

Eyre Peninsula Mallee Seeps Survey Results 2019 and 2023

A report for the Eyre Peninsula Landscape Board to provide a final assessment of the extent of seep issues affecting farmers across Eyre Peninsula at the conclusion of the National Landcare Program Regenerative Agriculture Program.



The Mallee seeps farmer survey for the Eyre Peninsula Landscape Board has been supported through funding from the Australian Government's National Landcare Program.

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Project introduction

Mallee seeps were first highlighted after reports of seeps and soaks appearing in the landscape in the eastern Eyre Peninsula for several years with no answers on how to stop them from spreading or where they were likely to appear in the landscape. In 2019 those reports increased, and also increased in occurrence further west across upper Eyre Peninsula, and some landholders and advisors became concerned about the impact of these expanding seeps in paddocks.

As a result of the questions raised by landholders, funding was received from the National Landcare Program to gain a better understanding of the extent, spread, and impact of seeps in the landscape from a landholder’s perspective. Mallee seeps were also a focus for the Eyre Peninsula Landscape Board’s Regenerative Agriculture Program, delivered by AIR EP through funding from the Australian Government’s National Landcare Program.

Survey results

The initial survey in 2019 was sent to 137 people via email and SMS on February 22, 2019. Although the initial engagement was excellent with 48% opening the survey, only 8% clicked on the link and 6% (7 people) completed the survey.

A follow-up survey was conducted in January 2023, with the survey link included in the AIR EP e-newsletter, as well as on social media and SMS to project participants, with 10 responses.

The survey consisted of 17 questions the full survey results and questions can be found in appendix 1.

Seep identification

There has been a raised awareness of Mallee seeps from 2019 to 2023 with initial survey results of 40% of respondents not identifying they have seeps and 55% identifying they have a few. The 2023 survey showed all respondents have at least one (20%) or many seeps (20%) across their property.

Q2 Do you have any Mallee seeps on your property?

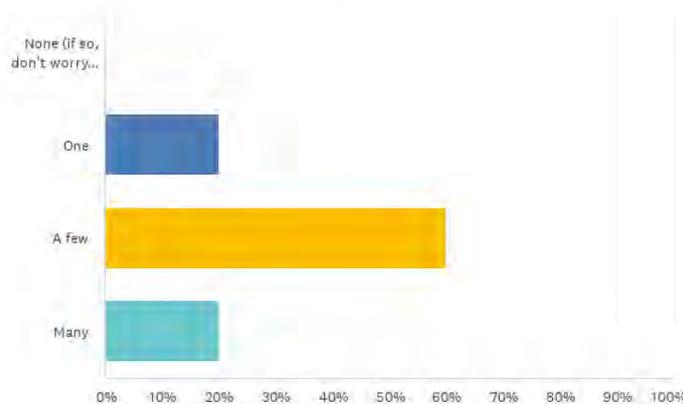


Figure 1. 2023 Survey question 2



Figure 2. 2019 survey question 1 responses

Seep affected area

The area (ha) identified by the respondents in 2023 varies from 0.2 of a hectare to 100 ha of productive land affected. This is a significant increase since 2019 when the survey results showed hectares affected cited by respondents ranged from 0-16 ha. This could be contributed to the large rainfall event that occurred across the Eastern Eyre Peninsula in January 2021.

Economic effect of Mallee seeps on farming land

In 2019 33% of respondents weren't concerned about the economic losses caused by their seep affected paddocks, 50% of respondents were mildly concerned and 16% were extremely concerned. With an increase in the size of the seep affected areas (Q2) has also triggered an increase concern around the potential economic impact of seep affected paddocks, 40% of respondents were extremely concerned and 60% were mildly concerned.

Q5 How concerned are you about economic losses caused by seeps on your property?

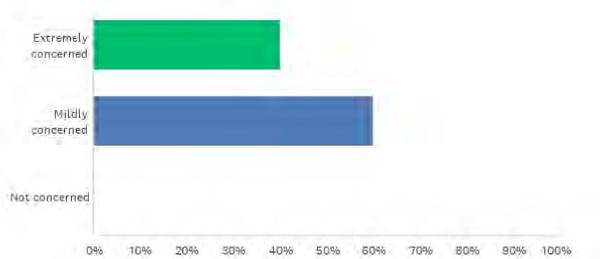


Figure 3. 2023 survey results to Q5

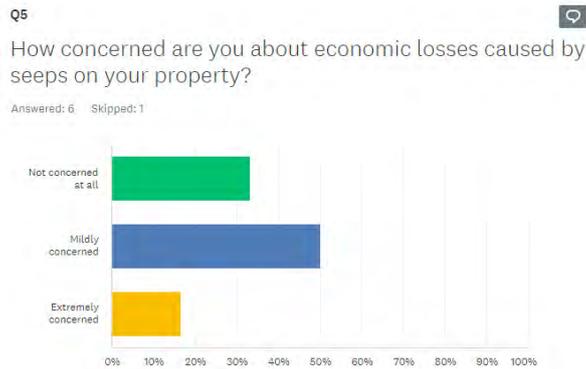


Figure 4. 2019 Survey results to Q5

Mallee seep emergence

All survey respondents reported they have had Mallee seeps appear on their properties since 2021 with 50% of them appearing in 2022, again this could be contributed to the large rainfall events but also due to increased efficiency of summer spraying weeds. Some of the respondents cited that they have some well-established seeps that have been present for over 20 years.

