



BIGG Producer Water Security Survey Report

December 2021

Prepared by Brett Nietschke, BIGG Technical Facilitator

*This survey is supported through funding from the Australian
Governments Smart Farms Small Grants*

TABLE OF CONTENTS

SUMMARY 3

BACKGROUND 4

SURVEY RESULTS AND DISCUSSION..... 4

Q1. Location of survey respondents 4

Q2. Enterprises run by survey respondents 5

Q3. Property water sources 5

Q4. Current annual water requirement..... 5

Q5. Future annual water requirement..... 6

Q6. Percentage water requirement increase..... 6

Q7. Water security issues experienced..... 6

Q8. Future water security improvements and innovations..... 7

Q9. Barriers to implement future water security improvements and innovations 8

Q10. Change in water salinity levels..... 9

Q11. Access to innovations to manage water salinity..... 10

Q12. Impacts on the lack of water security 10

Q13. General comments on regional water security..... 11

APPENDIX 1 – SURVEY QUESTIONNAIRE..... 12



Summary

An online survey of Barossa Improved Grazing Group (BIGG) subscribers was conducted in September-October 2021 to improve understanding of on-farm water security in the region. Thirty local producers responded to the survey. Respondents were mostly sheep, beef cattle and/or grape (vigneron) producers located in the neighbouring postcodes of 5353 and 5235 (these postcodes include the localities of Eden Valley, Flaxman Valley, Angaston and Keyneton).

The survey determined the:

- Water sources local producers rely on
- Future producer water requirements
- Current water security issues
- Barriers to undertaking future water security improvements and innovations
- Impacts of a lack of water security
- Rising water salinity levels

The water sources mainly relied upon by producers for their agricultural enterprises are on-farm dams (93% of respondents), bore groundwater (73%) and rainfall captured from house/sheds (63%). Twenty-three percent of respondents have previously carted water to meet their enterprise needs.

In three years' time (i.e. September 2024), half of the survey respondents expected their current annual water requirements would increase, while half expected it to remain the same (no respondents expected it to decrease in three years' time). Of those respondents that expected it to increase, the average estimated rise in annual water requirements was 47% (i.e. in three years' time compared to their current annual use).

A range of on-property water security issues have been experienced by producers over the last three years (i.e. September 2018-September 2021). Notably, low farm dam water supply (90% of respondents) and low rainfall capture (80%). Thirty-seven percent of respondents have an issue with saline bore groundwater.

Over the next three years, respondents would like to undertake a range of water infrastructure improvements and innovations on their properties. However, the key barriers for undertaking these are a high cost of infrastructure (72% of respondents), available funds to conduct improvements (52%) and a lack of access to mains water (48%).

A lack of water security has impacted respondents in various ways, notably, reduced crop productivity/quality (56% of respondents), constrained business growth (48%) and constrained business viability (44%). Concerningly, it has also affected the mental health/well-being of 41% of respondents.

The survey also highlighted the worrying issue of rising water salinity levels, which producers have measured in local dams, bores and springs. On properties where water salinity has been/are unacceptably high (i.e. 'not fit for purpose'), levels have increased annually by 10-100%.

Background

In recent years, water security has been a key issue for regional producers and landholders. Water security has therefore become a priority for BIGG, who in July 2021 received funding from the Australian Governments Smart Farms Small Grants to conduct the project, *Adoption of innovative practices to improve on-farm water security leading to increased sustainability and NRM outcomes in the Northern Mount Lofty and Barossa Ranges*. Activities for this project included support to conduct a survey of regional producers to improve understanding of on-farm water security.

A 13-question survey questionnaire (Appendix 1) was developed using the survey tool SurveyMonkey. The questionnaire was emailed to BIGG's subscribers (350) who responded to it online in September-October 2021. This report presents the survey results.

Survey results and discussion

Q1. Location of survey respondents

Thirty producers responded to the survey. Respondents' properties were located across seven postcodes with 83% being situated in the neighbouring postcodes of 5353 (47%) and 5235 (37%) (Table 1).

Table 1: Post code of survey respondent's properties.

