

Second Edition

Mid-Atlantic Guide to the

**Insect Pests and
Beneficials *of*
Corn, Soybean,
and
Small
Grains**



VIRGINIA
IPM
Integrated Pest
Management

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Authors:

D. Ames Herbert, Jr., Extension Entomologist,
Virginia Tech (retired)

Sean Malone, Research Specialist, Virginia Tech

Co-authors/Contributors:

Galen Dively, Emeritus Professor, University of Maryland

Jeremy K. Greene, Research/Extension Entomologist,
Clemson University

John Tooker, Extension Entomologist, Penn State University

Joanne Whalen, Extension IPM Specialist, University of
Delaware

Roger Youngman, Extension Entomologist, Virginia Tech

Produced by:

Communications and Marketing, College of Agriculture
and Life Sciences, Virginia Tech

Tim FisherPoff, Art Director

Thea Glidden, Director, Communications and Marketing

**Virginia
Cooperative
Extension**

 **VirginiaTech**
Invent the Future

VSU
VIRGINIA STATE
UNIVERSITY

CLEMSON
UNIVERSITY

PENNSTATE



College of
Agricultural
Sciences

 **COOPERATIVE
EXTENSION**
UNIVERSITY OF DELAWARE
College of Agriculture & Natural Resources

 **MARYLAND
COOPERATIVE
EXTENSION**
UNIVERSITY OF MARYLAND
COLLEGE PARK • EASTERN SHORE

Photo Credits:

Michael Boone	12, 14, 37
Scott Bauer	24, 38
Jack Kelly Clark	19, 22, 23, 24, 25, 26, 27, 38
Clemson University	3, 5, 8, 14
Whitney Cranshaw	7
Jack Dykinga	25
Mark Graustein.....	15
Jeremy Greene.....	11
Krista Hamilton	6
D. Ames Herbert, Jr.	19, 20
M. Kogan.....	15
David R. Lance	10
Jerry Leonard.	10
Richard Leung	18
Charles Lewallen	8
Sean Malone	14
Russ Ottens	10, 36
Marlin E. Rice.....	5, 6, 9, 18, 34
John Ruberson	26
Lynette Schimming	9, 36
Alton N. Sparks, Jr.	2, 18, 19, 25
Martin Spellman	1, 2, 3, 4, 8, 9, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38
Don Steinkraus	7
Richard G. Weber.....	12
Roger Youngman.....	4

Seedcorn maggot

corn, soybean



M. Spellman

Larvae

Feed on seed contents, leaving only empty shells; occasionally feed on seedling stems; damage pattern generally field-wide.

corn

Wireworm

Larva

Pale yellow to reddish-brown body; hard bodied; feed on corn seed and below-ground seedling stems and roots.



M. Spellman

Annual white grub

corn



Alton N. Sparks, Jr., The University of Georgia,
www.insectimages.org

Larva

There are several scarab species (Japanese beetle, June beetle, oriental beetle) that have similar-looking larvae called white grubs. They are typically cream-colored with a brown head and hold their body in a C-shape. They feed on germinating corn seed and newly developing roots. Damage is usually localized within fields.

Oriental beetle larva



M. Spellman

corn

Western corn rootworm

Larva

Cream-colored with dark brown head and rear end; feed on corn roots.

Adult

Yellow in color with three black stripes running down the length of the wing covers; feed on silks and tassels.



M. Spellman



M. Spellman

CORN

Seedcorn maggot • Wireworm
• Annual white grub • Western corn rootworm 2

Billbug

corn



Clemson University - USDA Cooperative Extension Slide Series,
www.insectimages.org

Adult

Ash-gray or brown in color, usually covered with soil. Often attached upside-down on corn seedling near the ground. Chew into side of corn seedling and feed on inner plant tissue which can result in excessive plant suckering.

corn, soybean Common stalk borer



Larva

Small larvae are cream-colored; first four abdominal segments of larger larvae are dark brown/purple; several dark lengthwise stripes may be present. They tunnel inside corn stalks in lower portion of plant.

M. Spellman

European corn borer

corn



R. Youngman

Larva

Flesh-colored, ranging from creamy-white to faint pink in color with a dark brown head; has several small dark spots on top of each body segment. They initially feed on the leaf surface, generally in the whorl, and later bore into stems and stalks.



M. Spellman

corn, soybean

Fall armyworm

Larva

In corn, they frequently feed on leaf whorls, causing ragged holes when blades unfurl. Later, larvae may feed on tassels and bore into ears and stalks. In soybean, they primarily feed on leaves.



