



Riverine Plains



Research for the
Riverine Plains

2010

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in the Riverine Plains

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Acknowledgements

Welcome to the 2010 edition of the Riverine Plains trial book.

Last year was a mixed bag across our membership base, with some areas having a reasonable harvest while other regions had their worst ever. Whichever end of this spectrum you were on, and whether the end result for you was positive or not so positive, you would have been challenged in a new way and most definitely will have learnt something new.

Farming is a continually evolving discipline and we hope this year's trial book will help you in some way — whether it's by introducing to you brand new research, following up or expanding on previous research or just giving you a new perspective on old problems. Either way, we hope you will find the information useful and relevant and that it helps your decision making.

Many of the articles in this trial book are researched wholly or in part in the Riverine Plains catchment. But because we seem to have less access to very local research these days, we also draw on research conducted outside the Riverine Plains area. We hope you find these articles equally useful as many address issues common to us — despite the obvious differences in soil type and rainfall!

Last year, Riverine Plains Inc committee member David Wolfenden carried out a random phone survey to gauge whether members still saw value in the trial book and how extensively they read it. I'm pleased to report that the response was overwhelmingly positive, with most survey participants indicating that the trial book was a worthwhile and valuable resource and that it was on the whole, widely read and referred to. While this was a great result, we do believe in continual improvement so if you have any comments or suggestions please feel free to share them with us.

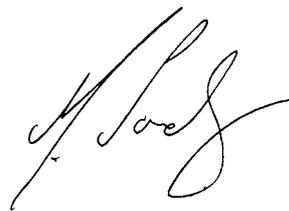
On behalf of Riverine Plains Inc, I'd like to formally thank all the authors for their submissions. We sincerely appreciate the efforts of our contributing research organisations and industry bodies in sharing their results with the Riverine Plains membership. We particularly recognise the ongoing support provided

by the Grains Research and Development Corporation (GRDC), which enables our locally-based research work to continue. This year, Nick Poole of the Foundation for Arable Research, New Zealand has also provided support for our local research into no-till systems in wheat and canola and his input has been invaluable.

We also thank the Victorian Department of Primary Industries and Industry and Investment NSW for their contributions and also extend our appreciation to John Sykes Rural Consulting for his continued support.

A very special thanks also to Fiona Hart who does a tremendous job obtaining articles, liaising with authors and in working with the designers and editors to get the book published.

We hope you find this year's range of articles valuable and we wish you all the best for the 2010 cropping season.



