

# Spraying locusts with Green Guard®

Mark Scott & Robyn Neeson (with assistance from David Hunter – BeckerUnderwood)

Handout prepared for locust campaign 2010-2011

## What is Green Guard®?

Although a registered pesticide, Green Guard® is not a conventional insecticide. Green Guard® is a biological insecticide, based on the naturally occurring fungus metarhizium. Green Guard® does not have a knockdown or immediate effect, like most conventional insecticides used for locust control. Locusts sprayed with Green Guard® take 8-12 days to die during summer and 12-15 days to die under mild spring temperatures. Green Guard® is most effective when used as a preventive spray, targeting nymphs.

For further information on locust behaviour, the need for early detection and action, and spray timing see the plague locust section on the I&I NSW website at:

[www.agriculture.nsw.gov.au/locusts](http://www.agriculture.nsw.gov.au/locusts)

## What formulations are available?

Green Guard® is available in three formulations.

1. The SC (suspension concentrate) is designed for ground based application equipment. The pack contains a container of emulsifiable oil, the fungal spores and a surfactant solution. The spores and surfactant are first mixed, then the oil is added. The resultant suspension is then diluted in water for spraying.
2. Green Guard® Premium is also a suspension concentrate but comes as a premix, with the spores already in a vegetable oil carrier. Instead of mixing the different components, all that is required is to shake the pack well before diluting with water.
3. The ULV (ultra low volume) formulation is mainly designed to be applied by air, in a mix with petroleum oil. However, it can be applied by mister (see below).

## How do I get Green Guard®?

In NSW, growers can obtain Green Guard® through their local Livestock Health and Pest Authority (LHPA) or directly from their local reseller. The responsibility to control locusts rests with the grower. Growers who do not own their own application equipment may be able to borrow

dedicated application equipment through their LHPA, depending upon availability. Due to likely strong demand, application equipment may not always be available. If growers do not have their own equipment, they will have to hire a contractor at their own expense.

In the table below is a list of LHPA offices and telephone numbers.

## LHPA contact details

Office	Phone number
Balranald	03 5020 1691
Bathurst	02 6331 1377
Bourke	02 6872 2322
Deniliquin	03 5881 1055
Dubbo	02 6882 2133
Forbes	02 6852 1688
Narrabri	02 6792 2533
Tamworth	02 6762 2900
Wagga Wagga	02 6923 0900

If you cannot make contact with your local LHPA, try the I&I NSW plague locust hotline on 1800 814 047.

## What formulations are acceptable to organic certifiers?

Only Green Guard® Premium and Green Guard® ULV are acceptable during the 2010-2011 season for Australian and USDA NOP certified properties.

The 1 L containers of ULV are available under PER12449 (expiry date 31.3.11), as this is an

especially decanted product made available to I&I NSW to assist organic growers to control locusts.

To bulk up ULV, only a narrow range mineral oil such as Caltex Summer Spray Oil should be used, as specified on the label.

USDA certified organic growers will need to use Caltex Organic Summer Oil with the ULV formulation of Green Guard. This oil can be obtained from the local LHPA and must be used in accordance with the APVMA permit, PER12429 (expiry 30.6.2011).

This information is current at the time of publication. Be sure to check with your organic certifier before spraying. (See contact list in the table at the end of this hand-out.)

### **What if I can't get Green Guard®?**

Organic certification standards contain clauses relating to 'application of prohibited substances to certified areas of land' . . . 'mandated by state authorities'. Locust control falls into this category. If you do have to control locusts with conventional insecticides, the land to which it was applied may be ineligible for recertification for a period, e.g. 12 months, and residue testing may be required. Livestock grazing treated or over-sprayed pastures have to be identified and quarantined for longer withholding periods, e.g. 3 times the usual, or even months, and their produce such as meat may lose certification permanently. Requirements vary depending on what standard applies. Before using a prohibited substance, contact your certifying body. (See contact list in the table at the end of this hand-out.)

### **How 'green' is Green Guard®?**

While a biological, Green Guard® has some side effects. Although it is relatively specific to locusts and grasshoppers, there is some hazard to honey bees in that bees can pick up a great deal of the product when foraging for pollen and nectar. Consequently, Green Guard® should not be applied within 1.5 km of commercial bee hives, and honey bees should be kept out of sprayed areas for 7 days.

