



Australian Government

Cotton Research and
Development Corporation



QUALITATIVE REPORT

on the 2016–17 cotton season:
A survey of consultants





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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 65 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 513 cotton growers, and covered 318,472 hectares: 55% of the Australia cotton production area for the 2016-17 season (not adjusted for row spacing). This is based on the 2016-17 production figure of 583,574 hectares (Cotton Australia).

METHODOLOGY

The survey consisted of 65 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 in June and July 2017, with questions referring to the 2016-17 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 2016-17 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.



Australian Government
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Publisher CRDC
Editor Liz Todd for Crop Consultants Australia
Design Black Canvas
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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?*

65 respondents

49 consultants completed the survey on behalf of their business or business unit, which involved completing the specific questions relating to staff, hectares and 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?*

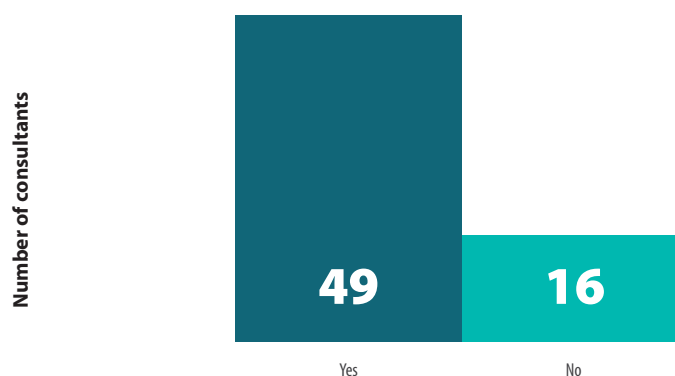
65 respondents

3

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

65 respondents

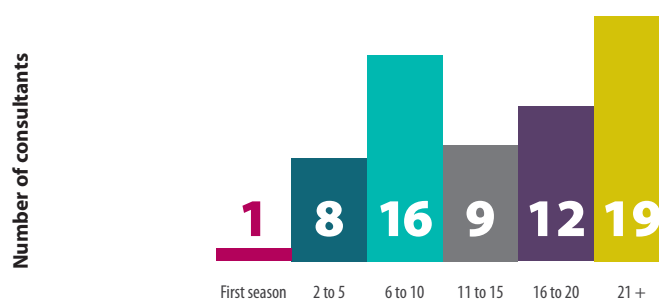
PRIMARY BUSINESS PERSON COMPLETING SURVEY



NATURE OF CONSULTANCY



NUMBER OF SEASONS CONSULTING IN COTTON



4

How many permanent staff were employed in your business to service cotton clients in January 2017?

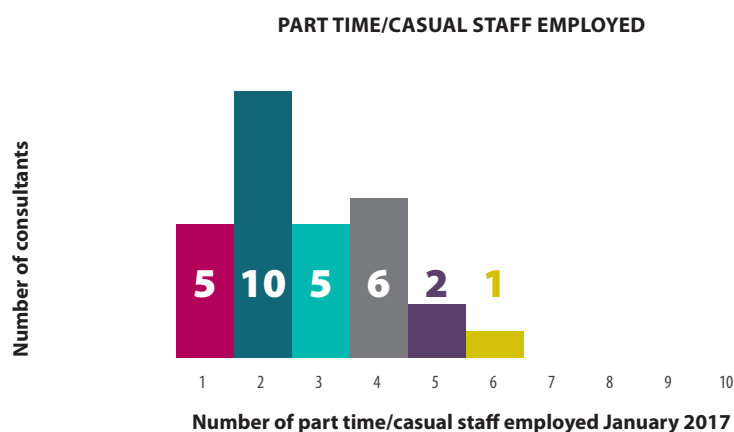
46 respondents



5

How many part time/casual staff were employed in your business to service cotton clients in January 2017?

47 respondents



6

With reference to recruitment for the 2016-17 season, how hard was it to find suitable applicants and fill positions?

48 respondents





THE CONSULTANTS AND THEIR CLIENTS

7

How would you rate your job satisfaction out of 10?

65 respondents



8

If you could automate or have a new technology developed to support one component of your in-crop monitoring activities, what would it be?

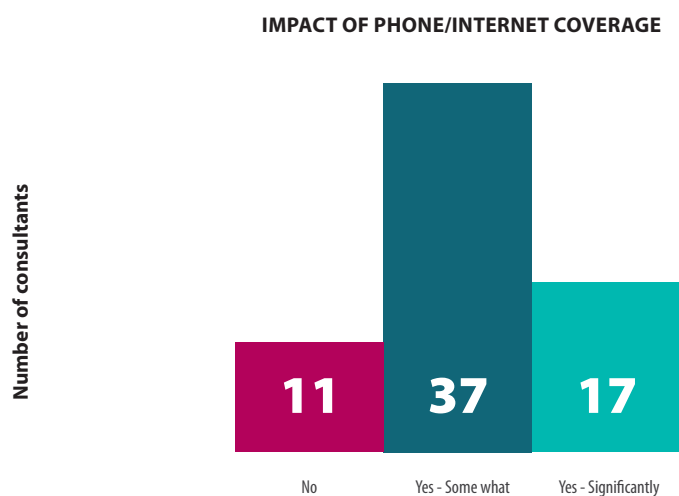
53 respondents

This was an open question. Please see the appendix for full individual responses.

9

Does limited phone/internet coverage/reliability impacting your ability to do your job or to innovate?

65 respondents



10

Please provide comment on the previous question relating to phone/internet coverage/reliability impact your ability to do your job or to innovate?

59 respondents

This was an open question. Please see the appendix for full individual responses.

ABOUT THE CLIENTS

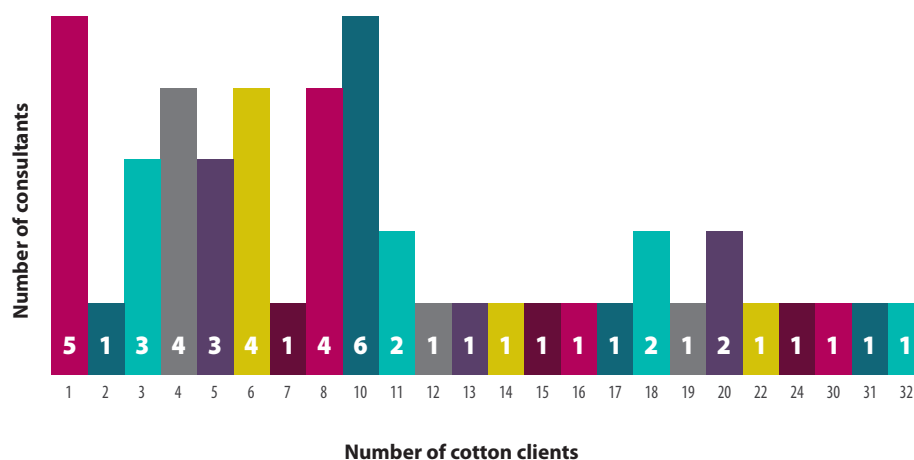
11

How many cotton clients did the business (or business unit) service in 2016-17?*

49 respondents

Note A total of 513 clients were represented in the survey.

CLIENTS SERVICED PER BUSINESS



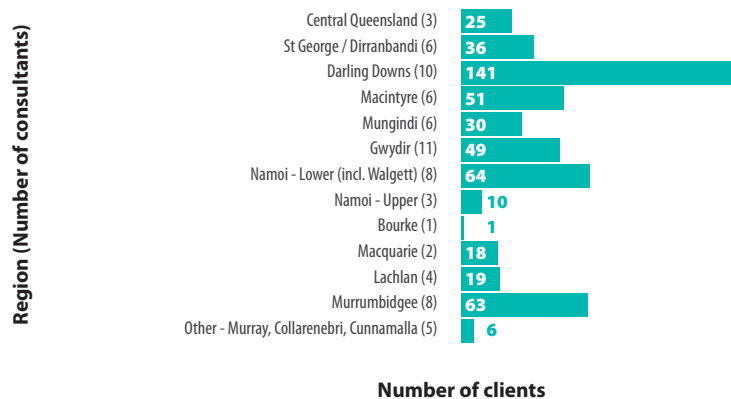
12

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

49 respondents

Note Some consultants have clients in more than one region, hence the total number of consultants is higher than the 49 respondents across the regions.

LOCATION OF CLIENTS





THE CONSULTANTS AND THEIR CLIENTS

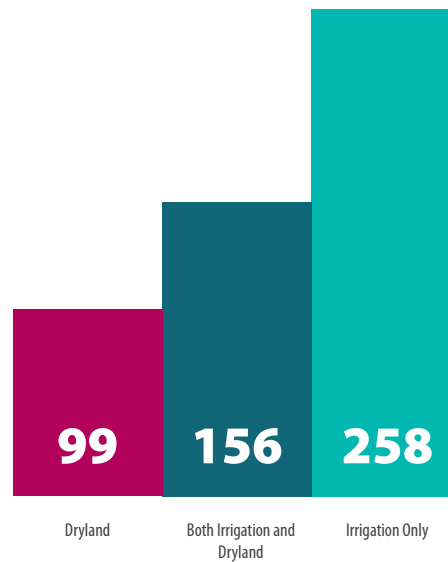
13

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

52 respondents

Number of clients

IRRIGATION STATUS



COVERAGE

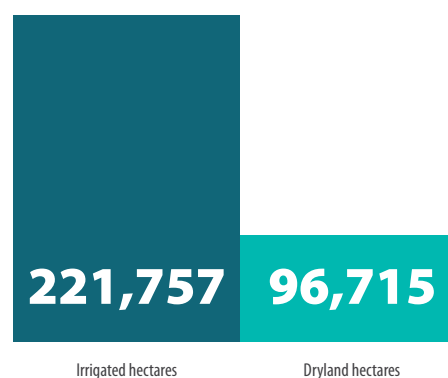
14

How many hectares of cotton (total area, not adjusted for row spacing) did your clients grow in the 2016-17 season?*

49 respondents

Note Clients grew of total of 318,472 hectares of which 221,757 were irrigated and 96,715 were dryland.

