



This photo was taken by Dubbo Golf Club superintendent Allan Horrocks in 2004 after a plague of locusts descended on the township. A triplex mower was just one novel way of removing part of the problem

Plague proportions

With spring on our doorstep most superintendents will be thinking of renovations and the approaching summer, but as John Neylan reports state authorities are warning all sectors of the agriculture industry, including turf, about the impending threat of locust plagues.

In this job you often receive some intriguing requests. In this instance it was from the horse racing industry regarding the effects of plague locusts (*Chortoicetes terminifera*) on race tracks and race meetings and how to control them.

Earlier in the year in northwest Victoria a race meeting was cancelled due to swarms of locusts upsetting horses and jockeys. In late August the AGCSA received advice from the Victorian Department of Primary Industries specifically for turf and parklands of the impact that plague locusts can have and the responsibility of land holders in relation to this pest. It seemed to be something that we needed to take seriously.

The media has recently carried numerous stories regarding the impending plague of this largely agricultural pest and the economic impact that it would have on the agricultural industries. The serious aspects to be considered from a turf perspective are that they can cause significant turf damage and if they occur on your property they must be reported and subsequently treated. The following information has been taken from the Department of Agriculture, Forestry and Fisheries website (www.daff.gov.au) regarding the national perspective on the plague locust.

AUSTRALIAN PLAGUE LOCUST THREAT

Widespread swarm formation occurred in NSW, northern South Australia, northern Victoria and southwest Queensland during early April after the fledging of the major nymph infestation during

March. There were three generations of population increase over 2009-2010 as a result of widespread heavy rainfall and favourable habitat conditions in inland areas. Despite intensive control of nymphs of the third generation in NSW, eggs laid in autumn will produce a further generation of high density nymphs in the spring.

Inter-agency meetings are continuing to plan and coordinate the response to the anticipated spring populations in NSW, Queensland, South Australia and Victoria. State agencies and industry groups are conducting landholder information meetings in areas likely to be affected. Information to assist landholders prepare for and implement locust control continues to be developed and is being provided through the Australian Plague Locust Commission and state agency websites, industry newsletters and discussions at landholder meetings.

Migration to the south during April brought many swarms into the Murray Valley and northeast regions of South Australia, northwest and north central Victoria and the southern Riverina in NSW. High density autumn egg laying followed immigration into these regions, and also occurred in other regions of NSW and Victoria.

The outlook is for a serious widespread nymph infestation in NSW, northern Victoria and eastern South Australia during spring, with some localised high density hatchings in southwest Queensland also possible. The plague situation, where numerous regions across several member states are affected by high densities of locusts, could continue during spring and summer if there is a high level of nymphal survival in spring.

In NSW, swarms affected the Western, Darling, Central West, Lachlan, Riverina, Hume and Central North Livestock Health and Pest Authority (LHPA) areas during April and May. Hatching of eggs will start in late August in northern areas, during September in the central west, Lachlan and western LHPA areas and from the end of September in the Riverina.

In South Australia, southward migration from the far north region of that state and from western NSW during the first week of April resulted in increased swarm activity in the southern Flinders Ranges area and throughout the Murray Valley region. Swarm activity and sporadic egg laying continued during May and June in some locations. Spring hatchings will commence in mid-September in the Hawker area and from the end of September in the Murray Valley.

Adult locust population levels continued to increase in northern Victoria during April. Migrations

from NSW and within Victoria resulted in egg laying by swarms in the Mallee and Wimmera districts of the northwest and in areas along the Murray River from Swan Hill to Echuca. Swarms were reported in the Bendigo and Shepparton districts of north central Victoria and as far south as Horsham and Maryborough in western Victoria. Spring hatchings will start at the end of September in northwest Victoria, through to mid-October in areas south of Echuca and late October in the Horsham area.

The Department of Agriculture, Forestry and Fisheries website provides a map of the key risk zones for anticipated locust control activity during spring 2010 and a table of forecast development dates as a guide to the expected emergence of nymphs in spring (<http://www.daff.gov.au/animal-plant-health/locusts/current#risk-map>).

The following information has been adapted from the Victorian Department of Primary Industries fact sheet for Turf and Parklands (<http://new.dpi.vic.gov.au>) and provides useful general information on the occurrence and control of plague locusts.

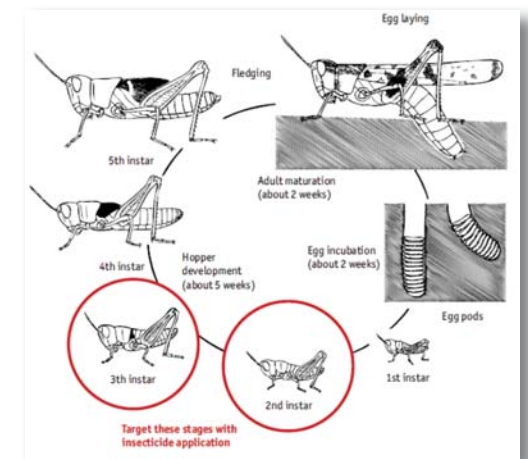
LOCUST EGGS HATCHING IN SPRING

Warm, moist weather conditions are the most favourable for locust egg hatchings. Locusts are hard to spot when they first emerge as young immature locusts (called hoppers). They are only about 3mm long and pale in colour. Newly hatched locusts can cause considerable damage and can consume half their body weight in food per day.

Hoppers, which are wingless and unable to fly, move as a 'band' or group, with up to thousands of hoppers for every square metre of the band. Spraying with insecticides at this stage is very effective and can greatly reduce numbers. Treatment of the hoppers is needed in spring to prevent another egg laying period in December and January 2011. Based on spring weather forecasts, it is expected the vast majority of hatching locusts will survive and grow into adults unless chemical treatment is undertaken.

