Psa

ARE YOU MAXIMISING YOUR PSA PROGRAMME'S POTENTIAL?

The recent GoldFutures project compared a set of Gold3 Psa-managed to Gold3 Psa-challenged blocks over a four-year period. The work showed that an optimised and proactive Psa management programme can make a significant difference in OGR (Orchard Gate Return), as shown by the graph below (Figure 1).

DIFFERENCE IN OGR FROM YEAR 1 TO YEAR 4 OF THE GOLDFUTURES TRIAL

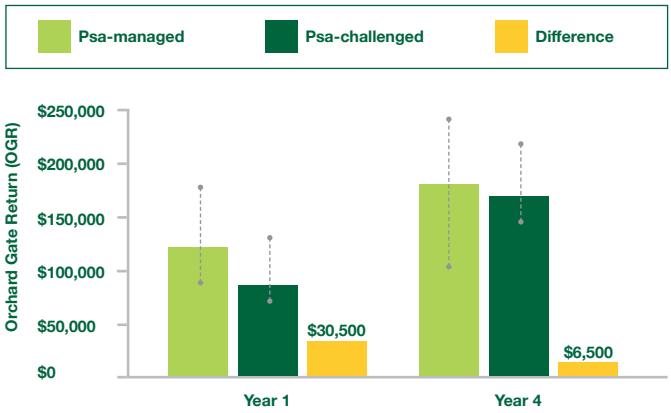
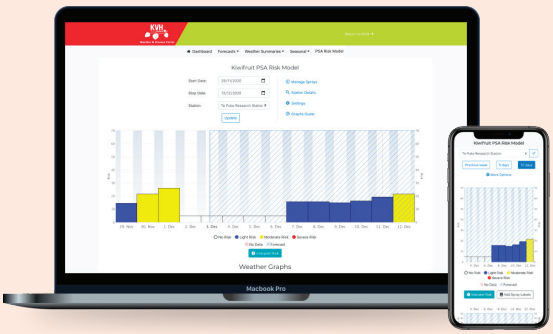


Figure 1. Estimated average OGRs for the Psa-managed (light green bars) and Psa-challenged blocks (dark green bars) and the differences in OGR (yellow bars) from Year 1 (2016) and Year 4 (2020). Moving to robust management programmes caused an increase in OGR's and overall profits.

FIND THE BEST PRACTICE GUIDE HERE:

www.kvh.org.nz/best_practice

PLAN AND PREDICT WITH THE RISK MODEL



The Risk Model is linked to a nationwide weather station network and forecasting platform which provides daily weather and Psa risk forecasting comparisons and much more.

Register online at www.kvh.org.nz or call 0800 665 825.

WHAT THE GOLDFUTURES PROJECT TAUGHT US

- Follow the *KVH Best Practice Guide* – implementing these recommendations reduces Psa over time
- Don't ease up on your winter spray programme – Psa inoculum can be high during dormancy. It's recommended that copper-based sprays be applied before and after pruning
- If spray timing is a limiting factor invest in a new sprayer – this will give you the flexibility to be more responsive to Psa infection periods and pruning operations
- Young plants and new blocks need a full season spray programme integrated with cultural controls to minimise Psa
- Learn how to use the **Risk Model** – it is a valuable tool.

Understanding the Psa disease cycle

Psa never sleeps. Even through winter dormancy Psa inoculum is still present – overwintering in rootstocks and woody tissue. When sap rises in spring cankers produce exudate, releasing inoculum. Cool, wet spring conditions create an ideal environment for Psa bacteria to multiply. Just 1mm rain is enough to cause multiplication and dispersal of Psa. The inoculum builds on breaking buds, leaves and flower buds leading to leaf spotting and flower bud rot. Early and ongoing Psa protection is needed to minimise production loss.