Michelle Pardy
Technical Editor

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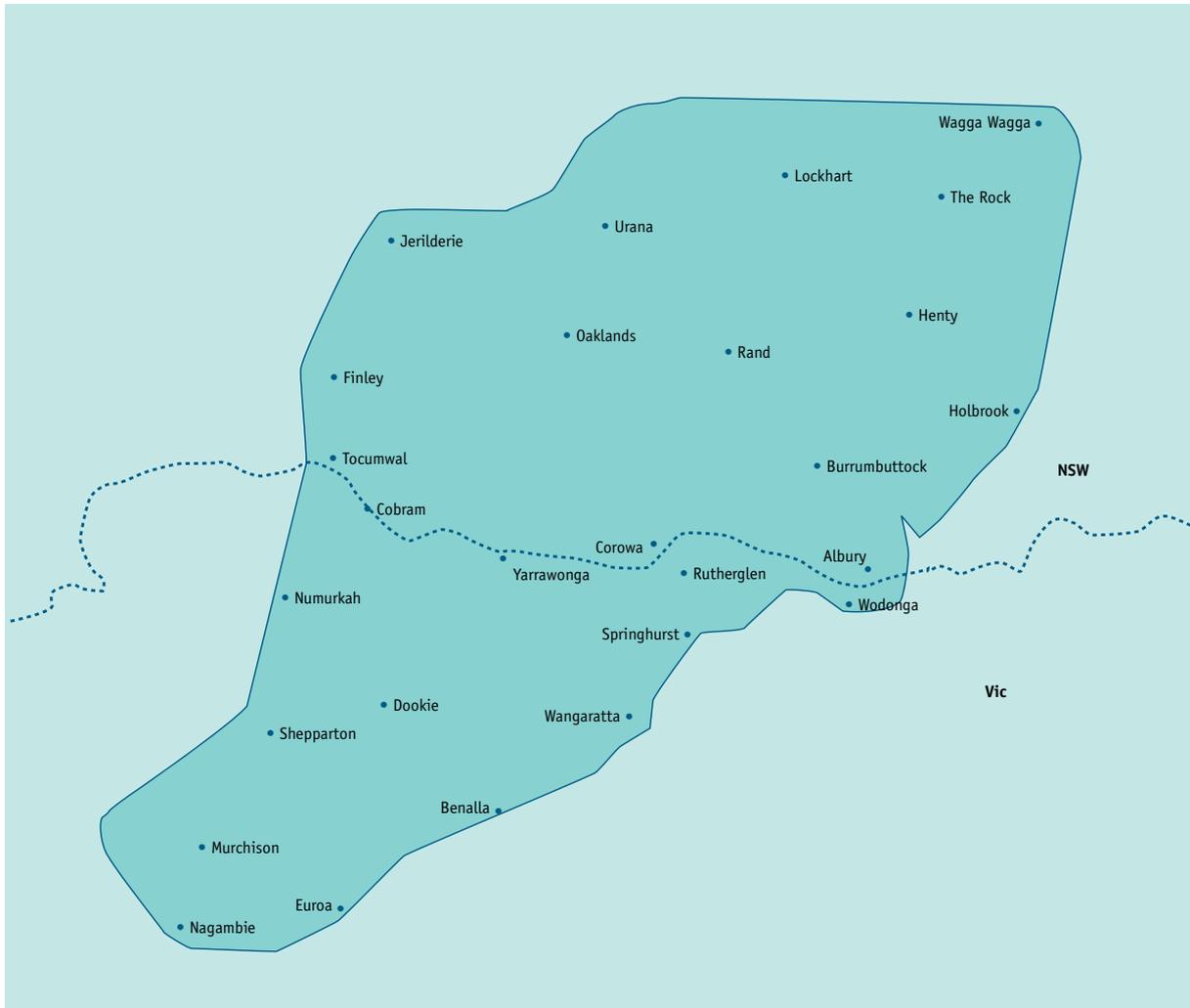
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Area covered by Riverine Plains Inc

Membership area



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Row spacings — conversion table

A number of trials carried out during 2009 have investigated the effect row spacings play in crop production.

Riverine Plains Inc recognises that while the research sector has moved toward metric representation of row spacings, most growers remain comfortable with imperial measurements.

Following is a quick conversion table for handy reference when reading the following trial result articles.

TABLE 1 Row spacing conversions

Inches	Centimetres
7.2	18
9	22.5
9.5	24
12	30
14.4	36
15	37.5



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Preface

Trials versus demonstrations — what the results mean

Research on the Riverine Plains takes different shapes and forms, each of which has the potential to make an important contribution to increasing the understanding about agricultural systems in the area. However, it is important to keep in mind results from the different forms of research need to be analysed and interpreted in different ways.

It is important to understand the difference between trials and demonstrations in the use of results for benefit on farms. A replicated trial means that each treatment is repeated a number of times and an averaged result is presented. The replication reduces outside influences producing a more accurate result. For example, trying two new wheat varieties in a paddock with varying soil types and getting an accurate comparison can be obtained by trying a plot of each variety, say four times. Calculation of the average yield (sum of 4 plots then divided by 4) of each variety accounts for variations in soil type.

Statistical tests for example, Analysis of Variance — ANOVA, Least Significant Difference — LSD) are used to measure the difference between the averages. If there is no significant difference between treatments the results will be accompanied by the mark NS (meaning not significantly different). A statistically significant difference is one in which we can be confident that the differences observed are real and not a result of chance. The statistical difference is measured at the 5% level of probability, represented as “ $P < 0.05$ ”.

