

Insecticide Options for Box Tree Moth Management

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This fact sheet is a preliminary list of insecticide options for managing box tree moth in nurseries and landscapes. Few insecticides have been evaluated for efficacy against box tree moth since most are not permitted for use on ornamentals in Europe. Following is a selection of active ingredients found in commercial products labeled for caterpillar management likely to be effective against box tree moth. A few of these are also found in home garden formulations.

The box tree moth, *Cydalima perspectalis*, feeds primarily on boxwoods (*Buxus* spp.) though has been reported on a few other hosts (*Euonymus*, *Ilex*, *Murraya*). It is native to China, Korea, and other parts of Asia. Box tree moth was introduced into Europe in 2007 and rapidly spread across the continent and in 2018 was found in Ontario, Canada, the first detection in North America. No box tree moths or caterpillars have been found in the US but the risk of introduction is high. Moths can fly over two miles and moths or caterpillars could travel on plants across the border.

Box tree moths are up to 4 cm and have two color morphs. The morph seen in Canada has white wings with brown borders. The brown morph also found in Europe is almost entirely dark brown with characteristic white specks on the forewings. Males can be monitored with pheromone traps. Caterpillars are up to 2 cm and yellow to lime green with dark stripes. They eat boxwood leaves and bark and can quickly defoliate and even kill large hedges. Caterpillars also create unsightly webbing and frass within plants which protects them from predators and could reduce insecticide efficacy.



Box tree moth, white morph. Szabolcs Sáfián, University of West Hungary, Bugwood.org



Late-instar box tree moth caterpillar with webbing. S.D. Frank, NCSU



Box tree moth damage. S.D. Frank, NCSU

Many insecticides (Table 1) are labeled for control of caterpillars. Some broad-spectrum materials (some pyrethroids, carbaryl) are known to flare spider mites or other pests. Note label cautions concerning environmental and non-target risks.

Table 1. A selection of insecticides labeled for caterpillar management in nursery and landscape sites where boxwoods are grown. Re-entry intervals (REI) apply to production (nursery, greenhouse) uses.

Active	IRAC MOA	Example products ¹	Notes
Azadirachtin	UK	Azatin O, Azatrol, others	Use site varies by product. Available in organic-compatible formulations. Biopesticide. Most have 4 hour REI.
Carbaryl	1A	Sevin, others	Broad spectrum, harmful to beneficial insects, may cause secondary pest outbreaks. 12-hour REI.
Acephate	1B	Orthene, others	Only certain caterpillars on the label. Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. 12-hour REI.
Bifenthrin	3A	Onyx, Talsar, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI.
Cyfluthrin, <i>beta</i> -cyfluthrin	3A	Decathlon, Tempo, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI.
<i>lambda</i> -cyhalothrin	3A	Demand, Scimitar, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 24 hour REI.
Deltamethrin	3A	DeltaGard, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI.
Fenpropathrin	3A	Tame, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 24 hour REI.
tau-fluvalinate	3A	Mavrik, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI.
Permethrin	3A	Astro, Perm-up	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI.
Pyrethrins	3A	Tersus, Pyganic, others	Broad spectrum, harmful to beneficials, may cause secondary pest outbreaks. Most products 12 hour REI. OMRI products available.
Pyrethrum	3A	Pyrethrum, others	Broad spectrum, harmful to beneficial insects, may cause secondary pest outbreaks. Most products 12 hour REI.
Acetamiprid	4A	TriStar, others	May not be effective option for all caterpillars but low toxicity to honey bees used alone. Acetamiprid is used for sucking insects and boxwood leafminer. EPA reduced-risk for ornamentals. 12-hr REI.
Spinosad	5	Conserve, Entrust, others	Used for caterpillars in greenhouses, nurseries, landscapes. They work by contact and ingestion. Homeowner formulations available. Entrust is organic-compatible formulation. 4-hr REI.
Spinetoram	5	XXpire (combination with sulfoxaflor)	For use in greenhouses and nurseries but not landscapes. Not registered in NY or CA. 12-hr REI.
<i>Bacillus thuringiensis kurstaki</i> and <i>B. t. aizawai</i>	11	Dipel Pro DF, Javelin, Deliver (Btk); XenTari, Agree (Bta); others	Bt <i>kurstaki</i> products are used in Europe for BTM management and appear to be effective. Must be ingested; apply when caterpillars are actively feeding. Biopesticide. 4-hr REI.
Diflubenzuron	15	Dimilin 4L, Adept	Use site varies by product. Labeled only for certain caterpillars and other pests. 12-hour REI.
Tebufenozide	18	Confirm	For Christmas trees. EPA reduced-risk for ornamentals. 4-hour REI.
Methoxyfenozide	18	Intrepid	Not for use in NY. Labeled for certain caterpillars. 4-hour REI.
Indoxacarb	22A	Provaunt	For landscape use only.
Chlorantraniliprole	28	Acelepryn	Foliar spray for caterpillars (systemic use for clearwing borers). Nursery, greenhouse & landscape use. Relatively low toxicity for bees and workers. EPA reduced-risk for ornamentals. No signal word on the Acelepryn label. 4-hr REI
Cyantraniliprole	28	Mainspring GNL	Foliar spray or systemic drench for caterpillars. Can be used in greenhouses, nurseries, landscapes. No outdoor uses in NY. EPA reduced-risk for nursery & greenhouse ornamentals. Note bee advisory. 4-hr REI
Cyclaniliprole	28 (29 w/ flonicamid)	Sarisa, Pradia (includes flonicamid)	Can be used in greenhouses, nurseries; not for residential use. Note bee advisory. Flonicamid combination broadens efficacy for aphids, psyllids and other sucking insects. 4-hr REI

¹Products listed are examples for informational purposes and are not recommendations. There may be other formulations and generics. Verify product registration, uses, restrictions, and pollinator warnings before applying. More information here: <https://content.ces.ncsu.edu/southeastern-us-pest-control-guide-for-nursery-crops-and-landscape-plantings>.