TOTAL SURVEY HECTARES





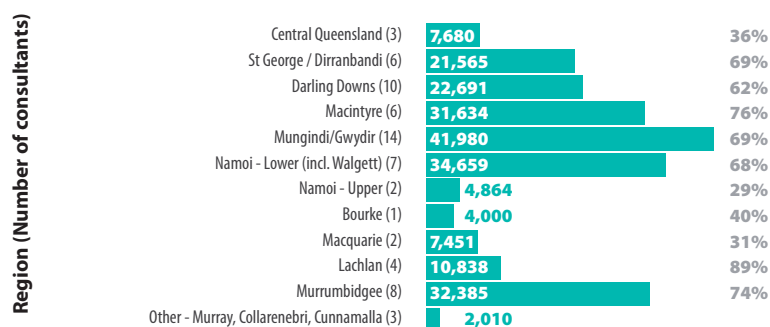
ON-FARM PRACTICES AND ATTITUDES

15

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

48 respondents

IRRIGATED COTTON HECTARES BY REGION



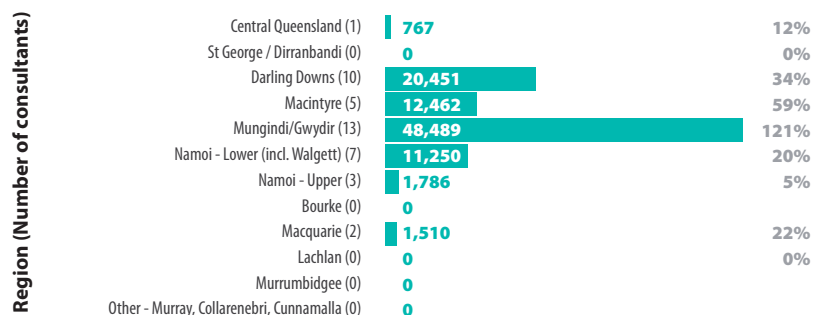
Number of hectares / Percentage of total cotton area per region

16

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

38 respondents

DRYLAND COTTON HECTARES BY REGION



Number of hectares / Percentage of total cotton area per region

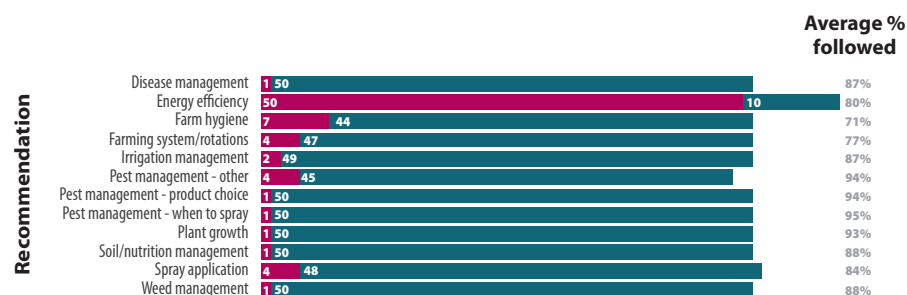
MANAGEMENT CONSTRAINTS

17

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

65 respondents

PORTION OF RECOMMENDATIONS CLIENTS FOLLOW



Number of consultants / Average percentage followed

Do not give advice Do give advice



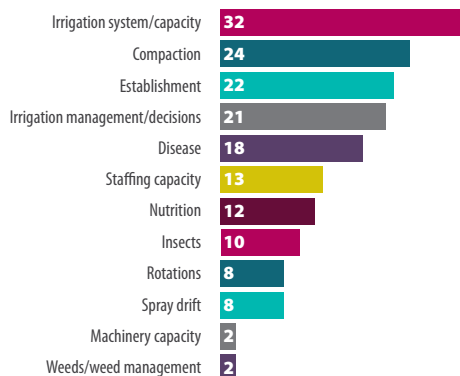
ON-FARM PRACTICES AND ATTITUDES

18

From the following options, what is the biggest yield constraint for your clients? (Consultants selected up to 3)

63 respondents

BIGGEST YIELD CONSTRAINTS



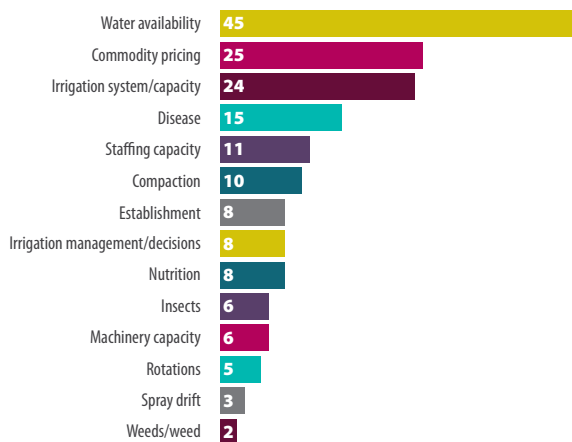
Number of consultants

19

What is the biggest profitability constraint for your clients? (Consultants selected up to 3)

65 respondents

BIGGEST PROFITABILITY CONSTRAINTS



Number of consultants

20

How has the biggest yield/profitability constraints changed for your clients over the last 5 years?

57 respondents

This was an open question. Please see the appendix for full individual responses.

21

Describe the 2016-17 cotton season in five words or less.

65 respondents



This was an open question. Please see the appendix for full individual responses.

PLANTING

22

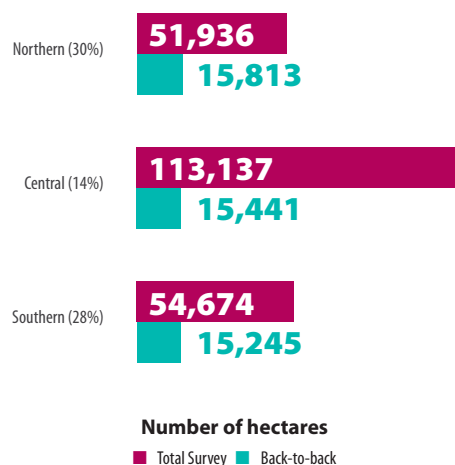
Of your irrigated cotton hectares in 2016-17, how many were back-to-back cotton, i.e. cotton grown in the same field in the 2015-16 and 2016-17 seasons?*

47 respondents

Note A total of 46,499 irrigated hectares (21% percent of irrigated survey hectares) were back-to-back cotton.

Region (percentage back-to-back)

BACK-TO-BACK IRRIGATED COTTON





ON-FARM PRACTICES AND ATTITUDES

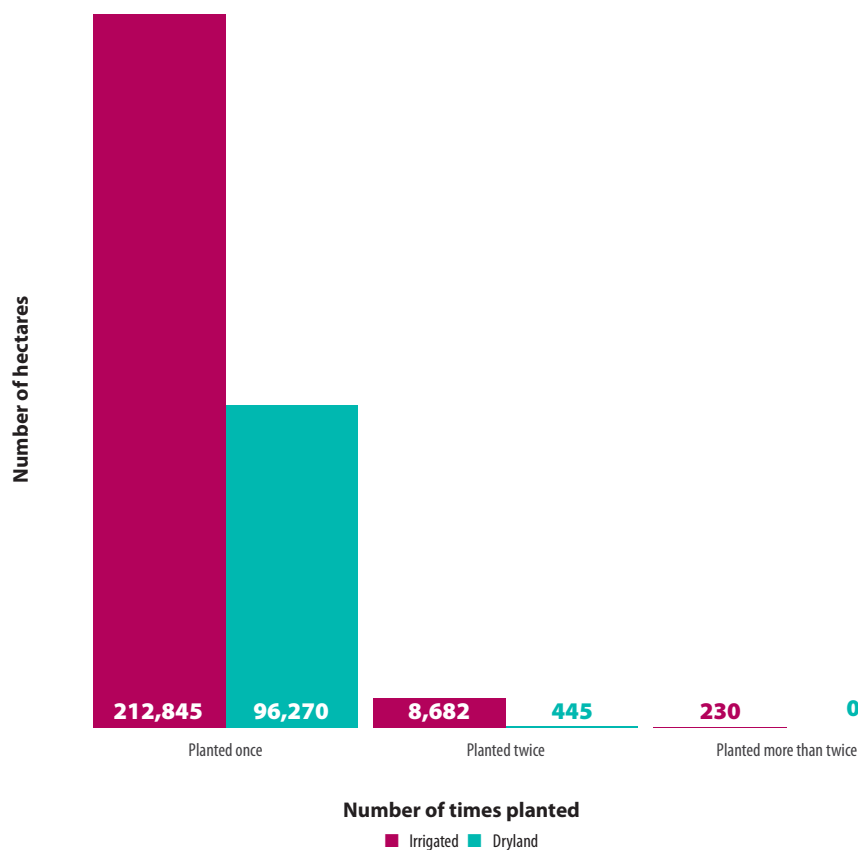
23

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

36 respondents

Note In total, 9,357 hectares were planted more than once.

REPLANTED HECTARES



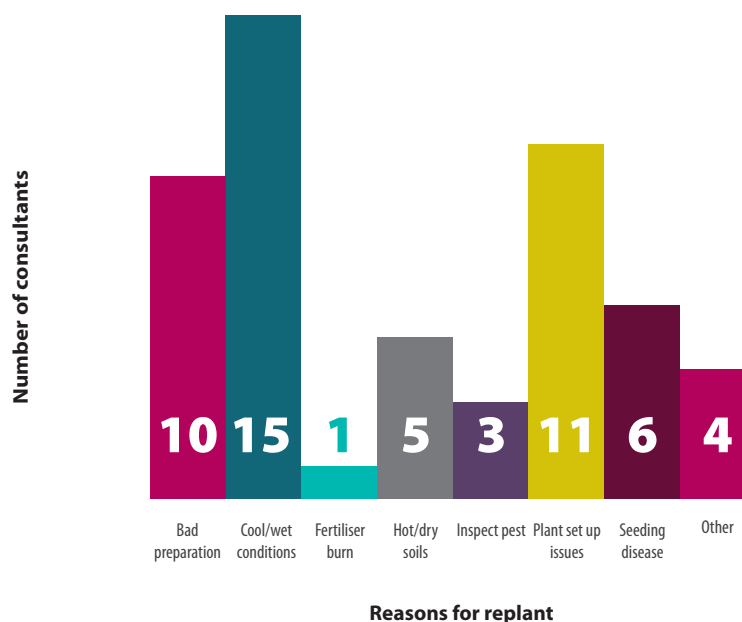
24

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

39 respondents

Note Other responses included: Poor seedling vigour (2), bed wetting up problems (1), hail and sand blasting (1).