Table 1 shows an LSD of 0.5 t/ha. Only Variety 3 shows a difference of greater than 0.5 t/ha, compared with the other varieties. Therefore Variety 3 is the only treatment that is significantly different.

TABLE 1 Example of a replicated trial with four treatments

	Treatment	Avg yield (t/ha)
1	Variety 1	4.2
2	Variety 2	4.4
3	Variety 3	3.1
4	Control	4.3
	LSD ($P < 0.05$)	0.5

A demonstration is a comparison of a number of treatments, which are not replicated. For example, splitting a paddock in half and trying two new wheat varieties or comparing a number of different fertilisers across a paddock. Because a demonstration is not replicated results cannot then be statistically validated. For example, it may be that one variety was favoured by being sown on the better half of the paddock. We can talk about trends within a demonstration but cannot say that results are significant. Demonstrations play an important role as an extension of a replicated trial that can be tried in a simple format across a large range of areas and climates.

Demonstrations are accurate for the paddock chosen under the seasonal conditions incurred. However, care must be taken before applying the results elsewhere.

Trials and demonstrations play a different role in the application of new technology. Information from replicated trials is not always directly applicable but may lead to further understanding and targeted research. Demonstrations are usually the last step before the application of technology on farm.

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Introduction

A word from the 2009 Chairman

Adam Inchbold Grand View, Yarrawonga

During 2009 many Riverine Plains Inc activities have occurred as usual, including the Pre Season Update, Precision Agriculture (PA) discussion groups, field days and workshops on more specific issues. We also saw the Winter Update split to have two separate events, specifically a technical update and a business management update held in conjunction with our two platinum sponsors NAB Agribusiness and RSM Bird Cameron. SPAA (Southern Precision Agriculture Association) conducted PA header set-up workshops in Rand and Dookie and it will be good to have SPAA involved in PA discussion groups this year. They are similar to Riverine Plains in many ways, a good group of farmers with good knowledge and interaction.

The newsletter continued, as did the trial book. David Wolfenden surveyed the members about the trial book and received outstanding feedback. The Grower Bulletin was successfully introduced and was well received; thanks must go to Allison Glover for her work producing the bulletin.

During 2009 we successfully completed the Grains Research and Development Corporation (GRDC)-funded project *Improved Winter Cropping Systems in the Riverine Plains*. I would like to take this opportunity to thank John Sykes, Brett Whelan and Peter Baines for their vital work enabling this project to have been so successful. Also thanks go to all the others who have chipped in including the Cays for their contributions as farmer co-operators.

During 2009 we also started a new GRDC-funded project *Improved water use efficiency (WUE) in no-till cropping and stubble retention systems in spatially and temporally variable conditions in the Riverine Plains*. As part of this project we are pleased to welcome aboard Nick Poole from the Foundation for Arable Research, Christchurch, New Zealand, the staff at Peracto and Rice Research Australia Pty Ltd. We are also pleased to have a new crew of farmer co-operators, namely the Hanrahan, Alexander and Harmer families.

The results Riverine Plains gets on a limited research budget is fantastic. We are getting feedback from researchers that they value and enjoy our research results. Goals have really been kicked in this area.

Overall, 2009 once again saw a successful program with an excellent response. As usual it was conducted in a very efficient manner thanks to the committee, executive, executive support (DPI Victoria and Industry and Investment, NSW), sponsors and the excellent work by Fiona Hart.

While there is no reason to expect any change to the above contributions, it is recognised that under the current level of resourcing, these people are fully extended. While, further expansion of the group's program may help extend its ability to deliver outputs (namely any extra projects that bring with them funding for additional staff), I believe that Riverine Plains has got to a point where care needs to be taken in how it operates going forward in terms of when and where the group commits its limited and precious resources.