WHAT FACILITIES ARE AT RISK?

Cultivated turf (e.g.: turf farms), sports grounds, golf courses and parklands are potentially at



high risk from locust attack. Green pastures are very susceptible and recently sown grasses are particularly vulnerable to these insects.

Locusts are ravenous feeders of fresh, green vegetation. Turf is particularly susceptible to hopper (immature locust) attack because they prefer to graze on short, green feed. This can potentially lead to widespread damage of turf farms, playing fields, parklands and golf courses.

WHEN IS THE BEST TIME TO ACT?

The best time to treat locusts is when they are in the 'hopper' stage and before the adults can fly. Programmes to treat adult flying locusts are generally ineffective.

When locusts first hatch and emerge from the ground, they are often scattered. Treating locusts at this stage may be inefficient as some locusts may not have yet hatched. Newly hatched locusts are vulnerable and without food and shelter they are susceptible to premature death. As these locusts develop, they form high density bands and this is the best time for treatment activities.

Treating locust eggs through cultivation of egg beds is generally ineffective. It is recommended that horticulturalists/land managers concentrate their efforts on more regular monitoring and applying chemicals while hoppers are in a concentrated band.

WHAT ARE THE TREATMENT OPTIONS?

The use of insecticides is the most effective method of treating locusts. There are a number of products eligible for rebate under the Victorian Government's Locust Insecticide Rebate Scheme. Horticultural business owners and land managers (including managers of council-owned playing fields, golf courses and parklands) should seek expert advice from their chemical reseller or agronomist as to which chemical best suits their situation.

The factsheet Locust Chemicals for Turf, Ornamental Plants, Flowers and Forestry Plantations (available through the <http://new.dpi.vic.gov.au>) lists



With favourable conditions earlier in the year, state authorities are warning all sectors of the agriculture industry, including those involved in turf, that the spring and summer could bring massive swarms to regional areas of NSW, QLD, SA and VIC

Figure 1. The most effective time to spray locusts is when they are in the second and third instar 'hopper' stage, before their wings have grown



PHOTO COURTESY CASEY GROVES, SUNRAYSDIA DAILY

This photo appeared in the 6 April 2010 edition of the Sunraysia Daily newspaper and shows Peter Gill, track manager at Sandilong Park in Mildura, surrounded by locusts as he prepares the track for a race meet

the chemical products eligible for the Victorian Government’s Locust Insecticide Rebate. Chemicals should only be used according to the label directions and all withholding periods observed.

The biological insecticide *Metarhizium anisopilae* is the safest of the products to use, but can take up to 20 days to kill hoppers under cool conditions, which may be too long to prevent crop damage. All of the other chemicals in the table work much quicker than the biological insecticides, causing locusts to stop feeding within a few hours, and to die within two or three days. Products containing the active ingredient fipronil can provide a degree of residual treatment in situations where use of these products is appropriate.

WHEN SHOULD GROWERS SPRAY?

The most effective time to spray locusts is when they are in the second and third instar hopper stage and form concentrated bands, before their wings have grown. The locust life cycle diagram (Figure 1, previous page) shows where this stage occurs within the complete locust life cycle. Third instar hoppers form large slow moving bands providing a clear target for efficient chemical use.

The hopper stage will last for around six weeks, depending on temperature, but the third instar stage only lasts for a week or so, making it important to carry out regular monitoring. The most effective treatment is achieved when hopper densities get up to around 80 hoppers per square metre. The best time of the day to spray hoppers is late morning through to late afternoon when they are most active and most visible.

OBLIGATIONS FOR TURF MANAGERS

Horticultural businesses such as turf farms, parklands and managers of community-owned recreational facilities (e.g. golf courses and ovals) need to be vigilant in monitoring their farms and facilities where known locust egg beds exist for evidence of activity and damage.

Throughout Australia, primary control of locusts is the responsibility of the landholder. Officers from the relevant state authorities are available to provide technical assistance, do inspections and advise on control techniques. These officers should be your first point of contact when reporting locust infestations or making inquiries about locust control.

It is important that any locust activity is reported as soon as possible to your local biosecurity authority or department of primary industries or agriculture. All chemical use must be in accordance with state laws and regulations including record keeping requirements.

While the Australian plague locust is an unusual pest of turf it can never-the-less damage turf areas. The photos on the previous pages show dramatic images from Dubbo Golf Club (superintendent Allan Horrocks) in 2004 when a locust swarm descended and a triplex mower was used as a novel form of control. The Dubbo Bowling Club was similarly affected.

Once the locusts are on the wing there is not a lot that can be done other than to physically discourage them from staying in one place long enough to damage the turf. It is at the fledgling stage before they take wing that is the critical time for spraying and controlling the infestation, both present and future.

Editor’s note: The above information is only a small amount of that which is available. If you have any queries please contact the relevant authority in your state (see table below). 📞

TABLE 1. STATE AUTHORITY CONTACTS

State	Department
NSW	Livestock Health and Pest Authorities (LHPA). www.lhpa.org.au
	LHPA rangers organise landholder control of bands and distribute insecticide.
	Primary Industries, Industry & Investment NSW www.dpi.nsw.gov.au/agriculture
SA	Primary Industries and Resources South Australia www.pir.sa.gov.au/home
VIC	Department of Primary Industries http://new.dpi.vic.gov.au
QLD	Biosecurity Queensland www.dpi.qld.gov.au/4790.htm
	Department of Employment, Economic Development and Innovation www.deedi.qld.gov.au
WA	Department of Agriculture and Food WA www.agric.wa.gov.au