

Corn Insect Pests

A Diagnostic Guide



Seedcorn maggot
Seedcorn beetles
Wireworms
White grubs
Corn flea beetle
Billbugs
Thrips
Grape colaspis
Black cutworm
Sod webworm
Southern corn leaf beetle
Chinch bug
Armyworm
Stalk borer
European corn borer
Southwestern corn borer
Corn rootworms
Grasshoppers
Fall armyworm
Corn earworm
Corn leaf aphid





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Introduction

Insects outnumber human beings by 200 million to 1. They make up some 40 million species, of which entomologists have studied and classified about 1 million. Yet despite these overwhelming numbers, only about 10,000 species of insects cause problems in food and fiber production or affect the well-being of mankind and domestic animals. Fewer than 100 species cause most of the pest damage to corn production in the United States. This guide focuses on about 20 of the most important insect pests affecting corn production in the north-central states and is meant to be used in the field, where preventive and corrective action can be taken.

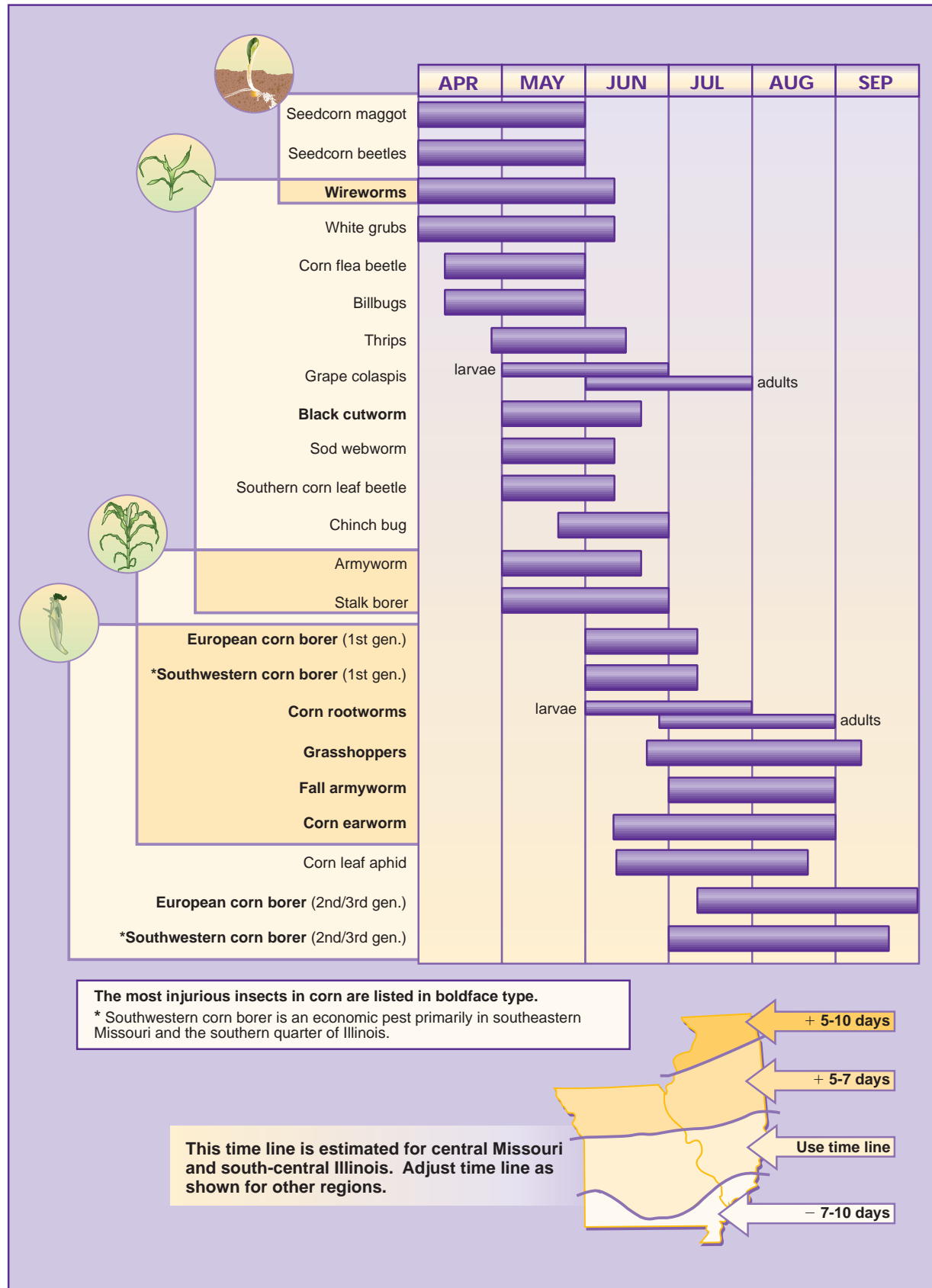
The difficulty of identifying and managing insect pests in the cornfield stems from the diversity of the insects themselves and the complex interaction of conditions that affect their movement and growth. Some insects are active only at night or may simply be difficult to find in the field. Certain insect pests are abundant almost every year and tend to be chronic problems. Other pests are sporadic and occur only every 5 to 10 years in numbers great enough to reach economic thresholds. Some of the most important corn pests, including black cutworm, fall armyworm and corn earworm, are migratory; others, such as European corn borer, overwinter in the field. For the migratory pests especially, it takes almost perfect timing to make a “successful” infestation. Weather events must favor the movement of migrating insects into corn-producing regions; corn or other suitable host plants must be available and in the preferred growth stage when the insects arrive; local weather conditions must also be favorable for the insects to survive and reproduce.