To that end, during 2009 a number of people on the committee went to great lengths to investigate and recommend a committee restructure. During September 2009, an extraordinary committee meeting was held to discuss these recommendations. The recommendations were subsequently adopted. One of the biggest challenges during 2010 will be for the new committee of Riverine Plains to implement these changes with diligence and goodwill.

The 10-year anniversary dinner, which was held last year was a very proud night. It was a chance to thank and honour the people who have been involved in Riverine Plains and to give support to those who are currently and will be involved in the group down the track. It was also a chance to reflect on our collective journey during the past 10 years. Interesting isn't it, to think that one of topics at the very first day was on raised beds. Also, to think of the things we now spend time pondering — stripe rust, yield maps and cutting back inputs. Progress, challenges and our response....

Reflecting on my time as chairman of Riverine Plains, it is with some sadness that four out of the five years were dogged by drought. There is an acknowledgement that due to this fact, we are all under more stress than would seem sustainable and for some, that stress, financial, emotional and otherwise has gotten to a point where it can be said with no exaggeration that it

is extreme. While there are no silver bullets for these problems, it is my hope that Riverine Plains has played and continues to play some sort of role that is useful by:

1. Providing good information — something that is critical no matter what the circumstances are, and
2. Operating with an enthusiastic and warm approach, as in the absence of a silver bullet it may be the one thing that helps people along.

On the flipside, Riverine Plains is without doubt the most rewarding community group I have ever been involved in — and I have been involved in a few. I was a green 22-year-old university graduate who had been away from home for 10 years when the initial meeting was called. As a result, Riverine Plains has been a massive driver for me on the practical/technical side of agriculture and also in helping me to become part of the wider agricultural community.

As I sign off for the last time, I am very grateful to the group for being all that it is. Riverine Plains is a group that has bucked the usual rural trends (full of young people and growing instead of shrinking). The successes it enjoys are overwhelmingly due to the efficiency that is derived from a team of capable people working cooperatively and enthusiastically. It has been an absolute pleasure to have been so heavily involved with a group such as this. It has been very rewarding and I have made many great friends along the way. It will continue to be a pleasure to work with the group in a new capacity.

I leave you with my best wishes going forward. ✓

Adam Inchbold (Chairman 2005–2009)

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Introduction (cont.)

A word from the incoming Chairman

Andrew Russell Glenmoir, Browns Plains

I should start by introducing myself to those of you I haven't yet had the pleasure of meeting. My name is Andrew Russell and I am the newly elected chair of Riverine Plains Incorporated. My wife Sue and I live just out of Rutherglen on a lovely farm called *Glenmoir*, with our two children Philippa and James. I work within our family farming business in the seed industry as a Farm and Seed Production Manager.

As well as being committed to our family business and to Riverine Plains, I am also the Captain of Browns Plains Rural Fire Brigade, a past President of the Rutherglen Branch of the Victorian Farmers Federation and Apex, and have also been involved in many community groups over the years.

I have now been a Committee Member of Riverine Plains for three years and during that time have been struck by the inclusive and forward-thinking nature of the group.

The challenges most of us have endured during the past few years have been extreme, and dealing with and overcoming these types of challenges can be difficult and burdensome. However, to be a part of a group whose committee and membership are willing to face these challenges head on, while offering support and attempting to find solutions to these challenges is just fantastic. These are some of the greatest strengths of a group like ours.

I would like to personally thank and congratulate outgoing chair Adam Inchbold for his fantastic efforts in successfully shaping and expanding Riverine Plains Inc during the past five years and for handing over the Chairmanship in such great shape!

Riverine Plains has played a crucial role in the agricultural sector since it was formed more than 10 years ago. I believe it will continue to perform an even more important role in the future as a medium and facilitator to local growers. It is becoming clearer to me that government agencies and researchers are looking to groups like ours to channel information into the farming community while also receiving direction and information back from our members. For this reason I see Riverine Plains' role expanding over time

to accommodate some of the services that were once provided by the respective State government agencies. However, I also see the group continuing to have a firm base in carrying out vital local research on pertinent issues and topics here in the Riverine Plains.