M. Spellman

See key on page 30 for more details.

CORN

Billbug • Common stalk borer
• European corn borer • Fall armyworm 4

Black cutworm

corn



Clemson University - USDA
Cooperative Extension Slide Series, www.insectimages.org

Larva

Have grainy skin like sandpaper; curls into C-shape when disturbed. Young larvae feed on leaves. Older larvae found near base of plants and cut plants near base or below ground. Larvae feed at night and hide in soil during the day.

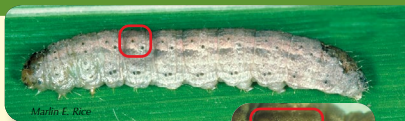
corn, soybean

Dingy cutworm

Larva

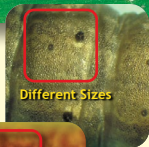
Smooth-skinned; eats leaves on young corn plants but rarely cuts corn.

To distinguish black from dingy, use a hand lens to look at the four tubercles (warts) along the top center of each body segment. On the black, the inside pair of tubercles is about half the diameter of the outside pair. On the dingy, these tubercles are about the same diameter.



Marlin E. Rice

Black cutworm



Different Sizes

Marlin E. Rice



Same Size

Marlin E. Rice

Dingy cutworm

Western bean cutworm

corn



Krista Hamilton, Wisconsin Department of Agriculture, Trade & Consumer Protection

Larva

Larvae feed on reproductive tissue of corn plants, primarily on tassels and inside husks on developing kernels. Larval coloration ranges from gray to tan to pink. Unlike many larvae, they do not have stripes extending down the sides of the body. Immediately behind the head they have a dark brown to black collar that is interrupted by light brown lines.



Marlin E. Rice



Marlin E. Rice

Head patterns (left to right)

Western bean cutworm (dark collar just behind the head with light brown lines, no stripes on the body)

Corn earworm (no dark collar, has distinct stripes down the sides of the body)

CORN

Black cutworm • Dingy cutworm
• Western bean cutworm 6

Thrips

soybean



Larva

Less active than adults; usually pale to yellowish in color.

Adult

Active crawlers; slender and cigar-shaped; feed on soybean leaves, causing faint striping and silvery appearance. Injury usually occurs to seedlings and because of plant regrowth is rarely of economic importance.

D. Steinkraus



D. Steinkraus

soybean

Twospotted spider mite

Eggs, nymphs, adults (non-insect)

Especially common during periods of hot, dry weather. Usually first seen along field edges. Initial damage appears as stippling at the base of leaves. Extreme webbing and defoliation can occur if populations are large.



Whitney Cranshaw, Colorado State University,
www.insectimages.org

Soybean aphid

soybean



M. Spellman

Wingless aphids

Pale yellow to light green with black tailpipes; can be found on leaves, stems, petioles, and pods; generally the only aphid that reproduces on soybean. Feeding causes leaf spotting, leaf loss, and pod shed if populations are large.

soybean

Threecornered alfalfa hopper

Nymph

Bright green with spines along top of back.

Adult

Bright green wedge-shaped hoppers; girdle soybean stems and petioles, causing lodging and breakage.

Charles Lewallen



*Clemson University
- USDA Cooperative
Extension Slide
Series, www.insectimages.org*

SOYBEAN

Thrips • Twospotted spider mite
• Soybean aphid • Threecornered alfalfa hopper

Potato leafhopper

soybean



Marlin E. Rice

Nymph

Nymphs resemble adults but are smaller and wingless. They feed by sucking plant juice and injecting toxic substances which causes stippling, leaf curling, and yellowing then dessication of leaf margins.



Marlin E. Rice

Adult

Spindle-shaped, yellow-green, elongate hoppers.

corn, soybean

Green stink bug

Adult

Pierce soybean pods destroying young seed resulting in flat pods or dark spots and shriveling of older seed. Feeding on seedling corn may kill plants or cause stunting or suckering; attacked ears may be misshapen.

See key on page 33 for more details.

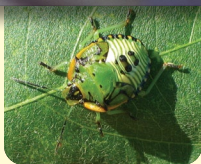
Nymph

Damage, especially by older nymphs, is similar to that caused by adults.

See key on page 34 for more details.



M. Spellman



Lynette Schimming

Brown stink bug

soybean



Russ Ottens,
The University of Georgia,
www.insectimages.org

Jerry Leonard

Adult

Damage is similar to green stink bug.

See key on page 33 for more details.



