

Outcomes and evaluation of GRDC Local Forums, Southern Region, 2019

Jen Lillecrapp - GRDC Regional Cropping Solutions Co-ordinator - South (jen@brackenlea.com or 0427 647 461)

Summary

- six GRDC Local Forums were held across the low, medium and high rainfall zones in South Australia and Victoria during June to August 2019
- 138 grain growers and industry stakeholders participated in these forums
- results from evaluation surveys (see Appendix 1) would suggest that forums achieved the objectives (outlined below)
- a total of 134 issues identified at these forums (see Appendix 3)
- GRDC Regional Cropping Solutions Networks (RCSN), Southern Region considered the issues identified at these forums were categorised as follows -
 - 30 new/additional issues
 - 11 issues were incorporated into re-defined or re-described existing issues
 - 71 issues that have already been captured
 - 22 issues deemed to be outside the mandate of the GRDC
- all new/additional issues were prioritised using a standard set of criteria (area, impact and frequency) and have been included in the updated prioritised lists of issues (constraints and opportunities) which affect the long term profitability of grain growers in the low, medium and high rainfall zones of the Southern Region identified by the RCSN which have been submitted to the GRDC

Background

Objectives –

1. reach and build connections with a new audience of growers and industry stakeholders;
2. strengthen connections and encourage growers and industry stakeholder to participate in the GRDC R,D&E planning and delivery process;
3. explain and promote investment of grower levies in R,D&E to create enduring profitability for Australian grain growers;
4. promote the role of GRDC Southern Panel and RCSN members so that growers and industry stakeholders know the local member(s), GRDC staff and RCS Leads who provide a two-way conduit between growers and industry stakeholders and the GRDC;
5. growers and industry stakeholders have confidence in the network of GRDC RCSN and Southern Panel members and systems to capture the important constraints and opportunities for the long term profitability of grain growers in the region;
6. growers and industry stakeholders are able to check/validate existing issues and identify any other important issues for the GRDC to consider;
7. growers and industry stakeholders learn about the R,D&E activities, learnings and have input into future R,D&E for focus issues (listed below);
8. growers and industry stakeholders have the opportunity to hear about a selection of R,D&E investments addressing locally important issues;

9. growers and industry stakeholders have the opportunity to raise issues and questions, have direct conversations which will influence GRDC deliver R,D&E which will provide the greatest benefit for grain growers.

Locations –

Low Rainfall Zone	Wandearah	Upper North, SA
	Cullulleraine	Northern Mallee, VIC
Medium Rainfall Zone	Farrell Flat	Mid North, SA
	Maryborough	Central, VIC
High Rainfall Zone	Kingscote	Kangaroo Island, SA
	Penshurst	South West, VIC

Format and content –

- 3.5 hours followed by lunch
- content –
 - investment of growers levies and government in R,D&E, GRDC vision and investment
 - check and identify issues affecting the long term profitability of growers
 - focus topic - overview of what is being done and is being learnt from R,D&E plus questions, answers and discussion to identify R,D&E gaps and future opportunities
 - snapshot of a selection of GRDC investments addressing important issues for the local area

Focus topics of forums –

- increasing the productivity of sandy soils
- better adapted varieties and agronomy practices for growing pulses in the Mallee
- new generation and adapted wheat and barley options for a range of sowing times to minimise the impact of frost and heat stress
- deep ripping
- the potential of better adapted cereals and practices for grain and graze crops in high rainfall environments
- nutrition strategies to realise the yield potential of cropping in the high rainfall zone and manage the impacts of waterlogging

Audience –

- target audience – local growers and grain industry stakeholders
- mix of growers: industry stakeholders at forums varied from 70% : 30% to 25% : 75%
- attracted a number of growers and grains industry stakeholders who have not previously or regularly attend GRDC or GRDC supported events

Outcomes

1. validated that the important issues for the long term profitability of grain growers across the Southern Region have been captured by the GRDC's RCS networks and systems;
2. a number of new or additional issues have identified, prioritised and submitted to the GRDC investment planning process;

3. engaged, built and strengthened GRDC connections with grain growers and industry stakeholder;
4. growers and industry stakeholders welcomed a GRDC event in their local area which enabled participants to talk directly with R,D&E specialists, GRDC staff and local representatives;
5. growers and industry stakeholders appreciated the opportunity to have their say on the important issues and put forward their ideas for R,D&E

Identified issues outside the mandate of the GRDC

A number of issues raised at GRDC Local Forums were deemed to be outside the mandate of the GRDC or issues for which a number of agencies or organisations including the GRDC have a shared responsibility (refer to Appendix 2).

These issues were to be referred to the relevant organisations and agencies including grain grower representative organisations, other rural development corporations, federal and state government agencies etc.