REASONS FOR REPLANTS

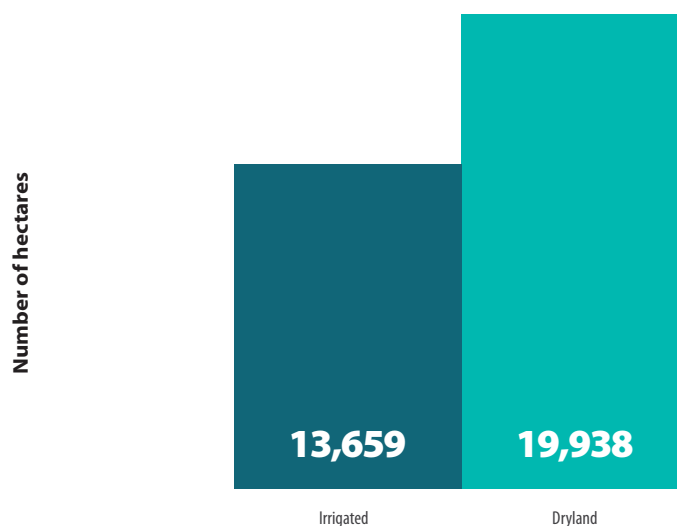


25

Of your irrigated and dryland cotton hectares, how many hectares were planted following a winter cover crop?

47 respondents

COTTON PLANTED FOLLOWING A WINTER COVER CROP



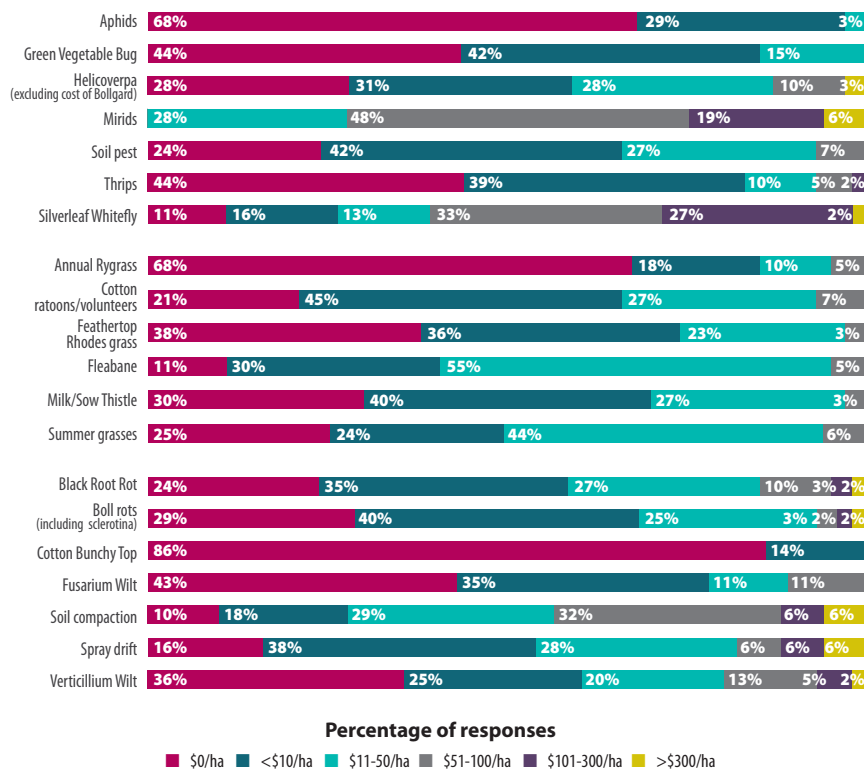
CROP PROTECTION

26

Rate the average impacts you think the following pests, weeds, diseases and disorders had on the profitability of your clients' cotton crops in 2016-17, either through budgeted or unbudgeted costs or through yield loss.*

65 respondents

ESTIMATED FINANCIAL IMPACT OF INSECTS, WEEDS, DISEASES/DISORDERS





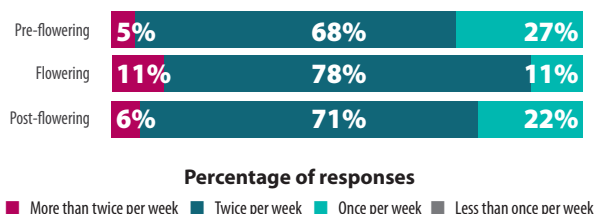
ON-FARM PRACTICES AND ATTITUDES

27

How frequently do you check Bollgard II cotton for making decisions about insect pests - pre-flowering, during flowering and post flowering?*

63 respondents

FREQUENCY OF CHECKING BOLLGARD II COTTON

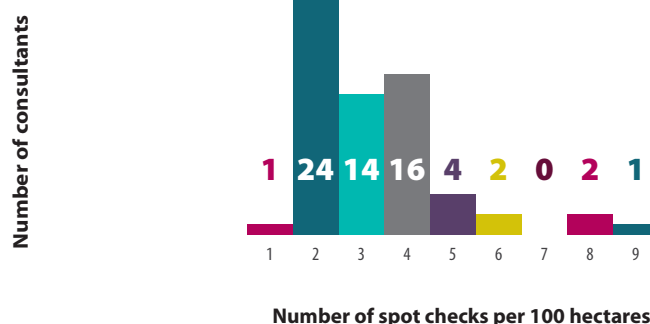


28

How many individual spot checks do you do per 100ha of cotton?

64 respondents

SPOT CHECKS PER 100 HECTARES OF COTTON

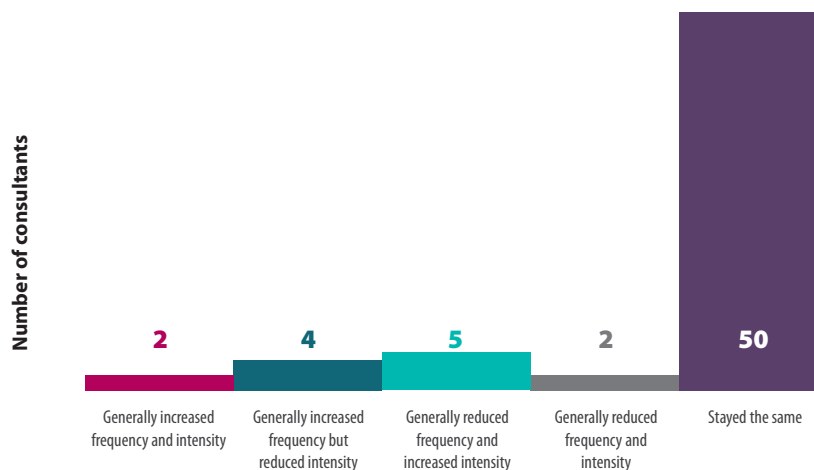


29

How has the frequency (number checks/week) and intensity (checks per 100ha) of your pest monitoring changed in the last 5 years?

63 respondents

CHANGE IN FREQUENCY AND INTENSITY OF CHECKS OVER 5 YEARS

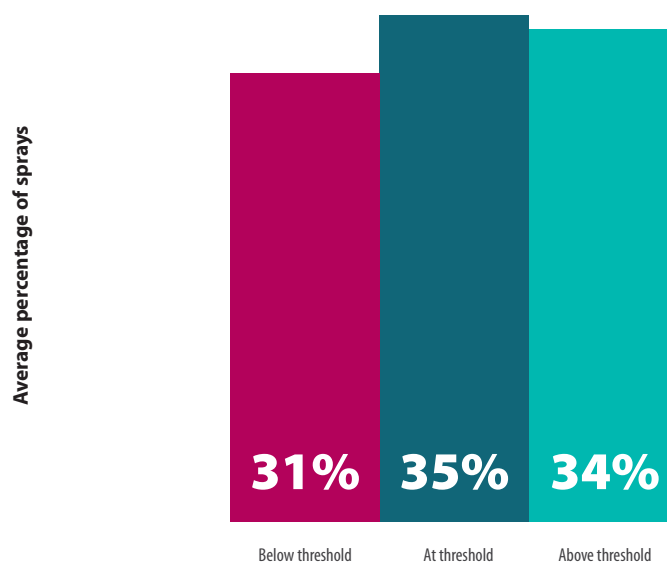


30

With regards to industry Mirid thresholds, how often were the sprays you requested for Mirids above, at or below the industry's general threshold?*

65 respondents

MIRID SPRAYS COMPARED TO INDUSTRY THRESHOLD

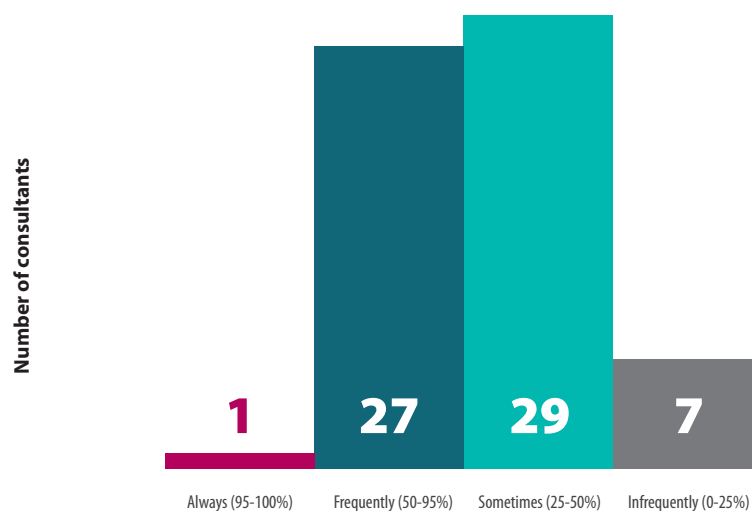


31

Do you think the mirid threshold is reliable?

64 respondents

RELIABILITY OF MIRID THRESHOLD



32

What are the factors that influence your preferred chemical option for managing Mirids?

63 respondents

This was an open question. Please see the appendix for full individual responses.



