Southern NSW Cotton survey 2022/23 season

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Best Practice

- This is a summary of a survey sent to southern growers and advisors.
- Area of survey was 8350 ha
- This is the ninth season of data collection in this format.
- Thanks to the growers and consultants that have contributed this year. It provides a good recap of the season and where lessons can be learnt.
- If you have any suggestions for questions to include just let me know.

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Comments on the season

- One to remember but one to forget.
- Terrible. Hail damage on 1/11/22 then following weather conditions (sand-blasting, cold, wet) never allowed the crop to recover.
- Really drives home the importance of planting date.

See other comments below……

- Was hoping for 6 bales/ha average, got close
- Been better to plant more corn. Planted too late.
- Fairly happy considering the season
- OK considering the weather conditions
- Good to see the back of it
- Cold wet year resulted to a 2+ bale loss across the board.
- Yields have been very disappointing; quality has also let us down. If we didnt have a contract to fill we wouldnt have dreamed of planting anything at all.
- Perfect example of why we dont plant past Oct 10. We expected yield to drop off after this date but werent expecting the wet conditions and record low solar radiation that came with it or the high water use with shallow rooting crops One to forget.
- Definitely not the worst result around. N was not our friend. Paddock that was only half manured. Manure area doing 5-6, immediately jumped to 8-9 once into no manure area.
- An extremely tough season and one where I was very excited to see mulchers and root cutters move into the fields. However despite this I got to see firsthand the risks and challenges we sometimes see in the south and consider myself fortunate to see it early in my career. It emphasised the importance that needs to be put on canopy and retention management, mainly through early season mepiquat chloride applications. Another big focus was on Irrigation management - given the low yielding season and mild season we saw, I was confident in stretching irrigations and pushing the envelope to save as much resource as I could. The same can be said for N-Management, as we lowered our inputs here to match the season and it has resulted in our best NUE (and WUE) season.
- Work experience

A wet start and a cool season

Record rain in October > 200 mm

85,000 ha planned; 50,000 ha planted.

1/3 of crop planted in November

Cold start Oct, Nov, till mid Dec

Day degrees only 77% of average over the season.

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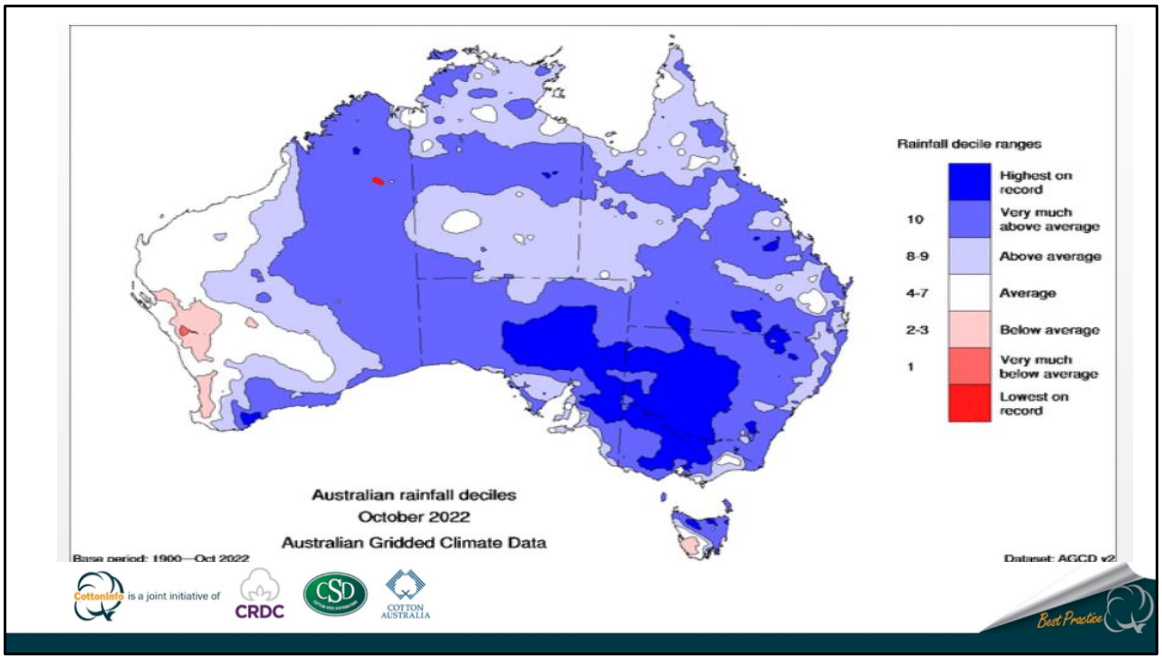
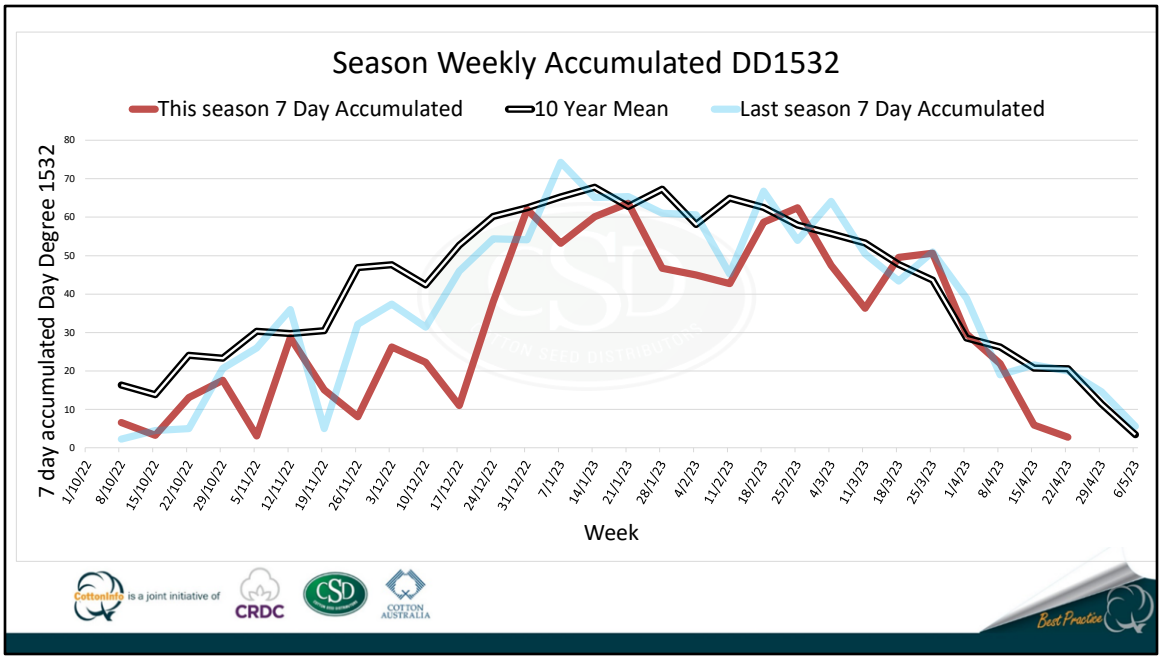
- Photo taken 15th December
- Crop planted 11th October
- Pre-emergent herbicide damage Stomp/Terbyne



