CRDC
COTTON RESEARCH AND DEVELOPMENT CORPORATION

CROP CONSULTANTS AUSTRALIA

QUALITATIVE REPORT

on the 2020-21 cotton season:
A survey of consultants

WILLIAM JACKMAN

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PURPOSE

The Cotton Research and Development Corporation (CRDC) commissions this survey each year to provide current and longitudinal knowledge of on-farm practices and attitudes, to aid the research, development and extension effort within the Australian cotton industry.

COVERAGE

Data was collected by Crop Consultants Australia Inc. (CCA) from 53 cotton consultants, who answered most or all of the questions about their own practices and attitudes, as well as those of their grower clients.

The consultants represented 320 cotton growers and covered 124,026 hectares: 40% of the Australia cotton production area for the 2020-21 season (not adjusted for row spacing). This is based on the 2020-21 production figure of 307,388 hectares (Cotton Australia).

METHODOLOGY

The survey consisted of 60 quantitative and qualitative questions, which sought to draw out both the details of actual agronomic practices and consultants' views of those practices. It was conducted from May to August 2021, with questions referring to the 2020-21 cotton season. Questions that collected data on clients or areas were only made available to one participant from a consultancy to avoid duplication.

DATA COLLATION

The online Cvent survey program (www.cvent.com) was used to compile the data. Interpretations are up to the user. An asterisk indicates questions that are recurrent over time to identify trends.

ACKNOWLEDGMENT

Thank you to the consultants who took the time and effort to complete this survey. The data in this survey provides valuable information for researchers and industry organisations in planning and carrying out projects. Thank you to Crop Consultants Australia and Black Canvas graphic design for the compilation of this report.

DISCLAIMER

The Cotton Research and Development Corporation (CRDC) provides the information in this publication to assist understanding of the agronomic performance of the Australian cotton industry. CRDC accepts no responsibility or liability for the accuracy or currency of the information contained in this publication, nor for any loss or damage caused by reliance on the information and management approaches surveyed. While the 2020-21 survey contains information that should be of value to extension officers and researchers in defining future industry needs and as an information source in seeking to improve industry management practices, users of this publication must form their own judgement about the information it contains.

Crop Consultants Australia took all care in the gathering and collating of the data; however, the data was provided by individual consultants and agronomists and therefore is subject to associated constraints.

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THE CONSULTANTS AND THEIR CLIENTS

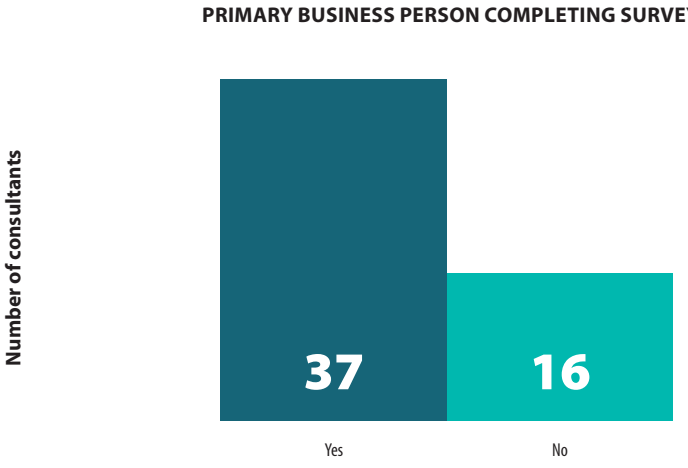
ABOUT THE CONSULTANTS

1

Are you completing the survey on behalf of the business or business unit?*

53 respondents

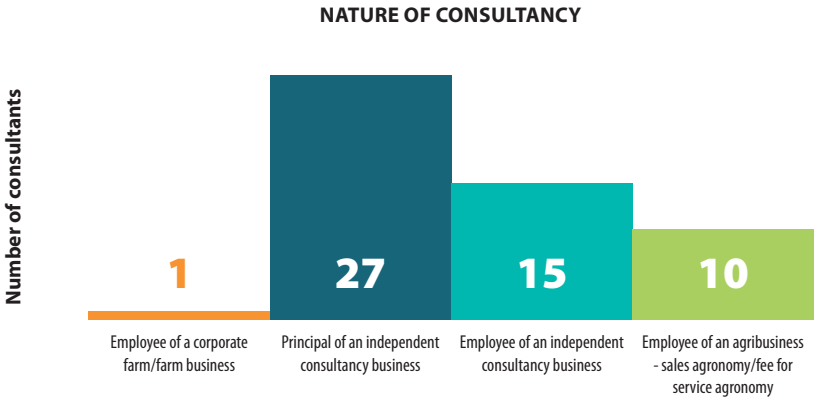
***Note:** 37 consultants completed the survey on behalf of their business or business unit, which involved completing the specific questions relating to staff, hectares and number of clients. 16 consultants completed the survey questions only relating to individual practices and attitudes.



2

Which of the following best describes your employment as a consultant?*

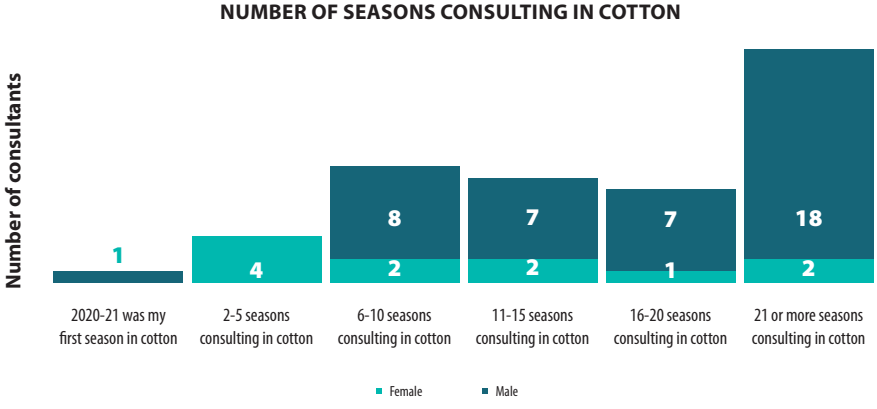
53 respondents



3

For how many seasons have you worked consulting in cotton?*

52 respondents



THE CONSULTANTS AND THEIR CLIENTS

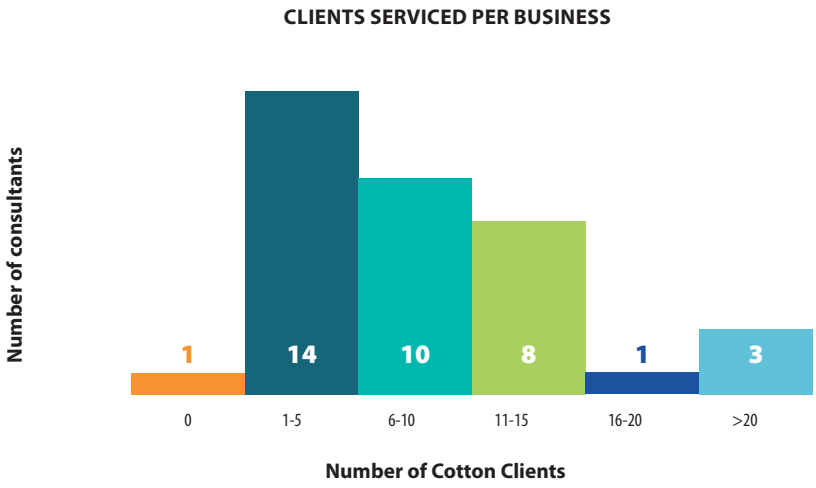
ABOUT THE CLIENTS

4

How many cotton clients did the business (or business unit) service in 2020-21?*

37 respondents

***Note** A total of 320 clients were represented in the survey.



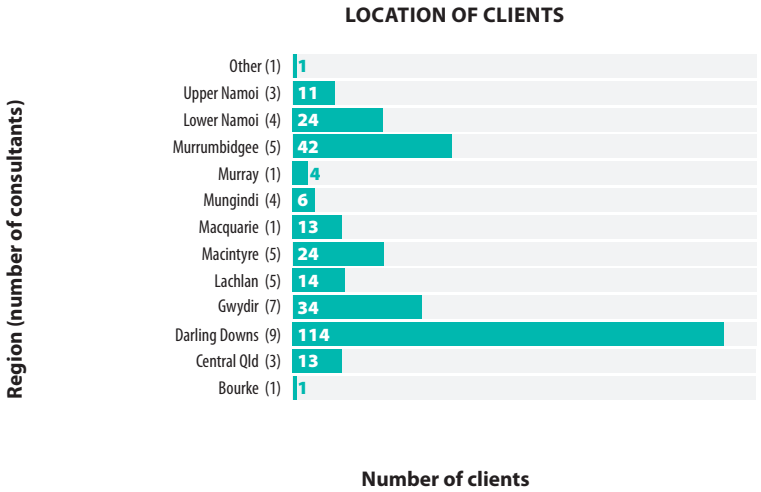
5

In which region/s are your cotton clients based?*

37 respondents

Note Some consultants have clients in more than one region, hence the total number of consultants is higher than the 37 respondents across the regions.

***Other:** Northern Territory



THE CONSULTANTS AND THEIR CLIENTS

6

Please list out any learnings or lessons that you have gained in the 2020-21 season.

45 respondents

Nitrogen management and adjusting to match the season is critical. In the south, micronaire is going to be something we put more attention to detail into as we are going to end up with big discounts long term. Pix needs to be pushed harder.

In our region, it is unwise to plant after the first week of December.

I have learnt a great deal in the latest season, particularly the importance of being punctual, cooperative, and transparent. Being the agronomist on the ground I had to be the eyes for my area manager and liaise information between the farm managers and those above me in the business. This meant that good communication was pivotal.

Can grow cotton successfully in a very cool climate. Being on time and constant monitoring the key to success.

Hard lessons learnt risking late cotton. What would have worked well in the past two years has been cut short with frosts. Reasonable crop but much higher potential cut short.

Inspired by how well cotton can recover and yield very high after very low fruit retention at 1st flower.

Watch for mice in cotton. More research can be done on water timing with limited water.

The weather was good, and the yields showed that.

Lessons around late plant December cotton and its management.

We are planting later to avoid the heat in January, however in a La Nina year we are now very late. We need to adjust our management for 'cooler' seasons. Our memories can be short sometimes. It may have also been a cooler season, but limited water scenarios don't discriminate. We need further work done on limited irrigation scenarios. When do we get our best bang for our buck?

Dryland cotton may not be a viable option on the Darling Downs anymore.

Late cotton can be profitable in dry years as it capitalises on the increased chance of late season rain and the cooler weather increases the water efficiency. Obviously, this will not achieve massive yields but a good alternative in semi irrigated crops.

Disappointing results from staying soft with whitefly management.

The risks of low mic and the expense of severe penalties... though cotton is still in front of anything else even with average yields and discounts. We were still better to plant late than have missed a crop.

Suspected whitefly resistance to Admiral was confirmed. This was costly, we all sat and sat waiting for it to work while the honeydew grew. How do we better anticipate product breakdowns, long term monitoring hasn't worked in this case.

Late season production of cotton in Upper Namoi is not a good option.

Don't plant cotton late in a La Nina.

Managing cotton in a low-water year and learning how to manage grow-on cotton.

Managing mirids and fruit loss early. Late crops and defoliation into wet cool weather.

Sometimes a lack of retention early can play in your favour. In the spring of 2020 we were seeing fruit retentions of around 60% heading into first flower. Despite this when it started raining over New Year the plant didn't shed a great deal of fruit it kept it then started packing on bolls leading to favourable yields of 15+ bales/ha.

Don't mess around with stink bugs. Remain cautious with predictions of a wet summer.

The difficulties of growth management, especially of 748B3F, when you don't know how much water you have. Or have no water after initial water but then get some rain, then no water etc. Early transient light mirid activity, especially in light soils. Multiple tipping out, which really sets those random plants back. They attack the same plants. The future risk of long season cotton in CQ with regards to reniform nematode, sucking pests and *Helicoverpa*. Normally late season pests such as cotton harlequin bugs and broad mites showed up in early crops from the beginning along with whitefly and cotton mealybug. A MASSIVE WARNING!

Allocate A and B fields at the outset - this based on yield potential - don't pour money into B fields.

Hit stink bugs hard if numbers are significant-need quick acting product. Very destructive pest.

Start rotating fields heavily infected with verticillium.

THE CONSULTANTS AND THEIR CLIENTS

There is always something new each season and in terms of pest management this season for me it was the green potato bug. It's been a while since our region has had optimum temperatures for cotton growth and development right through the months of December, January & February and what a difference it can make the districts yield results.

