



MICROCLIMATE UNDER PERMANENT NET

A Summary of Technical References

To summarize the cited references¹, canopy netting has been shown to:

- **reduce light levels**; coloured netting can alter light spectrum scattering;
- **reduce evaporation and transpiration** (or increase humidity) and subsequent irrigation requirements can also be reduced;
- **reduce windspeed** - physical damage from wind is discussed on our website under “Weather – Wind Protection”;
- **moderate temperature slightly**; possible effects such as frost mitigation are subject to site related variables such as topography and day-time temperatures, so are not consistent for different netted sites and trials – each site is unique in this respect.

Plant Response

Microclimate and pest exclusion contribute greatly to positive plant responses to netting.

(In addition to the references listed below, also read our website library article “[Apple Orchard Under Hail Netting](#)” by Simon Middleton).



Plant responses to the environmental and microclimate effects of canopy netting include:

- improved skin finish, reduced sunburn and reduced wind-rub
- lower fruit set with fewer multiple fruit clusters i.e. less hand or chemical thinning required;
- bee foraging behaviour can be altered, and hence pollination patterns
- improved tree water-use efficiency and less tree stress in hot dry weather due to the higher humidity and reduced evapotranspiration under the net.

Orchard Management and Economics

The installation of netting has a number of effects on management techniques, including pruning, thinning, spraying, and irrigation, pollination, and pest control.

Again, for more details refer to the cited references; following is a quick summary of the management practices found to be affected:

- slower drying times for chemical applications due to higher humidity and reduced wind
- no difference in disease incidence was noted in the AP320 trials¹
- consistent lines of supply for market development and greater financial security
- increased pack-out as less fruit is damaged by sun, wind and birds





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(continued)

- early maturing fruit and canopy-top that is normally lost to birds and bats can be harvested
- tree tops need to be kept well below the height of the netting, and bee hives placed under the netting for good pollination
- reduced irrigation requirements due to greater water-use efficiency
- depending on the crop, pruning needs to be timely and enable light penetration; tree vigour control may also be necessary due to the shading effect of net.

A major benefit in Crop Economics is the exclusion of pests and predators – from birds and bats, down to fruit-fly and other insects – depending on the type of net installed. Pest exclusion is discussed in more detail on our website under Pest Attack.

Economic Benefits of Canopy netting are a balance between costs and returns:

To summarise: costs of protective canopy netting may include:

- capital costs (materials and installation)
- finance required
- repairs and maintenance
- orchard maintenance due to changed management practices

The returns from protective canopy netting can include:

- greater quantity cropped (non-netted orchard losses are estimated to be as high as 60%)
- improved crop quality and higher grades of produce
- better pack-out with less sorting at picking and packing stages; improved picking speeds and reduced labour costs
- more reliable and predictable production
- extended production with harvesting of earlier top canopy fruit
- lower orchard maintenance due to changed management practices
- peace of mind and reduced fatigue levels for growers and employees (due to elimination of night-patrols and reduced noise from scare-guns).



References:

¹ Middleton S, McWaters A, (1997) “AP320 – Hail netting to increase apple orchard productivity”, QLD DPI Australia. Published by Horticulture Australia Limited; available through their website (www.horticulture.com.au) for \$22 (incl GST).

Direct Link: <http://www.horticulture.com.au/contactus/Contact%20Us.asp>

² Rigden P, “To Net Or Not To Net?”(2002), 3rd edition (2008), Qld DPI Australia.

Available Free of Charge on DEEDI website: www.dpi.qld.gov.au

Direct Link: http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/16_12622_ENA_HTML.htm