Research both in the laboratory and in the field has provided important information about many pest species and has led to development of economic thresholds and management strategies. However, methods for predicting insect pest outbreaks are by no means perfect. The first step in the effective management of corn insects is accurate and timely identification of the pest. Hence this guide.

We developed the guide with an awareness that sometimes the symptoms of crop injury are obvious, but the insect pests are not. Consequently, it is based not on insect taxonomy but on diagnosis of insect injury to corn. Diagnostic aids include damage symptoms expressed at four progressive growth stages of the corn plant: from planting to full emergence, from emergence to knee-high, from knee-high to tasseling, and from tasseling to maturity. Although the guide focuses primarily on diagnosis of crop injury, it includes condensed insect “profiles,” drawing upon photos and descriptions. It also describes which fields are most likely to sustain injury and discusses field distribution of pests, economic thresholds (if established), and management options.

There is a growing need for highly trained field diagnosticians and advisers in pest management, especially with the introduction of new production technologies such as precision agriculture and transgenic hybrids. We anticipate that *Corn Insect Pests: A Diagnostic Guide* will serve as a useful tool for those individuals with agronomic backgrounds who are required to troubleshoot insect pest problems in corn: extension agronomists, crop consultants and scouts, and agricultural input dealers and applicators. However, our most sincere desire is that this diagnostic guide will be of greatest ultimate benefit to the producers who plant and harvest corn — one of this nation’s most important crops.

Time line for corn insects in central Missouri and south-central Illinois



Diagnostic key

3

This diagnostic key divides corn growth stages into four periods. To use the key, find the appropriate growth stage and locate the symptoms you are observing in the field; additional choices can be found under some symptoms. Page numbers will direct you to photos and detailed information about each symptom and the insects that most likely cause it.

Pictures representing each growth stage (right) have been used throughout this guide and on the time line. For reference, corn growth stages are defined on the inside back cover, where you will also find a pest index and a short glossary.

 Planting to V2

 VE to V8

 V8 to VT

 VT to R6



Corn planting to full emergence (up to V2)

Gaps or skips in the row

Seedlings pulled up and eaten page 5

- *Birds*
- *Rodents*

Seeds bored into or hollowed out 5

- *Seedcorn maggot*
- *Seedcorn beetles*
- *Wireworms*



Emergence to knee-high corn (VE to V8)

Stunting or wilting

Stunting or wilting 9, 10

- *Wireworms*
- *White grubs*
- *Grape colaspis larva*
- *Chinch bug*

“Dead heart” (center leaves are dying or dead) 10

- *Wireworms*
- *Black cutworm*
- *Stalk borer*

Unnatural growth (stem twisting or excessive tillering) 16

- *Stalk borer*
- *Billbugs*
- *Stink bugs*

Speckled or “sandblasted” leaves 18

- *Thrips*

Removal of plant tissue

Irregular narrow lines or “tracks” scratched from top layer of tissue 18

- *Corn flea beetle*

Whole plants cut off near base 18

- *Black cutworm (less commonly, claybacked cutworm)*
- *Sod webworm*

Chunks of leaf tissue or entire leaves eaten 21, 22

- *Cutworms*
- *Sod webworm*
- *Leafrollers*
- *Southern corn leaf beetle*
- *Stalk borer*
- *Armyworm*

Small, symmetrical, rounded holes in leaves 22

- *Billbugs*

Lacy, skeletonized leaves 22

- *Southern corn rootworm beetle*



Knee-high to tasseling corn (V8 to VT)

Leaf tissue removed

Chunks of plant tissue removed from leaf margins, or ragged holes in leaves page 26

- Stalk borer
- Armyworm
- Fall armyworm
- Grasshoppers
- Corn earworm

Small, circular holes or elongated lesions in leaves 27

- European corn borer
- Southwestern corn borer

Stalks malformed: Lodging or growing upward in a gooseneck shape 36

- Corn rootworm larvae

Holes bored in stalk 36

- Stalk borer
- European corn borer
- Southwestern corn borer



Tasseling to corn maturity (VT to R6)

Leaf tissue removed

Chunks of plant tissue removed from leaf margins, or ragged holes in leaves 40

- Armyworm
- Fall armyworm
- Grasshoppers

Small, circular holes or elongated lesions in leaves 41

- European corn borer
- Southwestern corn borer
- Corn rootworm beetle (esp. western)

Stalks malformed or broken

Lodging or growing upward in a gooseneck shape 41

- Corn rootworm larvae

Stalks broken 41

- European corn borer
- Southwestern corn borer

Tassels damaged

Tassels broken 41

- European corn borer

Tassels eaten (in whorl) 41

- Fall armyworm

Tassels discolored 41

- Corn leaf aphid

Silks clipped 43

- Grasshoppers
- Corn rootworm adults
- Corn earworm
- Japanese beetle
- Yellow woollybear

Ear damage

Large chunks of kernels removed, often at blister and milk stages 45

- Grasshoppers

Tunneling or chewing damage 45

- Fall armyworm
- European corn borer
- Corn earworm

Ear drop 45

- European corn borer