Don't expect it to rain. There is always a new disease lurking.

Nitrogen management was critical this season. The better soil types lost more early positions. Compaction was a big yield drag.

Bollgard3 (748B3F) can and will require substantial and sometimes multiple applications of mepiquat chloride to regulate its vegetative growth under rain fed conditions in a very good season. We applied Pix in December and January at 400-600mls/ha and then still required a 2L cut out application in March or early April to arrest vegetative growth and prepare for defoliation.

One of our coolest and wettest seasons for a long time showed that Nov planted B3F rain fed cotton on wide to very wide rows will lengthen out and won't present for defoliation or picking until late Autumn. The decision to narrow row spacing in rainfed crops if planted in December paid off.

La Nina Summers always challenging. Sometimes have to use harsher chemistry in these situations and deal with consequences as they arise. Sensitivity to Pix exacerbated in seasons like this at various points of the growing season. Ability for Bollgard cotton to recover despite stress events really is phenomenal.

After using the canopy sensors it showed me that the plants showed stress earlier than expected.

After experiencing mild temperatures last season and significant fewer hot shocks the yields were 1.5 to 2.0 bales/hectare higher than previous years with hot temperatures. Irrigation timing during first flower and cutout is critical to achieve high yields.

Resilience of the cotton plant.

Importance of Pix applications. Importance of timeliness of watering. Importance of early insect control.

Learnt more about data analytics by undertaking short course through USC.

Don't plant cotton later than around 10th December in the Gwydir district.

Overhead sprinkler irrigation has reduced water use and improved cotton growth in a cool, wetter than average year.

Address soil fertility issues, check residual N. More Pix in cooler conditions.

Did not have any cotton in 20-21.

Label defoliant rates are not high enough for late finishes.

Verticillium is a huge concern, needs more attention from CSD/CSIRO asap. Growers / farmers will stop growing cotton due to this disease.

Leaf freeze issues with Pyraflufen-ethyl defoliant. 606B3F, 714B3F performance variable, 746B3F consistent yield performance.

Don't trust boll counts. Checking for whitefly nymphs is a time-consuming task.

Cotton can be planted on the inner downs in December, but it is slow to mature and can be a struggle to pick in a wet winter.

Better to water slightly later than ideal then slight earlier than ideal in strong soil. High yields can be achieved if good weather is experienced from mid-January to late February regardless of how bad the start is.

1. A reminder that with the right season and water being available the cotton plant has an amazing ability to compensate for early fruit loss.
2. Nothing beats a kind weather season for high yields!

Less concerned about early season retention. Should probably be using more Pix and less insecticide.

Quality issues in shorter season environments. It's a very risk growing situation and any complacency with growing cotton will show up in quality results.

Bare long drought fallows are hard to sub. Need to be wary of planting later due loss of yield potential. Growers have been getting used to hot dry summers and good yields off later plant dates. Use of group B herbicides to improve defoliation in cold temps.

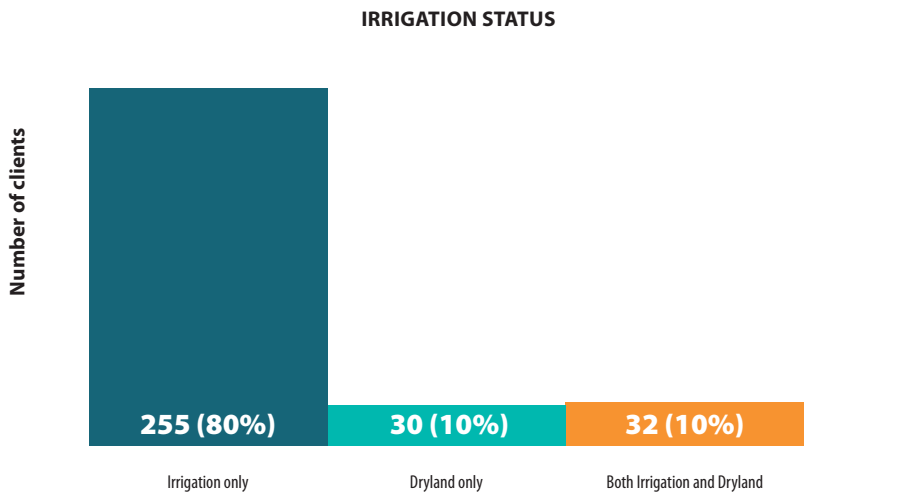
AWM of whitefly with hayati releases very successful.

THE CONSULTANTS AND THEIR CLIENTS

7

How many of your cotton clients have dryland, irrigation or both?*

36 respondents



WILLIAM JACKMAN

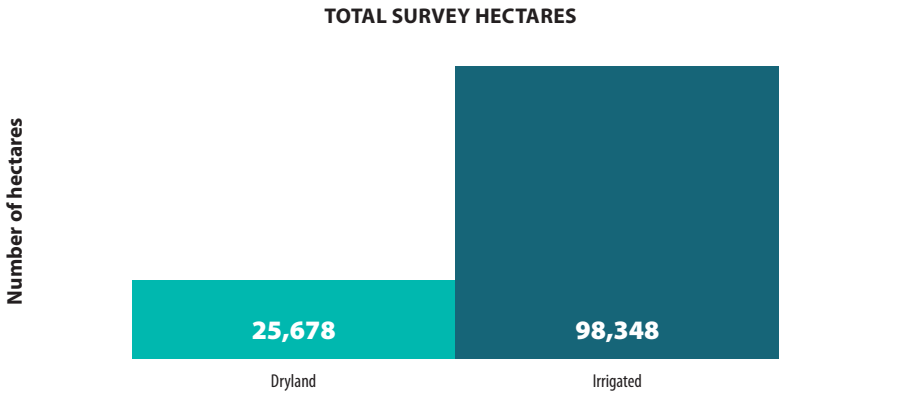
ON-FARM PRACTICES AND ATTITUDES

COVERAGE

8

How many hectares of cotton (total area, not adjusted for row spacings) did your clients grow in the 2020-21 season?*

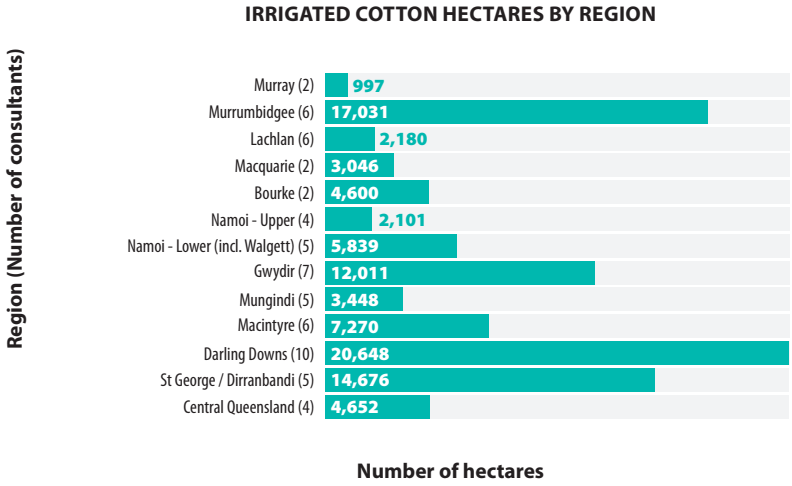
37 respondents



9

In which region/s are the irrigated cotton hectares of your clients situated?*

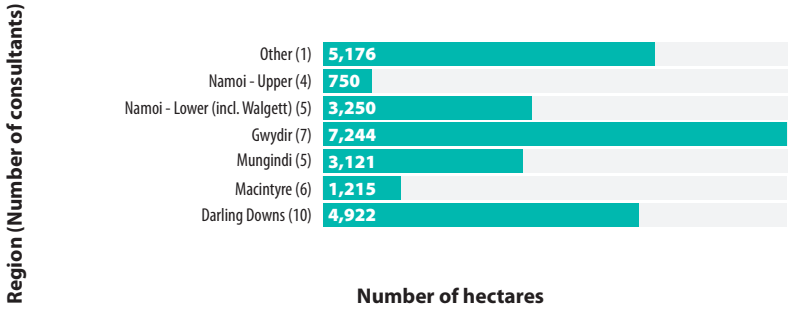
37 respondents



10

In which region/s are the dryland cotton hectares of your clients situated?*

37 respondents



***Other:** Northern Territory

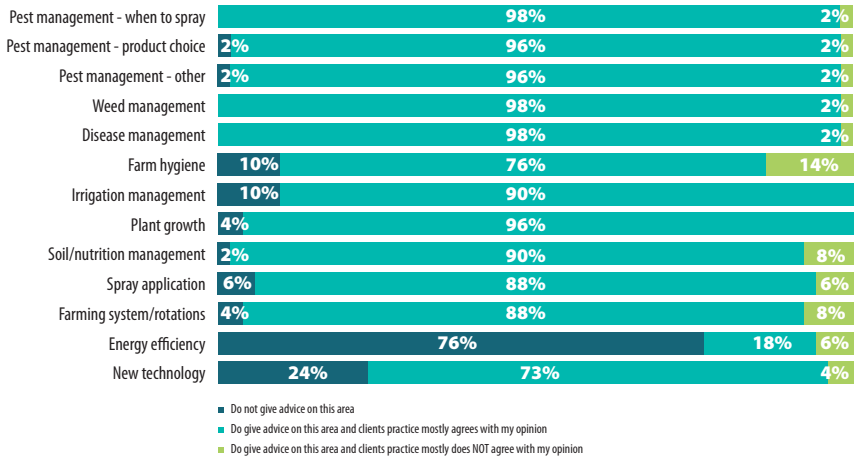
ON-FARM PRACTICES AND ATTITUDES

11

On average, what proportion of your recommendations do you think your clients follow?

51 respondents

TYPE OF ADVICE GIVEN TO CLIENTS



2020-21 SEASON

12

Describe the 2020-21 cotton season in THREE words or less.

50 respondents

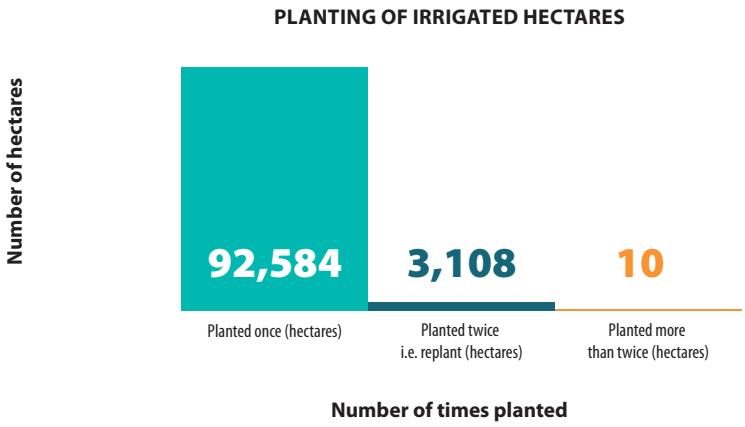
ON-FARM PRACTICES AND ATTITUDES

PLANTING

13

Of the irrigated cotton hectares, how many were planted once, planted twice or more than twice?*

37 respondents



14

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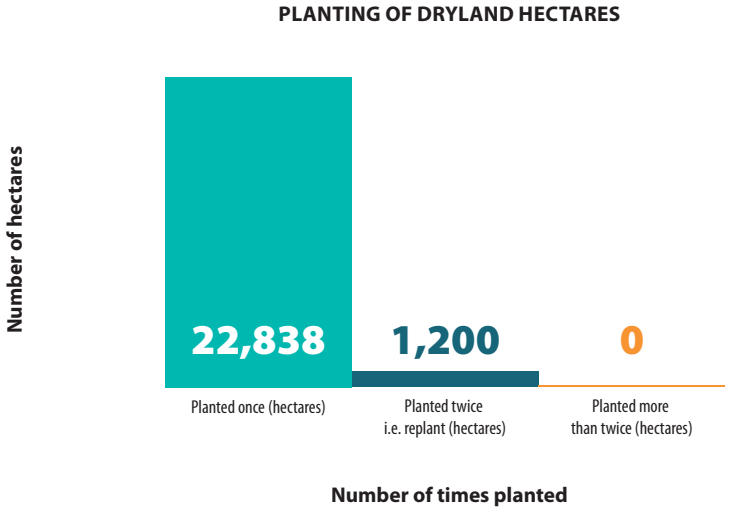
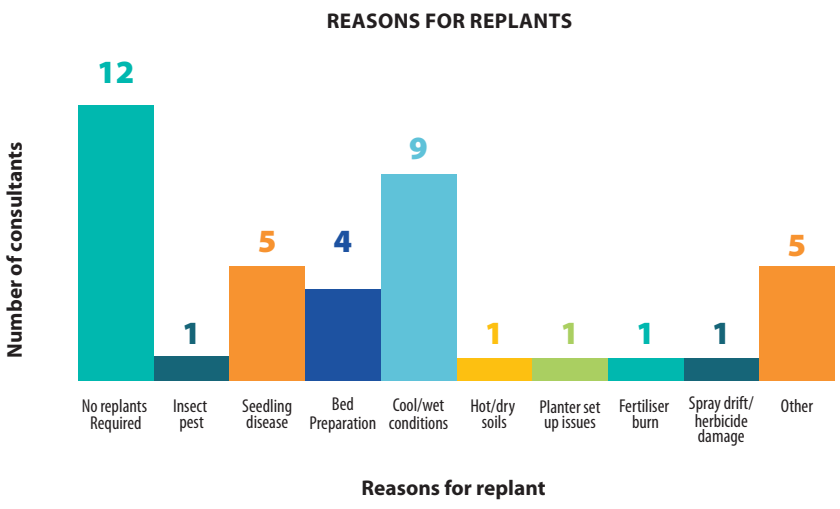


15

Select the reason/s why replants were required (select multiple as required).*

37 respondents

***Other responses included:**
Mice, long watering up times, sandblasting & drowned, cool/dry soil, planted into moisture then dried out.



