

# Covering passionfruit blocks pays off

By Pat Sale

A trend over recent years to cover passionfruit blocks with hail or shelter cloth has given good benefits in canopy condition, yield and export grade out.

This trend was started independently over 10 years ago by Alan Laird at Opotiki and a grower in Taranaki. Neither of these two were initially aware of what the other was doing. Their main motivation was to reduce the adverse effect of wind, although hoping for temperature benefits and reduction of the frost risk. Alan already had a wind machine for frost fighting. Both found that there were noticeable benefits immediately. According to Alan, yields were improved by up to 50% and export grade out improved from 30-40% to around 80%. Temperature recordings showed there was a 1.5-2°C advantage when light frosts occurred. In addition, under the covers it was slightly cooler in summer when temperatures soared. This is a distinct advantage as at very high temperatures fruit setting of purple passionfruit can be adversely affected. Other advantages were that fallen fruit did not sunburn so rapidly, although picking up once a day was still necessary, and in the unfortunate circumstances of a significant hail storm the vines were protected.



**Green Sarlon cloth 1.5m wide over the vine rows on Peter Mitchell's pergola block.**

On his Opotiki property Alan Laird had basically well-sheltered blocks so put cover over as a flat top but only partially down the sides. The northern end of his block was open to damage from a northwesterly wind so he ran an angled cover down from the top at about 45° to 1.5m above the ground and this, with the living shelter lifted the wind over the top of the block. As he progressively covered more blocks he tried four different types of cloth and settled on Donaghys Hailguard with 17% shading. It would appear from anecdotal evidence in New Zealand that passionfruit are not as sensitive to shading as kiwifruit, and Alan Laird found an Australian reference suggesting that up to 30% shading did not significantly reduce cropping of passionfruit.

In Taranaki the first block was covered with an Italian cloth, Tunnet supplied by Polynet Products of Christchurch, with a dome configuration over the top only, there being good shelter around the block. Subsequent blocks were covered with a peaked configuration and a lighter grade of cloth, Mikroclima also from Polynet Products. It was ascertained that the heavier grade of cloth performed better.

After several years of this pioneering effort by these two growers the benefits of covering were confirmed and one or two more growers covered their blocks. These included Doug Raper in Taranaki and Peter Mitchell in Katikati. Doug used a Longer Life Monofilament cloth and Peter green Sarlon wind cloth which he put over the rows attached to the top of his pergola structures

**Passionfruit grown in greenhouses produce good quality fruit that matures early but high temperatures can adversely affect fruit set so yields are often low.**



to a width of 1.5m. He immediately noticed an improvement in export gradeout from 40-50% to as high as 95% in one season. He also noticed a benefit in reducing frost risk and less risk of sunburn on the fruit both on the ground and on the vine.

In more recent seasons several more growers have covered their blocks and confirm many of the advantages recorded by the pioneers of covering. Nolan Urry at Katikati was convinced of the benefits to be gained after his vines were damaged by frost and talking with Alan Laird. In fact as Alan sold his Opotiki property and moved to a smaller property on the Bombay Hills in South Auckland, he took some of his cloth with him to cover his small block of passionfruit there, and supplied some of the rest to Nolan. Nolan has not only the top cover but sides and ends as well. The ends can be raised for working the blocks and to allow air movement and bee access but can be closed when damaging winds are likely to occur. In the winter of 2004 he recorded 23 frosts and containers of water froze on about 12 of those occasions outside the cover but not at all inside. In the 2005 season he achieved a 95% export gradeout and did not have enough fruit for local market consignment except right at the end of season when local prices were superior to export. In the heat of the summer he noticed a more pleasant working temperature under the covers.