- Over 200mm in October average is 30 mm



- Day degrees only 73% of average

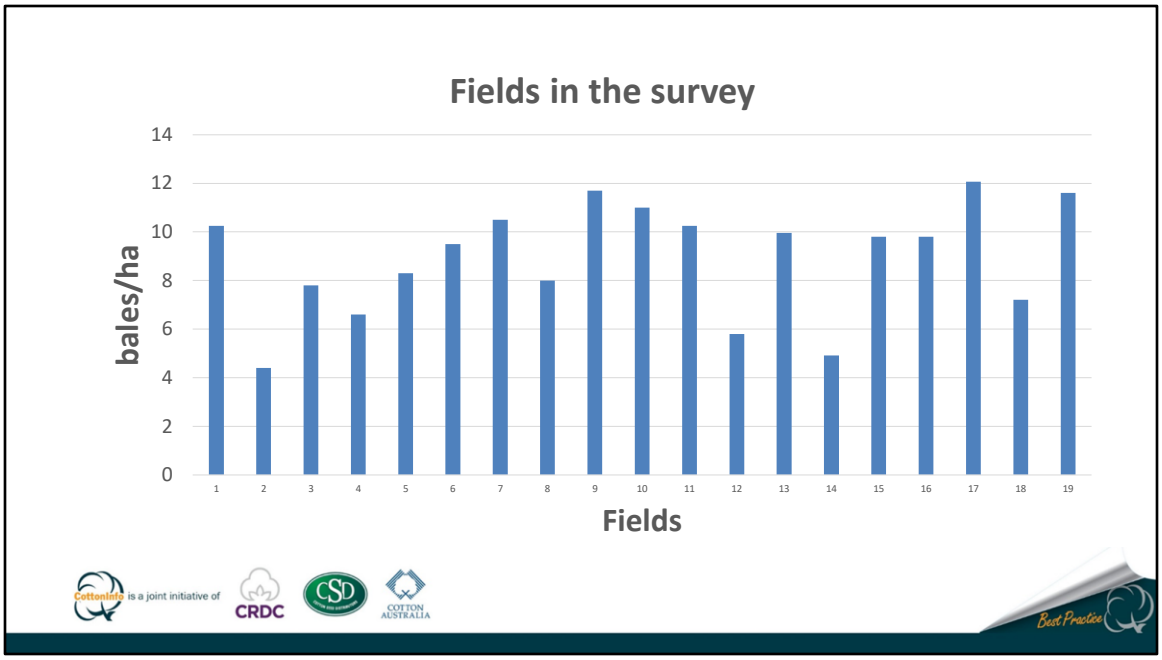
Highest yielding field (bales/ha)

