

**RUTGERS**

New Jersey Agricultural  
Experiment Station

# **Managing Turfgrass Insects of the Northeast**

## **Part 3: Surface-feeding insect pests**

(updated 3-15-2022)

**Albrecht Koppenhöfer**

**Rutgers Cooperative Extension**

- **ID, BIOLOGY & SPECIAL CONTROL CONSIDERATIONS**
  - **Stem- and crown-burrowing pests (3-54)**
  - **Sucking pests (55-74)**
  - **Leaf- and stem-chewing pests (75-105)**

# **Stem & Crown Burrowing Pests**

- **Billbugs**
- **Annual bluegrass weevil**
- **Frit fly**

# Billbugs

*Sphenophorus* spp.  
(Coleoptera: Curculionidae)



Snout  
(‘bill’) →

Adult

D. Shettlar



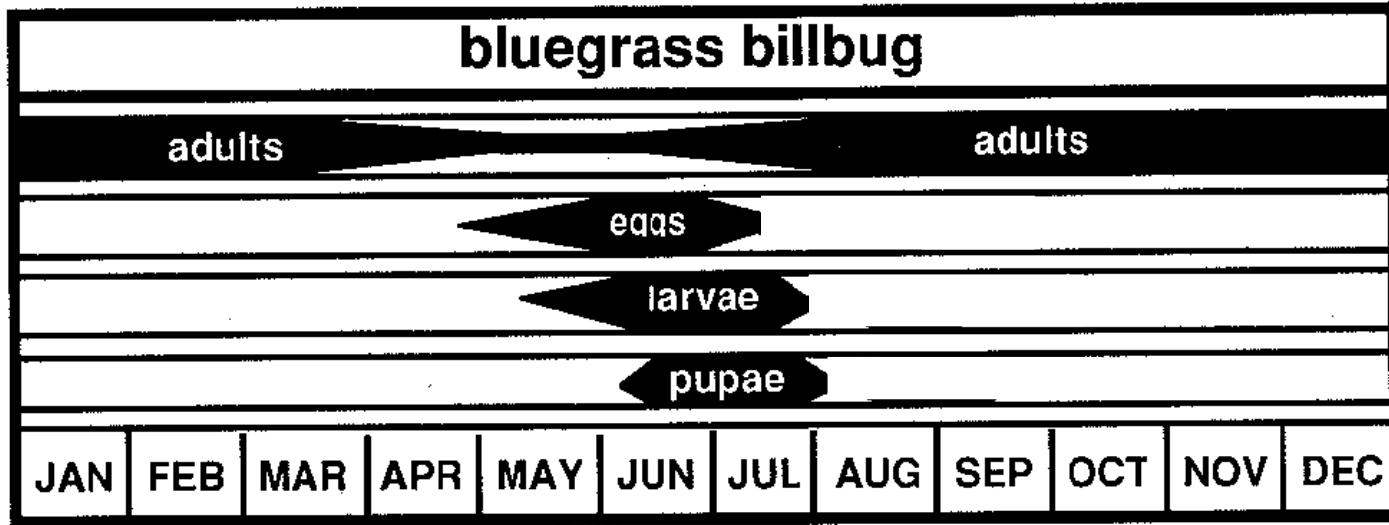
0.3-0.5”



Larva

M. Johnson

# Billbugs - Development



Hunting BB,  
uneven BB,  
Small BB  
Probably  
similar in NE

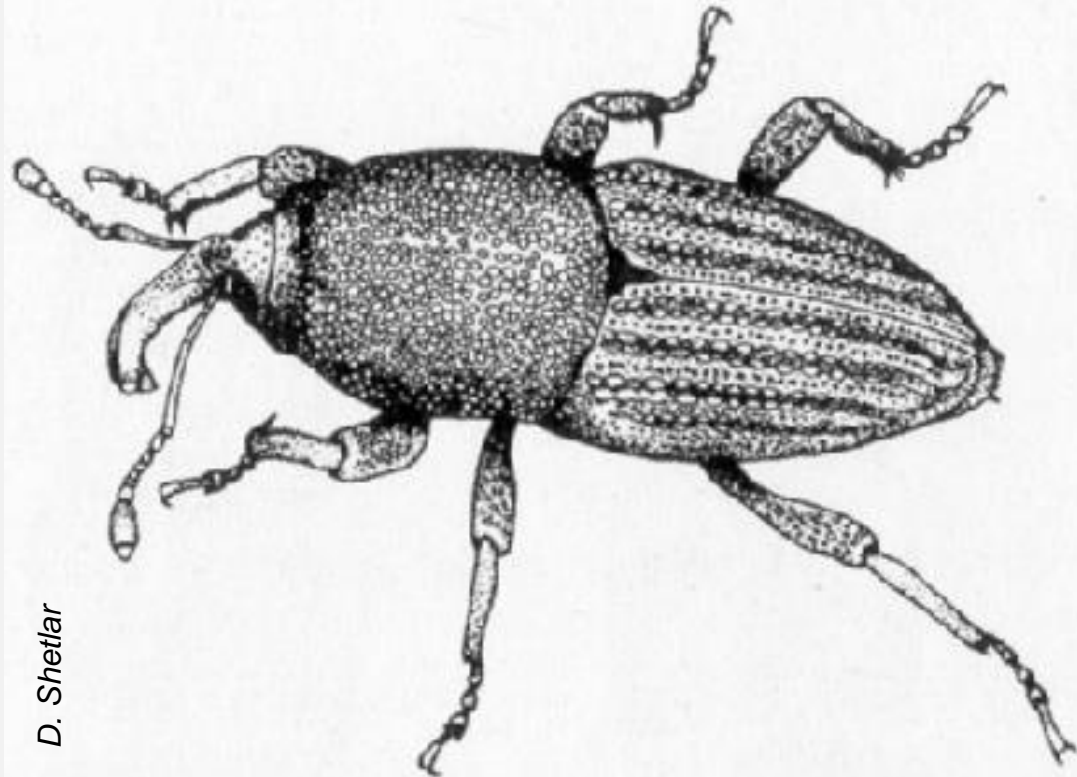


from Brandenburg & Villani 1995

## Billbugs

## Adults

- Long snout (bill) with mouthparts at tip
- Elbowed antennae attached at snout base
- Length of snout+head+thorax ~ elytra
- 0.3-0.5" long
- Grayish to black



## Billbugs

## Larvae

- Cream colored body
- Brown head
- Body somewhat curved, fat through middle, pointed at tail
- Like small white grubs but legless
- 0.05 (L1) to 0.4" (L5) long
- No differences between species



# Billbugs – Important Species

Bluegrass billbug, *S. parvulus*

- Common in cool-season zones across USA
- Prefers cool-season grasses

Hunting billbug, *S. venatus vestitus*

- Common in transition and southern turf areas where it prefers warm-season grasses, espec. Bermudagrass and zoysiagrass.
- In NJ also common in cool-season grasses; probably *S. venatus venatus*.

Other species more restricted in distribution.

In NJ also small billbug and uneven billbug.



# Billbugs – Identification of Species



D. Richmond

**Small**  
*S. minimus*



D. Richmond

**Uneven**  
*S. inaequalis*



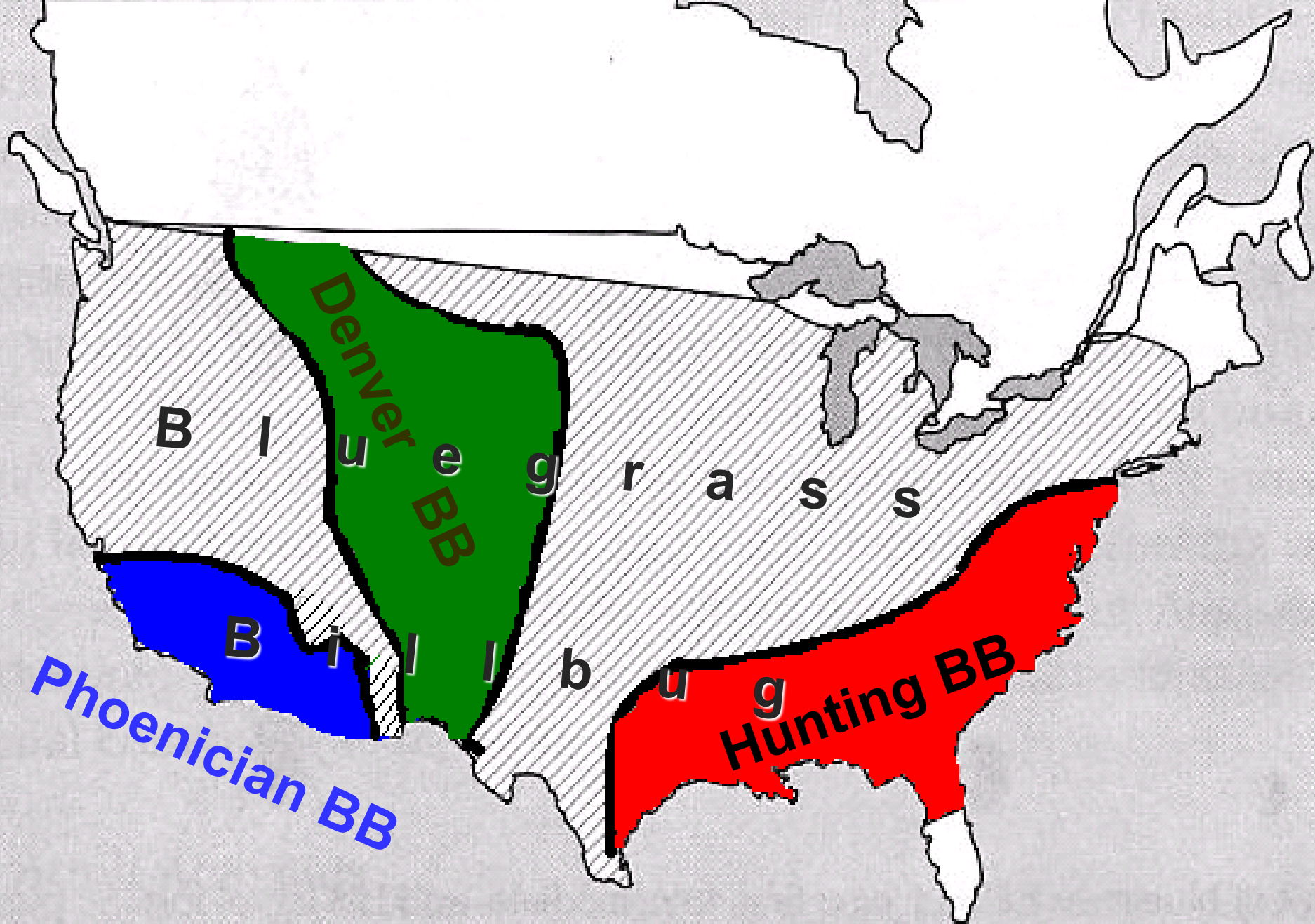
J. Kalish

**Bluegrass**  
*S. parvulus*



D. Shetlar

**Hunting**  
*S. venatus vestitus*



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Denver BB

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Phoenician BB

Hunting BB

## Billbugs

# Injury

- Young larvae feed inside grass stems, then burrow down to feed on crown.
- Older larvae feed externally on crowns, roots, and rhizomes.
- Stems break off at crown, are hollowed out or filled with sawdust-like frass.



D. Shetlar

D. Shetlar

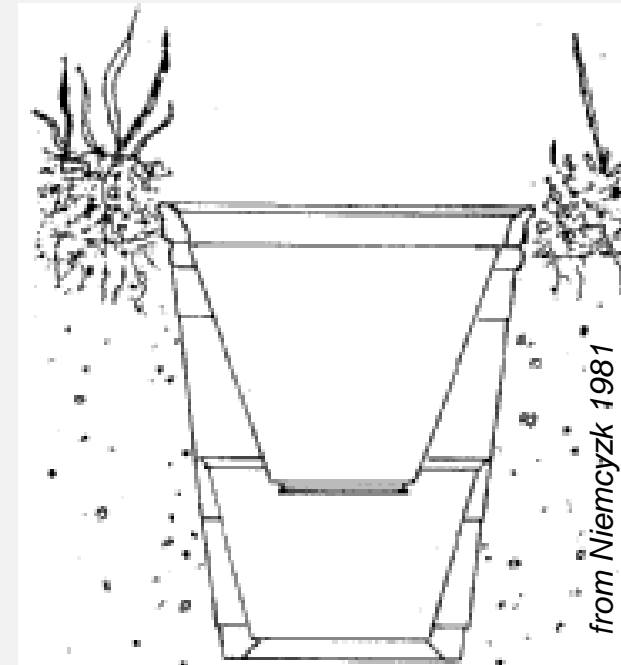
# Injury

- Initially scattered dead stems, later growing patches of dead turf
- Damage in mid/late summer, especially during extended dry periods
- Symptoms often attributed to drought, dollar spot, brown patch, other insects



# Billbugs - Monitoring

- Monitor adults in spring visually or with pitfall traps. Check 2-3 times/week. If > 7-10 adults/trap day, expect severe damage.
- Detection of adults and older larvae with cup cutter sampling.
- “Tug test” to confirm billbug damage.



# Cultural control

- Endophyte-enhanced grasses more or less resistant to billbugs
- KY bluegrass varieties that are thinner leaved, aggressive creepers, and/or more heat/drought tolerant are more billbug-tolerant.
- Moderate damage can be masked by light fertilization and deep watering.



Endophyte hyphae  
between plant cells

# Management

- Preventive treatments vs. adults before egg-laying: spray or granules; 1/10" post-treatment irrigation; withhold deep irrigation for 1-2 days (often unnecessary).
- **Preventive treatment vs. young larvae inside plants using systemics (most effective).**
- Curative treatments vs. larvae in soil: spray or granules; 1/4" post-treatment irrigation (timing difficult).

