



Know-how for Horticulture™

**Sustainable crop
management for
potato farms on the
Atherton Tableland**

J Gunton and M Hughes
Queensland Department of
Primary Industries

Project Number: PT402

PT402

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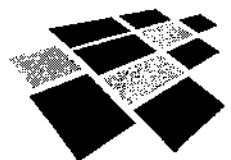
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HRDC Project PT 402 (October 1998)

***Sustainable Crop Management for
Potato Farms on the Atherton
Tableland.***

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Queensland Department of Primary Industries



And

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HRDC Project PT 402

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This is a **final report** on a project - *Sustainable Crop Management for Potato Farms on the Atherton Tableland*. This project was commenced in July 1994 and project activities concluded in October 1998. It evolved a participatory action learning extension/developmental approach with groups of potato farmers - acknowledging their experience, and used adult learning principles to increase the understanding of their farming systems to develop more sustainable practice changes.

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**Queensland
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The Queensland Department of Primary Industries



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The Queensland Fruit and Vegetable Growers

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INDUSTRY SUMMARY: PT402 - Sustainable crop management of Potato farms on the Atherton Tablelands.

“I have learned more in the time of this project than I have learned in all my past years on the farm!” (unsolicited statement by a group member).

Potato growing on the Atherton Tablelands is a major cropping industry contributing up to \$15 million (depending on fresh market price) from approximately 1000 hectares of irrigable land.

Years of government agency research development and extension work resulted in little change to the way potatoes were being grown and in the change to more sustainable farming practices in the district.

A previous extension officer was reported as saying - *“I’ve talked myself blue in the face, trying to get better management practices adopted, but I’ve seen bug... all changes over all these years!”*

Even the personalised results from trials on growers properties funded by the Department of Primary Industries (DPI), the Horticultural Research and Development Corporation (HRDC) and Queensland Fruit and Vegetable Growers (QFVG), were largely ignored where these conflicted with traditional ways of doing things. (Gunton *et al.* 1993)

To try to get around these problems the DPI, HRDC and QFVG funded this project based on newer ways of involving farmers in their own learning activities. Where **they** decide what **they** want to learn, what **they** want to investigate and how **they** want to do it.

Two groups of potato growers have been involved in this project with extension officers of the DPI facilitating meetings and coordinating activities. Many activities were planned, carried out, carefully observed, discussed and thought about before any decision was made to try it out in a commercial way on their own farms. Private consultants and agribusiness have been significantly involved in these activities. *“It has been a pleasure having DPI work in conjunction, guiding us, not pushing us, .. allowed us to make mistakes and then overcome them, and trusting that the farmer does know something.”*

Activities included : Trips away to different potato growing areas and southern markets. Getting in experienced speakers about irrigation, integrated pest management and disease control. Carrying out trials on farms with tensiometers, fertilizers, predatory insect release and selective spraying practices.

Each year the group reviewed its progress, reported to the funding bodies and set its agenda for the next year. Most learning occurred in a relaxed, good humoured atmosphere but where underlying assumptions about the topic were uncovered.

The group were responsible for setting up a James Cook University/ DPI project on improving predatory insect releases and applied for a phase II funding to HRDC/ QFVG to continue this work but were unfortunately unsuccessful in this latter bid.

A face to face survey was carried out with the group members to find out what had actually changed as well as a survey of some non-group members which showed how well the message was spreading to the rest of the potato growers.

There were many changes made by members and non-members, but probably the biggest single change was in integrated pest management. Using beneficial insects, using specific chemicals (not broad spectrum) when necessary, and generally a lot more understanding of what's happening in a potato patch.

One piece of advice for future work of this kind was summed up by a group member - *"If you are going to do more of this (group learning). It is important for the group to get away on trips to other places – much greater learning in a fun atmosphere. Helps the group get on together."*

INTRODUCTION

This project aimed to change the way growers think and act about growing potatoes and influence their learning environment so that they could change their knowledge, skills, attitude and practices toward more sustainable growing of potatoes and of farming in the larger sense.

Previous research, development and extension activities have resulted in very low uptake of 'improved' management changes to potato production, especially in relation to sustainable farming practices.

Some different approach was needed to see if practice change could be brought about. A suite of 'new' extension methodologies was becoming available. Basically these revolve around, action learning, co-learning and participatory learning methods, using adult learning principles (Knowles, 1990), which intentionally recognises the previous learning and knowledge system of the learners.

This project established Participatory Action Learning groups among potato growers on the Atherton Tableland.

Two groups were formed. The first called '*Lapdog*' (Lucky Atherton Potato Diggers Options Group) started in Nov 1994 and a second group '*Topcat*' (Team of Potato Croppers on Atherton Tableland) commenced in June 1996.

Following a session of setting directions (planning), a large number of action learning cycles were carried out within the framework on a yearly cycle which was imbedded within the overall project cycle.

As the whole project has been constructed around the action learning cycle -- the project report structure will follow the same format. That is *planning, action, observation* and *reflection*.

While the project officially finished in Oct 1998 the groups have continued to meet on a needs basis. These activities are coordinated by Michael Hughes, the heavy vegetable extension officer for this region.

PLANNING

Preproject phase

Previous research, development and extension (RD & E) efforts by QDPI had not achieved significant uptake of sustainable potato or farming practices.

Even a project carried out on farmers properties using very large plots (HRDC/DPI/QFVG – PT 012 - *Soil Fertility Management in Potatoes on the Atherton Tableland*. Gunton *et al*, 1993) did not provide the necessary motivation to prevent involved growers reverting to traditional ways when any conflict arose.

One example of this is shown by a grower who regularly applied extra trace elements – after the trials were over, he concluded, “*that he’d been wasting his time and money applying these chemicals.*” The next year when I was checking back to see what practise changes had occurred I found he was applying the trace elements as previously because “*It doesn’t cost much more and it’s good insurance.*”

So, I consulted with the extension community and found that there were a range of ‘new’ extension methodologies being developed that revolved around the principles of adult learning (Knowles, 1990). (see King 2000, for a detailed history of extension development).

We chose to try the Participatory Action Learning approach to see whether this method would help to enhance changes in the knowledge, aspirations, skills, attitudes and practice - Bennett’s Hierarchy of learning; (Bennett, 1990) of the participants, including the facilitators.

A project proposal to DPI, QFVG and HRDC was submitted for funding in February 1994.

A schematic diagram (figure 1) is shown of the Kolb experiential cycle and the action learning cycle(s) (figure 2.) we planned that the groups would intentionally use in their learning processes.

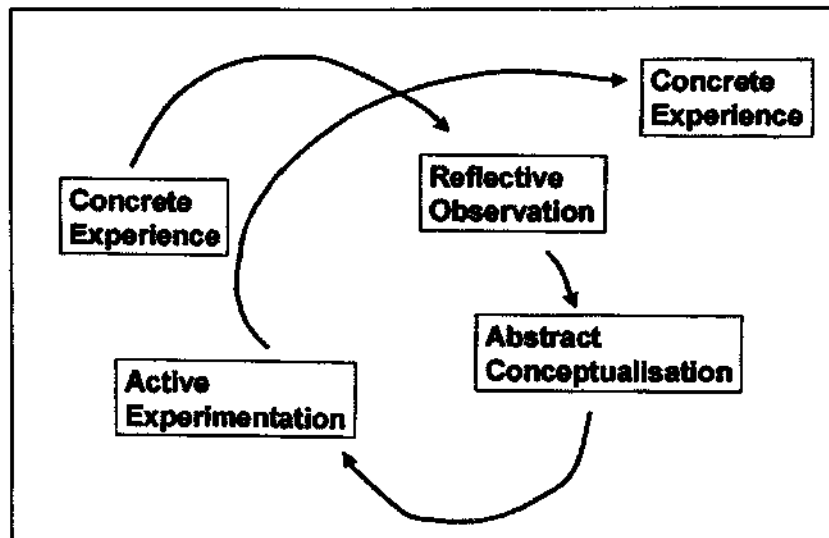


Figure 1. Schematic drawing of the Kolb experiential learning cycle (Source: adapted from Kolb, 1984)

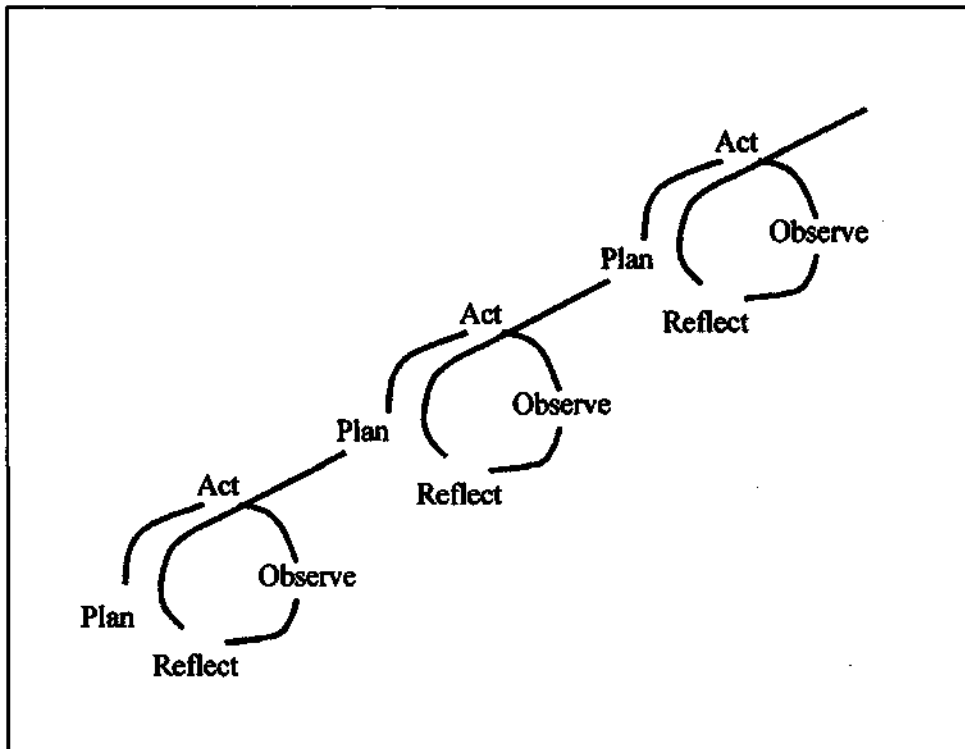


Figure 2. Schematic diagram of three action learning cycles with increasing knowledge as the process continues .