Q6 How long ago did the seep/s you are most concerned about appear? (you can tick multiple boxes for seeps appearing at different times)

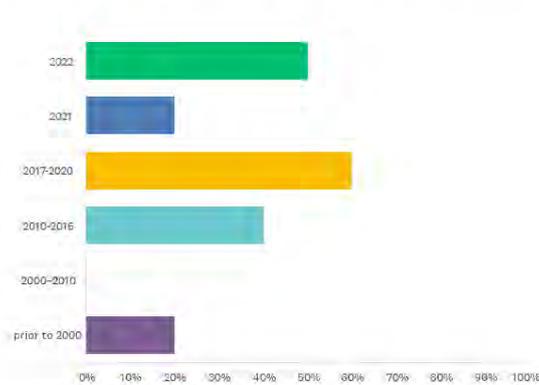


Figure 5. Survey results from 2023 question 6

Water quality in Mallee seeps

In 2019 50% of respondents stated that their water quality in the seeps was both fresh and becoming saline in nature. In 2023 the water quality cited by the respondents has declined with 30% of seeps presenting highly saline with another 30% saying they have both fresh and saline seeps present on their properties.

Q7 What is the water quality within the seep areas?

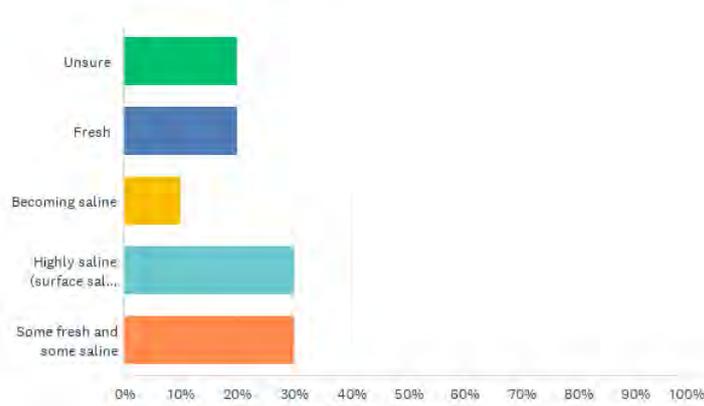


Figure 6. Survey results from 2023 question 7

Mallee Seep Development & Management

Seeps can occur across many parts of the landscape generally in lower lying areas. The 2023 survey (question 8) showed that more seeps were being recognised as multiple seeps possibly connected across a paddock landscape (2019 25%, 2023 50%). The surveyed farmers also cited they were finding seeps in low lying swales 60%, beneath non wetting deep sands 30%, in mid slope areas 30% and as single isolated areas 20%. Comments from farmers noted “2022 flood affected areas are developing seeps” and “seeps occurring on the topside of farm tracks at the base of a hill”.

Survey respondents were asked what they believe has contributed to the growing seep issue on their property. Poor water usage on deep sands/non wetting sands has the highest number of responses in 2023, followed by chemical summer weed control and periods of well above average rainfall. Respondents made comment that “2022 floods and water laying” has contributed to the issue as well as compaction under farm tracks stopping the natural flow of ground water”.

Q9 What do you think may have caused or contributed to the growing seep issues on your property? (you can choose multiple responses)

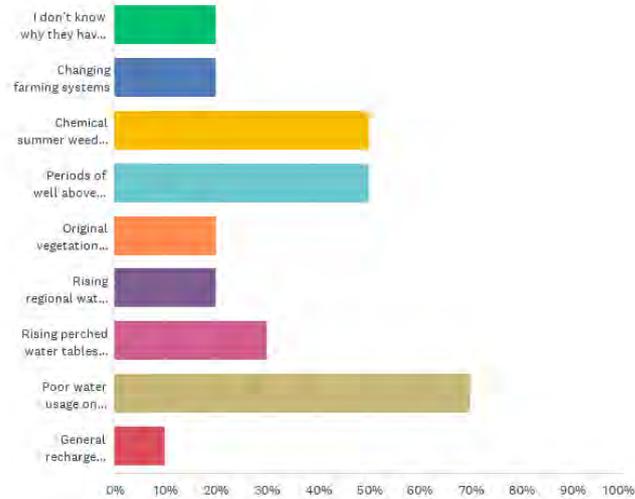


Figure 7. 2023 Mallee seep survey results

In both survey years 60% of respondents said they have tried management strategies to help control their seep areas. Results show an 80% increase in the use of salt/waterlogging tolerant pastures has worked well at managing the areas. Strategic tree planting was used by 3 of the respondents and they have observed some slight improvement. Lucerne planting in the recharge area has also been used as a management strategy with many of the respondents feeling it was too early to tell whether it had been a successful strategy due to establishment issues.

Q10 Have you done anything to control seeps or their impact on your property?



Figure 8. Eyre Peninsula Mallee seep survey results 2023, question 10.

Q11 If no OR if you have taken only limited action, what are your reasons for this?

