

AN INTERGRATED FERAL PIG PROGRAM FOR THE BRIGHTLY LANDHOLDER GROUP

By

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Introduction:

Within the Mackay and surrounding region, feral pigs (*Sus scrofa*) pose a substantial threat to both the sugar industry and the natural environment.

In the 2014 season at least 16,500 tonnes of cane was destroyed by feral pigs in the Mackay Sugar district. This equated to about a \$1M dollar loss to the local industry. In 2015 we believe this figure has increased to well over \$1 million dollars loss with a increased pig activity being observed by growers and their MAPS advisors.

The feral pigs cause this high intensity damage through the consumption, digging and trampling of sugarcane crops which impacts both the standing crop and subsequent ratoons.

In the natural environment they cause damage to wetlands by destroying plant communities and reducing water quality. They disturb soil along sensitive riparian areas which in turn promotes erosion and enables invasive weed species to take hold. In our local rainforests, state forests and national parks they promote the spread of weeds and disease, disturb the natural recruitment of species and feed on vegetation particularly in vine forests.

The difficulty in managing this pest is due largely to the terrain in which they roam, their high reproductive potential, their cunning wariness of humans and the inconsistent success of hunting, baiting and trapping activities. As it stands, individual farms attempting control have had minimal impact on the whole population and typically will only succeed in scattering or moving the feral pigs from one farm to another.

In response to this, the Mackay Area Productivity Services (MAPS) , Mackay Regional Council (MRC), Reef Catchments Whitsunday Isaac Ltd (RCL), Queensland Parks and Wildlife (QPWS), a motivated grower group and a feral animal control contractor combined their efforts to develop and demonstrate a more coordinated and integrated approach to feral pig control.

A pilot project commenced on 23rd November 2015 centred on a group of Brightley Landholders (Brightley landholders Group or BLG). Working with 11 farmers from both the cattle and sugarcane community, the aim was to employ a single contractor (CQ Feral) to apply an integrated control program to the whole area using techniques including ground baiting and trapping. This project also planned to release two feral pigs fitted with GPS satellite collars to monitor their range and to help determine strategic locations for trapping and baiting.

Trap maintenance, site monitoring and pre-feeding work was contracted out to Steve Andrews of CQ Feral.

Objective:

The objective of this project was to form a proactive landholder group that could focus on managing their feral pig population through a collective coordinated approach using an IPM program.

This IPM program aimed to control feral pigs across 11 properties in the Brightley area, occupying an area of approximately 2926 ha (Appendix 1, Map 1). It would focus on best management control techniques such as ground baiting and trapping. This would be supported by releasing pigs fitted with GPS satellite collars as part of the “Judas Pig” technique in order to better monitor their movements and determine strategic locations for trapping and baiting.

Project Area:

The Brightley Project area is predominately open cane land adjacent to grazing country with Mount Kinchant National Park to the West (managed by Queensland Parks and Wildlife Services). The country is also broken up by gulleys, creeks and irrigation channels owned by Sunwater which run from Kinchant Dam approximately 3.4 km North West of the project area.

This location was selected due to its long history of cane crops being damaged by feral pigs and the cooperative-nature of the landholders in the area. As part of the project the influence of habitat adjacent to cane lands was also assessed.

The members of the BLG, each contributed about 40% of the projects operating funding, their time, some resources (e.g. food for baits) and underwent training on best practice management pig control. This encouraged commitment and ownership of the pilot project and hopefully laid the groundwork for future self-motivated IPM programs.

If successful, MAPS and RCL could potentially roll out the program to other interested grower groups in the Mackay catchment area. This would, in time, hopefully stimulate more proactive integrated feral pig management groups to form across the district.

Resources:

Item		Responsible Entity		
Farm maps		MAPS		
Feral pig traps x 3		MRC		
GPS tracking collars x 2		RCL		
Veterinary Services		RCL		
Mangos for baits		BLG		
Molasses for baits		CQ Feral		
1080 (sodium fluoroacetate)		MRC		
Motion sensor cameras x 5		CQ Feral		
PPE, Vehicle, Fuel, Firearms & Ammo		CQ Feral		
Item	Rate	Hours or Km	Agreement Costs	Individual Landholders Share of Costs
CQ Feral				
Fee *	\$70 /hr	140	\$9800	\$980
Fuel	10L/ 100 km	7000	\$1000	\$100
Baits			\$2000	\$200
Cameras			650	\$65
Total			\$13450	\$1345
Reef Catchments Subsidy			\$6000	
Total BLG Cost			\$7,450	\$745/Landholder
Reef Catchments				
2x GPS Collars			\$4000	0
2month satellite service for GPS			\$550	0
Vet- collar fitting			\$550	0
MAPS Contribution for extra contract hrs	\$70 /hr	21.4 hrs	\$1500	0
Total Project Cost			\$20,050	\$745/Landholder



Image 1: GPS Tracking collar set to upload a fixed position every 2hrs to a 10m accuracy.