Evaluation

Appendix 1: A summary of results of evaluation surveys completed by participants of GRDC Local Forum in 2019.

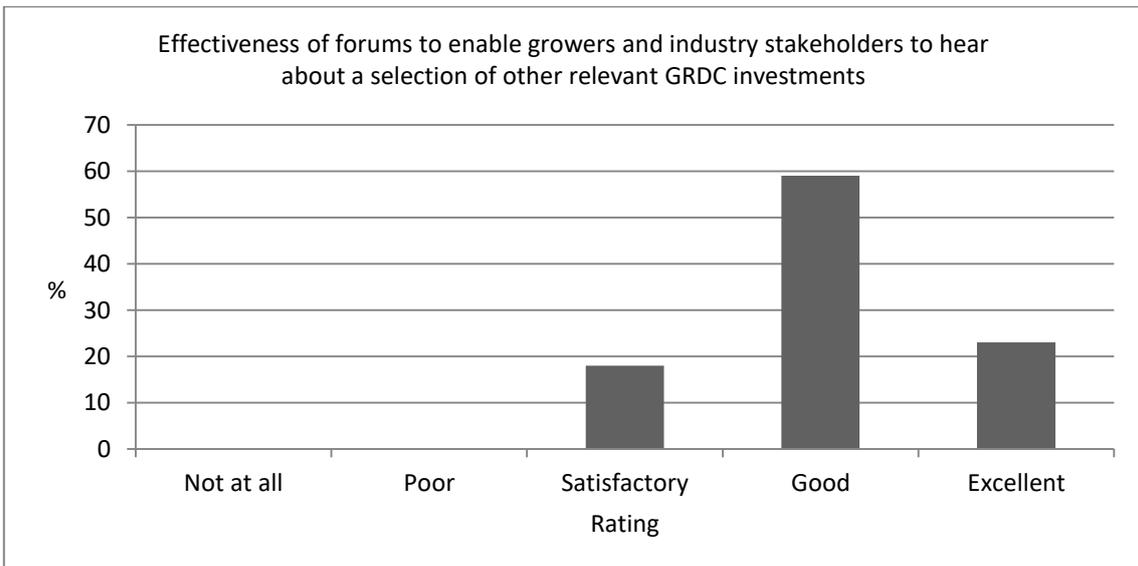
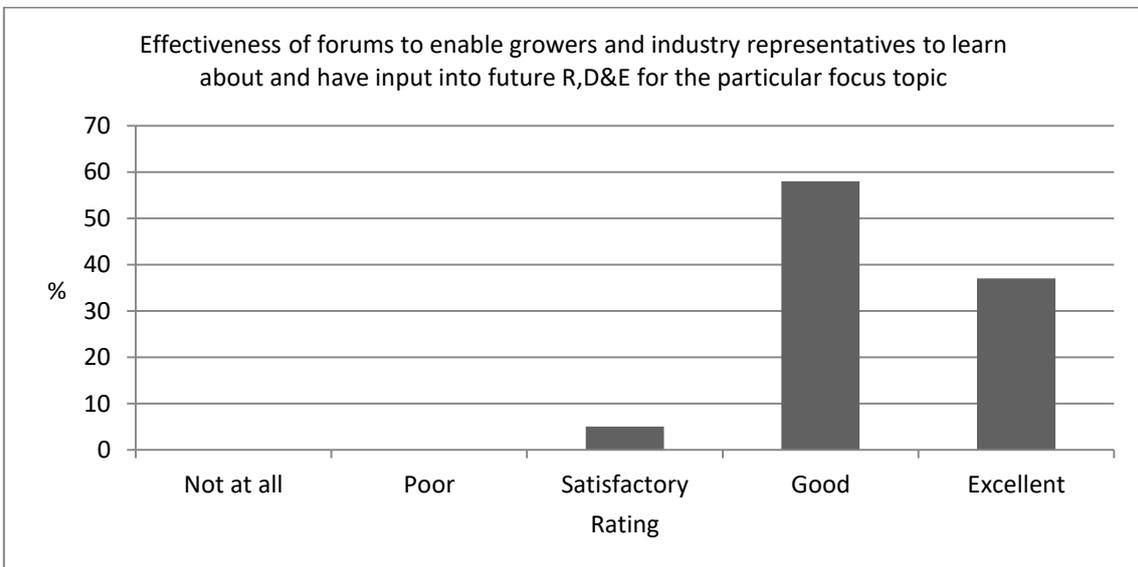
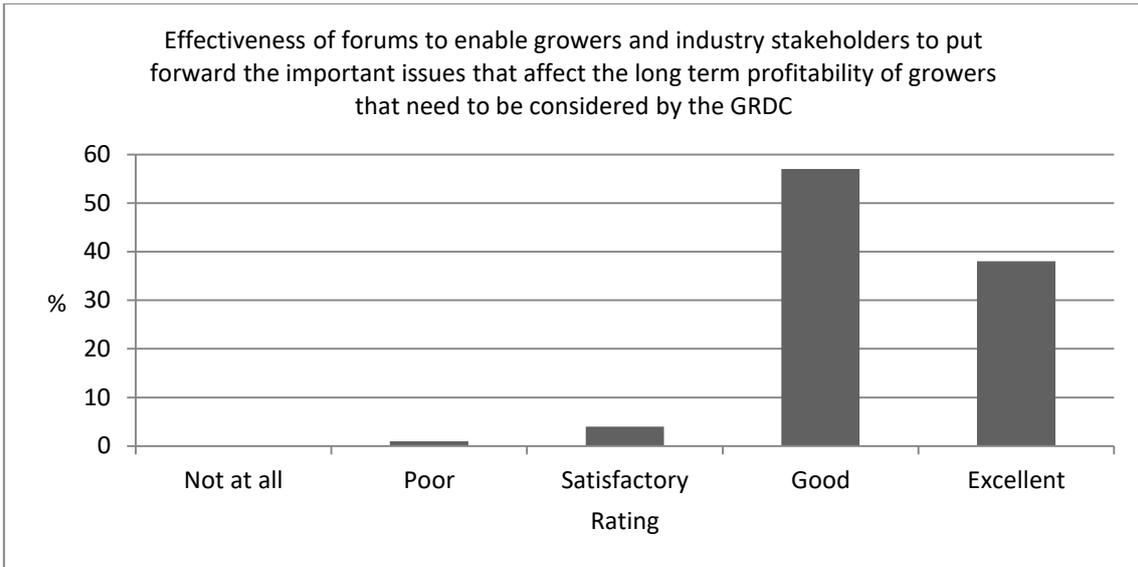
Further information

