Getting the most out of Bt sprays

VEG IPM NOTE

Bacillus thuringiensis (Bt) sprays

Bt sprays contain live spores and endotoxins of a naturally occurring bacterium. These sprays are excellent IPM tools because they are highly selective and do not harm beneficial insects and mites.

Different subspecies of *B. thuringiensis* are used to make Bt sprays. These include:

- *B. thuringiensis aizawai* (Bta) for caterpillars
- *B. thuringiensis kurstaki* (Btk) for caterpillars
- *B. thuringiensis israelensis* (Bti) for fly larvae, including fungus gnats and mosquitos

Within an IPM program, Bta and Btk sprays can give excellent control of many caterpillar pests, provided they are applied correctly.

Bts do not kill immediately. Once a caterpillar eats treated foliage it stops feeding, thus protecting the crop from further damage, but it may remain visible on the foliage for 3-4 days before dropping to the ground.

Resistance management

Each *B. thuringiensis* subspecies produces a different toxin, so if Bts are used regularly, we suggest growers minimise resistance selection pressure by rotating between the product that contains Bta (XenTari) and products that contain Btk (e.g. Dipel and Delfin).

In the interests of resistance management, we do not recommend tank mixing Bta and Btk products or the use of Bt products that combine Bta and Btk.

Getting the best results from Bt sprays

Bt sprays need to be applied with care in order to achieve good results. Bts are not residual and to kill the target pest the Bt toxin must be ingested. The caterpillar needs to feed on treated foliage before the Bt toxin is broken down by UV radiation or washed away by rain or overhead irrigation. So factors such as coverage, timing of application and choice of spray adjuvants play an important role in determining the efficacy of a Bt application.

Your Bt application checklist

- ✔ Check the date of manufacture – do not use product that is more than 2 years old
- ✔ Use a high water volume to ensure good coverage, especially on larger plants – at least 500 L/ha, but more if possible
- ✔ Between Spring and Autumn, spray after 3pm to avoid peak UV
- ✔ Use a **sticker,** such as NuFilm-P, if possible
- ✔ Avoid overhead irrigation or rain for 24 hours after application

Additional measures to improve Bt efficacy

- ✔ Use a feeding attractant such as milk powder
- ✔ Target small caterpillars
- ✔ Ensure the tank and lines are clean of other pesticides, especially synthetic pyrethroids
- ✔ Use a wetting agent
- ✔ Keep the pH in the tank neutral
- ✔ Use as part of an IPM program

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