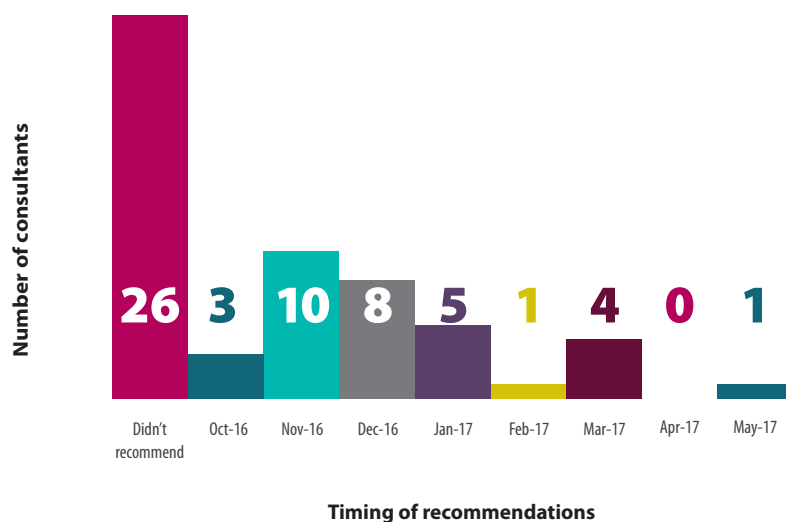
ON-FARM PRACTICES AND ATTITUDES

33

When during the 2016-17 cotton season did you make your FIRST recommendation to apply dimethoate/omethoate?*

58 respondents

TIMING OF FIRST DIMETHOATE/OMETHOATE RECOMMENDATION

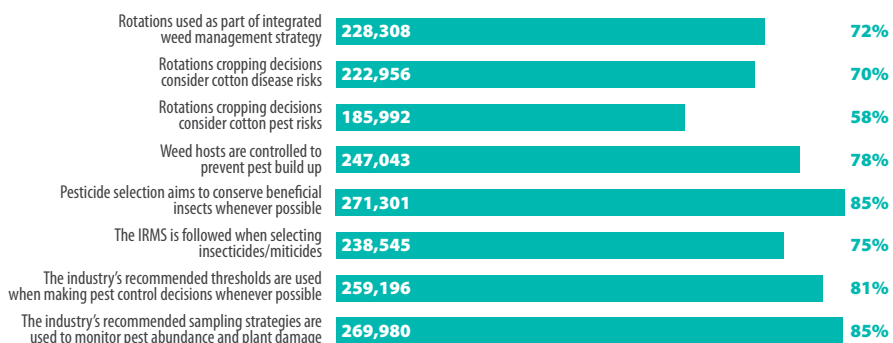


34

With regards to insect pest management in 2016-17 cotton fields, how widely used (in terms of total irrigated and dryland hectares) were the practices listed.*

49 respondents

INSECT PEST MANAGEMENT PRACTICES



Number of hectares / Percentage of total survey hectares

35

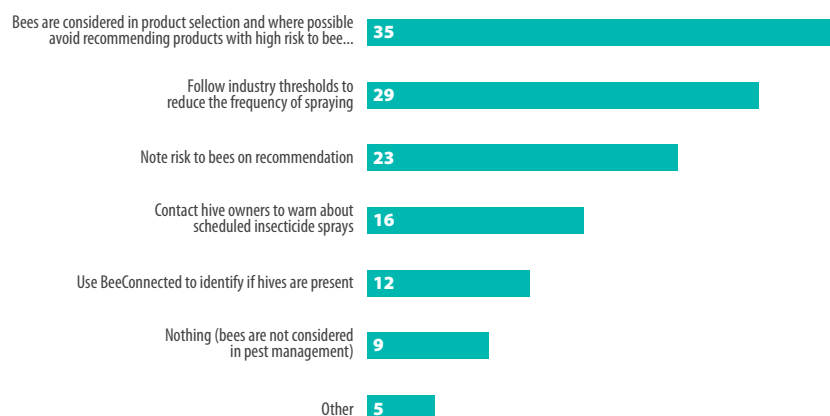
What do you do to minimise impact on bees?*

Consultants selected multiple options.

65 respondents

Note Other responses included: Avoid fipronil when possible, Bee Connected doesn't have all hives marked on it, unable to find hives on Bee Connected, considered but nothing done, timing of spray.

TACTICS TO MINIMISE IMPACT ON BEES



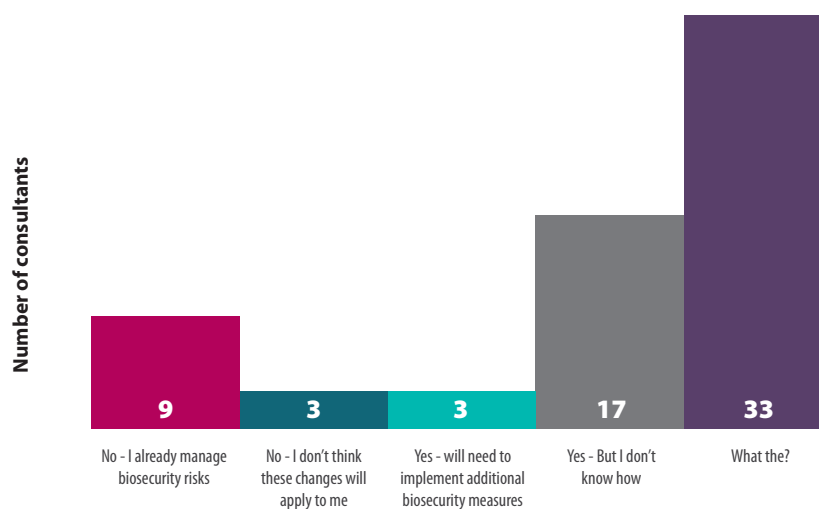
Number of responses

36

Do you think the new Queensland Biosecurity legislation that imposes a General Biosecurity Obligation on persons; or the proposed NSW General Biosecurity Duty will impact how you do business?

65 respondents

BIOSECURITY LEGISLATION IMPACTS





ON-FARM PRACTICES AND ATTITUDES

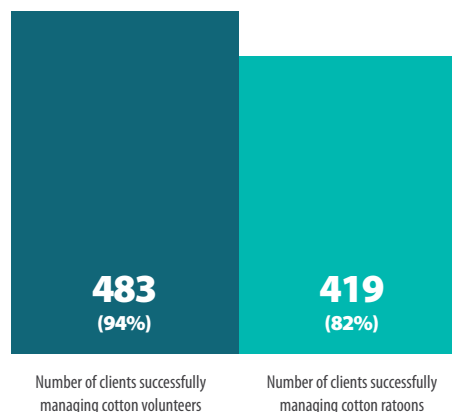
37

Of your cotton clients, how many do you think are successfully managing cotton volunteers all of the time?*

49 respondents

MANAGING COTTON VOLUNTEERS

Number of clients

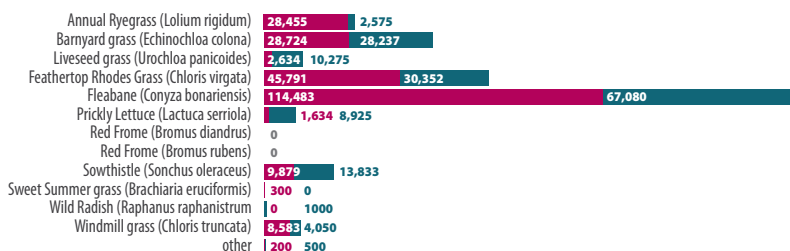


38

Of the irrigated hectares and dryland hectares over which you consulted in 2016-17, please estimate the total areas you believe to contain populations of glyphosate resistant weeds.

49 respondents

AREA OF GLYPHOSATE RESISTANT WEEDS



Number of hectares

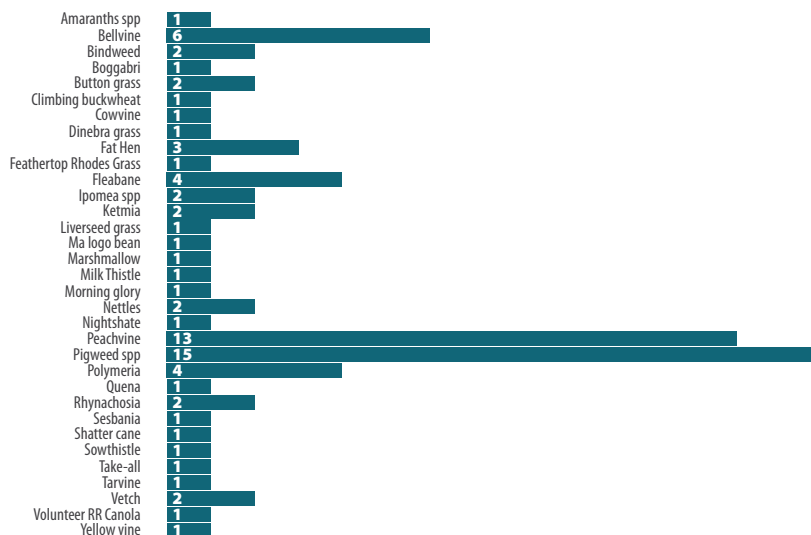
■ Irrigated ■ Dryland

39

Aside from weed species known to have glyphosate resistance (listed in previous question), what other weed species are becoming more challenging to control in the irrigated farming system?

34 respondents

OTHER CHALLENGING WEEDS



Number of responses

40

Of the irrigated and dryland cotton hectares over which you consulted in 2016-17, what is the total area (suspected or confirmed) with herbicide resistant weeds?

46 respondents

	Group M	Group I	TOTAL area with herbicide resistance (All herbicide mode of action groups including M & I)
Irrigated	75,177 ha	1,700 ha	79,467 ha
Dryland	33,390 ha	1,750 ha	40,440 ha

41

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

48 respondents

105 cotton clients (20%) have had herbicide resistance confirmed.

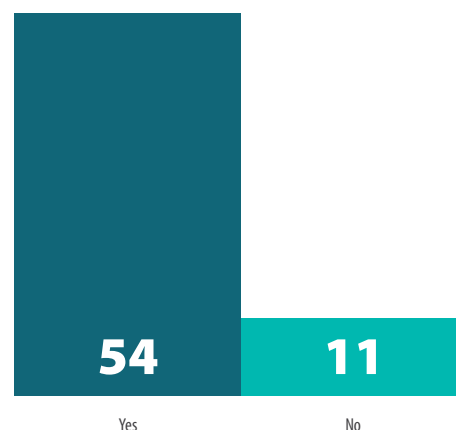
42

Do you think confirming herbicide resistance has an impact on management decisions?

