

Industry strategies for the control of Virus Yellows (VY) in sugar beet

2020 Support traditional seed breeding

First partially VY tolerant variety "Maruscha KWS" available on the industry Recommended (seed) List (yield drag compared to elite varieties). Partial tolerance to Beet Mild Yellowing Virus (BMYV).

2022

New seed working model brings VY tolerant varieties to market sooner to accelerate adoption novel ratings.

Additional varieties with partial tolerance, but with continued yield drag relative to the susceptible alternatives.

2026

Continued development and adoption of tolerant varieties with less yield drag compared to elite varieties onto the BBRO Recommended List.

2030 onwards

Gene Editing (GE)

programmes

Genotype/phenotype evaluation, data mining and gene mapping towards identification of genes to be silenced.

Sugar, The John Innes Centre and Tropic Biosciences.

2024

Viral target genes identified enabling GEiGS® silencing solutions to be generated and validated (in cells).

Innovate UK grant awarded for collaborative project between British

Viral silencing efficiency of GEiGS® solutions validated in plants. Development of sugar beet transformation platform. Generation of GE plants and validation in small scale. Progeny screened to ensure VY resistance expresses without detrimental traits. Escalate to field trials and multiply into commercial volumes

ahead of starting National and Recommended List trials.

Improved seed germination and rapid establishment

Improved knowledge exchange to optimise mature plant resistance by advancing crop development to 12-leaf stage, including best practice on soil health, cultivations and drill operations.

Giving growers access to improved pellet coatings to aid germination and faster crop establishment. Continued assessment of soil and foliar nutrient/microbiological applications to advance early leaf development.

Development of precision nutrient application techniques such as placement.

Flonicamid and acetamiprid fully-approved. Emergency Authorisations for sustainable 3-spray programmes.

Trialling new (to industry) sugar beet

2028

towards full approval of a 3-5 established sustainable spray programme.

Reviewing threshold for spray/treatment.

· Work with commercial companies to deliver companion/cover cropping products to growers capable of deterring aphid pressure in sugar beet plants.

Aphid forecasting, monitoring and reporting

Sustainable spray

programme

Aphid forecasting is undertaken using the Rothamsted Research model which accurately predicts Virus Yellows incidence. The BBRO's Yellow Water Pan network monitors and informs growers of local aphid pressure.

Ongoing work to improve specificity of forecasting, alongside weekly monitoring and reporting during late spring and summer months.

improve monitoring of aphids at field level. Continuation of monitoring and reporting to growers.

Explore and analyse the impact of integrating hyperspectral cameras to

Knowledge exchange

Knowledge exchange between whole industry to continue throughout the year: sharing the latest Virus Yellows research, advising on best-practice solutions to implement on farm, and promoting actions towards quicker establishment and earlier mature plant resistance.