My main focus this year will be to implement the recommendations put forward by the Riverine Plains Structural and Management Review Subcommittee regarding the changes to the committee structure and workings. This will be a great step forward and will allow us to streamline our limited volunteer resources and allow the group to grow as required into the future.

In regards to this trial book – it is a showcase of the year's work and I congratulate Adam Inchbold and the 2009 research committee for their hard work in planning and carrying out the Riverine Plains research program so thoroughly and professionally. I would also like to acknowledge Michelle Parry, Fiona Hart and Kondinin Group for their efforts in editing and putting together the book as well as all the contributing authors for sharing their work with us.

I am looking forward to another successful year with Riverine Plains. Let's keep our heads down and keep on keeping on! ✓

Andrew Russell (Chairman 2010)

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2009 — the year in review

Seasonal summary

Janet Walker Industry and Investment
NSW, Albury

The summer of 2009 was very hot and dry with no January or February rain across most of the district. The first widespread sowing rain was at the end of April, which was sufficient to sow most crops. This was followed by a relatively dry May where minimum temperatures were above average, particularly soil temperatures. Early growth of winter grazing cereals was slow to start, despite the warm autumn conditions, because of the lack of moisture.

The early sowing followed by a warm, wet June and July however, meant many crops set a high yield potential. The good rain during July and August was again followed by one of the driest springs on record. September, October and early November were very hot and dry.

Monthly maximum temperatures for early autumn and winter and spring were above average (see Figure 1). The warm minimum temperatures continued into winter leading to far fewer frosts than average during autumn and winter (see Figure 2). There were however some late frosts during September and October. A frost on 8 October 2009 caused some crop damage. Temperatures for November were well above average, which again caused crop damage combined with dry conditions.

Rainfall figures throughout the year were below the median. Although average rainfall was received during the winter months, the lack of spring rain again

resulted in a decile 1 or 2 year for towns across the district (see Figures 5 and 6).

The annual rainfall was 468 millimetres and 400mm for Albury and Corowa respectively (see Figures 3 and 4). The cumulative growing season rainfall (GSR) for Albury and Corowa, similar to the annual rainfall, was decile 2 for both towns (see Figures 7 and 8).

Cropping review

The rain during December 2008 germinated weeds. With little follow-up rain there were no further germinations and minimal fallow spraying during later summer. The lack of rain also meant there was less volunteer wheat or triticale in paddocks to act as a green bridge for stripe rust.

Cropping intentions were focused on cereals to minimise risk with decreased sowing of canola particularly in the western areas of the district. Following the dry run of seasons reducing phosphorus inputs was an important consideration in crop planning.

The April rain was perfect timing for a good start to the season. The rain was widespread across the district with most towns receiving at least 30mm. Soil temperatures were still very warm with crops establishing quickly. A lot of grazing cereals, mainly wheats, were sown dry in anticipation of the rain.