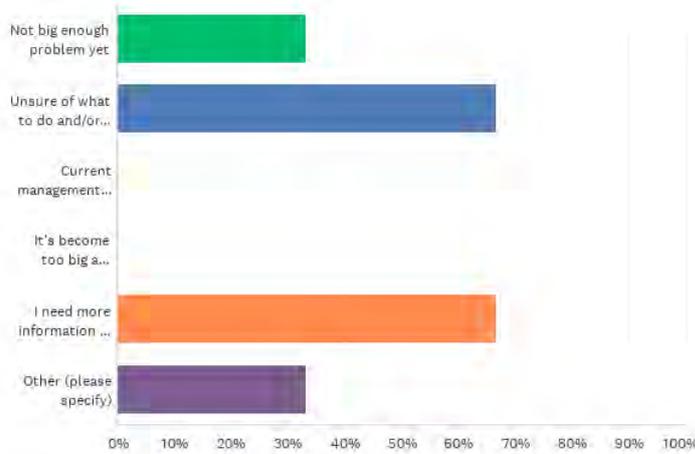


Figure 9. Eyre Peninsula Mallee seep survey results 2023, question 11.

Summary

The low farmer response to the surveys in both years conducted was disappointing, survey fatigue and timing would likely be a large contributor to this. The surveys do show an increase in area affected, and that farmers are growing increasingly concerned about Mallee seeps. Despite a range of activities through both the Regenerative Agriculture Program and the National Landcare Program funded Mallee seep project (including an online decision tree which steps people through the management options for Mallee seeps), as well as presentations at various 'sticky beak days' or crop walks and workshops, there is still a knowledge gap for farmers to feel confident in implementing management strategies.

Only one person that completed the survey was aware of the Mallee seep decision tree online, so there is a need to promote this tool to the right audience.

Appendix 1

2022/2023 Mallee seep survey results

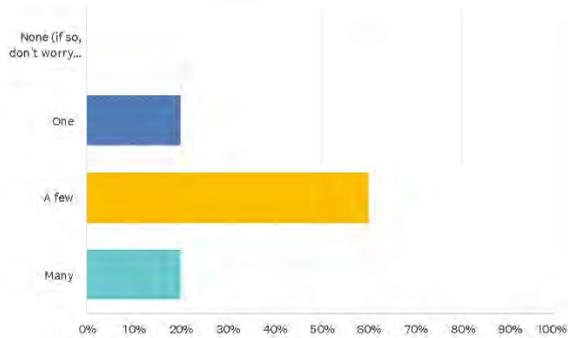
Mallee Seeps Survey 2022

Q1 What is your farm's nearest post code?

Answered: 10 Skipped: 0

Q2 Do you have any Mallee seeps on your property?

Answered: 10 Skipped: 0



ANSWER CHOICES	RESPONSES	
None (if so, don't worry about completing the rest of the survey - thanks!)	0.00%	0
One	20.00%	2
A few	60.00%	6
Many	20.00%	2
TOTAL		10

Q3 How big an area (in hectares) is affected by seeps/soaks on your property? (total area)

Answered: 10 Skipped: 0

Q4 What is your level of knowledge in the management of Mallee seeps and soaks (0 being none and 5 being high)

Answered: 10 Skipped: 0

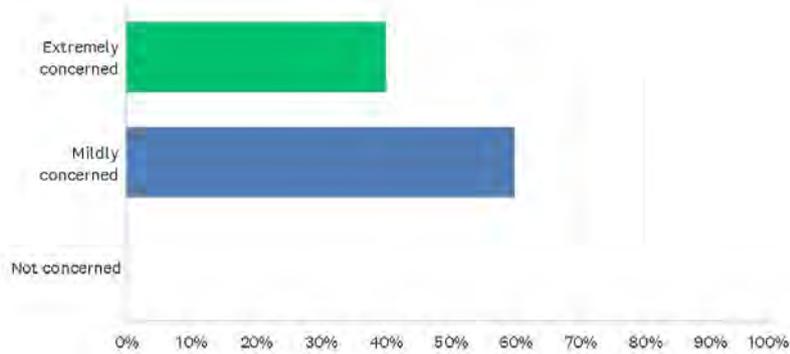
Mallee Seeps Survey 2022



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	3	25	10
Total Respondents: 10			

Q5 How concerned are you about economic losses caused by seeps on your property?

Answered: 10 Skipped: 0

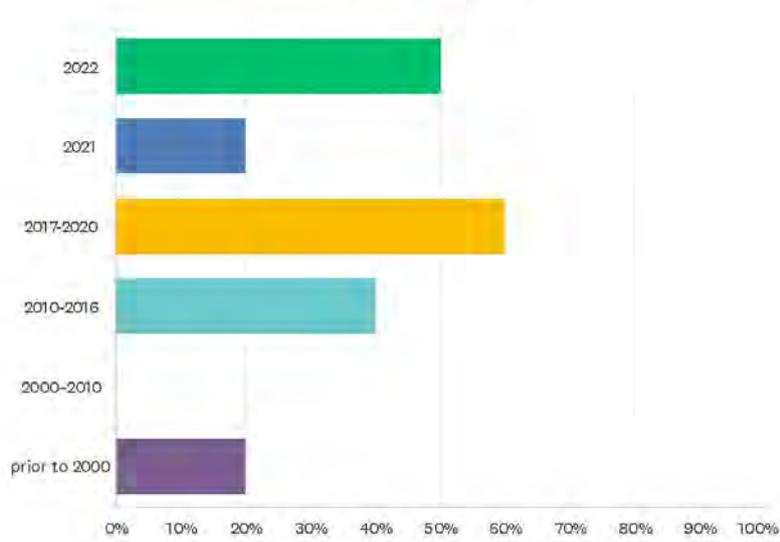


ANSWER CHOICES	RESPONSES
Extremely concerned	40.00% 4
Mildly concerned	60.00% 6
Not concerned	0.00% 0
TOTAL	10