Image 2: Standard Panel Trap provided by MRC.



Image 3: Spromise S158J 3G/GSM Cellular Camera capable of motion sensing capture with SMS delivery. (Source: CQ Feral)

Image 4: Mangos were used as pre-feed for 1080 baiting.

Methodology:

There were several basic control techniques used in this integrated pest program: pre-feeding for trapping or baiting, the “Judas pig” technique (GPS tracking) and shooting (as a final resort). The details of how each control technique was employed, their effectiveness and any observations made are described below.

Trapping:

The three traps available to the contractor were placed at the following three locations based on landholder recommendations and damage reports:

Trap number	Farm/block number	GPS coordinates
1	3548A/2-3	-21.2666496, 148.947072
2	3082A/1-1	-21.256463 148.934149
3	3556A/15-1	-21.239328 148.926204

These locations are identified on Map 1 in appendix 1 and were all accessible during wet conditions and were equipped with an adequate amount of water and shade. The traps were each fitted with a motion sensor camera to detect any activity near or in the trap. They were supplied with mangoes and molasses as an attractant.

Judas Pig Technique:

Once pigs were trapped successfully, plans were made to release them with an attached GPS collar in order to better monitor their movements and determine more strategic locations for trapping and baiting. This process is referred to as the “Judas Pig Method” (Sharp 2012). According to the Standard Operating Procedures of the Judas Pig Method, it works on the expectation that the collared pig will join up with other pigs.

Baiting Technique:

In this program, baiting techniques were also used. Once an area of recent pig activity is confirmed, the aim is to establish a pre-feeding schedule to attract the pigs and gain their confidence. This can take a number of days to a couple of week. Once a significant number of pigs are regularly feeding, the normal feed is substituted with baited food.

Shooting Technique:

Shooting typically only works to disperse a mob pigs from one area to another. It can also alter the mobs natural behaviour and make them less likely to enter traps or take to baiting. Aerial shooting can be relatively successful, albeit expensive, when water and food resources are scarce, causing pigs to congregate.

Results

Trapping Effectiveness:

The first trapping result occurred on the 17th of December 2015 in Trap 1 at Richard Bugeja’s property where one large sow was captured using the mango and molasses attractant (see images 5 and 6). The sow was estimated to be at least 50kg, not pregnant and without piglets, a potentially suitable candidate for the GPS collar tracking. The Vet was contacted immediately to organise sedation and attachment of the GPS collar. Unfortunately the Vet was unable to make it within an appropriate timeframe given his workload. It was decided

to humanely terminate the pig. The trap was re-set and re-stocked with mangoes in the hope that more suitable sows could be caught.

Image 5 and 6: 50kg adult sow caught in trap 1 at Ricard Bugeja property the night of the 16th of December 2015 using mangoes as attractant.



Source: (CQ Feral motion sensor camera 12/2/2015)

The second trapping result didn't occur until the 12th of January 2016 when two smaller 8-9 month old sows (approximately 35 kg each) were captured in Trap 3 at John Deguara's property using mangos as attractant (see images 7 and 8).

Images 7 and 8: Two young sows captured in trap 3 at John Deguara's property using mangoes as attractant.



Source: Video screenshots from CQ Feral 12/1/2016.

Unfortunately no other pigs were captured in traps over the remainder of the project.

Judas Pig technique effectiveness:

The two female candidates, without piglets and of an estimated weight of 35kg each were caught in trap 3. The vet was contacted immediately to carry out sedation and to allow the attachment of the GPS tracking collars. Unfortunately, it was discovered that the sows were not quite big enough to prevent the GPS tracking collars from slipping off. It was estimated that a successful candidate needed to be at least 50 kg for the GPS collar to fit securely. The pigs were subsequently terminated, the trap re-set and re-stocked for another attempt.

Unfortunately we failed to find a suitable candidate for GPS tracking within the project timeframe.

Baiting effectiveness:

Before a baiting site was determined, the contractor liaised with growers to find known areas of activity and/or identify fresh crop damage. Evidence of

crop damage was reported in blocks on Joe Deguara's property on the 3rd of December 2015. **Images 9-10** shows some of the damage caused by pigs trampling through young ratooning cane, breaking off sticks, chewing them and leaving the tops along the headlands and inter rows.