Jen Lillecrapp GRDC Regional Cropping Solutions Co-ordinator - South

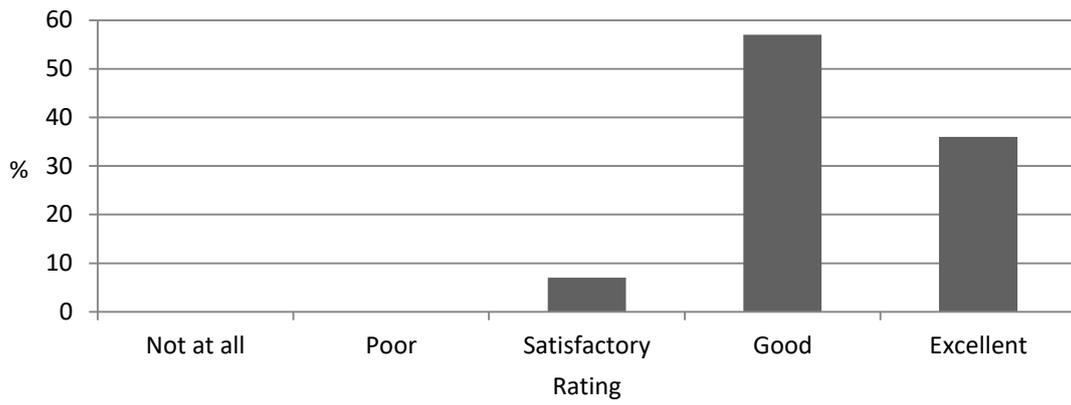
E- jen@brackenlea.com

T - 0427 647 461)

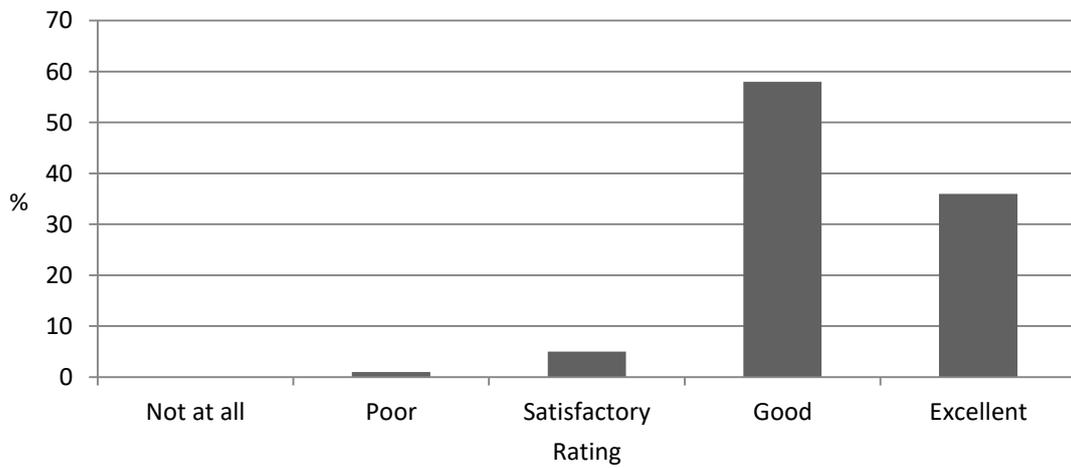
Appendix 1: A summary of results of evaluation surveys completed by participants of GRDC Local Forum in 2019.