# Control timing & choices

(Avg. timing for NJ)



	Stage	Apr	May	June	July	Aug	Sept	Oct
<b>Billbugs</b>	Pu							
	Ad							
	Egg							
	L1-5							
<b>Damage</b>	L3-5							
<b>Pyrethroid.*</b>	Ad							
<b>Merit</b>	L1-2							
<b>Meridian #</b>	L1-2							
<b>Arena #</b>	L1-4							
<b>Acelepryn</b>	L1-2							
<b>Tetrino</b>	L1-2							
<b>Ference</b>	L1-2							
<b>Suprado</b>	L3-5							
<b>Sevin</b>	L3-5							
<b>S.carpocap</b>	L3-5							
<b>Insecticide</b>	<b>Target</b>	<b>Apr</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>

\*, incl. combo products (Triple Crown, Aloft, Allectus)

#, not in NY



# Control timing & choices w/o neonics

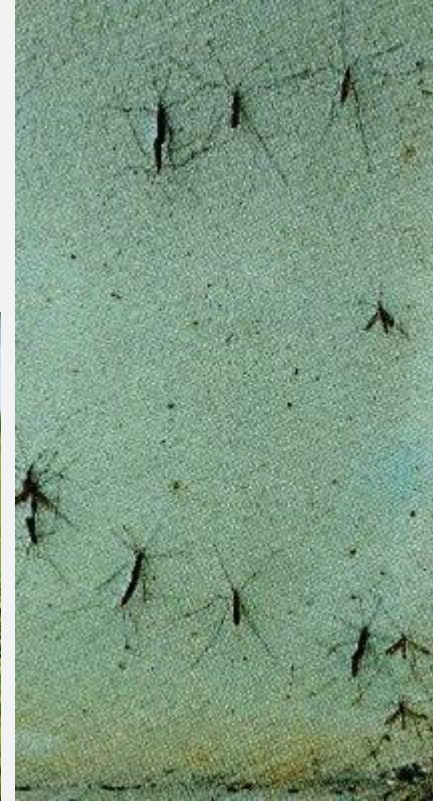
(Avg. timing for NJ)



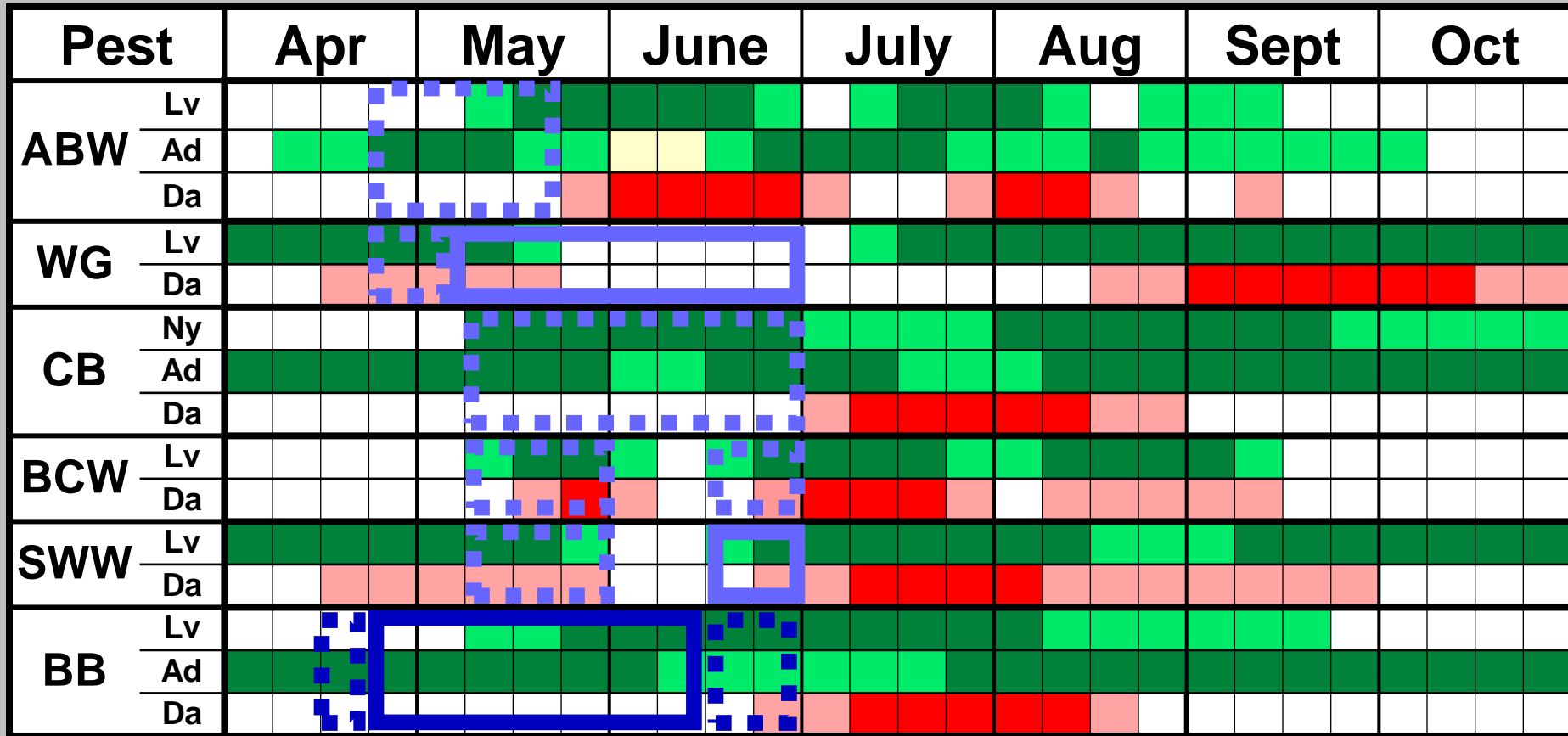
	Stage	Apr	May	June	July	Aug	Sept	Oct
<b>Billbugs</b>	Pu							
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	L1-5							
<b>Damage</b>	L3-5							
<b>Pyrethroids</b>	Ad							
<b>Acelepryn</b>	L1-2							
<b>Tetrino</b>	L1-2							
<b>Ference</b>	L1-2							
<b>Suprado</b>	L3-5							
<b>Sevin</b>	L3-5							
<b>S.carpocap</b>	L3-5							
<b>Insecticide</b>	Target	Apr	May	June	July	Aug	Sept	Oct

# Crane Flies - Monitoring

- Prefer moist, thatchy turf and wet soils high in organic matter
- Protruding pupal cases of emerged adults visible on short-cut grass.
- Adults don't fly far → flying adults and pupal cases suggest where larvae will be in next generation.



# Multi target - Key pest: *Billbug*



- Arena: BB control @ 0.3 lb ai/ac  
 → up to 0.4 lb ai/ac for early and late applications.  
 → also BB, SWW control.  
 → for CB, BCW, ABW control: 0.4 lbs ai/ac.

## Multi target - Key pest: *Billbug*

Pest		Apr	May	June	July	Aug	Sept	Oct
ABW	Lv							
	Ad							
	Da							
WG	Lv							
	Da							
CB	Ny							
	Ad							
	Da							
BCW	Lv							
	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

- Acelepryn: BB control @ 0.1 lb ai/ac  
 → up to 0.2 lb ai/ac for early and late applications.  
 → also WG, SWW, BCW control.  
 → for ABW control: 0.16-0.26 lbs ai/ac.  
 → CB only suppression.

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Pest		Apr	May	June	July	Aug	Sept	Oct
ABW	Lv							
	Ad							
	Da							
WG	Lv							
	Da							
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	Ad							
	Da							
BCW	Lv							
	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

- **Tetrino**: BB control @ 0.045-0.09 lb ai/ac
  - 0.09 lb ai/ac for early and late applications
  - also BCW, SWW, ABW control
  - also CB control if applied late at 0.09 lb ai/ac
  - also WG suppression if applied late at 0.09 lb ai/ac

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	Da							
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	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

- Merit: BB control @ 0.3 lb ai/ac  
 → up to 0.4 lb ai/ac for early and late applications.  
 → also WG control.  
 → CB, BCW, ABW only suppression

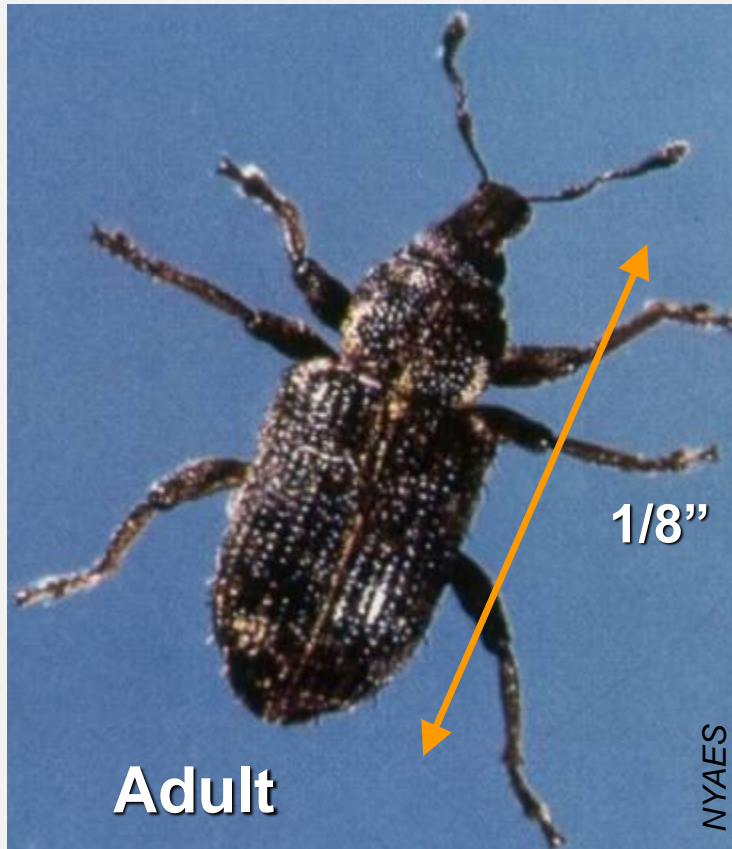
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	Da							
CB	Ny							
	Ad							
	Da							
BCW	Lv							
	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

- Meridian: BB control @ 0.2 lb ai/ac  
 → up to 0.27 lb ai/ac for early and late applications.  
 → also WG control.  
 → CB only suppression.

# Annual bluegrass weevil (ABW)

*Listronotus maculicollis*  
(Coleoptera: Curculionidae)



Formerly classified as *Hyperodes maculicollis*

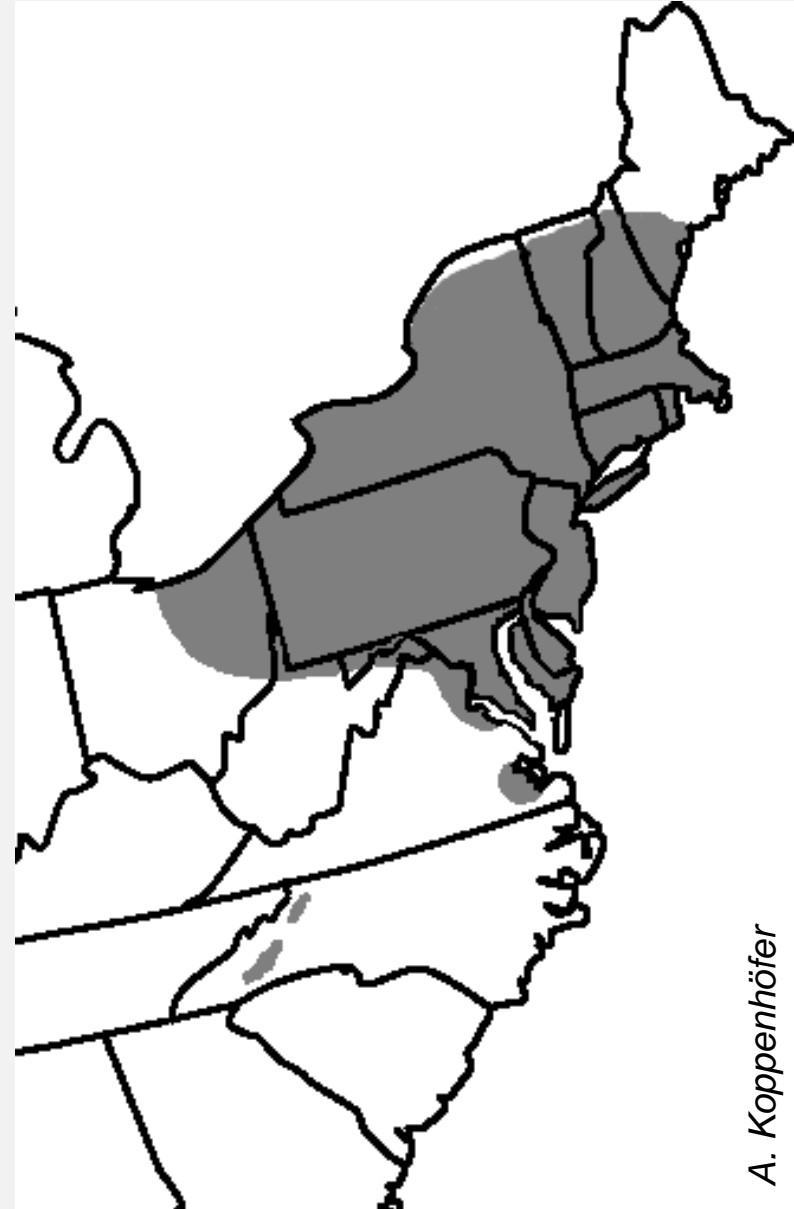




B. McGraw

**ABW**

- Serious expanding pest of close-cut annual bluegrass
- Serious problems throughout NJ, NY, CT, PA, RI, MA, NH, VT, DE, MD.
- Also problems in parts of OH, ME, VA, ONT, QUE.

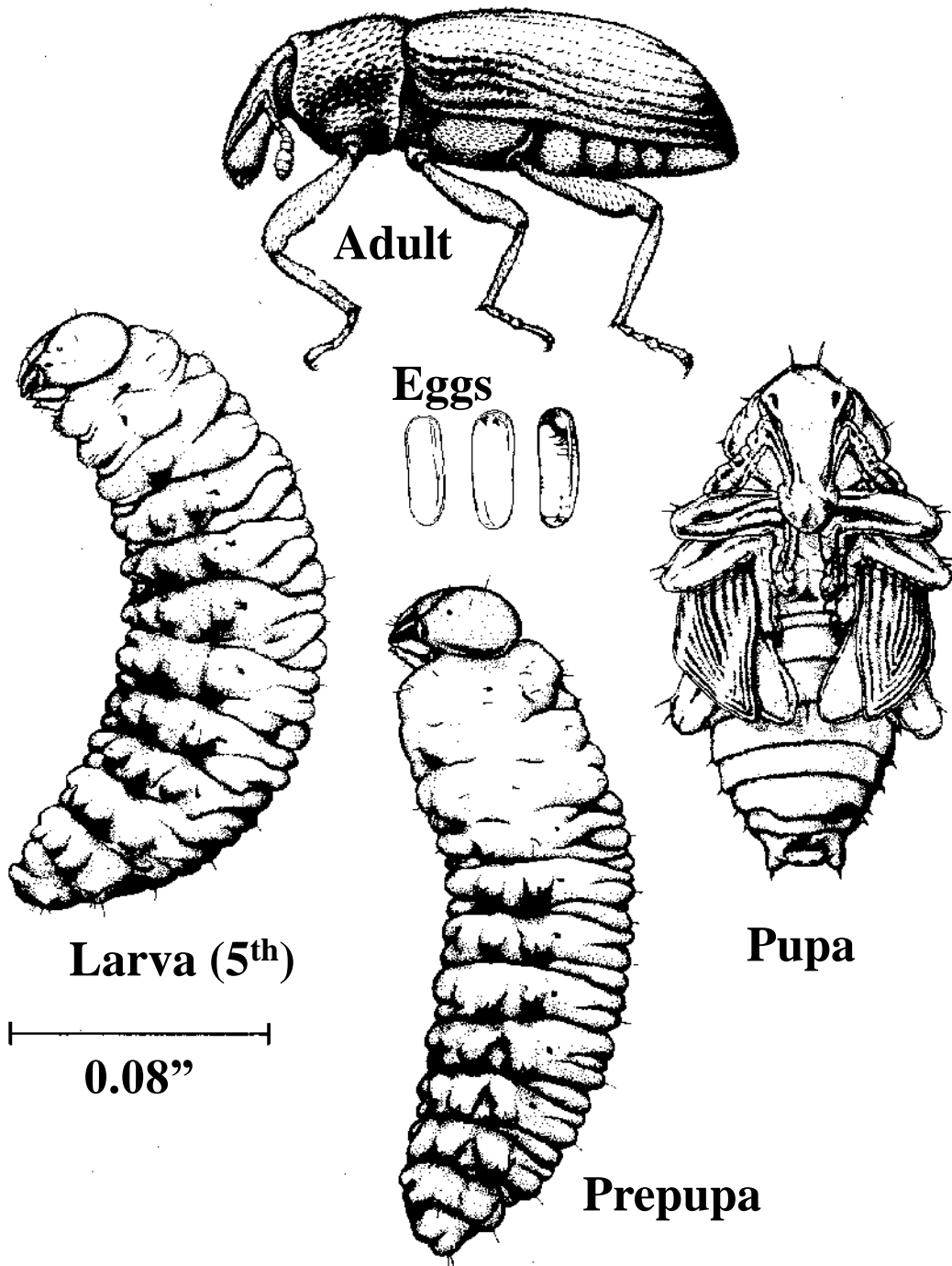


A. Koppenhöfer

# Host Plants

- ❖ *Poa annua* preferred for egg laying, better for larval development, and least tolerant grass.
  - ❖ Creeping bentgrasses can be damaged but much less likely, much less intensive, and can recover better.
- **Keeping *P. annua* percentage as low possible wherever possible using cultural practices and herbicides is the best preventive control for ABW problems !!!**