Q6 How long ago did the seep/s you are most concerned about appear? (you can tick multiple boxes for seeps appearing at different times)

Answered: 10 Skipped: 0

Mallee Seeps Survey 2022

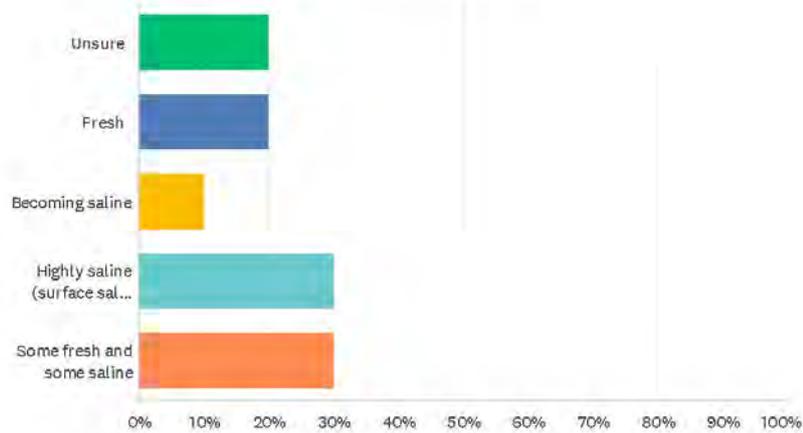


ANSWER CHOICES	RESPONSES	
2022	50.00%	5
2021	20.00%	2
2017-2020	60.00%	6
2010-2016	40.00%	4
2000-2010	0.00%	0
prior to 2000	20.00%	2
Total Respondents: 10		

Q7 What is the water quality within the seep areas?

Answered: 10 Skipped: 0

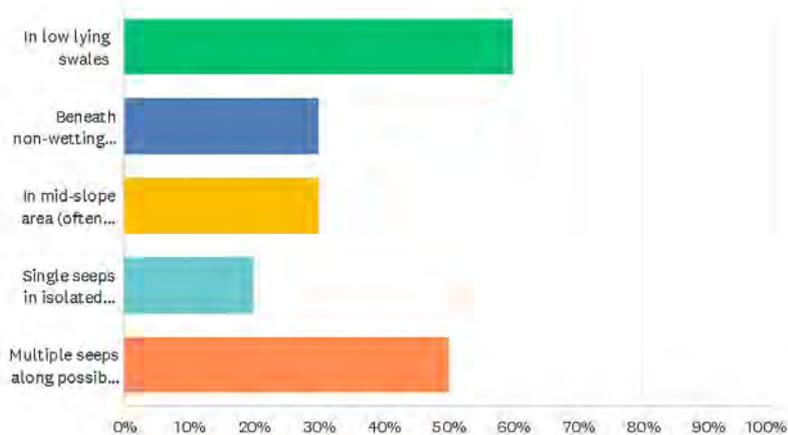
Mallee Seeps Survey 2022



ANSWER CHOICES	RESPONSES
Unsure	20.00% 2
Fresh	20.00% 2
Becoming saline	10.00% 1
Highly saline (surface salt crystals evident)	30.00% 3
Some fresh and some saline	30.00% 3
Total Respondents: 10	

Q8 Where in the landscape are the seeps found? (You can choose multiple answers)

Answered: 10 Skipped: 0

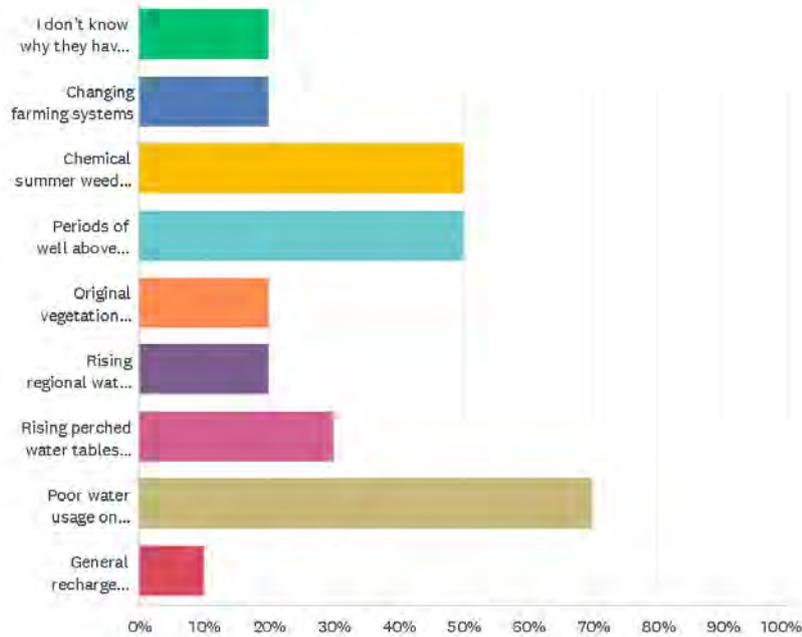


Mallee Seeps Survey 2022

ANSWER CHOICES	RESPONSES
In low lying swales	60.00% 6
Beneath non-wetting deep sandy rises	30.00% 3
In mid-slope area (often where clay is close to surface)	30.00% 3
Single seeps in isolated areas	20.00% 2
Multiple seeps along possibly connected water courses	50.00% 5
Total Respondents: 10	