ON-FARM PRACTICES AND ATTITUDES

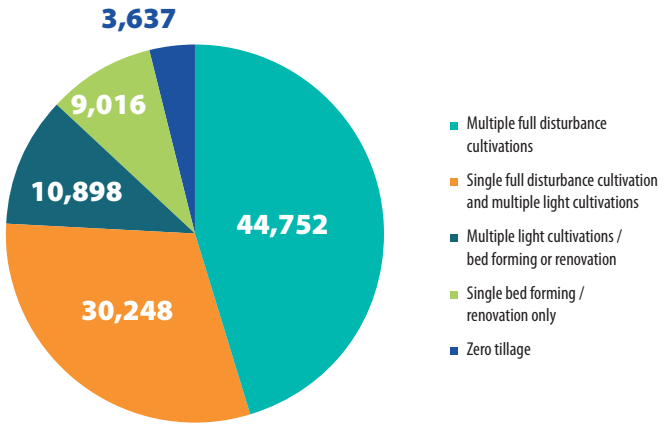
FARMING SYSTEM

16

Of your irrigated cotton hectares, how widespread in 2020–21 was the use of reduced tillage practices by your cotton clients?

37 respondents

IRRIGATED AREA (HECTARES)

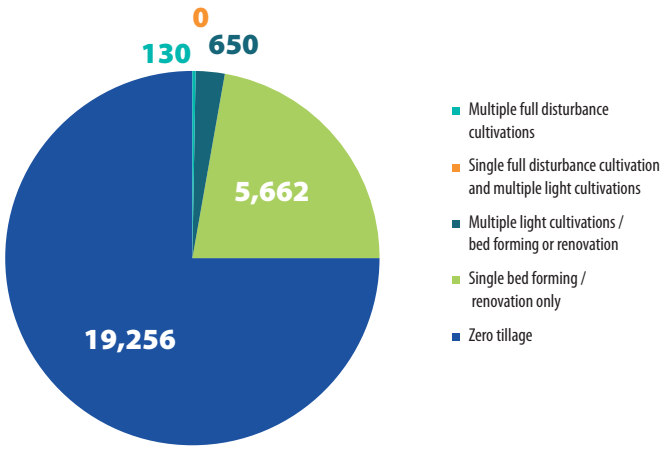


17

Of your dryland cotton hectares, how widespread in 2020–21 was the use of reduced tillage practices by your cotton clients?

37 respondents

DRYLAND AREA (HECTARES)

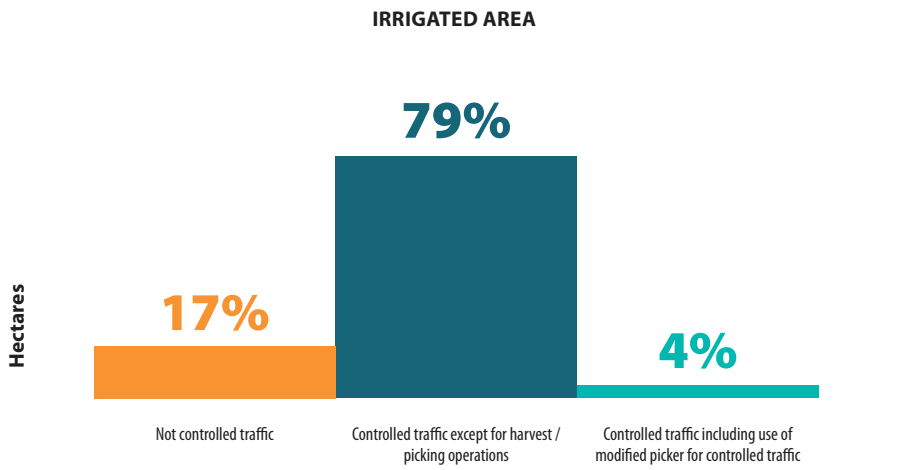


ON-FARM PRACTICES AND ATTITUDES

18

Of your irrigated cotton hectares, how widespread in 2020–21 was the use of controlled traffic by your cotton clients? Please allocate number of hectares (to best of your knowledge) to the options listed.

51 respondents



19

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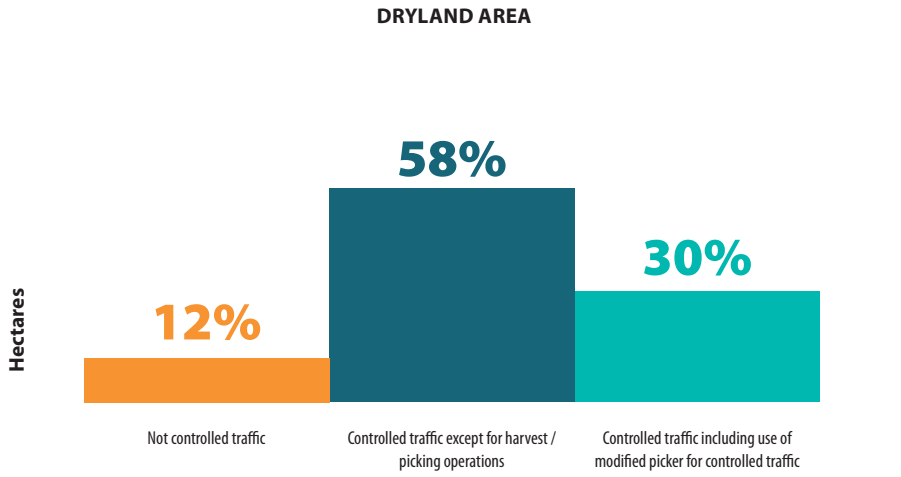


ON-FARM PRACTICES AND ATTITUDES

20

Of your irrigated cotton hectares in 2020-21, how many were? Please allocate number of hectares (to best of your knowledge) to the options listed.

51 respondents

Definitions:

Back-to-back cotton (cotton grown in the same field for the past 2 seasons)

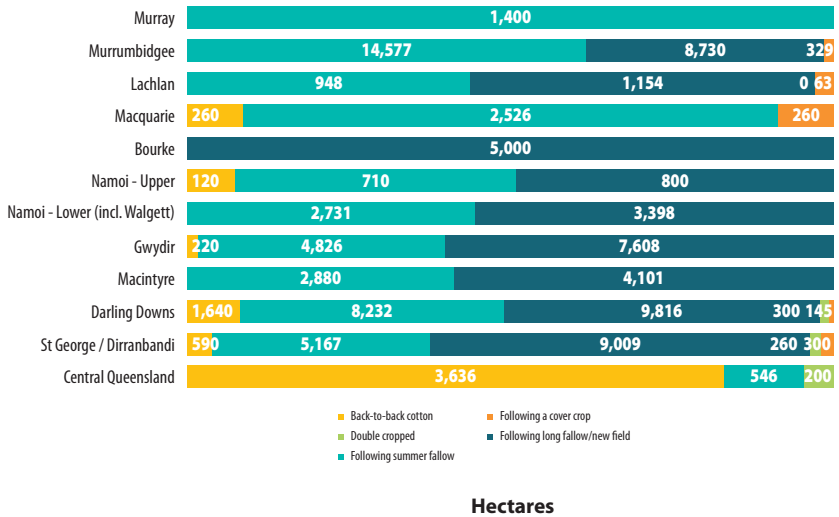
Following summer fallow (no crop in the 2019-20 summer or 2019 winter)

Following long fallow / new field (no crop for previous 2 winter and summer seasons, or longer)

Double cropped (following a 2020 winter crop that was harvested)

Following a cover crop (following a crop that was planted but not harvested)

CROPPING REGIME - IRRIGATED COTTON



21

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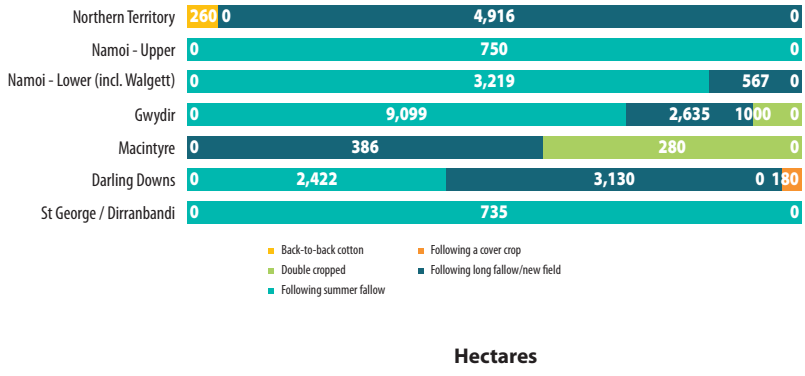
CROPPING REGIME - DRYLAND COTTON



ON-FARM PRACTICES AND ATTITUDES

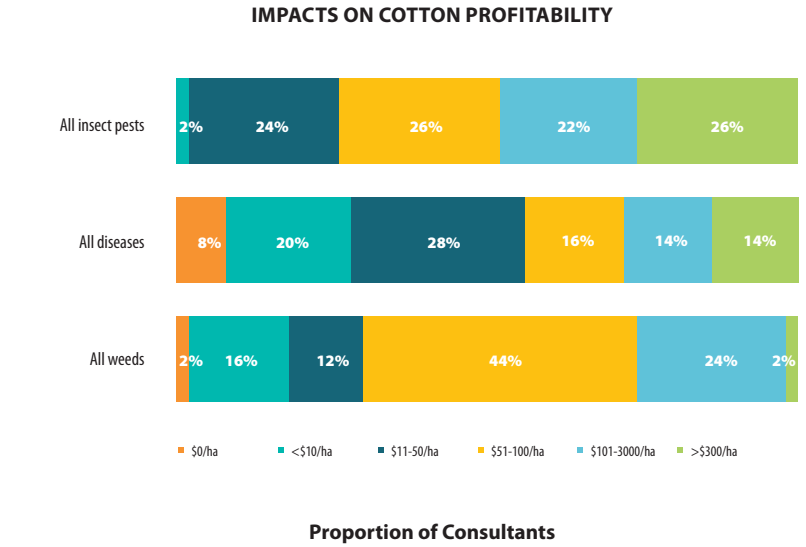
CROP PROTECTION

22

Rate the average impacts you think the following pests, weeds, diseases and disorders had on the profitability of your clients' cotton crops in 2020-21, either through budgeted or unbudgeted costs or through yield loss.*

