



# Barossa Improved Grazing Group Final Project Report

## **Livestock Grazing Management in Barossa Vineyards**

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Prepared by Brett Nietschke, BIGG Technical Facilitator

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Photo: Brett Nietschke

## Acknowledgements

The Barossa Improved Grazing Group (BIGG) acknowledges Natural Resources Adelaide and Mt Lofty Ranges funding for this project through a 2014-15 Community NRM Action Grant.

This project was conducted in association with Barossa Grape & Wine Association (BGWA) who through Nicki Robins helped facilitate the survey of its grower members. Thanks to the growers who completed the survey and to Bruce Hancock for donating a lamb as a prize for the survey.

BIGG is also appreciative of Ben Zander, Matt Neldner, Christa Deans, Tim Liersch, Kirsty Waller and David Vaughan for their participation in the project's focus group session.

## Summary

During 2015 BIGG conducted the project, '*Livestock grazing management in Barossa vineyards*'. The project consisted of a survey of BGWA grower members and a focus group to verify the survey results.

The project determined that the key reasons why BGWA growers graze livestock in their vineyards is: weed control, reduce chemical use/costs, reduce other input (machinery/fuel/labour) costs and to utilise feed. To successfully graze livestock in vineyards the key criteria were: conduct rotational grazing, manage the timing of grazing and ensure good fencing.

Of the growers that participated in the survey who are not intending to graze livestock in the vineyards their key reasons were: lack of/need to upgrade fencing, soil compaction and the need for sheep management. These factors were also identified as some of the common knowledge gaps.

The project also highlighted the differences in opinions that growers have about soil compaction being caused by grazing in vineyards compared to machinery. In addition, there is scope for BGWA growers to agist sheep in their vineyards if they don't own them.

## Background

In 2014, BIGG received a \$5000 Community NRM Action Grant for the project, '*Livestock grazing management in Barossa vineyards*', funded by Natural Resources Adelaide and Mount Lofty Ranges. The funding allowed BIGG to form a new partnership with BGWA to explore the NRM and productivity benefits of livestock grazing in vineyards.

The project consisted of a survey of BGWA grower members and a focus group to verify the survey results. The aim of the survey was to:

- Benchmark current grazing management practice in vineyards.
- Determine the interest of growers who do not currently graze their vineyards to do so in the future.
- Identify the benefits from the growers currently grazing vineyards.
- Identify the barriers for adoption of grazing in vineyards.

The survey questionnaire jointly developed by BIGG and BGWA, consisted of both 'yes-no' and 'open-ended' questions (where multiple answers could be given) (Appendix 1). It was emailed to 550 BGWA grower members in January 2015, who were given two weeks to voluntarily respond. The responses from the survey were then aggregated and presented to a focus group consisting of six grape growers/industry representatives who reviewed them.

The survey results, including feedback from the focus group (boxed and in italics) are outlined in this project report.

## Project results

### 1. Survey participation and grazing practice

- 34 out of 550 BGWA grower members participated in the survey, representing approximately 6% of the survey pool.
- Of the 34 survey participants, 24 (71%) had grazed livestock in their vineyard before, while 10 (29%) had not (Table 1).

*The focus group considered a more realistic estimate of BGWA members that had grazed livestock in their vineyard was 10-15%. Of the stock grazed in vineyards, the vast majority is sheep, with very few growers grazing cattle.*

- Of the 24 survey participants who have grazed livestock in their vineyard before, 22 said they would continue to graze and of the 10 participants that had not grazed before, six were interested to graze in the future (Table 1).

**Table 1: Number of survey participants and their livestock grazing practice in vineyards**

Grazed before (#)		Not grazed before (#)	
24		10	
Continue grazing (#)	Not graze again (#)	Interested to graze in the future (#)	Not interested to graze in the future (#)
22	2*	6	4

\*Of the two participants who wouldn't graze again, one wouldn't "because we don't own a vineyard anymore"

## 2. Survey participants who have grazed livestock in their vineyard before

The 24 survey participants who have grazed livestock in their vineyard before were asked if they would be interested to continue grazing in the future, their key reasons for grazing and their key criteria to successfully graze:

- Of the 24 participants, 22 (92%) would continue to graze, while 2 (8%) wouldn't graze again (Table 1).
- A total of 85 answers were received from participants as to why they graze livestock in their vineyard. The most common were: weed control, reduce chemical use/costs and reduce other input (machinery/fuel/labour) costs (Table 2).

