farmers once commercialised. For example, vegetables that will be grown in glasshouses will usually not be tested in the field, but in different glasshouse conditions.



In this process, data is collected and analysed from the trials to determine the performance and characteristics of the selected plants. The best performing plant from these trials will become a new plant variety.

3

OFFICIAL TESTING AND REGISTRATION

The next step is to submit the plant variety for official testing. Before a new variety can be registered and sold commercially, it must pass one or two official tests - depending on the kind of plant: the Value for Cultivation and Use (VCU) and the Distinctness, Uniformity, and Stability (DUS) tests.

The VCU test ensures that the variety has good agricultural performance and quality. The DUS test confirms that the variety is distinct from others, uniform in its characteristics, and stable across generations.



These tests are conducted by official government agencies or authorised testing organisations.

Once the new variety is approved for registration, it can be listed in the National Catalogue of Varieties, and then, in the EU's Common Catalogue of Varieties. Once that's done, the variety is allowed to be sold commercially in the EU.



OK... Are we there yet?

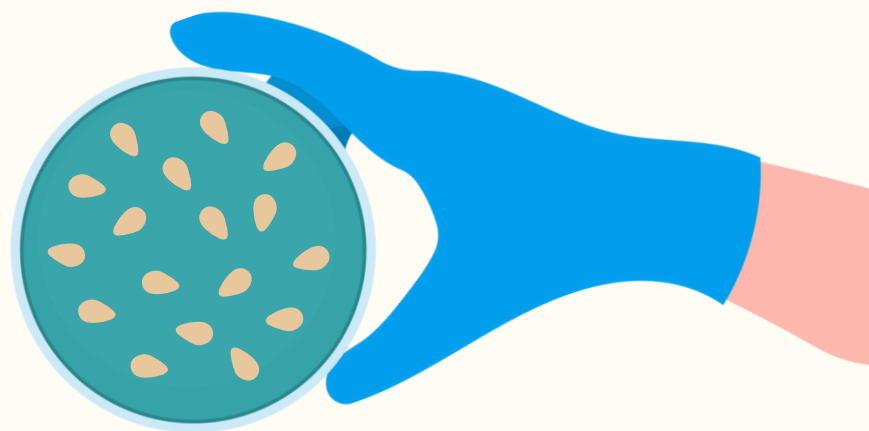
Patience...
We're almost there...



4 SEED PRODUCTION PHASE

Once the plant variety is registered, it is time to start the large-scale production and multiplication of seeds to have enough for distribution. This process includes quality control, to ensure seed purity and performance. Even before the variety is registered, if breeders get good results from the VCU and/or the DUS tests, they usually already start producing seeds in large quantities.


Finally, seeds are commercialised and become available to farmers and retailers!



help

All in all, the whole process from step 1 to 4 can take between **7 to 14 years** on average, although it will depend on the plant species, as the cycle time varies - but it is much longer for some crops, like fruit trees!

**Wow! That's a long time!
I need my disease resistance
variety like... yesterday!**



Well! By using plant breeding innovation, we can speed things up significantly! This acceleration is crucial for adapting plants to the rapidly changing environmental conditions.



New Genomique Techniques (NGTs) like gene editing (such as CRISPR) allow breeders to introduce specific genetic variations in a precise way. This massively reduces the time and resources needed to introduce variations and for genetic selection, thereby speeding up the development of new plant varieties.

However, once these plant varieties are developed, the time needed for field selection, testing and registration **remains the same as with other breeding methods.** This is because we still need to conduct thorough field trials and ensure the new plants perform well in different conditions and are safe and nutritious.



**SO WHILE THE INTRODUCTION OF VARIATION MAY BE QUICKER,
THE REST OF THE PROCESS IS JUST AS LONG AND THOROUGH**

ASK US

🌱 Got questions about plant science & breeding? We've got answers!

Join Plant ETP's campaign to feed your curiosity! 🌿

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[Advance Beneficial Characteristics while Minimizing Unintended Changes](#)

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**Thank
you!**

**A big thank you to Viktor for sharing his expert
knowledge and helping us with this post!**