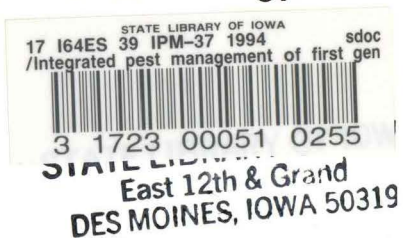


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Integrated Pest Management of First Generation European Corn Borer



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This publication

- **describes scouting techniques** for first generation corn borers,
- **explains economic thresholds**, the infestation level at which an insecticide application is economically justified, and
- **provides a calculator** for easily determining economic thresholds.

The European corn borer is one of the most destructive insects in the Corn Belt. The combined damage from large populations of both first and second generation corn borers can reduce yields up to 40 bushels per acre.

A single corn borer that tunnels into the stalk of a 10-leaf stage corn plant can cause a six percent yield loss. This yield loss can be multiplied by the number of corn borers per plant — up to six larvae per plant. It is possible to have a 36 percent yield loss, or more, during severe infestations.



Corn borers hatching from eggs.

Scouting

What does corn borer injury look like?

After hatching, larvae travel deep inside the whorl and feed on the leaves. When these leaves emerge, small holes (called shotholes) indicate that corn borers were feeding inside the whorl.



Corn borer shotholes in leaves.

When should you scout a field?

Begin looking for shotholes after corn reaches 17 to 21 inches in extended leaf height. Female moths usually are attracted to the earliest planted (tallest) corn to lay their eggs. Larvae usually do not survive on smaller corn because of a plant chemical known as DIMBOA.



Pulling whorl from corn plant.

How do you scout a field?

Your goal is to determine the average number of live larvae per corn plant. Scout each field and each variety within a field separately.

- Walk at least 100 feet in from the edge of the field.
- Pull the whorls from 10 plants at each of five locations across the field (total of 50 plants). NOTE: If you pull whorls from fewer plants, you may seriously underestimate the corn borer population. Be sure to sample areas that have differing plant height, age, or density.
- Unwrap the whorl leaves and count the number of live larvae.
- Add all live larvae counted in 50 plants. Divide total by 50 to get an average number of larvae per plant.



- Larvae in the whorl will be this size or smaller.

Additional considerations

Count only live larvae to estimate the potential yield loss. If you count only shotholed plants, you will have no information on the number of live borers inside the whorl.

Select plants at random. If you pull whorls only from plants with shotholed leaves, you will seriously overestimate the corn borer population.

Economic thresholds

When is an insecticide application economically justified?

A combination of factors determines the economic threshold:

- the average number of live larvae per corn plant (the size of the corn borer population),
- the expected corn yield,
- the market value of the corn, and
- the insecticide and application costs.

Crop value (\$/acre)	Treatment cost per acre (insecticide + application cost)						
	\$8	\$10	\$12	\$14	\$16	\$18	\$20
340	0.49	0.61	0.74	0.86	0.98	1.10	1.23

Economic Thresholds

(Control is justified if the number of corn borers per plant equals or exceeds the number below the treatment cost.)

Using the calculator

- Estimate the crop value in dollars per acre (expected yield multiplied by price per bushel). Pull the yellow card until this crop value appears in the left-hand window.
- Determine the treatment costs per acre (insecticide plus the application).
- The average number of corn borers per plant appears on the yellow card below the treatment cost. This is the economic threshold for your crop value and treatment cost. If your count of average larvae per plant equals or exceeds the economic threshold number, your benefit from spraying (saved bushels of corn) should exceed the cost (insecticide plus application) and provide an economic return.

Final considerations

If an insecticide is needed

- Spray before many larvae are $1\frac{1}{16}$ inch long (the diameter of a dime). Larvae this length are in the fourth instar. At this stage they leave the whorl or leaf midrib and tunnel into the stalk where an insecticide cannot kill them. **Economic thresholds assume 80 percent control by an insecticide.**

If the economic threshold is not reached

- Wait three-to-five days for additional larvae to hatch, then scout the field again. If more larvae are found now, the economic threshold may have been reached. However, some earlier-hatched larvae may have died from natural causes such as disease, beneficial insects, or inclement weather (rain storms or hot temperatures) during this time. Do not add the previous counts to the most recent field counts.
- Discontinue scouting when no newly-hatched larvae are found and large larvae are tunneling into the stalk.

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