Qualitative report on the **2011–12** cotton season

Australian Government

Cotton Research and Development Corporation

Contents

1 Background

COVERAGE

Data was collected by Crop Consultants Australia Inc. from a total of 63 consultants, who answered some or all of the questions about their own practices and attitudes, as well as those of their grower clients. These consultants represented 33% of the industry's growers and covered 64.5% of the Australian cotton production area for the 2011–12 season (not adjusted for row spacings).

An estimated Australian total of 583,000 hectares of irrigated and dryland cotton was grown in the 2011–12 season. The 2012 CCA survey represents a total of 375,865 hectares, comprising 281,339h hectares (75%) of irrigated and 94,526 (25%) hectares of dryland cotton.

METHODOLOGY

The survey consisted of 68 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 May and June 2012, with questions referring to the 2011–12 cotton season.

Crop Consultants Australia Inc. collected the raw data.

DATA COLLATION

The online Cvent survey program (www.cvent.com) was used to compile the data. Interpretations are up to the user.

ACKNOWLEDGEMENT

Thank you to the consultants who took the time and trouble to complete this survey. In previous years the data in this survey have provided valuable information for researchers and industry organisations in planning and carrying out projects.

DISCLAIMER

The Cotton Research and Development Corporation (CRDC) provide 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 2012 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 these data; however, the data were provided by individual consultants and agronomists and therefore are subject to the associated constraints.

DATA ANALYSIS

Helen Wheels Consultancy: Helen Dugdale 0417 064 507

TEXT EDITING, GRAPHING, DESIGN AND LAYOUT

Weemalah Writeability: Elizabeth Tout 02 6783 1423

Australian Government
Cotton Research and Development Corporation

Cotton Research and Development Corporation
PO Box 288
Narrabri. NSW. 2390
Phone: 02 6792 4088
Email: info@crdc.com.au

CROP CONSULTANTS AUSTRALIA

Crop Consultants Australia Incorporated
PO Box 11380, Centenary Heights QLD 4350
Mobile: 0429 925 459
Fax: 07 3036 6357
Email: info@cropconsultants.com.au

2 THE CONSULTANTS & THEIR CLIENTS

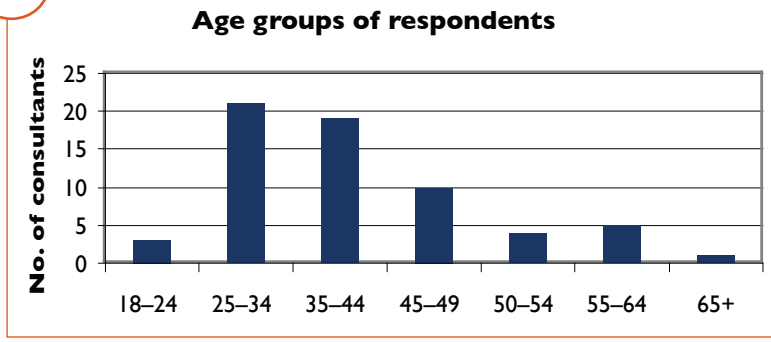
ABOUT THE CONSULTANTS

QUESTION 1

What is your age group?

(63 respondents)

1

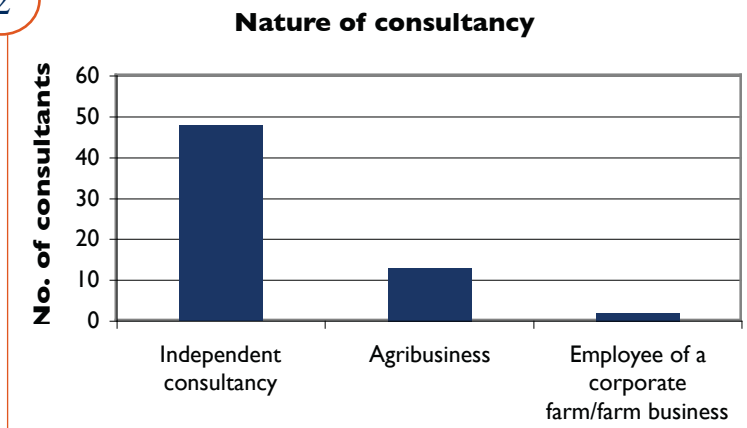


QUESTION 2

Which of the following best describes your role as a consultant?

(63 respondents)

2

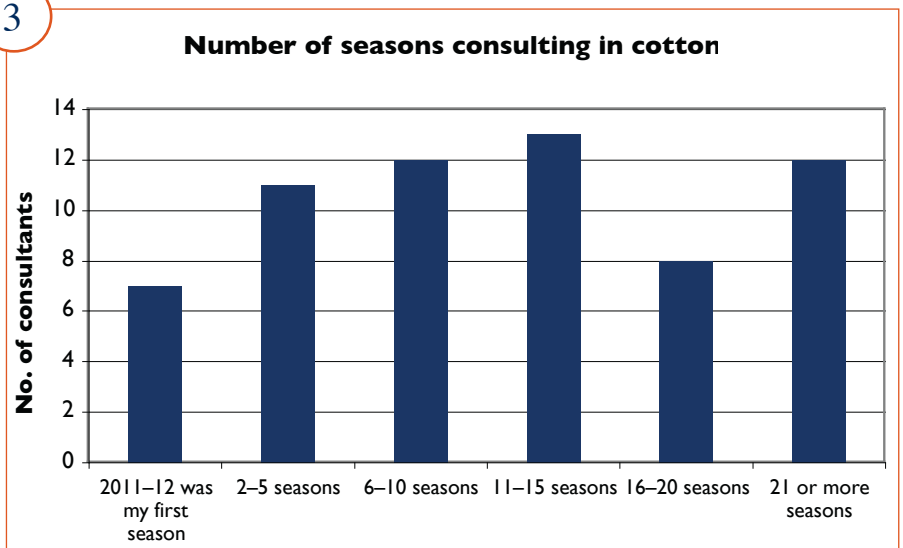


QUESTIONS 3

For how many seasons have you worked consulting in cotton?

(63 respondents)

3



QUESTION 4

What percentage of your consultancy income is derived from services in these categories?

(53 respondents)

QUESTION 5

What percentage of your consultancy time was spent on these cotton-related activities?

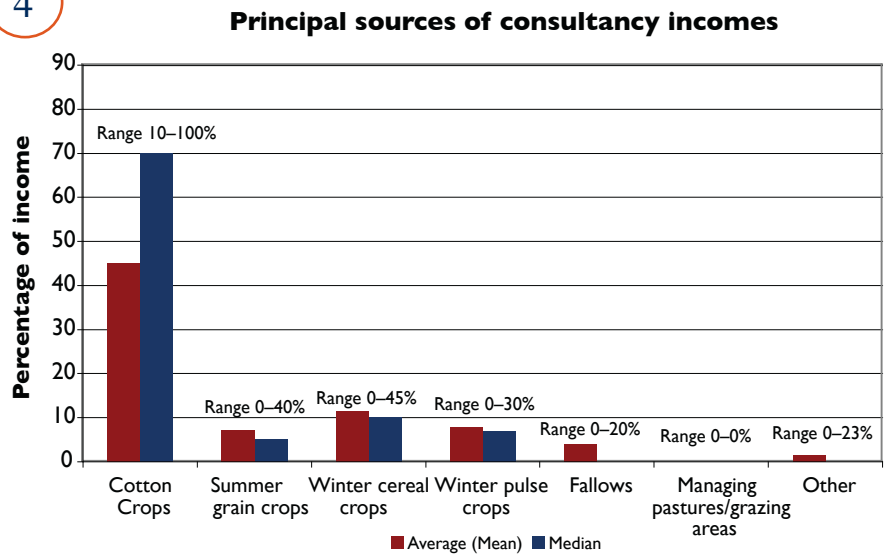
(53 respondents)

QUESTION 5.1

Details of 'Other' activities in Graph 5.

(7 respondents)

4



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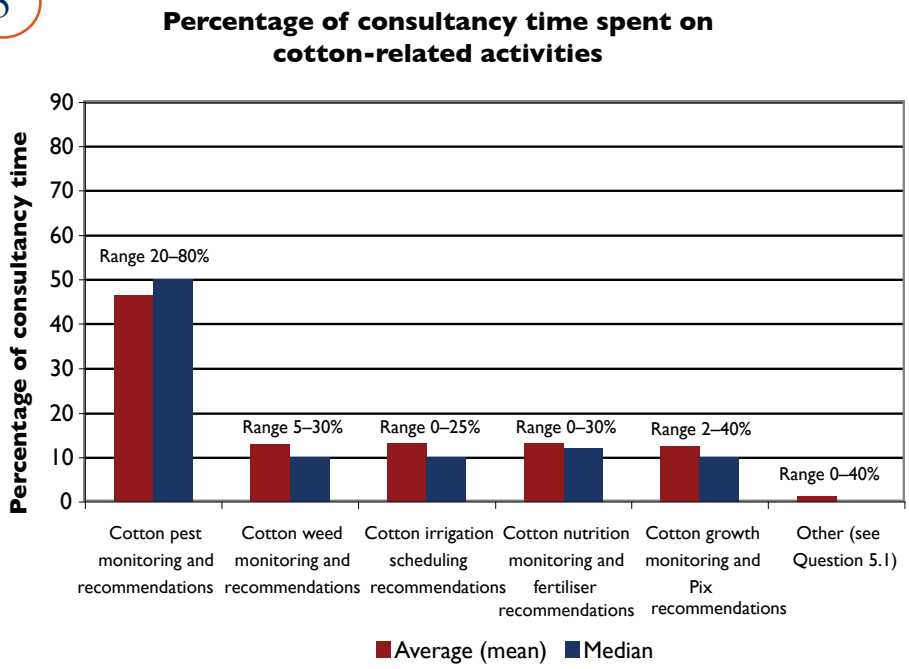


5.1

COTTON-RELATED ACTIVITY	PERCENTAGE OF TIME
Management and planning: i.e. Crop and paddock choice, rotation/stubble issues, soil preparation options.	10%
Computer-related data entry and grower communication.	3%
Technology User Agreement obligations.	5%
Record keeping.	10%
Rotations, planting configurations, precision ag, research, extension.	1%
Planning/reviewing.	40%
Litigation & investigation of agricultural problems. I also consult for melons, grapes and citrus.	Not provided.

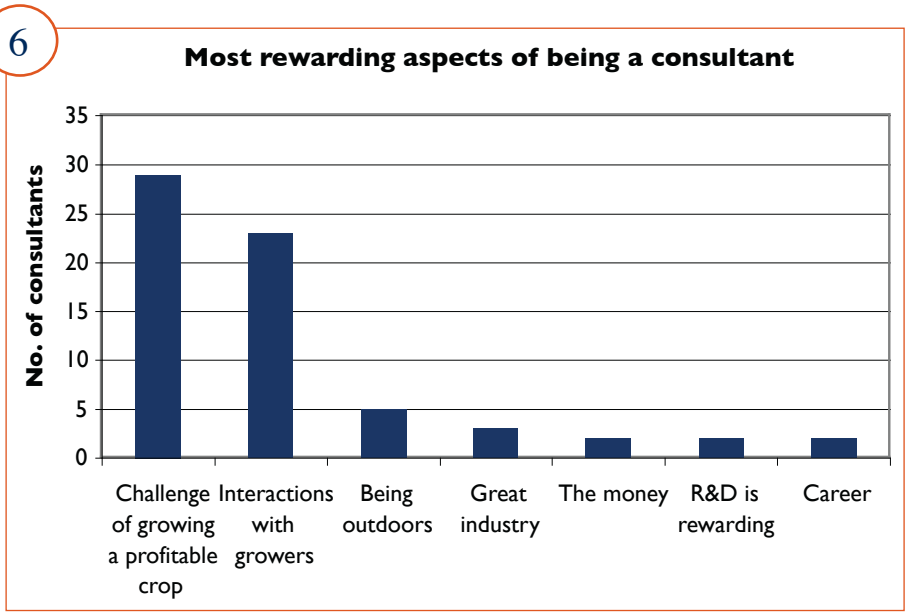
QUESTION 6

What do you love most about being a cotton consultant?

(46 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

6



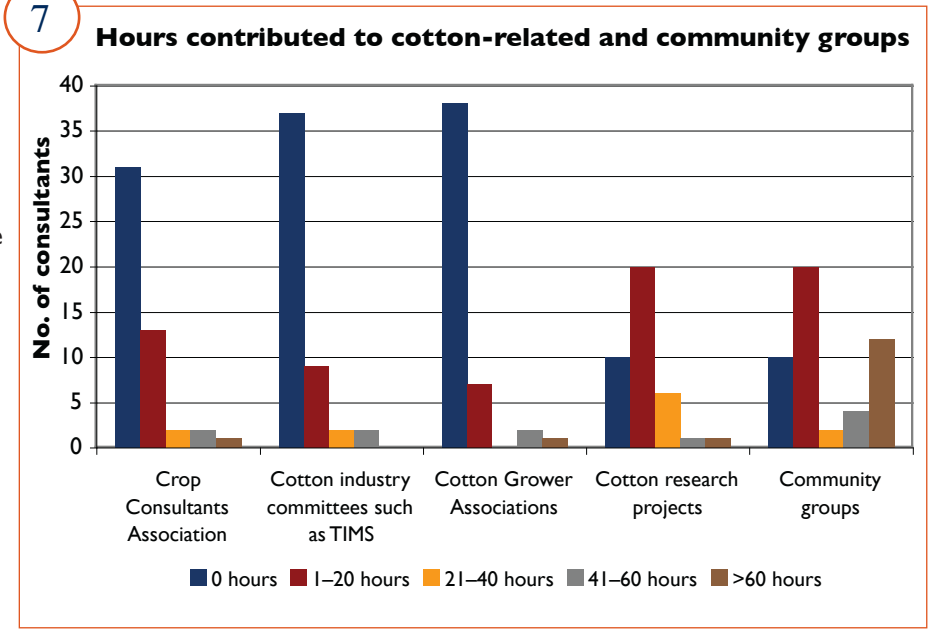
QUESTION 7

How many hours per year do you contribute voluntarily to cotton-related and community groups?

(49 respondents)

Comment Of the 49 consultants who answered this question, 6 indicated zero hours for all categories.

7



QUESTION 8

How many permanent staff were employed?

(41 respondents)

8

*Total permanent staff at January 2011 = 86; at January 2012 = 102

QUESTION 9

How many part time/casual staff were employed?

(40 respondents)

QUESTION 10

With reference to recruitment for the 2011–12 season, how hard was it to find suitable applicants and fill positions?

(48 respondents)

Note There were 31 respondents to this question in 2010–11.

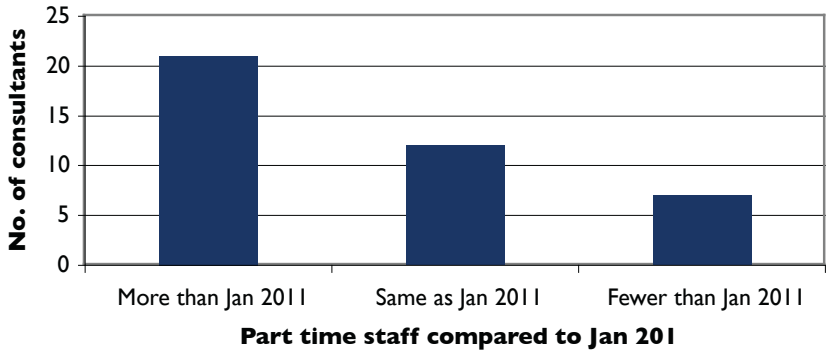
QUESTION 11

To what degree does strategic business planning influence the way you work (as many as are relevant)?

(48 respondents)

9

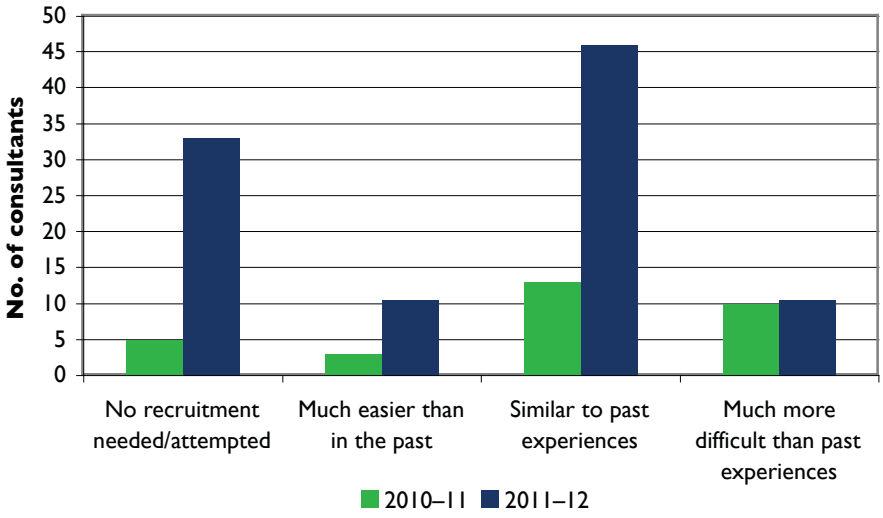
Number of part time staff in January 2012 compared to January 2011*



*Total part time staff at January 2011 = 97; at January 2012 = 111

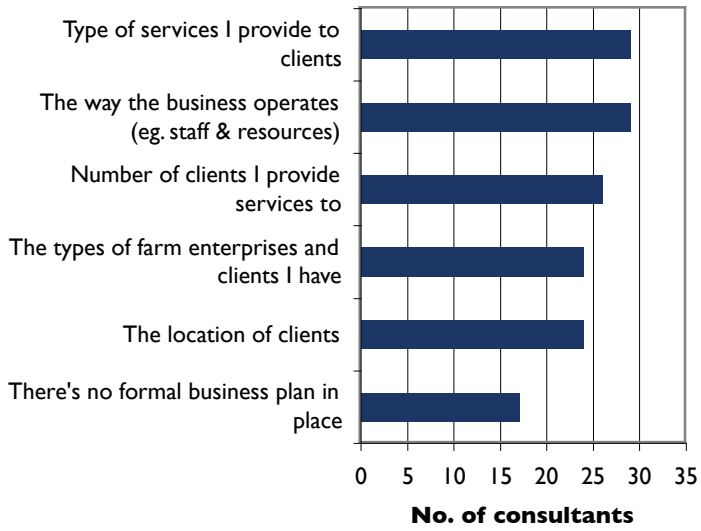
10

Ease of recruiting suitable staff in 2010–11 and 2011–12



11

Degree to which strategic business planning influences how consultants work



QUESTION 12

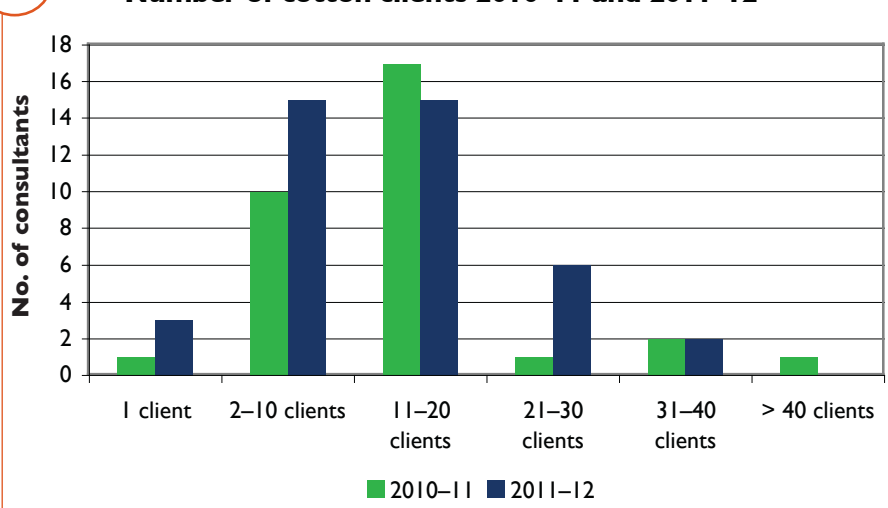
How many cotton clients do you consult to?

