

Screw worm fly trapping project

INTRODUCTION:

The Australian Department of Agriculture, Water and the Environment are attempting to test the efficacy of nonspecific insectocutor (zapper) traps for attracting screwworm fly, compared with a more specific modified Lucitrap, in a paired study (ie two of each trap).

Screwworm flies are more active in warm wet conditions and are attracted to wounded animals, so ideal trapping time will be during monsoon season and during/after calf marking, ideally in a location where there are no residual controls or deterrents (ie no other traps or treated animals).

Definitions used in this document

Term	Definition
Bezzilure A & B	Refers to the chemical attractant (the lure) used in the SWF traps. It is a two-bottle formulation (Bezzilure A and Bezzilure B) which needs to be replaced every 1-2 months or as needed.
Insectocutor	Also known as 'bug zapper' – non-specific electrical discharge traps generally used to control flying insects. Uses 240V power.
Killmaster pest	A non-persistent organophosphorous pesticide of low toxicity to humans. It is effective at controlling insects at all of the life stages (e.g. egg, larva, pupa and adult).
Lucitrap (LTM)	A specifically designed trap which uses a blend of chemicals as lures (Bezzilure) to attract and capture flies. The original Lucitrap was designed to capture sheep blowflies but has been modified to catch the larger SWF.
Myiasis	Refers to infestation of the body by the larvae of flies (usually through a wound or other opening) or any disease resulting from such infestation.
Screwworm Fly (SWF)	A large parasitic blowfly that preys on warm-blooded animals including people and birds. There are two species of SWF – Old World SWF (<i>Chrysomya bezziana</i>) is found throughout tropical SE Asia (including PNG), Middle East and Africa; New World SWF (<i>Cochliomyia homnivorax</i>) is currently only found in Central and tropical South America. Australia is currently free from both species of SWF.

THE PROJECT:

A total of four traps (2x insectocutors, 2x Lucitraps) will be placed at set locations with accessibility and practicality to be determined in consultation with on ground Ramu Beef staff. Note that the insectocutors (zappers) will need either 240V mains electricity or generator/battery power at each site.

Traps will be set continuously and cleared every 1-2 weeks, initially from December 2021 (or as soon as all equipment arrives) until May 2022, depending on volume of flies and extent of rain.

Trap locations will need to be swapped at each clearance, to account for site variation.

When traps are cleared, contents will be tipped into separate containers provided, labelled and dried out in a cool room or freezer and posted to Townsville each month for identification.