- A low yielding season.
- Ten best fields in the survey ranged from 12.07 to 9.5 b/ha. A few fields not in the survey were higher in yield.
- Farm average of survey was 6.7 b/ha.
- Estimated that the Southern NSW crop averaged 5.8 b/ha.

Highest yielding field (bales/ha)

12.07	**Sicot 746B3F**
11	**Sicot 606B3F**
10.5	**Sicot 746B3F**
10.25	**Sicot 606B3F**
9.96	**Sicot 746B3F**
9.8	**Sicot 714B3F**
9.8	**Sicot 714B3F**
9.5	**Sicot 748B3F**
8.3	**Sicot 714B3F**
8	**Sicot 746B3F**

- In the top 10 crops
- 4 Sicot 746B3F crops averaged 10.1 b/ha
- 3 Sicot 714B3F crops averaged 9.3 b/ha
- 2 Sicot 606B3F crops averaged 10.6 b/ha
- 1 748 B3F crop went 9.5 b/ha


Fields in the survey
bales/ha
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Fields
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To what do you attribute the success of this field (consider things within your control)?

- Early ground prep. Planting in the window.
- Tailoring nitrogen input to yield potential.
- Protected from wind
- Pix management and quick irrigation time of 6 hours
- Perfect irrigation management by delaying first in crop irrigation

- More pix applications and reduced Urea application from 500 kg to 250 kg
- Protected from wind and nice soil type
- Good drainage Lighter soil
- Trees around block Drainage
- Well drained red soil and 25mm less rain then other blocks in November.
- Nitrogen/pix managment least amount of hail damage / wind damage.
- Early planting and water up.
- Other main driver is small field size allowing for tail water to get off the field quickly, this field is also the reddest on the farm so it didn't suffer from waterlogging as much.
- None were a 'sucsess' this season given water use, crops were small in size with low solar radiation and day degrees, kept rootzone small to 50cm max so water use was high and therefore low returns per ML in all areas of farm - crop was planted a month late and lost a month of biomass
- Tree edges, back to back after corn. Corn stalks providing wind protection.
- Poor drainage at bottom of field. Could have done near 11?
- Perfect irrigation management. Pix management and water management. 1st in-crop irrigation was streteched out as far as pssible, by 1st in crop irrigation my highest yielding field had root down to 50cm. This set up a strong foundation and gave me confidence to push timing of irrigation each watering, it also meant deeper N was better able to be utilised to lower any in-season requirements. Pix management was vital in setting up our plants for the 14th Feb LEF date - had we pushed on and tried to grow the crops out to chase yield, we wouldve had significantly more low micronaire as a result.
- This season proved to me once again that you do not need a big plant to hit a high yield.
- Lighter soil type.

Planting water management

- Due to the season most crops planted and rained up
- Crops averaged 12.8 plants/m.
- Most struck on rain

