

Locust damage in crops and pastures

May 2015, Primefact 1016, 2nd edition
Emergency Management Unit

This Primefact contains observations and experiences of subject matter experts from previous Australian plague locust outbreaks. Damage is likely to be highly variable depending on the area, the locust population density and seasonal conditions.

How much do locusts eat?

Locust activity is largely regulated by temperature. Locusts will bask to maintain an optimal body temperature between 35-40°C and will be most active when this temperature is maintained. Damage to crops can still occur at lower body temperatures. Locust activity generally declines below 20°C and ceases below 15°C.

The Australian Plague Locust Commission estimates that locust nymphs can eat 100-450mg of green vegetation per day and adults can eat 0.2 g of green vegetation per day on average. If there are 50 locusts per square metre (a medium to high density swarm), the swarm could potentially eat around 100 kg/ha/day, equal to around 30 dry sheep per ha (assuming 30% dry matter).

These figures are highly variable and depend on adult densities and swarm size, nymphal band size (density and length), the number of bands in a given area, the pasture/crop type and stage and the temperature.

Damage to crops

Locusts will damage most green plants and pressure on individual crops will depend on alternative feed available especially if grasses or cereals are in the area. If locusts become trapped behind obstacles such as tree lines, valleys or hills then they will swirl around and cause more damage as they cannot move to other food sources. This means they are also more likely to eat less palatable crops.

Figure 1: A locust eating wheat plants. These plants are likely to survive.



Photo: Barry Haskins, NSW DPI

Figure 2: Wheat seedlings that have recovered from locust damage down to the coleoptile sheath.



Photo: Karen Roberts, NSW DPI.

Autumn

Vegetative cereal crops are very attractive to locusts, with many crops having to be resown in 2010. Part of the reason for this is timing. Firstly, locusts prefer to graze on short green feed. Secondly, early cereal crops are emerging as swarms have developed from late summer/autumn hatchings. Experience in autumn 2010 suggests that wheat crops are the preferred feed followed by barley and triticale. It appears that oats are generally only eaten when other vegetation is drying off or choice is limited.

Seedling crops are more likely to die from locust attack prior to the 2-4th leaf stage, especially if moisture or seed quality is low. If the seedling had one true leaf when attacked or is eaten off above the coleoptile sheath, it is more likely to survive in good conditions. After the 4th leaf stage, the crop appears to have enough height and bulk to recover from attack. Crop edges, particularly of dense well established crops, are likely to suffer more damage. Locusts prefer thinner and less advanced crops.

Figure 3: Cereal plants eaten above the coleoptile sheath generally recover.



Photo: Barry Haskins, NSW DPI.

Damage to winter pulse and oilseed crops is less common, although there have been widespread crop losses in canola, and to a lesser extent, forage brassicas, mustards and lupins.

Figure 4: Canola with the cotyledons eaten but the growing point and first leaf intact. These plants should recover.



Photo: Karen Roberts, NSW DPI.

If the growing point and cotyledons are removed in seedling canola, the plant will die. However, if locusts just nibble the growing point and the cotyledons are still present, then the plant may recover. If the cotyledons are removed but a leaf in the growing point remains then the plant may also recover. The same applies to lupins and other pulses.

Figure 5: The plant in the foreground has had the growing point removed and will not recover. The plant at the back should recover.



Photo: Karen Roberts, NSW DPI.

Spring

Locusts will affect crops that are still green or beginning to hay off. Mature crops are less likely to be attractive, especially if other green vegetation, in particular grass species, are present.

Locust nymphs and adults can strip a plant of its leaves which may affect grain fill. Thinner or less advanced crops are likely to suffer more damage.

Damage to cereal crops that are still just green includes chewing of the node below the head causing it to drop off, and chewing off awns and bracts surrounding the developing grain. There have been instances where locusts have chewed into milky-dough stage grain but this is uncommon.

Canola is at lower risk after leaf drop but adult locusts will chew on pods. If enough damage occurs, the pod will dry out, split open and shed seed. The chewing will decline as the pods dry out. Locusts like to be high in the canopy and are more likely to damage the upper pods rather than lower pods and leaves. In windrowed crops, damage is usually light and restricted to the upper edges where the adults are resting. Nymphs will rarely affect canola in spring and are more likely to eat the weeds under the canola.

In pulse crops, there is a low risk of damage once the pod turns bronze to yellow, although they may chew on the outside of the pods.

Grain receipt standards

There are minimum standards for locusts in harvested grain. Experience in 2004/05 suggests loads were rarely rejected. Occasionally, harvesting was delayed to avoid contamination in heavy infestations when locusts were roosting in the cooler parts of the day. Most locusts avoid mature crops or if present are blown out the back of the header.

Locusts are included with other large insects at receipt. One insect is defined as six legs, three body parts and two wings. Two heads will count as two insects.

The receipt standard for wheat is three field insects per half litre. Standards for other crops can be obtained from www.graintrade.org.au or grain traders.

It is also important to ensure that if paddocks have been sprayed, the insecticide withholding period (WHP) for harvested grain is observed.

Figure 6: Locust damage to wheat heads resulted in pinched grain, shown on the left.



Photo: Simon Oliver, NSW DPI.

Summer crops

Seedling cotton is susceptible to damage as it is often germinating when swarming adults are present. Cooler temperatures in the south of the state also reduce the opportunity to sow early to avoid damage at the vulnerable seedling stage.