Effectiveness of forums to enable growers and industry stakeholders to engage with GRDC staff and representatives and have the opportunity to ask questions and discuss GRDC investment in R,D&E



Effectiveness of forums in meeting participant expectations



Appendix 2: Issues and others where another or number of agencies or organisations including the GRDC have a shared responsibility

- loss of glyphosate – glyphosate is the most important cost effective weed control tool and essential to minimum and no-till farming systems which are critical for soil and moisture conservation
- chemical residue limits of export countries will limit market access
- social licence – research to provide scientific facts and evidence
- external perceptions and expectations e.g. environment, animal welfare and veganism
- pre-operational costs – registrations, licences, stamp duty
- better adapted cereal and pulse varieties i.e. shorter season varieties with a longer flowering period
- access to genetic modification technology which is limited by State government legislation
- cost of compliance to meet occupational, health and safety (OH&S) legal obligations could be reduced by making simple and practical safety guidelines and templates which can be adapted for an individual business or situation.
- educating the wider community and particularly school aged children to appreciate the importance of agriculture and gain an understanding of issue is important for building the capacity of the industry
- future availability (and cost) of P fertiliser based on forecast demand and available supplies to meet future demand
- independent evaluation of products to ensure efficacy and quality assurance
- limited supply of products e.g. fungicides limits options, yield, quality and profits
- control of vermin including kangaroos, pigs, emus and hares to reduce the damage and loss of crop and pasture production
- opportunity to increase the profitability of livestock and hay enterprises which are important enterprises which limit the financial impact of frost
- strong demand means hay is a profitable option but alternative uses for frosted crops is required because cutting frosted crops for hay is not without risks and the area or amount of hay that can be made is limited by the narrow window, machinery and logistics required to make hay
- improved varieties and improved agronomy would increase the yield, quality and profitability of growing oat and cereal hay
- no Maximum Residue Limits (MRL's) for fungicides which control Septoria tritici blotch limit access to markets or prohibit use of fungicides to control of STB in export hay crops, grazing (crops and stubbles) by livestock destined for export markets and or supply of grain, hay or straw to buyers producing livestock for export markets
- risk and impact of frost on canola and limited uses and market for canola hay has caused growers to reduce the paddocks/area planted to canola or to not grow canola which has limited the break crop options and diversity in rotations which has consequences particularly where pulses are not adapted which means there are no suitable break crops
- loss or limited access to the use of agri-chemicals e.g. glyphosate and practices and more broadly social licence and right to farm is threatened by misinformation, perception and or a lack of trust in the chemical regulator which is being pushed by a minority group of extremists
- protecting ownership of data which is an asset and is being collected by growers
- post farm gate costs - freight and others costs in delivering grain
- limited access for B-double trucks and road trains limit delivery options and increases freight cost

- closure of local silos has meant freight to deliver to “strategic sites” or port have increased freight costs and reduced profits of growers
- prohibitive premiums for multi-peril crop insurance in high risk districts mean this is not a cost-effective tool available for growers to manage climatic risks
- time and cost of administration including compulsory surveys
- promote alternative models for integrating livestock and cropping to capture the potential and benefit of integrating livestock and cropping enterprises
- virtual fencing is a new technology that will enable growers to extract the value of dual purpose crops, capitalise on the synergies of cropping and livestock enterprise and significantly improve the management and profitability of mixed farming systems
- understand the impact of weather damage on oaten hay varieties – independent evidence for a range of varieties over number of years is required to assist growers to select varieties
- additional investment in R,D&E for oaten hay given the increasing demand for hay from livestock producers and hay exporters with facilities in the area and hay is an important crop in the rotation for managing weed and managing risk (frost and failed spring)
- investment in livestock infrastructure (fences, yards and wool sheds) and equipment (sheep handling equipment) is limiting opportunities in livestock and increase the resilience and profitability of the whole farm business
- social licence - perception (not evidence) and expectations of wider community which will impose restrictions or greater obligations which will ultimately increase cost of production for example, restricted access to agri-chemicals etc.
- cost of freight to deliver grain to market and supply crop inputs is a major cost that limits the profitability of growers on Kangaroo Island (KI)
- opportunity to develop local livestock feed and additional niche market to increase profitability of growing grain on KI
- no (accessible) local source of gypsum required to ameliorate sodic soils
- opportunities to build upon “clean and green” image of KI, existing systems and track record to supply closed loop system for niche or specialty markets
- scattered paddock trees- limit efficiency and the use of tools and technologies e.g. controlled traffic farming and chaff-lining
- corellas or white cockatoos are a damaging pest which affect crop establishment and can cause up to 70% yield losses in windrowed canola