50 respondents

***Note** Bollgard and Roundup ready fees are considered budgeted costs



23

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50 respondents

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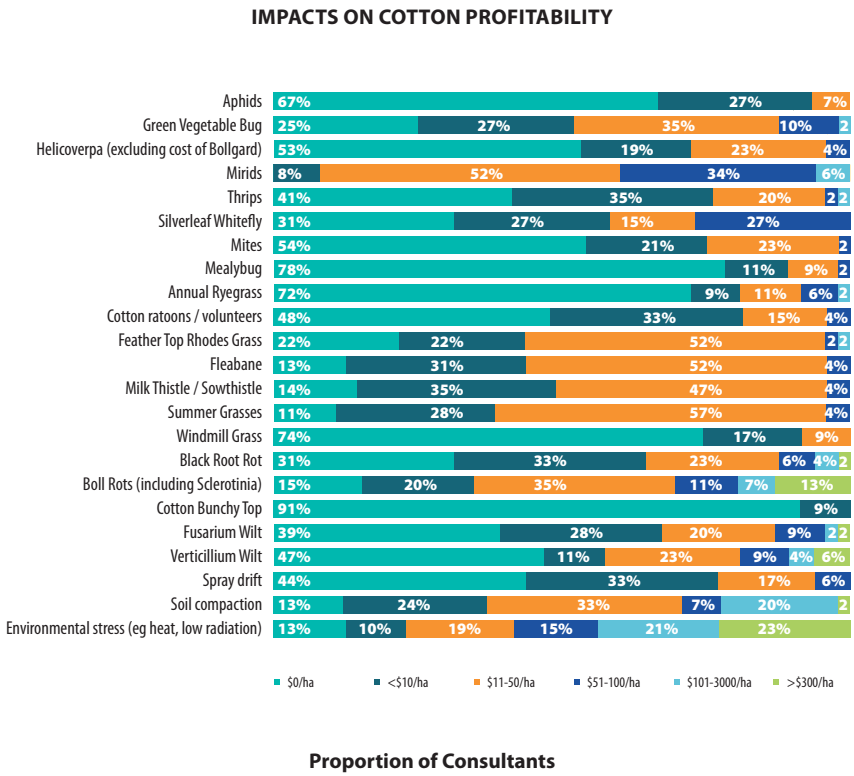


ON-FARM PRACTICES AND ATTITUDES

24

With regards to insect pest management in 2020-21 cotton fields, how widely used (in terms of total irrigated and dryland hectares) are the practices listed.*

36 respondents

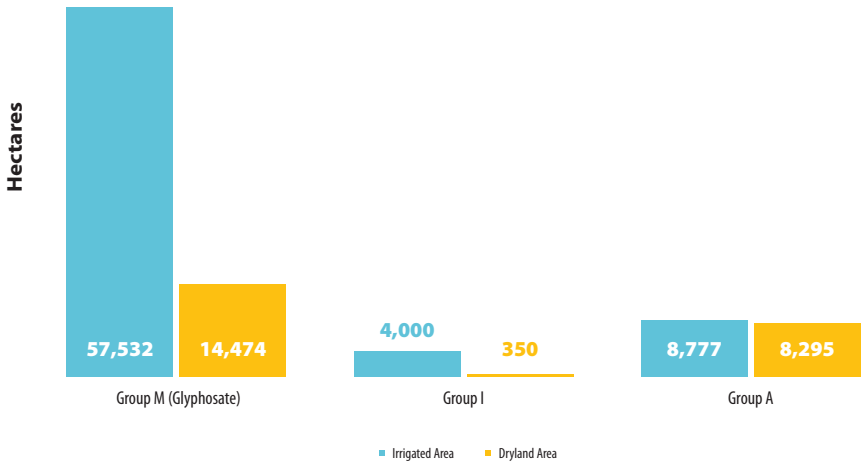
INSECT MANAGEMENT PRACTICES (COTTON AREA)

25

Of the irrigated and dryland cotton hectares over which you consulted in 2020-21, what is the total area (suspected or confirmed) with HERBICIDE resistant weeds?

36 respondents

TOTAL AREA (SUSPECTED OR CONFIRMED) WITH HERBICIDE RESISTANT WEEDS

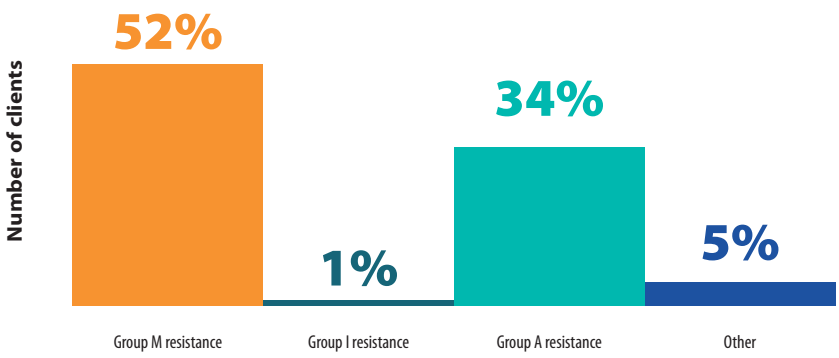


26

How many of your cotton clients have had herbicide resistance CONFIRMED?

50 respondents

HOW MANY CLIENTS HAVE HAD HERBICIDE RESISTANCE CONFIRMED



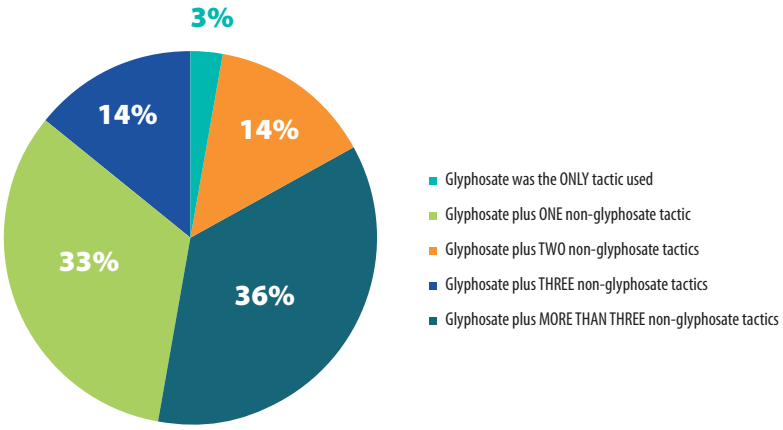
ON-FARM PRACTICES AND ATTITUDES

27

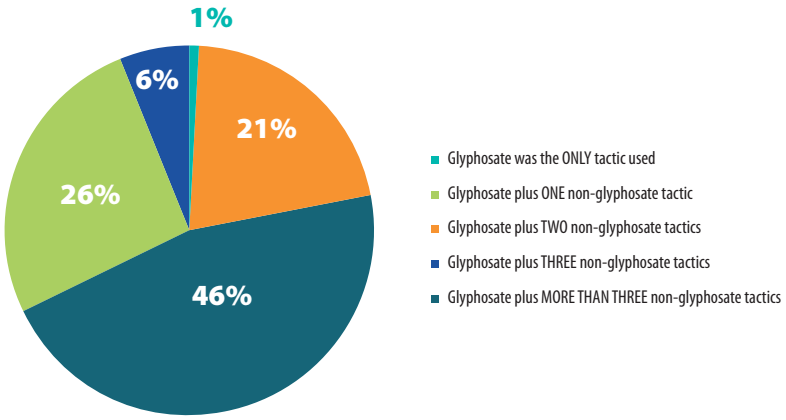
Of the irrigated and dryland cotton hectares over which you consulted in 2020-21, please estimate how many tactics were used for the cotton crop, including in preparation. For this question, a tactic is considered a weed control operation such as cultivation, herbicide, chipping.

35 respondents

NUMBER OF WEED CONTROL TACTICS - IRRIGATED



NUMBER OF WEED CONTROL TACTICS - DRYLAND

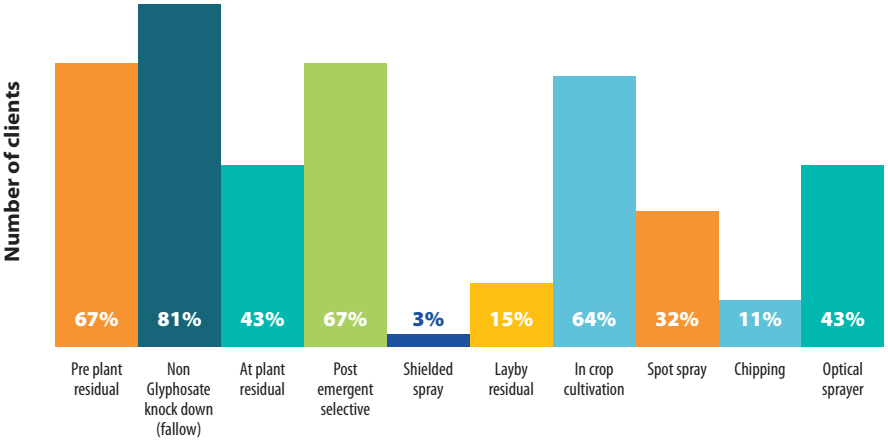


28

Thinking about your cotton clients, and how they have managed weeds across their cotton farming system, how many use any of the following weed control tactics?

35 respondents

USE OF NON-GLYPHOSATE WEED CONTROL TACTICS



ON-FARM PRACTICES AND ATTITUDES

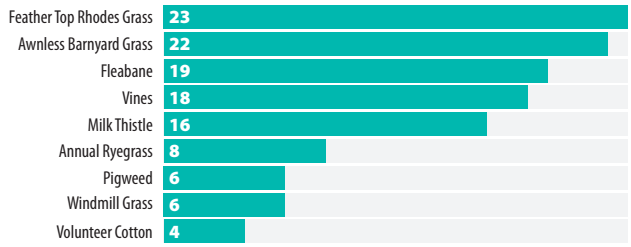
29

In your experience what weed species are CURRENTLY the biggest challenge to control in the IRRIGATED system? Please indicate where you think resistance is a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass).*

47 respondents

***Note:** Number of responses for major weeds presented above. Full verbatim answers are presented in Appendix 1.

WEED SPECIES CHALLENGES FOR IRRIGATED COTTON



Number of Consultants

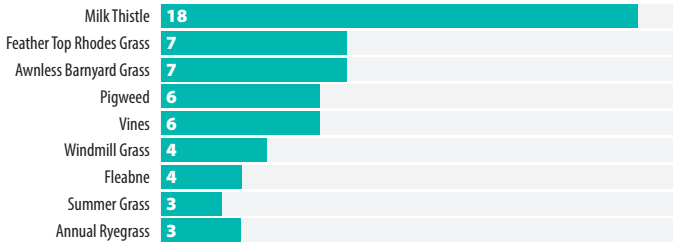
30

In your experience what weed species are EMERGING or likely to become difficult to control in the IRRIGATED system? Please indicate where you think resistance will be a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass).*

47 respondents

***Note:** Number of responses for major weeds presented above. Full verbatim answers are presented in Appendix 2.

WEED SPECIES EMERGING CHALLENGES IN IRRIGATED COTTON



Number of Consultants

ON-FARM PRACTICES AND ATTITUDES

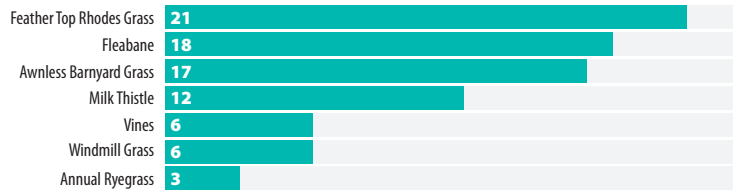
31

In your experience what weed species are CURRENTLY the biggest challenge to control in the DRYLAND system? Please indicate where you think resistance is a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass).*

47 respondents

***Note:** Number of responses for major weeds presented above. Full verbatim answers are presented in Appendix 3.

WEED SPECIES CHALLENGES FOR DRYLAND COTTON



Number of Consultants

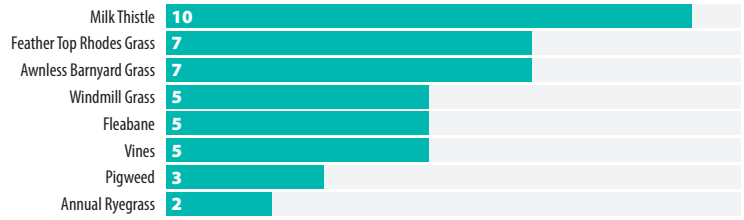
32

In your experience what weed species are EMERGING or likely to become difficult to control in the DRYLAND system? Please indicate where you think resistance will be a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass).*

47 respondents

***Note:** Number of responses for major weeds presented above. Full verbatim answers are presented in Appendix 4.

WEED SPECIES EMERGING CHALLENGES IN DRYLAND COTTON



Number of Consultants

ON-FARM PRACTICES AND ATTITUDES

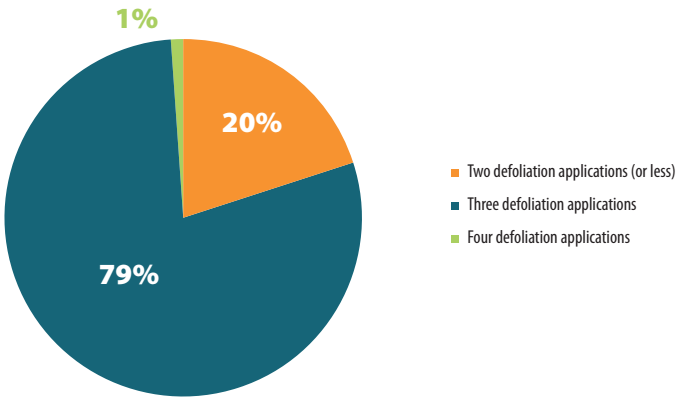
DEFOLIATION

33

Thinking about your irrigated cotton hectares, how many applications of defoliant products were required?