In 2004 Willem Alblas covered his 0.5ha block and December of that year a field day was held on his orchard and another not far away. It was obvious that the foliage on the vines under cover was in a much better condition than on the other block albeit having good shelter. The covered block went on to produce in excess of 80% export fruit of high quality. The cloth used was Donaghys Hailguard 12mm quad and the sides were covered down to ground level and the ends could be closed in when necessary. With the sides and sometimes the ends covered it was



***Urry's block covered after replanting and with wind cloth down the sides.***



***Young passionfruit killed by frost at Nolan Urry's orchard before the block was covered.***

necessary to make provision for bees to achieve pollination and bumble bee colonies were placed in the rows within the cover. In addition, hives of honey bees were sited in the lee of the southern shelter where they could fly north straight into the block when the ends were open. An excellent crop was produced with very well pollinated fruit. In fact fruit from this block averages 2.4kg per export tray when it is usually 2.0kg or just over.

Antony and Janine Simcock had a young block inland from Tauranga which was somewhat prone to wind and at the lower end had a significant frost risk. During 2005 they have covered the block over the top with either Donaghys Hailguard or Tunnet. They are continuing to cover the sides and the southern end in the season. They prefer the Hailguard as it is cheaper, easier to put up and they feel likely to last considerably longer. The Tunnet is very difficult to manage, catches the wind more and they think it is not likely to last very long. However, it does increase the temperature and they have had no frost damage underneath it. The product brochure suggests protection against frost of -2-4°C. It has led to an earlier canopy development and more early set fruit than under the Hailguard which in turn was an advance on an uncovered area.

Most of their area is covered flat on top of the A frames, but they have one row where it is peaked and there may be benefits from having it significantly above the canopy.

Dave Madsen had experienced frost problems in his passionfruit up in the Kaueranga Valley near Thames. In the

## Passionfruit

autumn of 2005 he covered his lower block with Hailguard, again ex Alan Laird's Opotiki property. Unfortunately he had significant losses from frost following a frost of  $-4^{\circ}\text{C}$ . He wishes he'd pulled the sides right down before that but  $4^{\circ}$  of frost is perhaps too much for Hailguard. He will cover his higher block before next winter having faith in a successful outcome, and if he is to try again with the lower block, Tunnet or similar type cloths could be considered.

The main benefits of covering have been recorded by all these growers except Dave Madsen, with some minor ones as well, and can be summarized as follows:

1. Affords excellent shelter and reduces wind damage to very low levels. Good yields and very high export gradeouts can be achieved.
2. Affords protection against damage from light frosts. It appears Hailguard will protect to  $-2^{\circ}\text{C}$  and Tunnet maybe to  $-4^{\circ}\text{C}$  but the 50 or 100 year frost of maybe  $-8^{\circ}\text{C}$  would almost certainly cause significant damage through all the covers.
3. Temperatures are slightly cooler under the covers in the height of summer which makes for more comfortable working conditions.
4. Sunburn of fruit on the ground or on the vines is significantly reduced.
5. In the event of a hailstorm the vines will be protected.
6. Spray drift will be minimized, especially with the sides covered.
7. It has recently been observed that rosellas can swoop into the crop and peck off flower buds. As they tend to drop into the crop it is likely that they would be deterred where there is a cover over the top.

Depending on the materials used, the cost of covering a block is plus or minus \$16,000/ha with immediate benefits apparent in the season of covering. To date all blocks have been covered as an afterthought over growing vines, and it is possible it could be cheaper and more convenient to cover at the same time the structures are erected.

Passionfruit is a tender subtropical crop and covering improves the environment for it to grow and produce to its potential. However, it must always be remembered that there are a large number of risks in growing passionfruit and covering will not ensure a good yield of export quality fruit unless the vines are under good management and have a good plant protection programme in place as well. 🌿

**Top Left: The end cloth lifted up for access at a field day at Willem Alblas's block in December 2004.**

**Bottom Left: An excellent first crop of quality fruit under the covers in February 2005.**

**Right: The canopy developing well with foliage in excellent condition under the cover in early November 2005, just after pruning.**

**Right Inset Top: A bumble bee colony sited in the rows under the covers at Willem Alblas's block.**

**Right Inset Bottom: A flat-topped Hailguard cover at Antony and Janine Simcock's in December 2005.**