Q9 What do you think may have caused or contributed to the growing seep issues on your property? (you can choose multiple responses)

Answered: 10 Skipped: 0

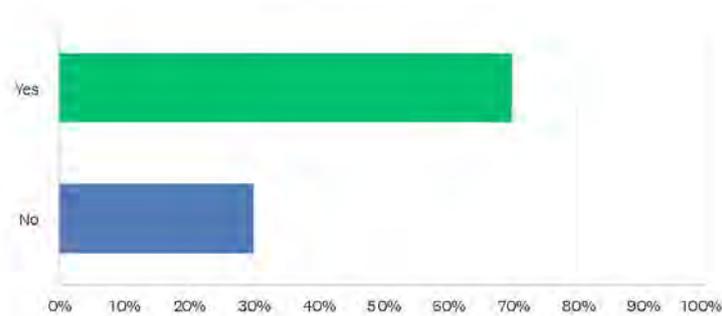


Mallee Seeps Survey 2022

ANSWER CHOICES	RESPONSES	
I don't know why they have appeared	20.00%	2
Changing farming systems	20.00%	2
Chemical summer weed control	50.00%	5
Periods of well above average rainfall	50.00%	5
Original vegetation clearance	20.00%	2
Rising regional water tables	20.00%	2
Rising perched water tables in localised catchments	30.00%	3
Poor water usage on deep/non-wetting sand causing recharge	70.00%	7
General recharge occurring across a range of soil types	10.00%	1
Total Respondents: 10		

Q10 Have you done anything to control seeps or their impact on your property?

Answered: 10 Skipped: 0

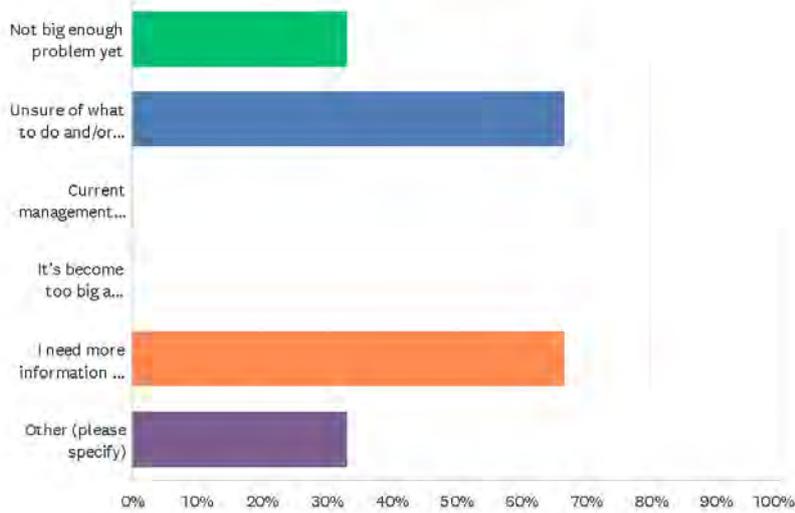


ANSWER CHOICES	RESPONSES	
Yes	70.00%	7
No	30.00%	3
TOTAL		10

Q11 If no OR if you have taken only limited action, what are your reasons for this?

Answered: 3 Skipped: 7

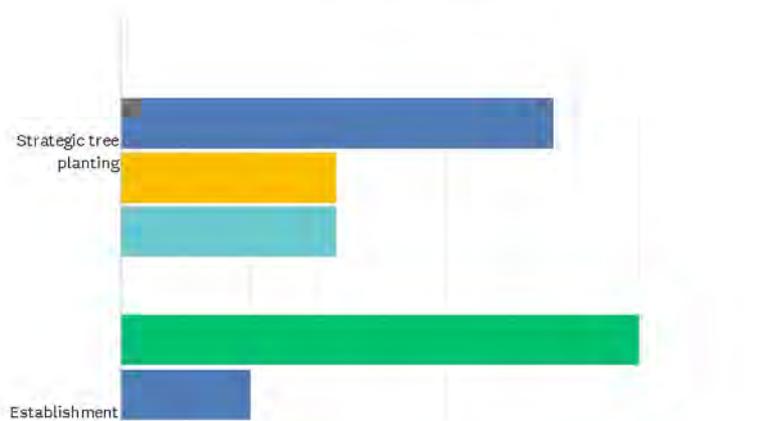
Mallee Seeps Survey 2022



ANSWER CHOICES	RESPONSES	
Not big enough problem yet	33.33%	1
Unsure of what to do and/or who to ask	66.67%	2
Current management solutions don't suit my farming system	0.00%	0
It's become too big a problem	0.00%	0
I need more information to know what to do	66.67%	2
Other (please specify)	33.33%	1
Total Respondents: 3		