# ABW Morphology

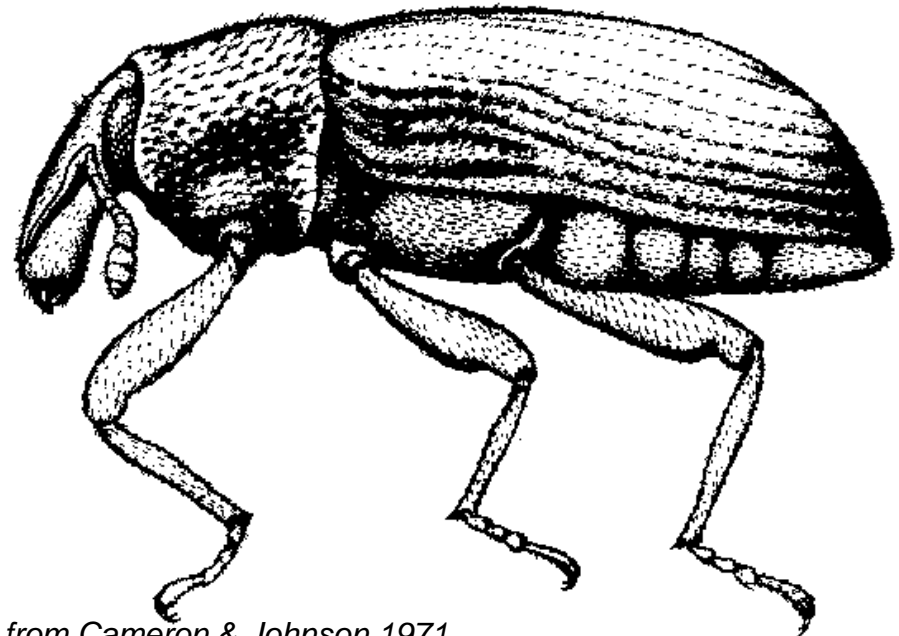


from Cameron & Johnson 1971



## Adult

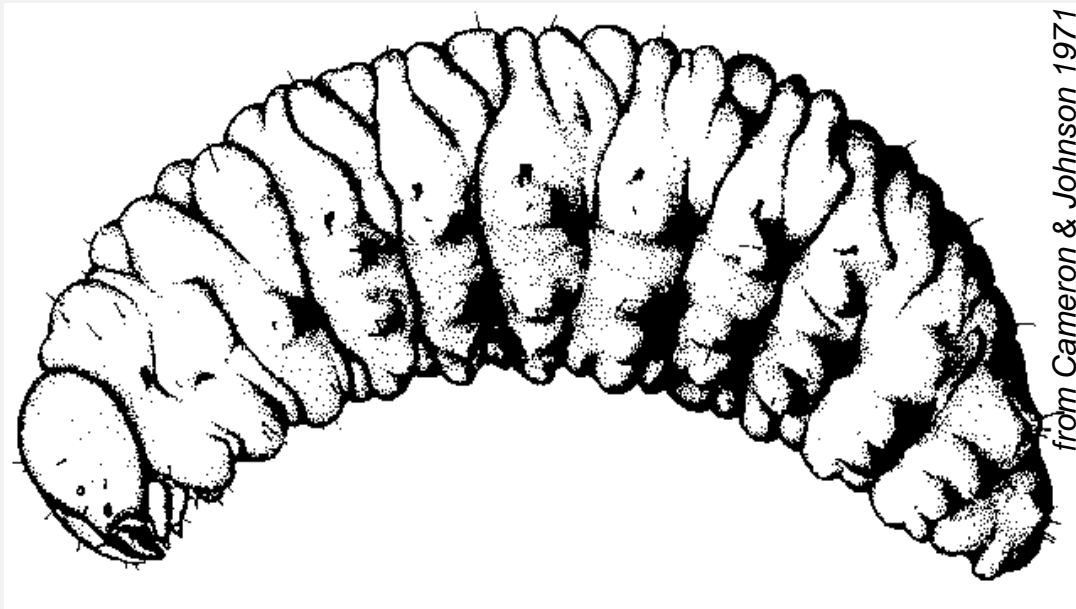
- Short, blunt snout with mouthparts at tip
- Elbowed antennae attached near snout tip
- Length of snout+head+thorax < elytra
- Body dark charcoal-gray, covered with fine yellowish hair and scales that wear off with age
- 1/8" – 5/32" long

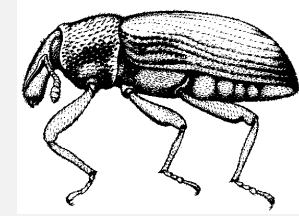
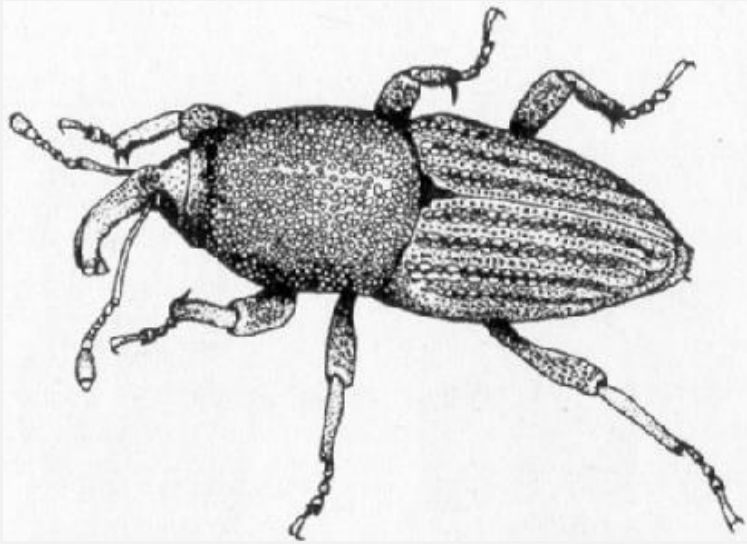


*from Cameron & Johnson 1971*

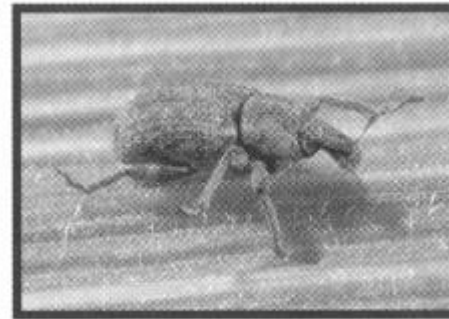
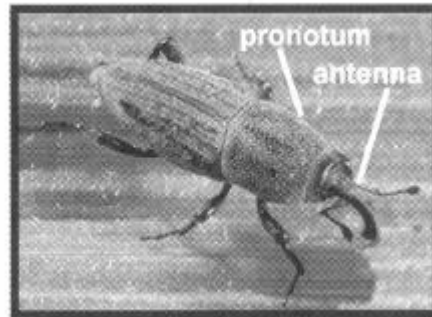
## Larva

- Cream colored body, brown head
- Body somewhat curved, pointed at tail, legless
- 0.03 (L1) to 0.2" (L5) long

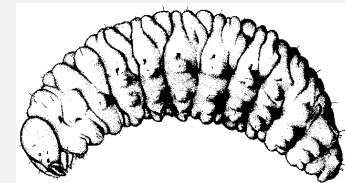
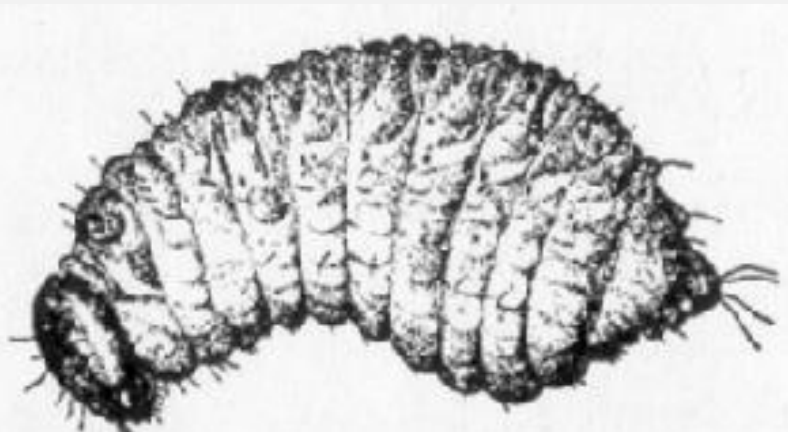




**Billbug**

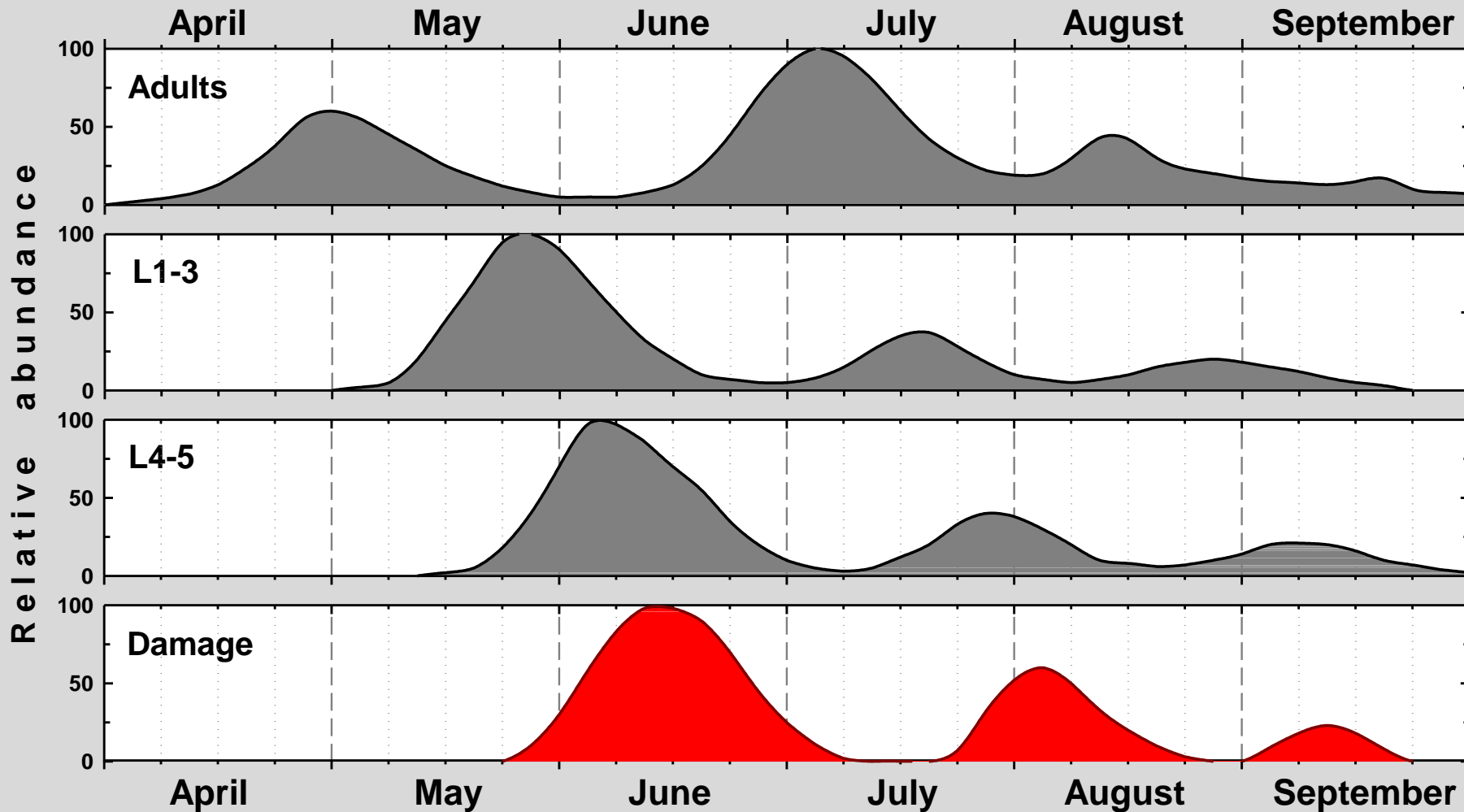


**Annual  
Bluegrass  
Weevil**

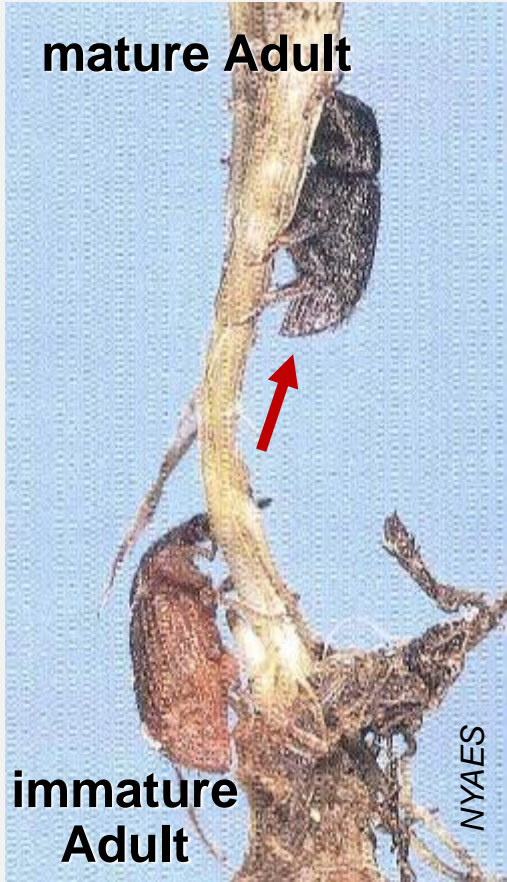


# ABW Seasonal Life-cycle

(average timing for NY metropolitan area)



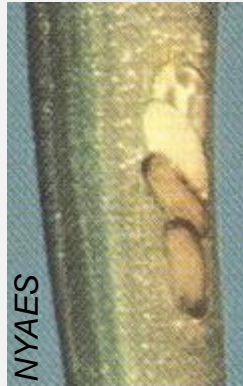
\*L1-3 = 1<sup>st</sup> thru 3<sup>rd</sup> larval stage; L4-5 = 4<sup>th</sup> thru 5<sup>th</sup> larval stage