Appendix 2: A list of important constraints and opportunities for the long term profitability of grain growers identified by participants of GRDC Local Forum in 2019.

Wandearah, June 2019

- i. loss of glyphosate – glyphosate is the most important cost effective weed control tool and essential to minimum and no-till farming systems which are critical for soil and moisture conservation
- ii. chemical residue limits of export countries will limit market access
- iii. social licence – research to provide scientific facts and evidence
- iv. external perceptions and expectations e.g. environment, animal welfare and veganism
- v. pre-operational costs – registrations, licences, stamp duty
- vi. better adapted cereal and pulse varieties i.e. shorter season varieties with a longer flowering period
- vii. improved long season wheat and barley varieties with boron and salt tolerance
- viii. potential losses caused by dry sowing, particularly the effects of (concentrated) salts limiting pulse crop growth and yield
- ix. access to genetic modification technology which is limited by State government legislation
- x. cost of compliance to meet occupational, health and safety (OH&S) legal obligations could be reduced by making simple and practical safety guidelines and templates which can be adapted for an individual business or situation.
- xi. lack of particularly seasonal farm and agribusiness labour – improving the image and promoting the opportunities to attract the next generation to a career farming and agriculture
- xii. realise the potential to improve yields through increases in water use efficiency
- xiii. accurate long seasonal (6 month) rainfall forecast especially early in the season when decisions are made and understanding how to apply this information to make decisions
- xiv. alternate pasture or fodder crops to fill the cold winter feed gap
- xv. new herbicide tolerant varieties which produce grain with lower residues thus reducing the risk of product exceeding Maximum Residue Limits (MRL's)
- xvi. identifying soil constraints at a farm and paddock level
- xvii. rapid or real-time soil testing technologies to measure status of nutrients and other soil characteristics
- xviii. evidence of the impacts of regenerative agricultural systems, specifically cover crops in low rainfall environments
- xix. soil biology – understand the value of beneficial microbes and the impacts of farming practices e.g. herbicides and insecticides on beneficial species
- xx. soil acidity is an emerging and under-recognised issue which is limiting productivity of legumes and even precluding the growing of legumes
- xxi. educating the wider community and particularly school aged children to appreciate the importance of agriculture and gain an understanding of issue is important for building the capacity of the industry
- xxii. utilise and apply (previous and current) research for a specific issue that will deliver the greatest benefit for growers

Cullulleraine, July 2019

- i. improved seasonal information i.e. early season forecast - March to May plus plant available water (PAW) at seeding to make (tactical) decisions and manage risk
- ii. more accurate weather (rain and wind) forecasts (5 to 7 days) to make decisions and plan logistics

- iii. threat that industry will lose access to glyphosate and other agri-chemical products and potentially farming practices based on perception (not evidence) and an education and awareness campaign of general public is required to ensure “social licence” for industry and its farming practices
- iv. non-chemical novel weed control technology
- v. real-time and rapid tools to measure residual fertiliser/nutrition (N, P and trace elements, particularly Zn) especially after pulses to enable fertiliser rates and timing to be adjusted
- vi. on- farm grain storage – systems e.g. silo bags, sheds and silos and best management practices to manage pests and chemical residues to ensure quality and market access
- vii. grass weeds (Brome, Barley and Annual Ryegrass) - alternative and sustainable options which include non-chemical strategies given reliance on Group A in pulses and increase the adoption of current best management herbicide strategies e.g. rates and mixes to delay resistance
- viii. future availability (and cost) of P fertiliser based on forecast demand and available supplies to meet future demand
- ix. strategies e.g. inter-cropping/cover cropping, seeding systems, crop sequencing to increase biomass production in pulses because the lack of groundcover in pulse crops leaves soil prone to wind erosion
- x. increasing the productivity of sandy soils – What is the most cost effective strategy? Which sands will be responsive to deep ripping? What strategies are required after deep ripping (e.g. to establish a crop and realise the increased potential of ameliorated sands including nutrition)
- xi. understand the potential and use of PA to undertake research on a larger (paddock and farm) scale to account for variability within and across paddocks
- xii. herbicide options and tips and tactics for summer weed control because restrictions on the use of important products has meant that spraying may not be able to occur under optimum conditions and the window for spraying has narrowed
- xiii. independent evaluation of products to ensure efficacy and quality assurance
- xiv. limited supply of products e.g. fungicides limits options, yield, quality and profits
- xv. options for onion weed control to limit the effects subsequent crops and exceeding maximum residue limits (MRLs)
- xvi. stem frost regularly causes damage which significantly limits yield – stem frost is more frequent and damaging than flowering or head frost in this area
- xvii. re-visit old chemistries (efficacy, crop safety and maximum residue limits) for control of weeds in vetch hay and fodder crops
- xviii. control of vermin including kangaroos, pigs, emus and hares to reduce the damage and loss of crop and pasture production
- xix. strategies to improve nitrogen fixed by chickpeas e.g. improved dry inoculant which is reasonably priced and double inoculation
- xx. opportunity to use virtual fencing to manage livestock to ensure adequate groundcover to reduce the risk of wind erosion
- xxi. increased biomass production and height of pulse crops
- xxii. accumulation of herbicide in sandy soils