33 respondents

NUMBER OF DEFOLIATION APPLICATIONS - PERCENTAGE OF HECTARES

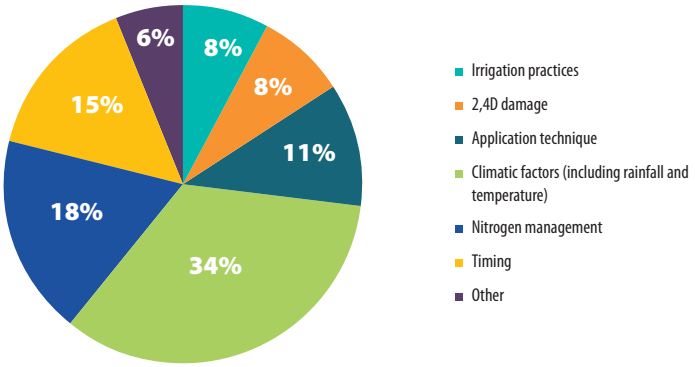


34

Based on your general experience, what are the factors that lead to three or more defoliation passes? (Select multiple as required)

46 respondents

FACTORS THAT LEAD TO THREE OR MORE DEFOLIATION PASSES (PERCENTAGE OF CONSULTANTS)



LIZ LOBSEY

ON-FARM PRACTICES AND ATTITUDES

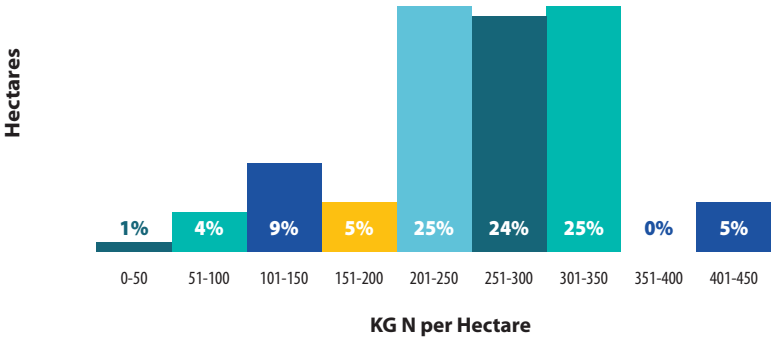
NUTRITION MANAGEMENT

35

What is your best estimate on how much nitrogen was applied per hectare for your total irrigated cotton hectares in 2020-21?*

33 respondents

AMOUNT OF NITROGEN APPLIED IN IRRIGATED COTTON

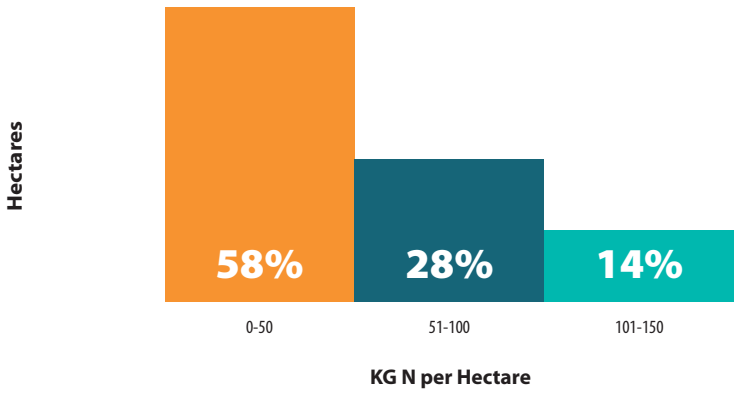


36

What is your best estimate on how much nitrogen was applied per hectare for your total dryland cotton hectares in 2020-21?*

33 respondents

AMOUNT OF NITROGEN APPLIED IN DRYLAND COTTON

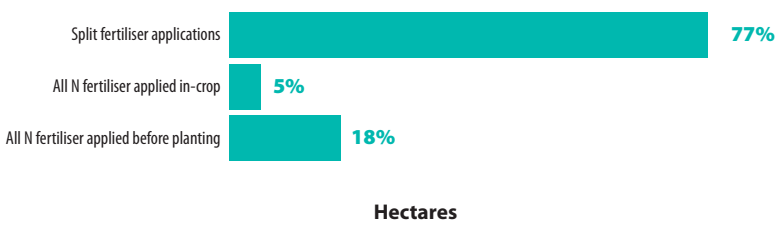


37

In 2020-21, when were the cotton crops' nitrogen fertiliser requirements applied?*

33 respondents

TIMING OF NITROGEN FERTILISER APPLICATION

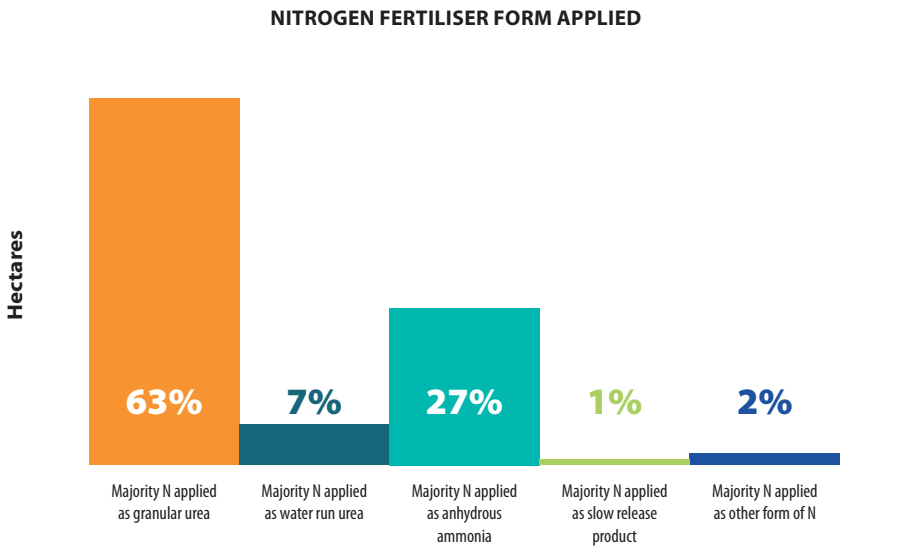


ON-FARM PRACTICES AND ATTITUDES

38

In 2020-21, how were the cotton crops' nitrogen fertiliser requirements applied?

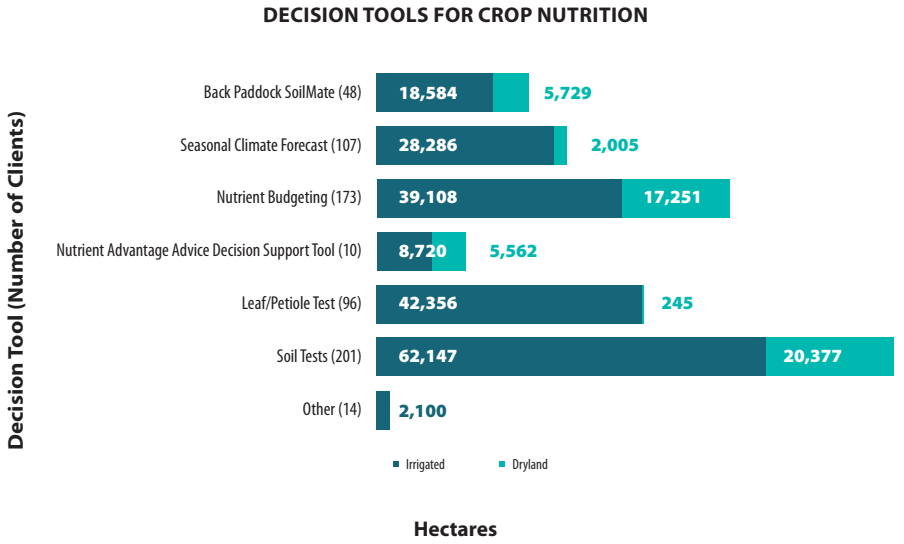
33 respondents



39

What decision tools are used by you and/or your clients to assist with decisions regarding application of fertiliser for your cotton clients and their irrigated hectares and dryland hectares?*

33 respondents



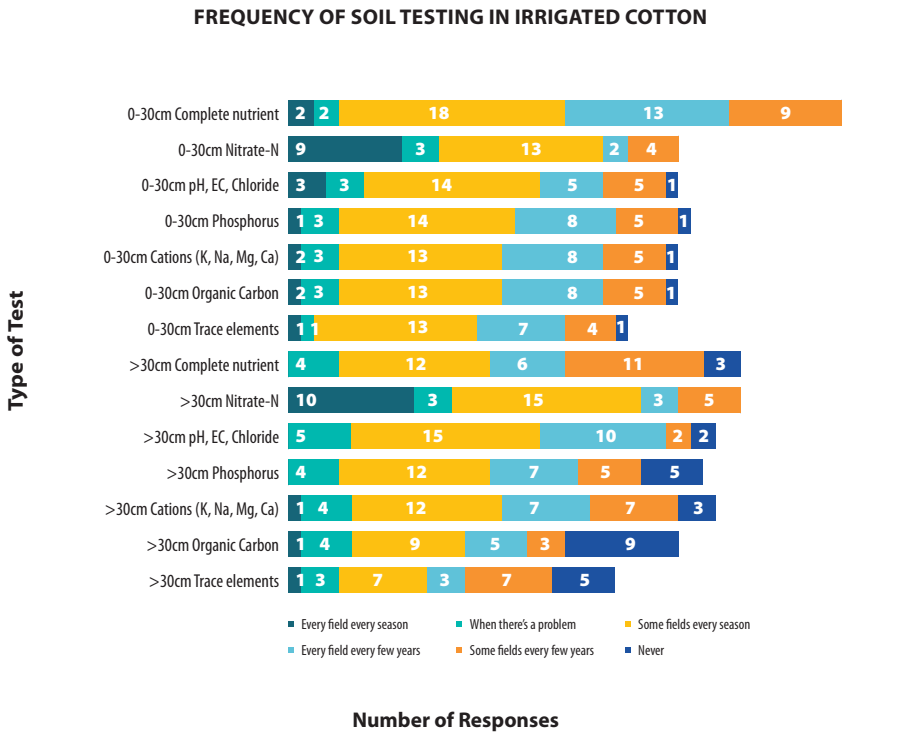
ON-FARM PRACTICES AND ATTITUDES

NUTRITION

40

For irrigated cotton, on average how often are soil tests conducted for each of these nutrients/conditions?

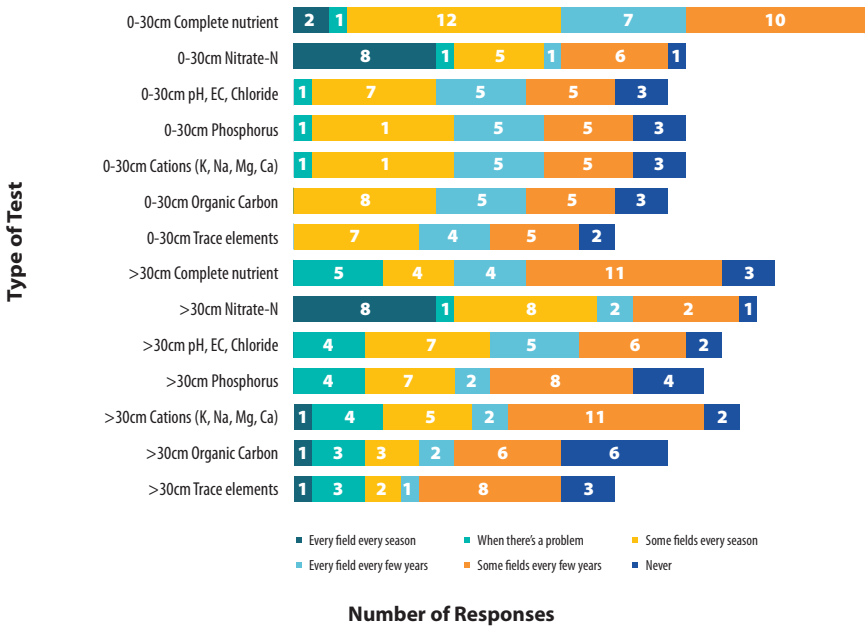
47 respondents



41

For dryland cotton, on average how often are soil tests conducted for each of these nutrients/conditions?