Post code	Responses	
	(#)	(%)
5234	1	3
5235	11	37
5352	1	3
5353	14	47
5356	1	3
5373	1	3
5374	1	3

The postcode of 5353 includes the localities of Eden Valley, Flaxman Valley, Springton, and Mt Pleasant, while 5235 includes Angaston, Keyneton, Moculta and Mt Mckenzie (Figure 1).

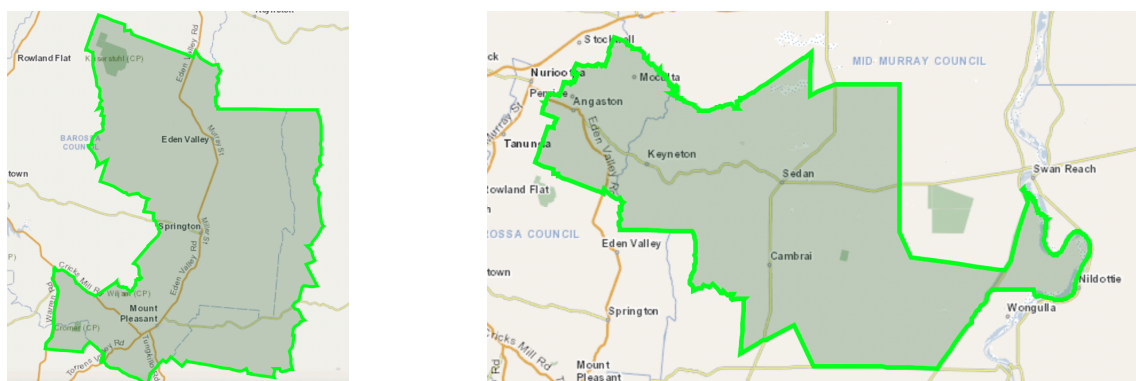


Figure 1: Boundaries of postcodes 5353 (left) and 5235 (right).

Q2. Enterprises run by survey respondents

Survey respondents ran various agricultural enterprises on their property, mostly sheep (73%), beef cattle (47%) and or grapes (43%) (Table 2).

Table 2: Enterprises run by survey respondents*.

Enterprise	Responses	
	(#)	(%)
Sheep	22	73
Beef cattle	14	47
Dairy cattle	0	0
Broad-acre crops	6	20
Grapes	13	43
Horses	3	10
Horticulture	2	7
None (i.e. non-commercial landholder)	0	0
Other (please specify)	5**	17

*Respondents (30) selected as many options as they wanted from the question choices. Top 3 responses in bold.

**Other - responses were 'truffles', 'angora goats', 'pasture cropping', 'tourism' and 'glamping tent accommodation'

Q3. Property water sources

Survey respondents rely on various water sources for their agricultural enterprises, mainly on-farm dams (93% of respondents), bore groundwater (73%) and rainfall captured from house/sheds (63%). Twenty-three percent of respondents have previously carted water to meet their enterprise needs. (Table 3).

Table 3: Water sources used for agricultural enterprises*.

Water sources	Responses	
	(#)	(%)
Mains water supply	7	23
On farm dams	28	93
Groundwater (bores)	22	73
Groundwater (springs)	4	13
Rivers/streams/surface water	8	27
Rainfall captured from house/sheds	19	63
Carted water	7	23
Other (please specify)	1**	3

*Respondents (30) selected as many options as they wanted from the question choices. Top 3 responses in bold.

**Other - response was 'Barossa Infrastructure Limited Scheme'

Q4. Current annual water requirement

The average current annual water volume requirements of respondents' properties was 11.6 megalitres (the median was 6.0 megalitres). Responses ranged from 0.5 to 75 megalitres (28 respondents).

Q5. Future annual water requirement

Fifty percent of respondents expected that in three years' time (i.e. September 2024) their current annual water requirement would increase, while 50% expected it would stay the same. No respondents expected it to decrease in three years' time (Table 4).

Table 4: Change in current annual water requirement in three years' time (i.e., in September 2024).