Farrell Flat, June 2019

- i. regular and severe (<3°C) frost events throughout the growing season and as consequence stem, flowering and post anthesis which affects all crops including cereals, canola, pulse and grain legume crops
- ii. stem frost damage caused by regular or extended periods of frost or cold temperatures limits yields and profitability

- iii. opportunity to increase the profitability of livestock and hay enterprises which are important enterprises which limit the financial impact of frost
- iv. spread time of sowing to spread production and financial risks due to frost, heat and/or lack of spring rainfall
- v. strong demand means hay is a profitable option but alternative uses for frosted crops is required because cutting frosted crops for hay is not without risks and the area or amount of hay that can be made is limited by the narrow window, machinery and logistics required to make hay
- vi. improved varieties and improved agronomy would increase the yield, quality and profitability of growing oat and cereal hay
- vii. not realising the water limited potential of wheat (4t/ha) due to effects of frost and poor seasons and growers generally will not target higher yields because of the increased financial risk
- viii. variable pulse/grain legume yields (e.g. faba beans yield from 300kg/ha to 4t/ha) and hence more stable pulse and grain legumes including faba beans, lupins, peas and vetch yields would improve profitability
- ix. lack of adapted and profitable legumes including pulses, grain or pasture legumes for acid, sodic soils which are prone to waterlogging for this environment which has long cold winter followed by acute heat stress and terminal drought in spring N.B. pulse or legume crops need to be profitable because benefits to next crop or rotation are not always able to be realised because of the effects of frost
- x. identify alternative options for frosted pulse/legume crops
- xi. unrealistic to avoid frost but need to balance against the effects of heat stress - data on the effect of frost and heat stress on grain yield and quality would assist decisions or motivate change to ensure growers select and sow varieties to flower during window which minimise the effect of frost and heat stress
- xii. opportunity to expand dual purpose crops (grain, graze or silage/hay options)
- xiii. biomass is critical for dual purpose wheat varieties and awnless varieties may provide a more productive option compared to the currently available cultivars and the cultivars that are being tested
- xiv. identify and screen alternative barley cultivars which are adapted to this environment (and more tolerant of frost/cold stress)
- xv. adoption of management strategies specifically for growing cereal crops for hay or fodder would increase productivity and profitability of these enterprises
- xvi. Identify and test alternative pasture options, including annual, perennial and hard seeded varieties (compared to vetch) to provide a range of options which will produce feed throughout the whole year in this environment
- xvii. no Maximum Residue Limits (MRL's) for fungicides which control Septoria tritici blotch limit access to markets or prohibit use of fungicides to control of STB in export hay crops, grazing (crops and stubbles) by livestock destined for export markets and or supply of grain, hay or straw to buyers producing livestock for export markets
- xviii. improved genetic resistance to STB to reduce reliance on fungicides which will reduce cost of production and delay fungicide resistance
- xix. improved adapt, high yielding (APW) varieties for a range of sowing windows which will produce higher amounts of biomass in winter and have a robust disease resistance package (Barley Yellow Dwarf Virus, Septoria tritici blotch, Eyespot and Yellow Leaf Scald)
- xx. risk and impact of frost on canola and limited uses and market for canola hay has caused growers to reduce the paddocks/area planted to canola or to not grow canola which has limited the break crop options and diversity in rotations which has consequences particularly where pulses are not adapted which means there are no suitable break crops
- xxi. loss or limited access to the use of agri-chemicals e.g. glyphosate and practices and more broadly social licence and right to farm is threatened by misinformation, perception and or a lack of trust in the chemical regulator which is being pushed by a minority group of extremists