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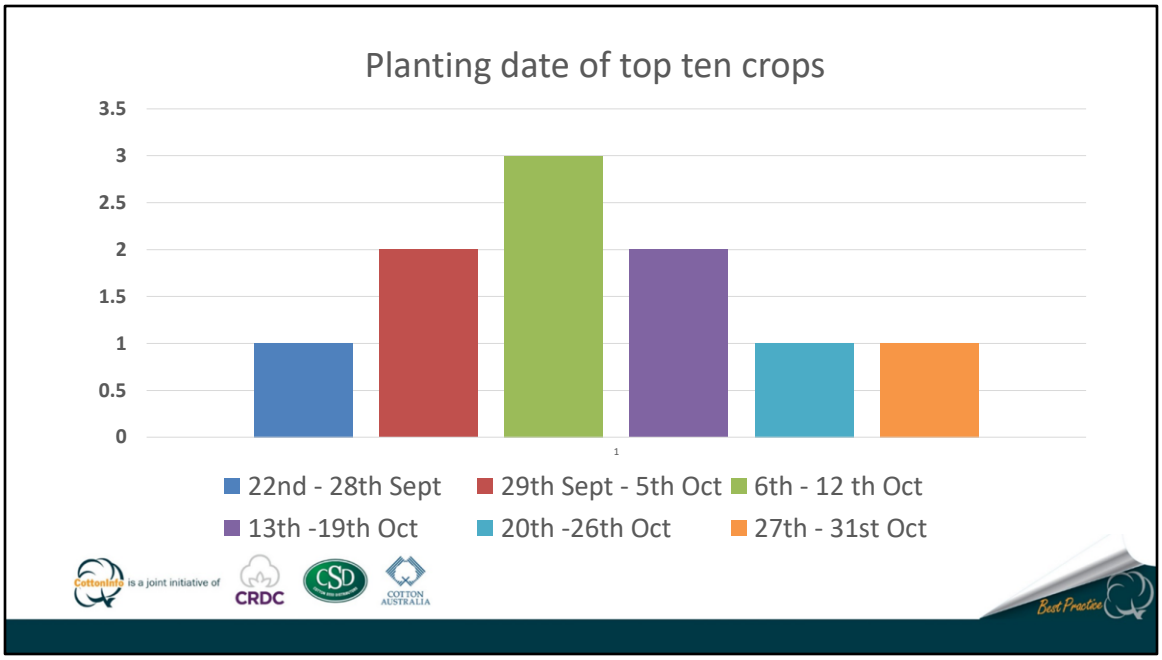
- Rained up on Oct 4th
- All rain, to much rain. First water was at the start Dec
- Rained up
- Rain after sowing
- Water up commenced 4/10/23
- Planted, not watered until December.
- Struck on rain
- Germinated on rain first irrigation 18/12
- Planted into moisture rained up
- Planted then rain strike
- Planted 70 mm rain germination
- Planted then rain strike
- Rain not watered
- Watered with spray irrigation on 9th Nov


Planting date of top ten crops
3.5
3
2.5
2
1.5
1
0.5
0
1
22nd - 28th Sept
29th Sept - 5th Oct
6th - 12 th Oct
13th -19th Oct
20th -26th Oct
27th - 31st Oct
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Gross margin 2023 (averages)

- Variable costs $ $3,708
- Total income $ 4047
- Gross margin/ha $ $339
- Gross margin/ML $ 48

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- Income varied from$6000 /ha to $1670 /ha for individual farms which is a direct function of yield and discounts
- Gross margins varied from $2,500 to -$1100
- Big variations in what is counted in for variable costs from $2,600 to $4,700.
- 10 full sets of data with 6 positive Gross margins from $2,500 to $600 and four negative GMs from - $100 to -$1100
- Water use in these figures assumes 7.1 ML/ha used in the season

Southern NSW Gross margins

	Income /ha	Variable costs /ha	GM/ha	GM/Ml
2016	$7,200	$3,895	$3,305	$330
2017	$5,458	$3,404	$2,058	$206
2018	$6,310	$3,850	$2,460	$246
2019	$7,260	$3,863	$3,398	$340
2020	$6,172	$3,860	$2,312	$231

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Average over last five years

- Income $6,480
- Variable costs $3,774
- Gross margin/ha $2,707
- Gross margin /ML $271

Nitrogen Fertiliser use efficiency

- NFUE - Rule of thumb – research asks to aim for 13 – 18 kg lint/unit N.
- More N does not always = more yield. Many factors determine yield.
- If your below 10 kg lint/unit N a soil constraint needs to be addressed or irrigation management needs to be assessed.
- Or YOU ARE NOT AT OPTIMUM RATES BUT LUXUARY RATES.

- This measure is a rough guide to efficiency as starting N and mineralisation are not accounted for.
- There has been an increase in pre crop soil testing and factoring in soil N at the start

Crop	Yield (b/ha)	Pre N	Post N	Total N app	Kg Lint/N
1 746B3F	**12.07**	**84**	**118**	**202**	**13.6**
2 606B3F	**11**	**100**	**130**	**230**	**10.6**
3 746B3F	**10.5**	**0**	**50**	**50**	**47***
4 606B3F	**10.25**	**0**	**100**	**100**	**23.3**
5 746B3F	**9.96**	**12**	**94**	**106**	**21.3**
6 714B3F	**9.8**	**97**	**115**	**212**	**10.5**
7 714B3F	**9.8**	**0**	**0**	**0**	**-***
8 748B3F	**9.5**	**150**	**0**	**150**	**14.4**
9 714B3F	**8.3**	**0**	**150**	**150**	**12.6**
10 746B3F	**8**	**100**	**150**	**250**	**7.3**
Ave	**9.9**	**59**	**86**	**155**	**14.2**

* Not included in NFUE

Nitrogen Fertiliser use efficiency - ten fields in the survey for 2022/23

- In 2013/2014 the average was 11.4 kg Lint/N,
- 2014/2015 13 kg Lint/N,
- 2015/2016 13.4 kg Lint/N,
- 2016/2017 10.6 kg lint/N,
- 2017/18 11.85 kg lint/N
- 2018/19 9.65 kg lint/N
- 2022/23 14.2 kg lint/N

