**PSA-V**

*Pseudomonas Syringae Actinidia*

PSA-V is a virulent strain of the bacterial disease *Pseudomonas Syringae Actinidia*, it is the most devastating disease to infect kiwifruit to date.

PSA-V is likely to have originated in China, although it may have arrived in New Zealand via Italy or France where it had already caused widespread destruction of Hort16A crops.

It first arrived in New Zealand in 2010, since then it has had a huge economic impact on New Zealand’s kiwifruit industry and its supporting industries especially in the Bay of Plenty.

Some varieties of kiwifruit are more susceptible to PSA-V than others. Hort16A Gold variety has very little resistance to PSA-V. The green Hayward variety appears to be the most tolerant to PSA-V of all the commercial varieties, although the tolerance of Hayward males is still questionable.

**Life Cycle Stages**

PSA-V is a bacteria about 2 microns in length with flagella which enable it to move. PSA-V bacteria can only reproduce and survive long term on kiwifruit vines. They favor warm, wet and humid conditions.

PSA-V can enter the plant through any opening; the leaf stomata, natural or man made cuts or breaks in canes, leaf scars and fruit stalks are all common entry points. PSA-V has also been shown to enter the plants through the lenticils on canes.

Once inside the plant the bacteria can become systemic and travel quickly throughout the plant causing possible death and disease.

**Typical Symptoms of Plant Damage**

The primary symptom of PSA-V infection is leaf spotting, especially common in spring-time or after wet periods. Depending on the time of year and the kiwifruit variety, leaf spotting may or may not occur, before the appearance of secondary symptoms.

Secondary symptoms are more serious; rusty cankers may appear on canes or trunks usually at knuckle joins or where wounds or cuts have led to infection.

Red or orange exudates indicate systemic disease and pure PSA-V inoculum is white or clear and tends to ooze from canes even with no apparent cut/wound.

The final symptom is cane death; canes wither, and fruit stalks shrivel. In the case of Hort16A if infected wood is not removed, eventually the entire plant may collapse.

**Life Cycle Stages and Control**

Dry bacteria can be blown about by the wind, easily transporting it to neighboring kiwifruit. Spring time is a particularly common period for new symptom expression. Cankers tend to occur more at this time of year.

Copper sprays are the most common way to protect kiwifruit from infection but they must be reapplied regularly and provide total cover to be truly effective, this is difficult in growing canopies or where new wounds and cuts are occurring regularly.

Antibiotics (such as Streptomycin) are currently the most effective way to kill PSA-V bacteria, but their effect is short lived and they is expensive to use.

Actigard (Bion) is an elicitor spray which has also proven to be very effective in helping the plant to fight the bacteria.

Many other products are being trialled with varying results but no complete cure exists. Keeping low vigor open canopies and removing all infected material from the orchard are strongly recommended.

Workers can also transport the bacteria into and around orchards on tools, clothing and machinery if strict hygiene measures are not followed.

**Stages of Crop Growth Susceptible to Damage**

Young vines and new spring growth are most susceptible to infection. Wounds can easily be created by blowouts and wire rub. Most orchard activities carry an element of risk, especially pruning and girdling. Always use good hygiene and avoid working in wet conditions.