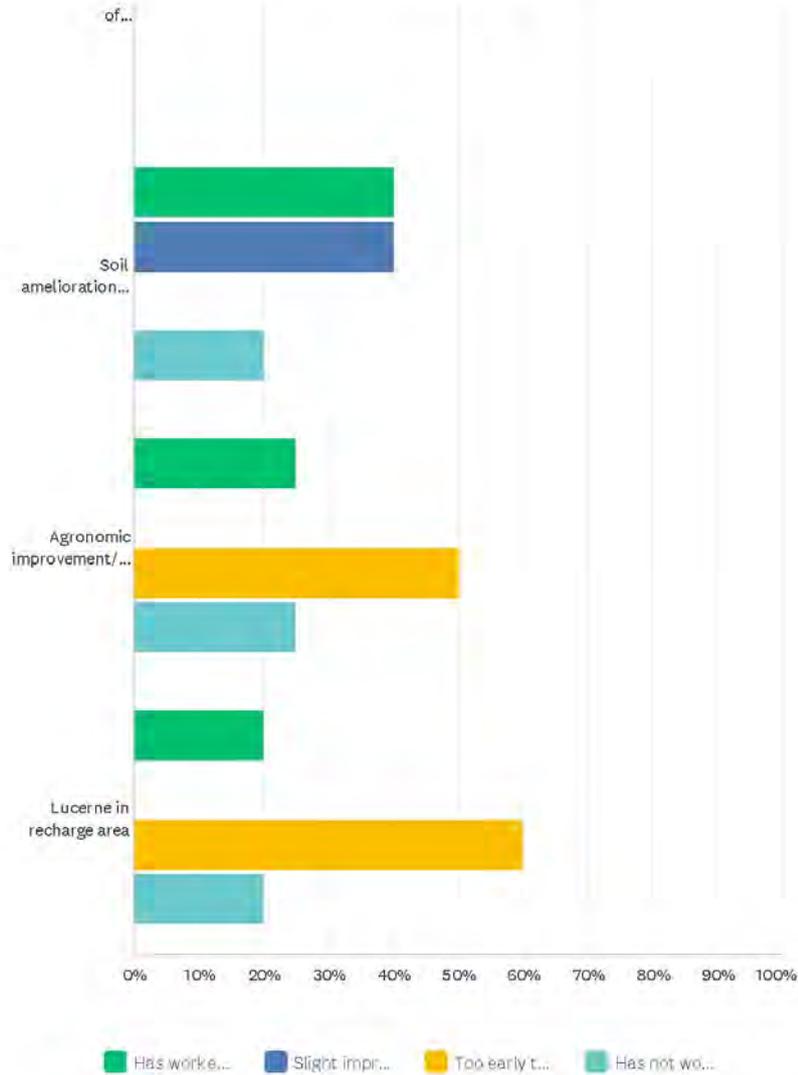
Q12 If yes what have you tried around or within the seep area? How successful has this been?

Answered: 7 Skipped: 3



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Mallee Seeps Survey 2022

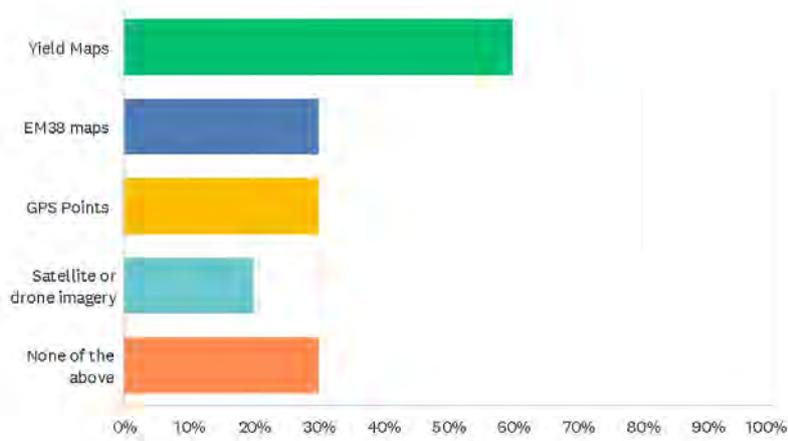


	HAS WORKED WELL	SLIGHT IMPROVEMENT	TOO EARLY TO ASSESS	HAS NOT WORKED	TOTAL RESPONDENTS
Strategic tree planting	0.00% 0	66.67% 2	33.33% 1	33.33% 1	3
Establishment of salt/waterlogging tolerant pastures	80.00% 4	20.00% 1	0.00% 0	0.00% 0	5
Soil amelioration techniques (eg deep ripping, spading, clay spreading, organic matter incorporation)	40.00% 2	40.00% 2	0.00% 0	20.00% 1	5
Agronomic improvement/changes (to help maintain higher water use)	25.00% 1	0.00% 0	50.00% 2	25.00% 1	4
Lucerne in recharge area	20.00% 1	0.00% 0	60.00% 3	20.00% 1	5

Mallee Seeps Survey 2022

Q13 Do you have any of the following in areas surrounding seeps?

