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primefact

Armyworms in rice

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The common armyworm *Leucania convecta* (*Mythimna convecta*) was a localised and sporadic pest of rice until the 2011/12 rice season, but since that time it has become a much more consistent and widespread problem, particularly in the Murray Valley. Major crop damage has occurred, partly as a consequence of inadequate crop monitoring in the period leading up to harvest, and also for logistical reasons in some seasons when shortages of aircraft or poor weather conditions have prevented prompt chemical application. Agronomists estimated that around 60% of Murray Valley rice crops required spraying for armyworm during the 2012/13 season, with similar proportions of the crop being treated in each subsequent year.

Damage

Armyworms feed initially on the foliage (figure 1), but in the later stages of crop growth they cause more severe damage by severing spikelets within the panicles (figure 2).

Figure 1. Armyworm damage to rice foliage.

Image: Kathryn Bechaz

Figure 2. Spikelet stripping caused by armyworm feeding.

Image: Mark Stevens

Biology and management

Armyworms are the caterpillars of a native noctuid moth (figure 3). The adult moths fly into rice crops after development in other crops or in rangeland areas, and lay their eggs on the leaves.

Armyworms (figure 4) go through 6 or sometimes 7 larval stages which increase progressively in size, with development from egg to adult emergence taking around 45 days at 25°C. Development is quicker at higher temperatures, and the majority of plant damage is caused by the final larval stages.

Figure 3. Common armyworm moth (body length 20 mm).

Image: Mark Stevens

Figure 4. Mature common armyworm (length 40 mm).

Image: DPI image collection

Little is known about the biology of armyworms in NSW rice crops. In maize, armyworms are very heavily parasitised by several fly and wasp species, however there is no data available on the level of natural biological control occurring in rice crops. There is a growing belief that crops that are drained mid-season are more vulnerable to armyworm damage. At present there is no hard data available on this issue, however it is possible mid-season drainage may be either damaging parasitoid populations by affecting humidity levels in the crop, or that the stressed plants are emitting a different profile of volatile compounds that attract greater numbers of female moths into those crops to lay their eggs.

In crops such as wheat and maize armyworms pupate in the soil, but this is not an option in flooded rice crops. Although some pupae can be found lodged in the leaf sheaths, it is likely that many armyworm fall off the plants and drown whilst trying to pupate. This suggests that significant infestations probably arise only from moths flying in from other areas, as there is relatively little chance of moths successfully completing development within the rice crop itself.

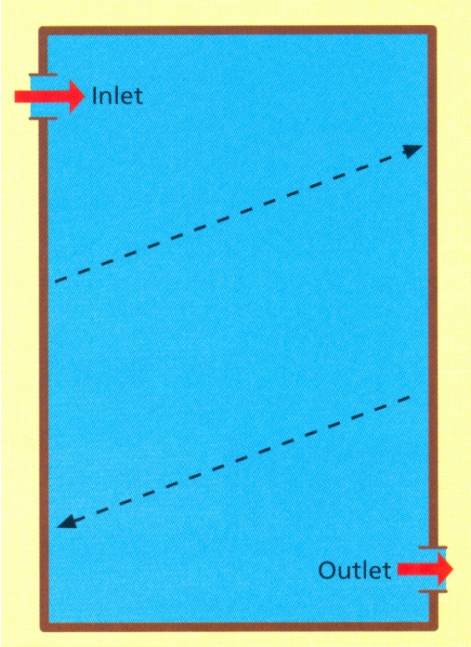
Until more is known about armyworm biology in rice, growers will remain dependent on chemical control, and should refer to the current edition of the **Rice Crop Protection Guide** for information on which chemicals are recommended for armyworm management. The key to effective chemical control is consistent crop monitoring, particularly from January onwards.

Crop monitoring

Because armyworm infestations arise (at least initially) from female moths flying into rice crops from other areas, infestations tend to be higher along crop margins. Armyworm may also be more abundant in any areas that have been double-fertilised, so these two areas are the best spots to conduct initial checks for the presence of armyworm. When armyworm are found, it is important to systematically assess infestations by sampling in diagonal transects across the bays before deciding whether treatment is warranted. Estimates of armyworm densities can be made by using a ‘beat sheet’ or sampling tray, and hitting or shaking the foliage to make the armyworm drop onto the sheet or tray where they can be

counted. Alternatively, armyworm dislodged from the foliage can be counted whilst floating on the water surface. A wire frame either 0.5 or 1 m^2 can be easily made out of fencing wire and used to delimit an area for each sample. At least 8 samples should be taken along each of 2 transects for each bay (see figure 5). No samples should be taken within 3 m of the crop edge, and no more than 2 samples should be closer than 8 m to the crop edge. The average count should be adjusted to an 'armyworms/m^2' value, and a decision whether or not to spray should be made based on the threshold values in table 1. These thresholds are estimates based on overseas data for other armyworm species, as thresholds for *L.convecta* on Australian rice varieties have not yet been developed. They should be considered as a guide only.

Figure 5. Sampling transects across bays for assessing armyworm populations.



If population thresholds are exceeded a registered pesticide should be applied as soon as possible, even if the armyworms are still quite small. Smaller armyworms are more susceptible to pesticides than larger ones, and should be controlled before they cause serious damage.

Table 1. Population thresholds for treating armyworm in rice. Chemical treatment should only be applied when populations exceed guideline levels.

Crop stage	Treat if pest density exceeds:
Panicles not exposed	8 armyworms/m^2
Panicles exposed – more than 2 weeks to harvest	10 armyworms/m^2
Panicles exposed – less than 2 weeks to harvest	12 armyworms/m^2

More information

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