(Source: adapted from Zuber-Skerrit, 1995)

To help achieve the proposed action learning, learning journals (hard cover) were prepared and supplied with learning questions following the ORID model, Spencer (1989).

Eg. :-

What topics were covered?

What activities occurred? (what did I see, hear, feel etc during this event)

What have I learnt? (rules of thumb, generalisations, conclusions)

How can I put this learning into practice?

Because the whole project was to run along the lines of participatory action learning, it was expected the learning would change the directions and processes to be used. The plan had to use an intentional flexibility principle, guided by our learnings. It was recognised that this would cause a degree of tension with those whose personality style requires stability in direction. Transparency of process and active listening were seen to be two ways of reducing this tension.

ACTIONS

There are two levels of action associated with this project.

- A. The project management level, eg. project administration, reviews and reports
- B. The group learning level. There is necessarily some overlap in these levels especially in the review, evaluation and report preparation activities. In this report we shall be mainly concentrating on this latter level (B).

Group Formation

The First Group

The first group were formed after invitations were sent to a number of growers(14). The list was restricted to younger growers, as previous research had shown that this age group were often more enthusiastic toward further learning (Daniels and Chamala, 1989), and hence the facilitation was expected to be easier and allow more scope for co-learning about group /adult learning by the facilitator(s). A follow up visit to repondents sought to provide more details and deliberately asked whether spouses wanted to be involved.

Seven growers accepted and met on November 1994. This initial meeting was to set the scene, find out the issues and needs of growers and set some directions for the group. The group agreed to be known as LAPDOG (Lucky Atherton Potato Diggers Options Group). NB. There will be a reflection on this in a later section.



Members of the LAPDOG L to R. Back: Louis Pregno, Tony Villella, Richie. Cuda, John Robinson; Front: Fred Cunzolo, Richard Standen, John Quadrio.

The grower's expectations of the group, and being in the group were as follows:-

- More profit per acre
- Control seed piece breakdown
- No preset ideas
- Get things done that the group wants to do
- Influence funding bodies
- On-farm work
- Gain some experience
- Learning from one another
- Improve on what we're doing
- Not be an exclusive group (ed. spread the information/learnings outside the group)

As can be seen from these expectations, response were wide ranging, from very specific and production orientated (seed piece breakdown) to general and person orientated (learning from one another).

Some of these responses will have arisen from their understanding of what the group was formed for, and as a response to being in a meeting with their peers with whom they would have had varying degrees of association.

We will refer back to these expectations during the reflective phase of the project.

The group then agreed on a question that would focus them on finding out their issues. This was “ **What are our production factors that effect yield and quality of our potatoes?**”

We used a nominal group technique (Chamala and Mortiss, 1990) to identify and rank issues. Table 1. shows the results of this activity.

The group decided to focus on the top four issues. It was interesting but not unexpected to see that different farmers had very different needs, and that the marketing issues, except for links to finance and harvesting, were not mentioned in this discussion. They certainly became so during the later stages of the discussions.

Some logistical operations for the group were discussed and the ‘How to do?’ was the main agenda for the next meeting. Each meeting became a small action learning cycle with planning for future activities based on previous learning etc.

Two significant developments were agreed. That the inclusion of agribusiness in regular meetings was welcomed and the contact made with the Robertson group would be continued for mutual advantage. Invitations went to local agribusinesses, and during the initial stages of the project active participation occurred from two businesses.

The group was introduced to the action learning cycle and to the importance of a learning journal. They were encouraged to use these books to keep information and reflections and learning. The rule of thumb was for all subsequent activities to allow time for discussion and recording of thoughts. Following discussion the group decided to get folders to hold hand out material and to keep the journals for hand recorded information.

Table 1. Identification and ranking of issues associated with potato production for LAPDOG in November 1994.

ISSUE	RANKING	RANGE OF RANKING BY MEMBERS
Seed – variety, source, cutting, quality, treatment	1	1 to 3
Pests & diseases - IPM, foliar diseases	2	1 to 7
Nutrition management – base fert., side dress, fertigation, trace elements	3	2 to 6
Irrigation – frequency, quantity, crop stages, efficiency	4	3 to 6
Planting – technique, time	5	1 to 9
Hilling – management, calcium, blackleg, moth, other disease	6	3 to 9
Finance – reduce costs, cut wages, increase sales prices, increase mechanisation,	7	2 to 11
Land preparation – tillage practices	8	1 to 10
Harvesting – tuber damage, ground conditions & disease	9	5 to 11
Crop rotations – green manure crops	10	8 to 11
Weeds – chemical control, cultivation	11	4 to 11
Neighbours – conflicts or cooperation	Not rated	
Weather – Temperature, rain, frost	Not rated	

The Second Group

After a successful year's operation, the LAPDOG recommended that a second group should be formed rather than to try to expand the numbers of farmers in LAPDOG itself. Names were put forward and in most cases these growers were canvassed by LAPDOG members to join a new group.

In June 1996 TOPCAT (Team Of Potato Croppers on the Atherton Tablelands) was formed with seven members. One member did not wish to continue.

A significant addition to this process at the initial meeting for the second group was the inclusion of them drawing and presenting their vision for their farm. This was done with a rich picturing process (drawing their vision and explaining it). Despite the initial reticence, ("*can't draw for nuts!*") this process provided a useful way to get growers to focus back to their farm but within the wider global framework they are operating in.

Their expectations were that:-

Farmers and DPI to jointly improve farming potato production systems resulting in –

- Improvement in sustainability of potato and farming systems
- Growers owning technology
- Improved interaction and communication between growers and DPI
- Better understanding of technology and it's utilisation
- Extension of group experiences to outside growers

- An agency to enable industry development
- Group learning by using our experience and sharing knowledge and providing support for other members of the group (This was the DPI expectation)

The TOPCAT



George Costa



Frank Rockley



George Serra



Warren Geddes



Nino Quadrio



Pompey Pezzelato

The expectations of this group were much more general than the earlier group. This may reflect the 'briefing' from the LAPDOG members or the different nature of this group whose members were mainly older than LAPDOG.

Their nominal group technique outcome is summarised in table 2.

Table 2. Identification and ranking of issues associated with potato production for TOPCAT in June 1996.

ISSUES	RANKING	RANGE OF RANKING BY MEMBERS
Nutrition – fertiliser, management	1	1 to 6
Seed – type, quality, treatment	2	1 to 5
Pests – insect, disease and weeds	3	1 to 6
Cost of production	4	3 to 6
Varieties	5	1 to 6
Markets	6	1 to 7
Water – irrigation, efficiency	7	5 to 7

It was interesting to see the marketing issue raised by this group. The LAPDOG was also raising this issue strongly by this time. The rankings showed a significant division between the top three issues and the rest. The issue that rated last (water) was the one where the group was in closest agreement.

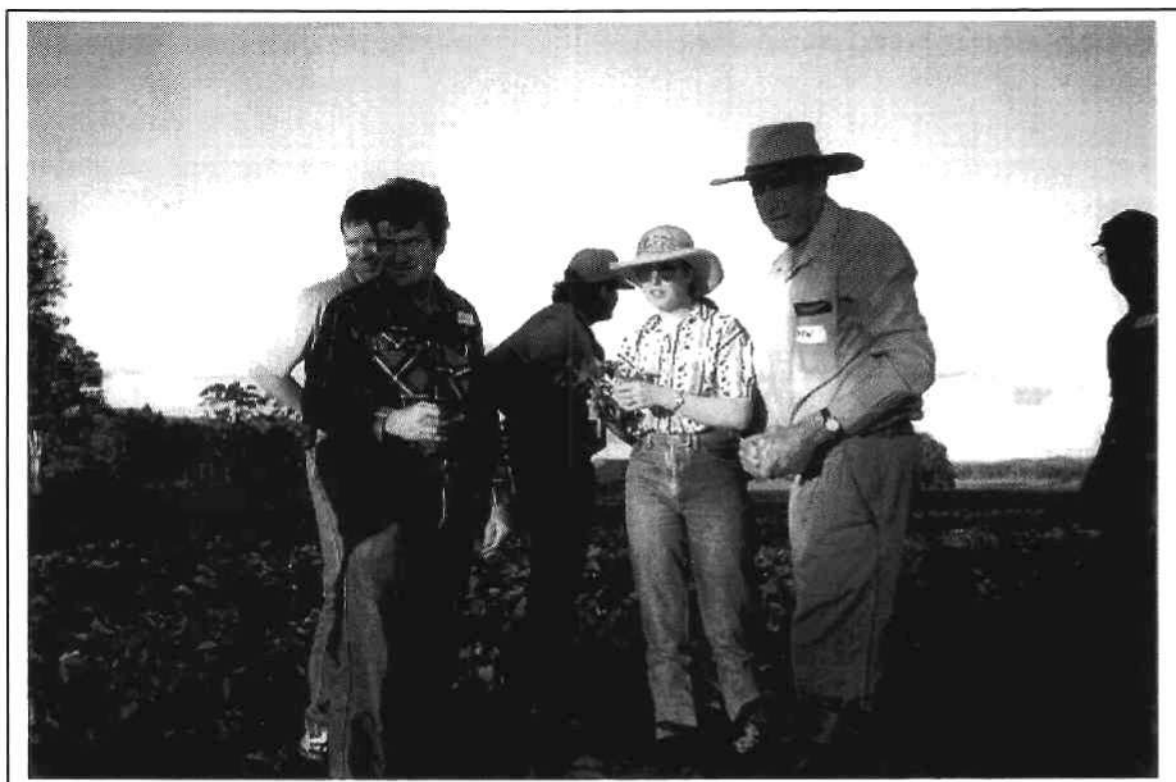
Post formation

It is not the intention of this report to detail all activities of the group. A detailed list of the main group activities is included in appendix 1. (pp. 38 - 39)). However, we do want to highlight some other significant events for learning, team building and extension processes.