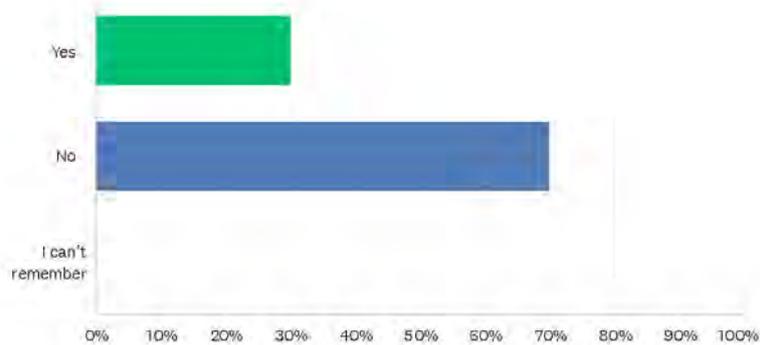
Answered: 10 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yield Maps	60.00%	6
EM38 maps	30.00%	3
GPS Points	30.00%	3
Satellite or drone imagery	20.00%	2
None of the above	30.00%	3
Total Respondents: 10		

Q14 Have you attended any Mallee seep workshops in the past 2 years?

Answered: 10 Skipped: 0

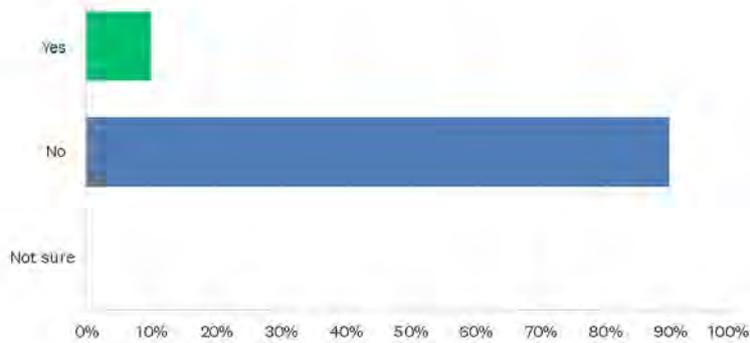


Mallee Seeps Survey 2022

ANSWER CHOICES	RESPONSES	
Yes	30.00%	3
No	70.00%	7
I can't remember	0.00%	0
TOTAL		10

Q15 Have you accessed the Mallee Seep Decision Tree on the internet?

Answered: 10 Skipped: 0

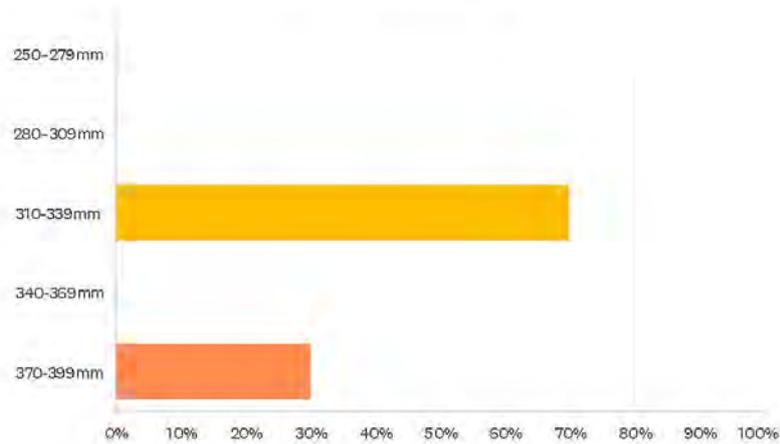


ANSWER CHOICES	RESPONSES	
Yes	10.00%	1
No	90.00%	9
Not sure	0.00%	0
TOTAL		10

Q16 What is your average annual rainfall?

Answered: 10 Skipped: 0

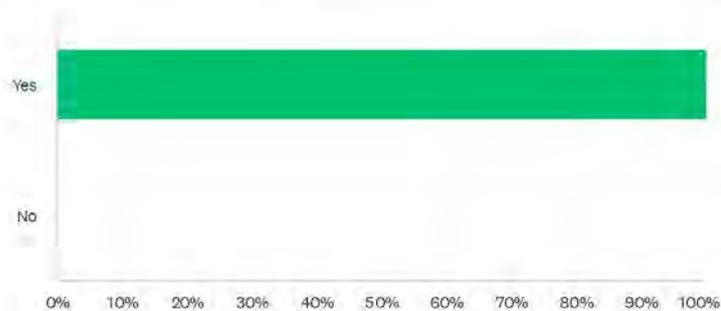
Mallee Seeps Survey 2022



ANSWER CHOICES	RESPONSES	
250-279mm	0.00%	0
280-309mm	0.00%	0
310-339mm	70.00%	7
340-369mm	0.00%	0
370-399mm	30.00%	3
TOTAL		10

Q17 Are you happy to be contacted if we need to collect more information regarding the extent of seeps in your region?