(42 respondents)

Note There were 32 respondents to this question in 2010–11.

Comment Consultants advised a total of 580 cotton clients, which represents 33% of the industry.

12

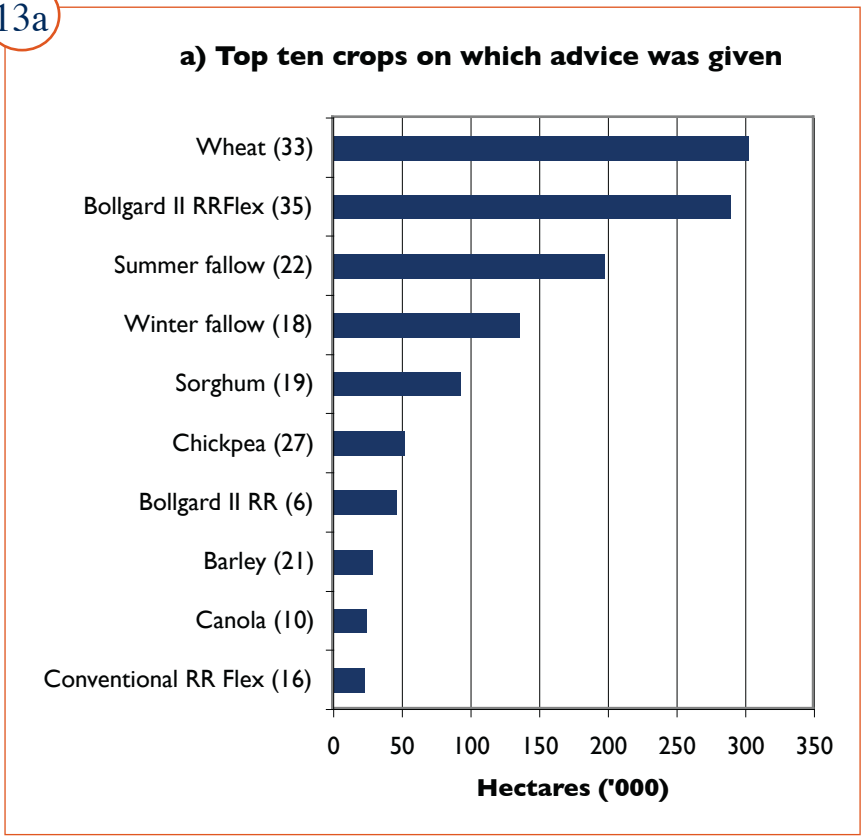


QUESTION 13

On the farms of your cotton clients, list the approximate hectares dedicated to each type of crop you were responsible for providing advice in 2011–12 (Considering winter 2011 and summer 2011–12).

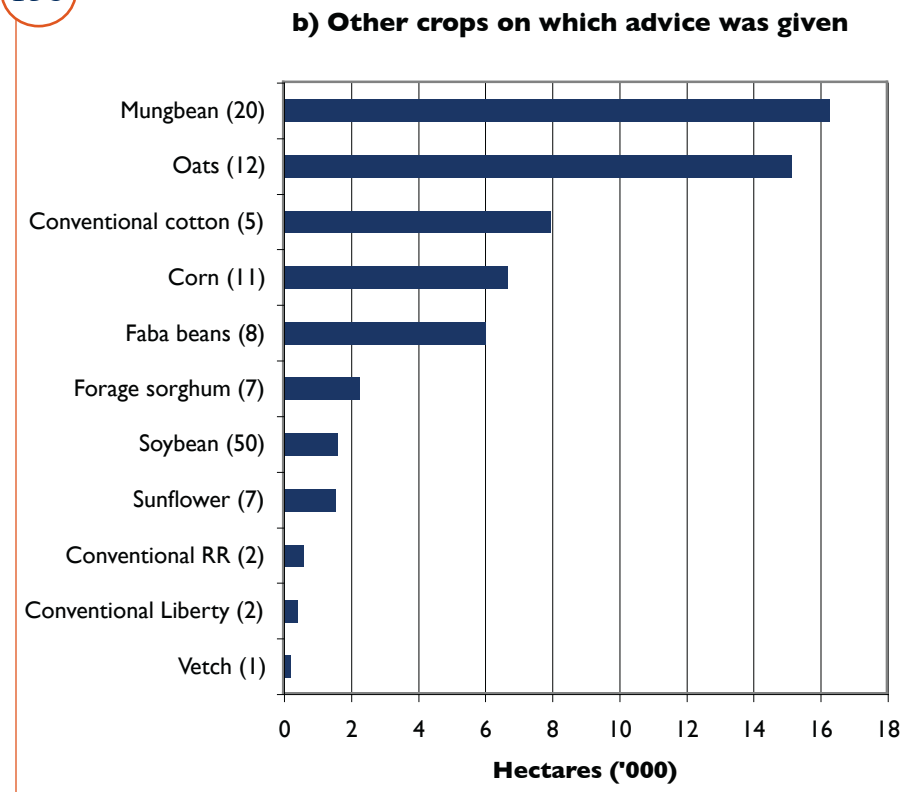
(46 respondents)

13a

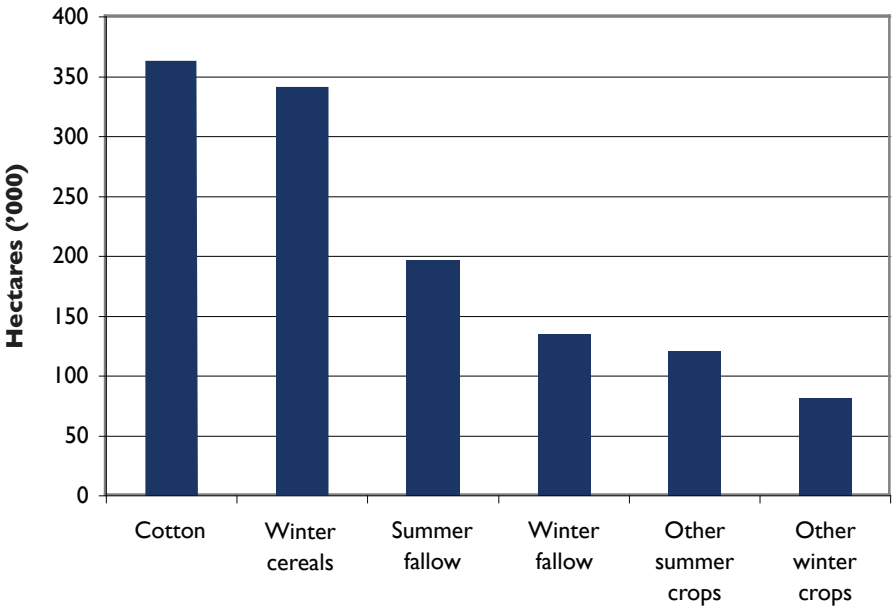


...Question 13 continued

13b



13c



PROFESSIONAL DEVELOPMENT AND INFORMATION SOURCES

QUESTION 14

What information events and educational activities have you attended in the past 12 months?

(51 respondents)

Comment The most common activities nominated were:

Cotton field days:
Variety trials etc; field days, Grower of the Year event; CSD field days

Grains field days:
GRDC; trial sites.

Technical updates:
Chemical companies; CCA; GRDC; CSD.

Online training courses:
Nutrient advantage upgrade; chemical information; CSD; workplace safety; software.

Short courses/workshops:
Nutrition etc; spray application; weeds; WUE; *my*BMP; IWM.

Conferences:
Cotton Conference; CCA; Irrigation Conference.

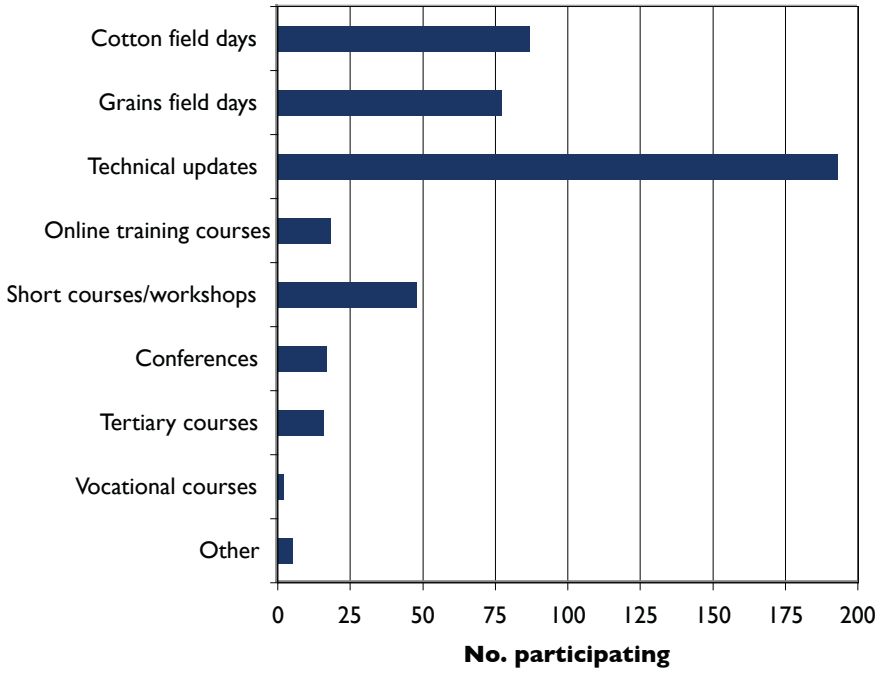
Tertiary courses:
UNE Cotton Production; B Ag Sci; Dip Ag.

Vocational courses:
Soil management; Field to Fabric

Other:
Visit farms overseas; Auscott farm walks

14

Participation in information events and educational activities



QUESTION 15

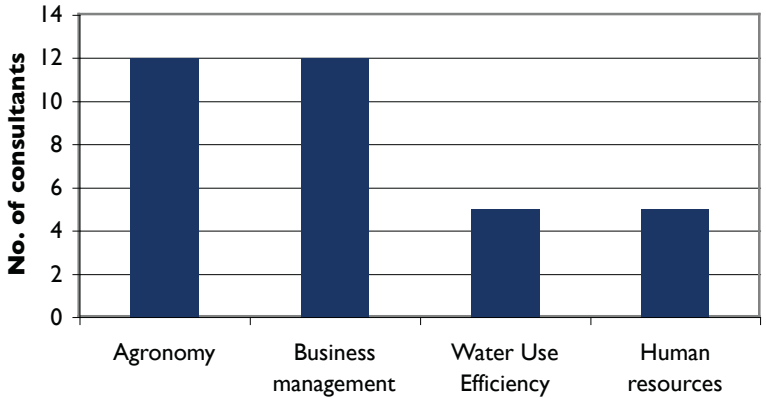
What professional development (across all issues, not just agronomic) would YOU be interested in doing over the next 12 months?

(34 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

15

Professional development in which consultants are interested (top responses)



QUESTION 16

In what ways have you engaged with the cotton industry's myBMP program (as many as are relevant)?

(51 respondents)

QUESTION 17

How valuable is each of the following publications and websites to you?

(52 respondents)

Note 3 consultants nominated other sources of information they find valuable. For details, see Question 18.

Comment 6 consultants indicated that they were not aware of the *my*BMP website.

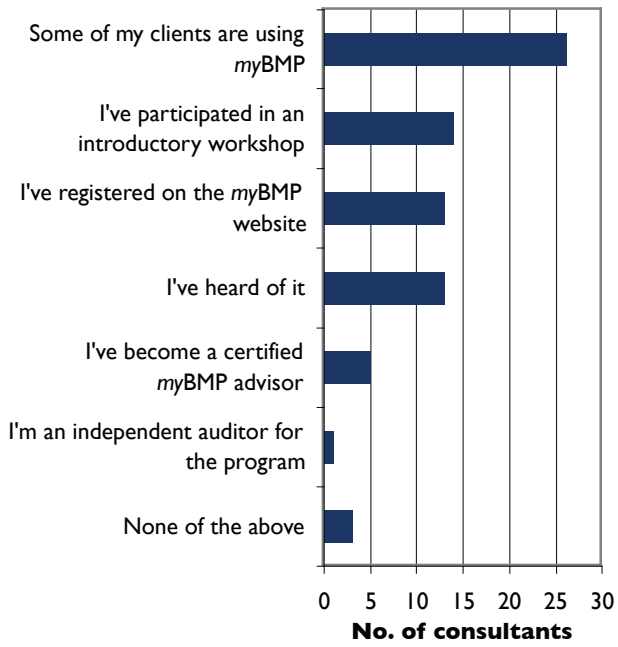
QUESTION 18

Details of 'Other' responses to Question 17.

(3 respondents)

Comment Respondents nominated Cotton Physiology Today (Cotton Incorporated), Insect ID guides, Acres Magazine, Google, and a range of other sources.

16



17

INDUSTRY PUBLICATIONS IN ORDER OF IMPORTANCE TO CONSULTANTS	
1	Cotton Pest Management Guide
2	Weather website
3	Cotton Symptoms
4	CSD website
5	Australian Cotton Production Manual
6	*The Australian Cottongrower* magazine
7	Cotton CRC website
8	*Groundcover* magazine
9	CCA e-newsletter
10	Spraywise website
11	*Spotlight* magazine
12	myBMP website

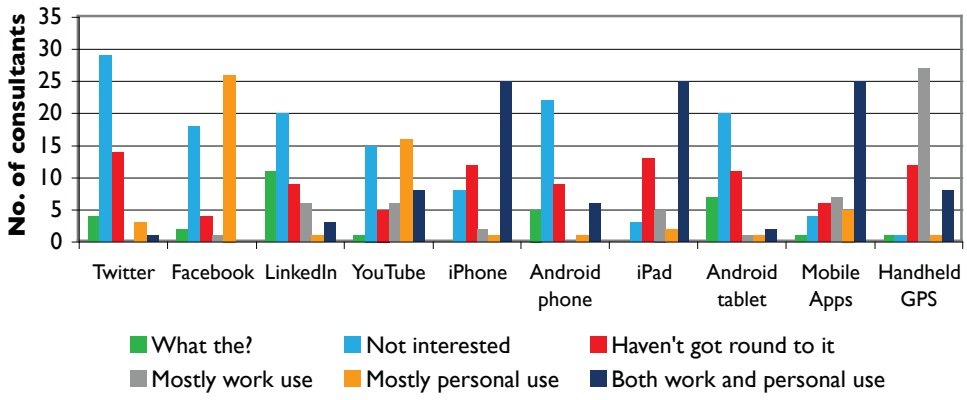
QUESTION 19

Thinking about the following technologies and social media, which best describes your use of each?

(51 respondents)

Note 2 respondents nominated other technologies. See Question 20 for details.

19



QUESTION 20

Details of 'Other' responses to Question 19.

(2 respondents)

Comment Two consultants nominated, respectively, farm management programs and databases, and GIS software (both used mostly for work).

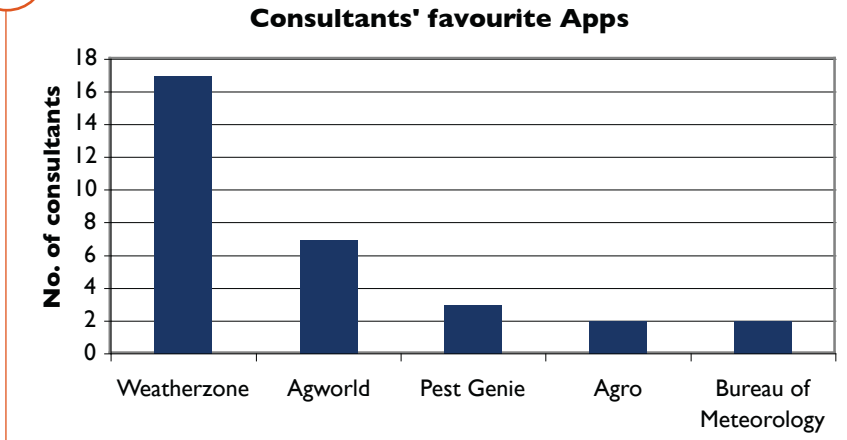
QUESTION 21

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

(34 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

21



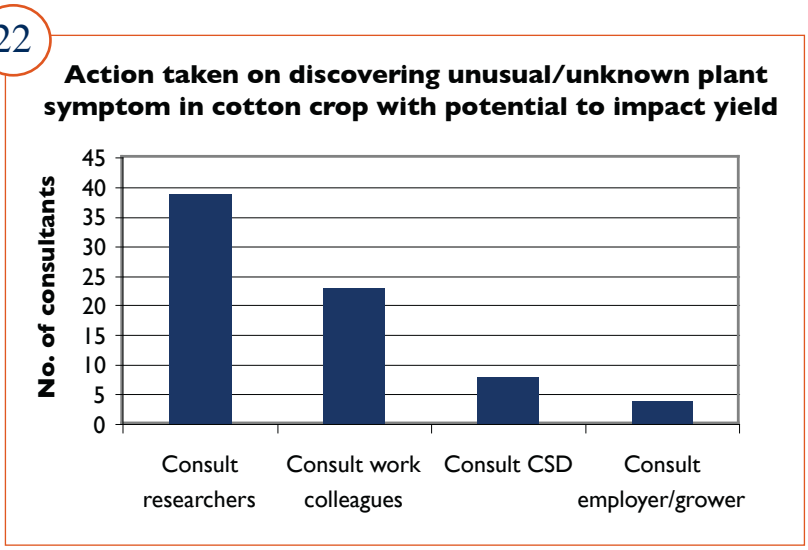
QUESTION 22

What do you do AND to whom do you talk if you spot an unusual/unknown plant symptom in a cotton crop that you think could impact yield?

(51 respondents)

Note A small number of consultants also mentioned Cotton Australia and Google as sources of information.

