THE FOUR STEPS

EFFECTIVE VIRUS MANAGEMENT IN WARE & PROCESSING POTATO CROPS

The National Virus Forum

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The 4-steps to effective IPM control of virus in ware and processing potatoes

Whilst UK Seed Potato Classification Schemes aim to provide assurance to buyers and growers that seed potatoes meet specified minimum health and quality standards, it does not fully eliminate the risk of virus infection in certified potato seed. Infected seed can reduce yield and impact quality in ware potato crops, so it is important growers take measures to control both seed and aphid-borne virus in their crops. This guide offers a simple 4-step approach for ware growers to follow.

STEP 1: Understand your variety

- Know the virus resistance of your planned crops. Resistance scores are an important IPM consideration, and data can be found by referencing the AHDB Potato Variety Database[1] or the European Cultivated Potato Database.[2]
- Speak to your seed supplier or the breeder for additional variety information.
- Some varieties can be infected but show very mild symptoms, these can be a source of virus for other crops.
- Know the propensity of your varieties ("propensity" describes whether symptoms observed in a variety are higher or lower than that observed across all varieties).[3]
- Target high risk varieties and crops with appropriate virus control measures throughout the season.

STEP 2: Seed and location

- Only plant certified potato seed (or seed which has been grown specifically as a seed crop and treated accordingly).
- Know if virus has been detected in your input seed; your seed supplier may have this information. If not, consider testing the seed yourself using an accredited laboratory.[4]
- Practice good husbandry, removing groundkeepers from neighbouring crops and always destroy potato dumps; this helps reduce virus (and blight) risk on your ware crop.
- Be aware of neighbouring crops which have the potential to be a source of virus vectors e.g., carrots, peas, and sugar beet.
- Encourage beneficial insects into your crop as they will naturally predate on virus vectors. Consider hedgerow management, buffer strips, and field boundaries. Annual pollinator mixes are widely available for drilling into field corners or any unused areas of land to provide a habitat for beneficials.

STEP 3: Crop monitoring and use of decision support systems

- Track the "enemy" (aphids) and understand the seasonal risk of aphid presence.
- Make use of information from yellow water traps networks and suction traps.[5]
- Monitor crops regularly for the presence of aphids and use this information to make informed spray decisions.

STEP 4: Target your spray programs

- If you are aware of a risk of in-season spread of virus within your crop, plan an appropriate control strategy in advance.
- Monitor aphid flights and target your spray applications based on variety risk.
- Understand the mode of action of insecticides in relation to the type of virus. Due to the mode of virus transmission, systemic products are effective against PLRV (Potato Leaf Roll Virus), but they are not particularly effective for PVY (Potato Virus Y) control.
- Identify aphid species present in your crops and only treat if they are a known vector of potato viruses.
- Only spray an insecticide for virus control when the crop is at risk of a reduction in yield or tuber quality. For example, varieties highly susceptible PVY^{ntn} or PLRV.
- Control treatments should start immediately once virus vectors are found in high-risk situations.
- The spray threshold to limit direct feeding damage due to aphid infestation is five aphids per compound leaf
- Refrain from using pyrethroid products alone, where possible, due to the risk of developing resistance and their negative impact on beneficial insects.
- **Make sure all insecticide applications are made in line with your retailer or end-user protocols**

[1] https://varieties.ahdb.org.uk/ Note that data has been generated using different strains of PVY which can affect resistance ratings.
[2] https://www.europotato.org/ Note as above.
[3] Propensity data is only available for Scottish seed crops. https://www.sasa.gov.uk/seed-ware-potatoes/virology/varietal-propensity-virus-infection
[4] Two types of virus test are available (a) Direct rapid tuber molecular method (<1 week turnaround) and (b) an ELISA growing on test (4-6 weeks minimum).
[5] https://aphmon.fera.co.uk/