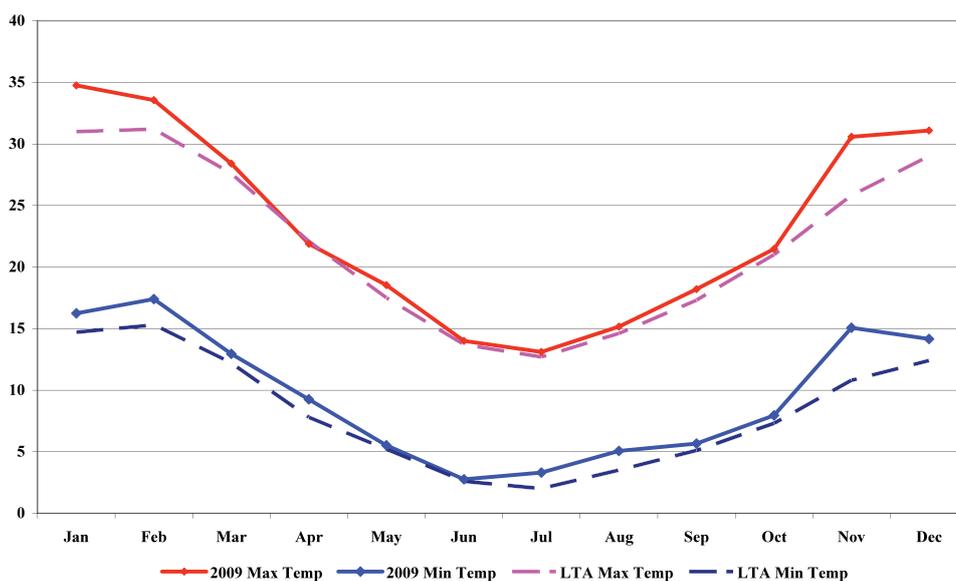


FIGURE 1 Minimum and maximum temperatures for 2009, compared with long-term averages (LTA)

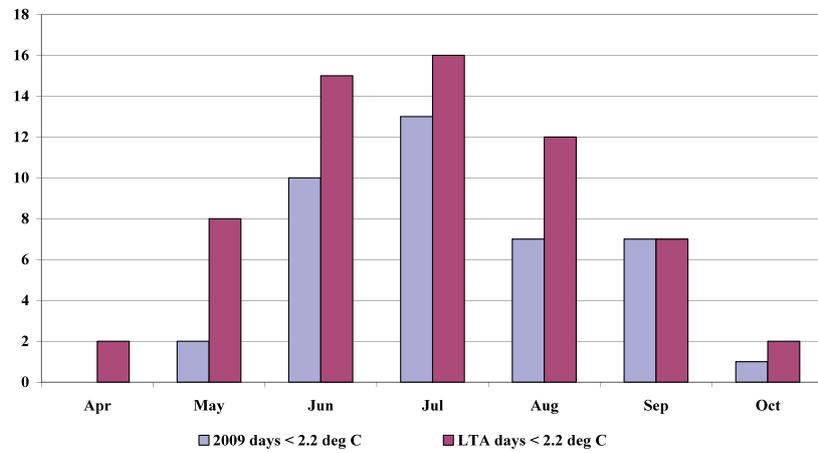


FIGURE 2 Frosts in Albury 2009 compared with long-term averages (LTA)

