

HAIL NET INVESTMENTS – DO THEY PAY?

By Ron Gordon

So you are considering an investment in hail netting – the following are things you need to consider.

Hail netting is a long term investment – today net suppliers are providing ten year warranty on materials but the expected life of the net and some of the peripherals is more like 12 to 14 years while the structures last up to 20 to 25 years if made of hardwood and treated timber or indefinitely in the case of structures of steel or concrete posts.

Ongoing maintenance

If you grow in an environment where snow is a common occurrence, the nets need to be rolled in the autumn and then expanded in the spring to protect the crop. This adds costs in the order \$ 300 to \$500 per hectare on each activity.

Light reduction and fruit colour

Expect light reduction from 12 to 25% depending on; the row orientation; whether the net is gable or flat net; and the time of year as the angle of the sun dips lower in the sky in the autumn so this may have an impact on late maturity varieties.

Reduction in light can influence fruit colour. However, my experience shows that the temperature on the lead up to harvest has a much greater influence on fruit colour than light providing the trees are in a pyramid shape and reasonably open textured.

Secondary Benefits

While the incidence of hail is often the prime consideration in the decision to invest in hail netting probably because it has the most visible impact but there are other considerations.

The time in the season the hail event occurs is significant, because the financial impact on early season hail can be quite different to that, which falls close to harvest after all the growing costs have been invested. While early season hail can be addressed to some extent by hand thinning and of course on the grading belt, in my experience there is no practical way of ridding the pack of all damaged fruit and it is this issue that retailers use to try to discount the price they pay for the whole crop if they learn that the crop has suffered hail damage.

Sunburn reduction and improved packouts

However, there are many other secondary benefits, which contribute to the financial equation in the hail net investment decision. Granted some of these are variety specific but much of the varietal suite we grow suffer from weather related impacts such as sunburn. Fuji, Braeburn and Granny Smith are especially susceptible to both sunburn and wind rub, which cause very significant reductions in packouts and hence returns. The market for No 2 grade fruit is not a paying proposition in most seasons, it merely offers some salvage of growing costs.

Just one day at over 35°C can cause 20% or more fruit to be down graded especially if stored any length of time as the blemish caused by even mild sunburn worsens in storage. This leads to a double whammy as you pay for the harvest, storage and packing costs and then throw it in a juice bin where you might get 10 cents per kilo if you are lucky.

Reduction in wind –more timely spray applications

Other more passive benefits are also derived from a hail netting investment. These include the 50% reduction in wind which enables sprays etc to be applied in a more timely manner where it may be too windy to spray outside of the net.

Some frost protection

While not documented in the literature there have been some reduction in the level of frost damage in light to moderate frost events. Under radiation frosts, the net canopy acts as a blanket and holds re-radiated heat around the crop providing some observable rise in temperature hence some protection relative to un-netted crops. Hail nets provide some frost protection where advection frosts (streams of cold air) occur because of the direct reduction in wind provided by the net itself.

The hail net structure also provides a platform on, which to hang frost protection infrastructure such as pipe and sprinklers etc.

Marketing benefits – guarantee of supply

As the consolidation of the retail sector continues unabated and with the advent of the category manager, the continuity of supply becomes more critical aspect in marketing. If you have hail netting and you can ensure you can deliver the product at the end of the season, you offer more security to the category manager that you can deliver and so value is added. Unlike the marketer for the grower who is un-netted, the year following the hail storm is spent searching for alternative markets only to find the second year following they have to re-establish their presence in the “up market” segment all over again. And so it goes on.

Bird and bat management of suppression

Conventional hail net offers considerable protection against bird and bat populations in particular the larger birds like crows and sulfur crested cockatoos. Hail nets can be readily modified to provide full protection by exclusion i.e. nets are draped to the ground in a full enclosure.

THE COST BENEFIT OF HAIL NETTING IN APPLE ORCHARDS

There are a number of ways of discussing this topic as the variables are almost endless.

Yield: The higher the yield the lower the unit costs per bin for hail protection and conversely the lower the yield the higher the unit costs; the cost of the netting structure is significant.

Hail net costs; the higher the initial cost of the net the greater the unit costs and conversely the cheaper the structure the lower the unit costs. Typically conventional netting has been priced from \$40 000 to \$50 000 per hectare to construct. Now with the introduction of the European controlled release systems – the price is now somewhere between \$25 000 and \$30 000 per hectare to construct and this brings the unit costs down dramatically.