Do not contaminate wetlands, water bodies or watercourses. For boom sprays, do not spray within 10 m of any wetland, water body or watercourse downwind. For aerial spraying or spraying with misters, do not spray within 100 m of any wetland, water body or watercourse downwind.

Green Guard® may provoke an irritant or allergic reaction in sensitive people. PPE (personal protective equipment) is specified in the label Safety Directions, and for re-entry into treated crops for 24 hours after application.

### **How should Green Guard® be stored and transported?**

As a biological, Green Guard® is not as robust as conventional insecticides. Containers need to be stored between 2-8°C but not frozen. To be kept within this temperature range, refrigeration is required. Just prior to use, short term storage at room temperature (<30°C) is acceptable. DO NOT transport or store in direct sunlight.

### **How should Green Guard® be applied? SC or Premium SC through a boom spray**

*Nozzles:* Extended range flat fans should be used, e.g. XR TeeJet (XR11002) or XRC Teejet (XRC11002), or equivalent, as these nozzles will produce the fine droplet spectrum required.

*Pressure:* refer to nozzle charts, inputting tractor speed and water application rate.

*Rate:* 75 g spores in 75-225 L water per hectare (SC) or 500 mL in 75-225 L water per hectare (Premium SC).

### **Premium or Premium SC through a mister**

*Nozzles:* TeeJet even flat fans TP6504E.

*Pressure:* 3.5 bar.

*Fan speed:* low.

*Rate:* 75 g spores (SC) or 500 mL (Premium SC) in 10-20 L water per hectare (10 L for average pasture/crop growth, 20 L for tall dense pasture/crop growth).

### **ULV through a mister**

*Nozzles:* TeeJet even flat fans TP6504E.

*Pressure:* 3.5 bar.

*Fan speed:* high.

*Rate:* The ULV should be bulked up with oil to enable the mix to be applied at 2 L per hectare.

For average pasture or crop growth, mix 1 L of ULV with 20 L of Summer Spray Oil. This will treat 20 ha. To treat 1 ha, mix 100 mL (30 g spores) of ULV with 2 L of Summer Spray Oil.

For pasture or crop that is denser or taller, mix 150 mL (45 g spores) of ULV with 1.85 L of oil to treat 1 ha.

For very dense and tall crop or pasture, mix 250 mL (75 g spores) of ULV with 1.75 L of oil to treat 1 ha.

## How do I calibrate a mister to apply ULV Green Guard®?

For help, use the mister manual and calibration video, both of which are on the I&I NSW website, on the plague locust page.

Refer to tables at back of mister manual. These can be used for any brand of mister, provided it is fitted with the correct nozzles.

Flow rates from nozzles can be checked by attaching tubing to the nozzle and measuring the output into a measuring jug over one minute. This should be done with the fan off.

The tables give the application rate in L per ha for TP6504E nozzles, depending on swath width and vehicle speed. The first things to determine are the swath width (which depends on fan speed) and how fast you want to travel in the conditions. The mister manual tells you how to measure swath width under 'Basic Operation'. For ULV, a swath width of 50 m is suitable; for SC reduce to 30 m.

Use the table for your chosen swath width.

Look up the jet number in the left hand column, i.e. 6504. Then look up the flow rate in L/min (3<sup>rd</sup> column from left) for the recommended operating pressure, i.e. 3.5 bar (remembering 1 bar = 100 kPa). The flow rates are per nozzle.

The calibration formula, which is in the manual, is:

$$L/ha = \frac{\text{total spray output (L/min for each nozzle} \times \text{no of nozzles)} \times 600}{\text{speed (km/hr)} \times \text{swath width (m)}}$$

For more than 1 nozzle, obtain the total flow rate by multiplying by the number of nozzles, e.g. 2 x 6504 nozzles at 3.5 bar in a swath width of 50 m and a speed of 20 km/hr will apply 2.05 L/ha. This would be suitable for ULV, as the high fan speed will give a wider swath width.

$$L/ha = \frac{(1.71 \times 2) \times 600}{20 \times 50}$$

For the SC, a narrower swath width will result from running the fan at a low speed, e.g. 30 m. 3 nozzles at 3.5 bar with a 30 m swath width and a speed of 10 km/hr will apply 10.3 L/ha which is suitable for the SC formulations.

$$L/ha = \frac{(1.71 \times 3) \times 600}{10 \times 30}$$

## How do I decontaminate spraying equipment before applying Green Guard®?

- DO NOT decontaminate on organically certified land. Decontaminate on the property where the

last conventional spray occurred, immediately after spraying.

