

Soil Fumigation Notes

Why fumigate ?

Soil fumigation is used to kill soil borne diseases and pests when they have reached potentially damaging levels for the next crop to be planted.

Target organisms for fumigating pesticides include fungal diseases like pythium, fusarium and rhizoctonia that cause damping of in seedlings and can severely affect or kill older plants under favourable conditions. Fumigation is also used to control root knot nematodes, a very common reason for fumigant applications in greenhouses.

Fumigants can be effective in killing Western Flower thrips pupae resting in the soil if thrips numbers and Tomato Spotted Wilt Virus levels were high late in the previous crop. This is important to protect new seedlings from early and devastating attack by thrips and virus.

Is fumigation needed between every crop ?

It should not be necessary to fumigate soils every year unless the pests are resistant to the chemical is not being applied properly. These issues must be ruled out or dealt with if treatments are giving poor results.

Fumigating too often also kills beneficial soil biology leading to other problems with reduced nutrient availability and even degrading soil structure.

Expert fumigation is expensive and total eradication of pests and diseases is not really possible. There will always be a low level of pests and diseases in most soils. Phuong's judgement is that he can successfully grow another crop if there are no obvious patches of disease or nematodes, or severe thrips problems with the last crop.

Methods of fumigating

- *Drip line; partial control only – resistance risk*
- *Injection as a gas; good if well done – use covering*
- *Injection as a liquid; good if well done – use covering for best results (see [‘Fumigating with plastic cover’ \(video\)](#))*

What factors are important in achieving a good result ?

1) A chemical to which the target pests/diseases are not resistant

This is the number one priority. The effectiveness of a chemical can only be judged if it is expertly applied. If you have complete confidence in the application but results are poor you need to identify another appropriate and legal chemical or consider adopting more IPM strategies to reduce pest levels including bio-fumigant cover crops, compost etc.

Even penetration across the growing area to required depth

- *Soil structure; Even cultivation (not overdone)*
- *Soil moisture: Correct moisture balance; some moisture needed to release the chemical, but does not clod in closed hand – better with compost. Less moisture in heavy soil before it clods*

- *Preparation of the soil*
- *Injection equipment and operator*

Temperature

Let plants dry out before chopping – dig in 3 months later ?

Temperature; consistently over 15 degrees = spring – autumn

Retention in the soil using a plastic cover

Lay plastic straight away – 100% cover

Leave 1-3 weeks – longer better

Plastic off for 10-14 days before planting; Test with a shovel – should not be able to smell the chemical

Legal Compliance

(South Australia only)

Who can use these chemicals ?

It is important to know about compliance regulations and available chemicals.

As a guide only the following information was obtained from:

Controlled Substances Licensing

Public Health

SA Health

Government of South Australia

General advice regarding the possession and use of pesticides and fumigants in South Australia (current at March 2013)

In summary:

- the possession of more than 7 litres chloropicrin or a compound containing more than 5% chloropicrin requires a licence
- to undertake pest control work (for fee or reward on another's property) the appropriately endorsed 'Pesticide Licences' must be held
- a person must be accredited to purchase (and use) S7 poisons not included in Regulation 25 on their own property.

For any person using scheduled pesticides i.e. schedule 5, 6 and 7 (S5, S6, S7), in any situation, Biosecurity SA's 'Control of Use' legislation applies. For further information on control of use legislation, please contact:

David Stephenson
Senior Rural Chemicals Compliance Officer
Biosecurity SA - Plant and Food Standards
33 Flemington Street
Glenside SA 5065
Phone: (08) 8207 7985
Phone (Chemical Trespass): 1300 799 684
Mobile: 0401 126 159
Email: david.stephenson@sa.gov.au

There are no training or licensing requirements with regard to purchasing and using S5, or S6 pesticides (e.g. Metham, 423g/L metham present as the sodium salt) on your own property.

If a farmer/landowner wishes to purchase a S7 poison for use on their own property only they must hold a current pesticide safety accreditation (e.g. ChemCert), or, in the case of S7 poisons listed in Regulation 25 of the Controlled Substances (Poisons) Regulations 2011 (Reg 25 below), a licence to possess under section 22 of the Controlled Substances Act 1984 (see Regulation 25 notes below) is required.

Examples of S7 soil fumigants that are listed under Reg 25 are:

- Telone C-35 (615 g/kg 1,3-dichloropropene, 345 g/kg chloropicrin)
- Telone C-60 (595 g/kg chloropicrin, 380 g/kg 1,3-dichloropropene)
- Methyl bromide (NB: people wishing to use methyl bromide need a ...

Critical Use Exemption from the APVMA is required and we would need to see this before issuing a section 22 licence or listing it on Pest Controller's and Pest Management Technician's licences)

- If a person wishes to apply any S5, S6 or S7 pesticide for fee or reward (i.e. For money or in exchange for goods or services) outside their own property they must hold a Pest Controller's licence (the business licence) and either be, or employ, the holder of a Full Pest Management Technician's licence endorsed to undertake soil fumigation (brochure attached) using specified fumigants. This means they can treat their own properties and contract out to others, and are also not required to hold a section 22 licence (or be accredited).
- To obtain a section 22 licence we that they have undertaken appropriate training. TAFE SA deliver the PRMPM11:Conduct Fumigation course, and farmers would only need to be assessed for

soil fumigation. This is the same course that would be required to obtain a Pest Controller's and a Pest Management Technician's licence endorsed for 'Fumigation Pest Control (soil)'.

TAFE SA contact:

Pest and Weed Unit, Urrbrae 8372 6800

Peter Keller, 8372 6842

For all licensing matters, contact SA Health, Controlled Substances Licensing on:

8226 7100

controlled.substances@health.sa.gov.au

For more specific enquiries, please call the relevant organisation (ie Controlled Substances Licensing, Biosecurity SA or TAFE SA).

Regulation 25 - Possession of poisons (section 22 of Act)

(1) Section 22 of the Act applies to the following poisons:

- Acrolein
- Arsenic as an S7 poison
- Chloropicrin
- Cyanides as S7 poisons
- Cyanogen
- DDT
- Fluoroacetamide
- Fluoroacetic acid
- Hydrocyanic acid as an S7 poison
- Methyl bromide
- Mirex
- Sodium fluoroacetate
- Strychnine as an S7 poison
- Thallium.

(2) A person is exempt from section 22 of the Act in respect of possession of chloropicrin if—

- (a) in the case of pure chloropicrin, the quantity in the person's possession does not exceed 7 litres; or
- (b) in the case of chloropicrin in a compound preparation, the concentration of chloropicrin does not exceed 5%.

(6) The Minister may exempt a person who is licensed under the Controlled Substances(Pesticides) Regulations 2003 from the requirement to hold a licence under section 22 of the Act in respect of the use of a pesticide that is a section 22 poison.

Section 22—Possession

(1) A person must not have in his or her possession a poison to which this section applies unless licensed to do so by the Minister.

Maximum penalty: \$10 000.

Relevant licence application forms are available. It is always recommend that people contact us before paying and sending an application for licence such as:

- Application for a Pest Controller
- Application for Pest Management Technician’s Licence
- Application for a licence to poses regulation 25 Poisons
- Brochure for TAFE Fumigation Pest Control course

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