Water use

- Water use varied from 5 to 9.36 ML/ha
- Average was 7.1 ML/ha

- Long term average of survey is 10 ML/ha

Crop	Yield (b/ha)	IRRIGATION System	ML applied # Estimated	ML/BALE
1	12.07	1m hills - Siphon irrigated	9.36	0.78
2	11	36 inch in hills	7	0.64
3	10.5	1m hills bankless	6	0.57
4	10.25	Bankless 1 m hills	7	0.68
5	9.96	1m hills	8.19	0.82
6	9.8	6 foot beds, pontoons.	7	0.71
7	9.8	36" beds	5	0.51
8	9.5	1m hills Pontoons 1 :2000	5.5	0.58
9	8.3	Bankless with 20 cm step 6 foot beds 36 inch	6.5	0.78
10	8	Pipe through bank 90cm rows	9	1.13

- 2018/19 at 0.85 ML/bale
- 2017/18 at 0.68 ML/bale
- 2016/17 at 0.76 ML/bale
- 2015/16 at 0.62 ML/bale
- 2014/15 at 0.66 ML/bale
- 2013/14 at 0.91 ML/bale

Crop	Yield (b/ha)	Mepiquat chloride management
1	12.07	25ml on 5th Jan 14.5 nodes Cut out 1st Feb @200ml 19.5 nodes & 5.25 NAWF.
2	11	Early tickle then another at a higher rate. It was 3 weeks behind normal pix dates.
3	10.5	2 Jan 10 ml, 16 Jan 200 ml, 30 Jan 200 ml
4	10.25	7th Jan 38 ml 24th Jan 80 ml
5	9.96	Blanket rate 25ml/ha on 6-1-23 200ml cut out on 23-1-23
6	9.8	40ml 8/12/2023 150ml 21/1 150mm 28/1
7	9.8	13 nodes 30ml/ 16 nodes 70ml /19 nodes 150ml /21 nodes 200ml
8	9.5	20/12 30 ml Cut out 16/1 200 ml
9	8.3	19/1 25 ml/ha
10	8	27/01/23 80ml 04/02/23 200ml 11/02/23 250 ml

- All rates above are 380 g/l active
- A range of strategies indicates Mepiquat chloride management is on a field by field basis depending on crop growth.

Insect issues?

- Comments reflect a low-pressure insect year.
- See below

- 2 preventative thrip sprays
- nil low
- Little pressure
- Two thrip sprays
- Nil No problems. Used Main man
- Mites noted in agronomist report 20/02/23 Also controlling thrips 3 applications
- No serious insect pressure
- none, did a thrip spray to reduce risk of further crop delay.
- had to spray for mirids once
- One insecticide for mirids only
- Only one Fipronil to give the crop the best chance at first signs of pests - couldn't risk losing any yield this year - almost had to do aphid spray with defoliation
- Thrips. 2 sprays
- Minimal issues, Mirids controlled when exceeding threshold.
- Low pressure - did one Fipronil spray for mirids
- No pest damage all