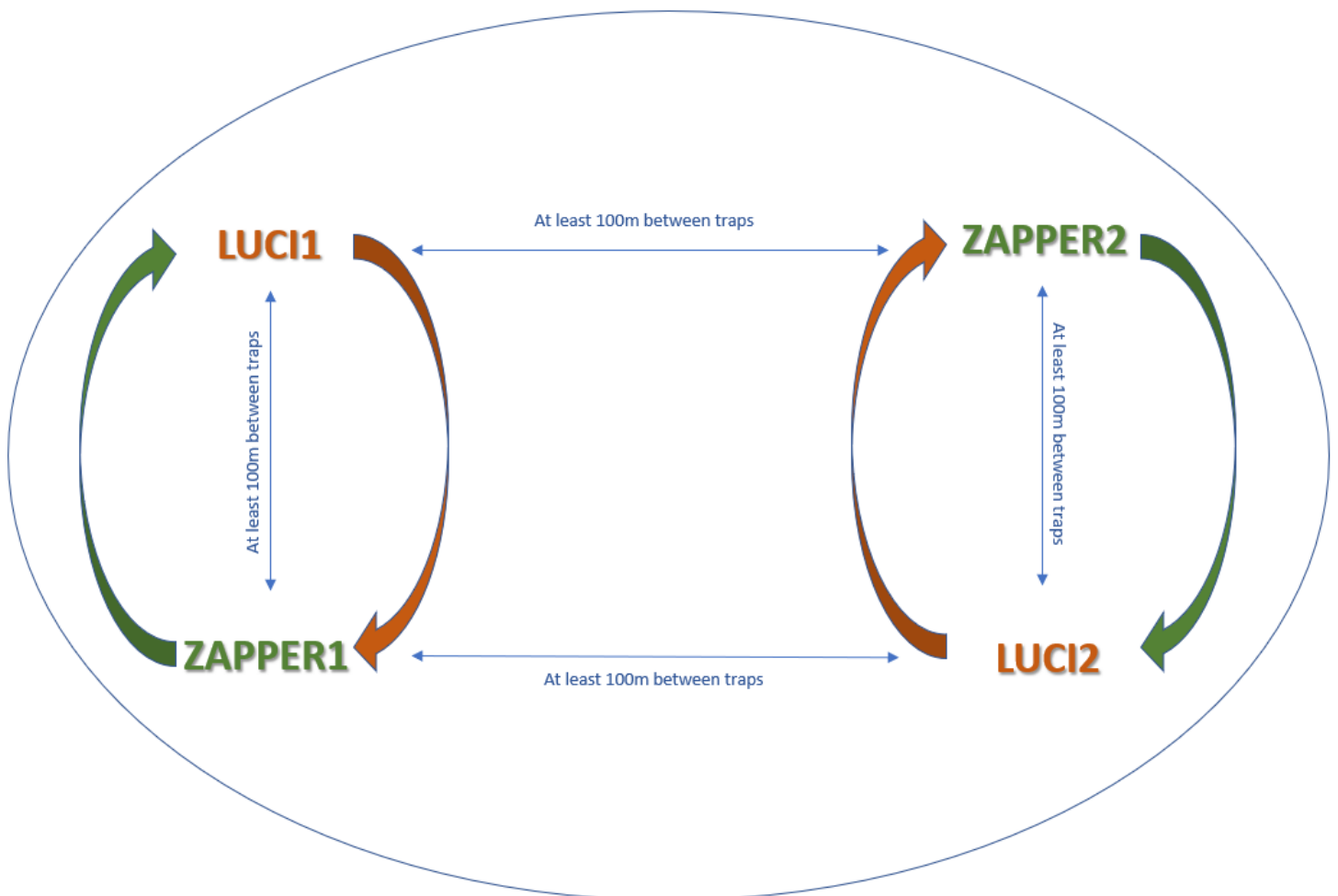


Figure 1 trap location and rotations within paddock or property boundaries

Trap Location

Good trapping sites include characteristics such as presence of hosts (ie cattle), transitional vegetation, creek lines, animal watering points and camps, and away from any residual chemical insecticides.



Paddock 25 – suitable vegetation for SWF habitat and large enough to set traps at each end

Trap sites should avoid dense vegetation and rubbish tips, and must be accessible in all weather conditions (ie not across a flooded creek)

Where possible, trap site temperatures should not be extreme (preferably within 20° - 30°C) and the traps should not be situated in direct sunlight.

The area should be protected from strong wind and exposure to heavy rain. A small shelter may need to be built to protect the trap and contents from heavy rain.

Suspend traps from posts or star pickets at a height of 1-1.5m from the ground. The roof of the trap should be 150-200mm above the trap (not less than 150mm).

Traps should be at least 100m apart (from other Lucitraps, and also insectocutor zappers)

Record GPS co-ordinates of each trap.

At least one trap pair (eg Luci1 & Zapper1) should be in SWF/habitat vegetation (such as paddock 25 in pic below) but the other trap pair (Luci2 & Zapper2) can be in the working parts (pens/crush area) of the feedlot if logistics & extreme weather doesn't permit all traps in paddocks.

Paddock 25 – suitable
vegetation for SWF
habitat and large enough
to set traps at each end



The Equipment

LUCITRAP

The Lucitrap consists of four parts:

- a) a modified lucitrap (LTM) as pictured
- b) the attractant lure which is called Bezzilure2 and has two parts A and B.



The Bezzilure-2 liquids A&B are both corrosive, and Bezzilure-2B is also flammable.

Whilst they require careful handling with appropriate PPE and good ventilation, they have no specific disposal requirements but must be inaccessible to scavenging animals, or for contact or ingestion by humans – deep burial away from water sources is recommended.

Material Safety Data Sheets for Bezzilure 2 A & B have been provided.

Unused bottles of attractant should be stored in a tightly sealed container in a cool place.

- c) an insecticide strip – one piece (approx 15x15 mm) of a pest strip releasing small amounts of dichlorvos insecticide is used to avoid flies escaping and to ensure that most flies are dead when they are collected from trap. No other insecticides should be used as many are repellent to flies.

Preparation of strips:

- remove one Killmaster Zero Pest Strip (186g/kg dichlorvos)
- wear gloves & cut the pest strip is cut into 16 or 18 pieces (15mm x 15mm) using a knife or scissors
- store pieces in a tightly closed container until used in the field.
- one piece is placed into each LuciTrap and can be used for up to one month.
- suspend the strip with a clip or wire inside the tub so it doesn't touch the bottom and get covered by dead flies or moisture.



