

PROTECTIVE STRUCTURES – EFFECT ON WATER USE

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Growcom's Water for Profit Program is part of the Rural Water Efficiency Initiative funded by Queensland's Department of Natural Resources and Mines.

Protective Structures Effect on Water Use

A recent trial on a farm in the Granite Belt has shown some interesting results in regard to the effect that protective netting has on the plants water demand. The grower has had the netting for some time and knew that it reduced the water demand on the plants, so Water for Profit decided to directly measure the difference in evapotranspiration (ET_o) or water demand on the crops.

The trial was sited on a plot where the grower grows vegetables in summer under netting which is used primarily for hail protection from summer storms. The manufacturer of the net lists the shade factor (reduction in ultra violet light between 300-700nm) at 20% plus or minus 2%. The grower has also fitted vertical netting on the sides of the hail nets as this helps protect the crop from insects. Water for Profit staff placed one weather station under the net and also placed one nearby outside the net structure.

The trial has been running now for just over two months, and is showing some interesting results. Data from the weather stations show that ET_o demand inside the net has been reduced by 20%. Solar radiation, temperature, relative humidity and wind are all factors that contribute to total ET_o. In the period tested so far over late summer to mid autumn, the changes in temperature and humidity are marginal, and the change in wind speed is not large enough to have a significant effect on ET_o.

However the results show that the reduction in ET_o closely correlates to the reduction in solar radiation reaching the plant. The net caused the biggest reduction in solar radiation on the days of highest sunlight intensity. This means that those days which had the highest ET_o demand outside the net, were the days in which the net had its largest effect in reducing ET_o. This is important not only in reducing water demand, but also on reducing overall crop stress. You can see this in the attached graph above which shows the daily ET_o for inside and outside the net. The high ET_o days have the largest gaps between the lines plotted on the graph.

The important aspects to note on this trial is that with these crops, very good yields are still seen under the nets. This means that the plants growth is not limited by a decrease in solar radiation, or changes in temperature, and experiences less stress on days with high solar radiation intensity. Growers using protective nets can save water by taking into account the reduced water requirement when scheduling their irrigation. This water saving is another advantage of protective structures and will change according the many types of net used.

Comparison of Evapotranspiration (ETo) Inside/Outside Net