**mature Adult**

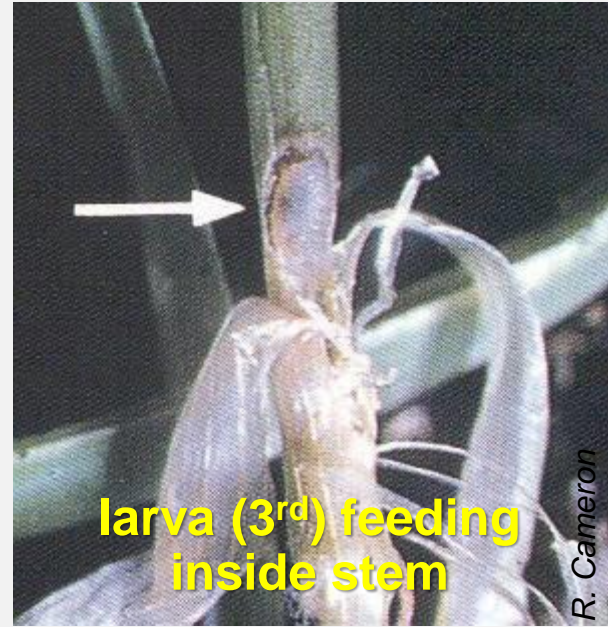
**immature Adult**

NYAES



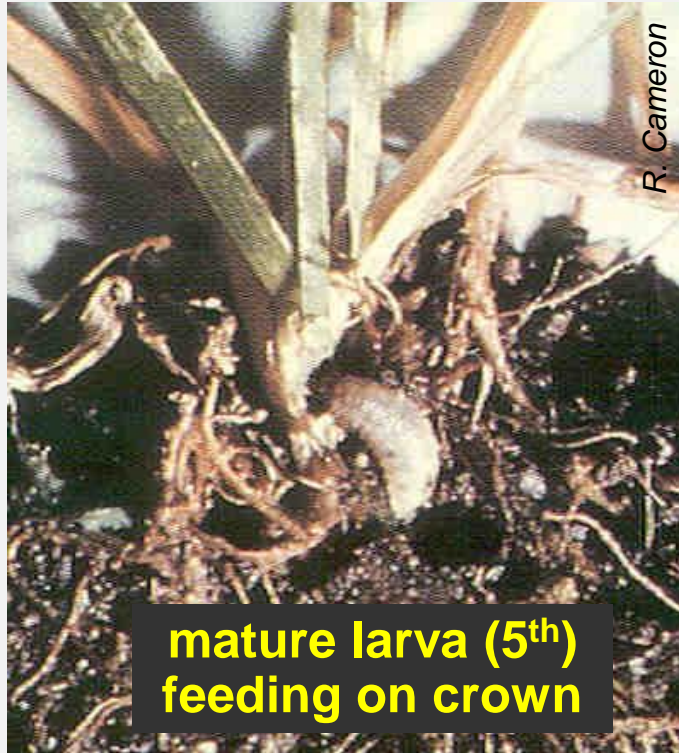
NYAES

**Eggs laid under sheath**



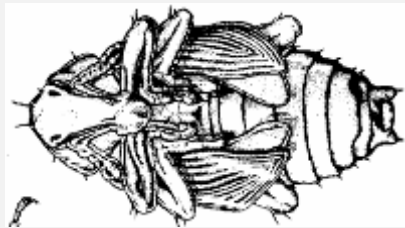
**larva (3<sup>rd</sup>) feeding inside stem**

R. Cameron



**mature larva (5<sup>th</sup>) feeding on crown**

R. Cameron



**Pupation in soil**

# **ABW Life Cycle**



# 1<sup>st</sup> Signs of Larval Feeding Damage (late May)

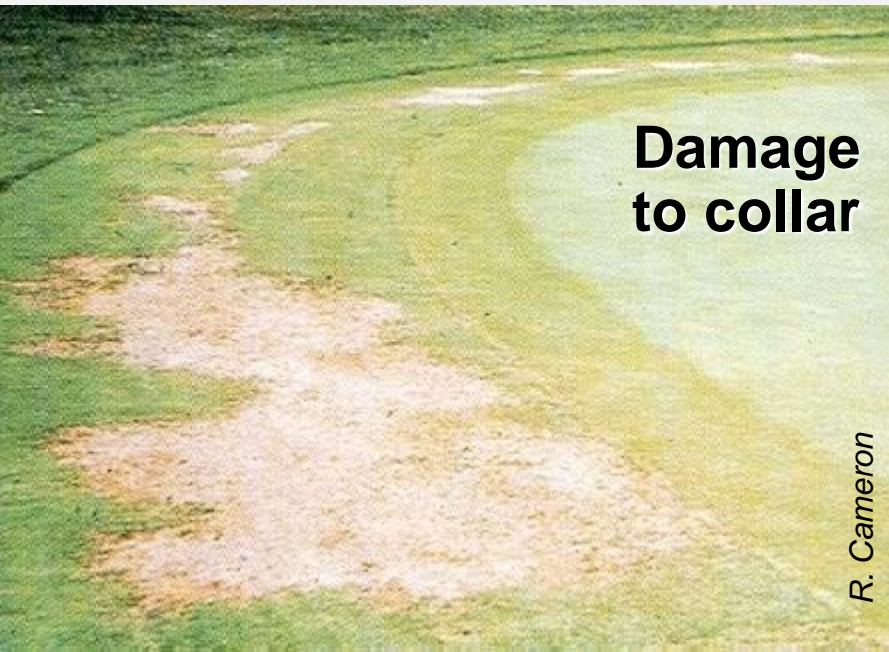
- Usually starts at edges of fairways, greens, or tees (in spring).
- Small, yellowish-brown spots
- Scattered dead spots grow together.
- Tunneled stems break off at crown.

## Extensive Larval Feeding Damage (early to mid-June)

- Worst damage early to mid-June (1<sup>st</sup> gen.).
- Usually less damage in late July/early August (2<sup>nd</sup> gen.).

**ABW**

# Injury



# Plant Phenology for ABW

- Forsythia full bloom → adults become active
- Forsythia ~ 1:1 gold:green → best time to spray vs. overwintered adults
- But: blooming variable. → Don't rely on just 1 or 2 plants.



- Flowering dogwood / redbud full bloom  
→ egg-laying has begun  
→ adulticides become ineffective.
- Full bloom hybrid Rhododendron  
→ larvae start appearing in soil  
→ curative larvicides.

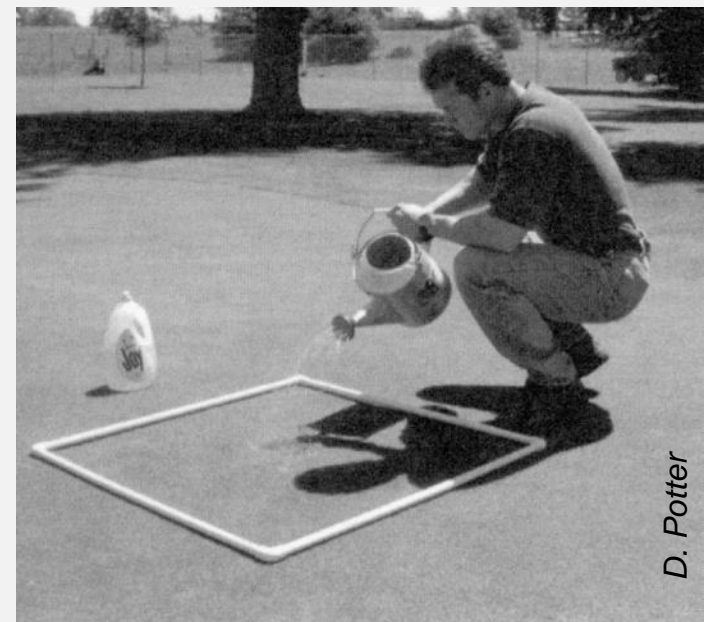


## Monitoring – Adults

- Inverted leaf blower to suck adults into an inserted sieve
- number of adults sucked up indicator of ensuing larval populations
- Irrigate adults to surface with soapy water. Irrigate afterwards to prevent sun scalding of turf.
- Linear pitfall traps for adult movement in spring



B. McGraw



D. Potter

# Does it make sense to apply adulticides before adult densities peak on playing surface?

- NY: 3-year study:
  - Few adults feed on migration
  - Adults don't lay eggs before peak densities reached
- Our recommendation: **Wait for peak adult densities!**



# Problems with pre-peak applications

- unnecessary kill of beneficials
  - increased exposure of adult ABW to sublethal insecticide concentrations
- less control
- additional applications
- faster resistance development !!



# Monitoring – All Stages

- Cut turf cores with turf plugger (2.5" diam) or just use a knife (1-2" deep).
- Break up soil and thatch and count insects.

For more detail:

- Place soil & plant material in dishpan with lukewarm water → remaining pupae, larvae, adults float up in 5-10 min.

**Adequately irrigated turf can tolerate 30-50 larvae/ft<sup>2</sup>**



# ABW - Chemical Control

## Preventive - Adults:

- WHEN: Forsythia 1:1 yellow:green (~late April/early May)
- WHERE:
  - high adult activity in late April/early May
  - in perennially infested areas
- WHAT:
  - short-residual insecticide vs. adults

# ABW - Chemical Control

## Preventive – Small larvae:

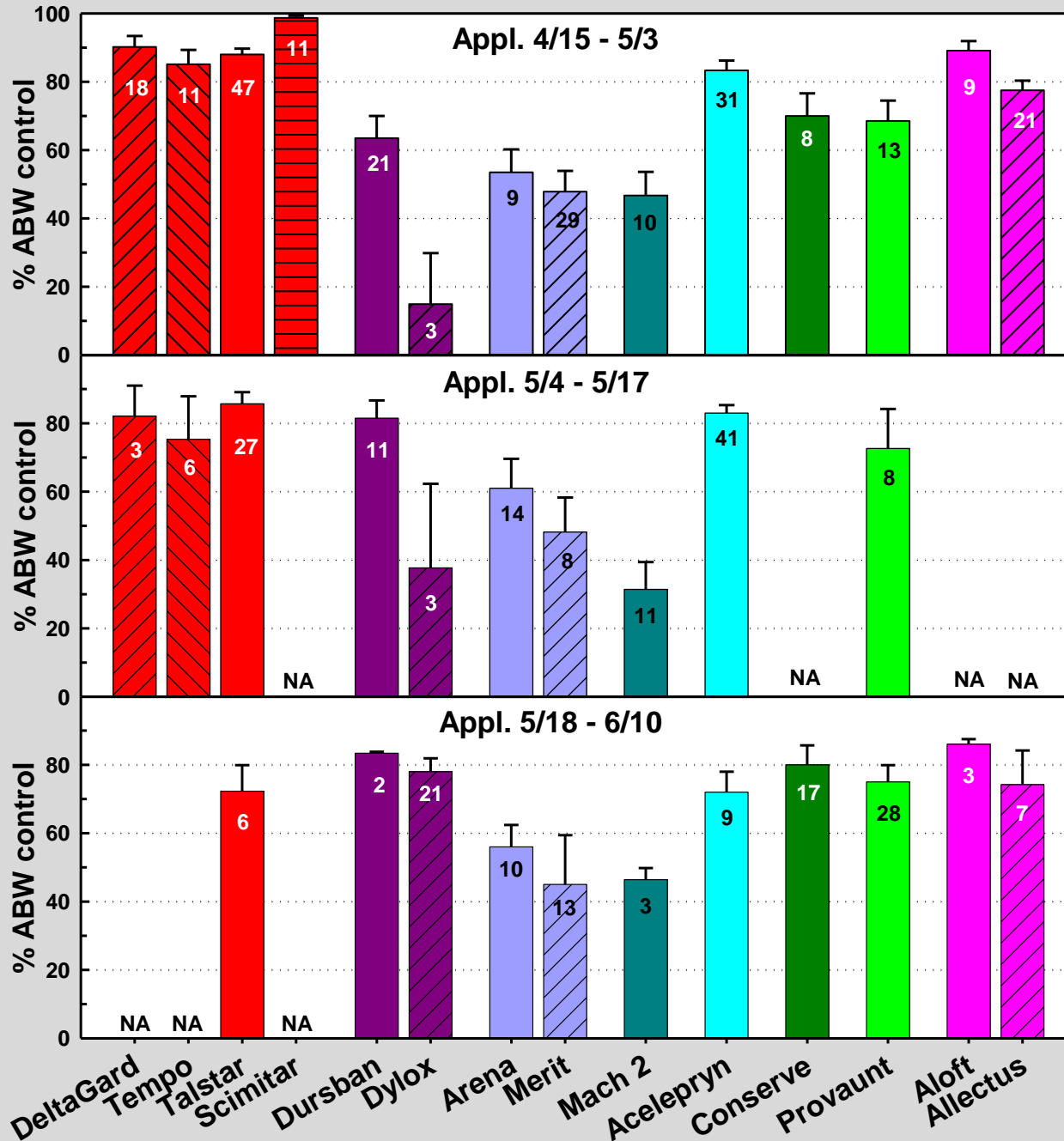
- WHEN: Forsythia 1:1 yellow:green (~late April/early May)
- WHERE:
  - high adult activity in late April/early May
  - in perennially infested areas
- WHAT:
  - systemics vs. young larvae inside plants

# ABW - Chemical Control

## Curative:

- WHEN:  
hybrid Rhododendron full to late bloom  
(mid- to late May)
- WHERE:
  - high adult activity in early May
  - high larval counts
  - perennially infested areas
- WHAT:  
Fast-acting insecticides vs. medium-sized  
to large larvae

# Insecticide Efficacy vs. ABW



DeltaGard (deltamethr.)  
 Tempo (cyfluthrin)  
 Talstar (bifenthrin)  
 Scimitar ( $\lambda$ -cyhalothr.)

Dursban (chlorpyrifos)  
 Dylox (trichlorfon)

Arena (clothianidin)  
 Merit (imidacloprid)

Mach 2 (halofenozide)

Acelepryn  
 (chlorantraniliprole)

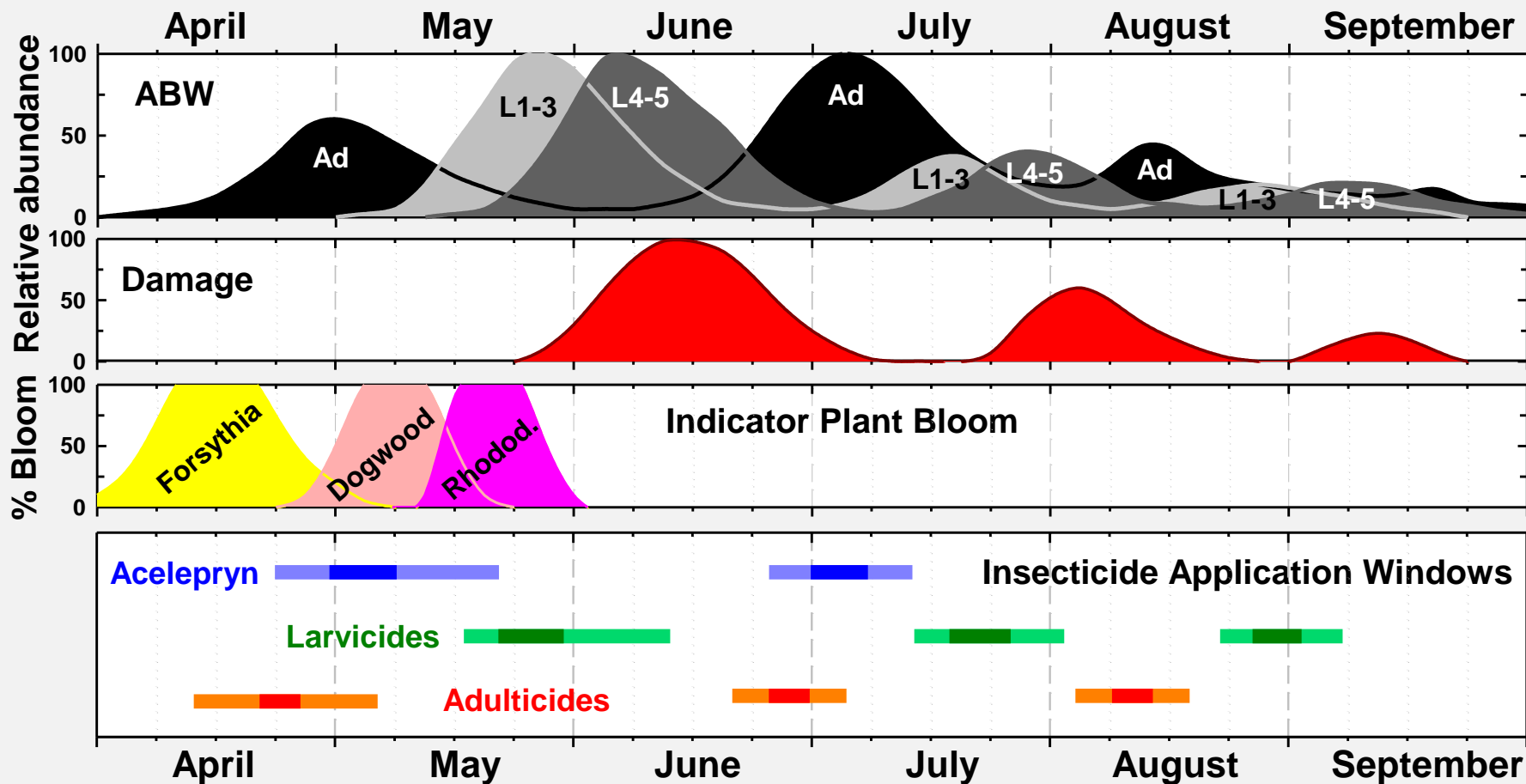
Conserve (spinosad)

Provaunt (indoxacarb)

Aloft (clothia.+bifen.)