22



ABOUT THE CLIENTS

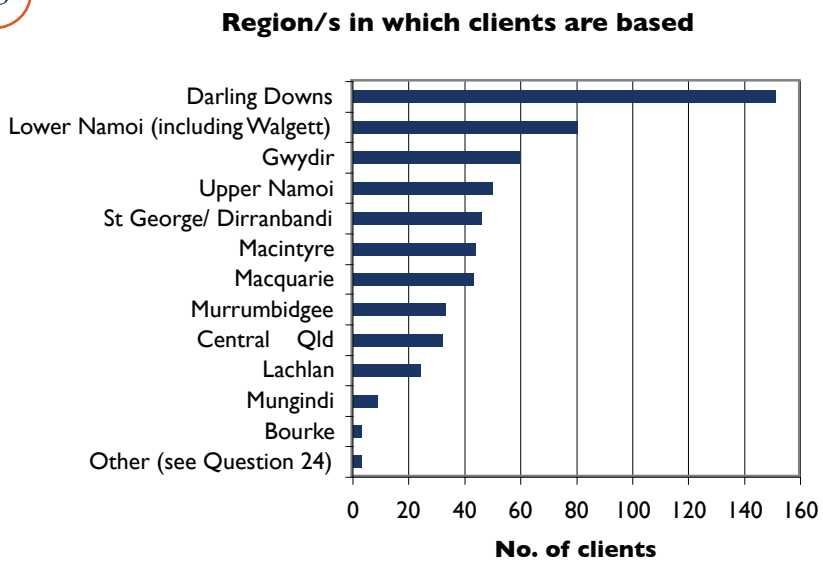
QUESTION 23

In which region/s are your cotton clients based?

(42 respondents)

Note Many consultants had clients in more than one region.

23



QUESTION 24

Details of 'Other' category for Question 23.

(3 respondents)

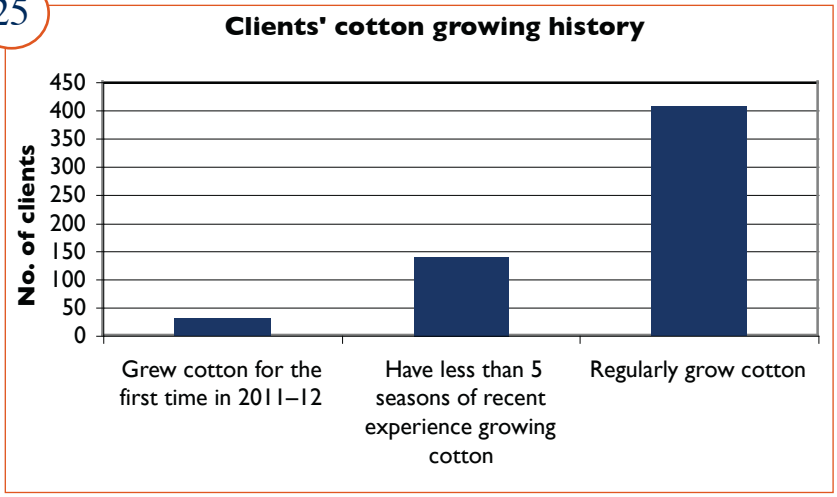
Comment These consultants had clients in the Burdekin, Mundubbera and Cunnamulla regions.

QUESTION 25

Of your 2011–12 cotton clients, how many fit the specified categories of cotton-growing history?

(42 respondents)

25



QUESTION 26

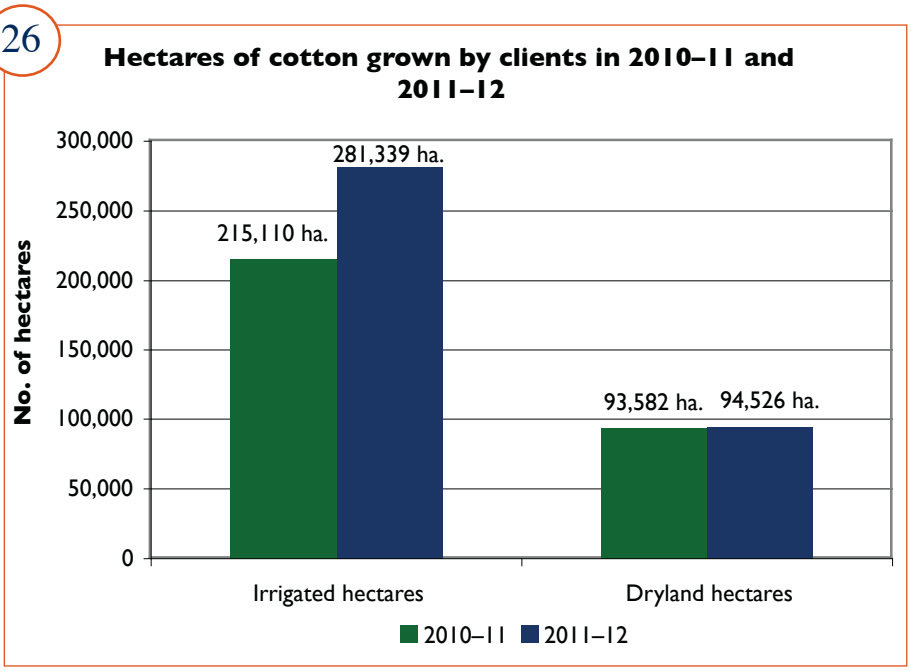
How many hectares (total area, not adjusted for row spacings) of cotton did your clients grow in 2011–12?

(42 respondents)

Comment While the number of dryland hectares remained consistent across the 2 seasons, the number of irrigated hectares increased by more than 66,000 hectares.

This is made clearer by noting that an additional 11 consultants answered this question in 2011–12 and that ten of the 42 respondents had only clients growing irrigated cotton.

26



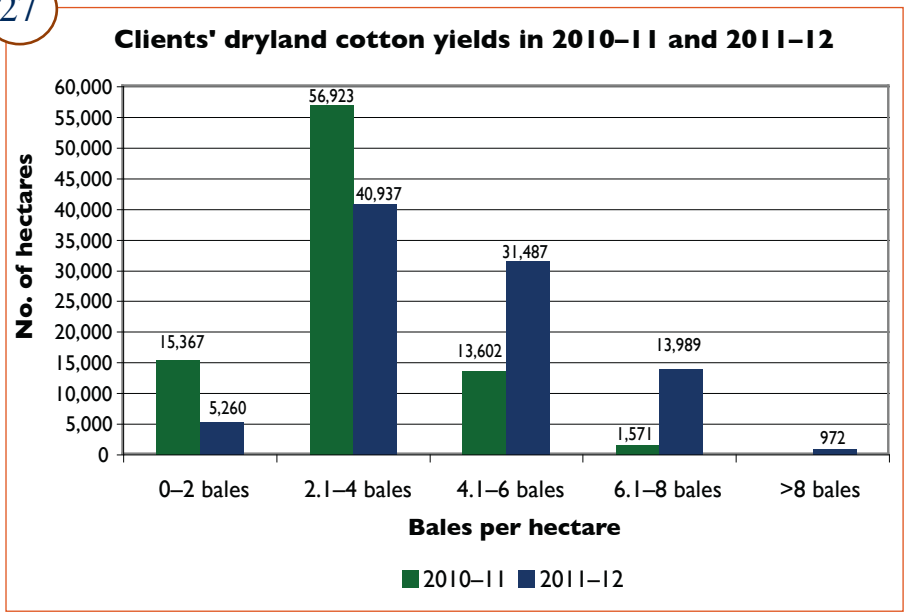
QUESTION 27

Across the dryland cotton hectares on which you consulted in 2011–12, how many hectares yielded in these categories (not adjusted for row spacing)?

(31 respondents)

Note There were 25 respondents to this question in 2010–11. Ginning was still underway in certain areas at the time of the 2011–12 survey, therefore some data is based on best estimate. The yields of more than 6 bales per hectare were from the Darling Downs and Liverpool Plains.

27



3 ON-FARM PRACTICES & ATTITUDES

BACK-TO-BACK COTTON, TILLAGE & ROW SPACING

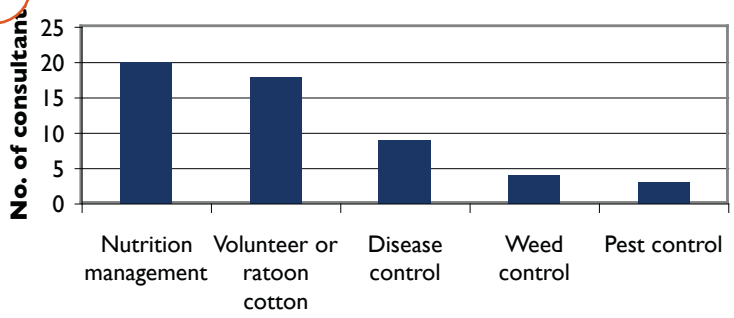
QUESTION 28

In your experience, what is the single most important factor in managing cotton crops that are back-to-back? Why?

(51 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

28



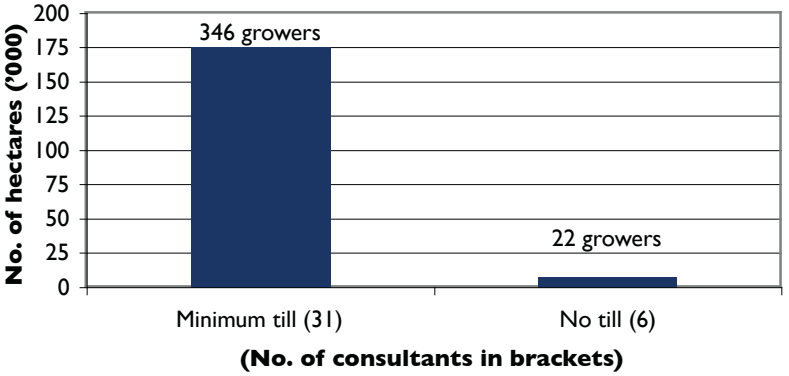
QUESTION 29

How widespread in 2011–12 was the use of reduced tillage practices by your cotton clients for irrigated cotton production?

(31 respondents)

Comment 73.6% of growers practiced either minimum till (346 growers and 175,247 hectares) or no till (22 growers and 7,516 hectares). All consultants had at least one client practicing minimum till.

29

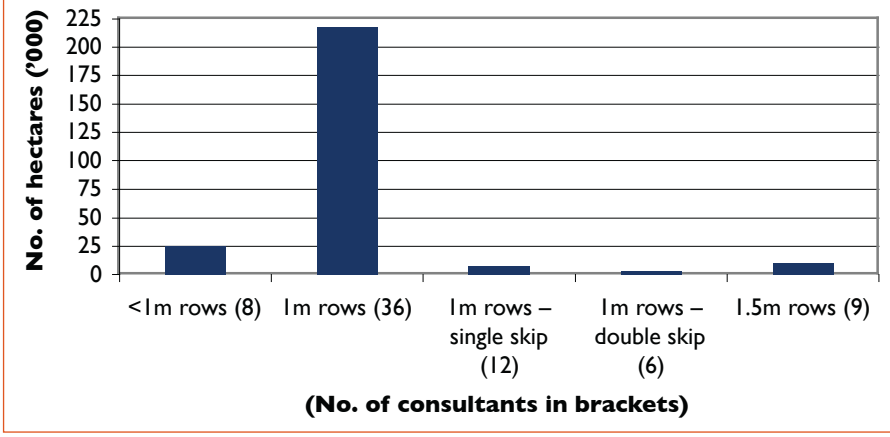


QUESTION 30

How commonly used were the following row spacings for IRRIGATED cotton in 2011–12 (number of hectares)?

(40 respondents)

30



QUESTION 31

How commonly used were the following row spacings for dryland cotton in 2011–12 (number of hectares)?

(31 respondents)

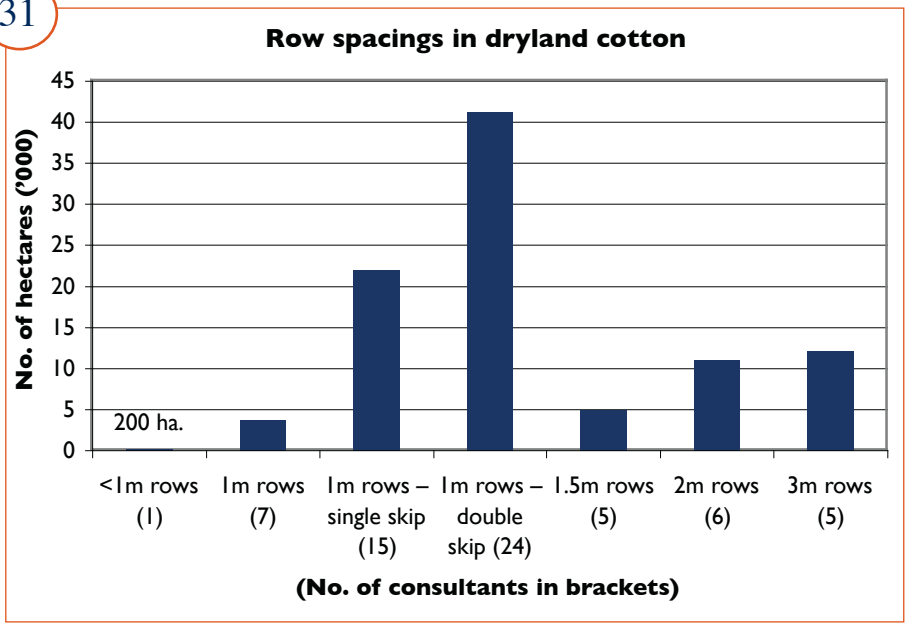
QUESTION 32

How many hectares of cotton crops exhibited symptoms consistent with soil compaction at some stage during the 2011–12 season (hectares of cotton with symptoms)?

(41 respondents)

Comment Symptoms were observed in 26% of the irrigated cotton hectares and 20% of the dryland hectares represented in the survey.

31



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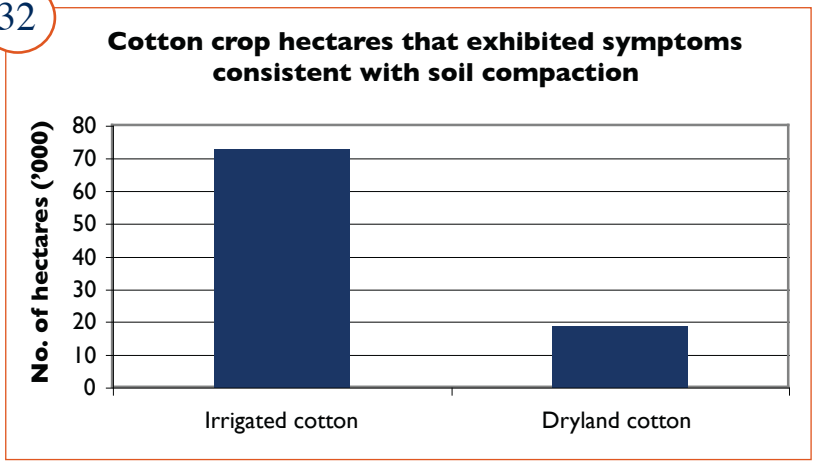


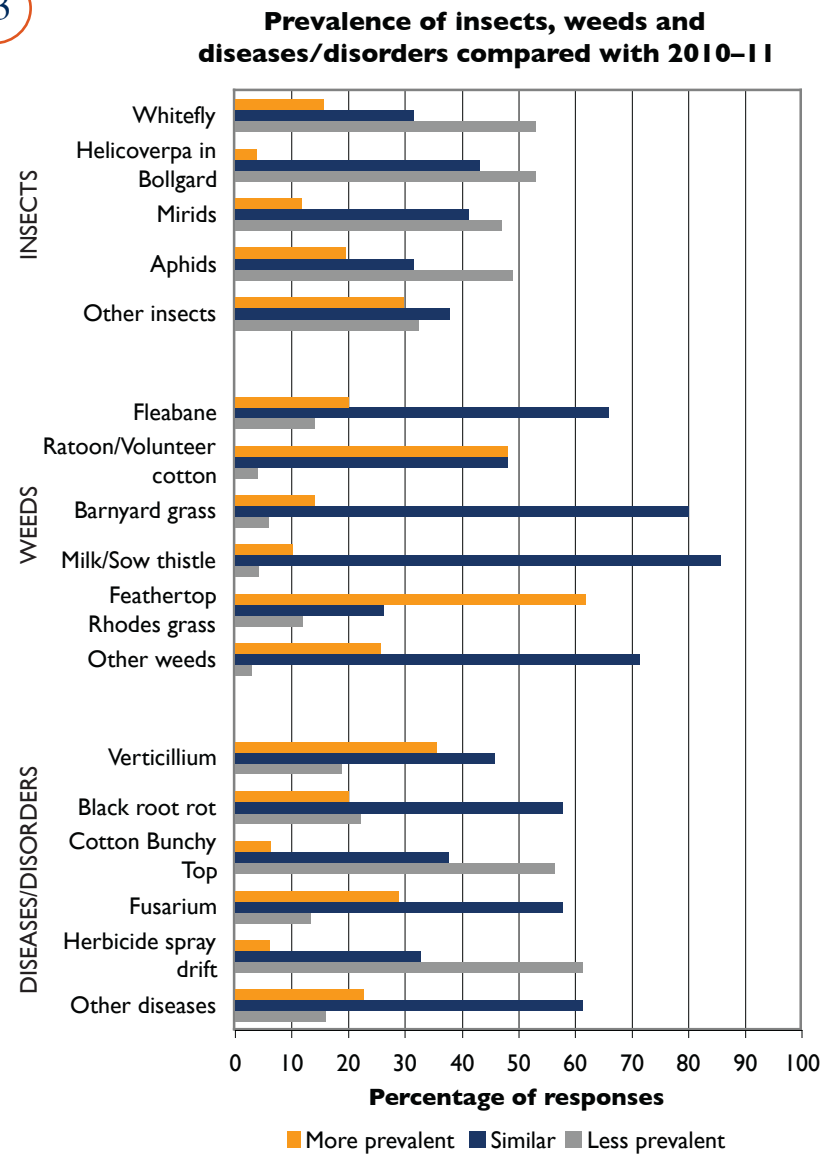
QUESTION 33

In comparison with 2010–11 season, what was the prevalence of insects, weeds and diseases in the 2011–12 season?

(51 respondents)

Comment The lower prevalence of Silverleaf whitefly and herbicide spray drift in 2010–11 continued in 2011–12. Cotton Bunchytop was noticeably more prevalent in 2010–11 than the previous season but less prevalent in 2011–12. Fleabane was noticeably more prevalent in 2010–11 but remained the same in 2011–12. Other significant figures in this graph are a lesser prevalence of *Helicoverpa*, mirids and aphids, and a greater prevalence of ratoons/ volunteers and Feathertop.