65 respondents

CONFIRMING HERBICIDE RESISTANCE IMPACT ON MANAGEMENT

Number of consultants





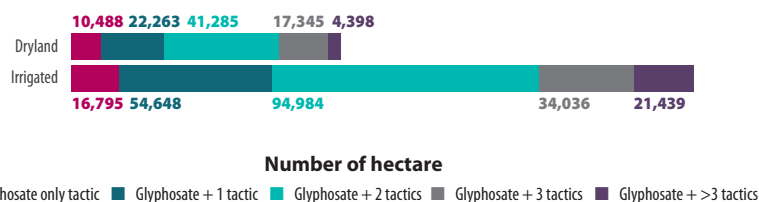
ON-FARM PRACTICES AND ATTITUDES

43

Of the irrigated and dryland cotton hectares over which you consulted in 2016-17, 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.*

49 respondents

WEED CONTROL TACTICS

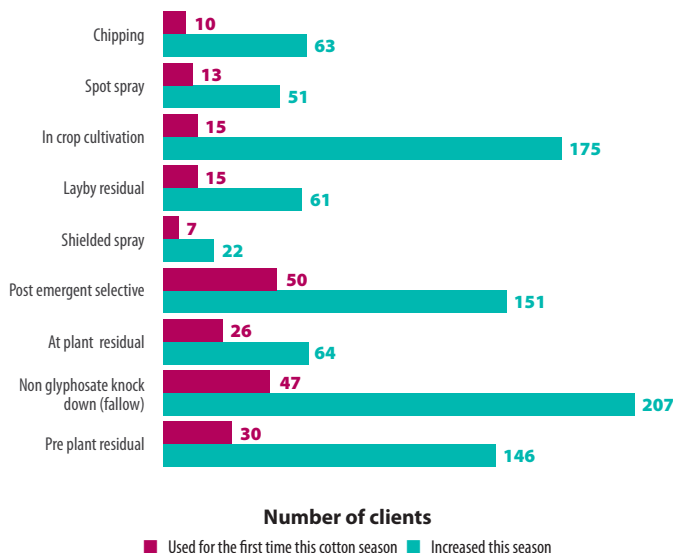


44

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

47 respondents

WEED CONTROL TACTICS INCREASED OR INTRODUCED

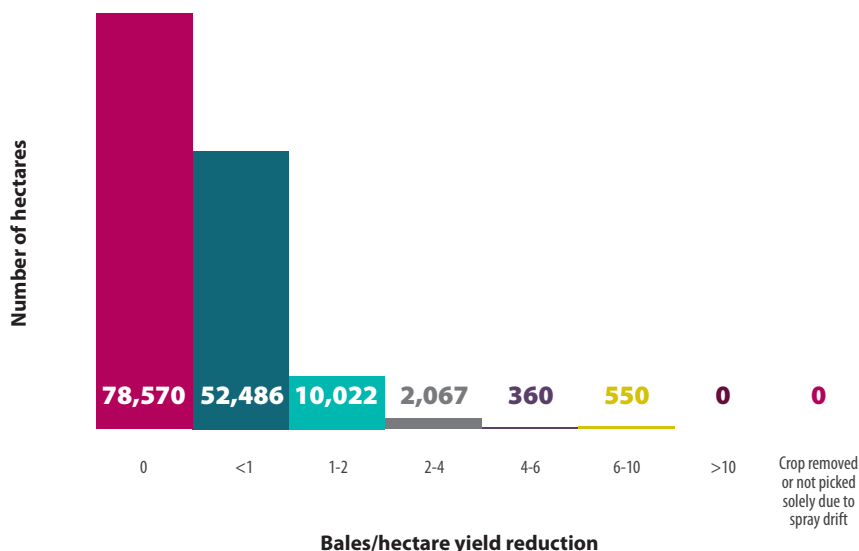


45

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

46 respondents

IMPACT FROM SPRAY DRIFT ON COTTON YIELD

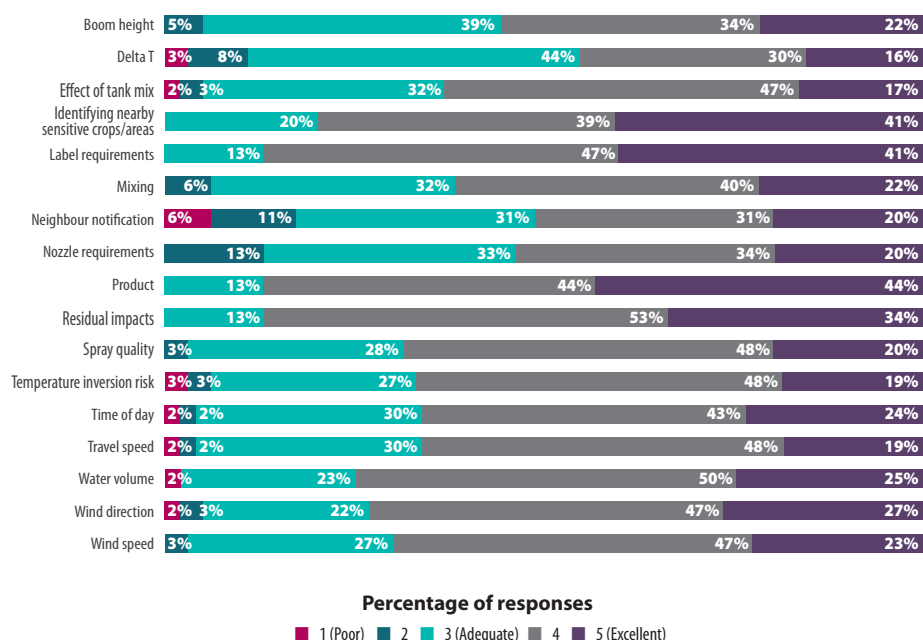


46

How would you rate your abilities to offer advice and assist your clients in the following aspects of spray application decisions?

64 respondents

ADVICE ON SPRAY APPLICATION



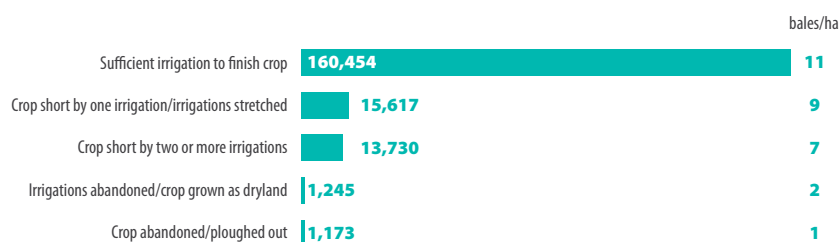
WATER MANAGEMENT

47

For the irrigated cotton hectares over which you consulted, how much area in 2016-17 season was affected by limited water? Please also indicate your best estimates of yield in each situation.*

46 respondents

IRRIGATED AREA AFFECTED BY LIMITED WATER



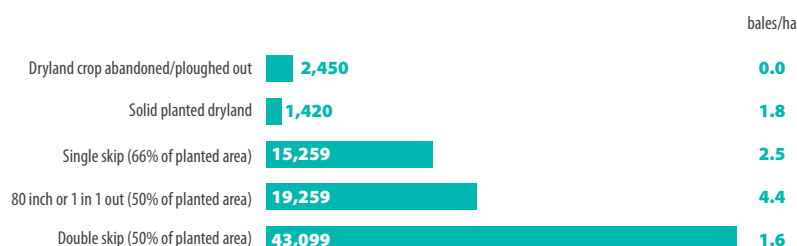
Number of hectares / Yield (bales/hectare)

48

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

35 respondents

DRYLAND AREA AFFECTED BY LIMITED WATER



Number of hectares / Yield (bales/hectare)



ON-FARM PRACTICES AND ATTITUDES

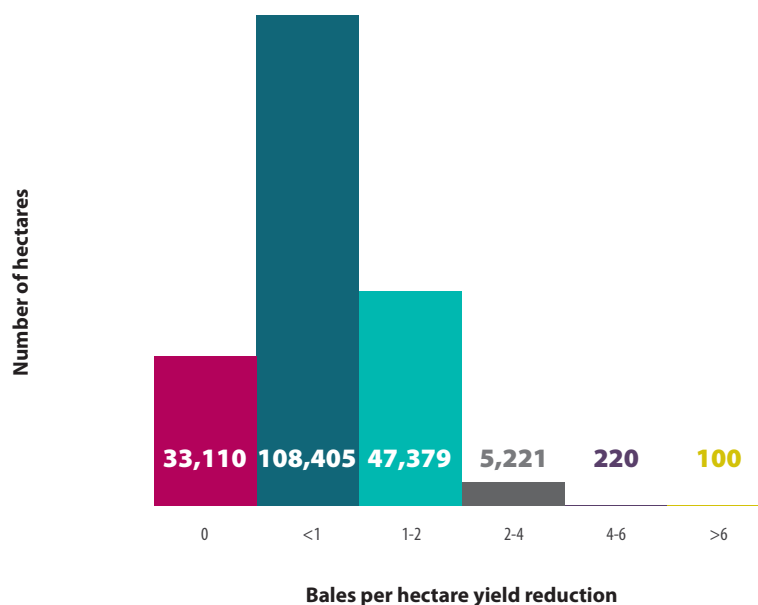
SOIL MANAGEMENT

49

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.