Annual water requirement	Responses	
	(#)	(%)
Increase	15	50
Decrease	0	0
Stay the same	15	50

Q6. Level of rise in future annual water requirement

Of the 15 respondents that expected their annual water requirement to increase in three years' time (Table 4), the average estimated rise in annual water requirements was 47% (i.e. in three years' time compared to their current annual use). The median rise was 20%, with responses ranging from 5-300%.

Q7. Water security issues experienced

Survey respondents have experienced a wide range of water security issues on their properties in the last three years (i.e. September 2018-September 2021). Notably low farm dam water supply (90% of respondents) and low rainfall capture (80%) (Table 5).

River/stream/surface water flow (53%), lack of access to mains water supply (47%) and saline bore groundwater (37%) were the other issues most encountered.

Table 5: Water security issues experienced in the last three years (i.e. September 2018-September 2021)*.

Water security issues	Responses	
	(#)	(%)
Farm dam water supply	27	90
Farm dam water salinity	9	30
Farm dam water algae	9	30
Groundwater (bore) supply	6	20
Groundwater (bore) salinity	11	37
Groundwater (spring) supply	6	20
Groundwater (spring) salinity	2	7
River/stream/surface water flow	16	53
River/stream/surface water quality	6	20
Low rainfall capture	24	80
Lack of access to mains water supply	14	47
Restricted flow of mains water supply	2	7
Needing to cart water	10	33
Lack of access to carted water	6	20
Other (please specify)	1**	3

*Respondents (30) selected as many options as they wanted from the question choices. Top 3 responses in bold.

**Other - response was 'Pump maintenance'

Q8. Future water security improvements and innovations

Survey respondents would like to implement numerous water security improvements and innovations on their properties over the next three years (i.e. September 2021-September 2024). The key options being the installation of tanks (66% of respondents), piping (59%), troughs (48%) and irrigation infrastructure (38%), and the related improvements of fencing dams/watercourses (38%) and increased revegetation (38%) (Table 6).

On average, each respondent would like to implement approximately six water security improvements/innovations (165 responses from 29 respondents) on their properties over the next three years.

Table 6: Water security improvements/innovations that would like to be implemented in the next three years (i.e. September 2021-September 2024)*.

Water security improvements/innovations	Responses	
	(#)	(%)
Tanks	19	66
Piping	17	59
Troughs	14	48
Pumps (including solar)	10	34
Bores	5	17
Desalination of bore water	2	7
Water shandyng (to become ‘fit for purpose’)	8	28
Reticulate water from springs	0	0
Irrigation infrastructure	11	38
Obtain/increase water licence, or water affecting activity permit	8	28
Clean out existing dams	6	21
New dams	2	7
Line dams with poly liner	2	7
Dam covers	4	14
Lined (poly) catchment for water capture	4	14
Increase roof space for water capture	6	21
Renew contour banks	2	7
Automatic weather station/soil moisture probe	6	21
Water monitoring equipment (e.g., tank level sensors, leak detection units, water quality tester)	6	21
Fence dams/water courses	11	38
Re-vegetation/increase biodiversity to improve water quality	11	38
Whole farm planning	9	31
None (i.e., no water security improvements/innovations planned)	2	7
Other (please specify)	0	0

*Respondents (29) selected as many options as they wanted from the question choices. Top 6 responses in bold.

Q9. Barriers to implement future water security improvements and innovations

Survey respondents noted numerous barriers in implementing the future water security improvements and innovations they would like to undertake. The key barriers were the high cost of infrastructure (72% of respondents), available funds to conduct improvements (52%) and lack of access to mains water (48%) (Table 7).

Table 7: Barriers to implementing future water security improvements and innovations in the next three years (i.e. September 2021-September 2024)*.

Barriers	Responses	
	(#)	(%)
Infrastructure costs	18	72
Labour costs	9	36
Government regulations	7	28
Lack of access to mains water supply	12	48
Available funds (to conduct improvements)	13	52
Available time (to conduct improvements)	9	36
Low water supply	8	32
Low water quality	4	16
Rocky terrain to lay pipe	5	20
Uncertainty where to drill bores	3	12
Restrictions to access water licenses	7	28
Effective government support and communication with community	6	24
Lack of financial support for water purchases	8	32
Lack of knowledge on what water security improvements are available and/or best options for your property	4	16
Other (please specify)	0	0

*Respondents (25) selected as many options as they wanted from the question choices. Top 3 responses in bold.