**Table 2: Key reasons for grazing given by the 24 survey participants who have grazed livestock in their vineyard before**

Key reasons for grazing livestock in vineyards	(#)	(%)
Weed control	19	<b>22.4</b>
Reduce chemical use/costs	15	<b>17.6</b>
Reduce other input costs*	15	<b>17.6</b>
Utilise feed	10	<b>11.8</b>
Add manure/attract dung beetles	8	<b>9.4</b>
Ease pressure on pasture paddocks	5	<b>5.8</b>
Reduce fire risk	3	<b>3.5</b>
Reduce soil compaction by machinery	2	<b>2.4</b>
Extra grazing land	2	<b>2.4</b>
Other (single answers)**	6	<b>7.1</b>
<b>TOTAL</b>	<b>85</b>	<b>100.0%</b>

\*Refers to all inputs that are not related to chemical use/cost (includes machinery, fuel and labour costs).

\*\*Other single answers given were: save on supplementary feed, shelter for lambing, agistment, already own sheep, assist herbicide control, likes eating lamb.

*Given weed control was the key reason why growers graze livestock in vineyards, the focus group questioned the level of weed survival after being eaten by stock. Note- for the key Barossa vineyard weed, annual ryegrass (*Lolium rigidum*) a study conducted by Stanton et al. (2002)<sup>1</sup> found that following ingestion and excretion of annual ryegrass seed by sheep and cattle, 3.9 and 11.9% of seeds, respectively, remained germinable.*

*The high level of seed destruction during digestion by sheep is particularly important for annual ryegrass management given the focus group felt that virtually all Barossa vineyards have herbicide resistant annual ryegrass.*

- A total of 61 answers were received from participants as to their key criteria to successfully graze livestock in vineyards (Table 3). The most common were:
  - Conduct rotational grazing (i.e. crash or strip graze smaller sections of the vineyard with high stocking rates before moving onto the next section).
  - Manage the timing of grazing (includes both removing stock at around budburst and ensuring vineyards are not overgrazed).
  - Good fencing.

*The focus group confirmed the importance of removing livestock from vineyards by budburst to mitigate against grape yield loss. They also suggested that grazing near urban areas might be an issue due to the presence of dogs and people.*

**Table 3: Key criteria to successfully graze livestock in vineyards given by the 24 survey participants who have grazed before**

Key success criteria to grazing livestock in vineyards	(#)	(%)
Conduct rotational grazing	14	<b>22.9</b>
Manage the timing of grazing	14	<b>22.9</b>
Good fencing	10	<b>16.4</b>
Run the correct stocking rate	4	<b>6.6</b>
Good water access	4	<b>6.6</b>
Infrastructure*	4	<b>6.6</b>
Sheep characteristics**	4	<b>6.6</b>
Move sheep out of vineyard if waterlogged	3	<b>4.9</b>
Keep dogs out	2	<b>3.3</b>
Move sheep out the vineyard to manage chemical withholding periods	1	<b>1.6</b>
Work with someone who knows sheep	1	<b>1.6</b>
<b>TOTAL</b>	<b>61</b>	<b>100.0%</b>

\*Single answers relating to 'infrastructure' were: best to have drippers on the ground rather than on a wire, some damage to irrigation infrastructure is unavoidable but cheap to repair, need to check drippers more often if sheep are in the vineyard as they tend to knock them a little more often, best with a high trellis which stock can't try to jump over.

\*\*Single answers relating to 'sheep characteristics' were: have sheep that aren't too adventurous, preferably don't have self-shedding sheep as these rub on the vines a bit too much, calm sheep, type of sheep.

<sup>1</sup>Stanton, R., Piltz, J., Pratley, J., Kaiser, A., Hudson, D. and Gill, G. (2002). Annual ryegrass (*Lolium rigidum*) seed survival and digestibility in cattle and sheep, *Australian Journal of Experimental Agriculture*, 42, 111-115.

### 3. Survey participants who have not grazed livestock in their vineyard before but are interested to graze in the future

The 10 survey participants who have not grazed livestock in their vineyard before were asked if they would be interested to graze in the future and if so, their key reasons why: Of the 10 participants, six (60%) were interested to graze in the future (Table 1).

- A total of 12 answers were received from the six participants as to why they would like to graze livestock in their vineyard. The most common were: weed control, reduce chemical use/costs and reduce machinery use/costs (Table 4).
- Of the six participants who have not grazed before but are interested to do so in the future, three participants also raised concerns about grazing. These related to: fencing, soil compaction, sheep management, lack of knowledge about sheep, damage to irrigation infrastructure, other weed control options instead of sheep and the extra work required to run sheep.