Nymph

See key on page 34 for more details.

soybean, corn Brown marmorated stink bug

Adult

A newly introduced species; speckled brownish-gray in color; a white stripe on the next to last antennal segment; several white spots on outside edges of rear abdominal segments; small round coppery patches appear on or near head.



David R. Lance, USDA APHIS PPQ, www.insectimages.org

SOYBEAN

Potato leafhopper • Green stink bug
• Brown stink bug • Brown marmorated stink bug 10

Kudzu bug

soybean

The species has a preference for leguminous hosts, such as kudzu, wisteria, soybeans, and others, but it has been reported on fruit trees and various other hosts also. Loss of soybean yield can result from extended exposure to these insects.

Jeremy K. Greene,
Clemson University



Eggs

Nymphs

Young nymphs are small and orange, and older nymphs are very hairy but resemble adults in body shape. When disturbed, the insects produce a foul odor similar to that produced by stink bugs.



Jeremy K. Greene, Clemson University

Adult

Adults are about 5-mm long, olive-green colored with dark brown speckles, and are almost square-shaped but taper near the head region.

Jeremy K. Greene, Clemson University

Jeremy K. Greene,
Clemson University



Heavily infested
soybean plants



Grasshopper

soybean, corn



Richard G. Weber

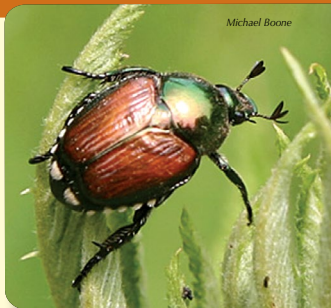
Adult

There are approximately 600 grasshopper species in the U.S. The redlegged (pictured here) is commonly found feeding on foliage, especially seedlings on field edges during dry periods.

soybean

Japanese beetle

Michael Boone



Adult

Metallic green body and coppery wing covers with 12 tufts of white hairs bordering the margin of wing covers. Adults skeletonize leaves, leaving large veins intact.

SOYBEAN

Kudzu bug • Grasshopper

• Japanese beetle 12

Bean leaf beetle

soybean



M. Spellman



M. Spellman



M. Spellman

Adult

Green, yellow, tan, or red with a darkened triangular-shaped marking behind head; the number of black spots varies. They chew characteristic round holes in soybean leaves and scar outer pod walls later in the season.

See key on page 35 for more details.

Blister beetle

soybean

Clemson University - USDA Cooperative
Extension Slide Series, www.insectimages.org



Margined blister beetle

Adult

Strictly foliage feeders; feed in clusters and skeletonize leaves similar to Japanese beetle.



Striped blister beetle

Adult

Orange with dark brown/black stripes.

Clemson University - USDA Cooperative Extension
Slide Series, www.insectimages.org

soybean

Mexican bean beetle

Larva

Larvae and adults feed between the veins on the surface of leaves, leaving a lacy network of the tougher leaf tissues and veins. Damaged leaves turn brown and heavily damaged fields have a brown or burnt cast.

Adult

See key on page 35 for more details.

S. Malone



Michael Boone

SOYBEAN

Bean leaf beetle • Blister beetle

• Mexican bean beetle 14

Dectes stem borer

soybean



Mark Graustein

Larva

Creamy-white color with a head wider than body and an amber head capsule; found in soybean stems. Older larvae girdle stems causing plants to lodge.



M. Kogan

Adult

Dark gray elongate beetles, about 1.5 cm long, with banded antennae longer than the body.

soybean, corn

Corn earworm

M. Spellman



Larva

In corn, larvae will feed on foliage but most typically feed on developing kernels in the ear tip. In soybean, young larvae feed on flowers and tender foliage. Older larvae feed on seed within the pods.

See key on page 30 for more details.

Beet armyworm

soybean



M. Spellman

distinctive dark spot on each side just above the second pair of true legs. They are foliage feeders and may cause severe levels of leaf damage when populations are high.

See key on page 32 for more details.

Larva

Light-green to black; green forms with many fine, white wavy lines along the back and a broader stripe along each side; usually a

soybean

Yellowstriped armyworm

M. Spellman

Larva

Range from almost black to light brown; feed on leaves but rarely in large enough numbers to cause economic damage.

See key on page 31 for more details.



M. Spellman

SOYBEAN

Dectes stem borer • Corn earworm

• Beet armyworm • Yellowstriped armyworm 16

Soybean looper

soybean



M. Spellman

Larva

Light green, body usually thicker towards the rear. Leaf feeding gives plants a ragged appearance and large populations are capable of causing heavy leaf loss.