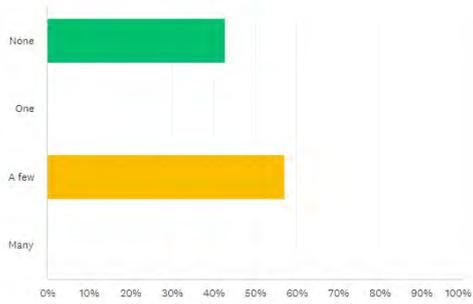
Answered: 10 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	100.00%	10
No	0.00%	0
TOTAL		10

1. Do you have any seeps/soaks on your property?

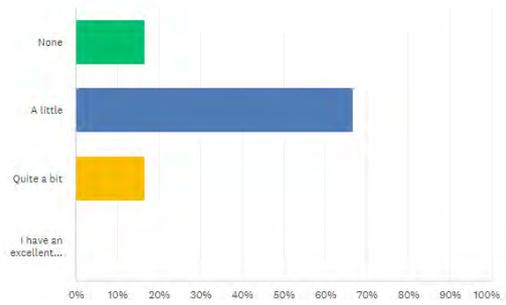
Answered: 7 Skipped: 0



Q4

What is your level of knowledge in the management of mallee seeps and soaks?

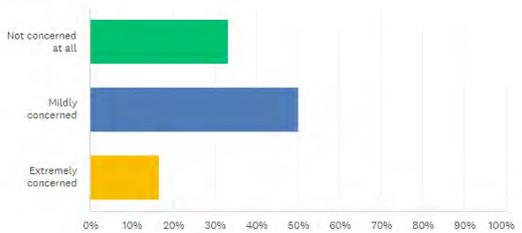
Answered: 6 Skipped: 1



Q5

How concerned are you about economic losses caused by seeps on your property?

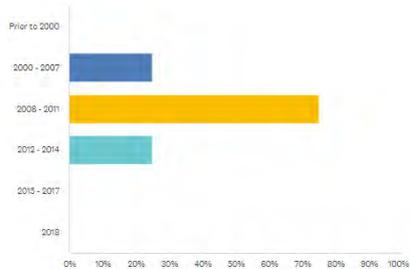
Answered: 6 Skipped: 1



Q6

How long ago did the seep(s) you are most concerned about appear? (select multiple boxes for seeps appearing at different times)

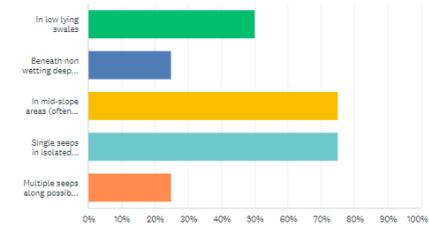
Answered: 4 Skipped: 3



Q7

Where in the landscape are the seeps found? (select all that apply)

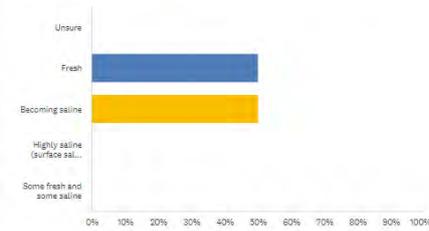
Answered: 4 Skipped: 3



Q8

What is the water quality within the seep areas?

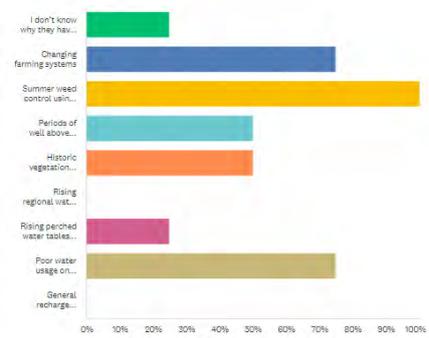
Answered: 4 Skipped: 3



Q9

What do you think may have caused or contributed to the growing seep issues on your property (select all that apply)?

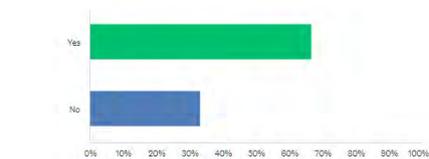
Answered: 4 Skipped: 3



Q10

Have you done anything to control seeps or their impact on your property?

Answered: 8 Skipped: 1



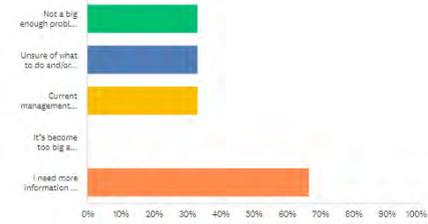
	HAS NOT WORKED	TOO EARLY TO ASSESS	SLIGHT IMPROVEMENT	HAS WORKED WELL	TOTAL	WEIGHTED AVERAGE
Strategic tree planting	0.00% 0	50.00% 1	0.00% 0	50.00% 1	2	3.00
Establishment of salt or water logging tolerant pastures	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0	0.00
Soil amelioration techniques (eg deep ripping, spading, clay spreading, organic matter incorporation)	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	3.00
Agronomic improvements or changes (to help maintain higher water use)	0.00% 0	0.00% 0	100.00% 1	0.00% 0	1	3.00

Comments (2)

Q12

If no, or if you have taken only limited action, what are your reasons for this? (select all that apply)

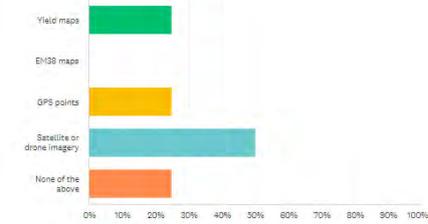
Answered: 3 Skipped: 4



Q13

Do you have any of the following in areas surrounding seeps? (select all that apply)

Answered: 4 Skipped: 3



Q14

What is your average rainfall?

Answered: 3 Skipped: 2