**Table 4: Key reasons for grazing given by the six survey participants who have not grazed livestock in their vineyard before, but are interested to graze in the future**

Key reasons for grazing livestock in vineyards in the future	(#)	(%)
Weed control	4	<b>33.4</b>
Reduce chemical use/costs	2	<b>16.7</b>
Reduce machinery use/costs	2	<b>16.7</b>
Utilise feed	1	<b>8.3</b>
Extra grazing land	1	<b>8.3</b>
Secondary income source	1	<b>8.3</b>
Monitor while pruning	1	<b>8.3</b>
<b>TOTAL</b>	<b>12</b>	<b>100.0%</b>

### 4. Survey participants who have not grazed livestock in their vineyard before and are not interested to graze in the future

Four of the 10 survey participants (40%) who have not grazed livestock in their vineyard before were not interested to do so in the future (Table 1). (However, one of the four would consider it “if it is a benefit to our vineyard management and is profitable”).

The four participants were asked their key reasons for why they don't want to graze livestock in vineyards in the future.

- A total of 12 answers were received with the key being: lack of/upgrade fencing, soil compaction and the need for sheep management (Table 5).

*The focus group also identified a 'lack of time' as why growers may not want to graze livestock in their vineyard.*

**Table 5: Key reasons for not grazing given by the four survey participants who have not grazed livestock in their vineyard and are not interested to graze in the future**

Key reasons for <u>not</u> grazing livestock in vineyards in the future	#	%
Lack of/upgrade fencing	4	<b>33.4</b>
Soil compaction	2	<b>16.7</b>
Sheep management	2	<b>16.7</b>
Not interested in sheep	1	<b>8.3</b>
Need to purchase stock	1	<b>8.3</b>
Alternative grazing area required when not in vineyard	1	<b>8.3</b>
Damage to irrigation infrastructure	1	<b>8.3</b>
<b>TOTAL</b>	<b>12</b>	<b>100.0%</b>

### 5. Survey participants who have not grazed livestock in their vineyard before – fencing system

The 10 survey participants who have not grazed livestock in their vineyard before were asked if they would be interested to graze if they had an easy to manage fencing system (i.e. a portable electric fence).

- Of the 10 participants, seven (70%) were interested to graze in the future if they had an easy to manage fencing system. Of these seven, six had already responded in the survey that they were interested to graze in the future. However one of the participants that had previously responded as not being interested in grazing said they would graze if they had an easy to manage fencing system.
- Of the remaining three participants, irrespective of an easy to manage fencing system, two (20%) were not interested to graze while the other participant (10%) answered “perhaps”.

### 6. Natural resource management benefits

The survey questionnaire did not include a question about the ‘NRM benefits of livestock grazing in vineyards’. However this was partly captured in the survey responses related to the ‘key reasons for grazing’ (Table 2), including in discussions with BGWA growers throughout the project. A summary of the key NRM benefits for grazing livestock in vineyards include:

- Improved weed control, particularly for ‘hard to kill’ and herbicide resistant weeds.
- Improved groundcover, particularly under vines that would normally be sprayed.
- Conserving plant biodiversity through reduced herbicide use, particularly where native grasses are grown.
- Improved nutrient recycling through the addition of manure.
- Reduced machinery and fuel use, through less slashing, spraying or cultivating the vineyard mid-rows.



## 7. Knowledge or information gaps

All (34) survey participants were asked to identify specific knowledge or information gaps for livestock grazing in vineyards. Their common answers related to:

- Fencing, specifically the type of fencing required for sheep (e.g. how many wires needed for an electric fence, cost of fencing).
- Information on sheep and sheep management (e.g. grazing timing, rotational grazing, stocking rate, temperament of crossbred sheep versus merinos, sheep husbandry and health requirements).
- Potential for soil compaction.
- Level of damage to irrigation infrastructure.
- Manure addition (e.g. gain/loss of soil nutrients after sheep removal, long term benefits of manure use, weed spread through sheep movement).
- Recommended pasture species/permanent sward to grow (e.g. how best achieve maximum mid-row growth for grazing without compromising vine health).
- Possibility to extend the grazing window (e.g. can livestock be grazed past budburst if a high amount of feed is on offer?, could smaller breeds of sheep (or ducks/geese/pigs) safely graze vineyards past budburst?, are the vines affected if stock are grazed before leaf fall post harvest?).
- Experience of other growers who successfully graze vineyards.