47 respondents



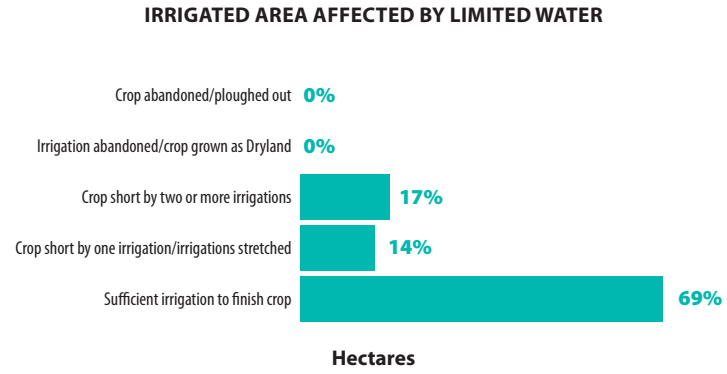
ON-FARM PRACTICES AND ATTITUDES

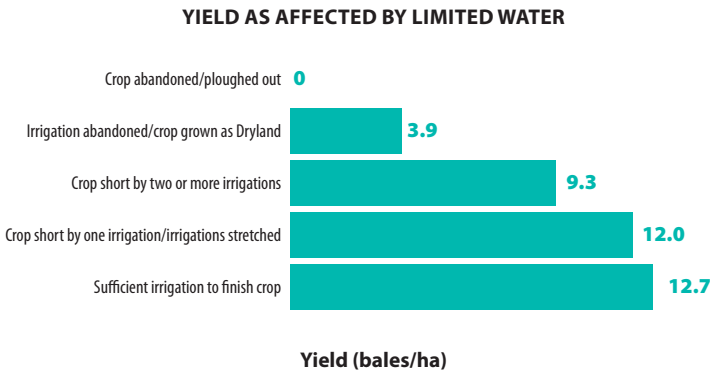
WATER MANAGEMENT

42

For the irrigated cotton hectares over which you consulted, how much area in 2020-21 season was affected by limited water? Please also indicate your best estimates of yield in each situation.*

33 respondents





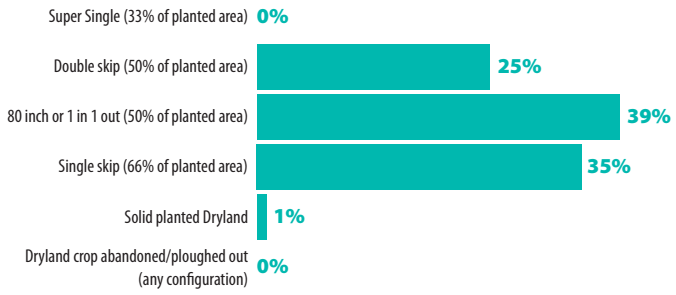
ON-FARM PRACTICES AND ATTITUDES

43

For the dryland cotton hectares over which you consulted, please indicate your best estimate of yield for each situation.

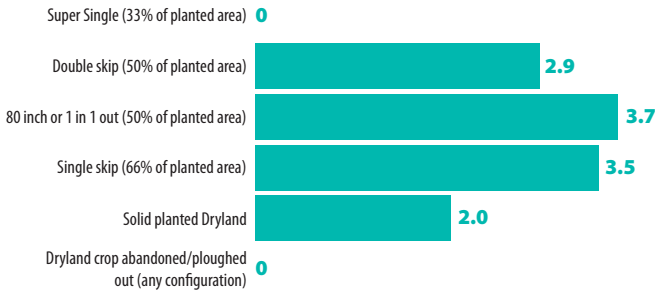
33 respondents

DRYLAND COTTON AREA BY ROW CONFIGURATION



Hectares

DRYLAND COTTON YIELD BY ROW CONFIGURATION



Yield (bales/ha)

HAYDEN PETTY / GABBY NAPIER

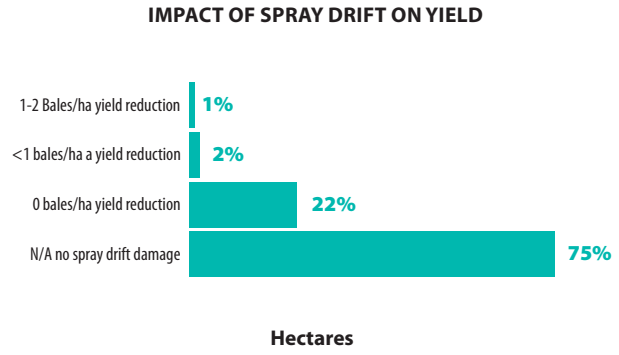
ON-FARM PRACTICES AND ATTITUDES

YIELD IMPACT

44

What yield impacts do you estimate spray drift had on your clients' cotton crops this season? Please indicate your best estimate.*

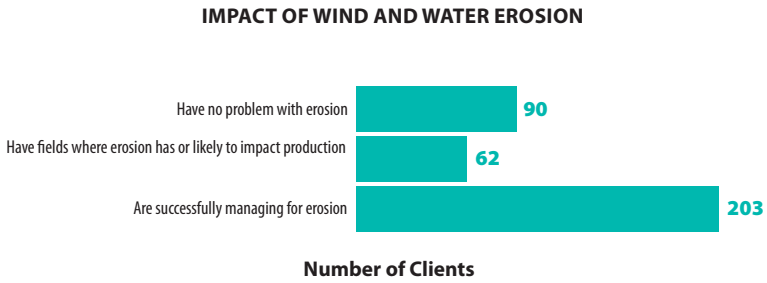
33 respondents



45

Regarding wind and water erosion, how many of your cotton clients fit these categories?*

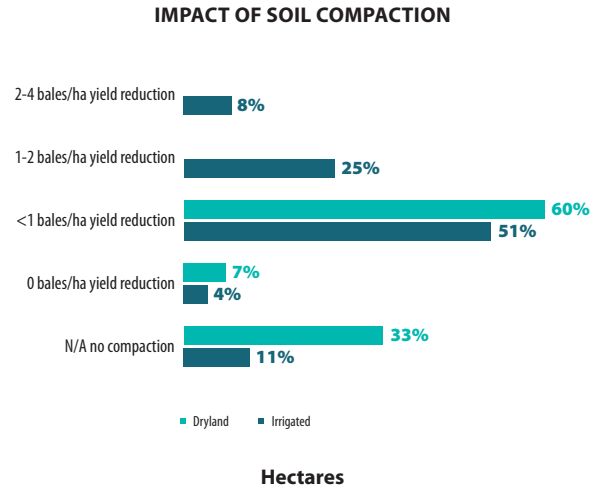
33 respondents



46

What impacts do you estimate compaction had on your clients' cotton yields this season? Please indicate your best estimate of total hectares for your irrigated cotton and dryland cotton.*

33 respondents



EMMA AYLIFFE

CRDC AND COTTONINFO

47

Thinking about industry EXTENSION services and your ability to access research, what do you value and what would you like to see the industry do differently?

39 respondents

I have liked the online format that has made it easier to get to stuff. Previously there has been an overload of field days showcasing the same stuff, so it's been nice to have them slow down a bit.

There's lots of handy, readily available information

Local field days and field walks discussing all things cotton.

Making recordings of all updates and presentations and make them available as podcasts or YouTube recordings.

I value the open transfer of information and research via extension. I would like CottonInfo to perform more of the extension in cotton research and to help organise "in field commercial tests" of this research.

Do not repeat what we are already doing in the paddock. Ask consultants what they have already done. Entomologists do not criticize what others are doing with success, even if you do not agree, Learn from it. You are not in charge of consultants; you are meant to be assisting them

It's time the growers coming through started learning more about the crop they are growing instead of depending on the agronomist to make the decisions. They didn't have the exposure to the 'bad old days' and haven't had a challenge to the industry like it. IPM needs to be rehashed and rebranded for the next generation so they understand it.

Would like to see more trials and engagement in the Mac Valley.

I value the access to research and extension through the Production manual, IPM guides, and paddock walks.

Extension services is limited in the CQ region. There is a great ability to be able to conduct research.

Work on herbicide resistance barnyard

It's all online or email if I want to look for it.

Too much info to digest if I want a yes or no answer

Overall I think extension in the cotton industry is quite well managed

Nothing other than shorter more relevant area wide management meetings. They go for far too long (2+ hours) one hour would be sufficient and have more concise and to the point research being conveyed.

It is all valuable, knowing who to contact about different aspects is handy.

Extension staff are valued in general

Better and harder information about the perils of long season cotton in CQ. This has real disastrous potential for not only CQ growers but for the future in the north and south

Would love the Cotton Pest and Management Guide as an App and bring back the charts showing all the trade chemicals with a certain active. Really helpful

Industry does a great job

Set up a regional consultant/grower panel to vote on research topics same as Richard Daniels NGA

CottonInfo doing a great job

Area wide management meetings in the Gwydir working well

Early season retention

Late season water

Happy with online updates.

Field walks are good and topical.

Would like to see more re Nutrition and new ag tech.

Quite happy with the current service

I value the high-quality publications, YouTube Videos and other information produced by the CottonInfo team. I feel there is a great fit for more extension and development personnel. That is rather than just extension they are involved heavily at a local level running more field level demonstration trials, looking at issues raised locally or road-testing new products / ideas.

Local people on the ground are very important

CRDC AND COTTONINFO

Newsletters are good

Continue to communicate within local industries on what issues are so they can react accordingly.

I think the extension services are fine

Both CRDC and CottonInfo are very active in our local area and are available when required for information.

Value being able to directly contact researchers at Myall Vale to discuss issues as they arise

Value having a CottonInfo person living in the local region, and providing seasonal/industry updates

Have a presence in CQ. ie CottonInfo

I highly value the industry extension personnel and resources that are readily available.

I think a 2-day pre bug checking school for people wanting to enter the industry at that level would be helpful. A similar idea could be pursued for aspiring operators and irrigators wanting to get a start also. Must be practical and hands on training - by practitioners.

Generally with the mix of CottonInfo and the CSD extension team I think the industry is well provided for. Also with easy access to researchers and their willingness to take calls and discuss topic's I doubt people aren't able to access the information they require. The CRDC does a great job for the industry. Janelle Montgomery and Chris Teague with Stuart McFadyen do a great job for the Border River Area. Some of the new tools being developed by CSD / Chris will prove to be extremely useful.

Better extension from CottonInfo team - they should link in with QDPI, NSW DPI, NGA and share relevant trial info. CottonInfo website needs to be updated with trial results (only list an email link to the trial lead).

CottonInfo is great resource

CSD extension also a great resource

Continue sending electronic extension info

Is doing well. Information is usually available if you're willing to look. Have senior agros talking about how there managing their season across different valleys

Case study exercise where growers are having success at managing a problem or achieving above industry standard WUE

CottonInfo area representatives good

CCA great at relaying information.

CottonInfo support

Value the local updates and consistent contact with local representative

Do differently, help coordinate and facilitate more information from private companies to feed through to consultants. I feel as though select individual consultants can gain information more easily

Disease information, more in detail disease monitoring and the impact different crop rotations have on levels and virulence (Verticillium, the new wilt occurring across valleys)

Janelle is great in the Gwydir.

CRDC AND COTTONINFO

48

Thinking about industry RESEARCH, what do you value and what would you like to see the industry do differently?

34 respondents

Would reverse osmosis treated water improve all the spray applications from insecticides and herbicides to growth regulants and defoliants applied to cotton?

Would reverse osmosis use in broadacre help minimise drift?

Improvements on the Apps like PestDect.

Confirm the benefits of using soil microbiological products to stimulate & improve soil health and the cotton growth. What products are considered to be of value & responsive in cotton fields?

Could the industry confirm the use of Ammonium Sulfate with defoliation sprays is a benefit or a detriment in cooler conditions?

What are best strategies for defoliation with out using UltraMax products in cooler conditions.

Will other Group G products be an effective option for defoliation?

I like being able to do some of the field work for ourselves to learn from. Project extension is very slow. We have relevant work sitting for approval that we need out now, the process is too slow.

I value our long history of good sound scientific research.

I would like the industry research to be focused on 3 things. 1. increased production, 2. increased profitability, 3. increased efficiency (water, nutrient, labour, land etc).