Robertson group (HRDC project PT 337 - Sustainable potato production in highland areas of Australia).

Because of the similarities of our projects HRDC requested that the two projects interact. This was achieved through exchanging information and exchange visits of people from each group.

Sandra Lanz and Snow Donovan from Robertson (in company with seed producers from Crookwell, NSW) visited some members farms and shared in a meeting in September 1995.



Sandra Lanz and Snow Donovan visit the Atherton Tablelands grower groups in September 1995.

In September 1996 four members from our groups were able to participate in the Robertson group workshop. This was a significant event for both groups, being the end of the phase 1 of the Robertson project and the presentation of their work and learning.

Team Building

It was never our intention to form the participants into a close knit team to achieve specific goals. However, we realised that a team feeling would be an important aspect for people to work together. In the early meetings we encouraged the sharing of non-farming information to allow members a chance to see different styles of living and values others portrayed.

The biggest single team builder that these groups experienced was in going on trips together. The quote in the industry summary (p.6) highlights this point and more will be said about this in the reflection section.

Extension Processes

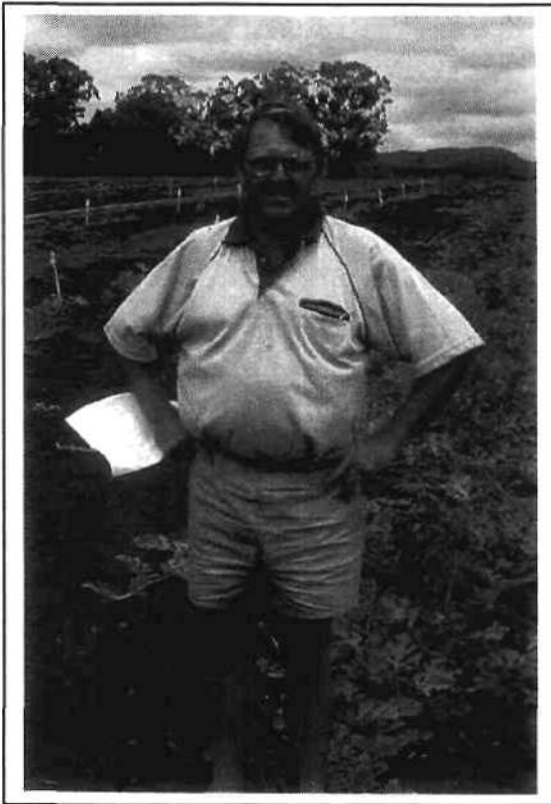
A number of extension processes were used generally and frequently, eg. group facilitation. Other more specific extension activities included:-

- Learning styles, (Honey and Mumford, 1992). This was run with LAPDOG in January 1995, to demonstrate individual differences in learning style and to get some appreciation as to queries like - *“Why doesn't everyone learn like me, from books and papers?”*
- Skills Audit. We used the S.E.E.K from the Rural Finance Corporation of Victoria. This technique is designed to help individuals assess the skills they need and to develop a plan to use what they have, and gain what they still need.
- Nominal Group Technique referred to previously.
- Rich Picturing referred to above.
- Action learning - where the group is the action learning set, occurs at all events.
- Participatory action learning – is the over arching process that covers how the project will operate.

Integrated Pest Management

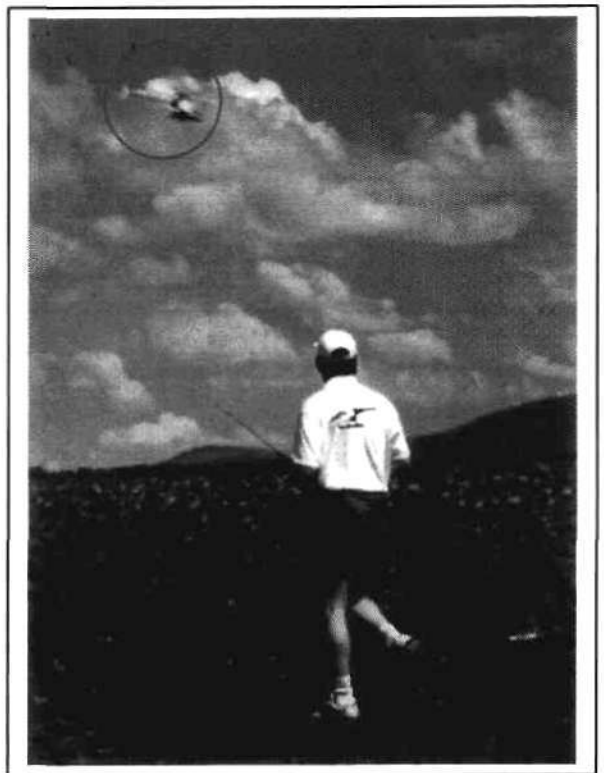
May 1995 – LAPDOG had an in depth discussion with a private consultant (Keith Lewis, Biological Field Services Pty.) who was starting to work on insect pest scouting and monitoring beneficial insects. A program to scout and work out best alternatives for controlling insects was commenced that lasted the duration of the project with an increasing depth of understanding through a number of learning cycles as depicted in figure 2.

As part of the integrated pest management, the group contacted Dr.Paul Horne who was also working with grower groups in Victoria (National IPM Programme for Potato Pests). He came and spent a useful period of time with individuals, LAPDOG and the group organised an ‘all potato growers’ night for Paul to address on integrated pest management. The group and Paul devised some field trials to study beneficial insect release. Paul returned in April 1997 for further ‘in field’ discussions and he and the group developed further trials to build on their experience.



Keith Lewis a consultant with Biotechnical Field Services – carried out ‘in the field’ studies in IPM and crop nutrition

John Quadrio with his remote controlled helicopter spreading eggs of beneficial insects over a potato field. He and another enthusiast developed a method to disperse the eggs evenly from beneath the aircraft.



As a result of the trial release of beneficial insects, one group member developed an attachment that could fit under a remote control helicopter to spread eggs over the crop from a low height. He tested this and the local TV station televised this activity giving good promotion of the group activities in the district. The success of this interview prompted a return visit from the TV station where other aspects of the groups activities were put to air.

Both groups shared many activities around this topic. They wanted to progress further understanding of beneficial insect and established a program with James Cook University (Cairns campus) that the DPI funded, to study better ways to breed and release a range of these insects. This study, “Integrated pest management in potato crops in North Queensland”, was under the supervision of Dr. J Seymour (JCU).

A further development in IPM was the interest in increasing owl activity in potato fields to reduce rodent damage, which can be quite considerable in most Tableland crops. Two owl nesting boxes were erected and several portable owl perches were constructed and placed round potato paddocks.

John Quadrio being interviewed by a local TV news crew about his helicopter development.



Seed source, quality and treatment

A number of activities were undertaken by groups, including trials with different seed sources, and comparison of whole round seed with cut seed, and various treatments of cut seed.

Trips to the south also provided opportunity for two-way communication with seed producers.



Members from TOPCAT & LAPDOG discuss issues about seed production and 'consumption' with a seed producer March 1996.

Crop Nutrition

Keith Lewis (BFS) was also instrumental in carrying out trials in grower's crops to help them evaluate crop fertility aspects. One trial was carefully run to show whether different plant nutrients could influence the severity of foliar leaf spot.

During this time contact was made with another HRDC project run by Dr. Norbert Maier from Adelaide(PT 428 – *Decision support software for the nutrient management of irrigated potatoes*). Our groups provided significant amounts of foliar

material from several crops and seasons to this program and received valuable plant analysis results in return.

Growers regularly compared their fertilizer practices with each other, again some to the underlying assumptions were often challenged.

Cost of Production

Both groups have examined their costs of production in some detail. The LAPDOG event included a detailed examination of the all crop operations with much discussion about the different operations growers were using to produce their crop. TOPCAT examined a DPI produced gross margin and took it apart.

Trips away

Three trips away from the district were available to the groups during the project.

- Charters Towers & Townsville – 17-18/07/96.