*The focus group also suggested the following knowledge or information gaps for livestock grazing in vineyards:*

- *Develop a register of growers who don't have sheep but want to graze sheep in their vineyards, so to 'marry them up' with local graziers who are looking for agistment. The register to include; vineyard location, block size and access to water/yards/loading facilities.*
- *Rates paid for sheep agistment.*
- *To gain a better understanding of the level of soil compaction caused by both sheep and machinery in vineyards, penetrometer and water infiltration rate measurements could be conducted in representative Barossa vineyards. Compare undervine, mid-row, mid-row traffic marks and sheep camp areas.*

## Summary analysis

- The majority of survey participants showed an interest in grazing in Barossa vineyards: 71% (24/34) have grazed livestock in vineyards before, while 82% (28/34) would graze again or are interested to graze in the future (Table 1). Compared to the survey figure of 71%, the focus group considered a more realistic estimate of BGWA members who had grazing livestock in their vineyard before was 10-15%. This large difference is probably because those participants that had grazed before had greater interest in the survey topic (compared to those that had not previously grazed) and were more likely to complete the voluntary survey.
- Weed control, reduction in chemical use/costs, reduction in other input (machinery/fuel/labour) costs and to utilise feed were the four key reasons given for grazing livestock in vineyards. This was consistent for survey participants that have grazed livestock in their vineyards before and those who are interested to graze in the future (Table 2, Table 4).

- Of the survey participants who had not grazed before (10/34), one (10%) participant who was not initially interested to graze in the future, would graze if they had an easy to manage fencing system (i.e. portable electric fence).
- Conducting rotational grazing, managing the timing of grazing and ensuring good fencing were the key criteria to successfully graze livestock in vineyards (Table 3).
- A lack of/need to upgrade fencing, soil compaction and the need to manage sheep were the key reasons given for not grazing livestock in vineyards (Table 5). These were also identified as some of the common knowledge gaps for livestock grazing in vineyards.
- The survey highlighted that for those growers that don't own sheep, agistment is an option. This is based on participants reasons for not being interested in vineyard grazing, including; the need to manage sheep, growers not interested in sheep, need to purchase stock and when it doesn't suit to have stock in the vineyard the need for an alternative grazing area (Table 5). However all these issues could be overcome if instead of owning sheep, growers agisted them. (One of the participants in the survey stated, "Why are some growers so reluctant to consider stock grazing? It has its benefits, and to those who don't own stock it could even be an additional source of income to assist with making ends meet").
- The survey highlighted the differences in opinions that growers have about soil compaction being caused by livestock grazing in vineyards. Survey participants cited soil compaction as a reason to not graze (Table 5), but also a reason to graze livestock in vineyards, as it was considered by some that grazing caused less soil compaction than machinery (Table 2). (One of the survey participants stated, "there is a stigma that sheep compact the soil").



Photo: Ben Zander

## Appendix 1

### **Barossa Grape and Wine Association Grower Survey: Livestock Grazing Management in Barossa Vineyards Project**

**Please complete the survey by Friday 30<sup>th</sup> January 2015**

**Name:** ..... **Contact no:** .....  
(please include your name & contact no. to go into a draw to win a dressed & packed lamb valued at \$250)

**1. Have you grazed livestock in your vineyard before? (please circle or highlight one)**

- a) yes
- b) no

*If yes go to Question 2, if no go to Question 5*

**2. What are the key reasons why you graze livestock in your vineyard?**

-  
-  
-

**3. In your experience what are the key criteria to successfully graze livestock in your vineyard?**

-  
-  
-

**4. Are you interested in continuing to graze livestock in your vineyard in the future? (please circle or highlight one)**

- a) yes
- b) no

*If yes go to Question 9, if no go to Question 7*

**5. Are you interested in grazing livestock in your vineyard in the future? (please circle or highlight one)**

- a) yes
- b) no

*If yes go to Question 6, if no go to Question 7*

**6. What are the key reasons why you would like to graze livestock in your vineyard?**

-  
-  
-

*Go to Question 8*

**7. What are the key reasons why you don't want to graze livestock in your vineyard?**

-  
-  
-

**8. Would you be interested in grazing livestock in your vineyard if you had an easy to manage fencing system - i.e. portable electric fence? (please circle or highlight one)**

- a) yes
- b) no

**9. What are the specific knowledge or information gaps that you would like addressed relating to livestock grazing management in vineyards?**

-  
-  
-

**Please email the completed survey to [nicki@barossa.com](mailto:nicki@barossa.com) or print and post to Nicki Robins at BGWA, PO Box 420 Tanunda SA 5352. Thank you for taking the time to fill out this survey.**