47 respondents

COMPACTION IMPACTS ON YIELD



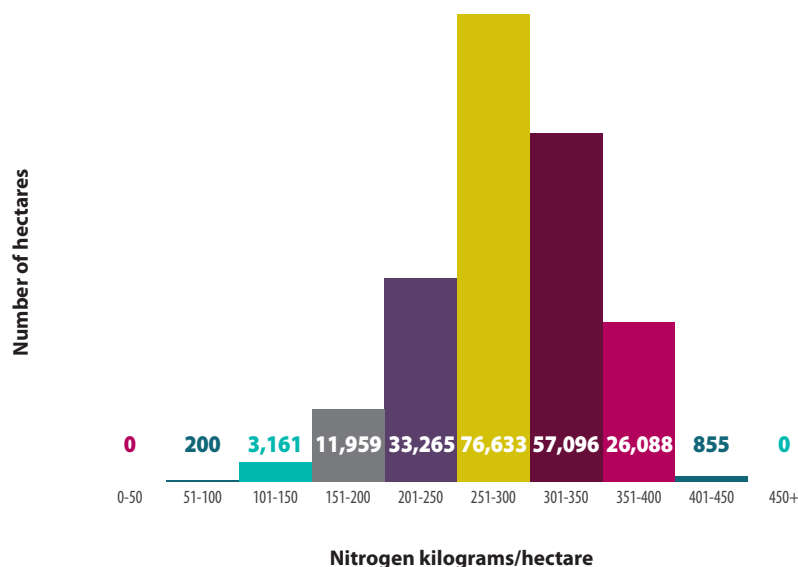
NUTRITION MANAGEMENT

50

What is your best estimate on how much nitrogen was applied per hectare for your total irrigated cotton hectares in 2016-17? *

47 respondents

NITROGEN ON IRRIGATED COTTON HECTARES

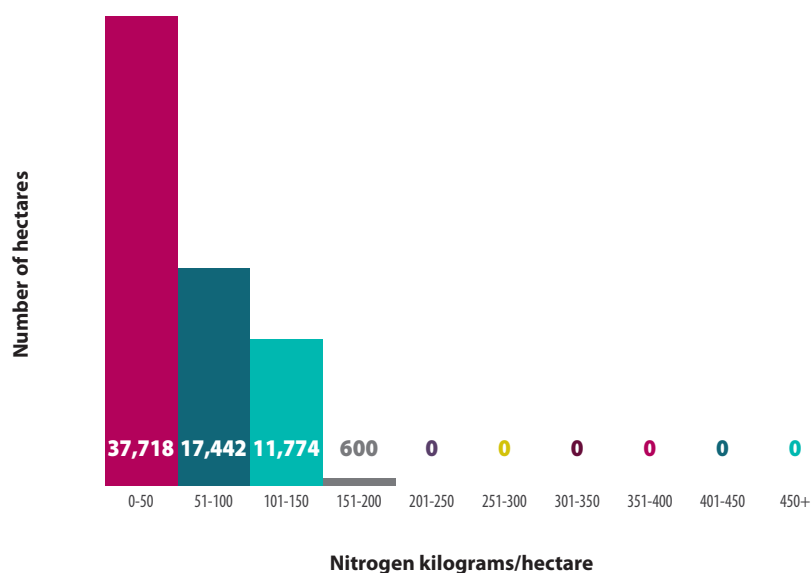


51

What is your best estimate on how much nitrogen was applied per hectare for your total dryland cotton hectares in 2016-17?*

32 respondents

NITROGEN ON DRYLAND HECTARES

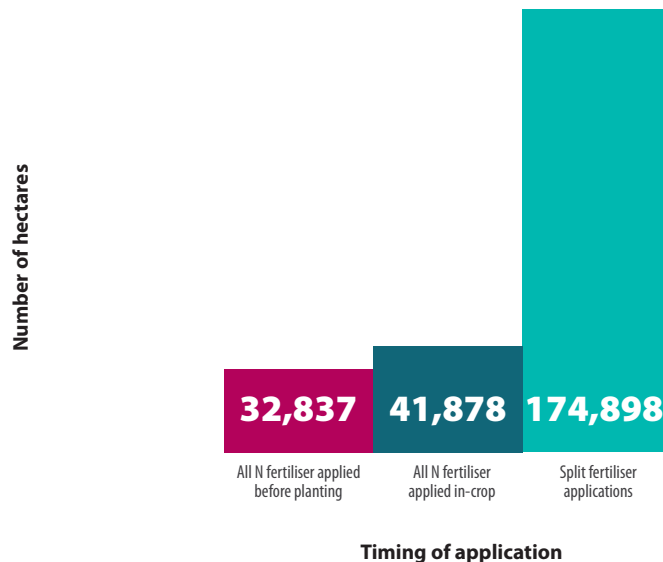


52

In 2016-17, when were the cotton crops' nitrogen fertiliser requirements applied?*

48 respondents

TIMING OF NITROGEN APPLICATIONS

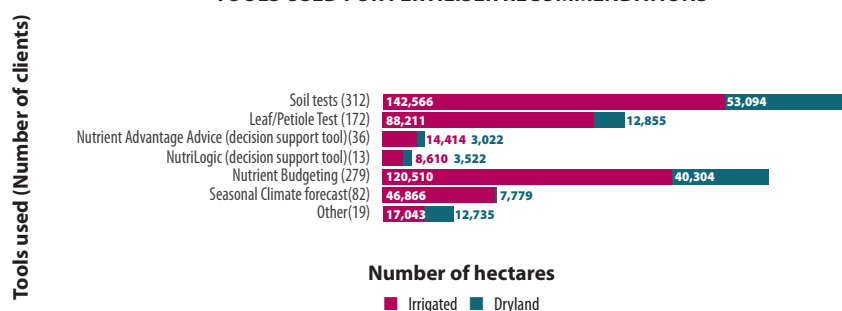


53

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? *

48 respondents

TOOLS USED FOR FERTILISER RECOMMENDATIONS





ON-FARM PRACTICES AND ATTITUDES

54

Other fertiliser tools used specified.*

11 respondents

Soil Mate - Back Paddock

Crop symptoms

Crop history in paddock and experience

Gas Nh3, Urea, Water Run Urea, N26

Was hard in this season as it was so wet for soil testing. Did more petiole testing to check in crop N levels

N-TESTER and imagery

Excel spreadsheet

Nutritional consultant

Growers have established their own use rates over a period of time

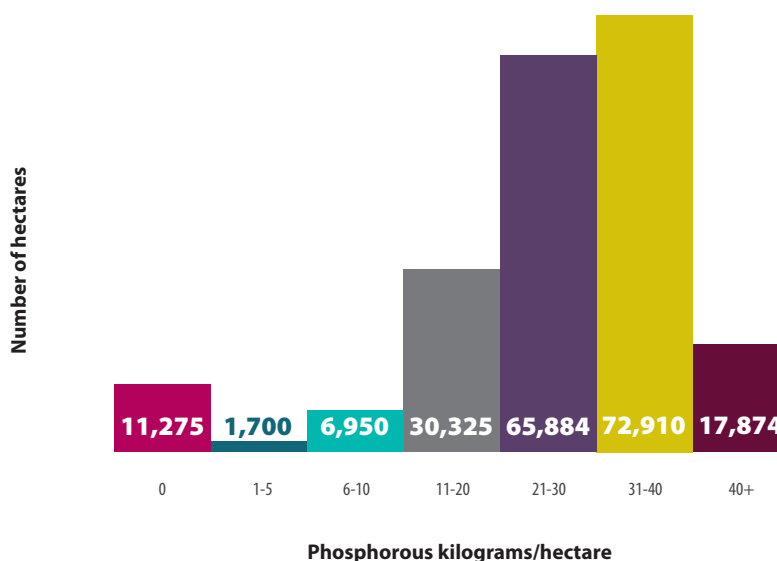
Back Paddock Soil Mate Advisor Software

55

What is your best estimate on how much phosphorus was applied per hectare for your total IRRIGATED cotton hectares in 2016-17?*(Kg P applied, not fertiliser product)

47 respondents

PHOSPHORUS ON IRRIGATED HECTARES



56

What minimum targets are you aiming for with regards to fruit retention or plant growth?

58 respondents

	First Flower			Peak Flower			Cut out			Defoliation		
	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max
Number of nodes	14.7	8	17	21.3	17	26	24.8	20	30	25.8	22	30
Retention (%)	74	50	100	77.4	60	100	73	60	95	67.9	50	90
NAWF	8.3	7	10	6.8	4	8	4.2	2	8	1	1	1
NACB	8	8	8	8.5	8	9	8.6	6	16	4.1	3	6



APPENDIX

WHAT IS INCLUDED IN THE APPENDIX?

Following on from here, you will find individual responses to Questions 8, 10, 20, 21 and 33 as these responses expand on, or add to an understanding of, graphed information.

QUESTION 8

If you could automate or have a new technology developed to support one component of your in-crop monitoring activities, what would it be?

- Drone to obtain images of crops.
- Boll/square counts via drone.
- Higher resolution multispectral data capture by autonomous drone.
- Something that the bug checkers can have so we can see what they are seeing live time. Face time doesn't work well enough.
- Live stream visual from the checkers, crop moisture status etc.
- Phone reception.
- Better phone reception.
- Irrigation scheduling.
- Scouting app with versatile checking sheet, written by iPad pen and converted into typed text.
- Better recording/note taking applications.
- An app to combine everyone notes together for each field, save hours in the office writing them up manually.
- Ease of data entry.
- Easy recording pest programs with insect id.
- Self-updating columns in weekly report table.
- Insect monitoring/reporting.
- Data recording by voice dictation.
- Faultless Robotic bug checker - "Tell 'im he's dreaming". Electronic checksheet shared with grower, bug checker and consultant - currently using a mix of paper check sheets and entering into Excel spreadsheet. Have some growers who are able to file share the spreadsheet.
- Check recording App that you can customise to your needs.
- Automated crop checking program linked to Agworld.
- Low cost weekly satellite images of each paddock would be useful.
- Cotton insect field recording app which can be tailored to what you need.
- An automation of checking that saves me walking in the mud would be handy.
- We spend a lot of time beat sheeting and plant mapping.
- Report writing.
- Irrigation scheduling.
- Decent voice recognition program so as to be able to dictate reports whilst driving rather than spending hours at night typing. Have tried a few programs but the background noise of the vehicle affects it too badly.
- Electronic check sheets.
- Whitefly nymph assessment and thresholds.
- Insect population monitoring.
- Easier, cheaper and more accurate moisture monitoring.
- For all parts of the field to have a "stress level" pretty simple. Gauge 1-10 for heat stress, dry stress, waterlogged stress, evaporative demand stress.
- Soil variability and Nitrogen management.
- Surviving weed detection.
- A real-time snapshot into the soil profile of what nutrients are available in the soil and the uptake from the plants at that time, or a prediction of future use based on the nutrient available in the soil. If there was a program or a correlation between the Phytex Sensors and the C-Probes (moisture probes) to indicate an ideal irrigation time. If this time was based on the predicted crop stress from the Phytex Sensors and then correlated with the moisture availability indicated by the moisture probe to give an ideal irrigation date.
- Insect density monitoring from drones i.e. mite or mealybugs infestations.