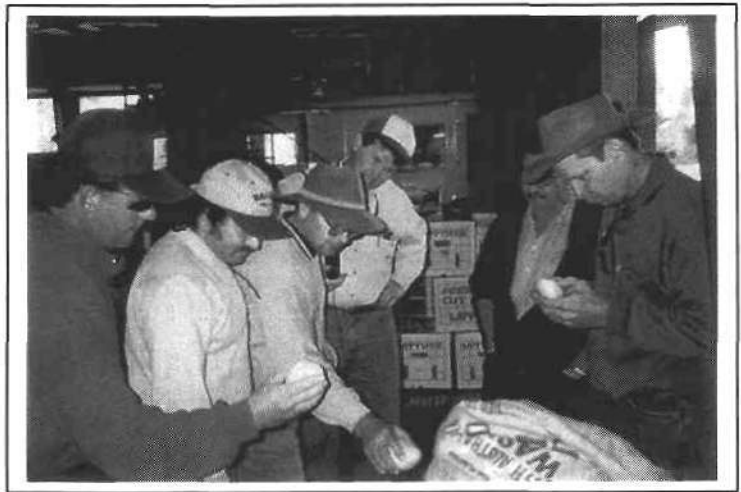


All but one of the LAPDOG went on a bus trip to visit the Penna potato farm near Charters Towers. This was followed by a good evening meal and social interchange.

Photographs show LAPDOG at the Penna's property inspecting their systems and asking a lot of questions about markets as well.



The next day they inspected a wholesale potato (and other fruit and vegetables) grading and packing operation in Townsville. This business was frequently used for North Queensland distribution and keen questioning and discussion ensued before the return trip.



LAPDOG check out a wholesale merchant in Townsville

- Robertson District and Sydney Markets – 17-21/09/96. Three growers and M. Hughes (DPI) travelled to the Sydney Markets. This is a major destination for Atherton Tablelands fresh market potatoes. They visited several wholesalers looking at quality and presentation aspects. Then they travelled on to Robertson to participate in the Robertson workshop over the next couple of days, followed by a conducted tour of the potato growing district.



Along side the big potato in Robertson – the tour party get accustomed to another districts highlights

Members enjoy the field trip – here meeting Todd Hill to discuss his learnings



- Victoria (Gippsland Field Day) and New South Wales Seed Potato and Sydney Markets – 16-17/03/97.

Four Growers and M. Hughes (DPI) went on this trip. They experienced the Gippsland Field Day – a premier potato expo,



and visited a number of seed growers in Ballarat (also a variety field day here), Ottways & Warragul (Vic) and Crookwell (NSW).



Then went on to the Sydney markets, visiting a number of merchants before returning home.

Irrigation

Both groups were interested in improving their irrigation efficiency and how to best schedule irrigation. A visit from Craig Henderson (DPI) Gatton increased interest in use of tensiometers. As well as this the group was interested to investigate the use of moisture probes (enviroscan) in local situations and this occurred for both groups in one member's potato crop. Some members kept very detailed tensionmeter readings and compared these with soil moisture (enviroscan) or crop water budgeting methods.

Quality Assurance

Eric Coleman (HRDC project PT 614 – *Development of quality- assured production and marketing system for fresh potatoes.*) visited the district speaking to the TOPCAT and LAPDOG about his project.

Closure

LAPDOG - meet on 12th August 1998 for a final review of the project. We carried out an ORID process (Spencer, 1989) at the whole project level. Checked to see whether our initial (and any changes in) expectations were met and to what level. TOPCAT had a similar meeting in March 1999.

Evaluation Survey

In November 1998, M. Hughes carried out an evaluation survey with the groups and with non-group growers to try to get an idea of how involvement in the groups had effected growers. The survey was designed as a qualitative evaluation of the changes in farmer's knowledge, aspirations, skill, attitude and practice (Bennett, 1990). The survey with non-group farmers was to see what transfer of learning had occurred into the wider community.

Questions asked of the LAPDOG/TOPCAT members included:-

- What do you do differently now to when you started with the LAPDOG/TOPCAT groups?
- Would you have done any of this without LAPDOG/TOPCAT?
- If so, How has LAPDOG/TOPCAT helped you with these changes?
- Through your membership of LAPDOG/TOPCAT, how has your produce improved?
- Do you believe the LAPDOG/TOPCAT have helped make your farm more sustainable?
- Why do you believe this?
- How has LAPDOG/TOPCAT changed your opinions on any aspects of farming, management or sustainability issues?
- Have you picked up new ideas, skills which are not yet using?
- Are your goals/aims different to what you had before your involvement with the groups/
- Have you done your own on-farm research, for the group/yourself
- Are you more confident in doing this type of work?
- Are you more confident with the results of other group members on-farm research?
- Are you more confident with the results of other farmers (non-group) research?
- What have been the highlights of group work?
- What have been the low points of group work?
- Have you communicated group results/learnings outside the groups?
- Has the project improved your ability to communicate with these people?
- On a scale 1 to 5, what effect has the project had on the following:-

- Potato management – yield
- quality
- pests
- nutrition
- water
- planting
- growing
- harvesting
- other
- Sustainability - profitability
- long term farming
- future cropping
- ability to keep growing
- long term experience
- Innovation - adopting new ideas
- developing new ideas
- Any other comments

This work is referenced in appendix 2. (pp. 40 to 56)

The advantage of home 'turf' did not seem to be an issue and most meetings were usually conducted in an informal manner and with good humour.

Learning Journals – The use of these books was specifically encouraged for the first twelve months by allowing time at the end of most activities for growers to write their thoughts down. This was an alien activity for most (including the facilitators), but seemed to meet an increasing degree of acceptance. The deliberate use of ORID questions (see in activities section) helped, and towards the latter stages of the project it was evident that we all tended to think along these lines when assessing activities. Seldom did growers turn up to group activities without their journals. Follow-up activities since the project have shown that there is still some use of these journals.

Robertson group project

This linkage was of great benefit to our group and the regular updates from their newsletters were useful and interesting. The contact between facilitators in both groups was helpful in solving problems about ways of working with the groups.

The visit by Sandra and Snow was remembered in review sessions and was part of the positive feedback about finding out different ideas and ways of farming, that the groups so highly valued.

Visit to Robertson by LAPDOG/TOPCAT – observations and reflections will be presented in the trips away section.

Team Building

It must be nearly impossible to interact closely with a small group of people for 2 to 4 years on a fairly regular basis and not form some closer alliances. Both these groups showed traits of team work in the loyalty, cooperation and support for other group members. There were times of 'storming', disagreement with aspects about how best to do something (especially their farming system), but it was a credit to them and the group ethic that most were able to look for and find the other persons perspective. Much of the learning occurred when this happened.

Extension Processes

What was it like to facilitate these groups? - mostly rewarding, sometimes challenging and a few times disappointing. The biggest response for the facilitators was the co-learning. That is, we learnt a lot about potato production, about growers, and about the processes we used to facilitate participatory learning. This was a steep learning curve for the facilitators as neither of us had much hands-on experience when we started.

Keeping focus (on task) without insisting that 'ours' was the only way to go; acknowledging the different learning styles of people and using their strengths where possible; negotiating consensus and resolving conflict; trying to give everyone a fair say; encouraging creativity and personal development – were among the many facets of group facilitation. It sounds a lot, but it was a rewarding opportunity with these groups, because of their willingness to learn and their respect for others. Adequate

planning and continual feedback and evaluation with other facilitators made our learnings profitable to group process. *“ It has been a pleasure having DPI work in conjunction, guiding us, not pushing us – allowed us to make mistakes and overcome them, and trusting that the farmer does know something.”*

Specific processes - used throughout the project.

Learning Styles - from the outset, it was clear that some tension developed from people's expectation that their learning style would be embraced by all. We introduced this exercise to allow the group to see the validity of many styles of learning. There did seem to be a better understanding and more tolerance following this activity, but there was still some unresolved tension. A further exposure to some personality testing may have helped to ease this, but these types of 'soft system' activities had to be balanced with the group wanting to get on with their main areas of learning. Continued interaction with each other and the facilitation model we were using may have helped to resolve some of this tension.

Skills audit (S.E.E.K.) – We used this tool to try to focus the group on individual and collective skills they had and match these with those necessary for sustainable farming. This was probably the most unsuccessful process we tried with the group (LAPDOG only).

Several reasons can be given. Firstly, inexperience of the facilitator and secondly, the length of time necessary to complete the process. We ran out of time – things got rushed and understanding and learning decreased.

Further intentional learning with this technique from another trial with a similar group of farmers showed an improvement in outcome but was still far too long for one evening meeting. A tick and flick option has recently be developed (Jones *pers comm*) and tested with dairy farmers on the Tablelands (Gunton, *pers comm*) appears to be very acceptable for the purpose of this task.

Nominal Group Technique – this method has worked well in focusing and drawing out and ranking group priorities. It's big draw back is that it doesn't tend to help develop lateral thinking and tends to maintain the *status quo*..

Rich Picturing – this technique does help to open up other thoughts about situations and was helpful to run prior to the nominal group technique. It is important to not only encourage the drawing, but to also allow the explanation about the drawing to be given. There has to be allowance made for those who genuinely have very low visual motivation, but these we find are very few and far between. There is generally a high initial resistance to drawing but these can be overcome with gentle persistence and repetition of the value of the exercise. The outcomes for all groups (not only LAPDOG/TPOCAT) have been outstanding in getting 'out of the box' thinking.

M Hughes reflections about extension activities

The group responded favourably to a variety of extension techniques, some of which I was not expecting to see favourable responses from, eg. The rich picture scenario, took some gentle persuasion to even have members participate and initially I thought it would be a failure. After seeing the facilitator's pictures and hearing their explanations of their pictures, all group members were keen to express their own visions. The effect of this visioning lasted for quite a while as on at least 2 occasions

The JCU project was a little disappointing from the aspect of grower involvement. Not enough time was spent in collaboration between the researchers and growers. This was an integral part of the Phase II application that was not approved.

One really keen grower did follow up more closely than others and has probably learned more from his efforts.



Richard Stander with the owl box he hopes will prove an attractive nesting site.