- Wear PPE: cotton overalls, gumboots and PVC or nitrile gloves as a minimum. Check label Safety Directions to see if more is necessary.
- Clean down ALL the exterior of the boom within 30 minutes of finishing the spray application. Use a brush and chlorine solution (see below).
- Drain and flush the tank, boom and lines with clean water for 10 minutes. Activate pressure relief and dump valves.
- Remove and clean separately all filters and nozzles in water with a soft brush such as toothbrush. Do the same for tank lids, caps at the end of spray lines and pressure relief valves. Remove pressure gauges if not isolated by taps and flush lines. Flush external tank sight gauges with clean water.
- Fill the tank with clean water and add the chlorine bleach. For every 100 L water, add 300 mL chlorine bleach (4% solution). Flush the boom, allow to stand for 15 minutes with the solution in the tank continuously agitating, then drain. Do this twice.
- Refill with clean water and repeat the initial flush.

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### Always read the label

Users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this publication. PUB10/145

## Organic certifier contact details

Name & Address	Contact Details
<b>AUS-QUAL Limited (AUSQUAL)</b> PO Box 3403 TINGALPA DC QLD 4173	Phone: 1800 630 890 Fax: 07 3361 9222 Internet: <a href="http://www.ausqual.com.au">www.ausqual.com.au</a> Email : <a href="mailto:organic@ausqual.com.au">organic@ausqual.com.au</a>
<b>Australian Certified Organic</b> PO Box 530 CHERMSIDE QLD 4032 LEVEL 1, 766 Gympie Rd CHERMSIDE QLD 4032	Phone: 07 3350 5706 Fax: 07 3350 5996 Internet: <a href="http://www.aco.net.au">www.aco.net.au</a> Email: <a href="mailto:akiko.nicholls@aco.net.au">akiko.nicholls@aco.net.au</a>
<b>Bio-Dynamic Research Institute</b> PO POWELLTOWN VIC 3797 Mallet Gum Lane POWELLTOWN VIC 3797	Phone: 03 5966 7333 Fax: 03 5966 7433 Internet: <a href="http://www.demeter.org.au">www.demeter.org.au</a>
<b>National Association for Sustainable Agriculture Australia</b> PO Box 768 STIRLING SA 5152	Phone : 08 8370 8455 Fax : 08 8370 8381 Internet : <a href="http://www.nasaa.com.au">www.nasaa.com.au</a> Email : <a href="mailto:technical@nasaa.com.au">technical@nasaa.com.au</a>
<b>Organic Food Chain</b> PO Box 2390 TOOWOOMBA QLD 4350	Phone: 07 4637 2600 Fax: 07 4696 7689 Internet: <a href="http://www.organicfoodchain.com.au">www.organicfoodchain.com.au</a> Email : <a href="mailto:ofc@organicfoodchain.com.au">ofc@organicfoodchain.com.au</a>
<b>Safe Food Production Queensland</b> PO Box 440 SPRING HILL QLD 4004	Phone: 07 3253 9800 OR 1800 300 815 Fax: 07 3253 9810 Internet: <a href="http://www.safefood.qld.gov.au">www.safefood.qld.gov.au</a> Email: <a href="mailto:bwitherspoon@safefood.qld.gov.au">bwitherspoon@safefood.qld.gov.au</a>
<b>Tasmanian Organic-dynamic Producers</b> PO Box 13 CAMPBELL TOWN TAS 7210	Phone: 03 6381 2004 Fax: 03 6381 2008 Internet; <a href="http://www.tasorganicdynamic.com.au">www.tasorganicdynamic.com.au</a> Email : <a href="mailto:tasorganic@bigpond.com">tasorganic@bigpond.com</a>