



 **DLF**
Beet Seed

SEEDS & SCIENCE

VYtech[®]
- grow with security



A beet field in Pithiviers, France infected with virus yellows

VIRUS YELLOWS

- a big problem that can be solved!

Virus yellows has been known since the 1930s as a sugar beet disease that can dramatically reduce the sugar yield. After the most recent years of phasing out effective plant protection products (neonicotinoids) for seed treatment of sugar beet seed, the virus yellows has returned as a serious plant disease in several European countries. E.g. in France the yield has decreased with up to 70% in some areas due to this disease.

DLF Beet Seed has therefore intensified the breeding of new varieties with virus yellows resistance/tolerance, and in the DLF Beet Seed gene pool strong tolerance and resistance to virus yellows has been identified. Progress is so good that we will soon be offering the beet grower the first varieties that are partially resistant to virus yellows.

The disease can be caused by single or mix infections of aphid transmitted viruses such as beet mild yellowing virus (BMYV), beet chlorosis virus (BChV) and beet yellows virus (BYV).

Many different aphid species can transmit one or more of the viruses, but the principal vector is the green peach aphid (*Myzus persicae* Sulzer).

In surveys during the past years, it has been shown in e.g. France, that mix infections of the mentioned viruses occur frequently. The combinations can change from year to year. Therefore, it is important for DLF Beet Seed to breed for resistance/tolerance to more than one of the viruses.



Green peach aphids that transmit viruses causing virus yellows

THE BREEDING STORY

- started in the 1980s

DLF Beet Seed could already in the past provide farmers with varieties resistant to the disease, and during the 1980s and 1990s there were dedicated breeding programs on virus yellows. During the past years extensive breeding is again ongoing.

A high number of elite lines, sources from gene banks, own wild beet collections, test hybrids and hybrids are now continuously under evaluation

for tolerance/resistance to the different types of viruses.

The evaluation is done in greenhouses, in semi field trials and in field trials. The plants are inoculated and the virus content is quantified in the plants and development of symptoms is observed. In the inoculated field trials the yield is measured.

Greenhouse experiment



Set up of the greenhouse experiment where plants were inoculated with different combinations of BMYV, BChV, BYV and BtMV. The plants were kept in the tents during the whole experiment to avoid contamination.



VYtech® - on the market in 2023

The first partially resistant varieties will be available on the market in 2023. The varieties will be marketed under the name VYtech® varieties.

In 2024, we plan to launch a range of VYtech® varieties on the market with slightly different profiles to suit different markets.

The VYtech® varieties will protect the crop and give a good yield in case of a viral infection, but during

the first years on the market the yield is expected to be slightly lower than non-resistance varieties in the areas without infection.

DLF Beet Seed expect that the yield in the VYtech® varieties will compete with non-resistant varieties by 2025.

Mix infection of four viruses in VYtech® (A) and VY susceptible (B) lines



Plants of a VYtech® line (A) and a susceptible VY line (B) inoculated with BMV, BChV, BYV and BtMV.



Semifield trials

Plants are inoculated with viruses in semifield trials and development of symptoms are observed. Tolerant and resistant plants stay green.

Field trials



VYtech® variety and traditional varieties in field trials with artificial infection with virus yellows. The VYtech® variety has a low virus content and retains its green colour compared to traditional varieties which, when infected, have a high virus content and become strongly yellow.



Virus yellows can be seen as at least three different diseases and it is a challenge to combine all genetic components to get a good final product, but in the near future DLF Beet Seed will be able to provide sugar beet growers with the first hybrids partially resistant to virus yellows.



DLF Beet Seed, Holeby, Denmark

DLF BEET SEED

- a global supplier of sugar and fodder beet seed

In October 2021 MariboHilleshög changed its name to DLF Beet Seed.

With the new company name we state that we are a part of the DLF Group – a leading global seed company.

DLF is dedicated to beet seed and together we create innovation and develop new varieties to the benefit of the beet growers and the industry.

DLF Beet Seed sell and market sugar beet seed through our two independent channels, MARIBO® and HILLESHÖG®, both going a long way back in the sugar beet history.

The DLF Beet Seed headquarters is located in Denmark, more precisely Holeby on the island of Lolland – the heart of the Danish sugar beet growing area.

The R&D and breeding activities are based in DLF Beet Seed AB in Landskrona, Sweden, and we have seed multiplication sites in Italy, France and the US.

The US business is based in Longmont, Colorado – where both the seed factory and the R&D activities are located.

DLF Beet Seed have 340 employees, all dedicated to beet seed.



DLF Beet Seed AB, Landskrona, Sweden



DLF Beet Seed LLC, Longmont, Colorado



 **DLF
Beet Seed**



For more information please contact:

DLF Beet Seed ApS

Højbygårdvej 31
DK-4960 Holeby
Tel.: +45 5446 0700
www.dlfbeetseed.com

DLF Beet Seed AB

Säbyholmsvägen 24
261 23 Landskrona · Sweden
Tel.: +46 418 437 000
www.dlfbeetseed.com