RESEARCH HAS SHOWN

early bud protection is key

PSA AND BUDROT

Psa causes budrot in Gold3, as well as Green varieties (Figure 2.). The source of the Psa is mainly external, and moves from the sepals to the inside of the flower bud. Getting a protectant spray on the vines early will help prevent the Psa from getting into the buds. Apply copper at winter rates before budbreak and continue strong protection through early canopy development stages. Infection of flower buds can occur at a very early stage of development, but it takes about 14 days for symptoms to show. So, you need protection in place before BBCH53 (Figure 3.).

As we know, rainfall drives Psa infection, so wetter years pose a greater risk of budrot.

Figure 3. Bud development stages. This research showed that Psa protection needs to be applied before BBCH53. BBCH53 is approximately four weeks after budbreak in Gold3 (budbreak is defined as when 50% of the canopy has broken bud).

The research also showed that Gold3 on Bounty is more susceptible to budrot than Gold3 on Bruno (Figure 4.). It's important for growers with Bounty rootstocks to remain alert and alter the timing of sprays where necessary to account for the earlier budbreak of Gold3 on Bounty.

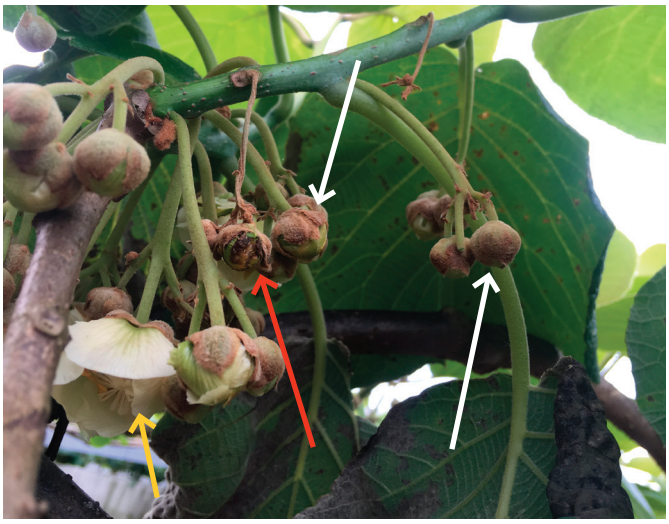


Figure 2. Impacts of budrot: Gold3 flower buds showing symptomless (yellow arrow), developing (white arrow) and advanced (red arrow) symptoms of budrot.

Figure 4. Gold3 grown on Bruno (left) and Gold3 grown on Bounty (right).

WHAT ABOUT RED19?

Red19 is susceptible to leaf spotting and flower bud infection. Typically, Red19 budbreak is three weeks before Gold3, so check your budbreak date and plan your Psa sprays to ensure early flower buds are protected.

As with Gold3, there appears to be a higher incidence of flower bud infection on Bounty versus Bruno rootstock. In our trials, warm, sheltered blocks which had a good Psa management programme had a lower incidence of Psa.

DO WE HAVE ENOUGH IN OUR TOOLBOX?

Protecting our toolbox

We are continually monitoring Psa for resistance to products in our toolbox. Our nationwide annual resistance monitoring programme confirms that the presence of Psa strains in the monitored orchards are stable, which shows the overall Psa risk level is steady. In the last three years, no resistance to kasugamycin was found, streptomycin resistance ranged from 3-8 percent and copper resistance continues to rise slightly each year. However, copper applied at label rates continues to be effective.

Developing our toolbox

We are continuously looking for new products to manage Psa in a sustainable way to reduce reliance on the use of agrichemicals, copper, and antibiotics. This is a lengthy process.

SO WHAT CAN YOU DO TO PROTECT YOUR TOOLBOX?

Continue to use products at label rates. Include products with different modes of action in your programme (see Figure 5.). Use the KVH wall chart to help you make these decisions (google “KVH wall chart”).

Adding to our toolbox

Aureo®Gold provides an additional tool to manage Psa. Aureo®Gold is a bio bactericide with protectant activity against Psa. As with other products, it needs to be incorporated into a Psa spray programme for best results.

