



The

OPRAtive Word

Technical Note 9

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Control of Insect Pests in Oil Palm; trunk injection procedures

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INTRODUCTION

To control the insect pests of oil palm, the technique of trunk drilling and insecticide injection is the standard used by the oil palm industry and smallholder growers in PNG.

For effective control by trunk injection, these procedures should be followed, as the insecticides used are unpleasant and potentially dangerous if used incorrectly.

PNGOPRA is charged by the Department of Environment and Conservation in PNG (DEC) to ensure that insecticides are only used as advised by PNGOPRA, and are within the requirements of ISO 14001. This requirement, Health & Safety and environmental considerations are of equal importance, and must be strictly followed.



Figure 1: trunk drilling

INSECTICIDES

The current recommendation applies only for Methamidophos (OPRAive Word Technical Note Number 3). An alternative insecticide, Monocrotophos (*Azodrin*) is only permitted for use if there are old (but not expired) stocks remaining unused. Specific authority must be obtained from PNGOPRA before this insecticide is used.

TRUNK DRILLING REQUIREMENTS

1. For the control primarily of sexava and stick insects. In PNG, trunk injection for controlling insect pests requires the close collaboration of three team members (*driller, injector and plug man*). Teams are supervised by Boss Boys/ Supervisors.

Control teams must be properly equipped with the correct equipment and protective clothing.

Appendix 1 shows a schematic view of the items required before teams move into the field to begin trunk injection. This list should be the responsibility of the store man. Without these items being issued, control teams should not begin trunk injection.

Operational safety (Column 1).

1. Teams should be equipped with at least two sets of overalls, so that one set can be washed while the other is in use. Overalls should be washed every evening, and ONLY be used for treatment work. A good colour which is readily seen is Orange. Overalls should properly fit the operators, as they will not be used if too large or too small.
2. A long butcher's PVC apron is required by each team. This will be used by the operator decanting the insecticide from the main container.
3. Rubber boots (*or safety boots for the driller*) of correct sizes are required for each team member.
4. Forearm-length heavy PVC RED gloves and the GREEN Nitrile gloves should also fit the individuals expected to use them. The PVC gloves are used during insecticide decanting, while the Nitrile gloves are used by the injector person.
5. A single-filter mouth and nose mask with organic vapour (*NOT dust*) filter will be required for each team, to be used by the decanting person and the injector (*in case of splash-back*)
6. Protective glasses or a full face mask are required for the trunk injector and the trunk driller.
7. Ear defenders are essential for the trunk driller, and should be worn at all times when the drill is working.

Drilling the holes (Column 2).

The instruction manual and most tools are not required in the field. A basic tool kit should be available in the field in case repair work or adjustment is required.

As the fuel tanks of the drills (*Stihl and Tanaka*) are small, use only a funnel with a small mouth when adding fuel, (*otherwise tanks are rapidly overfilled and fuel spill*).

A selection of rags (*cloth*) must be available for cleaning the equipment and the operator's hands.

Insecticide trunk treatment (Column 3).

Only an insecticide approved for use by PNGOPRA may be used for the control of insect pests by trunk drilling.

As the insecticide is packaged in a drum of either metal or plastic, a funnel with a wide mouth will be required to decant the insecticide into the drench-gun containers. Using a smaller funnel will inevitably result in the spillage of the insecticide; THIS IS A HAZARD.

A "drench-type" of injector which has been correctly calibrated is used for injecting the insecticide into the palm (*e.g. Henke-Sass Wolf Drench-Matic*).

All joints on the drench-gun must be regularly checked and kept tight. The joint at the nozzle is especially prone to leakage and must be checked daily. Thorough cleaning of the injectors after use is very important.

Old cloths (*rags*) should also be available to keep the pipette clean during the injection process.

Hole plugging (Column 4).

Holes should be plugged with wooden plugs. PNGOPRA recommends the use of hardwood square plugs. Examples have been seen where pointed plugs are used, these typically penetrate too deep into the palm. The use of palm fruits to plug the drill hole is not recommended, as on their breakdown, a hole is left in the palm which may encourage the invasion of borer insects and possibly bacteria or fungi. Rats have been observed removing the fruits which have been used as plugs.

TRUNK TREATMENT PROCESS

Each member of the three man team should be capable of undertaking any of the three tasks on a rotational basis as required. *Protective clothing is to be worn by all members of the treatment teams.*

Decanting the insecticide

This requires two persons. One (1) who will tilt the drum of insecticide into the funnel during the decanting process into a smaller (usually plastic) container, held by the second assistant (2) attached to the drench-gun. A small hand-pump would be a better option than the funnel, but is

not as durable.

One operator should wear a PVC butcher's apron and long PVC (*red*) gloves, also glasses or face mask. He should also wear a respirator.

The other should wear a respirator, glasses and Nitrile (*green*) gloves. His responsibility will be to steady the smaller recipient container and hold the decanting funnel or hand-pump.