Disease comments

- COME CLEAN, GO CLEAN

BRR showing up more
Verticilium wilt also increasing
Rhizoctonia widespread

See comments below

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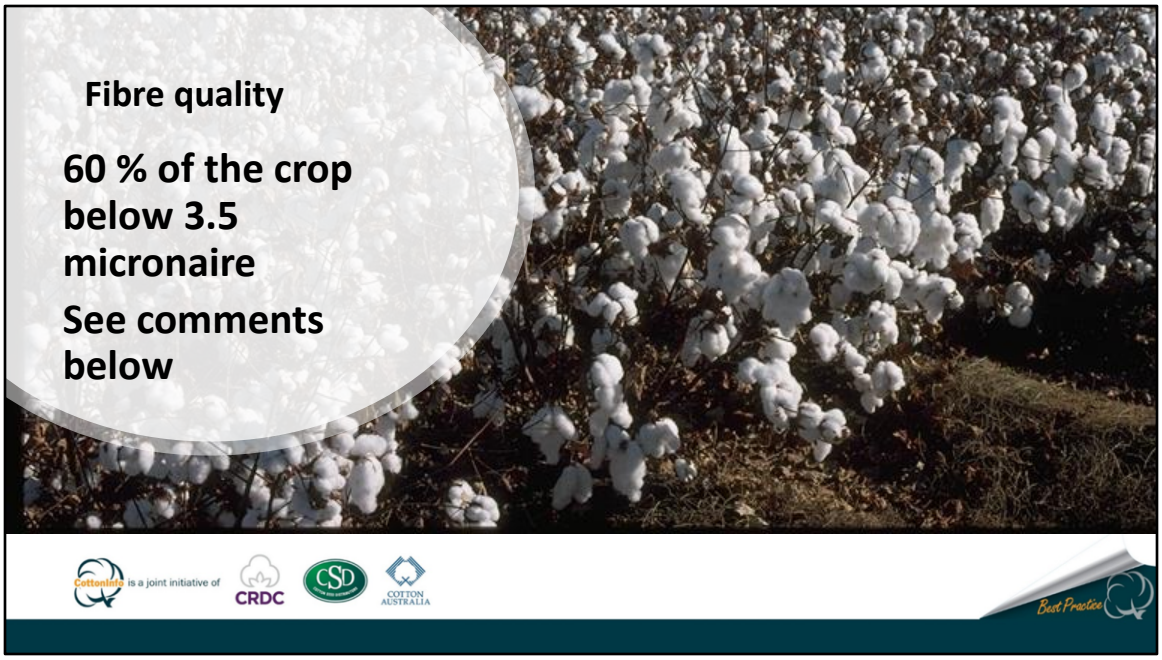
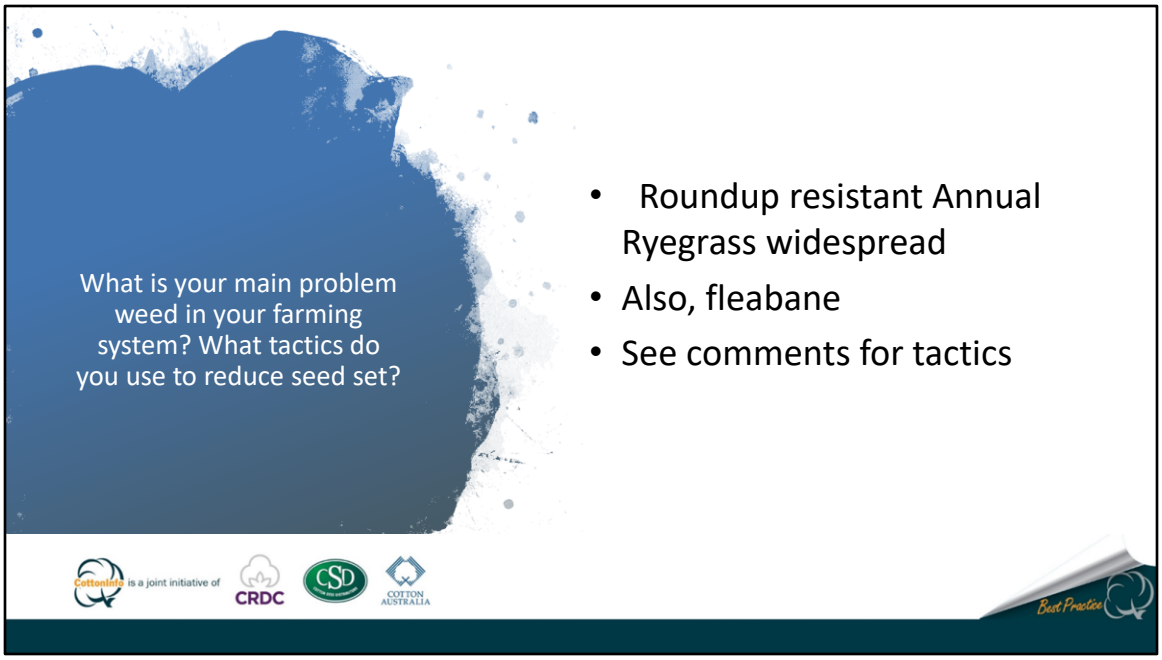
- Spay for alternaria on 6th Dec
- No DISEASE
- Some boll rot in previous canola fields
- Rhizoctonia everywhere
- Nil No evidence of root rot.
- Boll root at the end.
- None but cotton sat in wet/cold conditions for so long there might have been some secondary disease issues we werent aware of (rhizo,mild BRR)
- First time black root rot has been found on the farm.
- BRR and Rhyzoctonia in the one area planted at October 1st it had a very cold wet month to start
- None No issues in the crop
- BRR & Vert. However one paddock confirmed to have some seedling fusarium within it.
- Some black root rot.