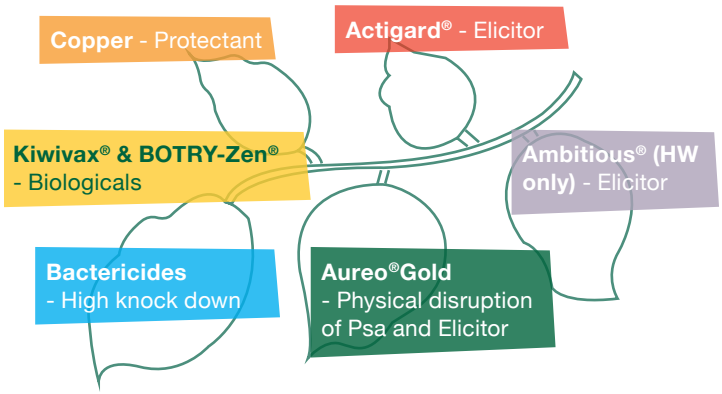


Figure 5. The modes of action of the most common Psa protectants.

ARE PSA STRAINS EVOLVING?

- We continue to look for new Psa variants. So far, no unusual genetic changes have been found. We will continue monitoring this by repeating the work every two years.
- If you are concerned about high levels of Psa in your orchard, contact KVH (0800 665 825) who can arrange sampling to check for product resistance. This helps us keep an eye on Psa.

Don't forget about cultural control!

VINE HEALTH
Optimise shelter, water and nutrition especially for young vines and new plantings. Tailor management to avoid vine stress.

SURVEILLANCE
Monitor your orchard regularly to identify presence of Psa symptoms.

CUT IT OUT!
Prune out infected material and remove from the block to reduce Psa inoculum.

PRE-FLOWER GIRDLE
On high-risk Hayward, girdle 30 days before flowering to reduce flowerbud infection.

TOOL HYGIENE
Ensure tools are sanitised between plants to reduce infection transfer.

PROTECT WOUNDS
This stops infection from entering the plant.

Getting the best out of YOUR PSA MANAGEMENT PLAN

REMEMBER: Psa infection happens from budbreak onwards, so early spray protection is essential. Maintain a regular spray program through spring to protect new growth.

THINGS TO CONSIDER

- What worked and what didn't work last year?
- Know your budbreak and flowering dates. This will help you plan spray timing
- How fast is the canopy developing?
- New plantings, varieties, and rootstocks
- What products suit your site risk?

TIMING

- Apply a copper spray before budbreak and reapply as canopy develops
- Apply elicitors, and bactericides once leaves reach 25-30mm diameter
- Apply Ambitious® when shoots reach 15-25cm (green varieties only)
- Observe recommended spray intervals.

WEATHER

- Spray before high-risk weather or as soon as possible after infection events
- Use the risk model to help you make decisions
- Only spray in suitable conditions to avoid drift.

TARGET

- Canopy coverage is essential for good Psa control
- Use AI nozzles and drift reducing adjuvants
- Ensure nozzles are directed to cover young or replaced vines.

SPRAY MIX

- Choose products according to site risk
- Use sprays with different modes of action
- Check product compatibility before you mix them
- Check water pH
- Ensure good tank agitation.

SPRAY PATTERN

- Calibrate your sprayer
- Check your coverage with water sensitive papers
- Change water rates as your canopy develops
- Alternate the direction of travel for the sprayer for neighbouring rows.

SPRAY RATES

- Use label rates to reduce risk of resistance developing
- Make sure you keep within your copper budget. (Max 8kg active/Ha/yr or 3kg for organics).

Approvals: Complete an online OPIS and Intent to Spray form for each KPIN before applying a bactericide. A second Kasumin® application and all KeyStrepto™ applications require a justified approval (JA). Bactericides leave persistent residues and must not be applied close to flowering (see Kasumin® and KeyStrepto™ user guides on Canopy for timing and other requirements). Ambitious® is not permitted for use on Gold3 or Red19.

NEED HELP? Contact spraydiary@zespri.com **NEED MORE INFORMATION?** www.kvh.org.nz/best_practice

If you would like more information or have questions relating to this insert, please contact Zespri's Global Extension team on extension@zespri.com or 07 572 7600.
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