Seedling rice is also susceptible to locust attack. Aerial sown crops are less likely to be damaged than drill sown crops as the water will discourage locusts. Once the growing point has been eaten, the plant will not recover. In the past, swarms have eaten crops down to the water line at later growth stages. Water can be kept a bit deeper to protect more of the plant, although rice will tolerate a reasonable amount of damage during the vegetative stage.

Sorghum is less likely to be damaged as it has a vigorous seedling that emerges strongly and quickly out of the ground.

Later sown crops like sunflowers and soybeans may avoid nymph damage but could be damaged by adult locusts.

Damage to pasture

Green pastures are very susceptible to locust attack. Grass species are preferred by locusts.

Newly sown grass pastures are very susceptible to attack and paddocks needed to be resown in 2010. Shorter pastures are also preferred. Couch grass is often attractive to locusts. Young annual legumes can also be attacked.

Lucerne crops are less prone to attack if green grass weeds are in the paddock and other crops are in the area. Newly sown lucerne up to the 5th trifoliolate leaf stage may be at risk of significant damage. Crops at the cotyledon stage were badly damaged in 2010. Lucerne after the 5th trifoliolate leaf stage with a developed crown has a better chance of recovery from damage. As lucerne is often green for longer and over summer when there is little other green vegetation it can become a target. Damage is restricted to stripping of leaves, similar to heavy grazing but the crown is rarely damaged meaning the plant is unlikely to die.

Figure 7: High density swarms trapped against trees lining the Lachlan River caused major damage to lucerne in 2004/05.



Photo: Simon Oliver, NSW DPI.

The decision to spray pastures for adult locusts will be influenced by the value and quantity of the feed, the likelihood of reinfestation, location of sensitive features and locust densities.

Withholding periods and export slaughter intervals must also be observed. This information is provided in the Safemeat brochure on the NSW DPI website.

Figure 8: Locusts chewing the leaf off mature lucerne plants.



Photo: Simon Oliver, NSW DPI.

Frequently asked questions

Should I delay sowing?

Monitor forecast temperatures. As locust activity diminishes below 20°C, significant damage from locusts should decline in late autumn, although locusts may still be around until June.

Delaying sowing can reduce yield potential, although current conditions indicate that good soil moisture is likely at the end of the season which will slightly reduce this impact. A balance should be struck between the risk of damage by locusts and potential yield penalties from delayed sowing.

Should I resow my crop?

Look carefully and assess the sort of damage that has been done. If unsure, wait a few days and see if the crop responds. Assess the amount of soil moisture available and the quality of the seed originally planted- low quality (eg drought affected) seed is less likely to recover. Assess the number of plants per square metre that will survive and compare it to the minimum required. Consider changing to a quicker maturing variety or crop as the delay for the new crop will be 2 to 3 weeks. There may be volunteers if sowing a different variety or crop, or plants of different maturity if sowing the same variety. Seek advice from your local advisor.

Do locusts emit a toxin that kills the plant?

No. The death of the plant is more likely to depend on growth stage and the extent to which the plant is eaten. If the growing point is eaten it is likely the plant will die.

Do locusts prefer some varieties over others?

It is unknown if some varieties are preferred over others. There were differences in damage between varieties in a barley variety trial at Tullamore in 2004, however it is thought that this was mostly related to maturity than variety. Other factors (such as crop species, maturity or tree lines) are likely to have a bigger influence on the possibility of crop damage than the variety.

If I cut hay or silage, will the locusts affect the quality?

Experience suggests that adult locusts will fly away during the cutting and baling process, meaning that very few are caught in the bale. Baling during the cooler parts of the day or at night should be avoided as locusts are more likely to be roosting in the plants during this time.

Fodder quality may be reduced if locusts have eaten the leaf in preference to the stem.

It is unknown if the physical presence of locusts in the bale or silage reduces quality and palatability.

Will cultivation of direct drill paddocks destroy egg beds?

No-till farmers have been concerned that bare inter-rows may provide suitable conditions for egg beds. Locusts have laid egg beds in these areas, but they prefer harder areas alongside tracks, fence lines, dams or in uncropped areas.

Cultivation may reduce the number of nymphs hatching by an estimated 20% at best. Egg beds are likely to be patchy and their location and extent unknown. It is more effective to mark and monitor these sites in spring when nymphs are due to emerge, and then treat with insecticide once bands have formed (usually 2-3 weeks after emergence).

Will herbicide effectiveness be reduced by locust damage?

The effectiveness of knockdown herbicides on weeds with locust damage will depend on how much of the leaf surface is left to absorb the insecticide and the general stress on the plant. Identify paddocks with low grass weed numbers to sow first.

More information

- NSW Department of Primary Industries
www.dpi.nsw.gov.au/agriculture/pests-weeds/insects/locusts
- Australian Plague Locust Commission
www.agriculture.gov.au/pests-diseases-weeds/locusts
- Local Land Services
www.lls.nsw.gov.au

Acknowledgments

Author: Karen Roberts, NSW DPI. Thanks to Simon Oliver, NSW DPI; Australian Plague Locust Commission; former Livestock Health and Pest Authority staff and former NSW DPI agronomists.

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Published by the NSW Department of Primary Industries.

Reference PUB15/163