Allectus (imida.+bifen.)

# Ideal Timing of ABW Applications (Timing for NY metropolitan area)



\*Ad = adult; L1-3 = 1<sup>st</sup> – 3<sup>rd</sup> larval stage; L4-5 = 4<sup>th</sup> – 5<sup>th</sup> larval stage

Larvicides: Conserve, Provaunt, Dylox

\*Adulticides: Pyrethroids, chlorpyrifos, Conserve, Provaunt

# Multi target - Key pest: **ABW**

Pest		Apr	May	June	July	Aug	Sept	Oct
ABW	Lv							
	Ad							
	Da							
WG	Lv							
	Da							
CB	Ny							
	Ad							
	Da							
BCW	Lv							
	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

- Acelepryn: ABW control @ 0.16 lb ai/ac  
 → up to 0.26 lb ai/ac for early and late applications.  
 → also WG, SWW, BCW, BB control.  
 → CB only suppression.

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	Da							

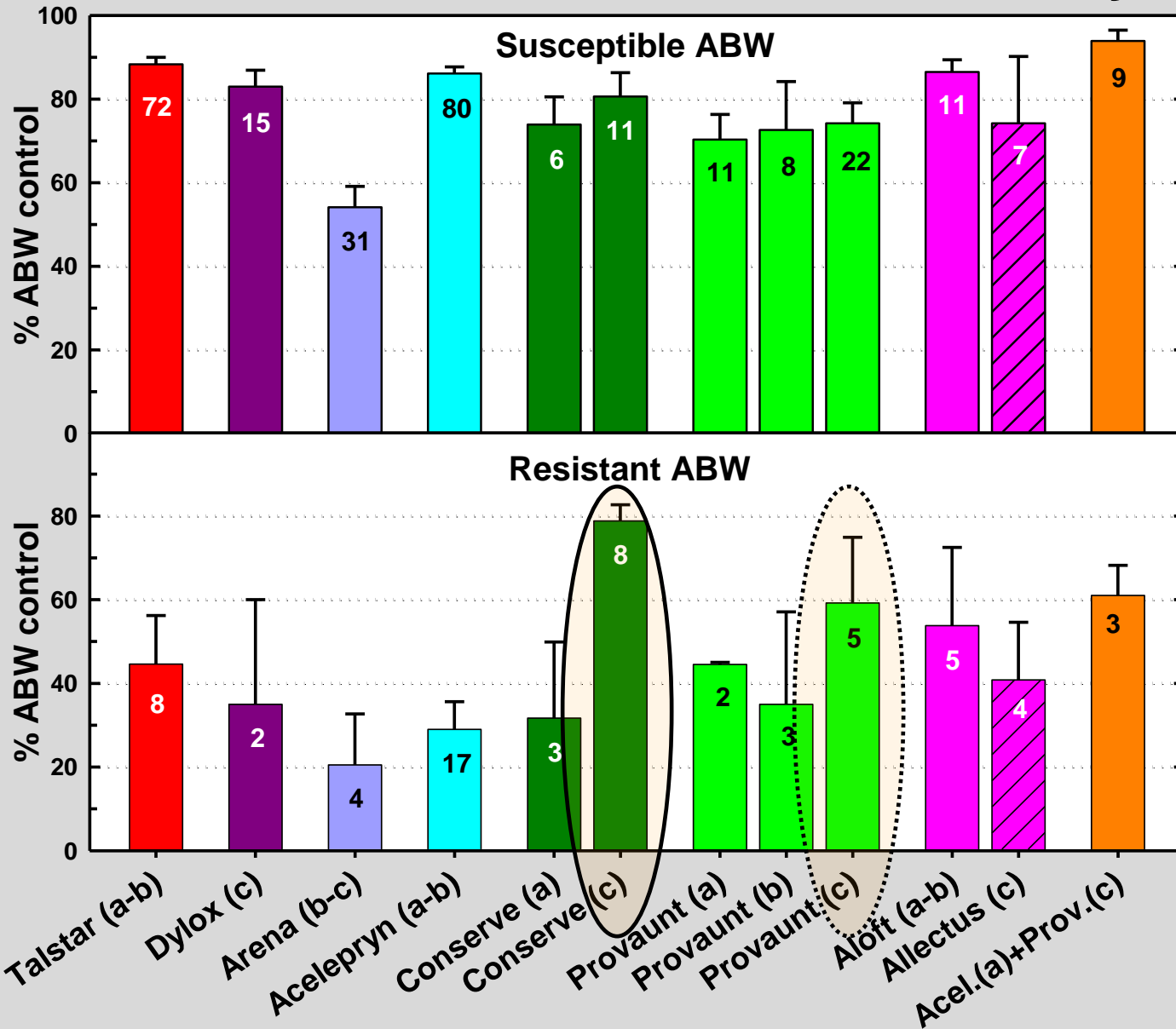
- Tetrino: ABW control @ 0.045-0.09 lb ai/ac
  - 0.09 lb ai/ac for early and late applications
  - also CB, BCW, SWW, BB control
  - WG suppression (too early)



# ABW Resistance to Insecticides

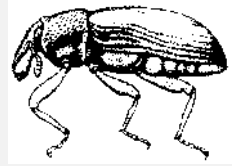
- Many GCs apply >3 treatments per season, up to 10 per season !!!
- suggests resistance to insecticides.
- **Many resistant populations detected.**
- Likely that most GCs with > 5 years of intensive insecticide use vs. ABW have some level of resistance!

# ABW Resistance and Insecticide Efficacy



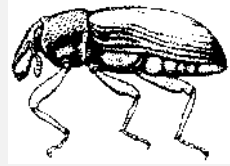
\*a, b, c = ~4/15-5/3, ~5/4-17, ~5/18-6/10 application timing; NY Met. area

# Resistance in ABW



- On GCs with history of intensive insecticide use, particularly of pyrethroids
- Resistance seems primarily based on **increased enzymatic detoxification.**
- **Continued intensive insecticide use**
  - involvement of up to 3 detox. systems
  - up to 343x rate required to kill in lab tests !!!

# Resistance in ABW



- **Increased detoxification particularly problematic because not very specific**
  - **Cross-resistance very common !!**
  - **In extreme cases most available AIs affected !!!**
  - MoA rotation no guarantee for resistance delay
- **Limited resistance to chlorpyrifos (up to 20x) already observed.**

# **Don't breed your own Super Weevil !!!**

- 1. DON'T do repeated applications with the same insecticide class (e.g. pyrethroids, OPs).**
- 2. DON'T exceed label rates.**
- 3. DON'T do 'wall-to-wall' applications.**
- 4. Spray as little as possible by practicing good Integrated Turf Management**

# “PROGRAMS”

- Manage ABW with applications tailored to the pest pressure.
  - Impossible to eradicate ABW!
  - Excessive insecticide use may release ABW from any suppression by natural enemies and has often led to resistant populations.
- Don't follow a 'program' blindly.
- Monitor ABW populations throughout season. Applications only when/where needed.

## **Sucking pests**

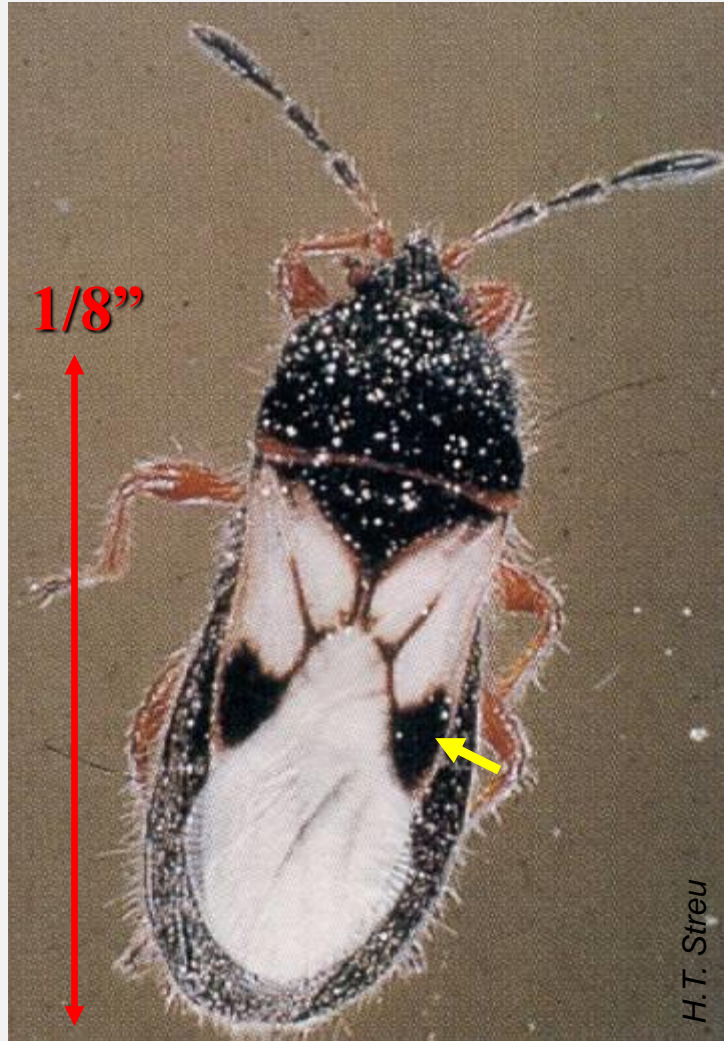
- **Chinch bugs**
- **Greenbug**
- **Mealybugs**
- **Scales**
- **Mites**

# Chinch bugs

*Blissus* spp. (Hemiptera: Heteroptera: Lygaeidae)



**Adult**  
short-winged



**Adult**  
long-winged



**Nymph**  
3<sup>rd</sup> instar



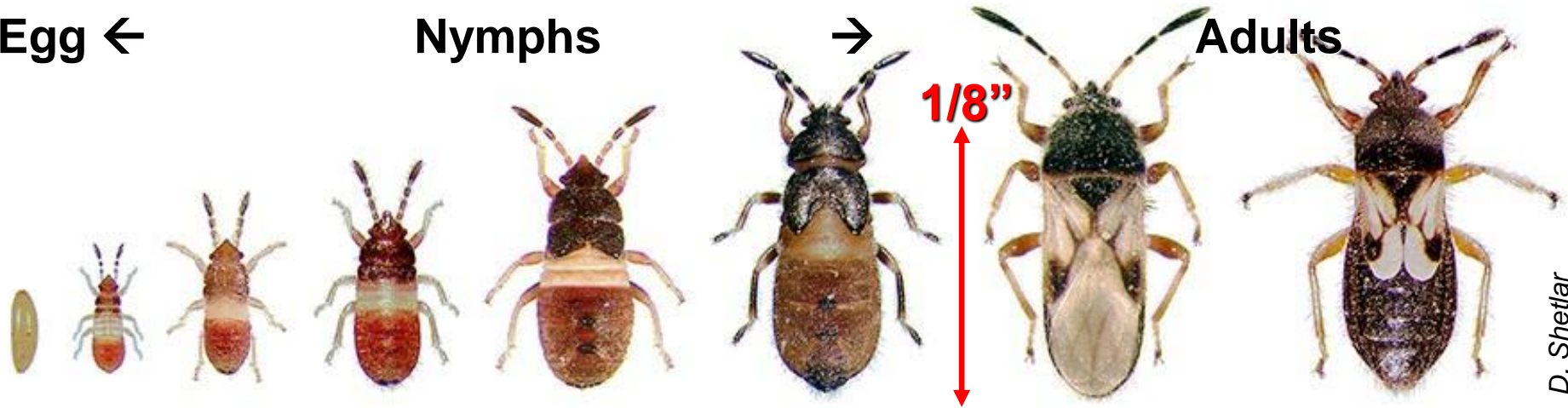
# Chinch bug - Development

## Chinch bug - Development

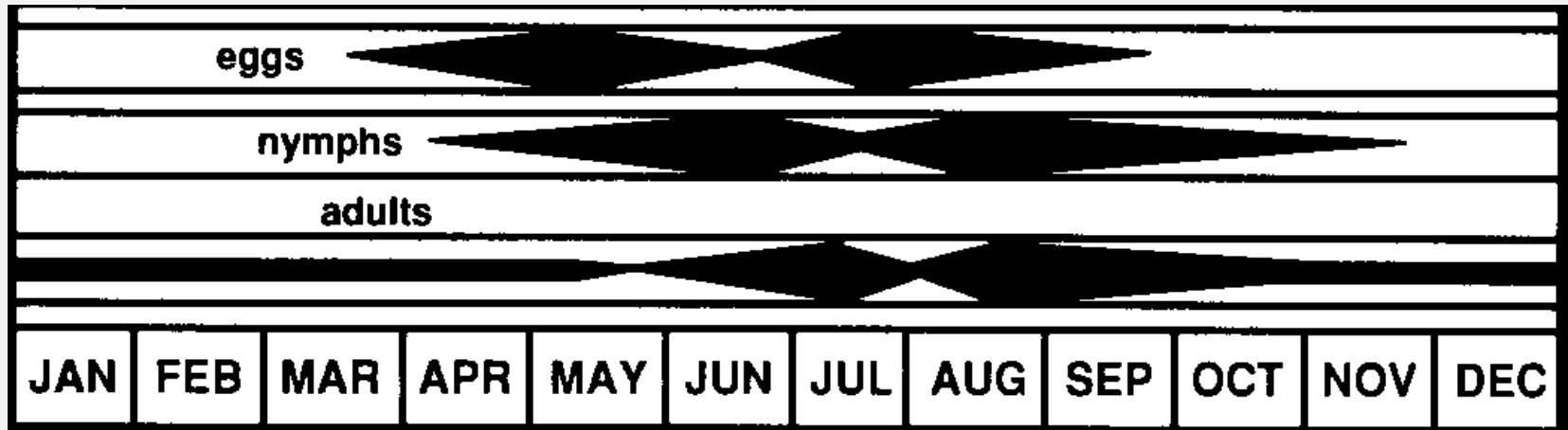
Egg ←

Nymphs →

Adults



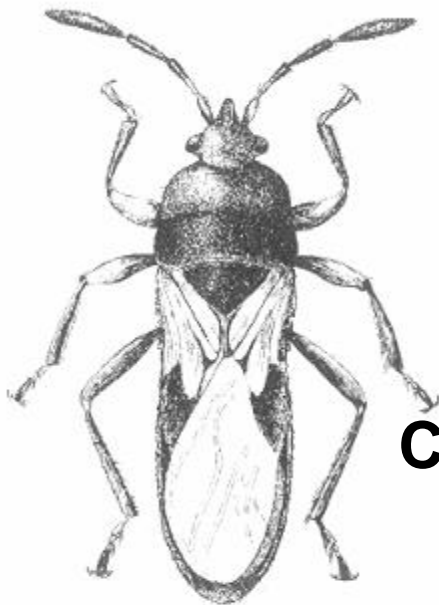
D. Shetlar



From Brandenburg  
& Villani 1995

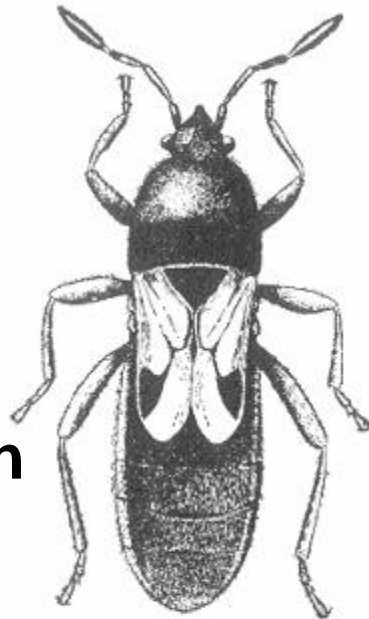
# Chinch bug – Adult

- 0.12-0.14” long x 0.04” wide
- Body grayish-black covered with fine hair
- Legs often with a dark, burnt-orange tint
- Wings shiny white, folded flat over back
- Triangular black mark on outer wing edge