- d) a roof to keep rain out of the trap. (might need to be bigger & more robust if heavy rain expected)



Lure preparation and setting the Lucitrap

Ensure that the bucket is clean and dry prior to placement. Wearing gloves, use warm water and detergent if needed to clean the bucket and then dry it before use.

Ensure adequate ventilation when handling lure attractant bottles.

Wear two layers of disposable chemical resistant (nitrile) gloves, and protective clothing when handling attractant bottles. If gloves do contact liquid lure – remove affected glove/s and replace with fresh glove/s.

Using tweezers pull the wick of the **Bezzilure-2B bottle** up approximately 10mm above the top of the bottle. When pulling the wick up, gently lever on the side of the bottle to prevent pulling the wick insert out of the bottle. Bezzilure-2A wick can stay just at top of bottle.

Screw each Bezzilure-2 bottle into the bottle holders on the underside of the trap lid.

Place new insecticide strip in bucket. The strips can be placed in between the neck of the lure bottle and the plastic strap of the trap or hung on the strap using wire. The strip shouldn't be placed on the bottom of the bucket.

Attach the bucket by aligning all 4 lugs on the top of the bucket with the slots in the yellow top, and then twisting to secure.

The post that the trap is mounted to should be "ant proofed" with a substance such as grease or Vaseline. This should be applied around the post under where the trap is mounted.

INSECTOCUTOR (BUG ZAPPER)

This is a non-specific trap in that it will attract a wide range of insects, including flies, moths, beetles, mosquitoes etc, but not specifically targeting flies, hence we are questioning whether or not it is effective enough for Australia's SWF surveillance.

In this example, the insectocutor has been hung in the crush/race area where there are no other residual insecticides, and hundreds of cattle in adjacent pens. You'll see there is no surrounding vegetation, which is less important in Australia because we don't have SWF, however at least one of the insectocutor sites at Ramu Beef should be close to vegetation, which is ideal adult SWF habitat.

The insectocutor requires a 240V power source, which may be on mains power in cattle working areas, or will need a generator or battery/invertor setup for the paddock location.

It will also need to be sheltered from rain – both to protect power source and so the zapped flies don't get wet.



Emptying the traps

- Traps are to be set continuously except in extreme monsoonal rain, and swapped locations at each clearance. Set in one location for a period of 7-10 days, then swap Lucitrap & Zapper positions to account for site variation.

To empty the Lucitrap:

- Wear gloves
- Remove bucket and place flies into individual bioboxes. Boxes should not be overfilled as this may cause damage to flies making identification difficult. Use multiple boxes for the one trap if required. Place 1-2 dessicant sachets in each box.
- Label the boxes clearly with trap location and date e.g. if three containers were used to collect the contents of LuciTrap1 by the creek then label them:
 - “LuciTrap 1 creek (1 of 3) 10/1/22”
 - “LuciTrap 1 creek (2 of 3) 10/1/22”
 - “LuciTrap 1 creek (3 of 3) 10/1/22”.
- Boxes of flies should then be stored in a fridge or freezer until postage to preserve the insects in good condition for identification.
- The amount of Bezzilure2 B lure should be measured at the end of the trapping period and a mark placed on the bottle to indicate liquid level as well as the date and number of times used. There should be about 10ml reduction in lure over a 10 day trapping period. If there is less than 1/3 of the lure remaining in the bottle it should be replaced with a new bottle for the next trapping period.
- When moving the Lucitrap, or if trapping is ceased due to inclement weather, make sure that the lid is replaced tightly on the lure bottles to prevent evaporation between trapping periods. The wick in Bezzilure2 B should be gently pushed back down to ensure that the lid is tightly fitted. Place the used pest strip into a container (separate to the unused strips) and ensure that it is sealed properly. The strip should be used for no more than a month before being replaced.

To empty the Zapper

- Disconnect from power source
- Carefully remove one tray at a time and tip contents into ziplock bag to avoid spilling any (shelter if windy), then transfer into appropriate number of biobox/es, labelling as above for Lucitraps. Place 1-2 dessicant sachets in each box.
- Move Zapper to where the Lucitrap was, and place Lucitrap where Zapper was until next clearance.
- Reconnect Zapper to power.

Fill in the form ‘SWF trap record form’ at Appendix 1.

Please email a copy to cassandra.wittwer@awe.gov.au and post the original with the flies.

