Managing Virus Yellows In Sugarbeet – **An Integrated Approach**

79th IIRB Congress, 27-28 February 2024, Brussels (B)
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Introduction

Virus Yellows (VY) outbreaks following the ban on neonicotinoids have made it clear that will be one of the biggest challenges in sugarbeet production in the future. Integrated solutions as a combination of variety tolerance, foliar spray and seed treatment are needed to realize the full sugarbeet potential under increasing aphid pressure.

This has been tested in the field since 2021. Here we show results from 2023 and our conclusions from three years of trials.

VY Management Trial

Concept

- Integrate different control components in one trial across various locations in Europe.
- Components consist of:
  - Virus tolerant varieties
  - Seed treatments
  - Foliar insecticides

Aim

- Evaluate integrated management strategies with similar efficacies formerly offered by neonicotinoids.

Graphic 1: Number and distribution of trial locations over three years of Virus Yellows Management Trial.

	Closterovirus + Polerovirus	Polerovirus double	Closterovirus	Polerovirus
Virus combinations	BMYV+BChV+BYV	BMYV+BChV	BYV	BMYV
No. of locations	2 DE	2 DE 1 FR	1 FR	1 UK
Inoculation density	5%	5%+5%	5%	10%
Genetics	Tolerant Susceptible	Tolerant Susceptible	Tolerant Susceptible	Tolerant Susceptible
Foliar insecticide treatment	No Early (Flonicamid) 1dai Late (Flonicamid) 6dai	No Early (Flonicamid) 1dai Late (Flonicamid) 6dai	No Early (Flonicamid) 1dai Late (Flonicamid) 6dai	No Early (Flonicamid) 1dai Late (Flonicamid) 6dai
Seed treatment	Standard (Force) Test products	Standard (Force) Test products	Standard (Force) Test products	Standard (Force) Test products

Table 1: Exemplary test setup of the VY Management Trial in 2023.

Results

Variety Effect:

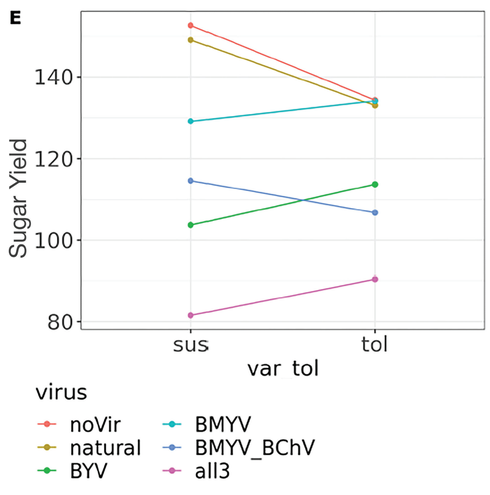

Figure 1: Reaction of different genetics to virus inoculation with a view to sugar yield in 2023.

Seed Treatment Effect:

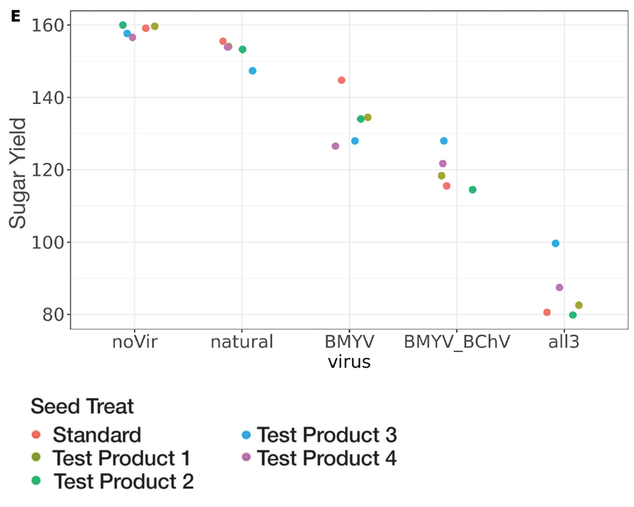

Figure 2: Effect of different seed treatments on sugar yield under different virus inoculation and without foliar insecticide treatment in 2023.

Statistically significant:
All three viruses: Test product 3 vs. Standard, Test product 1, Test product 2, Test product 4

Foliar Insecticide Effect:

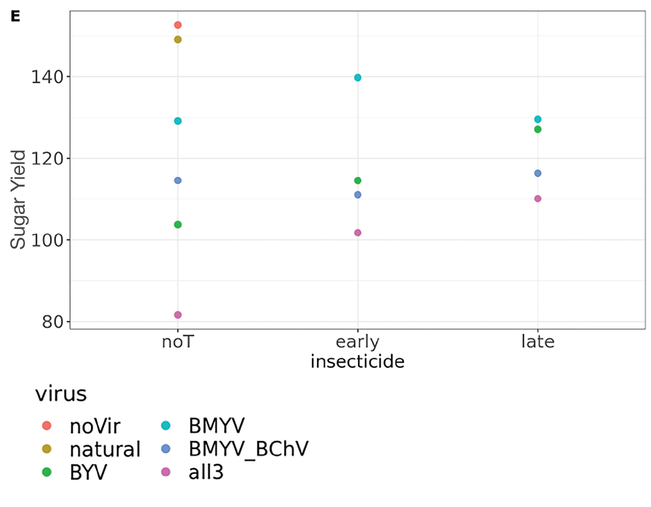

Figure 3: Effect of foliar insecticide spray timing (early: 1 day after inoculation [dai]; late: 6 dai) on sugar yield under different virus inoculation treatment in 2023.

Statistically significant:
All three viruses: no treatment vs. early treatment vs. late treatment
BYV: no treatment vs. early treatment
no treatment vs. late treatment
BMYV: no treatment vs. early treatment

Conclusion/Outlook

- 2023 data confirm observations from previous years.
- A tolerant variety forms the basis for yield stability under VY infestation.
- The use of new/alternative seed treatments further increases protection.
- The application of foliar insecticides remains an important pillar. The timing also appears to have a crucial effect on yield action and its impact must be investigated further.
- The right combination of the individual elements as an Integrated Solution maximizes yield under VY infestation.

Integrated Solution

Good Farmers Practice	KWS Breeding	Crop Protection by Farmer
■ Crop Rotation ■ Field Hygiene ■ Tillage Intensity	■ Special breeding program ■ Top performing variety in VY trials ■ High yields under infestation ■ Strong tolerance against Yellowing Viruses ■ Visibility greener canopy	■ Foliar insecticide spraying ■ Seed treatment

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