The incidence of hail: the incidence of hail storms in any one district is a major influence on the cost of losses due to hail and the viability of constructing nets. Unfortunately it is very difficult to ascertain how prone an area is to hail storms. From experience unless there is a horticultural pursuit at the site, hail storms go unnoticed simply because there are no financial losses to incur.

The time of year: the time of year the hail falls has a very significance influence the cost of hail is to your business. Early season hail storm provides the owner the opportunity to thin or re-thin the crop to remove blemished fruit and if the crop is not salvageable enables the grower has the opportunity to mitigate the losses. While a crop, which suffers hail damage close to harvest has the worst impact possible as the costs are already incurred.

The severity of damage: In some cases a value judgement is required. Can the crop be salvaged or would it be better to mitigate the losses and divert the crop to juice grade. Although this may not be the end of the costs – pest and diseases still require management other wise these will be more expensive to control next season.

The market environment: the supply to the market is a major influence on the cost of hail to the victim. If the market is over supplied then the opportunity to salvage the crop is less likely. No matter what measures are taken in the packhouse there is no practical means of eliminating all hail from the pack and retailers are usually quick to discount lines when affected by hail damage.

So what does hail net costs?

Table 1 below is an analysis of the annual costs of using hail netting based on the following assumptions;

1. Yield is varied from 100 bins (360 kg) to 125 bins per hectare i.e. 36 to 45 tonnes per hectare.
2. the price of constructing the net varies from \$25 000 to \$50 000 per hectare, which is somewhere near the price of the conventional netting and the cost of the new European hail net systems introduced and engineered by James Grigson and myself.
3. The net is depreciated over a 10 year period and financed similarly by lease over 10 years at a 10% lease rate with no residual. The cost of the structure and labour component is depreciated over a 20 year period and financed over a 10 year period at 10% lease rate with 50% residual

Yield bins/ha	Hail net costs \$/ha	Depreciation	Finance	Maintenance	Annual costs	\$/bin
127	\$25,000	\$1,587	\$3,427	\$600	\$5,614	\$44
127	\$30,000	\$2,715	\$3,728	\$600	\$7,043	\$55
127	\$50,000	\$3,175	\$6,859	\$600	\$10,634	\$84
100	\$25,000	\$1,587	\$3,427	\$600	\$5,614	\$56
100	\$30,000	\$2,715	\$3,728	\$600	\$7,043	\$70
100	\$50,000	\$3,175	\$6,859	\$600	\$10,634	\$106

Table 1: the estimated annual cost per bin of hail netting apple orchards

The analysis:

This is showing the annual cost per bin of using hail netting and the extra return per bin you require to break even on the investment. i.e. that if the net is priced at \$50 000 per hectare, using the above assumptions of a yield of 100 bins per hectare the grower requires a net after cost improvement of \$106 per bin to break even while if the yield is 127 bins per hectare the net requirement is \$84 per bin to break even. This is why the uptake of hail net in Australian orchards has been slow due to the high capital costs of the conventional net.

Conversely, where the capital cost of the new net system is somewhere around \$25 000 to \$30 000 per hectare the break even point is \$44 per bin and \$56 per bin for yields of 127 and 100 bins per hectare respectively.

Can these improvements in gross returns be met and exceeded?

The most likely gain through the investment of a hail net investment is by improvements in packout i.e. an increase in the percentage of first grade packed. Hail storms can significantly reduce gross yield where an attempt is made to clean up a moderately damaged crop. But often hail storms are not an annual event at a particular site and it can be difficult to justify the investment based on avoidance of hail damage alone. However, when the secondary benefits of reduced sunburn and blemish caused by wind etc. are considered in the equation, investment in the new European systems at the assumptions used in Table 2 above, are easily justified as a 10% improvement at any economic price point i.e. while price exceeds all growing and post harvest costs.

The financial justification for the more expensive hail net systems does require a higher price point to be viable and this is consistent with the way growers have invested in conventional hail net systems – netting their most valuable varieties and taking their chances with older blocks which consist of varieties of lower value or blocks which have lower yield profiles.

In conclusion the price of the hail netting system, the yield and market prices all impact the viability of the hail net investment. Table 1 demonstrates the extra returns required under the yield and cost assumptions used. It is found that a 10% improvement in packout whether it be due to a reduction in hail affected fruit or due to reduced sunburn, the new European system can be viable where returns exceed all growing and post harvest costs including marketing. The higher the yield and price profiles the higher the returns on the investment.