Q10. Change in water salinity levels

The survey highlighted the worrying issue of rising water salinity levels, which has occurred in local dams, bores and springs. On properties where water salinity has been/are unacceptably high (i.e., ‘not fit for purpose’), levels have increased annually by 10-100% (Table 8).

Table 8: Change in water salinity levels over time and their annual rate of increase.

Respondent response	Annual rate of water salinity increase (%)*
Dam salinity risen from 400ppm to 800ppm in 12 months. Spring water gets as high as 10,000ppm during the summer months decreases to around 5,000ppm during winter.	100
Dam salinity over summer increasing to 800ppm. Bore water gradual increases over last 5 years to 2,800ppm for stock only.	-
Around 2,500 ppm. Our salinity levels have risen by 500ppm in the last 12 months.	25
Bores have increased in salinity from less than 1,000ppm in 2005 to 2,600ppm in 2021. River ponds pre-winter were 3,600ppm and algae also a problem.	10
Bore water has over doubled in salinity over last 3 years. Bore one 700ppm to 1500ppm, bore two 1100ppm to 2500ppm.	38 & 42
800 parts up to 2,500 parts. Risen quickly over last 3 years.	71

*Percentage increase calculated by the author.

Q11. Access to innovations to manage water salinity

Survey respondents were asked how access to innovations for the management and treatment of water salinity would assist your business. Feedback reinforced the benefit this would provide, with notable responses including:

- *“Greatly. I have an abundance of ground water, but it is too salty to use”*
- *“A cost-effective solution to reduce salinity would be beneficial, but first need to secure an irrigation licence for the bore, which is difficult”*
- *“Ability to use improved bore water quality for stock and domestic would be a great help”*
- *“It would be a huge assistance with monitoring and managing salinity. By doing this, we could ensure that our livestock had access to optimal quality drinking water, thus we could produce optimal quality beef and lamb”*
- *“Improved production from stock and increase quality of grapes”*
- *“Return stocking levels to historic levels currently down 30%. Chance to diversify, irrigated pasture, viticulture”*

Q12. Impacts on the lack of water security

Survey respondents have been widely impacted through a lack of water security, with the key impacts being reduced crop productivity/quality (56% of respondents), constrained business growth (48%) and constrained business viability (44%) (Table 5).

Concerningly a lack of water security also affected the mental health/well-being of 41% of respondents. Of the 27 survey respondents, only one had not been impacted by a lack of water security.

Table 9: Impacts of a lack of water security on survey respondents*.

Impact type	Responses	
	(#)	(%)
Constrained business growth	13	48
Reduced business viability	12	44
Reduced crop productivity/quality	15	56
Financial stress	10	37
Mental health/well-being	11	41
Concerns related to property succession	10	37
None (i.e. have not been impacted by a lack of water security)	1	4
Other (please specify)	5**	19

*Respondents (27) selected as many options as they wanted from the question choices. Top 3 responses in bold.

**Other - responses were ‘Management changes, use of containment area, restricted use of paddocks (even when they have feed)’, ‘We have had to cart water during extended dry periods’, ‘Last year in the drought we had to reduce cattle carrying capacity numbers’, ‘Whole farm management of stock’, and ‘Limited ability to diversify’.

Q13. General comments on regional water security

In the final survey question, 13 respondents gave feedback on regional water security. Most responses related to queries about the proposed Barossa New Water project (the project investigating the delivery of a new water supply to the Barossa Valley and Eden Valley regions), particularly what the likely cost and quality of water will be.