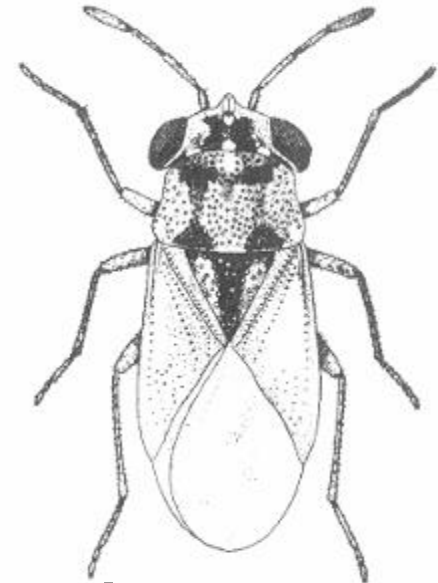


**Chinch  
bug**

**long-winged**



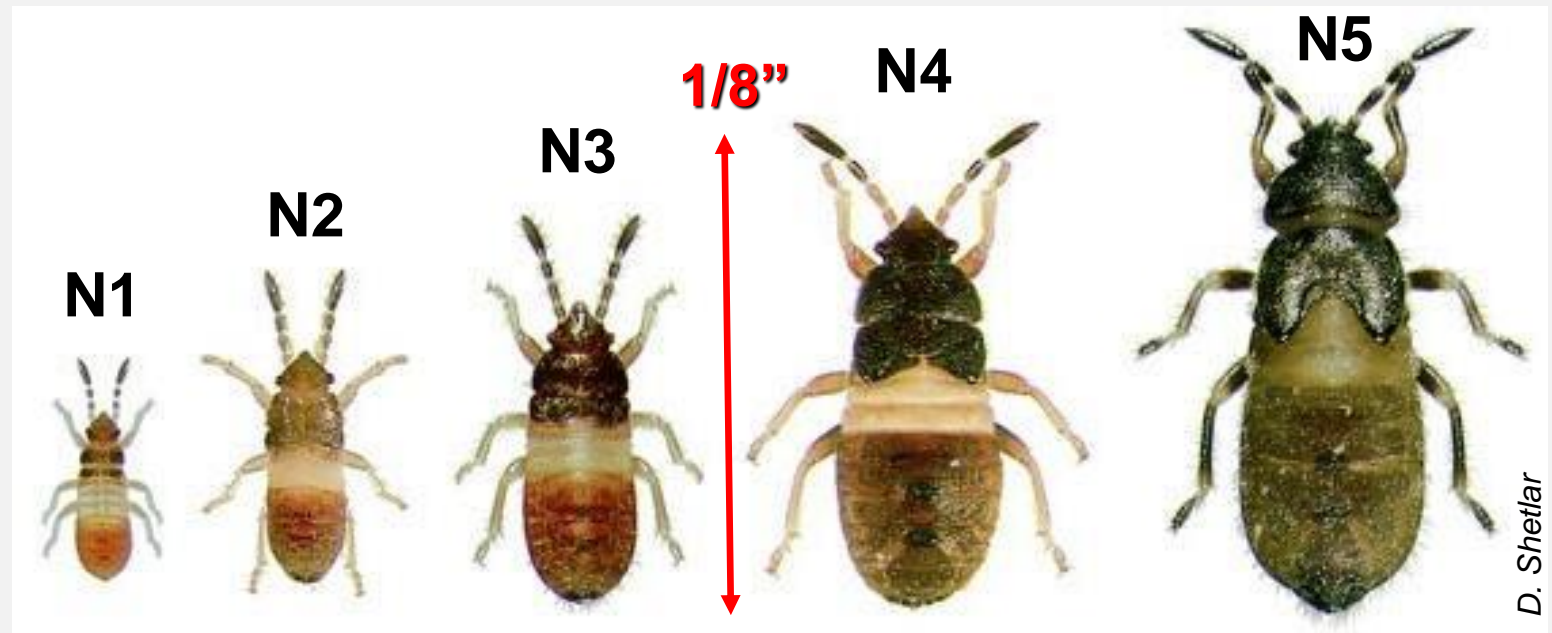
**short-winged**



**Big-eyed bug**

# Chinch bug – Nymphs

- 0.035 (N1) to 0.12" (N5) long
- N1-2 bright red; white band on abdomen
- N3 orange, wing pads appear
- N4 orange brown; wing pads extend over thorax
- N5 gray-black; pads reach 2<sup>nd</sup> abdomin. segment

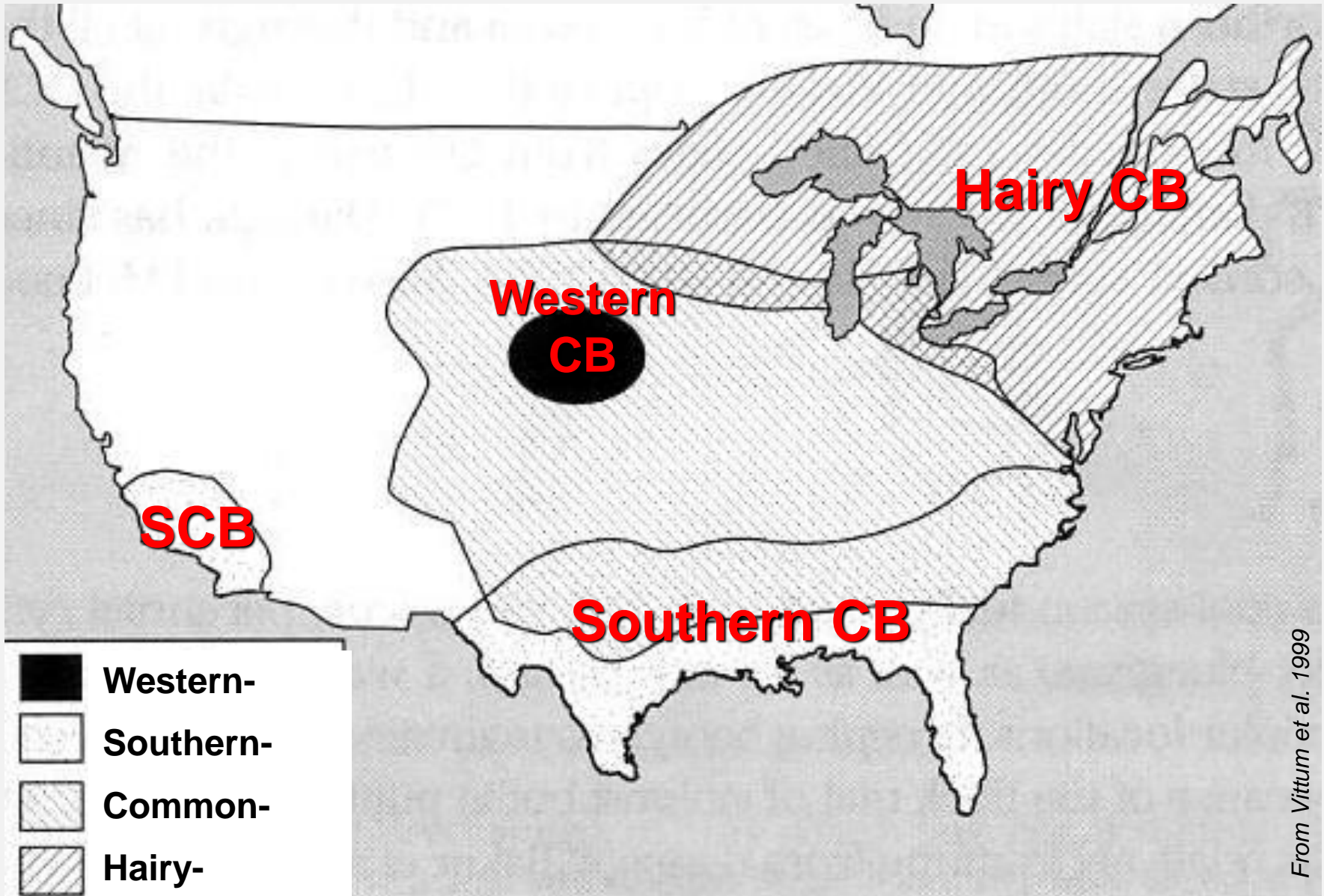


# Chinch bugs - Pest status & injury

- **Hairy chinch bug** important pest of cool-season grasses and zoysiagrass in Northeast and upper Midwest
- **Southern chinch bug** highly destructive to St. Augustine grass in South
- **Western chinch bug** important pest of buffalograss in Great Plains region.

Nymphs and adults suck juices from stems and crown and inject toxic saliva → cloggs conductive tissues in grass stem.

# Chinch bug - Distribution



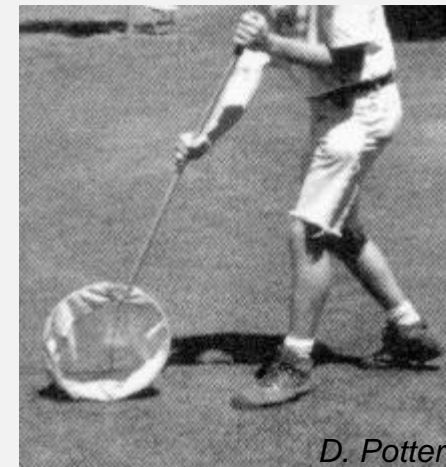
# Chinch bugs - Injury

- Irregular patches of wilted, yellow-brown turf
- Coalesce into larger areas of dead turf
- Damage in hot, dry periods in July/Aug. in **sunny lawns w/ thick thatch w/ south. exposure**
- Damage often masked by drought dormancy
- Warm, dry springs favor chinch bug buildup.



# Chinch bugs - Monitoring

- Best in June when nymphs are feeding, before damage starts
- In areas with chinch bug history
- Later, check areas with symptoms of infestation.
- Flootation method (20 -25 /ft<sup>2</sup>)
- Sweep net sampling
- 'Hand-and-knees' method



# Chinch bugs – Biol./Cultural Control

- Conserve natural enemies (selective insecticide use!).
- *Beauveria bassiana* can control chinch bugs under moist conditions (fungicides may suppress *Beauveria*!).
- Irrigate during dry periods to increase tolerance (also promotes *Beauveria*).
- **Control thatch.**
- **Overseed / renovate with endophytic grasses.**





# Chinch bugs - Timing & Choices

(Avg. timing for NJ)

- Curative spot-treatments as needed
- Liquid or granular formulations
- 0.1" post-treatment irrigation
- Delay deep irrigation for 1-2 d.



<b>Chinch bug</b>	Stage	Apr	May	June	July	Aug	Sept	Oct
	Nym							
Ad								
Damage	N+Ad							
Arena #	N+A							
Pyrethroid.*	N+A							
Tetrino	N1-3							
Suprado	N1-3							
Sevin	N+A							
Insecticide	Target	Apr	May	June	July	Aug	Sept	Oct

\*, incl. combo products (Triple Crown, Aloft, Allectus)

#, not in NY

# Chinch bugs - Timing & Choices w/o neonics

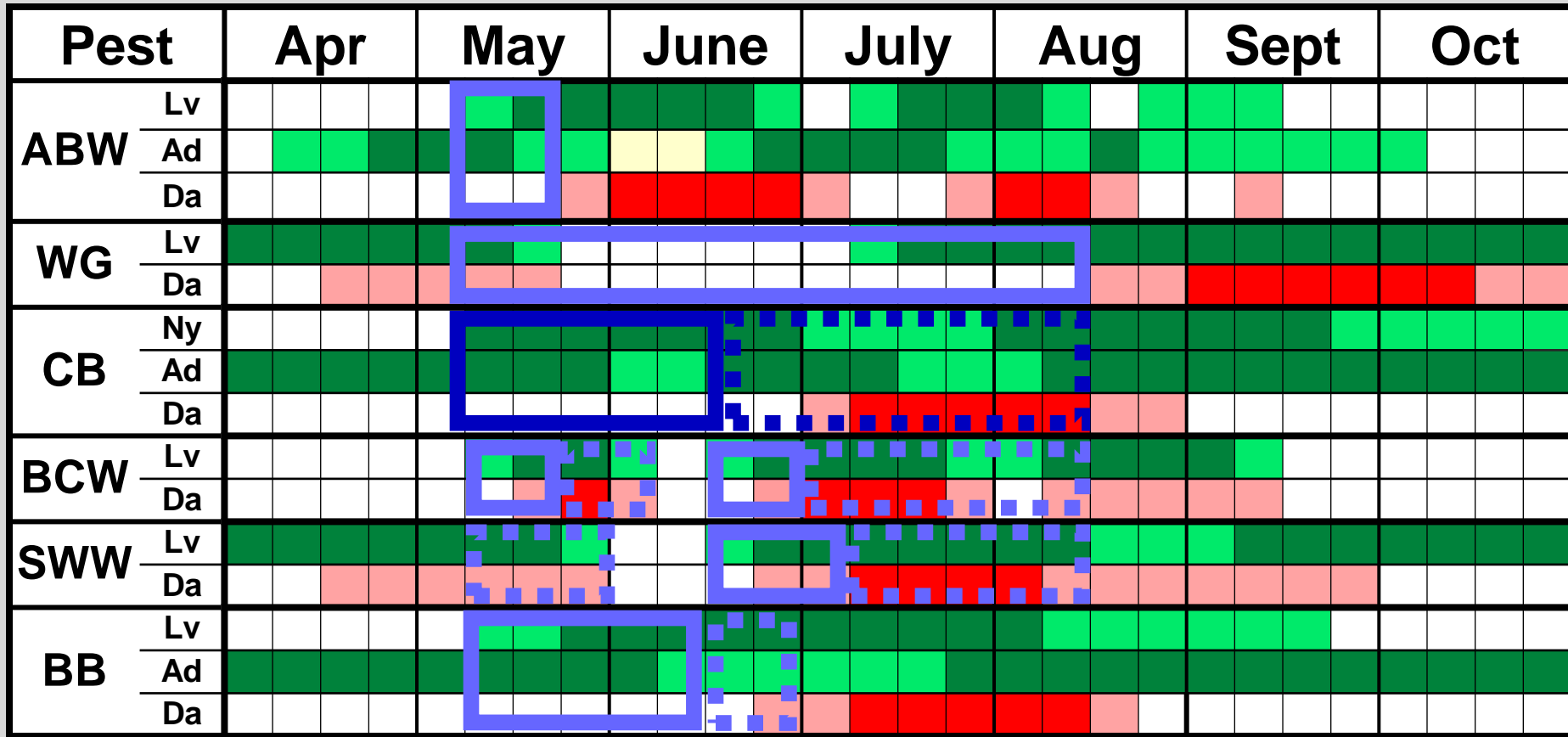
(Avg. timing for NJ)



- Curative spot-treatments as needed
- Liquid or granular formulations
- 0.1" post-treatment irrigation
- Delay deep irrigation for 1-2 d.