See key on page 28 for more details.

soybean

Green cloverworm

Larva

Pale green, often with 2 white longitudinal stripes on each side; thrash violently when disturbed. Feed exclusively on leaves but rarely cause economic damage.

See key on page 28 for more details.



M. Spellman

Saltmarsh and yellow woollybear caterpillars

soybean



Alton N. Sparks, Jr., The University of Georgia,
www.insectimages.org

Saltmarsh caterpillar

Fuzzy looking; pale yellow to red to nearly black. Look very similar to the yellow woollybear caterpillar. Both feed on leaves, causing damage similar to other caterpillars.



Marlin E. Rice

Yellow woollybear caterpillar

Color varies from pale yellow to red to black.

soybean

Silverspotted skipper

Larva

Greenish-yellow with dark brownish-red head and large, round, bright orange eye spots; young larvae construct a characteristic “folded leaf” nest. They feed on leaves at night.

Adult

Large silver spot on undersides of hind wings.



M. Spellman



Richard Leung

SOYBEAN

Soybean looper • Green cloverworm
• Saltmarsh and yellow woollybear caterpillars
• Silverspotted skipper **18**

Small grains aphids

small grains



Alton N. Sparks, Jr., The University of Georgia, www.insectimages.org

◀ Greenbug

All grain aphids feed by removing plant sap, which can introduce disease and cause leaf mottling and discoloration. Greenbug is more damaging, as it releases a toxin when it feeds, causing yellow spots and plant death. Greenbug is light green with a dark green stripe down middle of back; antennae and tailpipes not all black.



A. Herbert

M. Spellman

▶ Bird cherry-oat aphid

Dark green with distinctive reddish color around base of tailpipes.

English grain aphid ▶

Solid green with long black antennae and black tailpipes.



▶ Corn leaf aphid

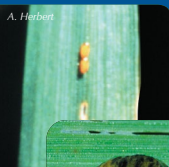
Appear pale blue-green to dark blue; black antennae and tailpipes; dark blue area at base of tailpipes. Body often seems to have a powdery coating. More common on sorghum but also found on wheat.



Jack Kelly Clark, courtesy University of California Statewide IPM Program

Cereal leaf beetle

small grains



Eggs

Orange colored; laid in groups of 1-3 end-to-end on tops of leaves often along midveins.



Larva

Most damage is done by larvae feeding on the leaf surface, causing a frosted appearance to heavily damaged fields. They are yellow but usually covered with a brown or black coating of fecal material.

Adult

Metallic blue-black head and wing covers; area behind head is red.



small grains

Hessian fly

Larvae

Red upon hatching but turn white after 4-5 days. Larvae extract juices from between leaf sheaths and stems. Fall feeding causes plant yellowing and death; spring feeding causes stunting and lodging of new tillers.

Pupae

Red to dark brown spindle-shaped 'flax seed.' Usually found below the soil (singly or in clusters) near or burrowed into plant crown.



SMALL GRAINS

Small grains aphids
• Cereal leaf beetle • Hessian fly 20

True armyworm

small grains, corn



Larva

M. Spellman

Typically a spring or early summer pest. In grain, they feed on leaves and later cut through stems just below heads. In corn, they feed on lower leaves, progressing upwards, leaving midribs of mature leaves. They migrate as an 'army' to new hosts. See key on page 29 for more details.

small grains

Grass sawfly

Larva

Solid green color, amber head with a brown band, and a pair of prolegs on every body segment. They prefer to feed on stems and clipping often occurs before grain reaches maturity.

*M. Spellman*

Syrphid fly



M. Spellman

Larva

Maggot-like larva with a body that tapers to the head end. No legs but moves well.



M. Spellman



Jack Kelly Clark, courtesy University of California Statewide IPM Program.

Adult

The adult looks like a small bee with a bright yellow and black striped body. They fly quickly and hover, hence the common name 'hover fly.'

Lady beetle



M. Spellman

Larva

Look like tiny alligators with blue to black bodies and distinct yellow to orange markings.

Convergent lady beetle larva



Jack Kelly Clark, courtesy University of California Statewide IPM Program.

Scott Bauer, USDA



Multicolored Asian lady beetle adult

See key on page 36 for more details.



Pink spotted lady beetle adult

Body elongated (not round like other lady beetles); pink to orange with black spots.

See key on page 36 for more details.

M. Spellman

Convergent lady beetle adult

See key on page 36 for more details.