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It has been disappointing to the groups to see application for funding for further on farm work and commercial development continually turned down

The use of owls for rodent control continues to be an area of activity. A number of growers are investigating the use portable owl perches around their potato crops and have reported reductions in rodent damage where perches are put out early in the crop life. Signs of owl and other raptor activity are frequently recorded. Several more nesting boxes have been erected on farms in the district and this activity is receiving wide support in the whole community.

In the post-project survey IPM rated very highly in the **things group growers do differently**, 31% of responses related to IPM practice changes.

Of the **non-group** growers, 62% of responses indicated that LAPDOG/TOPCAT had bought IPM changes to the district and 51% of these non-group growers had changed to some aspect of IPM recently.

Seed source, quality and treatment

While this issue rated highly with both groups this area did not seem to involve much group activity. Individual growers did follow through and some learnings were evident about seed quality, using whole seed and some dusting treatments showed promise in particular circumstances. The trips away where growers got to inspect and talk with seed producers seemed the best way to resolve a lot of these issues.

One grower's trial on seed piece treatment – cut seed untreated on left and dusted on right.



Crop Nutrition

“Changed fertilizer use after (his) trials.” And *“No more side-dressing, basal fertilizer only.”* Were two of the practice changes resulting from working in these groups.

Fertilizer programs was an area of common interest for the groups. They were amazed at the different approaches that others used. Questioning each other as to why they did these different things, again led to opportunities for deeper learning.

Many growers have decreased their nitrogen inputs to the crop, nitrogen applications are now less than 200kg/ha with no loss of yield. (Hughes *pers comm*).

Cost of production

There was some double-loop learning from this activity where growers examined the underlying assumptions involved in their operations. This was somewhat similar to the fertilizer comparisons above but there seemed to be a more rigorous questioning of the underlying assumptions during this activity. Maybe the hip-pocket nerve mentality made this exercise more real or personal.

Trips away

Charters Towers – Townsville

Having nearly all growers from the LAPDOG made this outstanding for team building. It's worth repeating the quote from the group evaluation - *“If you are going to do more of this (group learning). It is important for the group to get away on trips to other places – much greater learning in a fun atmosphere. Helps the group get on together.”*

There was a great sense of co-learning between the visited and visiting growers as they got to know each other. It was always necessary to offer a formal reflection time, but the learnings continued to flow while the group continued to travel.

The visit to the wholesale packing plant stimulated the topic of marketing and consumer needs and growers expectations of product preparation and ensured that marketing received a much higher priority in future activities.

Robertson District and Sydney Markets

This was a mix of the two groups and afforded the opportunity for some cross group dialogue. The setting for such an activity was outstanding. Being able to join the Robertson group at such a significant stage, when they were going through all their learnings in such a structured way, and then being able to visit the producers in a relaxed and informal atmosphere on their farms, was a perfect way to maximise learning transfer. The group prepared a short report from this trip for feedback to those unfortunate not to be able to go.

The market inspection again brought home to the group many of the consumer driven implications for marketing the products. Highlighting the variety of packaging and complexities of the demand/supply situation in the bigger markets.

Colourful variety of packaging seen by group members at the Sydney Markets.



The Victorian Trip

A highlight - "Trip to Victoria, seeing where seed comes from, and where (our) potatoes go to."

The opportunity to meet seed growers on their farms, and see first hand their production methods was beneficial. However, the chance to be face to face and to be able to discuss the differences between producer and consumer had a double learning effect.

Firstly, at the seed consumer/producer level and then, secondly, both parties can see the perspective of the reversed roles; that is, the seed purchaser looks at his consumer role, his want, his needs – then he can make the linkage to the how the consumer of his fresh potato may also be thinking, thus effecting his attitude and approach to marketing. *"very critical of marketing, especially what the consumer buys and what the farmer sells."*

Summary of reflection about trips and visits.

In answering the evaluation survey question 'what have been the highlights of group work?' Of the 35 responses, twelve (36%) mention the trips or visits as highlights. Eg

- *“Certainly trips away a highlight, - The Townsville trip brought back much talk among the group”;*
- *“Trips – excellent, learnt a lot, - wives should be invited.”* And
- *“ Field trips most enlightening, educational, social events. Gives focus on points and ideas years later.”*

Mike Hughes's learning.

The trips really brought the group to realize that they were a unified entity who were achieving things for their district. The value of bringing people out of their day to day routine working environment to relax and develop their common interests, potato production in this case, must not be underestimated. Unsolicited comments such as, “I have known and spoken casually to him (other group member) for years, but never knew how knowledgeable he really is.”, were made to me.

Repeat visits to locations has been shown to have major benefits. This was highlighted by return trips to markets. Much deeper learning was attributed to the return visits.

RECOMMENDATION ONE

That HRDC gives strong consideration to promoting and funding exchange visits between groups of producers whether product aligned or not.

It could be argued that if this activity is so evidently beneficial that growers will take this up themselves. This may happen, especially where some profitability exists in the enterprise.

One grower from LAPDOG does gather some other growers on a yearly basis and intentionally visits different agricultural in Australia – *“You've got to get out there and find out what others are doing and thinking, otherwise you just stagnate.”*

However, acting on the principle of 'you don't know what you don't know' it would be extremely valuable for 'visits to other areas' to become essential in beginning stages of any 'learning group' project and be funded accordingly.

Industry groups need to get over the paradigm that visits to other areas “are junkets.”

A facilitated trip may be the single most powerful learning tool available.

When it's all said and done, you will need times of informal reflection to sort out your learnings. One relaxed member made the most of this opportunity following one trip.



Irrigation

There are a number of responses in the evaluation survey that talk about learning and practice change. Eg. *“only give water as it is needed, use tensiometers.”* And *“more accurate watering.”*

While group priority was not high for this issue (Tables 1&2), several individuals obviously had a need to progress this issue. They were encouraged by the groups and provided useful learning transfer to the group and wider farming community.

Tensiometer studies saw half the group change their irrigation strategies, and a number of other members were made aware of how they could improve their irrigation strategies. (Hughes *pers comm*)

Quality Assurance

“Eric Coleman was the best speaker to the group I ever heard. No Bullshit, gave facts, not like other academics.”

“QA from Gatton and whole aspects of of quality.”

“more quality conscious when harvesting.”

“modified harvest techniques, monitoring for less damage.”

These were some responses to the visit by Eric Coleman talking about quality assurance and marketing in the evaluation survey.

One of the facilitators (Jim Gunton) reflection on this issue is that, quality assurance (in it's widest sense) could be the glue or cement in a co-operative marketing group. Where group members know and set the rules and put in place the necessary monitoring or auditing, then trust can grow and better marketing be achieved.

Miscellaneous Reflections

Use of consultants – While growers carried out quite a few of the trials themselves, the rigour and time needed for some of their investigations eg integrated pest management, would not have been available to individual members.

Because of the favourable temperatures in this district, and low profitability of any one enterprise, year round production systems are implemented. These include rotations of summer crops, irrigated winter potatoes and usually crops of grass/legumes for seed and hay, in between. This leaves little time for other activities including family and social involvement that is so necessary for a balanced life style.

This necessitated the interaction of experienced people (consultants and DPI) to implement trials which growers needed, to bring about useful understanding, and to provide support for further group learning and practice change.

LAPDOG and TOPCAT were very fortunate to form an alliance with both Keith Lewis (BFS – now SERVE-AG BFS) and Paul Horne to help them with trials, beneficial insect release and insect monitoring. Paul's involvement was due to networks established through the former Australian Potato Conference series and Keith's link was through his work with a far sighted grower who, encouraged by a Crisping Potato Group activity, began some IPM work prior to groups forming and went on to take up membership in TOPCAT. We acknowledge his efforts and information sharing.

RECOMMENDATION TWO

That HRDC take note of the necessity of these alliances and provide support and encouragement to foster such alliances when learning activities are proposed.

Personal development - Personal growth of all members could be seen to occur, including the facilitators. Some quotes from the evaluation survey give an indication.

- *“Ability to lead a debate”*
- *“More adept at using media sources.”*
- *“Encouraged me to do public speaking course.”*
- *“ Could not believe how confident I appear on TV.”*
- *“Prepared to say things at meetings.”*
- *“Gave more confidence.”*
- *“Little groups are better than big groups, you gain more confidence.”*
- *“I now have much more experience in facilitating in a range of situations and I learned to respect a range of individuals not just as potato growers but as parents, spouses, and their other community roles. I also learned a lot more about growing and marketing potatoes.”*

It has been rewarding to see increasing active leadership offered to industries and organisations in their communities.

Closure

The main reflections from this activity was one of acknowledging the breadth and success of the activities and learnings that had taken place and the perception that the group's efforts have made an impact to their sustainable potato growing system and to the districts as a whole.

There was disappointment that their phase 2 application (HRDC/QFVG) had not received support, but they used this application process to focus themselves for their future directions.

There is the intention from both groups to continue to meet to discuss topics, but without funding there was no immediate plans to carry out many activities.

Recommendations three, four, five and six

That the HRDC and all funding bodies concerned with achieving practice change through learning, acknowledge the success of participatory action learning in meeting those outcomes.

That the HRDC and other funding bodies replace the term '*transfer of technology*' with the term '*transfer of learning*' especially within projects where awareness, understanding, skill and practice change (adoption) are central to the project.

That the word adoption be dropped from all applications in future because of it's "we know best" implications. It could be replaced by the words *practice change* – giving credence to both farmers and scientists knowledge systems.

That the HRDC, other funders and industry organisations sponsor and support many more of these of these participatory learning activities. Not only to achieve short term aims but also to promote an improved learning model with clients that will enhance their learning for the rest of their lives.