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Automated insect checking/counting - would make counts more consistent than when using different manual checkers.

Bug checking.

Cheaper moisture probes.

Boll counts.

Measuring crop nitrogen status/content.

Rapid in-crop N monitoring.

Mirid monitoring.

Automatic plant mapper, to use to identify the plant fruit loss. Able to distinguish between fruit loss and a non-viable fruit position.

Instant results for tissue analysis.

Really time plant moisture requirements.

On the go soil nutrition and moisture monitoring. On the go plant tissue nutrient monitoring.

Remote scouting of crops for insects, diseases and physiology.

Some kind of mirid trap to get a better handle on thresholds.

Automated crop scout.

Plant Nutrient status - in field leaf/petioles etc.

In field device for recording pest/beneficial incidence.

Insect/Predator as well as Plant Growth monitoring would be great.

I think the canopy temperature sensors currently under development will be a valuable tool to aid with irrigation scheduling, going forward. The development and calibration of an adult mirid/plant bug, trapping system, would be useful. Drones will become increasingly useful for crop monitoring, once battery technology, and associated flight times improve.

QUESTION 10

Please provide comment on the previous question relating to phone/internet coverage/reliability impact your ability to do your job or to innovate?

Communication with staff and clients is vitally important but time consuming. Having to sit phone in car kit and wait in car due to poor coverage is costing company and grower money whilst not improving effective communication due to time constraints.

1st example: We use Agworld for our recs and as a business with multiple agronomists who share clients it is essential that we have phone service to sync our recs ASAP; but moreover, 2nd example: in addition to above it is essential we do our recs and the grower receives before we leave the farm and not some hours later when we come into range for sync and downloading and emailing. 3rd example: just being able to contact and talk to growers ASAP after we've finished otherwise end up making last of phone calls at once when do get back in service. If we had service all the time we can make better use of our time by calling growers during our travel time between farms.

Can't talk to growers, can't access info on the net - labels, weather...

Poor reception to make or receive urgent calls. Slow internet delays in doing paperwork in an already long day.

Delayed communication to growers and or contractors for direction in farming activities. Increased travel cost to physically check moisture monitoring and weather stations.

Unable to connect to farmers on farm in areas. Unable to connect with to web in areas to access information, and to display new technology to growers.

Very poor 50km out of town. Agworld wont sync and phone calls are limited. Growers expect immediate advice not in late afternoon when back in town.

Mostly impacting data transfer between agronomist and client.

Phone/data is unreliable at times to enable quick delivery of recs to client.

Sometimes delay in contacting clients etc due to black-spots. Not a major issue. In-ar mobile phone boosters are a help.

Ineffective coverage means reduced communication with growers by calls, messages and emails. It also reduces the ability to complete internet searches to solve problems and create recommendations.

Very hard to communicate with growers and their staff when 30% of the area I check is out of reliable mobile phone service. 15% has no signal. Timely communication is the first issue. Reluctance to take on consulting or management software or drone data processing software that is cloud based when I know how poor our connectivity is.

Having a large number of farms that are just on the edge of range or out of range means a lot of catching up on messages once back in range which holds up checking fields. Not being able to travel between Mungindi and St George without the phones dropping out at 4 different areas makes it difficult to have continuous conversations. Being able to download irrigation probe data also extremely difficult at times.

Drop outs talking to clients, poor internet sometimes searching for info. No service sometimes. Cost of data on mobile and lack of big data download capacity.

On farm research.

No service makes it difficult to organise contractors/farm staff efficiently.

Helps communication and enhanced ability to have information access.

No, due to that the software we use is designed to handle the lack of internet coverage.

Internet is reasonable where I work.

Slow data is a concern. Some black spots.

I don't have internet access in all areas I provide service.

I am pretty lucky. Most farms have good internet and phone service. However, some have very little service. The main issue is data speed for upload and download. I seem to have access to the internet in most places, however many of the services we use are data rich and require a lot of data to be sent/received and this causes issues with internet errors such as timing out...

In the past we have had a lot of issues with C-probes being able to communicate their data because of poor Telstra connectivity. On our farm we are probably relatively lucky but on our other farms I know there are issues with having to use several different service providers in their probes just to get the data to send.

Poor internet slows use of web based systems.

Areas that have phone range but not data - this impacts upon my use of cloud based software when I cannot send recs after making them due to not having data signal.

Some areas I work in does not have service for data usage, so this impacts the things I can do while at those farms.

Accessing online material or emailing reports is at times difficult and needs to be delayed due to limited phone coverage.

My work region is relatively close to Dalby so generally ok but better mobile internet would be a help.

We have a data drought. Very poor data transfer speeds.

50% of my farms have limited hand held phone range, so any apps that require connectivity are redundant. I do not have reliable mobile phone service at my house in Goondiwindi. When down loads are slow you tend to not want to use that application.

Sometimes data doesn't work at all in areas where it usually does which makes it impossible to check information regarding chemicals and thresholds. There are periods of time where the phone drops out dozens of times per day in areas that typically have coverage. Proper communication between staff, management and the growers suffers and can lead to major issues.

Phone and internet coverage is very poor in the Rowena area which makes it hard to use weather stations and moisture probes unless they have large areas, boosters or satellite capability.

The ability to use real-time apps/telemetry and to send and receive emails/recommendations on the go. Simply being able to make a phone call is tough enough.

Once drones become more efficient, then better internet speeds than those currently available will be necessary to help utilize the data collected in a timely fashion.

Poor mobile service can impact on research while on farm.

Some areas internet is patchy, to have to leave reports until suitable service. Can make communication difficult if working with someone and can't get messages through.



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In some areas it is difficult to even make a phone call let alone innovate using web based software.
Phone reception black spots. Needed to communicate and send recs, reports.
Phone coverage is unreliable and can drop out when in limited coverage even with the new car booster.
Reasonable coverage across farm. Poor access to data when away from main office or using phone.
We had issues this season just gone where our mobile service dropped in and out, which stopped us from receiving messages from our bug checkers and also made it hard to send and receive our check sheets in a timely manner.
To many areas can't get good service in a 10hr day I'm out of service for at least 3 hrs. Also, speed, need more data quickly (maps/photos/video/live stream).
Coverage is very poor in my area. Internet is slow.
Some blackspot areas to use internet.
Majority of farms have negligible service, phone calls, recs and reports need to be done later.
Phone service is poor unless you are close to town which means in paddock internet access is weak.
Skymuster has improved home/office internet significantly but data packages are expensive.
No internet coverage in areas limits the ability to use programs utilising cloud based functions.
60% of the time in field I have no coverage.
Drops out in a lot of areas.
Better phone coverage would allow for more efficient use of travel time.
Service generally adequate 90 % of the time.
Reasonable coverage throughout my area.
No service no technology.
Limited reliability at times when necessary/needed.
Inconsistent coverage makes it very difficult to receive and conduct calls.
Our area has reasonable coverage on most farms I visit.
Has got better since boosters become available.
Since we have had boosters put in the car the coverage is better.
Used to be an issue, but the recent purchase of a phone booster fitted to my vehicle it has enabled me to have better coverage

QUESTION 20

How has the biggest yield/profitability constraints changed for your clients over the last 5 years?

Quite a large increase in phenoxy drift, especially over the last 2 years. Some crops harvested were yielding at a loss due to summer fallow control from neighbouring farmers.
Black root rot capping yield potential as short growing season. Whitefly, Sclerotinia boll rots adding up.
Cost of production requires top end yields.
Still very similar in the south - anything that affects early plant growth i.e. disease, plant stand, establishment insects will have the greatest effect on yield and profit.
Increased Verticillium Wilt prevalence reducing profitability in some soil types through less yield.
As yield has increased and the varieties have been able to tolerate disease it has encouraged growers to risk back to back cotton growing when water is available - this in turn has magnified disease on farms that already have inoculum present making the severity of disease outbreak more devastating. This ties in with water availability as in the Gwydir the water reliability has decreased increasing financial pressure to grow cotton when water is available.
Incidents of disease (Verticillium Wilt) has increased. Phenoxy herbicide spray drift has varied.
Disease is still a major issue but it is no longer Fusarium its now Vert. Water is always an issue but is getting worse.

Disease mainly verticillium wilt, along with water availability i.e. droughts. Phenoxy drift remains a problem.

A lot of our clients have learnt to manage things better i.e. managing commodity pricing by growing more than one crop type, or managing establishment by making sure ground prep is close to perfect and not rushed.

Better commodity prices for some crops have increased profitability. Better nutrition and irrigation management has led to increased yields.

Quality issues have become a greater particularly colour downgrades. Water availability is much less. Costs have risen.

As we personally grow to be more efficient as a whole farming system we are definitely improving in many areas. Previously establishment has been a major cost and draw back for our business. Constantly replanting every season, sometimes up to 60-80% of our area was a massive drain to our economy. This season our replant area was down to about 20%, although this is still less than ideal, it is a major improvement and our decisions were less black and white. Traditionally what we do not replant can still be very marginal, but this year our plant stands were all quite good and our decision to replant was based on wanting to be at the top, for yields.

Staff becoming harder to source in outlying farms therefore affect operation timeliness. Compaction from round bale pickers becoming more of an issue when ground is wetter at picking. Water availability seems to continue to be an issue in the Balonne.

There has been a bigger push towards CTF but pickers are hurting that. There is a bigger shift towards water efficiency e.g. overhead sprinklers.

Purchase of new machinery and/or contracted specific applications out.

Adoption min/zero till farming.

Staffing and machinery capacity has become an increasing issue. Most farms seem to be short of at least 1-2 staff (or have inexperienced staff) which great impacts their ability to get operations done on a timely matter. Obviously, the reduction in water availability through the MDB scheme has been applying increasing pressure.

Low prices, low water and high insects.

Irrigation strategies for newer varieties continues to place pressure on infrastructure not designed to irrigate as frequently. Water - running short of water impacts yield and profitability more with modern varieties and yield potential. Running out of water or delaying water has a big impact. Disease - modern variety more susceptible to seedling diseases due to low vigour.