Other general comments about regional water security were:

- *“Are the existing on-stream dams fair to the environment and other water users”?*
- *“Need for easy fast access to water for emergency domestic use and for firefighting”*
- *“Access to water innovations is a key determinant with assisting rural producers to be innovative with best sustainable farming practices. We are having to tackle climate change and increasing population growth, with higher water demands, as we look to 2050 and beyond”*
- *“More information/assistance on treating salty water (desal). Essential to keep pushing forward with access to Mains Water Supply for Eden Valley”*

Appendix 1 – Survey Questionnaire

1. What is the postcode of your property?
2. What agricultural enterprises do you run on your property? *(Select as many as applicable)*
 - Sheep
 - Beef cattle
 - Dairy cattle
 - Broadacre crops
 - Grapes
 - Horses
 - Horticulture
 - None (i.e. non-commercial landholder)
 - Other (please specify)
3. What water sources do you rely on for your agricultural enterprises? *(Select as many as applicable)*
 - Mains water supply
 - On farm dams
 - Groundwater (bores)
 - Groundwater (springs)
 - Rivers/streams/surface water
 - Rainfall captured from house/sheds
 - Carted water
 - Other (please specify)
4. What is the estimated current annual water requirement (in megalitres) of your property? *(Include all needs e.g. stock, spraying, irrigation, domestic etc.)*
5. In three years' time, do you think the annual water requirement of your property will increase, decrease or stay the same?
 - Increase
 - Decrease
 - Stay the same (Go to Q7)
6. In three years' time, by what percentage (%) do you estimate your annual water requirement will increase/decrease?
7. What water security issues have you experienced on your property in the last three years? *(Select as many as applicable)*
 - Farm dam water supply
 - Farm dam water salinity
 - Farm dam water algae
 - Groundwater (bore) supply
 - Groundwater (bore) salinity
 - Groundwater (spring) supply
 - Groundwater (spring) salinity
 - River/stream/surface water flow
 - River/stream/surface water quality
 - Low rainfall capture

- Lack of access to mains water supply
- Restricted flow of mains water supply
- Needing to cart water
- Lack of access to carted water (due to distance, time, access restrictions, cost etc.)
- Other (please specify)

8. In the next three years, what water security improvements and innovations would you like to implement on your property? *(Select as many as applicable)*

- Tanks
- Piping
- Troughs
- Pumps (including solar)
- Bores
- Desalination of bore water
- Water shandyng (to become 'fit for purpose')
- Reticulate water from springs
- Irrigation infrastructure
- Obtain/increase water licence, or water affecting activity permit
- Clean out existing dams
- New dams
- Line dams with poly liner
- Dam covers
- Lined (poly) catchment for water capture
- Increase roof space for water capture
- Renew contour banks
- Automatic weather station/soil moisture probe
- Water monitoring equipment (e.g. tank level sensors, leak detection units, water quality tester)
- Fence dams/water courses
- Re-vegetation/increase biodiversity to improve water quality
- Whole farm planning
- None (i.e. no water security improvements/innovations planned)
- Other (please specify)

9. Of the water security improvements and innovations you listed in Q8, what are your barriers to undertaking these? *(Select as many as applicable)*

- Infrastructure costs
- Labour costs
- Government regulations
- Lack of access to mains water supply
- Available funds (to conduct improvements)
- Available time (to conduct improvements)
- Low water supply
- Low water quality
- Rock terrain to lay pipe
- Uncertainty where to drill bores
- Restrictions to access water licences
- Effective government support and communication with community
- Lack of financial support for water purchases

- Lack of knowledge on what water security improvements are available and/or best options for your property
- Other (please specify)

10. If the water salinity levels on your property have been/are unacceptably high (i.e. 'not fit for purpose'), what range have you experienced and how quickly have they risen?

11. How would access to innovations for the management and treatment of water salinity assist your business?

12. In what ways have you been impacted by a lack of water security (including 'not fit for purpose' water) on your property? *(Select as many as applicable)*

- Constrained business growth
- Reduced business viability
- Reduced crop productivity/quality
- Financial stress
- Mental health/well-being
- Concerns related to property succession
- None (i.e. have not been impacted by a lack of water security)
- Other (please specify)

13. Please provide any comments you may have about regional water security or activities/information you might like BIGG to deliver as part of its current water security project?