LAPDOG at the last formal meeting for this project – Closure. Behind the group are sheets of butchers paper filled with their overall observations and reflections, with some plans for the future.

ACKNOWLEDGEMENTS

The groups acknowledge the funding support from the Queensland Department of Primary Industries, The Horticultural Research and Development Corporation and the Queensland Fruit and Vegetable Growers.

We acknowledge the sharing of knowledge between the Robertson group, and hospitality of the Penna family, Charters Towers along with the Victorian and Crookwell seed growers. In addition the group appreciates the interest shown by merchants in various markets.

Appreciation is expressed to guest speakers Craig Henderson and Eric Coleman.

The groups drew information and support from some agribusiness people especially Andrew Irving and Naomi Strong.

A special note of appreciation is accorded to Dr. Paul Horne (then of the Victorian Institute of Horticulture, Victoria) and to Keith Lewis whose enthusiasm, skill and energy got us going and led to achievement of many of the groups activities.

The Queensland Department of Primary Industries thanks the growers aforementioned (cover page) for being dedicated, respectful, trustful, and patient learners. The potato industry and sustainable agriculture in general owns you a debt of gratitude for your involvement in this project. You may have learned a lot but we have had the privilege of co-learning with you; a win – win situation.

We wish you (as we hope for ourselves) continued effective and profitable learning.

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APPENDIX I

Activities undertaken by groups during the project

Group formation, needs analysis, BBQ	Lapdog	08/11/94
Group Meeting - S & J Quadrio - discussion on seed quality and handling, group forming exercise	Lapdog	15/11/94
Group Meeting - L&R Cuda - learning styles,	Lapdog	17/01/95
Meeting with Plant Pathologist re diseases Kairi Res Station	Lapdog	10/02/95
Seed and soil samples to patologist for pythium testing		
Soil tests for fertility levels	Lapdog	
Meeting - K&A Cunzolo, soil fertility, fertilizer useage	Lapdog	06/03/95
Meeting - L&A Villella , soil test results, pythium results, soil temperature	Lapdog	06/04/95
Meeting - A&L Pregno, Monitoring crops for IPM	Lapdog	04/05/95
Shed meeting with Craig Henderson from Gatton about irrigation talk about tensiometers	Lapdog	25/05/95
Meeting - S& J Robinson, project management, IPM, Fertilizer, Foundation seed trial	Lapdog	01/06/95
Group Meeting - L&R Cuda- IPM, Seed,	Lapdog	06/07/95
Meet with Dr Paul Horne - IPM at Ninos and Kairi R.S.	Lapdog	25/07/95
Paul Horne visit indiv. Farms and address general potato growers meeting on IPM	Lapdog and others	26/0795
Meeting with Paul to work out future plans - K&S Cunzolo, visit T Villella	Lapdog	27/07/95
Meeting Sandra Lanz (PT337) and others &BBQ Kairi R. S.	Lapdog	15/09/95
Meeting - S&J Quadrio, Irrigation Scheduling, IPM summary	Lapdog	05/10/95
Meeting -A&L Pregno, IPM monitoring, Thiomet trials, skills audit kit, group photo, press release	Lapdog	01/11/95
Christmas Break up and review	Lapdog and wives	16/12/95
Meeting - S&J Robinson review last year, IPM trial design, soil analysis	Lapdog	07/03/96
Meeting - L&A Villella Start gross margin discussion	Lapdog	04/04/96
Release of predatory eggs, J Quadrio, Channel 10 films and interviews		02/05/96
Meeting - S&J Quadrio Visit from regional development person, IPM, organise trip to T'ville	Lapdog	02/05/96
Potato seed cutting and dusting trial, R Standen		03/05/96
Meeting Kairi R.S. Harvesting issues, Cost of production, Seed problems, finalise trip	Lapdog	06/06/96
Meeting, group forming, priority setting	Topcat	12/06/96
Meeting, Kairi R.S. Disease control	Topcat	03/07/96
Meeting, K&A Cunzolo, Plant pathologist spot control, fertilizer project, IPM monitor	Lapdog	04/07/96
Bus trip to Penna's Chaters Towers on to T'ville	Lapdog	17/07/96
Morning visit to Pozzibon packing shed T'ville, travel home, see cane loading facilities Sth Johnstone	Lapdog	18/07/96
Meeting, Kairi R.S., Seed, spacing, round seed	Topcat	07/08/96

Group Activity	Which Group	Date
Meeting KRS, diseases, varieties, seed, Robertson trip, guest I. Johnston	Topcat	05/09/96
Trip to Robertson Field days & Sydney Markets	Both groups	17-21/09/96
Meeting, KRS, Trip progress, markets, seed, fertilizer placement - Guest J. Kilpatrick	Topcat	02/10/96
Meeting, L&A Villella, fertilizer trial results, report from Sydney trip	Lapdog	10/10/96
Meeting, KRS, nematodes, QA, markets, potato book, round seed, export	Topcat	06/11/96
Meeting, KRS, IPM report, guest J. Kilpatrick - potato book, varieties, xmas breakup	Lapdog	07/11/96
End of year activity - train trip to Herberton	Lapdog and families	30/11/96
Meeting, KRS, Marketing, Soil test nematodes, fertilizer, IPM trials with Lapdogs	Topcat	05/12/96
Meeting, KRS, seed treat, IPM,	Topcat	11/2/97
Field days Ballarat and Gippsland (Warragul) potato seed producers and Flemington Markets	Both groups	16-24/03/97
Meeting, KRS, seed and planting	Topcat	07/03/97
Meeting, Review and plan, Southern trip plan, IPM	Lapdog	03/04/97
Field inspection & meeting Paul Horne re IPM trials and insect control strategies	Both groups	24/04/97
More field inspections with Paul Horne	Both groups	25/04/97
Meeting, KRS, HRDC proposal, IPM, tensiometers, Nutrition,	Topcat	21/05/97
Meeting, KRS, HRDC - QFVG proposals	Lapdog	11/06/97
Meeting, KRS, Guest Jamie Seymour JCU, Predator rearing	Topcat	01/07/97
Meeting, Fertilizer, IPM, Seed	Topcat	06/08/97
Jamie Seymour, action plan for IPM field site	Both groups	11/08/97
Peter Trevorroy pythium, new projects, IPM	Both groups	03/09/97
Meeting disease, insects, blackleg, Austveg	Topcat	01/10/97
Review past year, what next	Topcat	04/02/98
Meeting Review set directions, IPM project	Lapdog	05/02/98
Eric Coleman Quality control project	Both groups	04/03/98
Meeting - QA, Cadmium, Chem safe courses	Topcat	08/04/98
Meeting - ACDC course, Ca deficiency	Topcat	13/05/98
Meeting - Fertilizer, Chem safe, Spraying tech.	Topcat	17/06/98
Meeting with marketing people to explore some other marketing options	Both groups and others	02/07/98
Final Meeting and BBQ	Lapdogs	12/08/98
Evaluation	Both groups & non group	2/11/98
Field day - DPI harvesting variety trial, IPM - J Seymour, Commercial harv. J Quadrio	Both groups & other growers	12/11/98
Michael Hughes continues to work with Topcat group		
when necessary (include any interested Lapdog)		
Review project - future directions - other projects	Topcat	31/3/99
And forward directions	Topcat	28/04/99
Another project proposal for IPM work	Both	29/07/99

APPENDIX 2. Results of evaluation survey of LAPDOG and TOPCAT as well as non-group growers.

SUSTAINABLE CROP MANAGEMENT FOR POTATO FARMS ON THE ATHERTON TABLELANDS (Project Pt-402)

SUMMATION SURVEY of (LAPDOG/TOPCAT PARTICIPANTS)

Q.1 What do you do differently now to when you started with the LAPDOG/TOPCAT groups?

More quality conscious when harvesting.

Using all tools at our disposal, better seed treatments, good seed lines, boxes, dusting, understanding diseases.

We reinforced our opinion that we are using fertiliser correctly.

More confident in disease and pest control, adopting IPM

Time of planting is better

Soil temperature conscious, water during the day in the cool and water at night to keep soil cool in the heat.

Did not grow potatoes at start and finish of project.(to do with price)

Very much more aware of marketing, in present system not worth selling.

IPM but the infrastructure is not there.

Do not just naturally grow potatoes, need to be aware of the market (not a free market operating).

Have hired a consultant.

IPM no insect sprays at all, roll potatoes to control tuber moth, don't panic with aphids.

Allow pest buildups for beneficiaries to take over.

Water more often but lighter.

Only give water as it is needed, use tensiometers.

No more sidedressing, basal fertiliser only.

Minimum tillage.

Modified harvest techniques, monitoring for less damage.

HDP in bunker.

Cost of production is less.

Hill up at planting, and except for spraying this is the last tractor operation in the field (reduces compaction)

Don't grow potatoes continuously, clearer marketing.

Now no clear market direction, no confidence in market systems.

When growing reduced spraying.

More accurate watering.

Provide better nutrition.

Biggest thing is IPM, don't spray as much

Changes fertilizer use after trials.

IPM definitely, - by far the biggest change on the farm here

Using more single sett seed.

Not using Thimet – kills predators.

More into IPM, right into it.

Enviroscan/Gopher moisture monitoring

Acutely aware of quality of seed planted (although often cannot do anything about it).