33



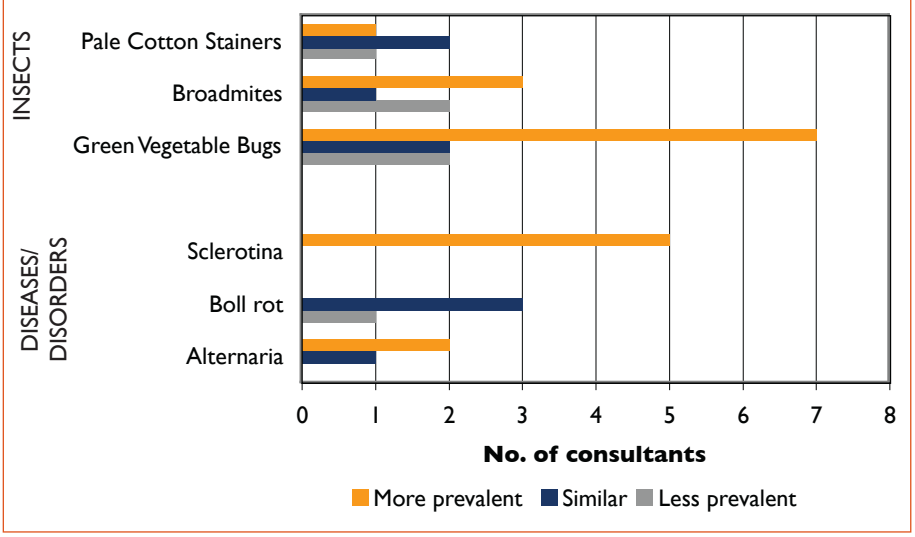
QUESTION 34

If you selected 'Other' in the above question, please list the insect, weed and/or disease you were referring to here.

(35 respondents)

Comment Note that 'Other' weeds are not included in this graph for the following reason: in Question 33, 35 consultants nominated 'Other' weeds as more or less prevalent, or the same. However, when asked to list those weeds, only 5 consultants did so, with each listing a single weed (native grasses, peachvine, sweet summer grass, cow vine and windmill grass). Of the 35 respondents, 25 said that unspecified other weeds were of a similar prevalence.

34



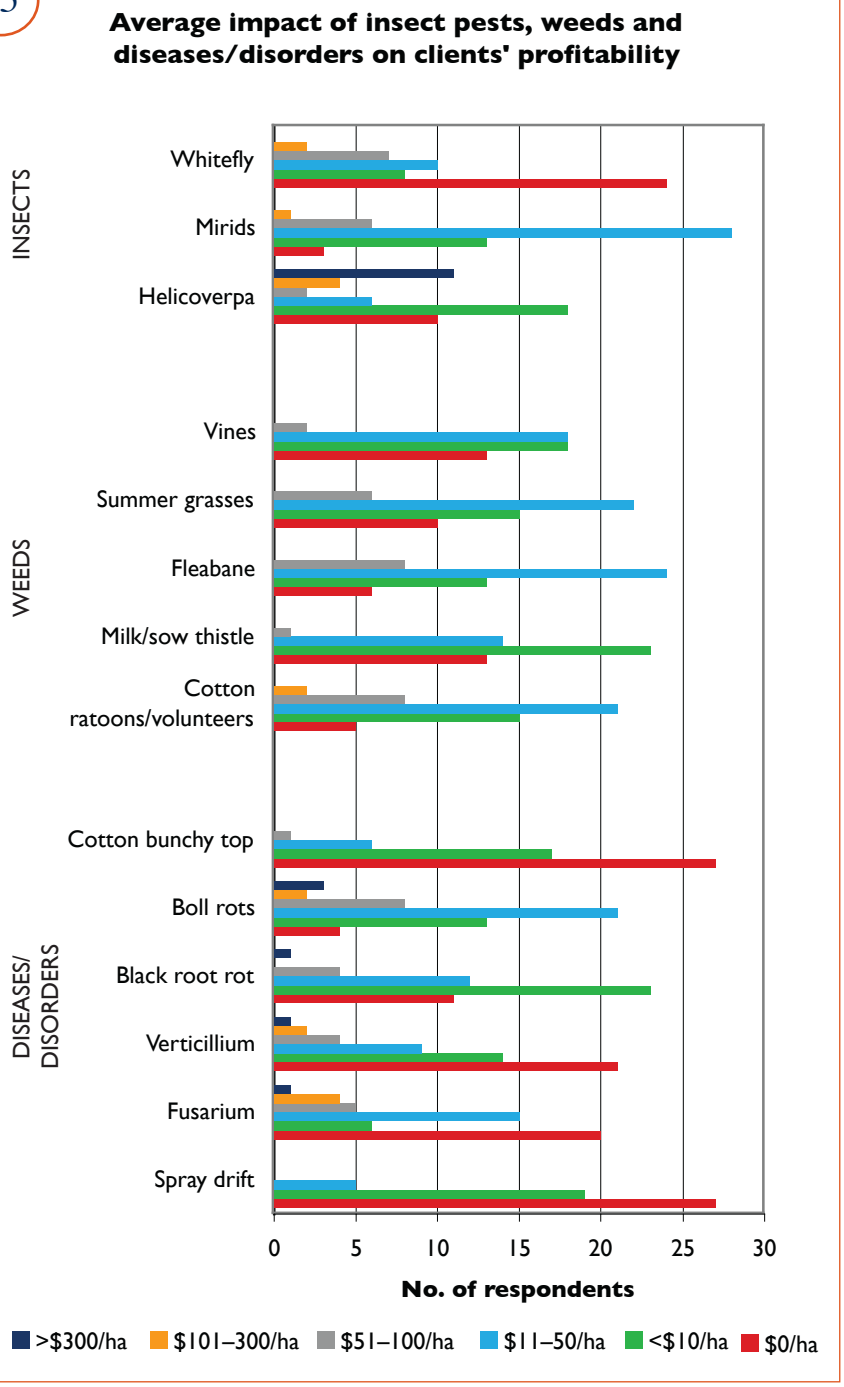
QUESTION 35

Rate the average impact you think the following pests, weeds, diseases and disorders had on the profitability of your clients cotton crops in 2011–12 (through either direct cost or yield loss).

(52 respondents)

Comment The standout results in this graph are that 11 consultants reported that *Helicoverpa* cost their growers more than $300/ha and, interestingly, that many consultants reported that whitefly, cotton bunchy top, spray drift, and verticillium had no impact on cost for clients.

35



QUESTION 36

With regards to insect pest management in 2011–12 cotton fields, how widely used are the practices listed below (in terms of hectares)?

(42 respondents)

QUESTION 37

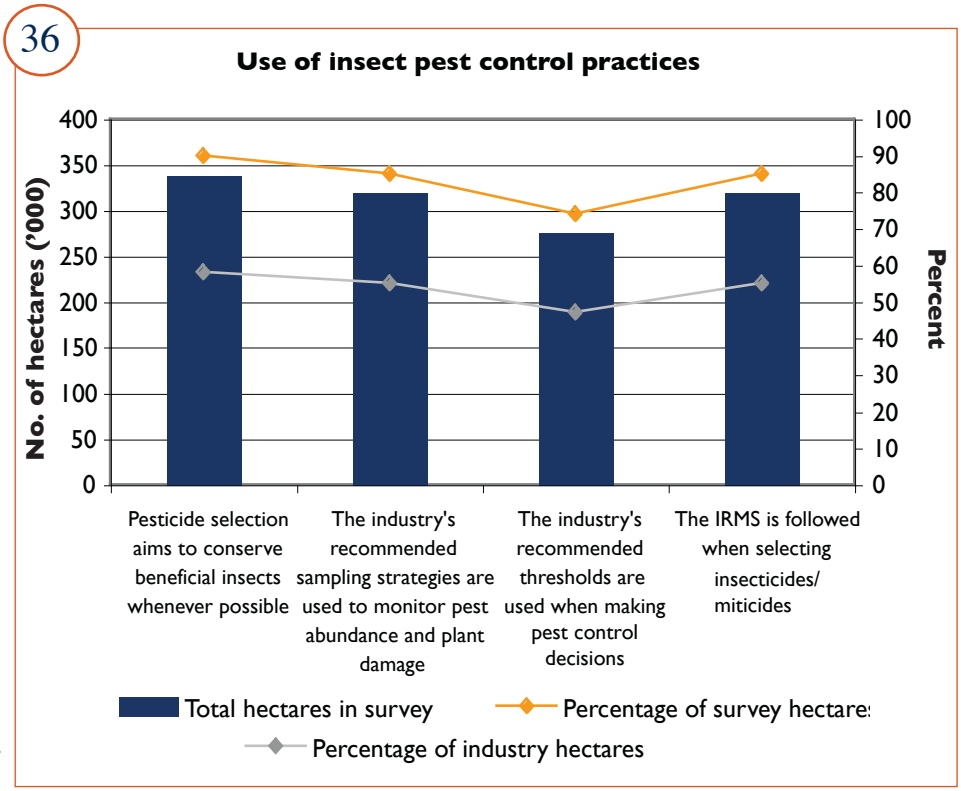
How often were the sprays you requested for Mirids in 2011–12 above, at or below the industry's general threshold?

(51 respondents)

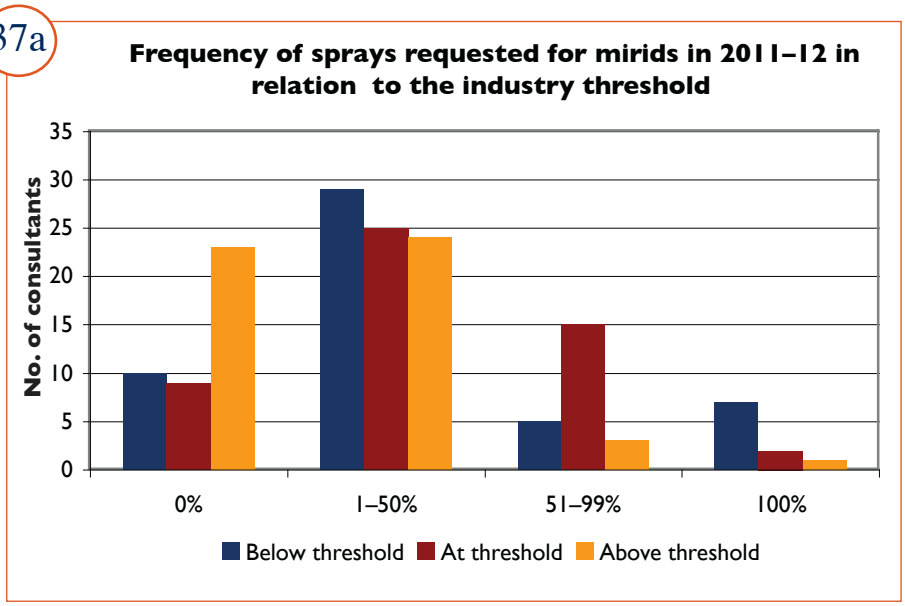
Note: The industry threshold for warm areas is 3 mirids per metre for beatsheets or visually 1 mirid per metre. For cool areas it is 1.5 per metre for beatsheets or visually 0.5 per metre.

Comment Use of the industry threshold still varies significantly between consultants, with the averages shown in graph 37b (on the following page) made up of values ranging from 0% to 100%. This makes it difficult to draw any year-on-year conclusions from these figures.

36



37a



... Question 37 continued

QUESTION 38

How early in the season did you make your first recommendation to apply dimethoate/omethoate for insect pest control?

(53 respondents)

Comment The earliest recommendation was 1 November 2011; the latest recommendation was 20 April 2012.

QUESTION 39

OR if you didn't recommend dimethoate/omethoate at all.

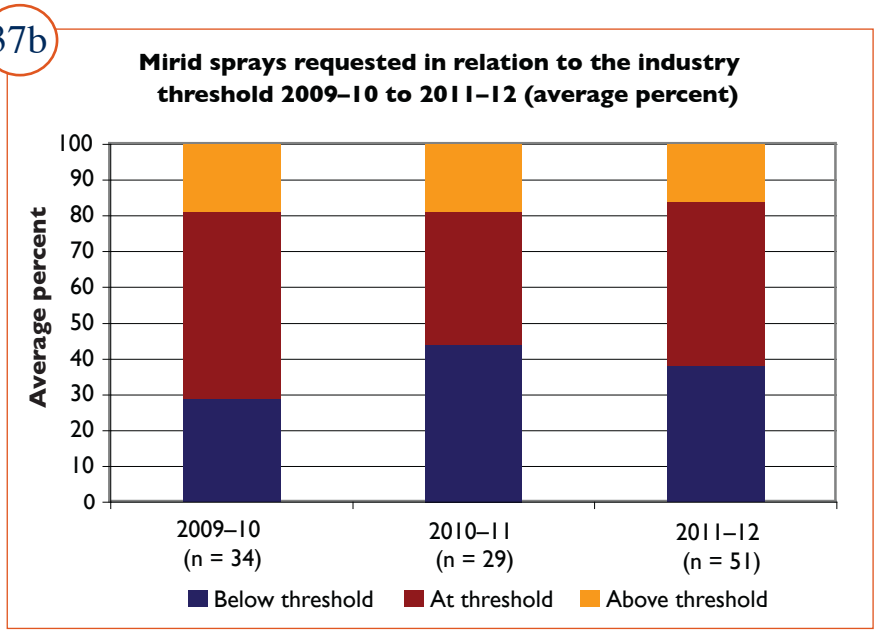
Comment Seventeen consultants reported not recommending dimenthoate/omethoate.

QUESTION 40

Describe your familiarity with the Aphid Yield Loss calculator on the Cotton CRC (CottASSIST) website.

(53 respondents)

37b



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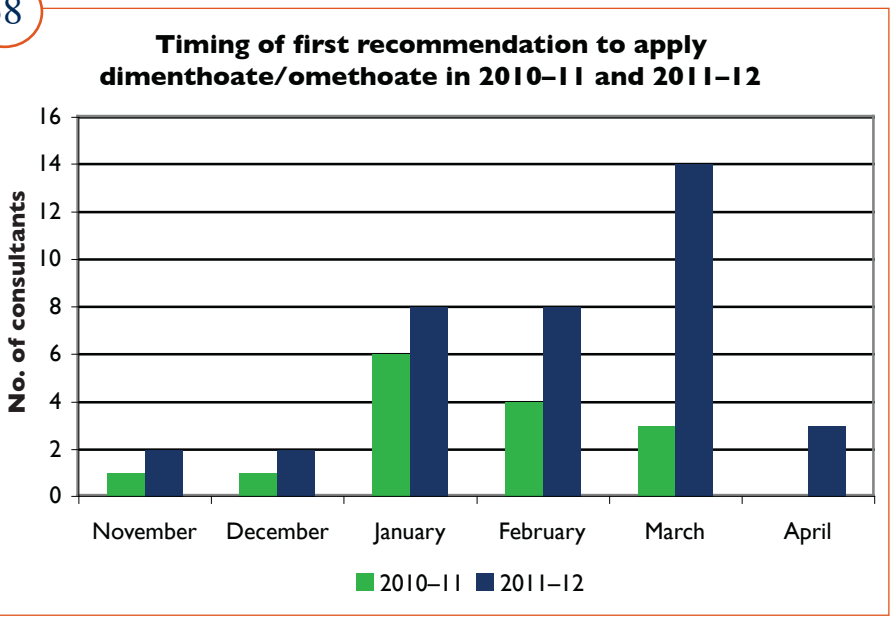

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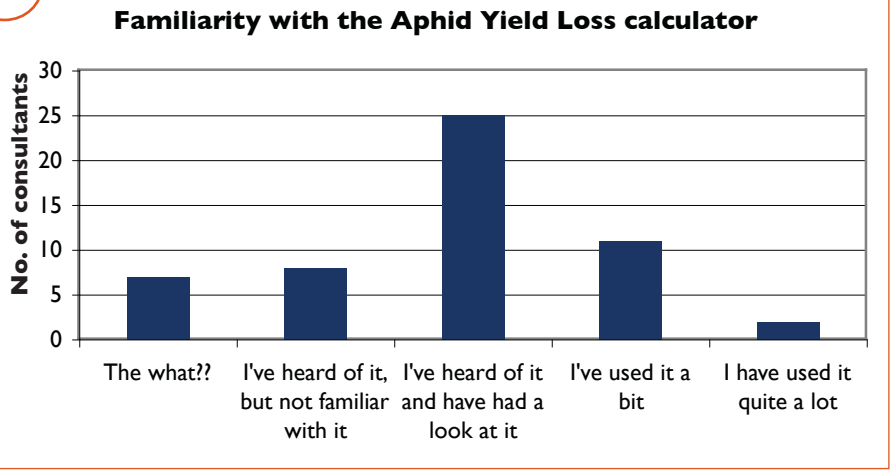
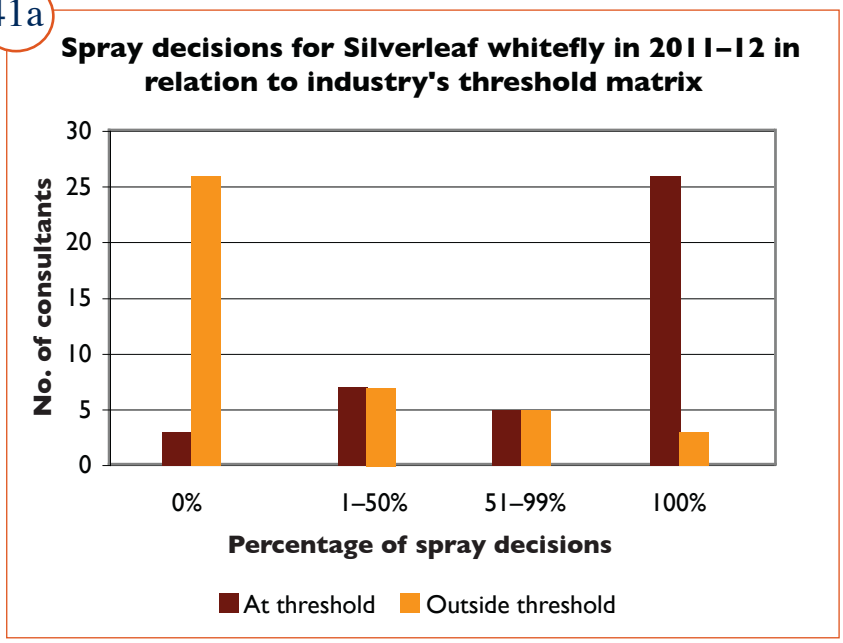


QUESTION 41

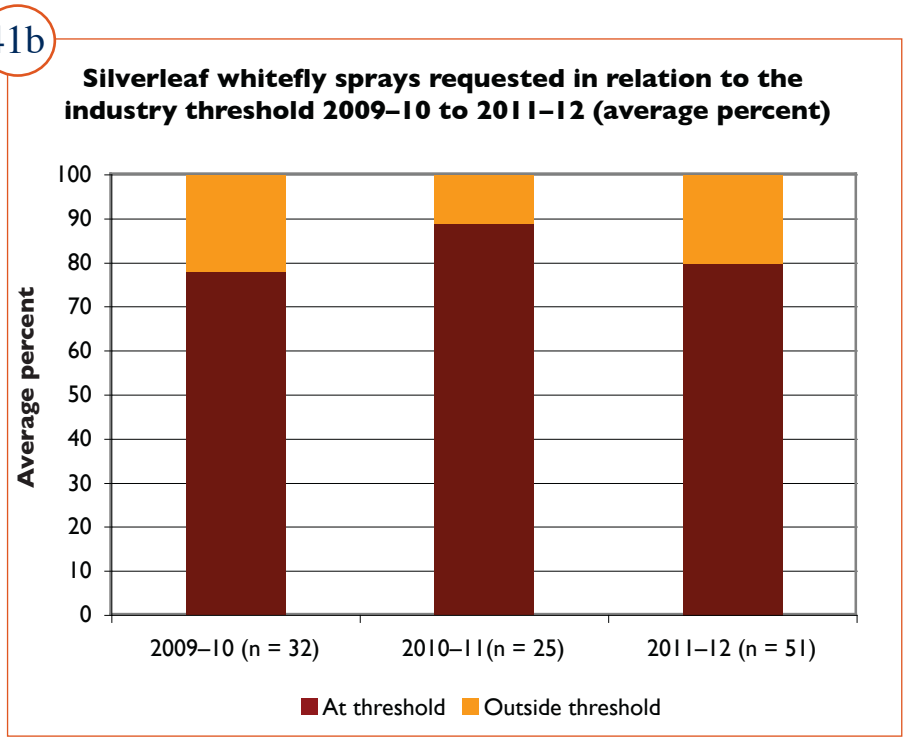
How often were the sprays you requested in 2011–12 for Silverleaf whitefly consistent with the industry's Threshold Matrix?