Jack Kelly Clark, courtesy University of California Statewide IPM Program.



Lacewings



Jack Dykinga, USDA

Larva

Similar to lady beetle larva but with prominent forward-extending mandibles.

Green lacewing adult

Yellowish green with four delicate transparent wings with many veins; has long hair-like antennae and red-gold eyes.



Alton N. Sparks, Jr., The University of Georgia, www.insectimages.org

Jack Kelly Clark, courtesy University of California Statewide IPM Program.

Brown lacewing adult

Similar to green lacewing but brown and about half the size.



Orius species



John Ruberson, The University of Georgia,
www.insectimages.org

Insidious flower bug

No V-shaped mark on back; have light yellow/tan wings.

Nymph

(not pictured) Shiny yellow-orange and do not have wings.

Minute pirate bug nymph

Yellow to amber pear-shaped body with red eyes and no wings.



Jack Kelly Clark, courtesy
University of California
Statewide IPM Program.



Minute pirate bug adult

Has a black V-shaped mark on back and a faint gray spot on the hind wing membrane.

Jack Kelly Clark, courtesy University of California Statewide IPM Program.

Bigeyed bug



Jack Kelly Clark,
courtesy University of
California Statewide
IPM Program.



Jack Kelly Clark,
courtesy University of
California Statewide
IPM Program.

Nymph

Slightly smaller than adults; predominately silver-gray with black markings.

Adult

Oval, somewhat flattened, about 4 mm long, usually brownish or yellowish, with a wide head and prominent bulging, widely-spaced eyes.

Parasitized aphids

Aphids can be parasitized by small wasps that develop inside the aphid body and exit leaving a hollow brown outer shell called a mummy.



M. Spellman

Fungal infected insects



M. Spellman

Fungal diseases infect several insect species, leaving powdery-looking cadavers.



M. Spellman



M. Spellman

Spined soldier bug



This stink bug resembles brown stink bug but is a predator that feeds on caterpillars and other small insects.

See key on page 33 for more details.

M. Spellman

Nabids

Adult

Slender mostly yellowish, gray, or dull brown with elongated heads, with long pointed beak-like mouthparts and long elbowed antennae.

M. Spellman



Lepidoptera larvae with 2 or 3 pair of prolegs



M. Spellman

Green cloverworm - 3 pair of prolegs.

Soybean looper - 2 pair of prolegs.



M. Spellman

Lepidoptera larvae with 4 pair of prolegs



True armyworm

Orange or brown stripe edged with white along sides with dark diagonal bands at the top of each abdominal proleg; head mottled with two dark stripes; commonly found in spring/early summer attacking grasses or grains.



M. Spellman

Corn earworm

Tan to amber head color and conspicuous black hairs on body.



M. Spellman

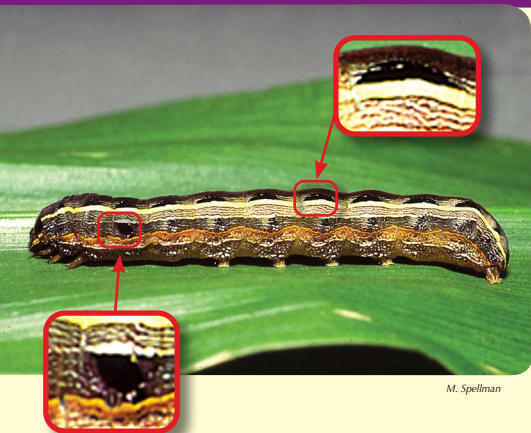
Fall armyworm

Dark brown head color with conspicuous cream-colored inverted "Y".

Black dots form a square on top of rear end.



Lepidoptera larvae with 4 pair of prolegs



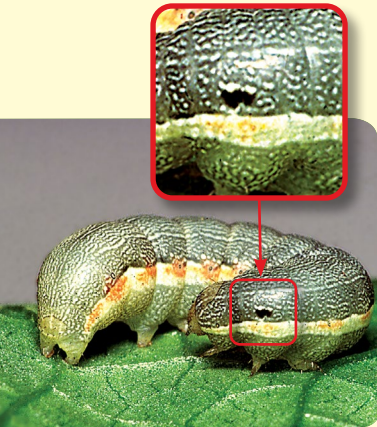
M. Spellman

Yellowstriped armyworm

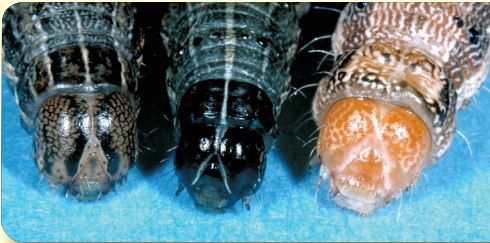
Pairs of black triangular markings on each segment of the back with bright yellow stripe just below; dark spot above first abdominal segment.