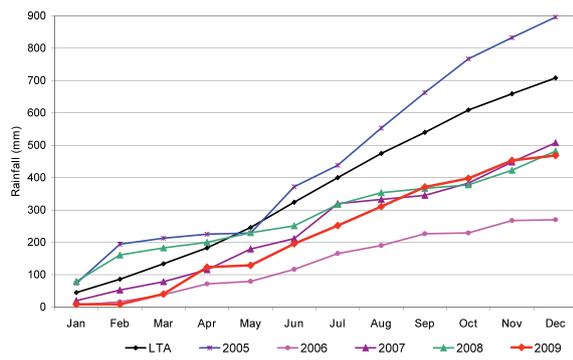


FIGURE 3 Cumulative rainfall Albury

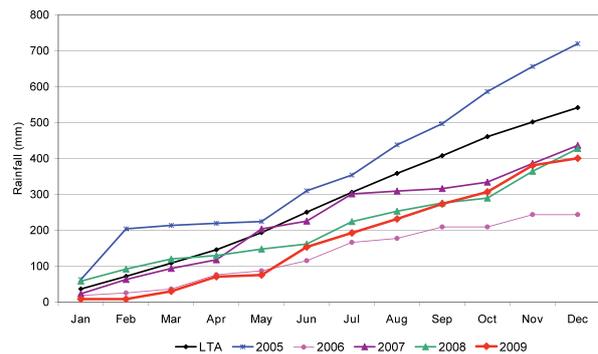


FIGURE 4 Cumulative rainfall Corowa

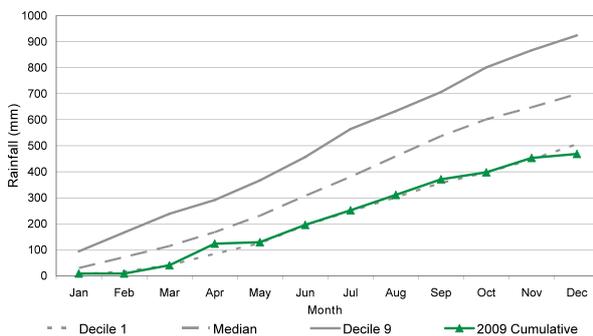


FIGURE 5 Cumulative rainfall at Albury 2009 against decile 1, median and decile 9

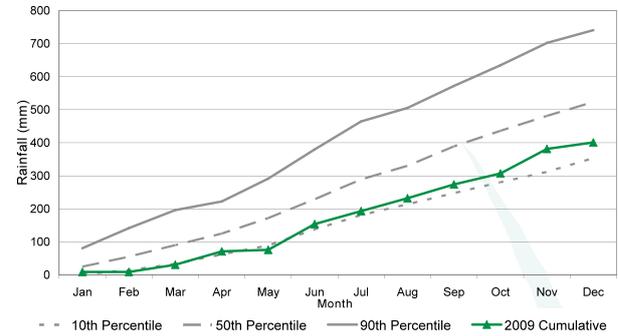


FIGURE 6 Cumulative rainfall at Corowa 2009 against 10th, 50th and 90th percentile

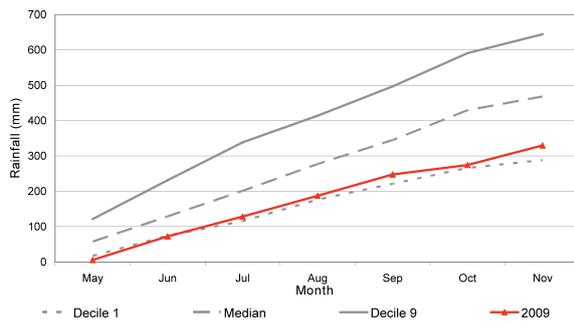


FIGURE 7 Cumulative growing season rainfall at Albury 2009 against decile 1, median and decile 9

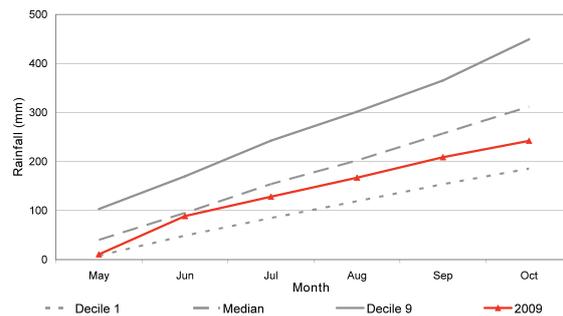


FIGURE 8 Cumulative growing season rainfall at Corowa 2009 against decile 1, median and decile 9

Despite the lack of May rain there was adequate moisture from the April rain for most crops to be sown and establish well. However some crops sown on marginal moisture had patchy establishment particularly on heavier soils with split germination. The warm and dry May conditions also lead to manganese toxicity in some canola crops. Early crop growth was slow despite the warm conditions due to the lack of moisture.

Average June and July rain, combined with warm conditions, meant many crops developed faster than would be expected for the sowing date, particularly canola crops and some cereal varieties. There was also good dry matter (DM) production in grazing crops.

Stripe rust was first found in the district during July, much later than the previous year due to the dry summer. The rust present during 2009 was mainly the Jackie pathotype, however there was a much higher prevalence of the Yr17 pathotype than previous seasons — particularly on Ellison and Ventura. There was no Jackie Yr27 rust detected for the season.

Continued rainfall and warmer conditions during August meant many crops continued to have advanced development and also set high yield potential. However by September crops were moisture stressed, though rain during late September saved many crops.