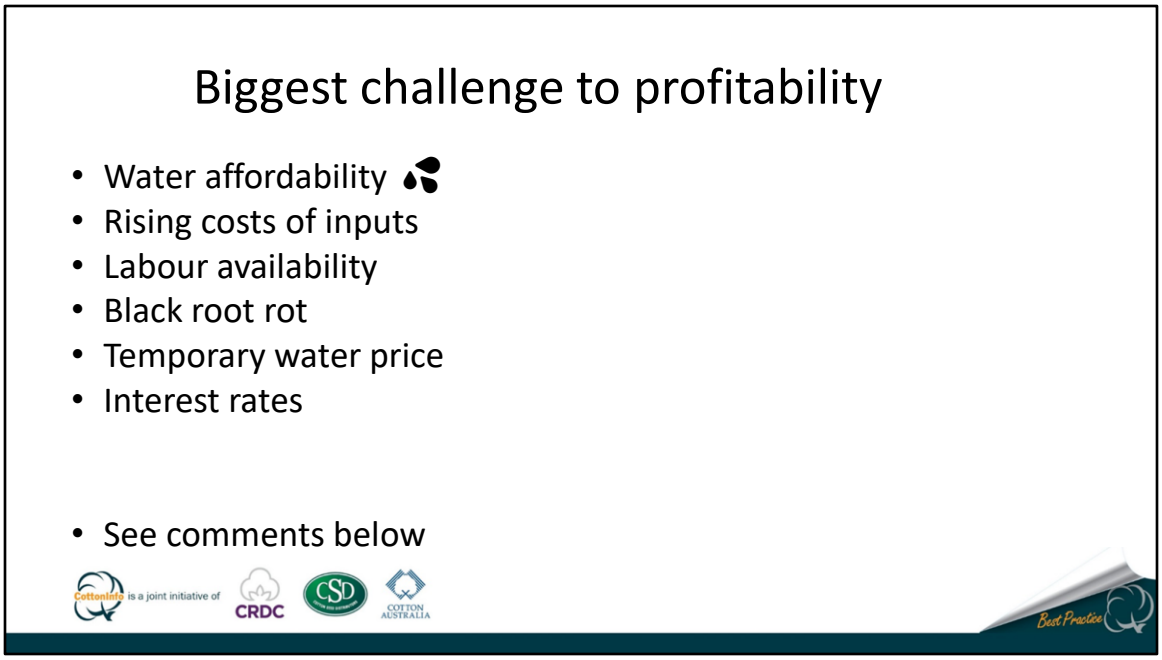
- Overall okay. There was only small % of low mic overall in the fields planted after the 20th Oct. We mitigated the risk of low mic by hitting our Feb 14th NAWF target and sticking by it. All fields planted after the 20th were 714 - so the more determinate growth habit assisted in lowering our low mic risks. It got worse the later we sowed.
- Finished sowing on the 29th Oct $41 /bale.
- No real trends, earlier higher yielding fields better,
- 20 % low micronaire.
- Everything planted after about the 10th of October (85% of the crop) has gone low mic.
- 606 was the lowest yielding and had the lowest mic.
- Sub $20 discounts for everything planted in October. Mid November around $75 mostly 606
- $30/bale micronaire issues
- Average $40/bale
- Best 748 then 714 then 606 $18/bale all fields similar
- Low micronaire $20-$50 Bale discount
- 714 10% low mic 606 50% low 746 70 % low $18 average/bale downgrade for micronaire
- Colour and trash discount on one field $100/bale
- Very low mic across all fields, some worse than others. average discount $115.
- 606 worse than 746
- Terrible turnout - only turnout above 38% was the one area planted on Oct 1