<b>Chinch bug</b>	Stage	Apr	May	June	July	Aug	Sept	Oct
	Nym							
Ad								
Damage	N+Ad							
Pyrethroids	N+A							
Tetrino	N1-3							
Suprado	N1-3							
Sevin	N+A							
Insecticide	Target	Apr	May	June	July	Aug	Sept	Oct

# Multi target - Key pest: *Chinch bug*



- Arena: CB control @ 0.4 lb ai/ac  
 → Also WG, BB, SWW, BCW, ABW control

# Multi target - Key pest: *Chinch bugs*

Pest		Apr	May	June	July	Aug	Sept	Oct
ABW	Lv							
	Ad							
	Da							
WG	Lv							
	Da							
CB	Ny							
	Ad							
	Da							
BCW	Lv							
	Da							
SWW	Lv							
	Da							
BB	Lv							
	Ad							
	Da							

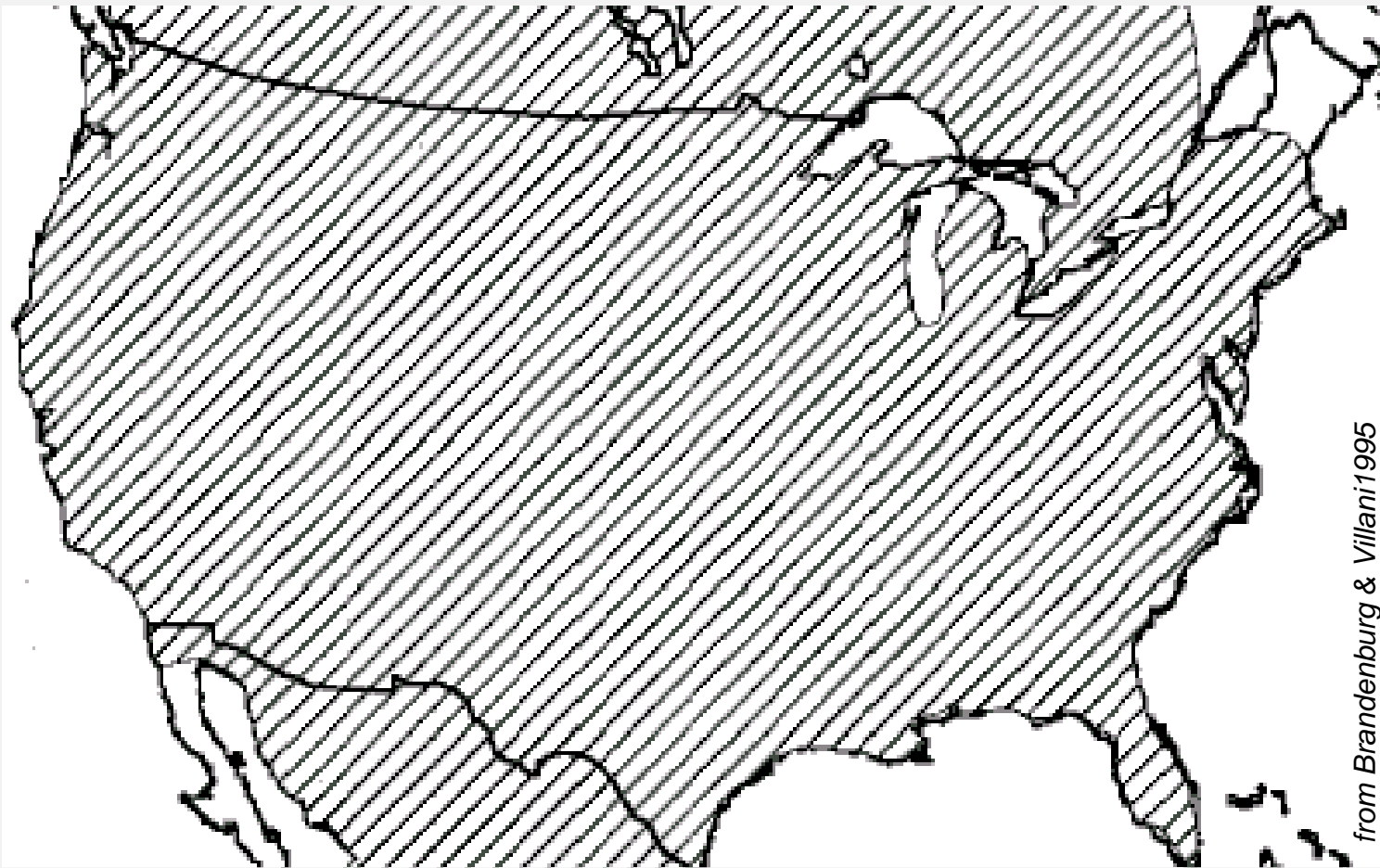
- **Tetrino**: CB control @ 0.045-0.09 lb ai/ac  
 → 0.09 lb ai/ac for early and late applications  
 → also BCW, SWW control, WG if June  
 → also BB control around mid-May

# Greenbugs

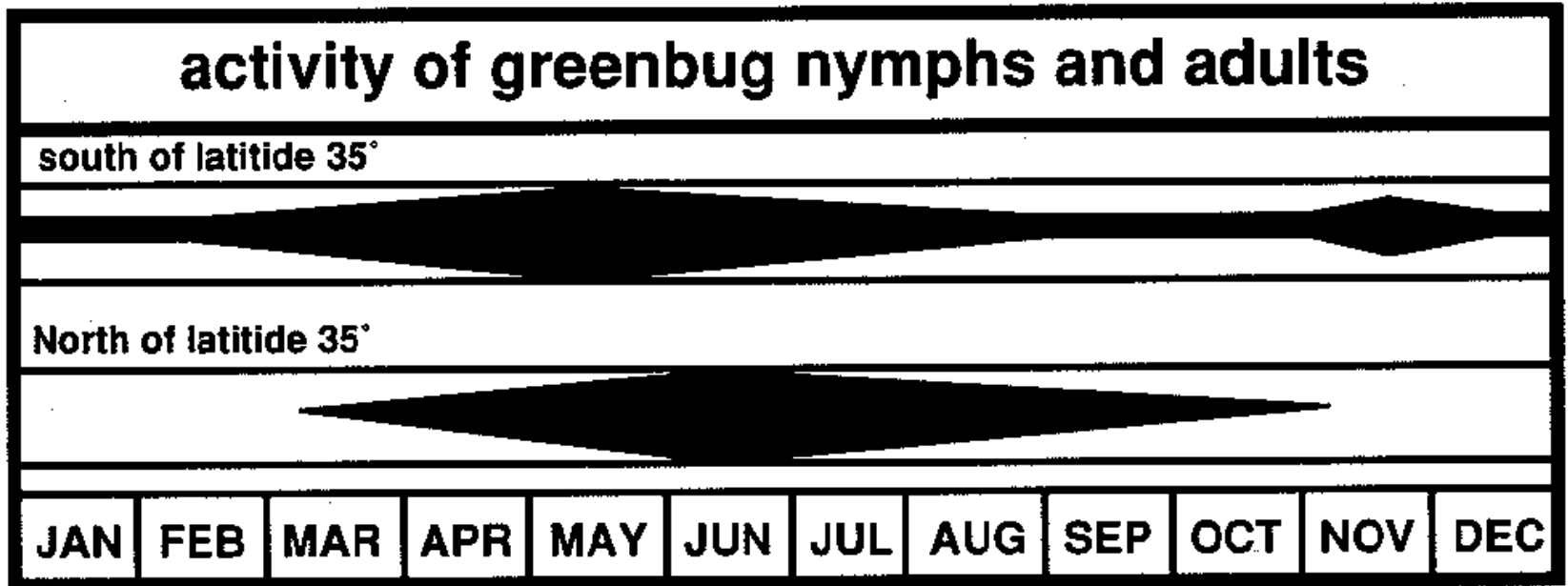
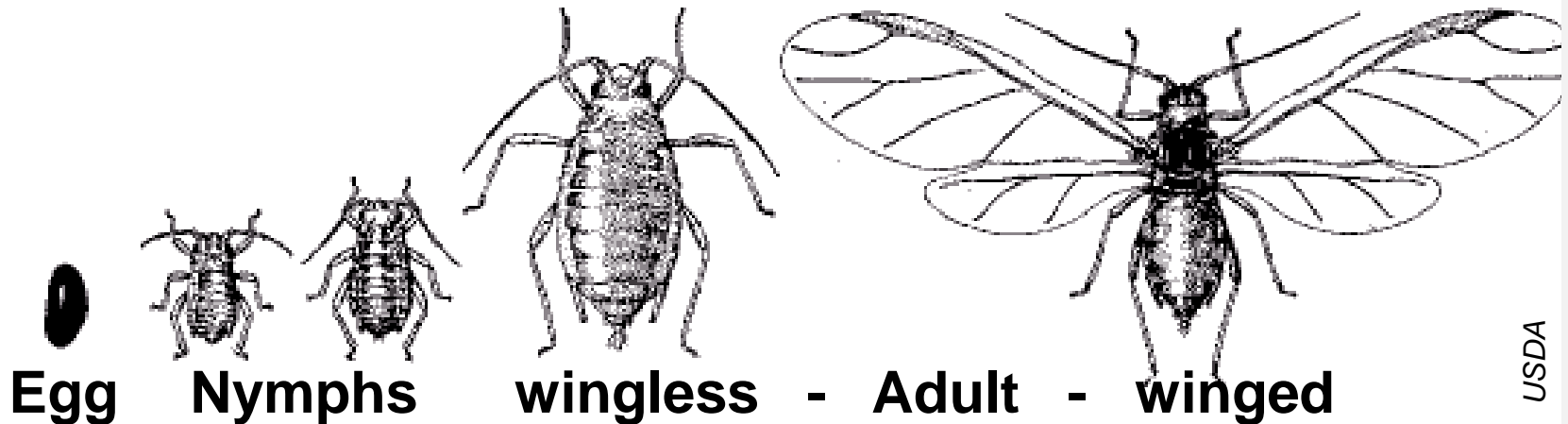
*Schizaphis graminum*  
(Homoptera: Aphididae)



# Greenbug - Distribution

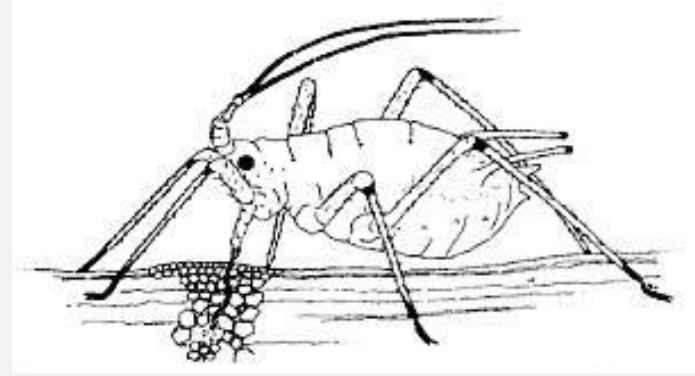


# Greenbug - Development



# Greenbug

## Pest Status & Injury



- Severe damage in localized areas on heavily fertilized lawns, espec. KBG.
- Espec. Midwest and north-central states
- Nymphs and adults suck juices from blades
- Plants are weakened.
- After heavy infestations grass may need reseeding/resodding.



# Greenbug - Injury



- Toxic saliva → tissue develops **yellowish, necrotic lesions** → **burnt orange** → **brown**.
- First circular or irregular shaped burnt orange/yellow patches
- Grow into patches of brown dead grass.
- **Often begins under shade trees or along foundation walls or fences.**

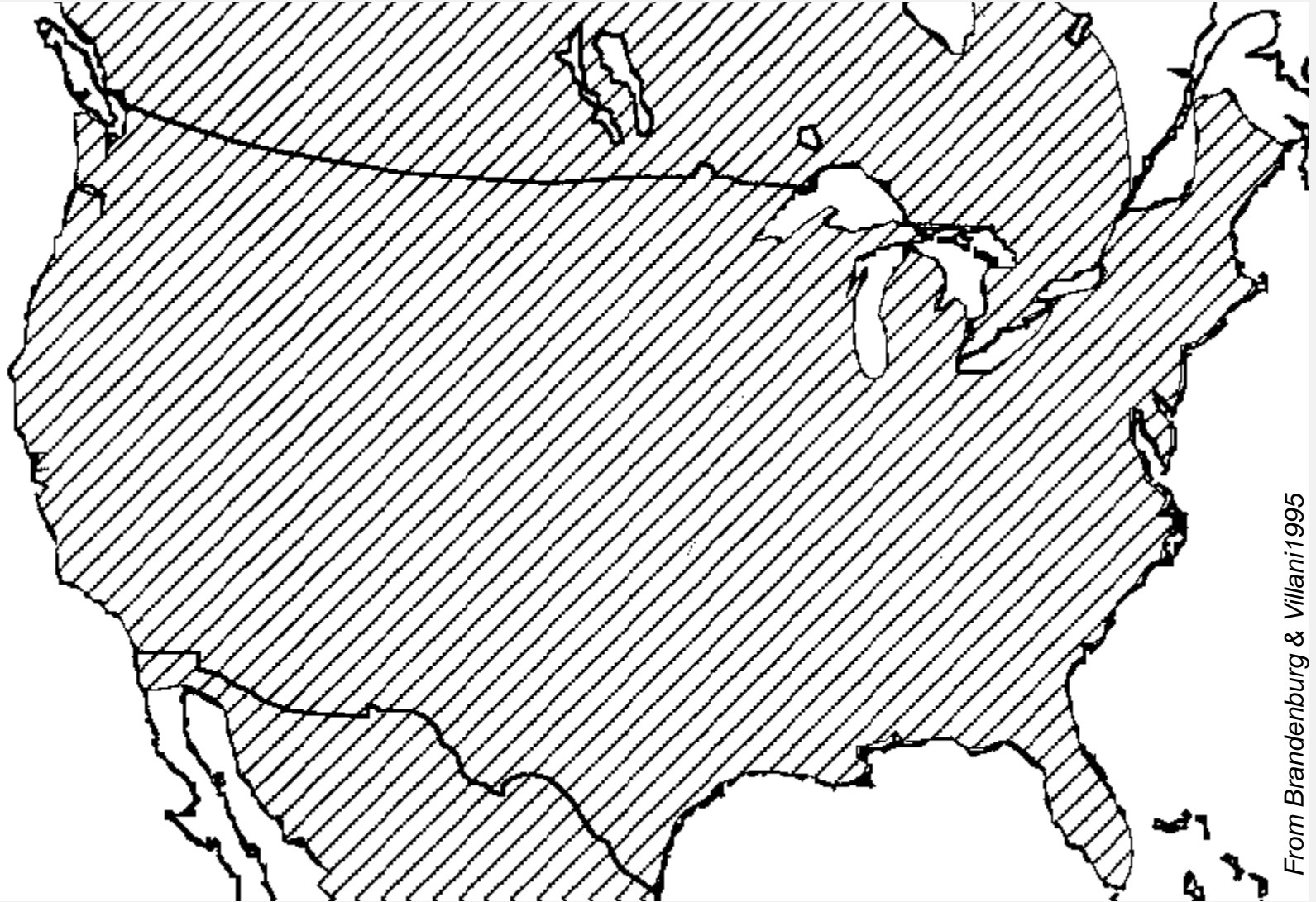
# Greenbug – Monitoring & Management

- Monitor visually and with sweep net.
- Avoid excessive fertilization.
- Conserve natural enemies (many!!!).
- **Endophytic grasses resistant to greenbugs**
- If necessary, easy to control with spray of contact or systemic insecticides.
- Acephate (Orthene) most effective; but some resistance observed.
- Treat infested area plus 6'-band.
- Delay mowing and irrigation for 24 h.