(41 respondents)

41a



41b



QUESTION 42

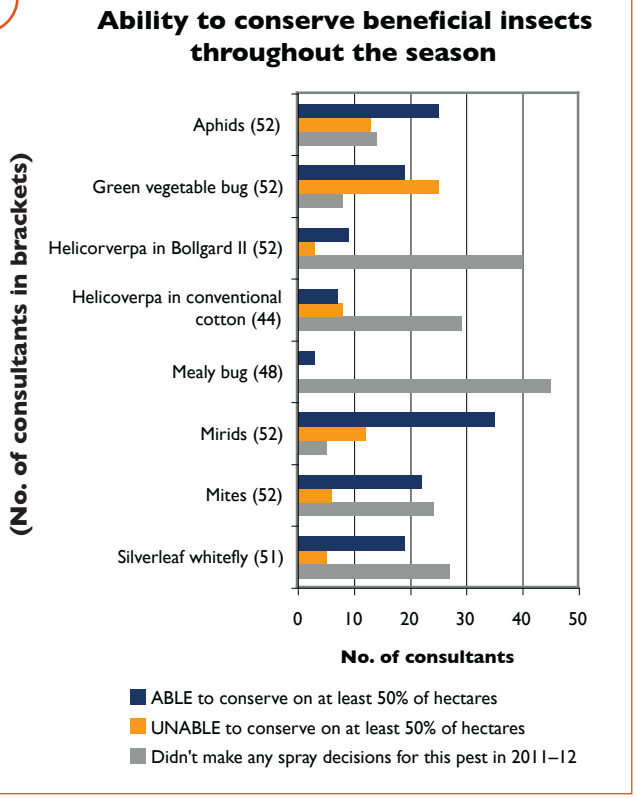
When making spray decisions, how well are you able to conserve beneficial insects throughout the season?

(52 respondents)

Comment Most respondents indicated that they had recommended sprays for mirids and green vegetable bugs (GVB) during the 2011–12 season.

GVB was the only pest for which the number of consultants unable to conserve beneficial insects exceeded the number who were able to conserve beneficial insects on at least 50% of hectares.

42

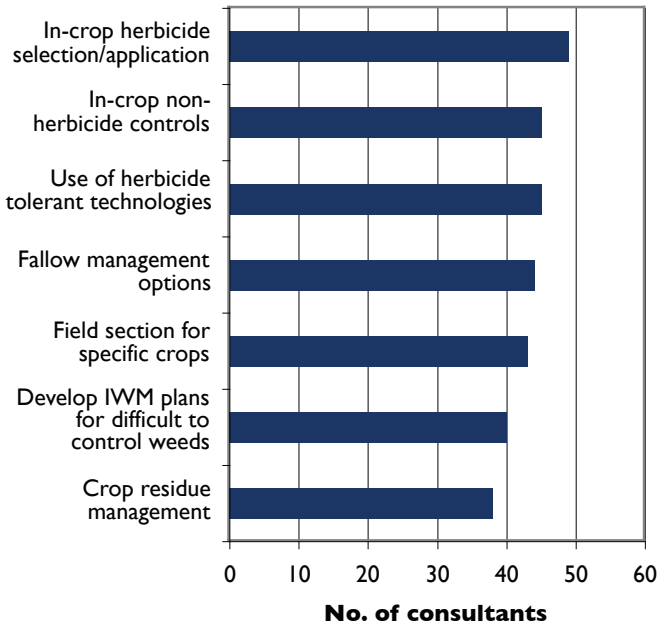


QUESTION 43

In which of the following areas of weed management do you assist the majority of your cotton clients with decision making for their cotton farms (as many as are applicable)?

(50 respondents)

43



QUESTION 44

With regards to weed management in the fields used for irrigated cotton in 2011–12, how widely used are the practices listed below/ (in terms of hectares)?

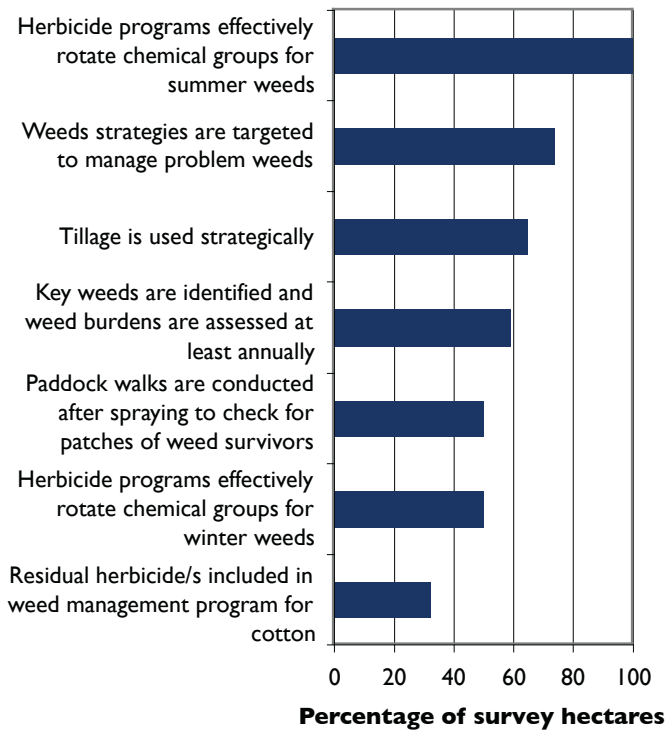
(40 respondents)

QUESTION 45

Of the cotton hectares over which you consulted in 2011–12, estimate the total areas you believe to contain populations of herbicide-resistant weeds (number of affected cotton hectares).

(41 respondents)

44



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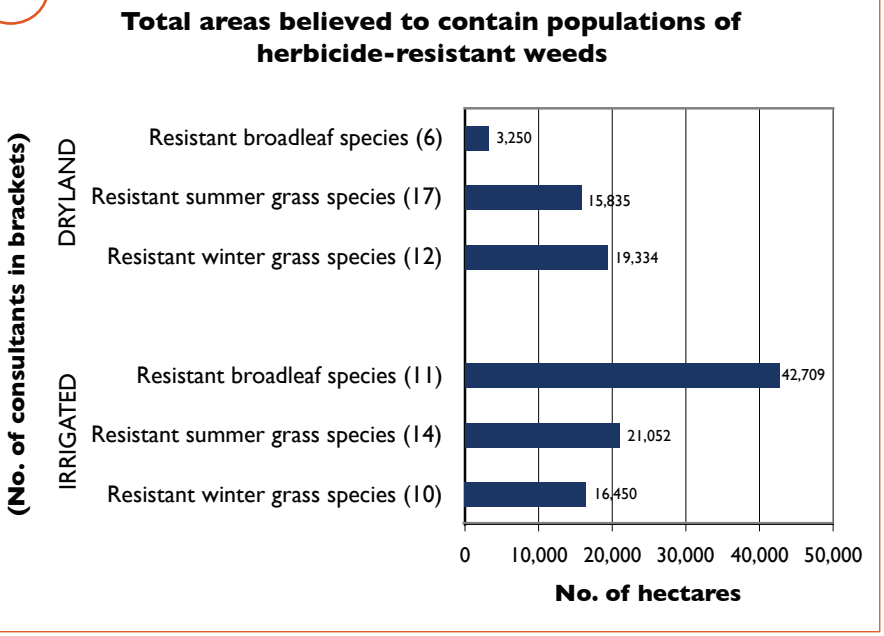


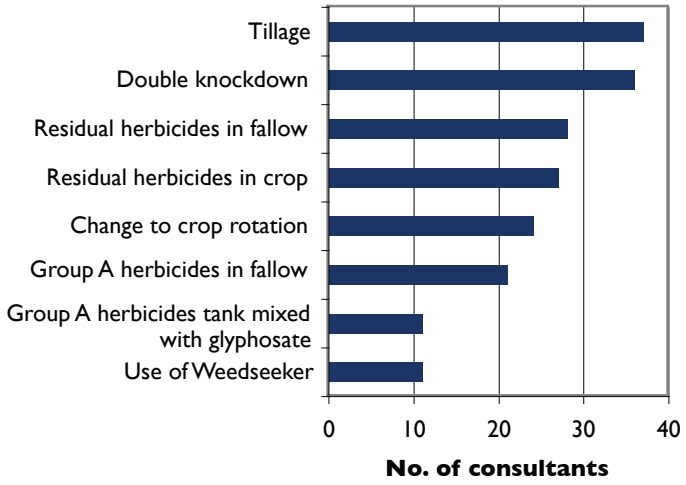
QUESTION 46

For fields where cotton is part of the rotation and glyphosate resistance is suspected or confirmed, the use of which weed control tactics has increased the most (up to 5)?

(46 respondents)

46

Weed control tactics that have increased the most in fields where cotton is part of the rotation and glyphosate resistance is suspected or confirmed



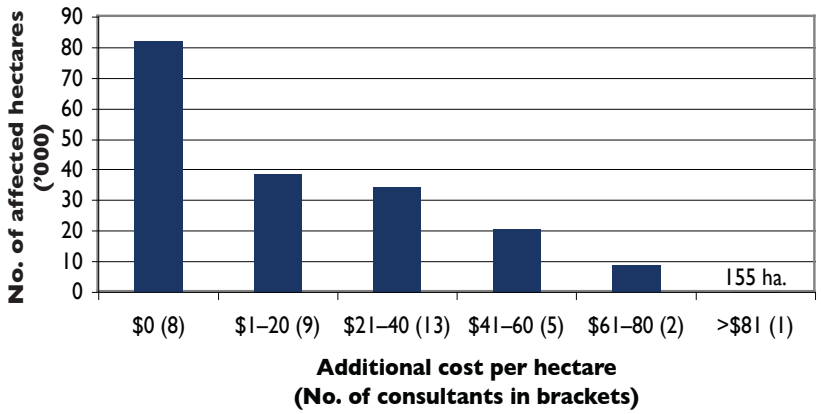
QUESTION 47

In your estimation, how much additional cost per year is being incurred to manage glyphosate resistant weed populations? (number of affected cotton hectares)?

(38 respondents)

47

Additional cost per year to manage glyphosate-resistant weed populations



QUESTION 48

Briefly, what are your expectations, if any, of Genuity Bollgard III?

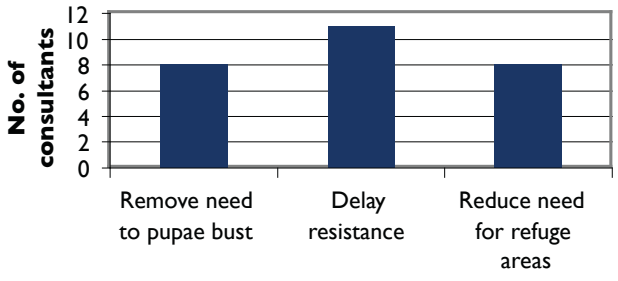
(36 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

Comment A small number of consultants commented on expectations in relation to cost and planting windows.

48

Consultants' expectations of Genuity Bollgard III®



QUESTION 49

Of the 5 elements of the Bollgard II Resistance Management Plan (RMP), which one do you think is the most valuable for delaying resistance to *Bt*?

(53 respondents)

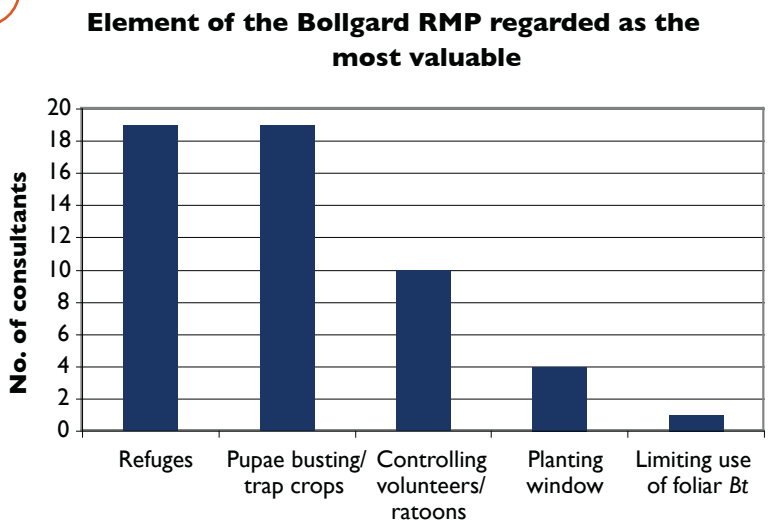
QUESTION 49.1

Why is that element of the Resistance Management Plan most valuable for delaying resistance?

(47 respondents)

Note These tables detail individual responses on the five categories in Graph 49.

49



49.1

CONTROLLING VOLUNTEERS/RATOONS
This has the lowest compliance.
This year I think this has been the most important, as we had a large planting 2010–11 and thus much more volunteers and ratoons survived in many fields. Some of these farms have not been planted back to cotton, therefore do not have a refuge to limit resistance. These plants are surviving as a breeding host for Bt resistance.
More water availability has increased back-to-back cotton and volunteer cotton, which increases disease and pest levels in the fields. By having a Bollgard environment year round, Helicoverpa resistance will have a greater chance.
Because there are so many acres of volunteers and ratoons that do not have a refuge.
Uncontrolled Bollgard II volunteers and ratoons are rarely surveyed for Helicoverpa pressure, therefore there could potentially be multiple populations of being exposed to Bollgard II plants that are moisture stressed and with poor nutrition. As a consequence, they could poorly exhibit the Bt proteins, providing sub-lethal doses to Helicoverpa populations.
Volunteers in fields that are not being monitored or on roadsides etc. may be hosting Helicoverpa undetected, which may be resistant to Bt.
These can survive all year round for us, therefore exposing continuous generations of Helicoverpa to the Bt.
These are potential feeding sites away from Bollgard crops.
No current monitoring.

Continued on page 25...

... Question 49.1 continued

PLANTING WINDOW
In our experience the planting window has the greatest effect on the number of *Helicoverpa* exposed to the *Bt* gene. On the Darling Downs, mixed cropping is widespread and the number of hectares grown to sorghum, corn and other *Helicoverpa*-friendly crops has a far greater impact on *Helicoverpa* than any amount of refuge.Pupae busting does not seem to have much impact, as we tend to detect pupae emerging in January with very few pupae emerging at the end of the season. And judging by Monsanto's resistance research, very few or none of the end of season pupae are resistant. There are nowhere near enough volunteer or ratoon plants on the Darling Downs to impact *Helicoverpa* resistance levels. The foliar use of *Bt* is minimal and its impact on resistance is minimal as well.
Limited time of exposure during the season and opportunity for other cropping systems to dilute populations.
It is critical we limit the number of generations being exposed to the *Bt* gene
Window is important, but then again it depends on variety and maturity variations. All elements are important because we do not have complete control over any; they all have their limitations, therefore many aspects are needed to have an impact.

PUPAE BUSTING /TRAP CROPS
Because it reduces the population of *Helicoverpa* that would have normally emerged; it physically destroys the pupae.
Planting window is a waste of time considering how late crops can go on, refuges are overshadowed by the amount of natural refuge, volunteers present everywhere outside the paddock, foliar *Bt* never worked well anyway. So good pupae busting is the most effective.
I think these have the greatest impact on breaking the cycle.
In order to stop the overwintering of a potential resistant population, I believe the industry should be given the option of a compulsory spray across all fields or grow a refuge area: one or the other.
On the Downs we have massive areas of other refuges, so the destruction of any resistant types in-crop must have the major effect.
It is ensuring any survivors in crop are destroyed before reproducing. I think this is more beneficial than a refuge crop, as last year there would have been plenty of pastures and sorghum that would have breed many *Helicoverpa*.
Pupae are the weakness to the *Helicoverpa* lifecycle. Tillage is available to all farmers in all situations.
To break the life cycle, the other four are important as well
Pupae busting reduces the numbers of survivors.
Pupae busting is the only definite control for any overwintering *Helicoverpa*. Refuges are too poorly managed.
Providing a clean break between seasons and generations.
Physically controlling any pupae that may be resistant. Refuges are important as well but rely more on chance mating to dilute resistant moths.
Pupae busting to reduce the number of moths over wintering. I think more work needs to be done with the percentage of trap crops on large farms.
All elements of the Bollgard II RMP are extremely and equally important for the protection of this technology. Pupae busting destroys over wintering pupae that may carry resistant genes.

... Question 49.1 continued

... Pupae busting/trap crops (continued)
Pupae busting, if well executed, provides guaranteed mechanical control of potentially resistant individuals.
It is a complete destruction of any resistance *Helicoverpa* which may come through in the next season.
Demonstrated by previous results.
It is the one opportunity where everybody can ensure they are achieving an adequate kill on any surviving *Helicoverpa* under Bollgard II crops, compared to refuges that may not be that attractive etc.

REFUGES
Because I feel all the others listed above are ineffective at delaying resistance to *Bt*. So refuges (by default) must be the most valuable. If *Helicoverpa* are present, they should breed in the refuge.
The production of a non-resistant population of adults to dilute any resistant population seems to be the most effective.
Refuges will assist in dilution of the resistant alleles that may be developed in Bollgard crops. These are more prominent than just pigeon pea areas in cotton field and range from a large host of native plants to other field crops grown within a region. This is better than planting date restriction, as weather events and the like can impact on the harvest timeliness of a crop, in which case the limitation to a set window becomes irrelevant at the end of the crop due to no fault of the grower/consultant.
It allows for the natural environment for the *Helicoverpa* to breed without using chemicals to destroy them.
Our region is primarily an irrigated cotton monoculture over the summer months and, by implementing the refuge strategy, we are able to produce unselected *Helicoverpa* moths that are then able to dilute any resistance genes that may have survived through on the cotton.
Producing large quantity of susceptible moths to dilute few resistant moths.
To encourage diversity in the population of *Helicoverpa*.
Breeds up large amount of susceptible insects, which will then dilute any resistance coming through.
Ensuring *Helicoverpa* moths are flying.
Dilution of potentially resistant *Helicoverpa* female populations.
Essential to dilute resistant individuals.
Allowing population dilution between susceptible and resistant individuals.
It is more about the whole season.
Pupae busting/trap crops are also important.
Resistance can escape the other four elements, but the refuge statistically makes the successful reproduction of resistance extremely remote.
Provides a source of susceptible moths to dilute any potential homozygotes.