More monitoring while growing.
Always refining harvests.
Very critical of marketing, especially what the consumer buys and what the farmer sells.
Tensiometers and Enviroskans trialled.
IPM experimented with, trials with Paul Horne
No major changes, some minor ones probably. Production is different in different geographical areas.
Using IPM to some degree, new information would not have had before.
Not much difference.
Nemacur granules not being used
IPM in particular.
Fertilizing a lot less but more responsively.
Saving in chemicals and fertilizer.
Planting with Monceron.
Watering more often (but lightly) at end of crop for moth control
Cut back on insecticide.
Better crop management.

Q.2 Would you have done any of this without LAPDOG/TOPCAT?

About ½ of it. IPM some adoption.
Would not have done IPM
Probably not, definitely not IPM – too much of a gamble to start.
Not to the extent at which developed in IPM , nutrition etc.
Probably not
Yes, but would not have caught on as quick.
Would not be using anywhere as near as much single sett.

Yes, but group has had some effect.
Probably not IPM
Probably not some of it.
Not nematodes
Yes but a lot slower.
It would have taken a lot longer to become aware of new trends.
In time maybe, but you don't know what you don't do.

Q2a. If so, how has LAPDOG/TOPCAT helped you with these changes?

Information and reinforcing what you are doing as a group.
Cannot afford to experiment alone due to the cost – it is too luxurious an idea.
Cheaper option is bouncing ideas off farmers
Worked off others, gained confidence.
Backup of DPI to help gain confidence.
DPI provides info backup to make decisions.
LAPDOG broke necessity to follow peer groups pressure (ie cut down on spraying).
Another information source – not only relying on chemical companies for information.
Consultant monitoring the crop gave you, on the ground, in your face, feedback.
Made more aware of what is available to me.
As far as different predators – ID which predators attack which pests.

Talking in groups has great merit, better than sitting at home.
Become more aware of what is around and what people are doing; in markets, packing sheds and other growers.
Open discussion has been good.
Information from other members
Keep abreast of newest technology, cannot grow alone.
Experience is a good teacher, but changes are so fast and farming becoming harder, so must keep abreast of changes.
Interesting learning off other growers.

Q. 3 Through your membership of LAPDOG/TOPCAT, how has your produce improved?

Growing a more robust product.
Not standing back and accepting facts, have become proactive and trying to change the situation.
Aware there is nothing to lose with finding answers to problems
Aware of other growers problems and are able to react faster, therefore do not suffer the same problems.
No – market problem
Cost of production is down.
Not as many diseased potatoes.
Yield increase
Water control; gives a more uniform marketable size.
Better shelf storage.
Less possible chemical residue.
More aware of market quality needed.
Grow better crop through using better hygiene.
Not really, market has dictated terms
Yes – cannot explain reason why.

This year no, otherwise it has improved.
I don't think there has been any real change.
Seasonal conditions cause more of a change than our farming.
Don't know there have been changes in the crisping industry and this year has been a bad season.
Chemical residues down.
Safer crop, hardly any insecticides.
Yes, quality is better
Good keeping ability.

Q.4 Do you believe the LAPDOG/TOPCAT groups have helped make your farm more sustainable? (x = lapdog; # = topcat)

Totally Disagree: 0:Disagree X :Probably X### :Agree XX#### :Totally Agree XX

Q. 4a. Why do you believe this?

Information availability. Discussions out of potato farming were important.
Bring to point of decision what to do.
Look at things more systematically.
Cannot do things out of habit anymore, you must assess all parts of production.
Start with selling, if you cannot sell, stop.
Answered previously (Q1)
Have more \$ in my pocket
Has taken the guesswork out of farming, more continuity in what I am doing.
Plant a crop and know I will get a crop out of it.
Field hygiene better, aware of importing diseases etc.
More aware of soil nutrition and need for maintenance.
Brought out need for good rotations.
Definitely, if not for group, IPM would not have taken
If I was not in the group, I would sooner or later be using the same practices so I do not feel it has made me personally more sustainable.

Rotations being looked at.
Interacting with other growers major effect.
Other farmers have a lot to offer.
Keith Lewis has come up with interesting results, especially SC27 trials etc.
Discussion has been beneficial.
Have picked up a lot of interesting things.
Feel at least 12 months advanced in knowledge.
Different crop management,
\$ savings.
Different fertilizer types
A bit less of this a bit more of that.

Q. 5. How has LAPDOG/TOPCAT changed your opinions on any aspects of farming, management or sustainability issues?

Aphids, need for spraying reduced.
IPM is understandable
Light shed on marketing.
Planting time more important.
Financial awareness
Changed rotations, pasture instead of sorghum
Will now look at seed before buying.
Think more about others, you are not Robinson Crusoe, check with others.
You do not have to reinvent the wheel.
Gone from pro-chemical to anti-chemical.
Try to have a better rotation instead of flogging the soil.
Less acres but better utilised, (rotations)
Still ways to improve, I realise I do not have all the answers, listen to others.

Changes in opinion to markets.- more respect for what people are trying to sell but also more critical of middleman's handling.
Now much more important to share information.
Now much more important to seek information.
IPM has been a big change – years ago we sprayed regardless.
Before I sprayed everything, now I do not have to.
Made me more aware of what can go wrong with seed, so I am taking the safe way out.
Made us growers more aware of our problems.

Looking at new chemicals
Continually looking at new ideas.
Interesting to see different irrigation techniques and results.
Looking for better spray techniques – very important – lot of money.
Understand the need for Quality Assurance.
New information, therefore some changes in thinking.
New ideas and I come home and check them out.
More conscious recommended rates (*chemicals*) are recommended for a good reason.
– does not need a top up to make it better, (quite often this can be detrimental).
Opened mind to more opinions.
Practices we are talking about will be essential in the future.

Q. 6. Have you picked up new ideas, skills which you are not yet using?

Better digger.
My establishment phase has been different to most, and may be moving to their way.
Enviroscan is the right way to go.
Moving away from cut seed to all round seed. (possibly need to educate seed growers on this).
Changing harvesting techniques.
More adept at using media sources.
Ability to lead a debate.
Irrigation technology and use of Enviroskans etc.(seen value in them)
Cutting seed into cabbage bags.
Seed handling. – if seed is not up to scratch, will send back (stronger management skills).
Learning more about insect ID.
Tensiometers
Rolling of ground for tuber moth control.

HACCP (quality assurance audit program)
Computers (am being forced into using it)
Rollers for moth control.
Using a rotary hiller for control of clods, does a very good job.
Rollers for tuber moth control.
Too much lime gives scab.

Nothing especially comes to mind.
Want to start treating seed at planting.
Rollers for controlling moth.
Rollers for controlling tuber moth.
Watering more frequently at low rates for tuber moth control.
Different cultivation methods (I will be trying these next year).

Q. 7. Are your goals/aims different to what you had before your involvement with the groups?

Trying to be in upper range of potato farmers.
If you are going to grow potatoes do it properly
To be early to successful marketing directions
No.
Yes. Are happy to get 14 t/acre Sebago's but now aim for 18 t/acre.
Not necessarily yield, but quality instead of tonnage.
Keep crop rotation up.
No.- no preset ideas when joined the group.
Goal still is to grow the perfect crop of potatoes.
No, not really.
No, don't think so.

Still a need for successful marketing venture from tableland growers. Unless marketing improves I may walk away from 'spuds'.
Always try to get better (but still no extra money).
No change, aim to grow top quality stuff.
Do what you can do properly.
No always try to do better than the last time.
Aiming for 100% in the size range.
Still want to survive.
Aim still to grow best crop.

Q. 8. Have you done your own on-farm research, for the group/yourself?

IPM moth releases.
Tensiometers
Soil temperature probes
Establishment progress
IPM with consultant
Never stop doing own research.
Yes – heaps of irrigation and IPM
Yes – all sorts of trials, tensiometers, consultant doing trials.
Stopped growing potatoes for a time.
Yes fertilizer trial.
Yes, IPM and fertilizer trials.

Yes – IPM, fertilisers.
Yes – IPM wasps, fertilizers
Yes – Individually on own farm and bringing results to the group.
Have done a lot of my own trials.

Yes – Nutrition, pest control, water.
Yes – Varieties, fertilizer comparisons.
Yes – Fertilizers, watering.

Q.8a. How are you more confident in doing this type of work?

Yes

Yes

Yes, having group opinions and support, backed with DPI expertise.

Not continually knocked by individuals, (group provides support).

Yes definitely prepared to have a go at anything.

Yes.

Yes definitely.

No – have gone back to more traditional smaller trials. (but am always doing them).

Suppose so.

Yes

No – have to do it anyway.

The more you know about something you realise you know less than you thought you did.

The more knowledge you have the better you are able to make informed decisions.

Yes a lot a lot of information and support from the older growers.

Q. 8b. Are you more confident with the results of other group members on-farm research?

No. Will listen but not confident

No but am doing own assessment of their work

Yes, know how the trials are being done.

To an extent., willing to take ideas on board.

Yes, everyone did different trials and it was good to hear the results.

No, I don't think so.

Only believe what you see.

Listen well.

Yes, they don't tell stories.

Yes because I talk about it with them and I am also aware of the differences on each farm.

Yes, they are not going to say something that is not correct.

Yes definitely the other farmers want the same thing out of the crop I do.

Some yes, some not.

Q. 8c. Are you more confident with the results of other farmers (non-group members) research?

No. – but listening

No – but happy to listen

No

To an extent, tried ideas picked up from seed trip.
Yes, listening more to other growers.
No definitely not.

Look at them and see what they are doing, but only believe what I see.
Listen to anything new and sounds feasible.
Picked up good information on seed trips.
No. I don't discuss with them.
Be cautious with what they said, and maybe give it a try.
Do not have much access to this research.
Our group share information freely, other farmers do not do that.
No not really, some of the best farmers are in the group.