- xxii. declining nutrient levels including nitrogen (N), potassium (K), sulphur (S) and trace elements Cu, Zn, Mn, Mg) which are being removed in hay and straw are or will limit crop yields
- xxiii. long term consequences of not retaining stubbles i.e. declining organic carbon (O.C) levels given the benefits are outweighed by the (i) significant challenges of heavy stubble loads and (ii) increased risk of frost with increase stubble load
- xxiv. technologies and tools to detect and quantify frost damage and variation across a paddock to enable earlier and better informed decisions
- xxv. independent evidence on what a technology or tools will deliver and the financial value (return on investment) of new technologies e.g. sensors
- xxvi. protecting ownership of data which is an asset and is being collected by growers
- xxvii. post farm gate costs - freight and others costs in delivering grain
- xxviii. limited access for B-double trucks and road trains limit delivery options and increases freight cost
- xxix. closure of local silos has meant freight to deliver to “strategic sites” or port have increased freight costs and reduced profits of growers
- xxx. prohibitive premiums for multi-peril crop insurance in high risk districts mean this is not a cost-effective tool available for growers to manage climatic risks
- xxxi. time and cost of administration including compulsory surveys
- xxxii. no network e.g. grower groups and agricultural bureaux for growers in this area to access latest research and share knowledge and experience is slowing the rate of adoption of R,D&E and the advancement of profitable farming systems and practices for this local area
- xxxiii. promote alternative models for integrating livestock and cropping to capture the potential and benefit of integrating livestock and cropping enterprises
- xxxiv. virtual fencing is a new technology that will enable growers to extract the value of dual purpose crops, capitalise on the synergies of cropping and livestock enterprise and significantly improve the management and profitability of mixed farming systems

Maryborough, June 2019

- i. numerous and combination of soil constraints, including -
 - low water holding capacity
 - acidity
 - sodicity
 - compaction
 - heavy, dense, impermeable clay layer
 - nutrition (loss of nutrients through leaching)
- ii. lack of knowledge and evidence on soil amelioration including –
 - impacts (positive and negative) consequences
 - which soils will be responsive and which soils will not respond and which soils where intervention or deep ripping should not be undertaken
 - which amelioration techniques will provide the greatest return on investment for variable soils and situations – is it better to start with least or most productive soils
 - what is the expected longevity of amelioration

- management following amelioration –
 - preparing a seedbed to successfully establish a crop
 - management to capture the higher water holding capacity and increased yield potential
- iii. opportunity to increase yields as currently only achieving 50 – 60% of water limited yield potential
- iv. awareness and strategies to reduce the risk of importing weeds in seed e.g. Wild Radish in oats
- v. best management practices which incorporates chemical and non-chemical tactics and new control options for the management of herbicide resistance in cereals and break crops
- vi. Annual Ryegrass and later germinating Brome Grass limiting crop choice, hay quality and yield and grain and therefore price and returns – require locally relevant data to quantify impacts and demonstrate and support adoption of best management practices
- vii. understand the impact of weather damage on oaten hay varieties – independent evidence for a range of varieties over number of years is required to assist growers to select varieties
- viii. management of (cereal, canola and pulses) diseases e.g. Septoria tritici blotch, aerial blackleg and sclerotinia, ascochyta and grey mould in pulses in medium to high rainfall seasons
- ix. additional investment in R,D&E for oaten hay given the increasing demand for hay from livestock producers and hay exporters with facilities in the area and hay is an important crop in the rotation for managing weed and managing risk (frost and failed spring)
- x. change mindsets and management e.g. sow early to grow biomass to achieve higher yields or provide the opportunity to cut hay when crops are frosted or limited by failed spring and supply higher inputs at optimum times to grow profitable (hay or grain) crops
- xi. alternatives strategies to meet N demand and target yield (grain or hay) given there often limited opportunities for applying N in form of urea
- xii. understanding and promoting the opportunity for integrating crop and livestock enterprises including dual purpose crops and feed-lotting lambs
- xiii. investment in livestock infrastructure (fences, yards and wool sheds) and equipment (sheep handling equipment) is limiting opportunities in livestock and increase the resilience and profitability of the whole farm business
- xiv. limited profitable legume options due to a range of constraints e.g. soil constraints including poor soil structure and drainage, acidity
- xv. on-farm storage to maintain the quality of product to optimise price
- xvi. lack of knowledge on how to maximise profitability of pulses in this environment including –
 - inoculation (myth busting)
 - acid tolerant rhizobia,
 - chemistry imidazole (imi) tolerant varieties for in-crop weed management and managing risk of herbicide carry-over from previous season
- xvii. insecticide resistance especially in aphid species and need to reduce prophylactic use of neonicotinoids
- xviii. social licence - perception (not evidence) and expectations of wider community which will impose restrictions or greater obligations which will ultimately increase cost of production for example, restricted access to agri-chemicals etc.