If any problems are identified with the traps or more equipment is required, contact cassandra.wittwer@awe.gov.au or phone Cass on **+61 417 094 633**

Submission of flies for identification

Packaged containers of flies with record sheets are sent by air each month to:

Bill Doherty
47 Mayneside Cct
Annandale, Qld 4814
AUSTRALIA

Please advise Cass by email cassandra.wittwer@awe.gov.au each time a consignment is sent.

Work health and safety

A copy of the safety data sheets for Bezzilures and the insecticide strip have been included with this equipment. Staff handling these chemicals need to familiarise themselves with these documents.

PPE as described in this document must be worn by whenever these chemicals are being handled.

Chemicals not in use are to be secured in the chemical storage facilities at each location.

Essential equipment

For setting the LuciTrap

- star pickets and cable ties
- trap lid (yellow) and bucket
- trap roof (black) and orange stabilizer pole
- disposable gloves
- Bezzilure2 A and B (one vial of each)
- forceps/pliers
- insecticide strip on wire/clip
- petroleum jelly to prevent ant access

For setting the Zapper trap

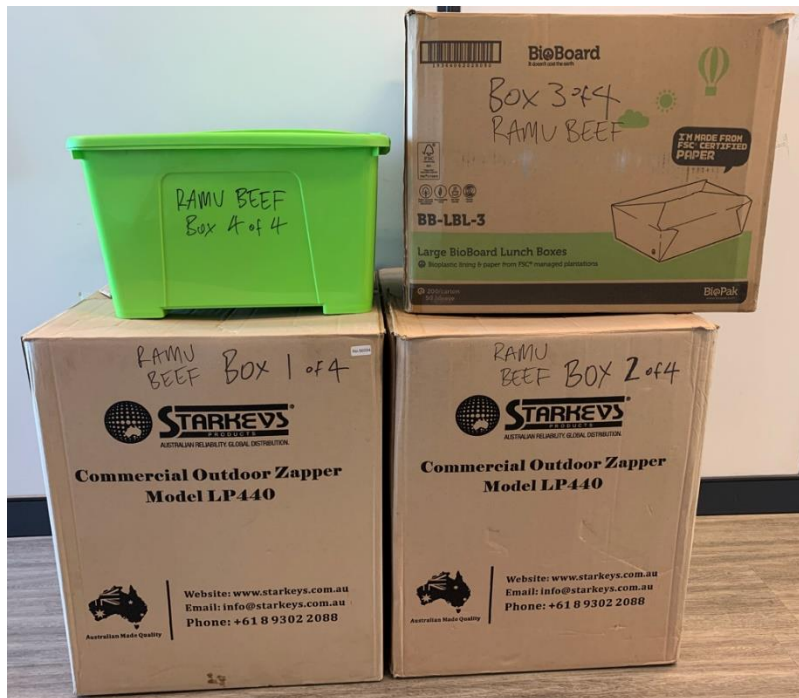
- star picket/wooden post to hang trap
- power source (generator, 240V power)
- extension cord
- any weather proofing required

For emptying and swapping both traps

- lids for lure bottles
- container/bag to seal insecticide strip
- disposable gloves
- marker pen to label containers & lure level
- plastic bags/bioboxes to collect flies
- dessicant sachets
- SWF trap record form.

WHAT'S IN THE BOXES:

1. GENERAL FREIGHT



Box 1:

Zapper 1
Support frame & screws for Zapper1
(may not need depending on where/how will set up)

Lucitrap1 roof

Box 2:

Zapper 2
Support frame & screws for Zapper2
(may not need depending on where/how will set up)

Lucitrap2 roof



Box 3:

200 x Bioboxes for storing/transporting trap sample contents.



Box 4:

1. Lucitrap yellow lids
2. Lucitrap x2 buckets
3. Lucitrap roof supports (fits between black roof and yellow lid)
4. Lucitrap support planks (bolt yellow lids on, screw black roof on top, strap to star pickets)
5. Paperclips and bulldog clips to hang pest strip in Lucitrap (use whichever works best)
6. Straps to hold Lucitraps to posts or hang insectocutors up
7. Gloves for handling pest strips and Bezzilure
8. Dessicant sachets to put in sample bioboxes
9. Paper towel (extra absorbent in bioboxes if flies not dried out)
10. Ziplock bags (for small trap samples or if too windy to tip into boxes)
11. Tape to close bioboxes
12. Marker pens
13. Trap reporting forms



2. DG FREIGHT

DG Bucket 1:
Bezzilure-2A

DG Bucket 2:
Bezzilure-2B

Non-DG Box:
2x Killmaster pest strips
3x tubs white petroleum jelly



Only one bucket shown here but will be two DG buckets and one box