QUESTION 50

What decision tools are used by you and/or your clients to assist with decisions regarding application of fertiliser to their cotton crops?

(40 respondents)

QUESTION 51

Details of 'Other' responses in Question 50.

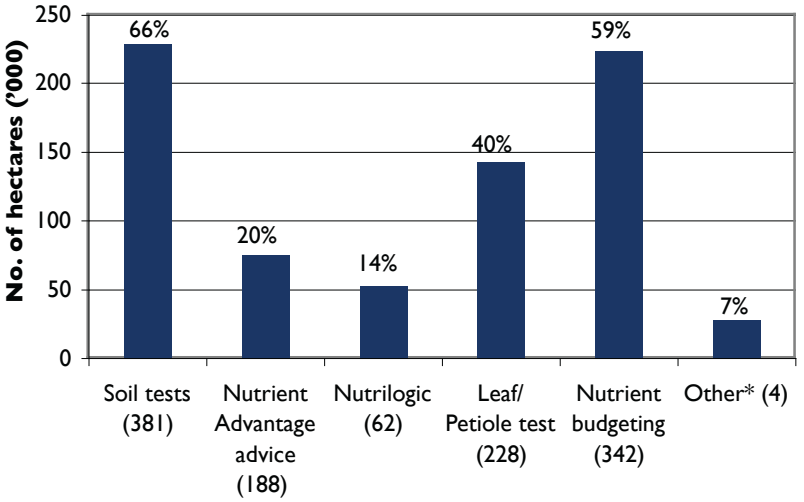
QUESTION 52

For fields where soil testing for nutrients is undertaken prior to cotton, across how many hectares are the following soil layers tested (number of cotton hectares)?

(35 respondents)

50

Decision tools used by consultant and/or clients to assist with decisions regarding application of fertiliser to cotton crops



No. of clients in brackets; % of survey hectares above columns

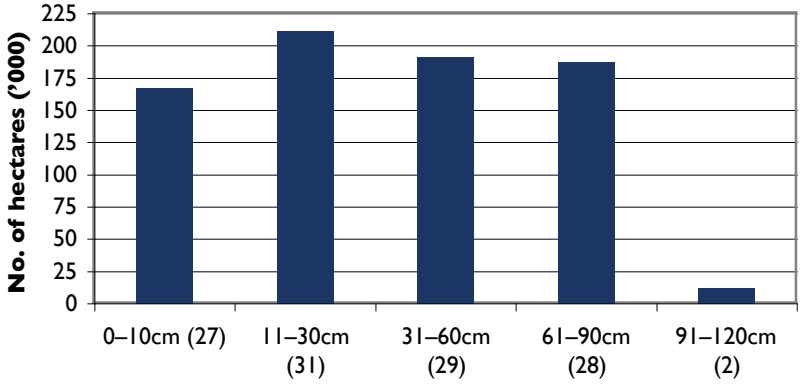
* See Question 51

51

Back Paddock web tool.
All clients base their fertiliser decisions off 'removal'.
Previous experience and yield history.
Sap samples.

52

Depths at which the soil testing was undertaken



Depth of testing (no. of consultants in brackets)

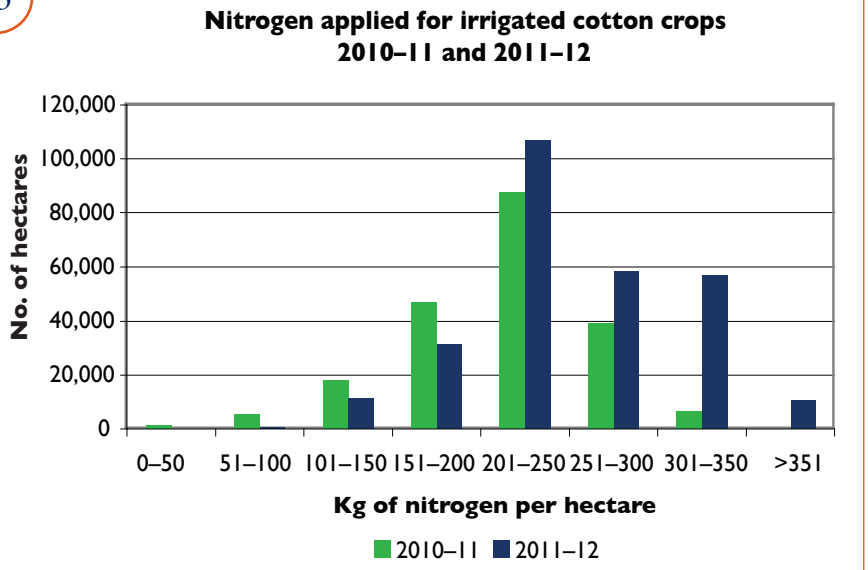
QUESTION 53

How much nitrogen was applied per hectare for irrigated cotton crops in 2011–12 (number of hectares)?

(40 respondents)

Comment It should be noted that the number of respondents in 2010–11 was 29, compared to 40 in 2011–12. In both years, a notably high percentage of hectares had 200 or more kilograms of nitrogen applied: 65% in 2010–11 and 61% in 2011–12.

53



QUESTION 54

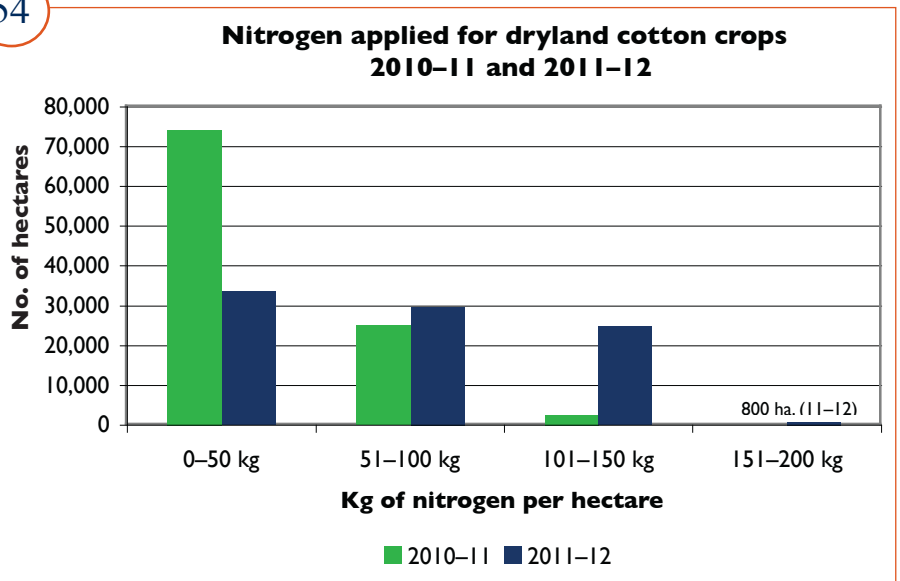
How much nitrogen was applied per hectare for dryland cotton crops in 2011–12 (number of hectares)?

(28 respondents)

Comment The number of respondents in 2010–11 was 22, compared to 28 in 2011–12.

The distribution in the two years is quite different though: in 2010–11, 97.5% of hectares received 100 kilograms or less, whereas in 2011–12, the figure was 65%.

54

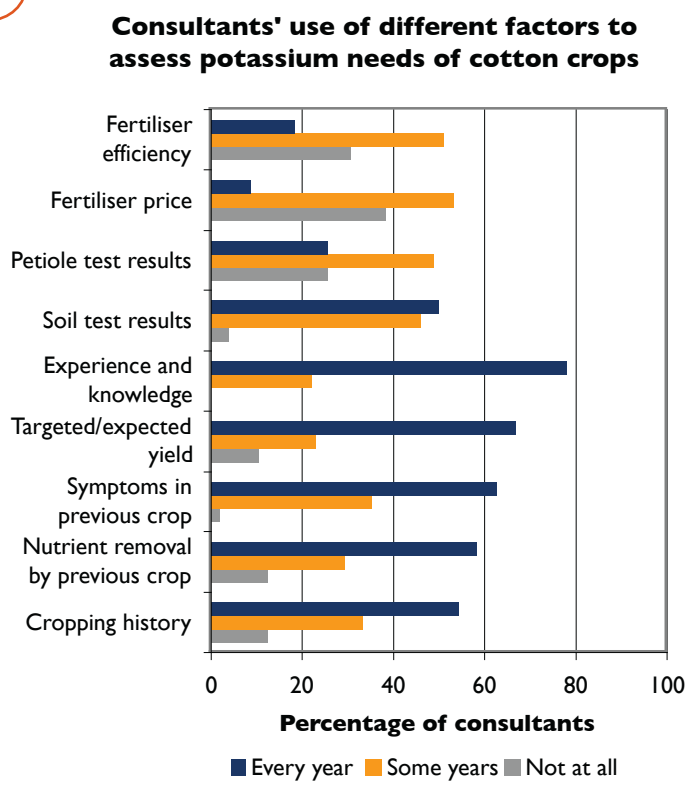


QUESTION 55

Rate the following factors according to the frequency with which you use them for determining potassium needs of cotton crops.

(51 respondents)

55



SPRAY APPLICATION

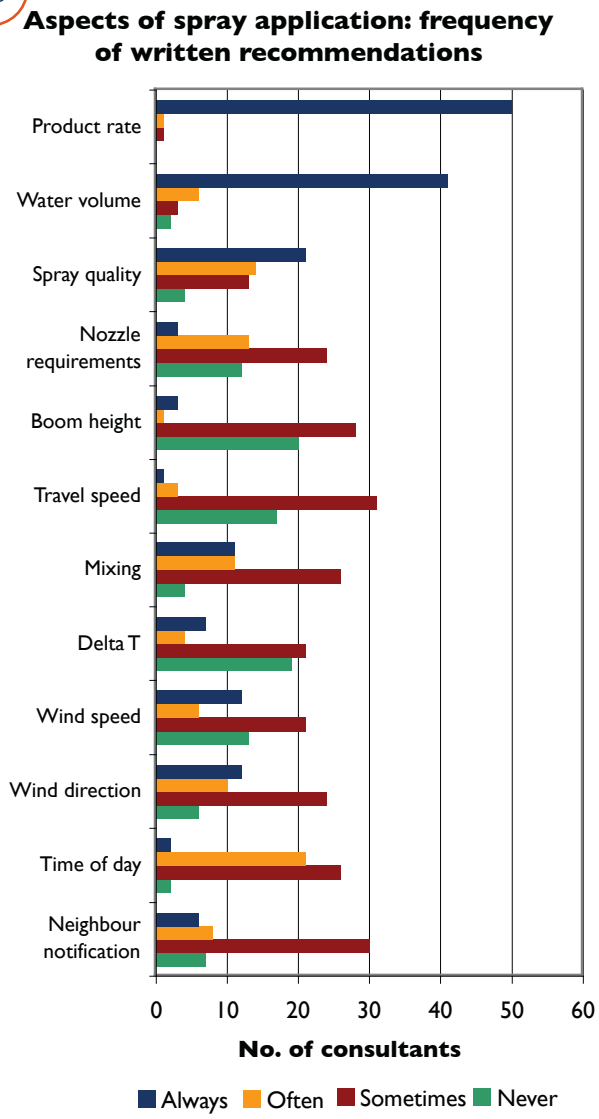
QUESTION 56

How often are aspects of spray application included in written recommendations to cotton clients?

(51 respondents)

Comment Comments were made that neighbour notification is only necessary if there are sensitive crops nearby and that some consultants believe notification is the grower's role. Standout figures from the table were the high rate for product rate and water volume and the low frequencies for boom height, travel speed, Delta T and nozzle requirements.

56



QUESTION 57

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

(52 respondents)

QUESTION 58

What impacts did spray drift from Group I herbicides (eg. 2,4-D, MCPA, Starane) have on your clients' cotton yields this season (best estimates of number of cotton hectares): bales per hectare yield reduction?

(40 respondents)

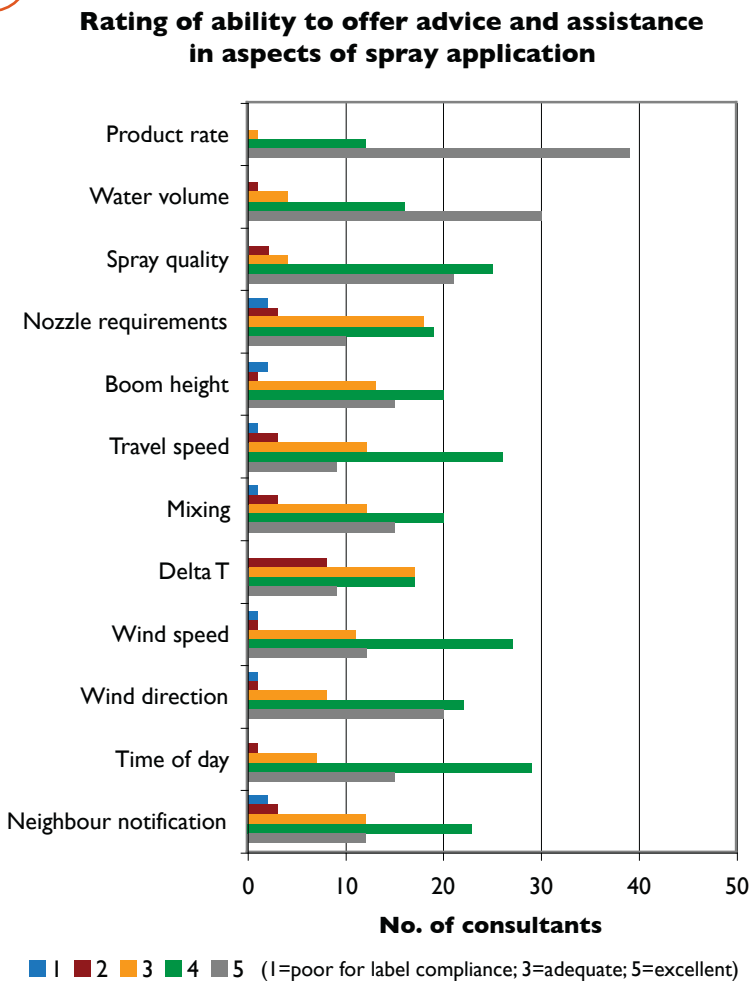
Comment A very low proportion of cotton was affected by spray drift in 2011–12. Of the 40 consultants who responded to this question, only 6, representing 6,350 hectares, had a yield reduction of 1 to 2 bales per hectare.

QUESTION 59

Were there any other impacts from spray drift?

(9 respondents)

57



59

Delayed maturity.
Increasing SpraySeed drift due to lack of caution but hormone drift saw a big reduction. Always some Roundup drift when there is a big reliance on planes in wet years – especially on pigeon peas.
Liberty onto RRF cotton within own farm, minimal (less than 1 bale per hectare reduction.
Low Gramoxone.
Only had spray drift impacts on dryland cotton and in which case some of the more highly affected areas were wiped out in floods at the end.
Only occasional visual symptoms.
Self inflicted from boom contamination and lack of cleaning.
Very light hit of 2,4-D product used in winter fallow on some crops just before defoliation. This caused some leaf freeze. It was self-inflicted. Despite leaf on the bush, early indications suggest no penalties for leaf in the sample.
Yes, but very low effect on crop.

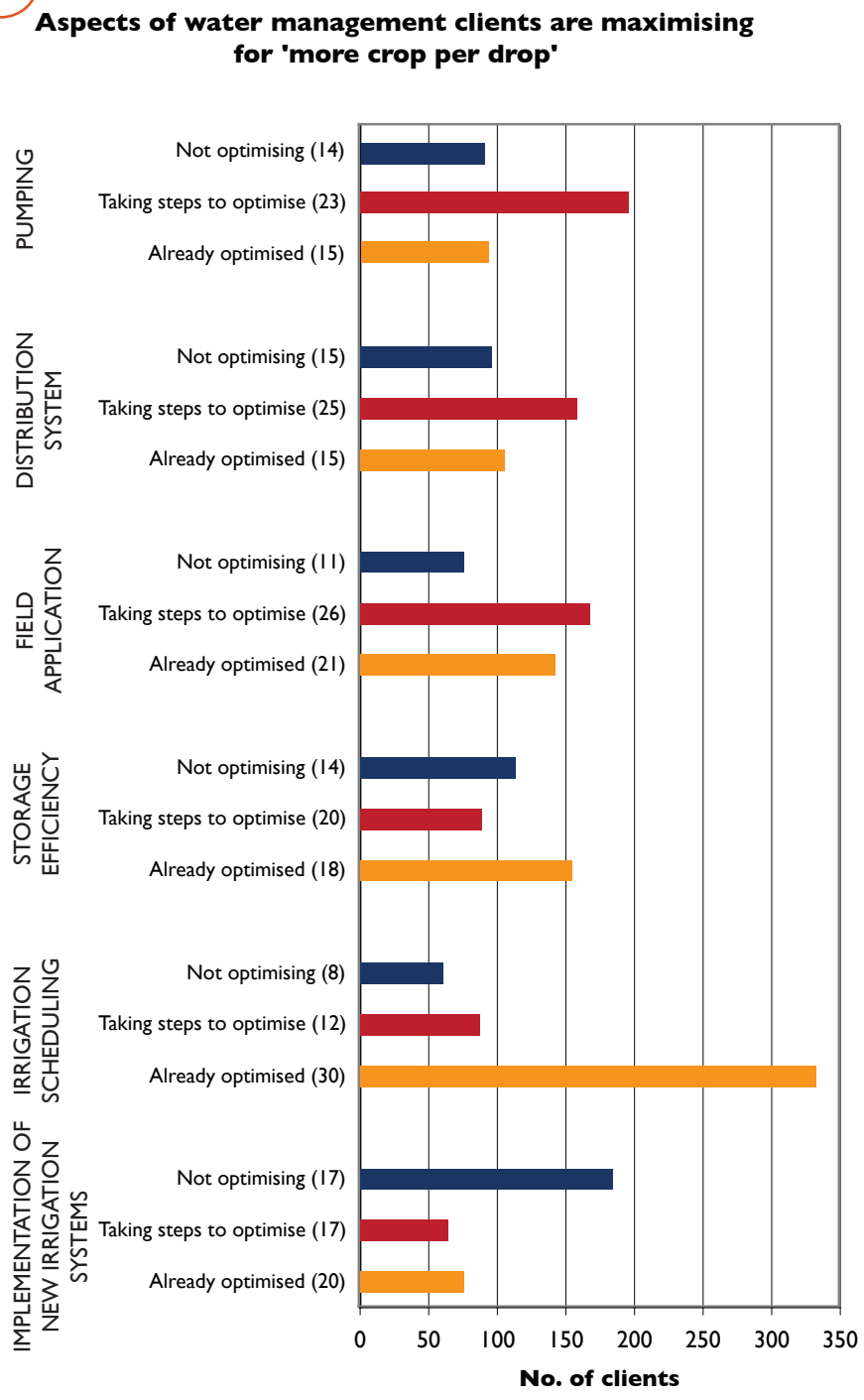
QUESTION 60

What aspects of water management are your cotton clients currently optimising to grow more crop per drop?