Irrigation and automation

More work on Vert

More work on better Dryland varieties

Continue work to find better ways to delay maturity in Dryland crops (Claire Walsh work)

More research based on the varieties from a neutral party instead of the CSD. A heavy focus on disease, less on herbicide traits that we didn't ask for.

Nutrition as a whole needs re-assessing. Why is one set of soil test 'critical range' accepted for all soil types, it doesn't logically make sense that a heavy dark clay and a sandy soil are treated the same for the sake of soil tests. Nitrogen shouldn't be the focus, we need to look at the whole spectrum as nutrients needed to grow a profitable crop, not necessarily a high yield crop.

Speak to consultants and see what they would like trialled?

I value the on going dedication of individuals to the their specific area of research. I think the industry would benefit from looking at researching ways to farm cotton in semi irrigated /water limited environments and the associated management strategies. Ie planting into moisture and stubble, planting later, more delayed first watering, utilising 2-3 irrigations, associated IPM risks and management strategies

It is great that there is research for all valleys, however, more research and extension in Central Queensland would be very beneficial to the growers in this region.

Pretty happy with current effort

Not near as many local reps to relay info personally or meetings

I still think there are advances that could be made in managing crops for stress events and better managing Bollgard planted late in the window (i.e. mid-late December)

Better research around nutrition especially in the effects of balanced nutrition, including micro, on not only yields but insects and diseases

Value a great overall team of researchers that in many circumstances are being more and more rejected by growers because their recommendations don't fit with the growers narrative

More dryland focussed trials

Increase level of research staff resources in Southern NSW in cotton diseases.

Speed up Black root rot tolerant varieties research.

Sclerotina control eg fungicides and timing.

All the research is valuable

CRDC AND COTTONINFO

Would like to see some flexibility to allow CottonInfo in collaboration with researchers to do local research on 'occasional' problems when they arise. For example, Green Stink Bugs this year - we don't see them very often but would like to think researchers are doing as much work on their management when they're present

Spread the south disease survey on various farms not the same ones each year. There are more problems out there than the survey picks up

Highly value existing research effort.

Better research into feral pig and mice damage (vertebrate pests).

More research on heat tolerant varieties.

That industry research is relevant, and the industry is proactive in its research.

Focus on the current growing areas to ensure sustainable production (Resistance management and improved productivity) rather than focus so heavily on the Northern regions. Believe there should be investment in that area, however we need to remain our main focus on the topical issues in current regions

Richard Sequira's whitefly decision management tool has been good.

Focus on real returns to the grower-efficiency and productivity.

Continued focus on the basics of nutrition, pests and disease. Black root rot in the south, alternaria.

Current research is good, we can pick up a lot of good info from other valleys or systems.

CSD data pretty good

Cotton research seems to be declining

More Vert research

Continuing to meet nutrition with increasing yields. Compaction issues.

Would like more research into Rotational profitability in the south

Any research promoting more sustainable long term farming without compromising bottom lines.

Being more forth coming and open about research findings and projects.

I highly value the cotton research effort.

I would like to see more resources put into the research arena in terms of nutrition management for high yielding cotton.

I would like to see more resources put into disease research, especially with new issues such as recurring wilt appearing.

I would like to see a return to more research presentations at the biannual Cotton Conference.

Value long term case studies/regional specific/tailor research to some of the commercial realities so implementation can be achieved.

CRDC AND COTTONINFO

49

Is there any other feedback or other issues that you would like to provide back to CRDC at this time?

19 respondents

More work on Vert
More work on better Dryland varieties
Continue work to find better ways to delay maturity in Dryland crops (Claire Walsh work)
Liaise with GRDC, please! All of my clients grow other crops, at all times. Cotton is generally grown in a sequence or rotation with other crops (wheat, barley, chickpeas to name a few) and its frustrating when I see poor investment decisions in one industry because the other industry has already done a lot of work.
I would prefer that research ideas/topics are driven by local groups. Similar to the way northern grower alliance (GRDC) put up proposals for research or in field validations of research.
I do not see a lot of valuable research occurring. Ask the older more experienced consultants what needs doing. A lot of the basics of Pix, water timing etc can be revisited
A lot of excellent research has been done with nutrition
Create a cotton 101 course for growers, get them more involved.
Greatly concerned with XtendFlex.
Think the meeting discussing research priorities was well worth it.
No
No
Rates of defoliation products I believe need to be reviewed and labels changes to allow higher use rates. Maximum rate is not always high enough in some circumstances.
Have to overcome the issue of researchers lack of certainty around work and their future. I feel this is getting worse. We have lost many very very good researchers in cotton because of this. It is not only the uncertainty it is also the amount of time they spend around justifying or reapplying for projects.
No just need to balance amount done in agronomy/farming systems with sustainability too. Need to cover it all
Please put priority on maintaining/ rebuilding experienced researchers in all disciplines. We've had a big exodus of knowledge over the last 5 years and I don't think it's all been filled through succession planning.
Ensure that all funding opportunity is to continue to create innovation rather than a return-on-investment dollars
No, I think they are doing a great job for the industry.
Do some real research for grower survival given current water politics.
Nil
Cotton research seems to be declining
No

CRDC AND COTTONINFO

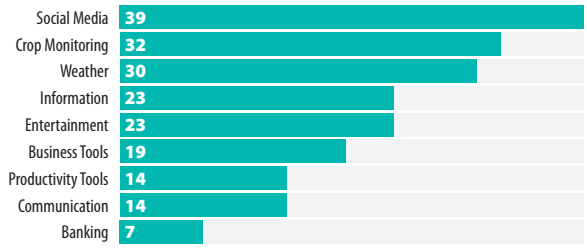
50

If you use Apps on your mobile device, please list your favourite Apps (for either work or personal use).*

55 respondents

***Note:** Full list of responses are listed in Appendix 5.

MOST USED APPS ON MOBILE DEVICE (BY GROUPING)



Tally

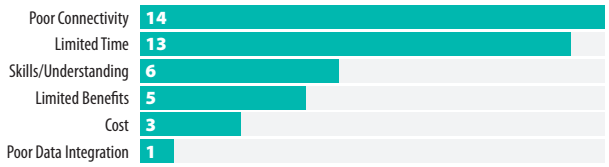
51

What is the biggest barrier to you increasing your adoption of digital technology?*

43 respondents

***Note:** Full list of responses are listed in Appendix 6.

BARRIERS TO ADOPTION OF DIGITAL TECHNOLOGY



Number of consultants

HAYDEN PETTY / GABBY NAPIER

52

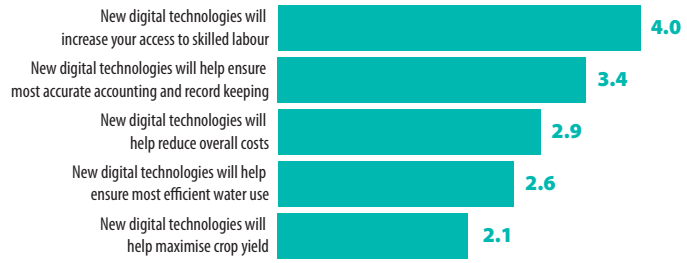
Respondents were randomly assigned to a different set of answers to this question, either framed as positive or negative responses. There were 19 respondents for the positively framed answers and 27 respondents for the negatively framed answers.

Adopting new digital technologies can have a significant impact on cotton farming. If you had to recommend a new digital technology for use in cotton farming, what order would you place the following points in relation to their importance? (1=most important, 5=least important)

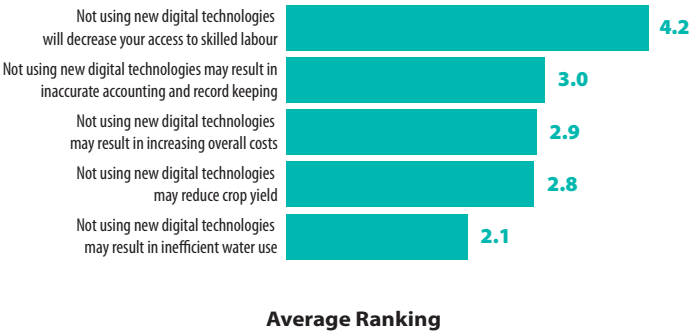
19 respondents

27 respondents

FACTORS FOR ADOPTION OF DIGITAL TECHNOLOGY



FACTORS FOR ADOPTION OF DIGITAL TECHNOLOGY



APPENDICES

APPENDIX 1

QUESTION 30

In your experience what weed species are CURRENTLY the biggest challenge to control in the IRRIGATED system? Please indicate where you think resistance is a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass)

47 respondents

Feather top rhodes grass
glyphosate resistant milk thistle
peach vine
fleabane
glyphosate resistant/Group A resistant barnyard grass

Gly and group A resistant ryegrass.

Fleabane, roundup ready canola, thistles

Glyphosate Resistance Ryegrass
Glyphosate Resistance Canola
Glyphosate Resistance Fleabane

Gly resistant ABYG

barnyard grass and feathertop rhodes grass because they respond so well to irrigation in the spring and early summer requiring many control attempts.
Glyphosate resistant barnyard grass and glyphosate resistant Feather Top Rhodes grass because of poor results with glyphosate

glyphosate resistant fleabane, awnless barnyard grass, FTR grass
glyphosate tolerant milk thistle and peachvine

Bell vine

Gly resistant awnless barnyard grass, gly resistant sow thistle, feathertop rhodes grass

Suspected glyphosate resistant sowthistle and Fleabane

glyphosate resistant windmill grass
glyphosate resistant milk thistle

Feather top rhodes grass, volunteer cotton, cow/bell vines - resistance/ poor control from current registered herbicides

fleabane, windmill grass (hard to kill/possible resistance), milk thistle (increased resistance), ryegrass, pig weed. All can be managed with residuals where possible but extra expense and doesn't last all season

Peachvine and fleabane

Bellvine
Feathertop Rhodes Grass
Volunteer Cotton
Red Pigweed

Sow thistle, fleabane, barnyard grass, peach vine.

n/a

Glyphosate resistant Feathertop Rhodes grass
Basically all Weeds are more tolerant to Glyphosate and other herbicides
Red Pigweed
Fleabane on some farms

peach vine
gly resistant barnyard grass

Feather Top Rhodes M resistant, Milk thistle, Fleabane in some areas, Barnyard grass and beetle grass becoming more of a problem in some systems

Summer grasses resistance to glyphosate
Fleabane

Gly resistant Sowthistle

glyphosate resistant FTR
roundup ready cotton
glyphosate resistant crownbeard (wild sunflower)

Bell Vine

Glyphosate Resistant Barnyard Grass
Glyphosate Resistant Feathertop Rhodes Grass
Red Pigweed
Peach (Cow) Vine
Bell vine

Gly resistant ryegrass

Glyphosate and group a Resistant ryegrass

bell vine

Glyphosate resistant feather top rhodes grass
Glyphosate resistant awnless barnyard grass
Bellvine
Glyphosate resistant fleabane

Glyphosate Feather top rhodes and sow thistle

Barnyard Grass. I think resistance is the problem.
Feather Top grass
Polymeria
Peach Vine

Roundup Ready cotton ratoons
Roundup Ready cotton volunteers
Roundup Resistant barnyard grass
Roundup Resistant milk thistle

Milk thistle

Glyphosate resistant feathertop rhodes grass.
Glyphosate resistant barnyard grass.
Glyphosate resistant windmill grass.
Glyphosate resistant flaxleaf fleabane.

APPENDICES

APPENDIX 1

Gly resistant rye grass, fleabane and windmill grass
Fleabane Ryegrass Windmill grass Barnyard grass Johnstons grass Wandering jew Vetch Climbing buckwheat Medic
Gly resistant FT and Barnyard grass
Feathertop rhodes grass, peach vine, bell vine
Fleabane.
Milk thistle increasing.
Fleabane FTRG
Glyphosate tolerant feather top rhodes grass and fleabane, glyphosate resistant barnyard grass, red pigweed, peachvine.
Glyphosate resistant Barnyard Grass Feather Top Rhodes Grass
Barnyard grass, milkthistle, feather top Rhodes, peach vine bell vine red pigweed. sesbania. Resistant grasses and milkthistle and tolerant to gly - vines, fleabane and pigweed.
Flaxleaf fleabane Barnyard grass with possible gly resistance
BYG, FTR, Milk thistle - gly resistance Peachvine, sesbania, polymeria, bladder ketmia - gly tolerance
Gly resistant annual ryegrass
Feather top rhodes in fallow and in crop. Gly resistant barnyard grass. Cowvine/peachvine becoming more tolerant to gly.