It hasn't changed, biggest driver of yield/profitability is still water or rain, staffing ability and having a well-maintained irrigation system with good capacity.

Drought, flood, herbicide resistant weeds.

Increasing size of storages where possible, skip row irrigated cotton.

Unreliability of consistent supply.

Lack of rainfall - reduce yields.

WUE has improved with better varieties and nutrition.

Have installed some pivot and lateral systems.

Less reliable climate. Different insect issues. Introduction bollgard 3. Market fluctuating. Lack of water. Extreme heat.

Commodity prices have improved. Improved irrigation efficiency (lower refill points, soil probes, laser levelling, increase storage capacity).

Improving soil constraints and understanding better irrigation practices.

It changes as commodity price increases and water value decreases and the likely hood of more growers pushing into a back to back situation to capitalise on the above, then we have subsequent issues of poor seed bed conditions, late planting and increased disease risk.

Season favourability, irrigation capacity improved, irrigation availability.

Water has become cheaper and more available with the full dams, though that said corporate ag entering the valley has dramatically changed water prices and inhibited further growth of the local farmers. Land values have also dramatically risen with the interest in the south and the large corporate/ international investment. Insects - both insect prevalence (particularly the no of mirids and the incursion of whitefly), and the lack of soft insecticide options.



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Irrigation systems have improved and continue to improve each year.

Water availability, cost of water.

Most of my growers are still new to the game. Water management in variable climates is the most difficult thing to deal with. We are generally supplementary irrigators but the last few seasons have demanded full irrigation on a supplementary area. When to make the decision to cut paddocks off or continue hoping for a significant event is an issue.

Irrigation systems have become more efficient and capacity to move water around farm has improved. Moisture monitoring information has become easier to access and read trends.

Water availability will always be the biggest profit factor for the Namoi Valley. Irrigation capacity on some clients need a major improvement to ensure more efficient irrigation. Disease, specifically Vert wilt is becoming more widespread and the effect is causing more impact on final yields.

Water availability and reduced rainfall are increasing becoming the most limiting factors. Reduced nutrient status of long-term cropping country thus increased Fert costs. And more costly weed control with increasing resistance.

Water reliability the biggest issue. As we chase higher yields water consumption per Ha is increasing, amplified this past season by extreme heat and low rainfall.

Insects and weeds used to be the biggest constraints. Water, sub soil constraints and irrigation management now the biggest in my opinion.

The poor seedling vigour of the cotton seed. Lack of water for irrigation. Poor seasonal conditions.

As 100% dryland grower's rainfall/available moisture is our biggest constraint. Rotation can be an issue if dryland cotton is planted into paddocks that aren't the best for it e.g. planted into faba bean, canola, linseed or chickpea stubble instead of wheat or barley stubble. Pre and post sowing water storage efficiency is compromised. This was a recent result of high chickpea prices stuffing up rotation plans. Spray drift on one farm cost us a profitable result this year.

Availability of water and weather conditions are still the biggest yield drivers.

The main profitability limiting factor is water and the reliability of it which is due to the weather and certainly water plans which have reduced amounts that can be harvested. Acres at Mungindi 2 seasons ago were down to 15% and this was during one of the kindest seasons which resulted in the highest yields. This year Mungindi averaged 70% acres but was the worse yielding season due to the extreme summer we had. Therefore, seasonal conditions - temperature, lack of rain is one of the largest constraints on profitability along with Water availability.

Water availability.

Water and commodity prices being lower has reduced cost of production to 7 bales/ha. Fallow crop rotations also allowing to maximise yield. Managing disease effectively so that it's not affecting profitability as much.

Water security/availability has lessened. Price fluctuations. Increased disease/vert.

With continuing climate variability, and some recent very hot and dry summers, most clients have become more conservative when deciding on the cotton area to be planted, based on the water supplies available at planting. In general, most are taking a much more conservative approach with regard to the reliance on in-crop rainfall and stream flows.

Less water is available for irrigation.

Hasn't changed X 8

QUESTION 21

Describe the 2016-17 cotton season in five words or less.

A cold and wet start

Challenging

Challenging

Challenging but educational season

Challenging but rewarding, winners

Challenging WRT insect pressures

Challenging, all weather related

Challenging, rewarding, frustrating, disappointment

Cold start, hot late flowering

Cold then hot, hot, hot

Cold, hot, not enough water

Consistently hot and dry

Could not plant on time

Decile 1 rainfall and heat

Difficult

Dry, hot, very poor yields

Excessive extreme heat

Extreme heat reduced yield potential

Extreme temperatures, high insects, hard season

Extremely challenging, wet start

Heavy mirid pressure hot humid

High inputs, with low outputs

High mirid population, extreme heat

High pest pressure, unusually hot

Hope next season is better

Hot and challenging no profit

Hot and dry

Hot hot hot hot hot

Hot with late preparation

Hot, challenging want to forget

Hot, dry and relentless

Hot, dry high pest pressure

Hot, dry, difficult, disappointing, disheartening

Hot, dry, disappointing

Hot, high suckers, lower yields

Hottest ever, disappointing yields

It was a hot one!!

Late cool start > reduced yield

Late start, late finish, cold, disease, high insects and low yields

Late, slow, small top fruit

Looking forward to next season

Mild start, hot middle, wet finish

Mirids, heat and small bolls

Nearly totally determined by limited rainfall and irrigation

Please erase from memory bank! Late planted, corresponding low yields.

Please never again

Record heat, dry, mirid damage

Short, hot, lots of bugs

Temperature and moisture extremes

The season from hell

The season from hell

Too ** hot and miridy

Too cold then too hot

Too damn hot

Too wet, cold then hot



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Tough
Tough start hot dry finish
Unrelenting heat and very dry
Very challenging one extreme to another
Very challenging!
Very hot
Very hot and dry
Very hot, difficult defoliation
Very very very very hot
Wet preparation to very hot flowering period

QUESTION 32

What are the factors that influence your preferred chemical option for managing Mirids?

Availability, effectiveness.
Bee location, effect on beneficials, cost.
Beneficial disruption, product efficacy, product residual control, product cost.
Beneficial friendly and cost, not potentially whitefly faring.
Beneficial impact, efficacy, residual.
Beneficial preservation.
Beneficial preservation.
Cost, beneficial impact.
Cost, length of residual, predator survival.
Cost, must be soft on beneficials, rotating chemistry.
Cotton growth stage. Mirid numbers and length of time mirids were in the crop.
Crop stage, bees, secondary pests.
Damage to beneficial populations, activity on nymphs/eggs v adults as a lot of the issues we were having was with adults flying into the crop. We also had exceptional numbers of beneficials and very little implications on their populations from sprays so our tactics may have changed throughout the season.
Disruption of beneficials that may flare whitefly later on.
Dynamic thresholds. Mostly timed around another pesticide application if populations are rising from week to week. Also, dependant on stage of the crop and first flower date (crop potential) in this area.
Effect on beneficials, efficacy, residual, price.
Effectiveness, residual, price, IPM, availability.
Efficacy, price, how soft it is on beneficials.
Efficacy, residual activity, IPM.
Efficacy, residual control and effect on beneficials.
Efficacy, Whitefly impact, and cost per ha.
Efficiency of control, compatibility, cost \$/ha.
Fruit retention. I am sure the early season weather played a part in reduced retentions this season leading up to flowering along with mirids. I couldn't control the weather so tried hard to control the mirids, thus used products that had good efficacy on mirids.
Growth stage, retention, numbers, season date.
Impact in beneficial insects, cost.
Impact on beneficial insects and price.
Impact on beneficials comes first - but then I have to consider bees, neighbour and rotation of chemistry.

Impact on beneficials, cost, are we spraying for multiple insect pests.

Impact on other insects and length of control.

Impact on thrip numbers and mite flare-ups.

IPM and parasitoid protection.

IPM fit, efficacy, length of control, price.

IPM implications, cost.

IPM strategies.

Likelihood of flaring other pests, product availability, product cost, other pests present.

Low impact on beneficials, cost.

Minimal disruption, efficacy, IMP principles.

Mirid number, nymphs present, crop stage, proximity to bees, beneficial number, presence of other insect and impact of affecting beneficials, price of products, availability of products.

Mirid numbers, beneficial numbers, crop stage/time of season, fruit retention levels, as well as other pests that may be present and possibly warrant controlling/suppressing.

Not flaring whitefly, level of pressure.

Other pests, timing, cost, grower preference, beneficial numbers, application technique.

Other pests/beneficials.

Pest flare ups, and price.

Presence of beneficial insects, or other pest levels, cost has an impact at times also compatibility.

Price, beneficial disruption profile, residual, tank mix with roundup.

Price, efficacy but will look at other options after this season as mealybugs became a problem along with whitefly.

Price, selectivity.

Protection of predators and parasites in the system, effectiveness of control, control of other pests (e.g. Intruder for mirids and whitefly).

Rising numbers and the opportunity to tank mix with RR, impact on beneficial insects, cost.

Risk to bees, product efficacy, softer on beneficials, cost.

Rotation of chemistry, beneficials, reduction of mite flaring.

Rotation of chemistry, other pests that are present and the likelihood of flaring pests such as Mealybug.

Selectivity, ranking on beneficial disruption index. Cost always a consideration.

SLW, cost, effect on other pests.

Softness and price.

Softness on beneficials to reduce risk of flaring mealybug and whitefly.

Softness on beneficials, residual, efficacy.

Softness on natural enemies, with the aim of trying not to flare other pests as much as is possible, reliability/robustness of mirid control, price.

Softness, effectiveness, availability, pressure.

Supply availability, effect on bees, application method, IPM.

The impact on SLW and the chances of flaring these. Haven't used Regent for the past 3 seasons and only use Transform for mirids which has resulted in not needing to spray any fields at St George for Whitefly during the 2015/16 cotton season and only 30% of fields at St George during the 2016/17 season which has resulted in some growers having saved up to \$240/ha during the past 2 years. Needing to build up the Hyati population at Mungindi as still needing to apply both Admiral and Pegasus for whitefly each year.

The stage of the season. Softness on beneficials. Potential to flare up other insects.

Whitefly and Mealybug management compatible.



NOTES

[illegible]





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