(53 respondents)

Comment This graph shows, for example, that (from 30 consultants) 57% of growers in this survey already optimise their irrigation scheduling and another 12 consultants report that 15% of their growers are taking steps to optimise irrigation scheduling.

60



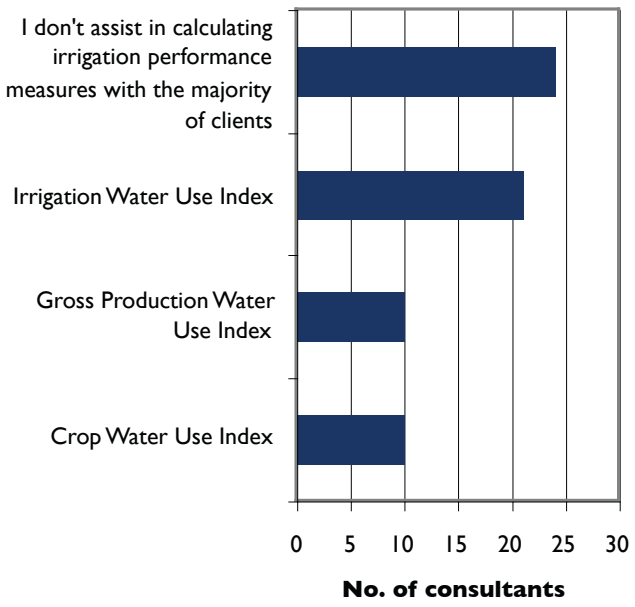
QUESTION 61

Which irrigation performance measure do you assist the majority of your clients to calculate (as many as appropriate)?

(49 respondents)

61

Irrigation performance measures which consultants assist the majority of clients to calculate



QUESTION 62

How many hectares of the cotton grown by your clients in the 2011–12 season were irrigated using overhead irrigation systems?

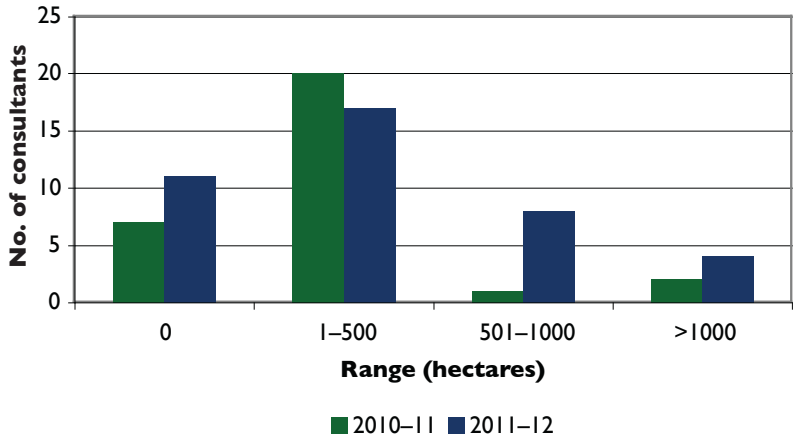
(40 respondents)

Comment A total of 18,351 hectares were irrigated using overhead irrigation systems in 2011–12, representing 6.5% of the irrigated cotton hectares in the survey.

In 2010–11, approximately 4.5% of the survey hectares were reported as having been irrigated using overhead systems.

62

Clients' cotton irrigated with overhead systems in 2010–11 and 2011–12



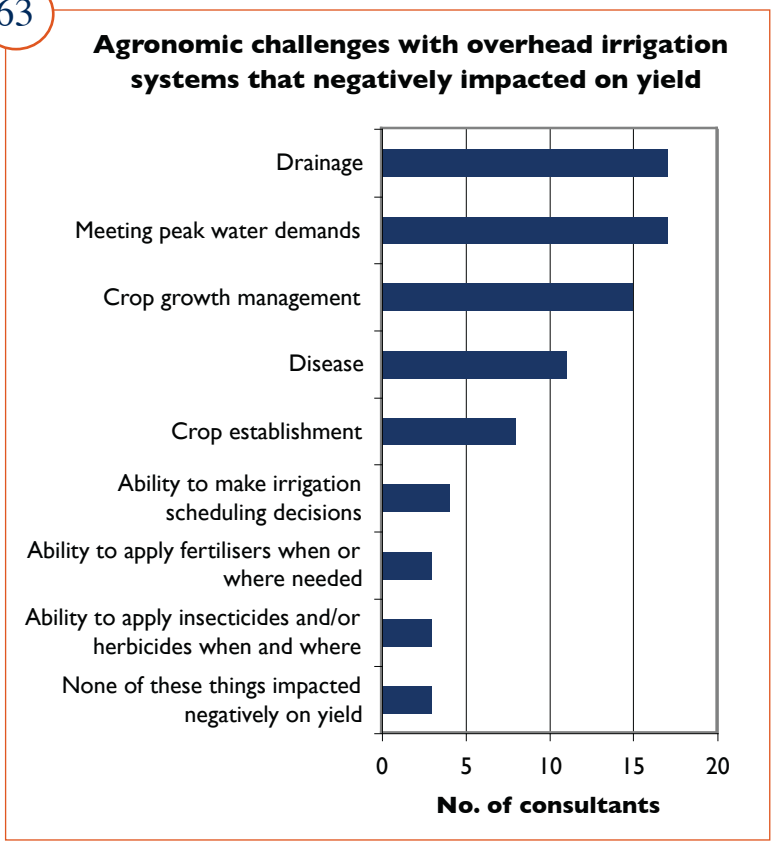
QUESTION 63

With regards to the cotton irrigated by overhead systems, which if any of the following agronomic challenges do you think negatively impacted on yield in the 2011–12 season (as many as are relevant)?

(47 respondents)

Note 8 of the respondents had no clients irrigating with overhead systems.

63



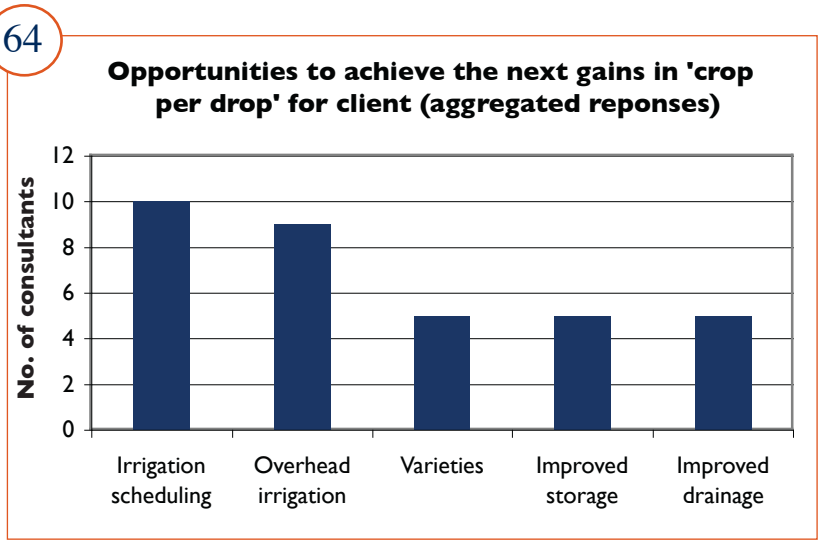
QUESTION 64

In your opinion, what do you see as the opportunities to achieve the next gains in 'crop per drop' for your cotton clients?

(35 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

64



QUESTION 65

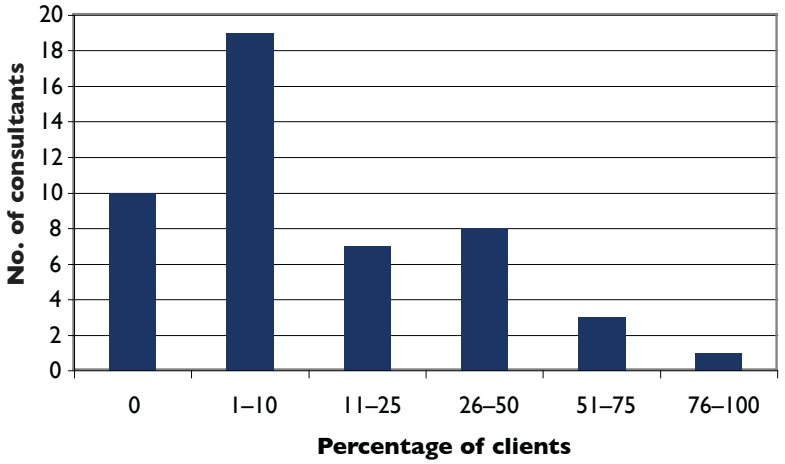
How many of your irrigation clients have accessed or are expressing interest in accessing federal government water structural adjustment funds?

(48 respondents)

Comment 10 consultants said none of their clients had accessed or were interested in accessing these funds, while a further 19 reported only 1 to 10% of their clients were.

65

Irrigation clients who have accessed or are expressing interest in accessing federal government water structural adjustment funds



R&D INVOLVEMENT

QUESTION 66

How many of the cotton growers you work with did on-farm trials in the 2011–12 season?

(50 respondents)

150 growers (26% of growers in the survey) participated in on-farm trials.

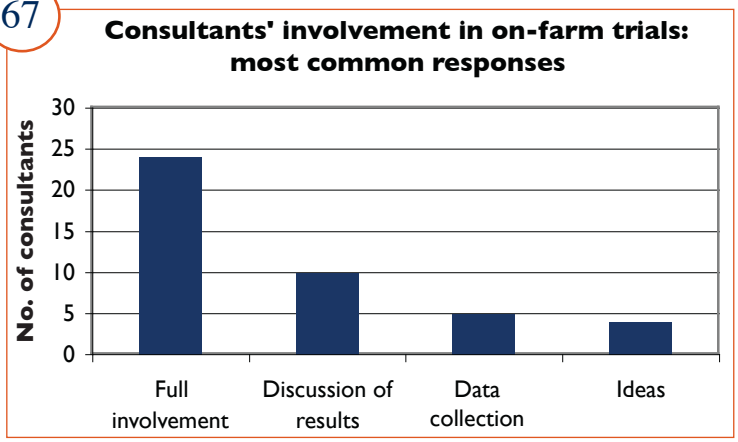
QUESTION 67

With regard to on-farm trials (as above), describe any involvement you have in the trials.(eg. Involvement could relate to: ideas, design, treatment application, data collection, analysis, discussion of results, etc)

(42 respondents)

Note This graph aggregates the most common responses. Please see the appendix for individual responses.

67



QUESTION 68

Between June 2012 and March 2013, CRDC will develop its Strategic R&D Plan for 2013–2018.Considering the mix of short and long term issues you face in delivering the best possible results for your cotton clients, what advice would you give CRDC for PRIORITIES for R&D investment over the next 5 years?

(41 respondents)

Comment These are useful comments with, in particular, a number mentioning nutrition, resistance and varieties.

68

Major investment needs to be given to southern NSW as the cotton area spreads into new and marginal territory. The absence of a cotton IDO while the industry is developing is a major shortcoming. I have been assisting new growers in the south since cotton was established in 1998. However, I feel now that many farmers are venturing into cotton unguided or by people with little experience.

The cotton industry has always been very controlled and worked together during critical times as a close-knit community. In the south this is not happening, as there are many new growers and a great potential for detrimental issues. New grower groups need to be established to bring about some cohesion.

Service / input providers have to be monitored for their input they are giving and the CRDC and CCA needs to have a greater presence in the area if they are to have any influence on cotton growing in the south. It can no longer be run from Narrabri as southern growers care little about what happens in Northern NSW or Queensland.
Few sales agronomists will be an active part of the CCA if the meetings are held in Nth NSW. Maybe the CCA needs to be split into a southern and northern region?? Those newer members of the CCA have become so to allow their employers to become Monsanto TSPs.

There is no cohesion between agronomic advice at the moment as it is being used as a tool for resellers to gain more customers and sales, not because the employees have a general love of cotton growing.

Research into what is the minimum required refuge for BGIII. Phosphorus and potassium nutrition and placement of fertiliser.

Fusarium and other diseases, *Helicoverpa* resistance monitoring, soil physical and biological management, keeping young researchers, exotic pest monitoring, how to run a better overall farming or consultancy business.

Get the breeding program sorted out.

Providing research to develop a nationwide sustainable cotton farming system, with particular focus on specific area issues such as CQ boll disease issues which impact the entire industry, however are more evident in the CQ system.

Providing some support into the human resources sector of the industry to cater for the changing of the guard of generations within the industry to maintain the sector.

... Question 68 continued

Making sure that our clients remain profitable without up-heaving current operating techniques.
Nutrition is an extremely important area for the production of high yielding and sustainable cotton crops. I believe a lot more work could be done in this area. Maintain *Bt* resistance monitoring program – need early warning of any changes to resistance frequencies. Continue work on controlling and managing new and emerging insect pests such as mealy bugs. Continue work on optimising irrigation systems. Managing glyphosate resistant weeds
Short season varieties for southern NSW. Cotton seedling vigour genetics research – key trait for southern NSW. Bollgard III – longevity of this trait is a priority for southern NSW.
Green veggie bugs!
Fertiliser inputs, IPM and irrigation efficiency.
Continued nutrition research
Variable rate technology and precision agriculture; disease; WUE.
Encourage more IPM insect management, and avoid over-sprays from the neighbours. Get more involved with weed control and weed control management strategy, including chemical rotation groups.
Development of higher f rank varieties.
Pix management in the south.
Nutritional research, IWM, resistant Management.
Maintain investments in the people that make it work so well, work on ways to easily draw on research and information already conducted.
Plant Nutrition review critical levels for plant and soil analysis.
Refuge for Bollgard III; high yielding conventional varieties;pupae busting requirements; drought tolerant varieties.
Keeping the water for crop production. Profitable rotation options for the future. Nutrition under Bollgard III. Soft options for difficult pests such as GVB, which chemical companies cannot economically address.
Rebuild the industry's research capacity in the important in-crop aspects of pest management, nutrition, disease management and weed management. Also a strong, well directed extension team to drive this. A lot of good people were forced out of the industry during the drought and effort needs to be made into rebuilding this human capacity before Lewis Wilson, Steve Allen etc retire.
Producing more from dryland systems, particularly short season environments.
Roundup resistance, Fusarium – to rotate or not to rotate – what will give me best return? Pix application in different valleys.
Haven't given this any thought. Sorry.
An issue that I am concerned about is selective insecticides for Bollgard. GVBs, whitefly, mealybugs, aphids – we need more options. Why was Intruder from Dupont taken off the market. I think it is registered for whitefly in the States at higher rates? Also very concerned about glyphosate resistance. As far as I know there is no product in the pipeline to replace glyphosate. I believe we are putting far more pressure on glyphosate than we should be. I think with regards to Roundup Ready Flex, lay bye herbicides should be compulsory.
Bollgard resistance; weed resistance.

... Question 68 continued

Revisit nutrition requirements and efficiencies – crops are much higher yielding now. Effects of newer water application methods on nutrients.
Technology in terms of phones tablets etc, as much as I hate to say it, is probably something that needs more work as this technology is increasing rapidly. I would also warn that this area could easily turn wasteful and just for toys so they need to be careful. Nutrition is still a major factor and one which, even after all the work, seems to be managed with guesswork and mumbo jumbo. Rocky does some fantastic work but I don't think people are listening.
Revisit nitrogen fertilisation in high yielding cotton crops with a view to reducing wastage and environmental impact (nitrate in ground water, NO2 in atmosphere (carbon tax).
Would like to see funding towards reducing cost of production: 1. Driverless tractors to decrease labour cost; 2. More efficient engines, perhaps running on biofuels; 3. More efficient ways to provide nutrients to crops.
Firstly, do an audit of the modern Australian cotton industry and determine a sustainable size and path forward. More emphasis on long-term economics. Determine how to maintain some Australian control of the industry for the good of the long term 'members' and stop the short-term exploitation and expansion everywhere. Learn from the past cooperative type approach that built the industry. Re diseases and pests: a more proactive approach on prevention and control.
Collaborate with the GRDC, nearly every cotton grower is a grain grower also we need to have collaborative research, NOT competing research (to get the best out of our research dollar). Nutrition-requirements and responses in dryland and irrigation. Row spacing work with 1.5m spacings and raised beds – there is still much more to learn. Pix application and canopy management. Improve the use of CottonMap (for ALL crops, including cotton, to prevent spray drift – still a significant issue that not all industry are utilising).
Getting balance right for Bollgard III, including refuge and pupae busting. Weed work with FTR. Resistance work with aphids to continue. Fusarium monitoring. Nutrition for higher yields 12+ bales per hectare and supplementing manures on a 1 to 2-yearly basis.
Think Outside the Box.
Nitrogen rates. Green Vegetable Bug Thresholds? (Possible to spray earlier – with product we have now.)
Disease. White fly management. Weed resistance. Fertiliser efficiency.
Long-term profit analysis on overhead irrigation systems on different soil types. Understanding foliar diseases and nutrient losses (other than nitrogen) in exceptionally wet years. Pix management with new varieties and it cool wet years. Weed management options for Fleabane, Windmill grass and volunteer Roundup Ready cotton. Improving configuration, nutrient and Pix management in dryland cotton.
Fuel efficiency. Fertiliser efficiency: i.e. nitrogen side dressing. Critical levels for petiole or leaf blade P, K, S, Zn, Cu, Boron. Pump efficiency. How to grow high input cotton and get 15+ bales per hectare
Look into the opportunities for the Australian cotton industry to develop their own Ingard/Bollgard product so that we will not completely be dictated to by Monsanto in the future.
Refuge alternatives. Fine tuning of GVB thresholds. Mid-season Pix use.

4 APPENDIX

WHAT IS INCLUDED IN THE APPENDIX?

Below you will find individual responses to questions where these responses expand on, or add to an understanding of, the graphed information in this publication.

QUESTION 6

What do you love most about being a cotton consultant?