Images 9-10: Pig activity and damage to blocks of young ratoon cane that fringe Kinchant National Park. (Source: CQ Feral 3/12/2015)



Another motion sensor camera was set up (4th December) facing this cane. A baiting pad was established to entice the pigs away from the cane and to start them acquiring a taste for mangos, which at this point were still ripening on local trees. Mangos were not in abundance on the ground. The next morning, after the camera was set, the mob of pigs most likely responsible for the previous damage were captured eating the pre-feed of mangos (**Image 11**).

Image 11: Mob of at least 12 pigs of varying age and sex captured at the pre-feeding site at Joe Deguara's farm during the day.

Source: CQ Feral motion sensor camera 5/12/2015



After 5th December, surveillance showed no more activity at this site despite leaving more pre-feed. It wasn't until over 4 weeks later on the 10th of January 2016 that a large mob of pigs was sighted again at Joe Deguara's property, this time in the scrub country behind his house on farm 3083A Block 8-2 (GPS coordinates -21.234000 148.927398).

Here the contractor set up a motion sensor camera and began pre-feeding with freshly picked mangoes. There was an immediate take to the pre-feed by this mob as shown by the images: **11-16**.

Images 11-16: Pre-feed of mangoes taken from baiting site 1 over a 24hr period shown in sequential order from left to right. (Source: CQ Feral 10/1/2016)



Given this result, the Mackay Regional Council team was contacted immediately to initiate the preparation and application of the Sodium Fluoroacetate poison (1080). The mangos had to be crushed into a pulp material, the seeds removed and the bait material dyed green to be less appealing to birds as per the “Standard Operating Procedures of Poisoning of Feral Pigs with Sodium Fluoroacetate (1080)” (Sharp 2012).

Approximately 60 kg of mangos were prepared, baited and placed at Joe Deguaras baiting site on the 13th of January 2016 with the motion sensor cameras activated. The following series of images (**17-22**) shows the mob returning to take all 60 kgs of the baited mangoes. A total of 24 pigs of varying age and size were identified from the footage with the biggest sow estimated to be 90-100kg in size. There are also a number of piglets in this mob. The ratio of sows to boars was very difficult to obtain accurately from the images.

Following this successful baiting event, the site was baited with a further 20kg of mangos laced with 1080 to see if any remaining pigs would return. No pigs were sighted on second baiting. A survey was done by the contractor in the area to locate any dead pigs within 24 hrs of the baiting. None could be found and no smell (expected from dead animals) was reported by the landholder weeks later. According to the Council officers, the immediate reaction of pigs once they have consumed 1080 baits is for them to head towards a source of water. In this case that could have been km’s away in several directions before perishing with 12-24hrs

Images: 17-22: Successful uptake of baited mangoes by a mob of approximately 24 feral pigs shown by a series of video screenshots in sequential order from left to right. (Source: CQ Feral 13/1/2016)





Shooting effectiveness:

The shooting technique was only used as a last resort in this project due to its limitations. Nevertheless a total of 12 boars and 4 sows were shot on site at various farms over the period of the project.

Observations Comments & Recommendations:

Trapping:

From the results obtained it is easy to see that the trapping technique is not the best choice for removing large numbers of pigs at a time. Trapping is more useful as a pinpoint control effort- a tool to remove small numbers of pigs or to

focus on a relatively small defined area perhaps close to urban areas where other methods such as baiting are not acceptable.

Although trapping is environmentally friendly and humane, it requires a larger amount of effort and food source material for a small number of pigs being captured at a given time. The contractor also found it very difficult and time consuming to allow the pigs to become accustomed to the traps and for them to acquire a taste for the pre-feed of mangoes.

In future, the timing of trapping techniques should be implemented when conditions are much drier and when natural sources of food and water are less available.

For the purpose of initialising GPS tracking and gaining additional information on sex, age and weight, trapping is the only technique appropriate.

Baiting:

From range of control techniques employed in this program, baiting was shown to be the most effective method of culling large numbers of feral pigs quite rapidly with relatively low effort and cost.

According to the contractor and landholders involved, conditions were ideal for baiting at this time of the season (Jan 2016) as the cane was relatively small, conditions were drying out and the pigs had a keen taste for mangos that were in coming into season locally.

It can also be the most effective method in rugged terrain or in seasonally inaccessible areas due to the wet season.

Grower Feedback on the project:

To gauge grower feedback a series of questions were asked of them including:

- What is was your opinion of the BLG project?
- What were its outcomes or achievements?
- Were there any issues or problems?
- Rate the contractor's performance?
- What improvements can be made in the future?
- Would you like to continue with this type of management program?

