UNDERSTANDING IPM – INDUSTRY ATTITUDES, PRACTICES AND EDUCATION

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Discussions with any number of people in the cotton industry will indicate that the move towards Integrated Pest Management (IPM) has been one of the most significant changes in the industry in recent years. As a pest management strategy that utilises a range of tools to achieve economic, environmental and sustainable management of pests, IPM has been essential for an industry facing significant public pressure as well as the need to economically manage pests that have shown an increasing resistance to conventional insecticides.

The use of crop checking and thresholds is an IPM tool that has been used by the industry for many years. Significant effort in research, development, extension and agronomic advice is refining and improving other elements of IPM programs, particularly for the management of insect pests. With this in mind, how does the industry as a whole view IPM?

Understanding Industry Attitudes to IPM

Regular evaluation, formally and informally, by the national cotton extension network provides focus for planning research and extension efforts. In addition to this, the Cotton Research and Development Corporation (CRDC) has commissioned specific studies to better understand and record the industry's changing attitudes towards IPM, including a Focus Group Assessment of Industry Attitudes towards IPM (Cotton Extension Network, 1997 and 2001) and a Qualitative IPM Attitudinal Survey (CCA, 2000 and 2001). A range of other sources also depict trends in insect management strategies including the Cotton Industry Benchmark Survey, CCA Market Survey, Cotton Comparative Analysis (BOYCE) and Benchmarking studies.

Focus Group Study

In May 1997 and October 2001, focus groups were run across the industry with groups comprising either consultants, growers, researchers or extension officers. Facilitators (from the cotton extension network, DPI extension and Cotton Australia) interviewed groups in districts away from their normal location to minimise their influence on discussions. Focus groups gather the range of experiences, views and attitudes within a specified group. They do not provide statistical data but do provide

some indication of the weight of opinion relating to particular views and attitudes. Conducting a number of focus groups across all regions can capture most attitudes.

Focus groups were undertaken with:

Consultants	Darling Downs; Emerald; Goondiwindi; Lower Namoi
Growers	Darling Downs; Emerald; Goondiwindi; Gunnedah; Gwydir; Lower Namoi; Macquarie; Mungindi; St George
Extension officers	Across the industry X 2
Researchers	Narrabri

CCA IPM Survey

Quantitative and qualitative information was gathered regarding aphid management, endosulfan usage, IPM guidelines, area wide management groups and beneficial management. In a survey undertaken by the Institute for Rural Futures at the University of New England with Cotton Consultants Australia (Doyle et al, 2001) on behalf of CRDC. On the basis of advice from cotton agronomic consultants, it aims to quantify the industry movement towards insect IPM in the cotton industry. The survey was emailed to 173 CCA members with 22% responding.

Key Findings

The following information gathers findings of both the focus group study and the CCA IPM survey.

Understanding and perception of IPM

Integrated pest management has established a wide level of acceptance throughout the cotton industry with the 2002 studies indicating:

- A high level, broad understanding of IPM principles and practices is evident across all industry sectors.
- The perception of IPM varies between regions.
- IPM was universally viewed as the use of a wide range of tools used in overall farm management.
- The emphasis on different elements of IPM (such as beneficial insects, resistance management strategies, trap crops, damage levels) varied between regions.
- There was particular reference to the need to stay 'soft' as long as possible to avoid getting on the "merry-go-round" of needing to spray.

This represents a significant change from 1997 where there appeared to be a lack of understanding and confidence in IPM systems amongst both growers and consultants. Many growers have made a deliberate decision to choose an IPM approach, generally moving gradually towards softer and softer approaches each year. Some growers indicated that their general approach has changed from one of ***"if in doubt spray"*** to ***"if in doubt, don't spray"***. The use of Ingard cotton, and particularly unsprayed

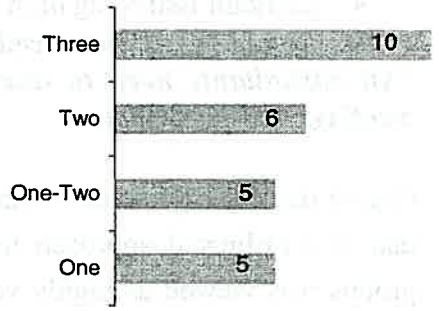
refuges, has been regarded as a valuable educational tool in helping to better understand and experience IPM.

There is a feeling that the industry is only just starting to really understand and use IPM. ***"Profitability and Sustainability are the key two words. IPM has been bashed around the industry for decades and is something many growers have been playing with but is only coming to the forefront now and hasn't been used to its fullest extent and ability".*** In some regions, whilst IPM was consider the way forward, there was some degree of concern of "being pushed into IPM" by the rest of the industry.