Growing the cotton crop and achieving its optimum potential. Technology transfer to the growers.
Working in an industry that is open to ideas and is always on the move, striving for better profitability.
Working outdoors with great people.
Being outdoors, driving around, seeing people and trying to help farmers. Mostly it's being outside and being physically active all day, I could not sit in an office!
Getting a really profitable crop outcome.
The big thankyou I get from my clients at the end of the season.
Career opportunity, being involved in the industry and having a close personal relationship with grower to assist them to make the best decision for their crop. When a success comes about, it's a great feeling to know that you have helped in some way.
The clients are fantastic people. They have a world of knowledge that you can't get from a textbook.
Managing crop canopy.
Crop Consultant Surveys!!!!!
I enjoy the satisfaction of helping grower clients to achieve their aim of growing high yielding, profitable and sustainable crops.
Challenges of the crop in terms of yield, season, pests. Client, staff and professional interactions.
Being outdoors.
The great 'community/network' the industry has developed. It is a very proactive, exciting industry to be involved with.
Being self employed, working closely with farmers on a day-to-day basis and enjoying the challenges of growing a high yielding and profitable crop.
The clients and playing a constant role in helping produce a quality crop.
Client contact. Interesting challenges.
Challenging crop and a great industry but most of all, cotton is an important part of our rotations.
Challenge to grow the best crop the season allows.
Uses a variety of skills that keeps your body and mind active.
Good research and development.
To provide a service where you assist in producing a high value product for growers.
Results.
Variety of inputs required, usually the more knowledgeable and switched on growers that grow it.
When your decisions contribute to a favourable outcome/yield for the grower.
Helping growers improve their yields.
Being involved with the growing of good, profitable and sustainable crops.
Getting a good result for clients.
Are you mad?!? In saying that, cotton is a highly rewarding crop that can be truly 'managed'.
The people.... good and bad.
Drinking a few beers after a hot day in the sun!
The challenge of producing a high yield and the money.
The relationships that you develop with clients.
Cotton is a challenging crop – every season throws up something different.

I work outside and I enjoy being involved in managing crops.
Building a relationship and interacting with clients. Seasonal character of the work.
The yearly challenge of producing a good paying cotton crop from seed in as sustainable way as possible and making clients happy.
The challenges of cotton production.
Working with clients who always like to improve yields. Seeing first hand high yielding crops.
Seeing clients improve their yields.
People – both research and commercial.
The challenge.
Taking responsibility for the crop. Seeing a well thought out strategy hopefully produce big cotton.
Helping growers achieve their goals; new technology adoption; challenging environments; high yields.
The money; and that it provides me with a career that is spent the majority of the time outdoors. Also that you have the opportunity to interact with a wide range of people on a daily basis, such as growers, farm managers, other consultants, researchers, industry staff etc., making it a rewarding industry to be a part of.
Achieving results for clients.

QUESTION 15

What professional development (across all issues, not just agronomic) would YOU be interested in doing over the next 12 months?

Agronomy Upskilling; business development.
At the moment it is hard to say, but I really would like to get a handle on WUE and variable rate technology.
Australian Rural Leadership Program.
Business course.
Business development.
Business Management.
Business management.
Business management. Hiring and training staff. Benchmarking training.
Business planning, human resource for consultants, first aid courses.
Business, soybean course, basic cattle nutrition, staff management, time management.
CCA meeting: distance to meeting is an ongoing problem. Goondiwindi is 10 hours drive from Griffith without stopping, Moree 8.5 hours and Narrabri 7.5 hours.
Cotton nutrition.
Financial management, understanding markets. John Deere/Trimble course. What is available, what is coming.
How to operate the business more effectively and efficiently.
How to run a better small business in terms of staff and HR, accounting, people management, WHS, technology.
Human resource training.
I need to improve phone/tablet/computer skills. Am doing a panelbeating course.
I will do and pay for some Back Paddock nutrition stuff.
Improve cotton nutrition and irrigating knowledge.
Information management and access. Mind management and strategies for success.
Irrigation management and budgeting. Integrated weed management. *my*BMP.
Learning more about benchmarking, to help with our end of season reviews with clients and for own personal interest and development.
Looking at starting a MBT through UNSW in the next 12 to 18 months, once our second kid is born in October this year.

Management, business development, communication, second language, computer science, new technology communication, statistics, risk management.
More precision agriculture training.
More spray and irrigation monitoring workshops, revision courses for chickpeas and mungbeans, Ethics course through the St James Ethics Centre.
None.
None.
None planned.
Nutritional and WUE.
Research updates, weed/pest and disease workshops.
Safe driving skills on dirt roads.
Soil training. Improving communication.
Staff management and business planning.
Succession planning and resource management.
Technology competency. Winter and summer pulse advisor courses.
Train young agronomist in southern regions from Goondiwindi.

QUESTION 21

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

Agro and Twitter.
Agrow data, Sydney Morning Herald, Numbers, Pages, Dropbox, WeedID, iplantfile pro, Weatherzone, rain.
Agworld, Quickoffice and Google.
Agworld and Soilmate.
Agworld, quick-link to weather sites, Internet banking, Numbers, Aqua-spy, Farm Connect, quick-link cotton price.
BOM radar, Weatherzone and Commbank.
BOM Weather.
Calculator, photo editor, flashlight, weather.
Compass, GPS, Torch.
Do not use them.
Dropbox.
Dropbox, Docs to go and Tank mix (dupont). Live traffic - for road closures during floods.
Dropbox and Agworld.
Elders weather app.
Facebook, Twitter, Pest Genie.
GRDC weeds identification app.
Internet Banking, TuneIn Radio, iBooks, Pages and Google Earth.
Ixalander, Citrix, Team viewer, Elders weather and Tango.
Looking at weather information sites - probably not really an app?
Mail, Messages, Skype, Safari, oz weather, Facebook, Currency, Flashlight, calendar, contacts, Filemaker go, iWork apps.
NRL Supercoach.
Oz Runways and YR Weather for work. Shazam for personal use.
Pest Genie and weather.
Pest Genie. Landmark.

Pest Genie and iTunes.
Sydney Morning Herald, Courier Mail and Agworld.
Smurfs, Agworld and weather apps.
Weather and Agworld.
Weather, Maps and Dragon.
Weather, GPS.
Weatherzone plus.
Weatherzone and Facebook.
Weatherzone and Rainradar.
Weatherzone, Rainradar, Cyclingnews and DocsToGo.

QUESTION 28

In your experience, what is the single most important factor in managing cotton crops that are back-to-back? Why?

Regrowth control: it has played havoc with stand establishment, plant population, weed control and nutrition management. It is usually not pick-able as it is outside the picker line.
Don't skimp on fertiliser because the season may not allow you to apply it in-crop when you need to. More chance of coming unstuck in back to back.
Managing compaction and nutrition.
Maintaining soil health: for example, breaking down cotton stubble, working the country through cultivations, incorporating composts/fertilisers and giving enough time for the soil to 'rest'. The previous cotton crop uses a lot of nutrients and moisture and this must be restored if the following crop is expected to perform the same on the same soil.
Managing soil compaction.
Ground preparation. Good preparation leads to better water and nutrition efficiency plus better crop establishment.
Control of disease/insect green bridge through winter. CBT is becoming another major issue across the regions and back to back always seems to have ratoon or volunteer cotton plants unable to be removed from the field. This can obviously also cause issues with insect carry over for the next season.
Nutrition. Knowing what you have taken out in the previous cotton crop and what you need to put back into it to have the next crop to meet its potential is essential.
Nutrition.
Management of Volunteer RRF cotton.
Volunteers.
Timeliness and care in the quality of operations. Successful back to back is not just about one factor, it is about seedbed preparation in a timely manner, avoiding compaction, ensuring adequate and timely provision of appropriate nutrition and timely irrigations, and weed control operations.
Volunteer cotton management: you can have an impact on commercial crop yield while trying to remove volunteers because of factors like cultivation stress and competition.
Disease – black root rot in cooler years.
Volunteers. It is difficult if environmental conditions don't work in your favour.
Maintaining good growth and vigour.
Volunteer and ratoon cotton. Hosting diseases and pests. Getting coverage over these plants to control pests, difficulties in defoliating and picking.
Removing previous crop stubs to minimise ratoons because they compete very aggressively as a weed and can harbour insect pests.
Getting the paddock back into shape and suitable to replant cotton. I found this year that diseases such as Fusarium and plant establishment were the biggest factors.

Crop establishment. To start the crop off as well as a fallow crop is critical.
Disease and nutrition.
Pupae destruction, managing volunteers.
Ratoons and volunteer cotton management. Back to back cotton has seen the increase in these plants, which are usually carrying diseases and have provided a host for pests through the summer. These pests have an increased chance to become resistant to chemicals and also the GM traits. They then compete for nutrition from the crop and also impact picking.
Land preparation.
Nutrition.
Cotton volunteers. They always cause issues as they compete for nutrients and water and, if they are not controlled well and are in between rows, they are not picked.
Inter-row volunteer control: if not controlled, they are a strong competitor and can reduce yield significantly because much of the inter-row volunteer cotton cannot be picked.
Nutrition.
Volunteer cotton control for its effect on yield and its difficulties to control.
Nutrition and water is less forgiving.
Adequate nutrition, especially P and K.
Removal of volunteer and ratoon cotton. Disease and insect host and a weed that is very difficult to control in-crop which, depending upon severity, can impact yield.
Establishing uniform plant stands.
Volunteers and land preparation.
Controlling volunteer cotton and cotton bunchy top, and planting early.
In relation to Bollgard II: the 2 most important factors of management are nutrition and water. Adequate nutrition (particularly nitrogen) and water are needed to achieve the desired node number. Split application of nitrogen (25–30%) in-crop seems to deliver the best results.
Soil management leading to good seedling establishment.
Nutrition, due to high nutrient removal from the previous crop.
Nutrition.
Reducing the potential for volunteer and ratoon RR cotton because they are not controlled by glyphosate and Liberty Link cotton is currently not seen as a comparable alternative (in terms of yield potential and 'user friendliness').
Controlling return cotton and ensuring enough fertiliser has been applied.
Avoiding soil compaction and keeping the beds/hills in good tilth to get good stand and early establishment of the next cotton crop.
Disease and nutrition: both the most costly next to water.
If an overhead system used, then must start filling the profile in July-/August.
Nutrition. Limited mineralisation.
Ground purification (seed beds).
Disease and plant establishment.
Getting bed preparation right: having hills we can get a good establishment in, which are ready in time with fertiliser in.
Volunteers, Verticillium, Black root rot.
Nutrition, as we need to ensure adequate reserves of N, P and K to achieve reasonable yields. The next factor would be trash management at planting followed by cotton volunteers.
Nutrition management – it has a big impact on yield if got wrong.

QUESTION 48

Briefly, what are your expectations, if any, of Genuity Bollgard III®?

I expect that we will not be required to pupae bust. I expect to grow a lesser percentage of refuge, if any. I expect only to be allowed to grow cotton as a refuge. I expect the price of Bollgard III to be no more than it currently is. I expect it to provide no better control of *Helicoverpa* than Bollgard II.
Less damage to larger bolls by very small and small *Helicoverpa*. I expect it to take longer to develop overall resistance.
I expect that the unsprayed refuge required will reduce and that the cost of the technology will be increased.
Genuity will provide similar control of lepidoptera species, potentially slightly better on some species; however, the visual increase in efficacy will be difficult to see compared with the change from conventional cotton to Ingard.
To manage *Bt* resistance.
I expect some costly practices such as pupae busting and crop refuge to be reduced or abolished.
Hopefully, it will further delay the development of resistance by *Helicoverpa* to *Bt* cotton.
Much more robust in terms of *Helicoverpa* resistance: much less likely to develop resistance with 3 genes. Possible removal of need for refuges and/or pupae busting in Bollgard fields.
Similar to Bollgard II.
We may see a slight improvement in efficacy in the field but there will be significantly less chance of resistance developing.
Should conserve the technology for 20 plus years. I would still expect the odd grub, similar to Bollgard II.
Enforce pupae control with relaxed refuge area. Full IPM strategy to be adopted. Better control of volunteer cotton plants.
Bollgard II has worked well in my area, so expectations are for Genuity to be better and to have no need for the use of insecticides for controlling *Helicoverpa*.
Hopefully, it will extend the life of the Bollgard product.
If it will provide extra safeguard against resistance, I believe that we should be able to do away with the need to pupae bust in dryland and double cropping scenarios.
Less refuge area for unsprayed cotton. Fewer demands on pupae busting in dryland.
It will give us improved resistance management and should control Cluster Caterpillar.
Fewer escapes. More flexible/less stringent planting date and refuge requirements.
It's not needed in this area yet. It had better stay the same price or less.
Improved *Helicoverpa* control in stressed conditions.
Cluster Caterpillar control and possible relaxation of dryland cotton pupae busting rules post-picking.
Expectations similar to Bollgard II.
Keep ahead of resistance issues, and hopefully to have some better efficacy in the peak flower period.
I expect no better efficacy but a much longer time before resistance develops. It should cost no more and the plant window needs to be opened up.
It should provide further improved *Helicoverpa* control and delay resistance. No yield increase over Bollgard II expected, except when introduced into new genetically improved varieties.
Lower yielding varieties to start with.
More robust *Helicoverpa* control.
No spraying for or significant feeding upon by *Helicoverpa* spp, HOPEFULLY not pupae busting (especially for dryland production). No frivolous thresholds for *Helicoverpa* spp. as this should either not occur OR we should not wear the full cost of the technology (as happens with Bollgard II).
Not to see survivors in cotton (more of a wish than an expectation); better use of refuges.
To maintain the current RMP. But unfortunately I do not think we will make it to Bollgard III without changes to the RMP.
Nil. Probably genes a little better than Bollgard II.
Will depend upon the price.

We generally have low *Helicoverpa* pressure. Should allow Monsanto to relax the resistance requirements by allowing 5% in sprayed cotton or less pupae busting requirements.
Bulletproof against *Helicoverpa* but more expensive then Bollgard II.
I'm not sure that growers will see value for money, as we currently manage Bollgard II well in regards to resistance. Therefore, will there be any benefit in the extra $100 or so a hectare price increase that Monsanto will be extracting out of the industry?
Will provide longevity of genes with equivalent or better control.

QUESTION 64

In your opinion, what do you see are the opportunities to achieve the next gains in 'crop per drop' for your cotton clients?

Irrigation scheduling, farm storages, soil water monitoring.
Improve water on-off during irrigations. Improved drainage during rain events. Better weather forecasts to accurately predict irrigations.
Better paddock drainage, quicker watering times and improved Fusarium resistance.
Nutrition, deficit management, anything that increases yield, well timed rainfall.
The use of flat bays and bankless channels.
Expanded use of overhead watering systems.
Automated irrigation systems using through the bank pipes.
Cotton breeding for water use efficient varieties – plenty of natural genetics in plant species in terms of water use efficiency that can be incorporated via GM or conventional breeding. Also, if we can increase yield through breeding and agronomic practice then this increases the yield per megalitre.
Pretty tight water budget now.
More lateral and centre pivot machines, quicker irrigations cycles.
Fertiliser/water management. irrigation scheduling.
Improving farm design: e.g., shortening fields to a maximum of 650 metres, better tail water drainage for quick removal and regularly levelling. More overhead systems.
Mainly it will come from varieties, but irrigation on time and working out when it is really needed and nutrition.
Improved drainage and on-farm storage.
Tailoring nutrition.
Easier/more accurate ways to measure, monitor and calculate water use in cotton crops.
Improved timeliness, supply and accuracy of delivery of in-crop nitrogen. Re-levelling of fields on an ongoing basis. Meeting peak demand for all nutrients. Increased irrigation capacity.
Better varieties.
Continued development of CPLM and minimising storage losses.
More movement to overhead systems. Reducing storage losses.
Overlaying soil properties, with plant growth and better weather forecasting to identify variable water application.
Correct timing and correct volumes.
Have not given this any thought beyond strategic irrigation timing.
Fine tuning irrigation times; get longer shifts down to 8 to 12 hours instead of 18 to 24; run more water per furrow. Convert to overhead irrigation, Lateral move. Use of groundcover (cereal stubble). Convert to 2 metre beds instead of 1 metre beds.
Moving to CPLM or optimising older CPLM machines.
Apart from system efficiency, application efficiency with siphon pipes.
Improving genetic yield potential (new varieties); improvements in technologies available for reduction of storage losses (evaporation in particular).
Ensuring field are on grade, including head ditch and tail drain maintenance.

Shortening time to irrigate farms. Better tailwater management and drainage. Timeliness of all cropping operations, shorter time from planting to harvest Avoiding compaction of round bale pickers.
Through irrigation and water/fallow efficiency and matching nutrition, variety and agronomy with water.
Having extra labour, canopy management, better nutrition and soil health.
Irrigation scheduling.
Use of more c-probes. Increased adoption of overhead irrigation. Although this isn't critical at the moment with plenty of water. It's mainly about mechanical costs, interest/capital costs and inputs costs to maximise profit per hectare.
The greatest area for reduction is some form of storage mitigation system.
Use of overhead sprinklers on certain soils.

QUESTION 67

With regard to on-farm trials describe any involvement you have in the trials.(eg. Involvement could relate to: ideas, design, treatment application, data collection, analysis, discussion of results, etc).

I would love to do more but I don't have the staff resources at this stage. I have plenty of ideas that could improve southern cotton. I just need the help.
Ideas, treatments, collection and discussion of results.
Find sites, help where possible with information and trial location, local liaison with external (to district) trial facilitators.
Full involvement in planning and initial ideas.
1 trial was CSD; 2 trials were Boll rot mitigation trials, one of which I designed and completed, the other was a discussion regarding results. One grower doubled up with a Genuity trial, for which I was site compliance manager.
I helped with the Caltex Canopy trial this season. With assistance, I set up the trial structure, created the worksheets for data and how we checked the trial site.
Ideas and discussion of results.
All conducted by industry personnel.
Spray recommendations, weed management, data collection, discussion of result.
Idea to trial, and trial design. Discussion of results.
Instigated and set up 2 plant population trials. K trial involvement with a fertiliser company. Nitrogen fertiliser trial with full involvement with grower.
Ideas, design, discussion of results.
Encourage participation, partner with the necessary organisation, analysis and discussion of results.
Involved in the planning and application, results are measured by yield.
None. CSD variety trial.
Data collection, discussion of results.
Idea, design, implementation, monitoring, analysis and discussion.
My role was to collect raw data from the trial plots, and analyse and discuss results in order to see if any treatments could be used in future crops.
Design and treatment.
Trial ideas, design, data collection.
From start to finish, except for statistical analysis.
Site selection and discussion of results.
Full initiation and carrying out of trials in some instances. With others, the grower carried them out and we just looked at and discussed results.
CSD trials: minimal involvement.

Location setting up, design, ideas of chemicals/varieties/ fertiliser, rates, application types, opinion of results.
Planning and management.
Trial data collection, doing the trial, monitoring.
Idea generation, data collection.
All of the above.
Ideas, data collection, discussion of results.
Working out treatments, and discussion of results.
Doing a lot of work on using compost to replace all other fertilisers except nitrogen. Results are great and the use is expanding.
Encourage trials with different fertiliser rates. Discussion of results. Observation and discussion of differences in variety trials managed by CSD.
I help organise and run these trials.
Limited involvement with design and location, they are other people's trials.
We are involved in design, treatments, data collection.
All of the above.
Discussion of results.
Ideas, design, data collection (I.e. in-crop progression analysis), result analysis and debrief.
Treatments, rates, analysis and discussion.
Setup, what products to trial, etc.
Aid in design, treatments, plant mapping and results.

Qualitative report on the 2011–12 cotton season

For further information on this report:

crdc@crdc.com.au
(02) 6792 4088

www.crdc.com.au