Master thesis at the Institute of Sugar Beet Research

Topic:

Investigations on Rz1 resistance breaking in sugar beet by Beet necrotic yellow vein virus

Research issue:

Beet necrotic yellow vein virus (BNYVV) is a member of the genus *Benyvirus* in the family *Benyviridae*. BNYVV causes Rhizomania disease in sugar beet, which is characterized by the abnormal proliferation of lateral roots leading to a significant decrease in sugar content and massive yield losses. Therefore, all sugar beet cultivars carry the *Rz1* resistance gene preventing infection with BNYVV. However, there are several reports describing the occurrence of *Rz1* resistance breaking strains. The high selection pressure has led to several mutations in the pathogenicity factor P25 at amino acid positions 67-70 (AS67-70). Furthermore, an additional RNA component from the P-type (RNA5) has been associated with *Rz1* resistance breaking. Experimental studies confirming the resistance breaking effect of the mutations and reassortments are missing. Therefore, a reverse genetic system for sugar beet using a cDNA clone of BNYVV A-type and P-type has been developed at the Institute of Sugar Beet Research. This infection system will be used to study *Rz1* resistance breaking by BNYVV in sugar beet. The influence of mutations in the pathogenicity factor P25 will be investigated by PCR mutagenesis. Furthermore, reassortment experiments should be conducted to confirm an effect of RNA5 on resistance breaking. The student will learn modern molecular techniques including PCR mutagenesis, cloning and agroinfection of sugar beet.

Start: At any time

Supervisor: Dr. Sebastian Liebe

Are you interested? Fell free to contact:

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