Q. 9. What have been the highlights of group work?

Information

Confidence

Functioning with different personalities

2 years ahead of where we would have been without a group.

The trips – all of them

Enviroscan

Fact that projects have worked.

IPM – without a doubt, top of the list.

Water practices.

Christmas parties excellent.

QA from Gatton and whole aspects of quality.

Trips – excellent, learnt a lot. – wives should be invited.

IPM outcomes

Certainly trips away a highlight, - Townsville trip brought much more talk amongst the group.

Credibility the group attained with industry.

People were interested about what we wanted to say.

Respect from universities, media, companies, local potato growers.

Field trips most enlightening, educational, social events. Gives focus on points and ideas years later.

Townsville trip, pity there were not more of them.

Open discussion, people not scared to talk, - best point.

Field trip done was terrific.

Seed growers and Robertson growers.

Paul Horne discussion

Visiting markets.

Seed Trip.

Visitors discussing topics with the group.

Discussions

Trip to Victoria, seeing where seed comes from and potatoes go to.

Eric Coleman was the best speaker to the group I ever heard. No bullshit, gave facts, not like other academics.

Night out, bit of a yarn and discuss a few ideas. – Should be more of it.

Information sharing and the discussion itself.

Plenty of ideas, good food for thought.

Visit of seed growers excellent, being able to share our perceptions of seed with seed producers.

Just leaning – never learn enough.

Q. 10. What have been the low points of group work?

Some honesty?

Not full attendance

Disagree with value of trips

Disappointed agencies did not continue funding – benefits long term.

-

Initially knocking of ideas.

Bit too casual in the beginning.

Breakdown of it, - no funding

Ran out of enthusiasm.

Funding for further trips etc. not available.

A few times we became stuck on one subject and could not move off it.

Sometimes it was inconvenient to attend.

Not enough people were game to have a go with new ideas at an on farm level.

Always up to the same 2 people doing all trials.

Not getting insects from Paul Horne (would really have liked to carry on with this).

Marketing problems ongoing.

Didn't do some of the research we wanted to do.

Not enough time to put everything into place (what was talked about at meetings).

-

Might have done a few more trials as a group.

Sorry missed seed trips – these broadened the other growers knowledge.

Missed southern trip.

Q. 11. Have you communicated group results/learnings outside of the groups?

Other farmers (who) XXXXX(constantly) ##### Not as a practice. Some confidential information is shared with the group but this is not for everyone.#

Consultants XXXXXX #####

Researchers XXXXX ##

Media TV, Landline called, Magazines(including one from the UK), the lot of it.

Others ? Relations, general public, friends, people, general public, housewives etc., anybody, seed growers, sales people.

Q. 12. Has the project improved your ability to communicate with these people?

It has not improved communication skills but given interesting topics to discuss.

Increased information and confidence and directions, therefore communicate more clearly.

Yes speaking to group members much more, especially those I did not grow up with.

Yes for sure.

Could not believe how confident I appeared on TV

Encouraged me to do public speaking course.

Yes – media.

Prepared to say things at meetings.

Gave more confidence.

No

No

No

Yes, talking to consultants.

Sometimes I am more confident.

Little groups are better than big groups, you gain confidence.

Yes – don't get around too much.

Yes – we have a similar plane of interest.

Yes

Q. 13. On a scale of 1 (total waste of time) – 5 (could not survive without it) what effect has the project had on the following: (Please circle)

Potato Management	- Yield	1.....2.....3.....4.....5
		<p style="text-align: center;">X</p> <p style="text-align: center;">X</p> <p style="text-align: right;">X</p> <p style="text-align: center;">X</p> <p style="text-align: center;">X</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p>
	- Quality	1.....2.....3.....4.....5
		<p style="text-align: center;">X</p> <p style="text-align: right;">X</p> <p style="text-align: center;">X</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: center;">#</p> <p style="text-align: right;">#</p>

	- Pests	<p>1.....2.....3.....4.....5</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p>
	- Nutrition	<p>1.....2.....3.....4.....5</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>X</p> <p>X</p>
	- Water	<p>1.....2.....3.....4.....5</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>X</p> <p>#</p> <p>#</p>
	- Planting	<p>1.....2.....3.....4.....5</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p> <p>X</p> <p>#</p> <p>#</p> <p>#</p> <p>#</p>

	<p>-</p> <p>- Growing</p>	<p><i>1.....2.....3.....4.....5</i></p> <p>X</p> <p>X</p> <p></p> <p>X</p> <p></p> <p>#</p> <p>#</p> <p>#</p> <p></p> <p>#</p> <p>#</p> <p></p> <p>X</p> <p></p>
	<p>-</p> <p>- Harvesting</p>	<p><i>1.....2.....3.....4.....5</i></p> <p></p> <p>X</p> <p></p> <p>X</p> <p>X</p> <p></p> <p>#</p> <p>#</p> <p>#</p> <p></p> <p>#</p> <p></p> <p>X</p> <p></p> <p>X</p> <p></p>
	<p>- Other</p>	<p><i>1.....2.....3.....4.....5</i></p> <p>X</p>

Sustainability	- Profitability	<p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p> <p># #</p> <p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p>
	- Other - Long term farming - Future Cropping - Ability to keep growing - Future Cropping - Long term Experience	<p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p> <p># #</p> <p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p>
Innovation	- Adopting new ideas	<p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p> <p># #</p> <p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p>
	- Developing new ideas	<p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p> <p># #</p> <p>1.....2.....3.....4.....5</p> <p>X X</p> <p>X X</p> <p># #</p> <p># #</p>

Q. 15. Any other comments you wish to make?

Dynamics of group, would have felt uncomfortable in the other group.

More funding needed.

Rats, Moth, Marketing (especially when people are capable of digging 100t/day) (tuber quality) are major issues which need to be addressed

Driving lessons for Jim!!

It has been a pleasure having DPI work in conjunction, guiding us not pushing us, allowed us to make mistakes and overcome them and trusting that the farmer does know something.

Taken a lot of guesswork out of cropping and made us more professional about our growing.

Still a lot could be done, especially with water (eg. Enviroscan), also more nutrient work is needed, especially foliar and trace elements.

Every grower on the tablelands basically has reaped the reward of the hard work done by LAPDOG and TOPCAT people, especially in IPM.

Potato industry on tableland's future depends on growers improving marketing skills, probably on an individual basis.

Will keep the group working. Group members will, fund their work, do not need outside funds.

IPM has resulted in an increase in rats.

SUSTAINABLE CROP MANAGEMENT OF POTATO FARMS ON THE ATHERTON TABLELANDS

(Project PT - 402)

SURVEY of NON-PARTICIPANTS GROWERS

Q.1. How are you producing potatoes differently to five years ago?

From aerial spraying to tractor spraying

Hardly use any insecticides.

Last 2 years I have had my crops checked by consultants.

Moved from harvesting in bags to bulk.

Insect sprays reduced.

Giving right amount when need (*water*), years ago I only gave enough to carry on.

Monitoring water closer.

Using consultant for crop monitoring

Trying to use IPM.

Using slightly higher rates of fertilizer.

Doing IPM.

Don't hill up at planting

Using more sophisticated chemicals but having less control.

Less insecticides.

Watering from hard hose instead of all solid sett.

Using tensiometers.

Crop monitoring now.

Q.2. Why have you made these changes?

Better results from tractor spraying.

I was over-spraying before, when I started to look at it I realized I did not need to do it.

Years ago I sprayed regardless of insects, now I'm more aware of beneficial insects and can get away with less sprays.

Drier seasons and some DPI discussions etc have changed my watering.

Reduce costs and increase yields.

Older I get the more I loathe chemicals.

Cost effectiveness.

Economics

Learning new ways and techniques

Get better spuds.

Less insecticides, save on costs. (Insecticides are not real good to use).

Q.3. Have you heard of the LAPDOG/TOPCAT groups?

YES XXXXX

NO

Q.4. What changes do you think these groups have brought to the district?

IPM has made a major difference to the district.

15 - 20 sprays have been reduced to 1 insect spray.

Brought changes for spraying insects.

Blokes who are in it provide a means of technology transfer.

Blokes in it are keen and probably better growers, - keen growers on the coalface of technology.

Thoroughly looked into techniques (*IPM etc.*).
 Tried to introduce better ways of doing things.
 Brought awareness, chemical use etc.

Q.5. What new ideas or thoughts on potato farming have these groups given to you?

Not a lot off anyone.
 Idea good, but not passed on well.
 Some farmer to farmer ideas passed on.
 Given ideas on using tensiometers and pan evaporation dishes.
 Mostly in IPM.
 IPM
 Rolling spuds instead of spraying for tuber moth control.
 Tensiometers monitoring water.

Q.6. Are you confident to follow any results of on-farm trials conducted by the group?

Yes, I think so.
 Still rather do trials myself, but the work done has been good
 Yes if they say it is OK I tend to believe.
 Oh yes, definitely
 Yes

Q.7. Has having these groups in the district changed your attitude towards group work?

I think it has, having seen it getting going was a good thing.
 No – yes & no. Spraying has been shared out, but with other growing techniques I like to keep my ideas.
 Have usually been involved in groups, now I am prepared to push my boys to be involved in groups.
 Certainly can be a big benefit in any field.
 Getting of knowledge, information is a big plus.
 Yes

Q.8. On a scale of 1 (total waste of time) – 5 (best project ever seen), how effective do you think the project has been to:

Bringing new ideas to the district	1	2	3	4	5
			X		
			X		
			X		
				X	
					X
Bringing change to the district	1	2	3	4	5
			X		
			X		
			X		
			X		
			X		

Q.10. General comments re LAPDOG/TOPCAT