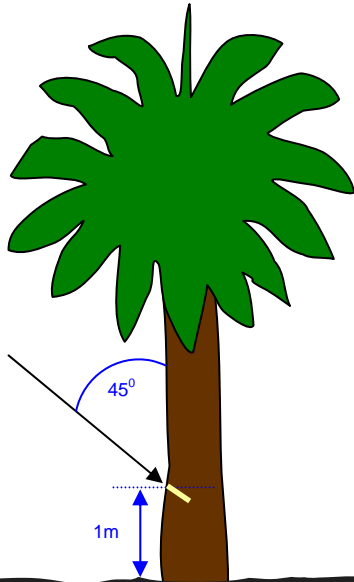


Figure 2; choosing angle & height for drilling

Drilling

1. Filling the drill with fuel.

Use **only** the recommended mix of petrol and oil. If too much oil is used, the drill may not start correctly, and it will smoke heavily during use, while if too little oil is used, the engine will become too hot and may well seize up. A suggested mixture is 1:25 (*oil/petrol*). Use the small mouth funnel and filter to add fuel. Remember to shake the container to thoroughly mix the oil/fuel mix before filling the drill fuel tank. When preparing the mixture, always add the petrol to the oil to ensure it is well mixed.

Clean around the fuel inlet to keep grit/soil away, and wipe the whole machine thoroughly after it has been filled to remove excess oil. Tanks will probably hold about 300 ml only.

2 Starting and carrying the drill.

This will vary to some extent between different drill types; however, it is important to remember to keep the drill bit wedged into the base of a tree before starting. This reduces the chance of an accident during starting, when the drill may spin loose if not wedged in this manner.

When carrying the drill, ensure that the sharp drill bit is always kept pointing towards the ground and pointing away from the person carrying it. The drill must be carried with **both** hands all the time.

3. Drilling the hole in the palm trunk.

Before beginning the trunk drilling, the Boss Boy/ Supervisor will decide on which side of the palm the hole should be drilled. This will make the job of checking the work much easier.

Identify a gap in the frond bases at about 1m (*at*

about waist height) above ground, and angle the drill bit at 45°. Imagine a right angle with the tree as the vertical and the ground as the horizontal, and then take a line through the middle (See *Figure 2*). When drilling move the drill in and out and do NOT push hard straight into the trunk as the drill bit is likely to jam. The clutch may be damaged if it is forced.

The hole should be approximately 15cm deep and ca. 1.2cm wide. It is recommended that the High Speed Steel (*HSS*) metal drill bits (*as supplied by OPIC*), are used, as they are able to drill many more trees before requiring sharpening than the wood augur drill bits.

The drill operator must wear ear defenders and protective glasses or face mask, to avoid any danger of the drill bit breaking or wood chips flying into the unprotected eyes.

The trunk driller should never be more than one palm ahead of the injector, who should retain the same separation from the hole plug man. If the team becomes separated, then often palms are missed from one or more of the procedures.

Injecting the insecticide

This individual must wear Nitrile (green) gloves and have either a full face visor or protective glasses.

Once the hole has been drilled, and the driller has moved on, the injector rapidly injects the correct (*pre-calibrated*) amount of insecticide into the hole in the trunk (*currently 10ml*). The tip of the gun is then wiped clean. Having injected a number of palms, the injector should check the volume of insecticide being injected is still correct.

The plug man should wear green Nitrile gloves and either a full face visor or protective glasses.



Figure 3; injecting the insecticide

The plug man carries with him a supply of wooden plugs which are square ended at about 2.0cm and about 12cm long. He should carry a wooden mallet.

Once the injector has moved on, the plug man will insert the wooden plug into the hole mouth and, standing to one side of the hole (*to avoid possible splash out from the hole*) will hold the plug



Figure 4; plugging the injection hole

from below firmly tap it into place. He should hold the plug from beneath (*Fig.3*) to reduce the chance of the mallet hitting his hand.

PNGOPRA recommends the use of square plugs because they:

- fit tightly into the hole,
- do not penetrate too far into the hole,
- are more easily seen when checking
- are more durable than natural sticks of wood and oil palm fruits,
- are less likely to fall out leaving a hole which may permit contamination by micro organisms or wood-boring insects.

Completing the work

Once the work has been completed for the day, all equipment should be thoroughly cleaned and checked. Overalls must be washed before the next use. Team members must have a thorough wash and when clean drink plenty of fresh water.

HEALTH and SAFETY

Team members should report to their Supervisor before starting work if they are feeling unwell (*e.g. colds or malaria*), and should not join in operations until they have fully recovered and be medically cleared. At the end of the day, any member feeling unwell must report any sickness or accidents to a senior individual who will be expected to complete an accident report form. Monthly monitoring of Acetyl-cholinesterase levels should be undertaken at the clinic, and levels recorded against those of an un-exposed group. A first aid kit should be taken into the field during treatment work, with advice from a qualified medical practitioner.

ALWAYS REMEMBER, INSECTICIDES ARE DANGEROUS!

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Appendix 1 - Oil Palm Trunk Injection CHECK LIST

