Barbon Estate - a case study of an irrigation system upgrade

Steve Barbon
Barbon Estate Vineyard, Griffith, NSW

Introduction

Barbon Estate is a 17 ha vineyard located at Hanwood, NSW. A family run enterprise Barbon Estate supplies fruit to Orlando Wyndham wines.

Barbon Estate is typical of many vineyards in the Griffith area and was originally setup with a flood irrigation system. Due to a change in family circumstances the system required changing and has since been converted to drip irrigation. This paper describes the reasons for the change and the issues encountered with the change.

Flood Irrigation

The flood irrigation system involved small furrows running between the vine rows from the main scheme water open channel. To get water from the main channel grooves were cut in the main channel and the water allowed to flow into the furrows between the vine rows. This was a time consuming process as the furrow banks had to be monitored to ensure that the furrow banks did not break.

Preparation for an irrigation would take 2–3 days. This involved ploughing between the vine rows and forming the furrows in the middle of the vine rows. Preparation of the headlands was undertaken by hand.

Once the water had begun flowing along the vine row furrows, the bank required constant checking to ensure no water ran onto the headlands.

Despite careful preparation and monitoring of the furrows during the day, at night time headlands often flooded and rows that were closed often reopened flooding rows that should have remained dry. Flooding of the rows that were to be kept dry, caused water tables to rise. This lifted water tables into the rootzone of the vines affecting growth yield and fruit quality.

In 1996 changes within the Barbon Family saw one person left to irrigate the vineyard. This took the time to complete and irrigation from 2–3 days to 5 days. To ensure the sustainability of the farm a better watering system had to be found that would reduce water tables, work loads, fuel and time spent on maintenance.

After seeking advice and quotes on alternative irrigation systems it was decided that a pipe and riser system would be too expensive, despite this being the system that most locals were recommending. Drip irrigation was then considered.

A farmer looking at many vineyards locally who had converted to drip the decision was made that this system would best suit the needs of the farm. It also attracted a substantial subsidy from the Salt Action Committee.

The Rural Assistance Authority also granted a loan to allow for the conversion. These loans were only available to farms converting to pressurised irrigation systems.

The Drip system

Before installing the new system a soil survey was undertaken to determine the rooting depths of the vines. A soil moisture monitoring system, Enviroscan®, was also installed to aid in scheduling irrigations.

The system was designed and installed by a local company. The system installed irrigates the vineyard in 4 shifts and the dripper output is 3 L/hr.

There are 4 main filters at the pump station and backup filters in the field at the valves. The system also has a controller that allows for programming of the irrigation and fertigation. A mimic panel was also installed, this shows which blocks are being irrigated and also enables the system to be run manually should a power failure occur. It also allows blocks to be isolated so individual blocks can be irrigated or fertigated.

The system has a 3000 L fertigation tank that allows fertilisers to be mixed before being injected into the system by a fertigation pump. The system is electrically powered with a main irrigation 10 Hp pump.

Advantages of the new system

Since converting the system to drip irrigation water usage has reduced by 70%. The reduction in water applied and by being able to accurately schedule the irrigations has produced dramatic improvements in fruit quality. Disease levels have also been drastically reduced.

The water table has also been lowered below the vineyard. This in turn has allowed the farm to avoid having to invest an estimated $250,000 on a tile drainage system. This would have been required, as the rising water table under the old irrigation system would have made the vineyard unproductive and unsustainable. It has also improved the local environment.

The labour savings that the new system has produced have allowed off farm employment to be sought and increased leisure time.

Summary

Installation of the drip irrigation system has increased the value of Barbon Estate. It also has reduced labour inputs, equipment repairs and fuel costs.

Above all fruit quality has improved strengthening the relationship with my winery customers and allowing me to be paid more per ton of grapes. This has improved the income from the farm and allowed a better lifestyle to be achieved.