Monitoring

The move towards IPM has increased monitoring requirements with a general trend towards checking three times a week. Many consultants (over 90% of survey respondents) now monitor beneficial insects and spiders. A range of visual, de-vac, sweep net, plant shake or beat sheet sampling strategies are used for beneficial monitoring. Some consultants record beneficial insects as individual beneficials, others in the groups "insects and spiders" and some record all species together as one group. The frequency of sampling for beneficial insects is quite variable as indicated in Figure 1. Sampling for beneficials is often restricted to Stage I and II. This data is then used as an overall abundance or as predator:prey ratios for making decisions. In addition, monitoring of the crop itself has increased with a focus on damage thresholds, fruit retention and fruiting factors.

Figure 1: *Frequency of beneficial insect sampling per Week (from a total of 31 responsdents) Source: CCA Survey*



Decision making

In many cases, making decisions on insect control measures appears to have moved more towards a partnership between grower and consultant. Many growers consider they are more involved in discussing and questioning the need to spray.

"Five years ago if your consultant said jump you'd ask 'how high' – now if your consultant says jump you ask 'why'?"

"The importance of the relationship with the consultant has increased because of the higher cost of chemicals".

There is a clearly identified need for growers to take ownership of pest management decisions. The focus group study indicates that generally growers are accepting that they are primarily responsible for managing risks on their farm.

Communication

Both growers and consultants valued pre-season meetings as a forum to discuss the type of approach to take to the season. It was generally considered that the Endosulfan issues, BMP and area wide management groups have done much to minimise impacts on neighbours.

Area wide management (AWM) groups have established widely throughout the industry in recent years providing a forum for growers and consultants to share information and enhance cooperation within a local area. Overall both growers and consultants are very enthusiastic about these groups in helping to implement IPM.

"Individuals are limited with IPM without AWM"

Some key factors were considered to aid the success of AWM groups:

- Must be grower driven.
- A key, respected grower willing to lead the group.
- Coordination and support from an independent facilitator (eg IDO)
- Need to actively maintain interest.
- Group size – preference for smaller groups.
- Informality (ie no formal meeting process).
- Difficult issues (eg high aphid pressure) created more interest.
- Both growers and consultants to be involved.

"All consultants need to attend and actively encourage their clients to attend meetings and participate."

One of the key objectives of many groups is to delay use of pyrethroids. Several also take a coordinated approach to trap cropping. The effectiveness of each of these groups was viewed as highly variable by consultants. Some growers have indicated that they are close to giving up on AWM because of the lack of interest amongst other growers in their area. There was also frustration about AWM working well only until pyrethroids were applied nearby. Others have indicated that AWM can be effective despite these products being used. AWM was considered to give a sense of responsibility to neighbours: ***"you feel you let the side down if you do something wrong...if you are there by yourself it's a bit easy just to go.. 'it would be good to get 100% kill'."***

There was a widespread feeling that to be truly effective, AWM groups need to actively involve other stakeholders, in particular grain growers.

Economics

Detailed economic studies, undertaken on the recommendation of the 1997 focus group study, indicate that softer approaches can in fact enhance or at least maintain profitability (Dillon and Hoque, 2000; Quinn, 2001; Wicks, 2001).

In 2001, there were highly variable views of the economics of IPM. Some regions expressed concerns about the high cost of softer options. In other regions, it was felt that a "cheap", disruptive chemistry may be the most expensive option by wiping out the beneficial population. Benchmarking within grower groups had been a particularly valuable tool in the uptake of softer approaches in some regions. As a result of the benchmarking exercise, farms have moved towards similar approaches.

There was a feeling in some regions that once a pest threshold is reached, "cheaper, nasty" chemicals are needed to get through to the end of the season: ***'You have to keep your finger on the trigger.'***

Information Resources

There is a high level of awareness of the IPM guidelines, which are used regularly for reference. Surprisingly, 16% of consultants responding to the CCA survey indicated that they were unaware of the IPM guidelines. Perhaps due to a confusion as to their identity as others indicated that they sourced the guidelines through ENTOpak, the Cotton Pest Management guide, mail-out or on request from the Technology Resource Centre, from their IDO, at AWM meetings, the Pocket guide, on the CottonLOGIC CD, or at various industry events. ***"...*[the IPM guidelines]*** ***are great stuff, because*** [they] ***put this philosophy into words that people can apply to their own situations."***

Information on the Beneficial Disruption Index and the effect of products on each group of predators and parasites was valued. There was also demand for more understanding of predator ratios and what the abundance of each predator type means in practical terms.

