AWRI

opportunities in a new climate

Case Study
VITICULTURE

Grazing sheep in vineyards

Merino sheep grazing the midrow after harvest in Orange, NSW. Photo courtesy of Martin Gransden.

Background

Australian vineyards are generally highly mechanised, relying on heavy machinery for pruning, slashing, trimming, spraying and harvesting. Diesel pumps are also used by some properties to pressurise irrigation systems. Together, these operations explain why fuel use is for many growers their biggest source of greenhouse gas (GHG) emissions and a high input cost. Using sheep to control midrow and undervine growth is one option to reduce the need for slashing and spraying and therefore reduce vineyard management costs and GHG emissions.

Sheep in vineyards

In Australia, sheep are typically grazed in vineyards between harvest and budburst. Sheep are generally not used during the growing season because they eat the grapevine leaves that are required for photosynthesis and to protect the fruit from sunburn. In cooler regions sheep can be used for leaf plucking between fruit set and veraison.

Before considering the use of sheep in a vineyard, it's important to be aware of the agrochemicals that have been used in that vineyard. Some agrochemicals have labels that state that stock should not be grazed in the vineyard or foliage cut for stock food if the chemical has been applied during the season. For other products, there may be a withholding period before stock can be grazed or a defined interval between removal of the sheep from the vineyard and their slaughter for consumption.

Case study: Cumulus Vineyards

Cumulus Vineyards has a 508 hectare vineyard in Orange, NSW. In 2014, Cumulus trialled the use of sheep in a small section of the vineyard to assess the impacts on vineyard inputs, especially fuel use.

A neighbour's sheep were placed in a 100 ha fenced portion of the vineyard. The sheep remained in the vineyard during winter and were removed in mid-September. Introducing sheep into the vineyard was found to provide a source of revenue from sheep agistment and reduce expenses associated with slashing and herbicide spraying.

In 2015 sheep were grazed across the entire 508 hectares of the Cumulus vineyard. The sheep grazing allowed Cumulus to avoid two passes through the vineyard that would otherwise have occurred (one for slashing and one for spraying herbicide). Details of the savings achieved are shown below.

2015 results

Estimated fuel and greenhouse gas savings:

- 1 slashing pass @ 5 L diesel/ha x 508 ha = 2,540 L diesel or 6.91 t CO_2-e
- 1 herbicide pass @ 5 L diesel/ha x 508 ha = 2,540 L diesel or 6.91 t CO_2-e

Total saving = 13.82 t CO_2-e or 0.03 t CO_2-e/ha.

Estimated cost savings:

- 1 slashing pass @ 0.5 Hours/ha x 508 ha = 254 Hours @ $60*/Hour = $15,240
- 1 herbicide pass (3 row sprayer) @ 0.25 Hours/ha x 508 ha = 127 Hours @ $60*/Hour = $7,620 plus cost of chemical

  (*Hourly rate includes labour, fuel, repairs and maintenance and depreciation.)

  Total saving = $22,860.

The details

To accommodate the sheep without disrupting vineyard practices, Cumulus split their 508 ha area into five different parcels for the sheep to graze. The flock of 3,500 Merinos were kept together and rotated through the parcels using a technique called 'cell' or 'crash' grazing. The aim of this method is to have the midrow and undervine growth heavily grazed so everything is eaten and no weeds are left before moving the sheep onto the next parcel. If sheep are introduced into a larger area, they could graze preferentially - only eating the vegetation they like and leaving the weeds behind.

There were no transport costs because the sheep came from a close neighbour; however some temporary fencing materials (posts and wire) were purchased to divide up the vineyard.

Cumulus Vineyards and Entwine

Cumulus Vineyards Pty Ltd became vineyard members of Entwine in 2010. Figure 1 shows the greenhouse gas (GHG) emissions from Cumulus Vineyards in 2014/15 benchmarked against other similar sized Entwine member vineyards. Cumulus Vineyards ranks in the lowest 37% of vineyards for total GHG emissions. This low ranking is driven by very low fuel use, with Cumulus ranking in the lowest 5% of similar sized Entwine member vineyards. The grazing of sheep in the vineyard is likely to be one of the contributors to the low fuel use at Cumulus.

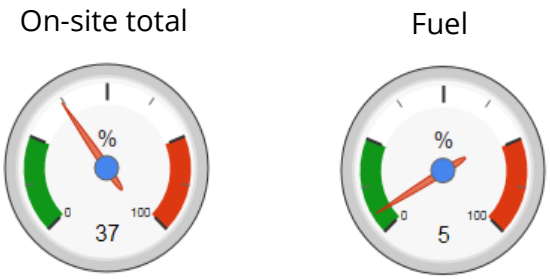

Figure 1 Ranking of Cumulus Vineyards' greenhouse gas emissions in 2014/15, compared to similar sized Entwine members. On-site total greenhouse gases (left dial) and greenhouse gas emissions from fuel use (right dial), showing that Cumulus is in the lowest 37% of similar sized vineyards for total greenhouse gas emissions and the lowest 5% of similar sized vineyards for emissions from fuel use.

Acknowledgement

This project has been supported through funding from the Australian Government.

Contact

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