

[HAS Training and Consultancy](#)

Postbus 90108  
5200 MA 's-Hertogenbosch  
The Netherlands  
T: + 31 88 - 890 36 37  
haskennistransfer@has.nl  
www.haskennistransfer.nl

[HAS University of applied sciences, location Den Bosch](#)

Onderwijsboulevard 221  
5223 DE 's-Hertogenbosch  
The Netherlands

[HAS University of applied sciences, location Venlo](#)

Spoorstraat 62  
5911 KJ Venlo  
The Netherlands

[Breedwise, location Geldrop](#)

Herdersveld 143  
5665 JN Geldrop



This course is a collaboration between HAS University and Breedwise.



## Plant Breeding essentials in one week



# Plant Breeding essentials in one week



## Scope

Many employees in plant breeding companies need a concise overview about the background and set up of a breeding program. Breeding requires fundamental knowledge of plant genetics and supporting techniques to choose the correct strategies. HAS University and Breedwise collaborate in organizing a training course for professionals in the plant breeding industry from all over the world. It is meant for plant breeders and for researchers who collaborate with plant breeders. This one week course is a mix of theoretical sessions, practical applications and field visits.

## About this course

Building on the success of our Dutch and international training courses on plant breeding, and our extensive cooperation with

the international seed industry we can provide a course which gives good insight both in the theory and its application in breeding.

This 5 days course provides you with a concise overview of essential principles of plant genetics, plant selection, variety development, resistance breeding and supporting techniques, such as molecular markers, mutation breeding and cell biology techniques.

## For who?

The course is aimed for assistant breeders, junior breeders and researchers in plant breeding companies that are involved in plant breeding programs, but who lack the theoretical background in plant breeding. Breeders that are interested in a refresher course or would like to broaden their

expertise could also join this course.

## What you can expect

**Day 1: Botany:** Sexual and asexual reproduction  
**Genetics:** Genetic material, genes and chromosomes; mitosis and meiosis  
mendelian genetics, linkage, epistasis, multiple alleles, cytoplasmic inheritance.  
**Plant breeding:** Introduction to plant breeding

## Day 2 en 3: Plant breeding continued:

Genetic resources and recombination; polyploidy, Interspecific hybridisation, introgression, repeated backcross; selection, quantitative characteristics; resistance breeding; breeding vegetative propagated crops; breeding self-pollinated crops, line development  
breeding open pollinated crops; principle of hybrids; general and specific combining ability, developing of hybrid varieties; Seed production in hybrids (male sterility, female lines, incompatibility); Intellectual property.

## Day 4: Variety testing and statistics

### Laboratory techniques, biotechnology

Cell biology based techniques: tissue culture, doubled haploids; DNA based techniques:

- Marker assisted breeding (Principles, techniques, application)
- Mutagenesis
- Genome editing and genetic modification

## Day 5: Field day

2 breeding companies will be visited

## Requirements

Employees have at least a BSc, preferably in agriculture or molecular biology and some knowledge of genetics. This course is also suitable for employees with a MSc degree without breeding. If you do not have or you want to refresh your knowledge of plant genetics, you can follow as a preparation of this course the online course plant genetics (distance learning: [www.has.nl/en/training](http://www.has.nl/en/training)).

The course material is at bachelor+ level.

## Course duration

5 days in one week; from monday till friday.

## Price and data

For actual prices and starting data, visit our website [www.has.nl/en/training](http://www.has.nl/en/training)

## Location

HAS University of Applied Sciences in 's-Hertogenbosch, The Netherlands

## Certification

After successful completion of the program, you will receive a certificate of HAS University of applied sciences and Breedwise.

EXPECTED STUDYLOAD: 5 days  
DURATION: one week  
CONTACT PERSON: Lamiaa Fareh  
[lfareh@has.nl](mailto:lfareh@has.nl) / +31 88 890 3774