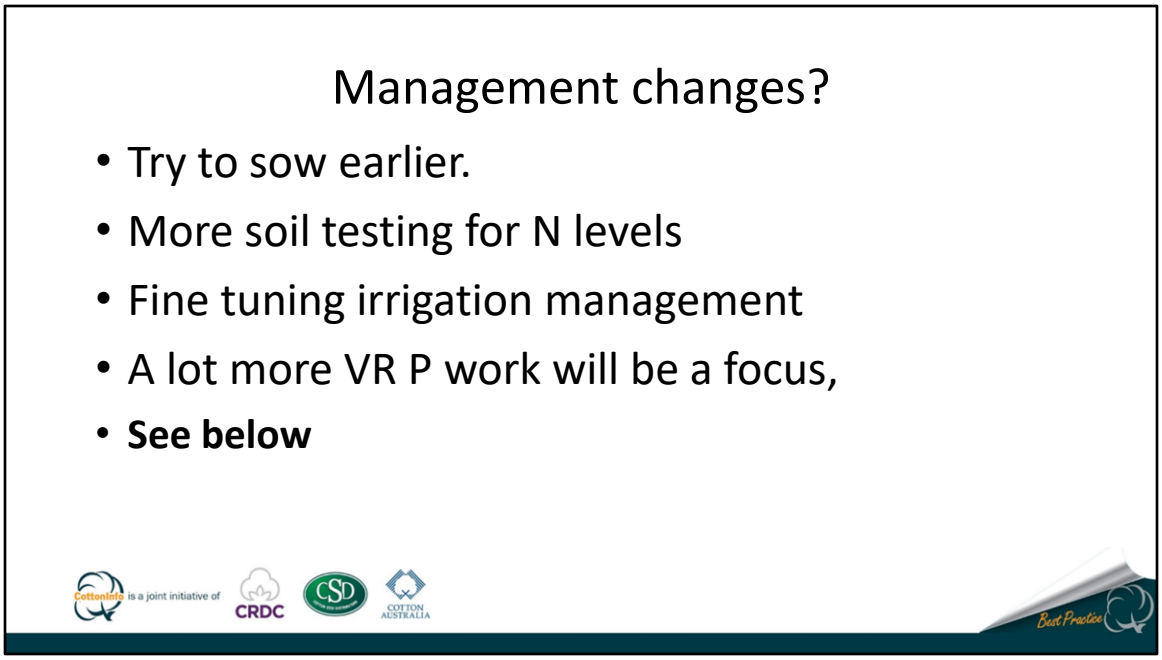
- Ryegrass. Lots of passes with chemical and cultivation ryegrass
- Ryegrass, wireweed Timely sprays and mix chemistry.
- Fleabane. Trialing XtendFlex in a field
- Resistant ryegrass. Paraquat spray in fallow
- Ryegrass Pre ems Fleabane, ryegrass. Pre-emergents, controlling edges of fields. Steel
- Fleabane Round up ready canola Tactic used is regular spraying
- Flea bane. Inter row cultivation
- fleabane. use terbyne
- Fleabane. Use of residual herbicides on channels to stop incursion and crop rotation to mix herbicides, not just relying on gly.
- Fleabane - pre sow knocks, cultivation and residuals on edges and roads etc.
- Ryegrass. Sakura over winter running into corn program.
- Fleabane. Pre emergent herbicides
- Fleabane - cultivation and in crop Gly
- Ryegrass - early season pressure mainly, used Gly Cletho mix Gly Haloxyfop (if small) and hand chipping
- Rye grass. Some hot spot of FTR grass also showed up this season.

Lessons from last season

- The planting operation is critical to get right
- Timely irrigation scheduling.
- No back to back is planned.
- Sicot 714B3F has less risk of micronaire discounts
- Check N status of fields
- Look for season signals early on



- Water availability at an affordable price.
- Disease
- Water cost/availability
- Interest rates
- A greater variable climate, weeds and carbon insetting
- cold/wet starts. current varieties are not good enough for cotton to be sustainable long term if we keep having these conditions in October
- Access to water and social license.
- Disease is another big threat
- Disease - BRR Temp water price.
- Inputs
- Labour availability
- Disease, water security
- Aside from water availability long-term and increased contracting/application and input costs, BRR is our biggest disease issue on the farm. Shortening the cotton crop intervals will prove challenging long term. Water availability.



- Stick to planting window. Corn
- Pre irrigation
- No changing from terbyne to diuron/dual gold.
- pre-watering (always pre-water but last 3 seasons it has been too wet to do this)
- Changing the mepiquat strategy for the 606 variety, we brought the application forward this season compared to previous but will probably bring it further forwards this year.
- Not really, just slowing irrigations etc, have made sure field prep is up to scratch- last season it was rush, we had small little crooked hills trying to pull up wet country - caused waterlogging, water breaking across rows, cold wet plants
- Less cotton for better management.
- Continue to question agronomists recommendations. Eg mepiquat chloride rates and urea.
- Tighter nitrogen management.
- A lot more VR P work will be a focus, some significant savings have come from this already. We now have more laterals on farm to grow both semi-irrigated and fully irrigated cotton to better utilise water and lower usages/ha.
- Yes looking in different mepiquat chloride management strategies. Possibly even

early cutout .

Technology changes?

Considering …

- Moving into more zonal soil testing to allow for VR inputs such a P.
- New moisture probs with forecast water dates.
- Variable rate lime
- Grid soil sampling

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Best Practice

- Up grade spreader for variable rate. Improve planter
- VR seeding at planting
- VR gypsum VR urea depending on price
- currently use VRT for pix and fertilizer
- Have done VR MAP, will try to use drone for NDRE if req
- Already doing 1ha grid samples. 2 paddocks left to do.
- Grid soil sampling, VR nitrogen application
- VR Fert and Gyp. Been doing VR Mepiquat for years now.

Research areas /information/skills

- Cover cropping
- More work on rotations
- Root disease cropping system trial
- Continued research into BRR tolerance and resistant varieties.
- Self sufficient solar N fertiliser factory either on farm or close by
- Irrigation management – pushing limits further here.
- Micronaire management

A big thank you to all those that have provided data for this survey.

- The strength of this survey comes from participation and over the years to see trends and benchmark performance.
- If you have any suggestions for questions to include just let me know.

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