APPENDICES

APPENDIX 2

QUESTION 31

In your experience what weed species are EMERGING or likely to become difficult to control in the IRRIGATED system? Please indicate where you think resistance will be a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass)

47 respondents

peachvine, pigweed

None

Clethodim Ryegrass
Glyphosate & Clethodim Barnyard
Glyphosate Resistance Sowthistle
Glyphosate Resistance Red Pigweed

Milk thistle with possible group M and I resistance

glyphosate resistant milk thistle
glyphosate/Group A resistant barnyard grass

Sow thistle as glyphosate resistant plants find their way into our farming systems

Ryegrass in a cool wet finish – resistant

Dinebra grass

Sow thistle resistant to Glyphosate

Suspected glyphosate resistant Barnyard grass and Feather Top Rhodes Grass and increasing pressure on Dual Gold and Group As

glyphosate resistant sow thistle.

Sesbania - some clients have big issues control this weed, however, I believe it's due in part to the seed bank in certain fields.

Fleabane

glyphosate resistant ryegrass

Summer grasses, resistance to glyphosate
Milk Thistle resistance to glyphosate

All weeds have much greater tolerance to all herbicides

Melon, polymeria, marshmallow peachvine, fleabane, sesbania- all could develop gly resistance

Milk thistle

Gly resistant summer germinating sow thistle.

tarvine, tall fleabane, radish

Glyphosate resistant milk thistle
Glyphosate resistant red pigweed?
Yellowvine

Father top Rhodes grass

Glyphosate resistant milkthistle

gly resistant sow thistle

Glyphosate resistant sow thistle

glyphosate resistant summer grass
glyphosate resistant crownbeard

Gly Resistant Sowthistle - some challenging populations of pigweed that do not die with Gly effectively

Red Pigweed

Feather top grass it will be a big problem in the near future.

gly resistant milk thistle

Feather top Rhodes grass

windmill grass is getting worse

Red Pigweed and Peachvine were becoming more difficult before we started using Stomp Xtra at planting and Dual Gold in crop with either the 1st or 2nd Roundup Ready application. These are no longer an issue but with Gulfosinate technology available may tend to use this in the mix and rotate usage year on year with the in crop Dual Gold.

Peachvine/Fleabane, this is why we should be looking forward to Enlist and not Extend flex. Dicamba is not a summer herbicide, is not widely used in fallows.

Roundup resistant summer grasses
Roundup resistant milk thistle

Xtend flex is expected to control the weeds that are currently problematic

Milk thistle

Glyphosate resistant milkthistle.

glyphosate resistant Windmill grass

Gly resistant Patersons Curse on many farms now.

Gly resistant barnyard grass

Barnyard grass (Possible M Resistant), Feather Top Rhodes due to prolific seeder, beetle grass becoming harder to control near water ways

Glyphosate amaranth

n/a

APPENDICES

APPENDIX 3

QUESTION 32

In your experience what weed species are CURRENTLY the biggest challenge to control in the DRYLAND system? Please indicate where you think resistance is a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass)

47 respondents

Glyphosate & Clethodim Ryegrass

As per Irrigated above

Windmill grass

Fleabane and roundup resistant barnyard grass

glyphosate resistant fleabane, awnless barnyard grass, FTR grass
glyphosate tolerant milk thistle and peachvine

Gly resistant awnless barnyard grass, gly resistant sow thistle, feathertop rhodes grass

N/A for our operation

Barnyard grass, fleabane, roly poly.

Suspected glyphosate resistant sowthistle and Fleabane

glyphosate resistant ryegrass
glyphosate resistant windmill grass
?glyphosate resistant milk thistle?
?glyphosate resistant fleabane?

glyphosate resistant barnyard grass
glyphosate resistance feather top
glyphosate resistant fleabane

Feathertop Rhodes Grass
Flaxleaf fleabane
Sumatriensis fleabane

Glyphosate Resistant Barnyard Grass
Glyphosate Resistant Feathertop Rhodes Grass

Resistant Feathertop Rhodes grass
Fleabane
Bellvine and Peachvine
Milkthistle
All these weeds in difficult in zero till

BYG, FTR, milk thistle

Summer grasses, glyphosate resistance

Glyphosate tolerant feathertop rhodes grass, milk thistle & fleabane, glyphosate resistant barnyard grass and ryegrass. Peachvine.

Vol fabas hard to control without using Grp I's ahead of cotton.
But if don't get residual out in time - controlling milkthistle and fleabane very tricky.

Barnyard grass, milkthistle, feather top Rhodes, peach vine bell vine red pigweed. sesbaina.
Resistant grasses and milkthistle and tolerant to gly - vines, fleabane.

Barnyard Grass I think resistance is the problem
Feather Top grass
Fleabane

Roundup resistant milk thistle
Roundup resistant summer grasses

Feather Top Rhodes Grass

Feather Top Rhodes, Fleabane

Fleabane

Feathertop rhodes grass, fleabane, vines, barnyard grass

Fleabane
Windmill grass
Barnyard grass

Resistant Barnyard Grass and Feather Top Rhodes Grass.

FTG

Fleabane

FTR

Glyphosate resistant feathertop rhodes grass.
Glyphosate resistant barnyard grass.

Glyphosate resistant windmill grass.
Glyphosate resistant flaxleaf fleabane (only in sensitive areas).
Glyphosate resistant milkthistle.

Feather top rhodes in fallow and in crop.
Gly resistant barnyard grass.
Cowvine/peachvine becoming more tolerant to gly.

Glyphosate resistant sow thistle

glyphosate resistant Feathertop Rhodes grass

APPENDIX 4

QUESTION 33

In your experience what weed species are EMERGING or likely to become difficult to control in the DRYLAND system? Please indicate where you think resistance will be a contributing factor (eg. glyphosate resistant windmill grass, instead of windmill grass)

47 respondents

- peachvine, pigweed
- Glyphosate & Clethodim Barnyard
  Glyphosate Resistance Fleabane
  Glyphosate Resistance Sowthistle
- As per Irrigated above
- Gly resistant ABYG
  FTRG
  Gly resistant ryegrass
- roundup resistant sow thistle
- None
- Saltbush, glyphosate resistant milk thistle.
- All glyphosate resistant grass weeds.
- Sumatriensis fleabane
- Sow thistle resistant to Glyphosate
- Suspected glyphosate resistant Barnyard grass and Feather Top Rhodes Grass and increasing pressure on Dual Gold and Group As
- nothing new yet
- N/A for our operation
- resistant barnyard grass
- All Weeds under zero till and higher stubble cover
- Fleabane, melon, windmill grass
- tarvine, tall fleabane, radish
- Glyphosate resistant windmill grass
- Glyphosate resistant milk thistle
- Gly resistant sowthistle. Feathertop can be managed with plenty of options
- Feather Top grass
- FTR Milk Thistle
- Button grass.
- Milk thistle/Sowthistle, summer grasses
- Glyphosate resistant tall fleabane
- gly resistant sow thistle
- Davids spurge. Naturally resistant to gly.
  Gly resistant summer germinating sow thistle.
- Pigweed
  Yellowvine
- Roundup resistant summer grasses
- Xtend flex is expected to control the weeds that are currently problematic
- In the NT, sesbania and onion vine may become more difficult as time goes on.
- Glyphosate resistant liverseed grass
- peachvine, pigweed

APPENDIX 5

QUESTION 51

If you use Apps on your mobile device, please list your favourite Apps (for either work or personal use).

55 respondents

Yacker, Google Calendar, Monday, Zoom

Weather, Twitter, Email, Goanna, Whatsapp

1. Agworld
2. BOM, Windy YR, Weatherzone
3. Banking
4. Excel
5. Service NSW
6. Photos
7. Twitter & FB
8. Water Live

Instagram
Twitter
Google Maps
Windy
Agworld

Agworld
Spotify
Podcast
Banking
Instagram
Facebook
Whatsapp
Maps
Weather
Service NSW

Windy
Oz Forecast
Banking
Messenger

Agworld
Dropbox
Social Media
Banking

Agworld
Excel
Dropbox
Satamap
Netflix
Twitter
Facebook
Davis Weather Link
Farmcommand

Weather, Messenger, Podcasts, Ag World, Instagram, Goapp, Mail, Safari, Spotify, Camera, PCT Agmap, Stocard, Books, Snapchat, Garmin, Arlo

Agworld, Weather Apps, Whatsapp, Telegram, FB, Messenger, Instagram, Excel, NAB, Salesforce

Weather Apps, Agworld

Fergus for time keeping
Google Calendar for scheduling
Agworld & Agworld scout

Yr.No
Slack
Snapchat
Instagram
Facebook
Banking
Notes
Calculator
Whatsapp
Measure Map
Goapp

Agworld
Safari

Weatherzone
Fishing Times
Facebook
Viber

Croptrak, ANZ, Numbers, American Express, MLB, Qantas, Linkedin, Stan, Netflix, Realestate, Health Apps, Photos, Messages, WhatsApp, DJI Go, Drone Deploy, GoApp, Aginfinite Lots of others

Backpaddock
Weatherzone
Yr
Goanna probes
Audio books

Dropbox

Excel
Agworld
Safari
Facebook
Messenger

Weather apps
Twitter

Telegram
Climate
Soil Water App
Strava
Spotify
Podcast
Trello
Whats App
Maps
Agworld

APPENDICES

Goanna Telemetry App
Agworld
Safari
Windy Weather

Agworld app for spray recs
Weather app eg Elders

Numbers
Yacker

Telegram
Agworld

SLWF app
Trello
Planaway

Soil Mapp, Echelon, Irramax

Weatherzone, Agworld, News

Willy Weather
Bom
Twitter

Agworld
Instagram
Facebook
Bom

Agworld
Twitter
Instagram
Google Sheets
Weather Sites on Web Browser

Google Earth
Satamap
Oz Runways
BOM
Shazam

Weather forcasting apps (multiple)
Weather station apps (multiple)

Whatsapp
my John Deere ops centre

Agworld
Numbers
Zoom
Scannable
Camera
Calculator
Spotify
Clock
Messenger
WhatsApp
Cricket Live
NRL Live
Union live
Google maps
ABC Kids

Outlook
Safari
(Not my favourite apps but the ones I use the most)

Agworld
Ozforecast

Spotify

Weather
Instagram
Triple M
2GB

Ozforecast
AGWORLD

Twitter
DJI Go4
Connect Lite
BOM Water storage

Agworld
Twitter

Facebook, Snap chat, Weather, Netflix, Agworld, Excel

To Do, Various weather ones, ATO etc - don't have many or refer to many agronomy apps

APPENDIX 6

QUESTION 52

What is the biggest barrier to you increasing your adoption of digital technology?

43 respondents

Phone service
My low skill base with digital technology
Service and signal
Time to do so
Access to consistently good internet throughout the entire region. We have pockets of good access and areas of poor to no internet access
Time to learn
The cost and the time that training is required. We as agronomists have issues charging on digital technology to the growers.
Having the time and also still issues with phone service/access and also older growers who have no interest in embracing digital technology
Service and Data
Not my barrier but I believe the biggest barrier to the industries adopting is understanding digital technology, how to utilise it in the field, and how PA is used to quantify and understand the impacts of management and season conditions on production and is not just about applying something by variable rate.
Cost of new technology. None really...
Age - getting too old to bother
Price and many uses for that technology
Mobile coverage and internet speeds
Filtering through which app is the most useful. Don't have time to play around with them
Connectivity/service in the bush/speed of connection Failing 3g services Data sharing across services / connected platforms
Ability to get stable and good connection, Download speed and data limits
New tech needs to be time efficient and usable in the field.
Collaboration between all parties Growers desire to use it varies - demonstrating value has been difficult in the past but making significant gains through a lot of effort now
None
Time to understand it/ change
Time
Phone signal coverage and data transfer rates. 30% of my checking area is still without any or adequate phone coverage.
Time to learn new UI.
Connectivity and knowledge
Way too much useless stuff, just because its new doesn't make it better
Time
Lack of time Poor reception on farms
Finding the right people or courses to learn more.
Mobile coverage.
Phone coverage
Too many apps and software doing very specific jobs. Not enough combined or integrated packages.
Time
How it can benefit my clients
Time to gain an understanding
Young staff
Acquiring information from growers to make it worth while
Knowing what's out there and knowing how to use it
There are more variabilities in our farming system then any increases we can gain with digital technology and to date, uncertain the technology is at a point whereby it can aid our decision making
Mobile service Proof of concept Economics
Client willingness to also adopt
Cost and return on investment Applying the tech in the business that saves time and not uses up more time without creating value
Fully understanding and knowing how to use the technology efficiently to be a value to clients and the industry

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