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European Corn Borer Management in Field Corn

Michigan State University

Cooperative Extension Service

IPM Facts

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European Corn Borer Management in Field Corn

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In most of Michigan, the European corn borer¹ has two generations per year, with a third generation common in southern counties. Damage may be caused by the first, second, or even the third generation, but seldom by all three in the same planting. Early planted corn is most susceptible to the first generation, while late planted corn is more likely to be attacked by second and third generations.

Description of life stages:

Corn borer eggs are laid in masses on the under-side of corn leaves, near the midvein. Each about the size of a pinhead, they overlap much like fish scales, and the mass may be 1/4 inch in length. Newly hatched larvae (or borers) are about 1/16 inch long. They have smooth whitish bodies, black heads, and three pairs of legs near the head and five pairs of fleshy legs (prolegs) near the tail.

Full grown larvae range from 3/4 - 1 inch long, vary in color from gray to creamy white and have numerous prominent dark brown or black spots. Adults are pale yellow to light brown with a wingspan of about one inch.

Life cycle:

Mature larvae overwinter in corn stubble or in other plants and pupate in early spring. Adult moths lay first generation eggs in early to mid-June. Eggs hatch into larvae that crawl into the whorl. After feeding in the whorl, the larvae tunnel into the stalks.

First generation adults lay the eggs for the second generation in August. Mature larvae of this second generation is the stage that overwinters.

Damage:

Newly hatched borers crawl into the whorl where they feed on leaf and midrib tissues. Whorl feeding produces the "shothole" type of damage that is typical of the first generation borer. After feeding within the whorl they tunnel into the stalks and ear shanks of the corn plant. This weakens the stalk and can cause lodging which makes harvesting difficult.

Management:

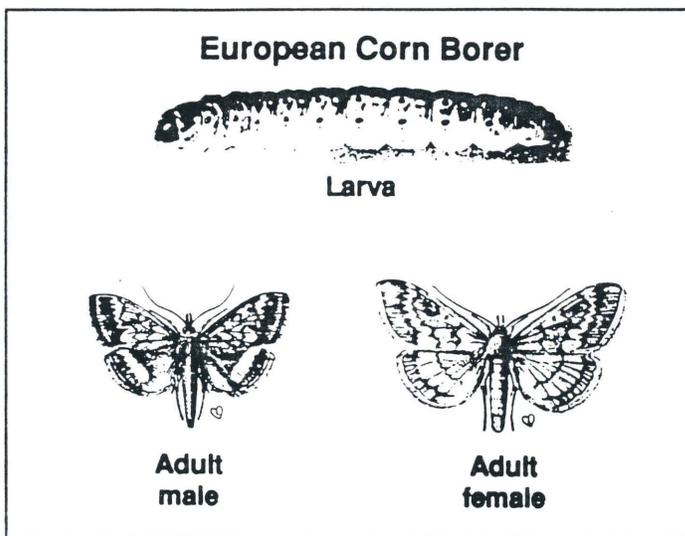
Biological Control - Many predators and parasites feed on borer eggs and larvae. Several parasites that are natural enemies of the corn borer have

been introduced from Europe and are now common in corn-growing areas of the state. Natural enemies of corn borer eggs include parasitic wasps, ladybird beetles, and minute pirate bugs. Larval enemies include various flies, wasps, and diseases. *Bacillus thuringiensis*, a biological insecticide for borer control, is commercially available.

Cultural Control - Corn borer damage can be reduced by avoiding extremely early or late plant-

ings. Early planted fields attract first-generation egg-laying adults while late plantings are more susceptible to second or third generation attacks. Several corn hybrids that are resistant to first generation corn borer attacks are available. County Extension agents or seed salespeople can recommend resistant hybrids suitable for individual areas.

Chemical control - The economics of chemically controlling corn borer on field corn depends on the



¹ European Corn Borer: *Ostrinia nubilalis* (Hübner)

infestation level, price of corn, potential yield, and the cost and degree of control. Granular formulations directed into the whorls or leaf axils generally provide the best control because granules lodge behind the leaf sheath and in the plant whorl where the larvae feed.

Liquid applications are generally less effective than granulars. If liquids are applied, use large droplet sizes and increase the application rate to get material into the whorl. Banded applications over the whorl, of either liquids or granular products, will increase control.

Recommended insecticide applications for controlling European corn borer larvae in field corn¹

<u>Chemical</u>	<u>Formulation*</u>	<u>Rate²</u>	<u>RUP³</u>	<u>Restrictions & Suggestions⁴</u>
Furadan	4F	1 1/2 - 2 pt	Y	30-day PHI; max. 2 applications per season.
permethrin (Pounce, Ambush)	3.2 EC	4 - 8 oz.	Y	Apply prior to brown silk stage.
Lorsban	15 G	5 - 6.5 lb aerial	N	
		6 - 8 oz/1000 row ft	N	Directed into whorls with ground equipment.
Dyfonate	10 G	10.0 lb aerial	N	
		12 oz/1000 row ft	N	Directed into whorls with ground equipment.
Javelin B.t.		2 qt	N	Especially recommended where honeybees may be exposed. Apply to early instar larvae only.
Dipel B.t.	ES	2.5 pt	N	Same as Javelin.
Dipel B.t.	10 G	10 lb	N	Same as Javelin.
Asana XL	0.66 EC	7.8 - 9.6 oz	Y	21-day PHI.
phorate	10 G	10 lb	Y	30-day PHI. Do not apply after tasseling.
PennCap-M	2 EC	1-2 qt	Y	12-day PHI.

¹ Timing is critical for borer control. Do not try to control large larvae (1/2 inch long or longer); they are usually too deep in the whorls to be reached by insecticides. Granules penetrate better than sprays and are recommended over sprays. If you do use sprays, adjust the nozzle pressure to produce large droplets.

² Rate per acre if broadcast. Consult label for rules when banding. Be sure your equipment is properly calibrated. Refer to Extension Bulletin E-1582 **Chemical Control of Insects and Nematodes in Field and Forage Crops**, available at your county Extension office.

³ Restricted use pesticide. If yes (Y), a pesticide applicator certification is required.

⁴ PHI = Pre Harvest Interval.

* Other formulations may be available.

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To protect yourself and others and the environment, always read the label before applying any pesticide.

This publication contains pesticide recommendations based on research and pesticide regulations. However, changes in pesticide regulations occur constantly. Some pesticides mentioned may no longer be available, and some uses may no longer be legal. If you have questions about the legality and/or registration status for using pesticides, contact your county Extension office or manufacturer's representative.

Illustrations courtesy of United States Department of Agriculture.



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