Commitment to IPM

The level of interest in and commitment to IPM has clearly changed over recent years. In 1997 consultants indicated that growers pressured them to maximise yield and were reluctant to try softer options. Today, growers are far more willing to accept a level of damage and many will focus on conserving beneficial insects. Some felt that IPM systems had not as yet been tested in a year with high insect pressure. Concerns were expressed about the level of commitment to IPM if or when high insect pressure was to be experienced. Alternately, some felt that the change in management with IPM is contributing to the lower pressure experienced.

There were clearly a range of factors that influenced the interest in IPM – some were driven by economics, others because conventional approaches were no longer

considered effective and others from a desire to move towards a more sustainable system. *" Life has improved lots since we don't spray thrips like 15 years ago".*

Potential Issues for the Future

There was an identified need to measure the effectiveness of various IPM tools, particularly in relation to trap crops. *"...you need to be able to measure what you are doing, and I think that is the biggest problem that we have at the moment is that yes we are doing IPM, but is it working? We are doing trap crops but are we getting anywhere with them...."*

There is significant interest in how far IPM could be pushed. Some were hoping that in 5 years time there would be no need to spray conventional cotton, others were looking for systems with a maximum of 5 sprays. Opportunities exist to not simply preserve but to enhance and manipulate beneficial insect populations. The release of beneficial insects, currently considered cost prohibitive, may be a key part of a future system. Secondary pests were a significant concern and late season options in an IPM strategy considered limited.

There was also an interest in manipulating other elements of the cropping system to grow a crop that is less attractive to insects and encompassing weeds and diseases as a part of an overall approach. *"I really think it is going to go below the ground. We've been looking above the ground all these years and we have only just started learning about* **[soil health and crop functioning].** *...if we are putting on pesticides...what are the impacts on the soil?"*

Supporting the Industry through Education and Coordination

Extension

Supporting the uptake of IPM through trials, demonstrations, information resources and coordinating and supporting area wide management groups is a significant focus for Australian Cotton CRC's National Extension Network. Feedback from the evaluations of attitudes towards IPM outlined here will be used to help set priorities for the coming seasons.

IPM Short Course

The IPM Short Course was developed in response to recommendations of the 1997 focus group study which identified the need for greater knowledge, understanding and confidence amongst growers for IPM to be successfully adopted. The Australian Cotton CRC has developed a national competency based, grower-focused IPM short

course. Timed to suit the cotton production season, the IPM short course moves through 3 phases: pre-season, in-season and post-season (Table 1).

Table 1: IPM Short Course Structure

Structure	Duration	Broad Content	Broad Objective
1st Component Winter component Pre-season	**2 days**	Define IPM and establish an understanding of its importance and knowledge of components	Understanding how components of IPM can be utilised in Australian cotton production
2nd Component Summer Field day Early season	**½ay**	Early squaring practical - plant growth, pests, predators and crop management	Knowledge of the role of effective monitoring and confidence in early season IPM practices
3rd Component Summer Field day Late season	**½ day**	Post flowering practical - plant growth, pests, predators and crop management	Knowledge of the role of effective monitoring and confidence in late season IPM practices
4th Component Post –season review	**½ day**	Post season review and evaluation of individual IPM programs	Evaluate the implementation of changes in pest management

The 2-day 'information transfer' component in winter, with presentations from researchers and other industry figures, develops the fundamentals of IPM, reviews contemporary research and allows practical experience of IPM. This is followed up by two half-day sessions in the field each at appropriate times with the aim of firming the theory into practice. Finally a ½ day session at the completion of the cotton season acts provides opportunity to review how participants managed their crop, what they have learnt and to apply that to their plans for the future. Some groups who have completed the course have indicated a desire to meet again on a regular basis.

Participants receive a resource kit with a comprehensive reference manual, a course workbook and several handbooks. In order to refine and target the course, three pilot courses were held in the 2001-02 season – in Trangie, Wee Waa and Dalby. To allow maximum interaction and participation each IPM short course is restricted to no more than 15 participants. The IPM short course will be held in each region this winter at dates and venues arranged with local groups. Course costs are subsidised by FarmBIS.

"Great learning experience that I hope to pass on to my staff and other members of our area wide management group"

Conclusions

Two key evaluations of industry attitudes towards IPM indicate that the industry has moved substantially towards IPM approaches in recent years. Whilst IPM poses a riskier and more complex system, growers and consultants are generally highly

positive about the benefits it offers. Current IPM systems have a strong focus on "softer" options and the preservation of beneficial insects. There is perhaps room to further explore the use of other IPM tools.

Information, education and communication are crucial for the adoption of IPM. Grower driven area wide management groups have an important role to play and are highly valued for information, communication and social reasons. Groups benefit from the commitment of growers and the support of independent coordinators. Along with AWM groups, the IPM short course assist with providing growers with the information and confidence to play a more active role in IPM decision making.

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