Overall the BLG members felt that this integrated control approach was more successful in eradicating pigs over their traditionally used hunting methods (shooting and dogging) performed by individual farmers without collaboration or communication with others in the locality. The landholders now believe that having a group work together in a focused and coordinated fashion is pivotal to effective pig management.

The outcomes of removing 24 pigs with baiting in one event has demonstrated its advantage over trapping and shooting which required more time, labour and resources. The growers who typically see pig damage to cane blocks early in the season made observations that pig-activity had reduced considerably since the project's completion and that some of the high risk blocks (historically prone to pig attack) on their farms had increased production from an average of 60 t cane/ha to 80 t cane/ha.

The secondary benefits of this work can be measured in better subsequent ratoons, reduced spread of weeds and the reduction of erosion along creek banks and fallow paddocks that are often disturbed by pigs. Also the ability for landholders to continue to perform their normal farming activities in a timely manner (such a irrigating and weed control) while the control work was managed by the contractor was a bonus.

There were no major issues raised by the BLG members or the contractor. Each party abided by the rules stipulated in the contract. Communication between members was structured, clear and forthright.

Suggestions for future improvements in the program, as raised by the BLG members were:

- The project probably started a month too soon as pig activity in cane was low in November because there was still an abundance of water and food resources spread around locally. Better timing and monitoring of activity in the lead up to commencement of any work will help.
- Changing the BLG payments systems from an equal share of costs to a \$/ha amount could make it more fair (larger properties contribute a greater share).
- Growers feel confident enough to buy/setup their own cameras, do the monitoring, surveillance and baiting themselves given learnings from the project.

The BLG members are happy to continue to put money towards this group management scheme going into the 2016/17 season. The lessons learnt and results achieved, through baiting in particular, has demonstrated to them that this coordinated effort is the only way to go.

Contractor Performance:

The contractor, Steve Andrews from CQ Feral, was held in high regard by the BLG members following the completion of the project and they are happy to continue working with him privately in the future. They commented that he always acted in a professional and safe manner. He communicated well with growers by contacting them before and after performing work on their property. He was observed to be putting in extra hours and effort beyond the contract agreement at free of charge.

In future the contract needs to include restrictions on talking to the media or other landholders about the project without first seeking group approval.

Conclusions:

This project investigated four different methods of best management pig control via trapping, Judas pig technique, baiting and shooting. Each method has their own advantages and disadvantages but can complement each other when used in an integrated fashion.

An effective strategy depended largely on sticking to a pre-agreed group plan, sound timing of activities, cognisance of environmental conditions, good surveillance and intelligence on pig activity and consistent clear communication between the landholders and the contractor. This lead up work set the foundations for the feral pig population to settle and become accustomed to the area, traps and baiting sites.

The projects ability to get growers working together and communicating with one another was a pivotal factor in its overall success.

By having one licenced contractor implement a range of control techniques across a large area, showed the landholders the benefits over their historic individual methods which often worked against each other chasing the pigs from one farm to the next and back again.

By engaging a contractor to manage feral pig control, each grower had more time to focus on managing other important farm tasks.

Going forward, the BLG members are looking to expand their control area by encouraging more landholders to participate in their group work.

Recommendations:

1. Early surveillance (October/November) should be done to monitor pig activity prior to implementation of control techniques. Food and water supplies must be shrinking in availability to concentrate the pigs.
2. Focus on baiting controls in the future and perhaps target the difficult to reach terrain and forestry areas simultaneously.
3. Use traps to capture suitable pigs for GPS collar tracking (Judus pig method) to help monitor their movements and potentially target known refuge sites more efficiently.
4. Extend project findings to Mackay landholders and facilitate Feral Pig Management Group formation. This will set the foundations for a greater network of feral pig control on a district and regional scale.

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References:

Di Bella L, Fuller S, Stallan R, Buchman M, Bacchiella D. 2013, The Impact and Management of Feral Pigs in the Herbert Cane Growing Region of North Queensland, Herbert Cane Productivity Service Limited, Ingham.

Mitchell, J 2011, Trapping of Feral Pigs, NQ Dry Tropics, Townsville.

Mitchell, J 2011, Shooting/Hunting of Feral Pigs, NQ Dry Tropics, Townsville.

Sharp, T 2012, Standard Operating Procedures PIG004: Use of Judas Pigs, Invasive Animals CRC.

Sharp, T 2012, Standard Operating Procedures PIG005: Poisoning of feral pigs with sodium fluoroacetate (1080), Invasive Animals CRC.

Appendix 1- MAP 1: BLG Project area with Trap and Baiting Site Locations