The dry warm conditions continued into October. A frost on 8 October 2009 caused damage to many crops in the Howlong, Brocklesby and Walbundrie areas. Frosting was patchy, affecting crops just after flowering so the partially-formed grain did not look frosted until a couple of weeks after the event. Some crops were cut for hay but most frosted crops lost between 5 per cent and 30% to frost damage so were harvested. In general only some varieties were affected — mainly Gregory wheat, triticale and some lupin crops.

Mid-October rain mainly on the eastern side of the district resulted in these crops continuing to have a high yield potential. It also led to unexpected rust problems in Tobruk triticale, particularly around Holbrook.

The high number of cool wet days during mid-October led to ideal rust conditions and there was significant stripe rust in flowering Tobruk crops, particularly head infection, which greatly reduced yields. Hot dry conditions during late October and November caused heat shock in many filling cereal crops.

Harvest started early, canola yields were below average but oil content was better than expected particularly on the eastern side of the district. Further north and west, quality and yields were lower. In the east average canola yields were 1.5 tonnes per hectare with some crops higher at 2–2.3t/ha. In these cases oil content was better than expected with most above 40%. However further west and north, canola yields were less than 1t/ha with low oil (32–38%).

Crop yields varied across the district and also from paddock to paddock. Cereal yields in the west were low, but quality was generally high. The exception was barley, which had screenings up to 45% and in some cases was not harvested at all.

The high yield potential of crops in the east meant they were severely affected by conditions during October and early November. These crops were filling in very hot conditions so grain quality was poor with test weights low and variable screenings up to 15%. The light grain was due to the very hot (over 35°C) and dry conditions.

Early-sown, quick-maturing cereals yielded better than late-sown or long-season crops. This was because they finished grain fill before the hot weather. The longer-season varieties, in particular triticale, were affected by heat shock at grain fill and many of these crops had low yields and very poor grain quality. Late rain during November held up harvest and further reduced grain quality.

Pasture production

There was some pasture and weed growth for grazing during early December 2008 and stubble grazing was important following the dry spring. However, this feed soon died out with little rain during January and February. Water was also critical in some areas with spring-fed dams very low and some springs ceasing to run. Isolated storm events increased lucerne and weed growth providing valuable feed in the short term. Most producers relied on hand feeding during summer with failed crops cut for hay or silage from the preceding seasons.

During March there was a small area of grazing crop sown on storm rain in the eastern side of the district. Hand feeding continued through into mid or late autumn. The lack of feed meant there was a greater focus on sowing crops for early grazing. Crops were grazed during June. The warm conditions led to above-average pasture growth for winter, so despite the dry May there was winter feed available.

August pasture growth improved with warmer conditions and rain, this led to strong growth and conditions for

silage and later hay making on the eastern side of the district. However, pasture growth in the western area of the district was poor as this area missed out on much of the October rain. October rain did affect some silage and hay making, however more quality fodder was stored this season compared with previous seasons.

The below-average spring rain resulted in critically-low dam levels with many farmers planning to water stock through the summer period. Stock went into the summer period in good condition, however there was a low feed base.

Note: The details of this report are based on the Industry and Investment NSW Albury agronomy district. The weather data in the report is sourced from Silo weather data. ✓

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MURRAY CATCHMENT MANAGEMENT AUTHORITY

As well as providing financial assistance for on ground works, increasing the community's ability to make informed decisions about effective natural resource management is a core responsibility of the Murray CMA.

Throughout 2010, the CMA will be organising field days, forums, newsletters, training and many other activities that allow people of the Murray Catchment to play their part in building sustainable communities in sustainable catchments.

The 2010/11 incentives program will be opening in the second half of 2010. Programs will focus on protecting Indigenous cultural heritage, biodiversity and aquatic habitat conservation and sustainable farm practices (soil health, dryland salinity and erosion). For further information about the Murray CMA's activities call your nearest Murray CMA office or visit our website at www.murray.cma.nsw.gov.au.

The Murray CMA is proud to support Riverine Plains Inc.

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