Kingscote, August 2019

- i. understand causes e.g. phenology of cultivars, inadequate number of tillers, disease and determine strategies e.g. suitable germplasm with phenology for early sowing, agronomy practices and crop inputs, fungicide and nutrition

strategies etc. to produce biomass/tillers required to produce higher yields to close the cereal i.e. soft ,APW and feed wheat and barley yield gap from current 4t/ha- 6t/ha to achieve 8-10t/ha yield potential yields

- ii. soil and sub-soil constraints of clay or gravel soils including, sodicity, aluminium toxicity etc. are limiting water holding capacity and yields
- iii. strategies for diverse systems to manage the significant number and late germinations of Annual Ryegrass
- iv. IPM strategies to effectively control of slugs, snails, vegetable beetle, earwigs, slater and millipedes in canola and cereals
- v. acid tolerant rhizobia for pulses
- vi. soil acidity is increasing at depth
- vii. cost of freight to deliver grain to market and supply crop inputs is a major cost that limits the profitability of growers on Kangaroo Island (KI)
- viii. opportunity to develop local livestock feed and additional niche market to increase profitability of growing grain on KI
- ix. increase N use efficiency of N based fertiliser
- x. no (accessible) local source of gypsum required to ameliorate sodic soils
- xi. high risk of fungicide resistance in high rainfall districts given elevated disease pressure which is in part caused by favourable conditions which allow volunteers and other host species to provide a “green bridge”
- xii. outbreaks of Sclerotinia in canola in seasons where conditions are favourable i.e. wet or humid conditions during flowering limits yield
- xiii. alternate control options which reduce reliance on Group B herbicides to control Wild Radish and vetch in beans
- xiv. opportunities to build upon “clean and green” image of KI, existing systems and track record to supply closed loop system for niche or specialty markets
- xv. scattered paddock trees- limit efficiency and the use of tools and technologies e.g. controlled traffic farming and chaff-lining

Penshurst, June 2019

- i. opportunity for alternative and greater range of crops to be grown under irrigation and/or as summer crops in the Port Campbell to Heywood area which might include options similar to those grown in the SE of SA and Tasmania e.g. seed production and seed bulk-up for the Northern Hemisphere, poppies etc.
- ii. alternative dryland crops e.g. hemp, pulses and summer grain and fodder crops
- iii. corellas or white cockatoos are a damaging pest which affect crop establishment and can cause up to 70% yield losses in windrowed canola
- iv. resistance in Annual Ryegrass (ARG) to a range of herbicide products and groups including glyphosate and clethodim is a major constraint which could be lessened by increase the adoption of the range of strategies which when used in combination will achieve greater control
- v. develop new markets e.g. human and stock feed markets for intensive industries for faba beans would moderate the volatility of faba bean prices
- vi. identify winter active rhizobia to improve the nodulation lupins and beans
- vii. technologies and tools to detect and quantify frost damage and variation across a paddock to enable earlier and better informed decisions
- viii. evidence to protect access to glyphosate and other agri-chemicals

- ix. a range of options to solutions including drainage, management and genetics are required to reduce the extent, duration and impact of waterlogging
- x. opportunity to increase water use efficiency and utilise water especially out-of-season rainfall by growing relay crops or companion (combination of winter crop or winter and summer) crop which raised the idea to assess the concept to use polymer seed treatment to delay the germination and manipulate crop development of a companion crop
- xi. alternative sources of nutrients e.g. waste water and bio-solids from cities
- xii. identify and develop alternative markets for straw e.g. biochar and biofuel
- xiii. improve harvest index to increase grain relative to straw may be another tool to reduce the challenges of managing high volumes of stubble
- xiv. understand the impact of spring diseases in canola including sclerotinia, alternaria, powdery mildew and white spot
- xv. improved genetic resistance for Septoria tritici blotch in wheat and Scald in barley
- xvi. yield stability of canola could be improved by selecting and developing varieties which have greater waterlogging tolerance
- xvii. increasing herbicide resistance in Wild Radish populations
- xviii. understanding nitrogen losses and mineralisation in high rainfall environments
- xix. technologies and tools e.g. probes for rapid in paddock measurement of nitrogen status
- xx. nitrogen strategies to increase early vigour and root development to reduce the effects of waterlogging and strategies for crops to recover from the effects of waterlogging
- xxi. data or tools to quantify or measure the effect of waterlogging on nitrogen availability to develop nitrogen budgets and make fertiliser decisions i.e. how much N and when?
- xxii. more accurate seasonal forecasts