

Early season armyworm on the march

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This season has seen unusually high spring armyworm (*Spodoptera* spp.) larvae infestations in cotton and other crops across most areas of Queensland. There have been reports of heliothis and cutworm in the complex of larvae as well — but it is armyworm numbers that have been at record levels.

In cotton the armyworm problem has usually (though not always), been associated with large armyworm larvae migrating from adjacent cereal crops causing stand loss on the edges of cotton fields. But in many instances this season, the armyworms have been found within the cotton fields — especially the more weedy fields.

The armyworm moths lay egg rafts on favoured weed hosts growing in cotton fields and the young larvae feed happily on the weeds. When the weeds are removed, either by spraying or cultivation, the larvae have no alternative but to migrate on to the young cotton seedlings.

The density and duration of weed growth will determine the extent of the problem if armyworm moths are laying. Fields with heavy weed populations have supported higher larvae numbers. This could be through increased attractiveness and therefore increased egg laying by moths, or simply increased survival of larvae.

The problem with weeds being present over a long period is that armyworm larvae will be older and larger when they are forced to feed on the cotton seedlings. The potential for damage to the plant stand is much greater from large larvae.

Recent changes to weed control in cotton, especially the introduction of optional use of post-emergent herbicides (rather than programmed residuals), requires extra vigilance for unintended secondary pest problems. There have been a number of situations this season that highlight the need for awareness of weeds as alternate hosts for cotton pests.

Around Emerald, heliothis larvae have been in high numbers on chickpea volunteers in some cotton fields. The combination of post-emergent spraying and cultivation has forced larvae onto



Armyworm on cotton seedlings.



In the Emerald area heliothis larvae have been in high numbers on volunteer chickpeas.



cotton crops resulting in the need to spray.

Banded Staple applications seemed to move the larvae rapidly off the weeds, while the associated cultivation disturbed the larvae and forced them on to the cotton plants.

Further south, armyworms have been attracted to lay on weeds after irrigation, especially pre-irrigated fields with heavy weed populations. The larvae seem to be able to continue to feed on the weeds after the broad-spectrum herbicide for some time, but eventually they move off the dying weeds and on to the cotton.

If the armyworms are large (fourth or fifth instar), they have a big appetite. And even though they dislike the cotton plants they will still feed on them — often moving rapidly from plant to plant, possibly in search of a more palatable food source, though destroying the seedling in the process.

In this situation, heavy populations can do a lot of damage to the plant stand in a pretty short time. A number of these fields are Roundup Ready fields where residual herbicides have been left out of the program and weeds have been allowed to grow well into the over-the-top window.

The key to avoiding problems with Roundup Ready fields is to spray early, especially if there is heavy weed pressure. But both conventional and Ingard fields — as well as fields treated with Staple and Envoke — have been sprayed because of stand loss due to armyworms and heliothis.

Armyworm and Bollgard

One of the benefits of Bollgard II will be the added control of armyworms. This season we have seen armyworm and heliothis larvae in a couple of Bollgard fields where there were reasonable weed populations. There have been some interesting observations of larvae in Bollgard fields in comparison to conventional fields.

Once they have fed on the Bollgard the larvae do not move around much. They just sit on the plants doing a small amount of grazing. In conventional fields larvae will move around quite a bit and may spend the middle part of the day in the soil, especially during hot weather.

The result is that scouted populations may be higher in the Bollgard but damage will be much less than conventional cotton. This is demonstrated by the surviving plant stand in a

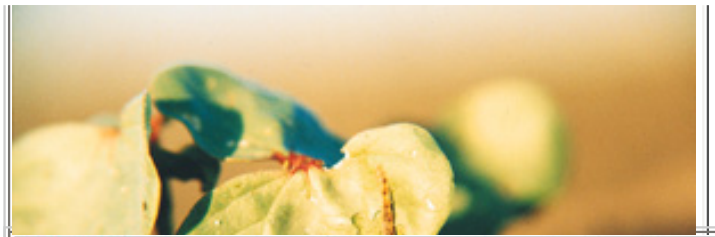


TABLE 1: Plant stand 30 days after planting (and eight days after sprayed treatment)

Variety/line	Insect protection	Plants per mete
Sicot 289RRi	Ingard	10.1
CSX 415	Bollgard II	12.0
Sicot 189RR	Endosulfan EC 2.1L/ha @ 40% Band (8 DAT)	9.1
Sicot 189RR	Unsprayed	3.8



Large armyworm larvae.



Greg Kauter inspecting Bollgard seedlings for armyworm damage.

field at Goondiwindi where armyworm larvae were at moderately damaging levels this spring (Table 1). An area of 24 rows of Sicot 189RR remained untreated for armyworm adjacent to the experimental Bollgard II line CSX 415. The Sicot 289RRi and Bollgard areas were also unsprayed for armyworm.

Armyworm larvae, ranging from very small to large, migrating off a heavy and uniform weed population, caused some plant loss in all treatments. This was primarily due to large larvae feeding at or below the cotyledons of some plants. But the remaining plant stand indicates that damage was much more extensive in the unsprayed conventional cotton which had approximately 30 per cent of the plant population of the Bollgard II line.

The larger larvae that have fed on weeds and moved on to the Bollgard plants may survive for some time. Except for some light grazing they are not feeding while the Bt is doing its job. But this can take some time due to their size.

The spring armyworm and heliothis larvae have infested Bollgard fields but the Bollgard II has not needed additional control and plant health and population has been maintained.

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