Beet armyworm

Light green to black with many fine white wavy lines along back and a broader stripe along each side; small black spot on each side of body above second true leg.



M. Spellman



Marlin E. Rice

Head patterns (left to right)

True armyworm (head mottled with 2 dark stripes)

Fall armyworm (dark brown color with conspicuous cream-colored inverted "Y")

Corn earworm (tan to amber head color)

Stink bugs



Green stink bug adult

Bright green with black bands on antennae.

M. Spellman

M. Spellman

Brown stink bug adult

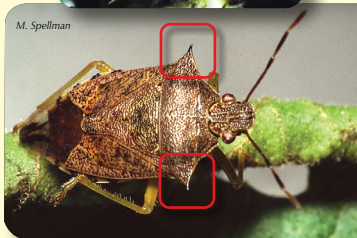
Brown with either a yellow or light green underside; has rounded shoulders.



M. Spellman

Spined soldier bug (beneficial)

Brown with a white to light cream-colored underside; has sharp-pointed shoulders.





Lynette Schimming

Green stink bug nymph

Predominately black when small, but become green with orange and black markings as they mature.

Brown stink bug nymph

Yellow to tan with brown spots down the middle of the back.

*Russ Ottens, The University of Georgia,
www.insectimages.org*



Beetle adults



M. Spellman

Bean leaf beetle

Body color and number of black spots variable but always has black triangle behind head.

Mexican bean beetle

Copper-orange color with 3 rows of black spots (16 spots total).



Michael Boone



Jack Kelly Clark, courtesy University of California Statewide IPM Program.

Convergent lady beetle

Has two distinct white lines behind the head that converge towards the back.



Scott Bauer, USDA

Multicolored Asian lady beetle

The 19 spots may be faint or missing; ranges from yellow to red-orange in color; has W-shaped mark behind head.

Pink spotted lady beetle

Lacks the black triangle behind head that helps distinguish it from bean leaf beetle.



M. Spellman

Index

Annual white grub.....	2
Bean leaf beetle.....	13, 37
Beet armyworm.....	16, 34
Bigeyed bug.....	27
Billbug.....	3
Black cutworm.....	5
Blister beetle.....	14
Brown lacewing.....	25
Brown marmorated stink bug.....	10
Brown stink bug.....	10, 35, 36
Cereal leaf beetle.....	20
Common stalk borer.....	3
Convergent lady beetle.....	23, 24, 38
Corn earworm.....	15, 32, 34
Dectes stem borer.....	15
Dingy cutworm.....	5
European corn borer.....	4
Fall armyworm.....	4, 32, 34
Fungal infected insects.....	28
Grass sawfly.....	21
Grasshopper.....	12
Green cloverworm.....	17, 30
Green lacewing.....	25
Green stink bug.....	9, 35, 36
Hessian fly.....	20
Insidious flower bug.....	26
Japanese beetle.....	12
Kudzu bug.....	11
Lacewings.....	25
Lady beetle.....	23, 24, 38
Mexican bean beetle.....	14, 37
Minute pirate bug.....	26
Multicolored Asian lady beetle.....	24, 38

Nabids.....	29
Orius species.....	26
Parasitized aphids.....	27
Pink spotted lady beetle.....	24, 38
Potato leafhopper	9
Saltmarsh and yellow woollybear caterpillars	18
Seedcorn maggot.....	1
Silverspotted skipper.....	18
Small grains aphids.....	19
Soybean aphid.....	8
Soybean looper	17, 30
Spined soldier bug.....	29, 35
Stink bugs.....	9, 10, 35, 36
Syrphid fly	22
Threecornered alfalfa hopper.....	8
Thrips	7
True armyworm	21, 31, 34
Twospotted spider mite.....	7
Western bean cutworm.....	6
Western corn rootworm.....	2
Wireworm	1
Yellowstriped armyworm	16, 33

Funding sources:

This publication is supported, in part, with funding from the United Soybean Board/Soybean Checkoff.





2023

444-360 (ENTO-575P)

Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and local governments. Its programs and employment are open to all, regardless of age, color, disability, sex (including pregnancy), gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, military status, or any other basis protected by law.