## **Leaf & stem chewing pests**

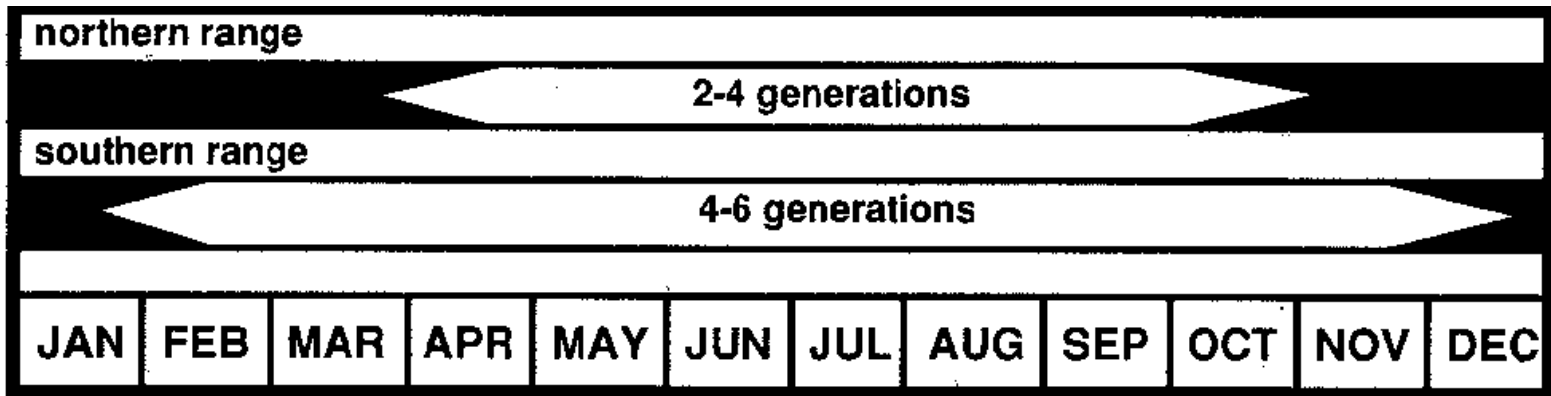
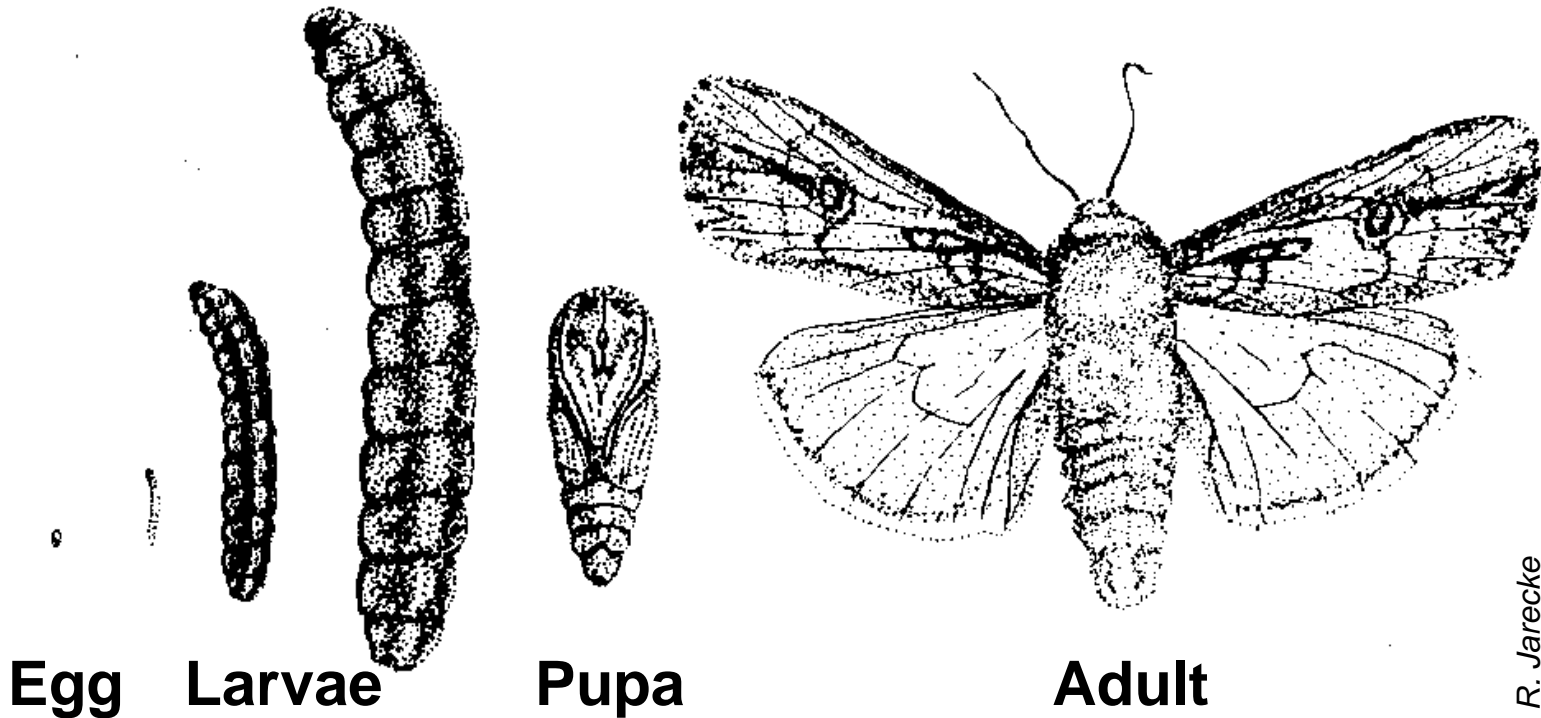
- **Cutworms**
- **Sod webworms**
- **Armyworms**

# Cutworm - Distribution



From Brandenburg & Villani 1995

# Cutworm - Development

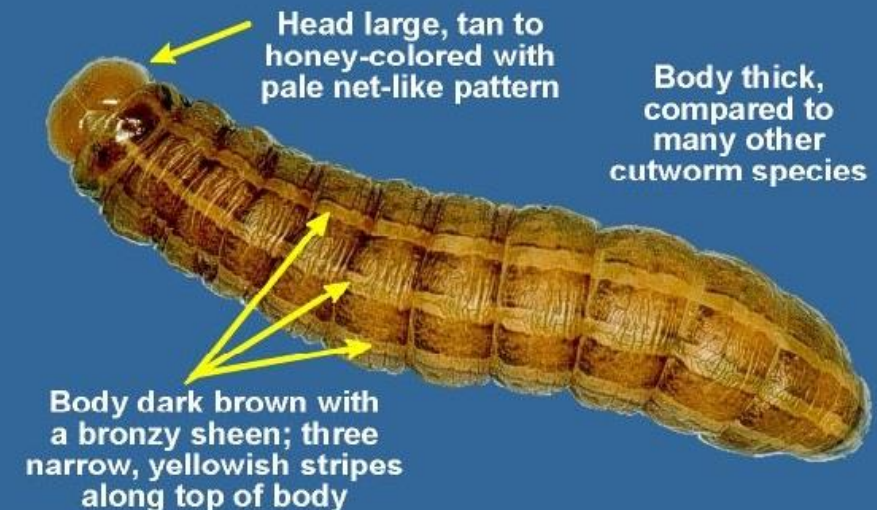


# Bronzed cutworm, *Nephelodes minians*

- Occasional pest of lawns, golf roughs and pastures in northern half of USA east of Rocky Mountains.
- Especially fond of bluegrasses
- 1 gen./year: fly in early fall, eggs hatch in spring.
- Damage mostly in mid-May → summer quiescence



## Bronzed Cutworm Identification

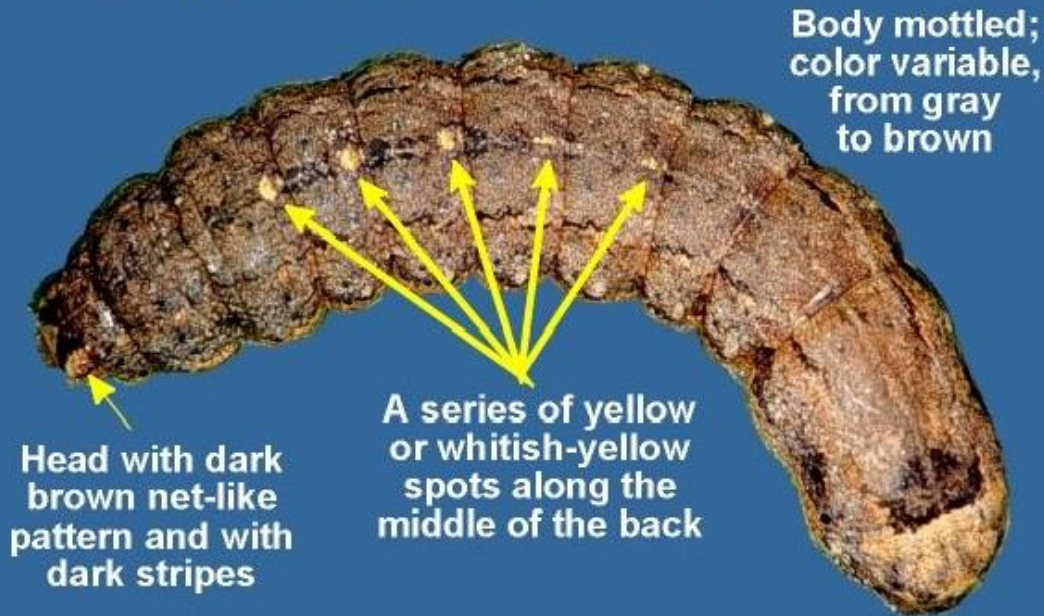


# Variegated cutworm, *Peridroma saucia*



- Rare pest of lawns and golf roughs throughout USA
- Especially in rural areas bordering field crops
- 4 gen./year
- Less subterranean and nocturnal than other cutworms → may feed on foliage on dark, cloudy days.

## Variegated Cutworm Identification



## Cutworm - Injury

- Many species throughout USA
- Usually dig burrow in ground and thatch, clip off grass at night.
- Bronzed cutworm occasional pest of lawns, golf roughs and pastures in northern half of USA east of Rockies
- Variegated cutworm rare pest of lawns and golf roughs throughout USA.
- Black cutworm only a pest on short-cut bentgrass (golf courses)

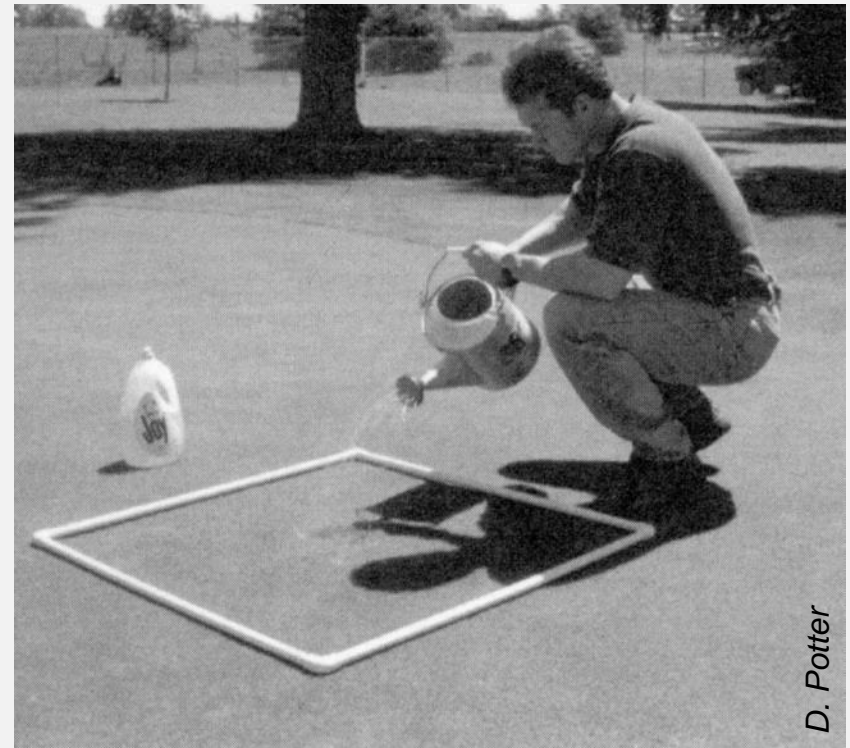
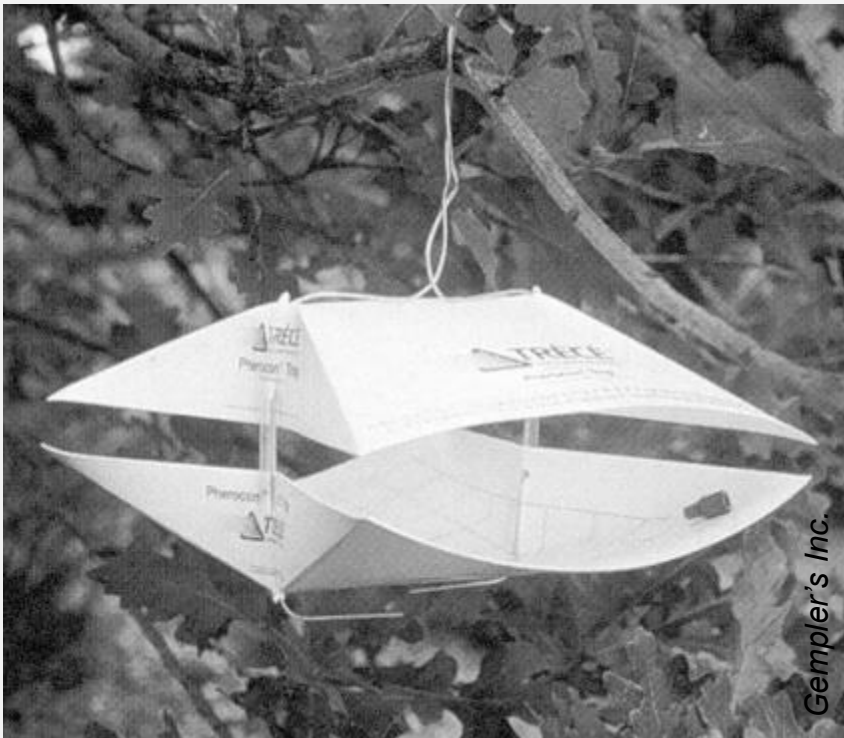


**Black cutworm**  
*Agrotis ipsilon*  
(Lepidoptera: Noctuidae)



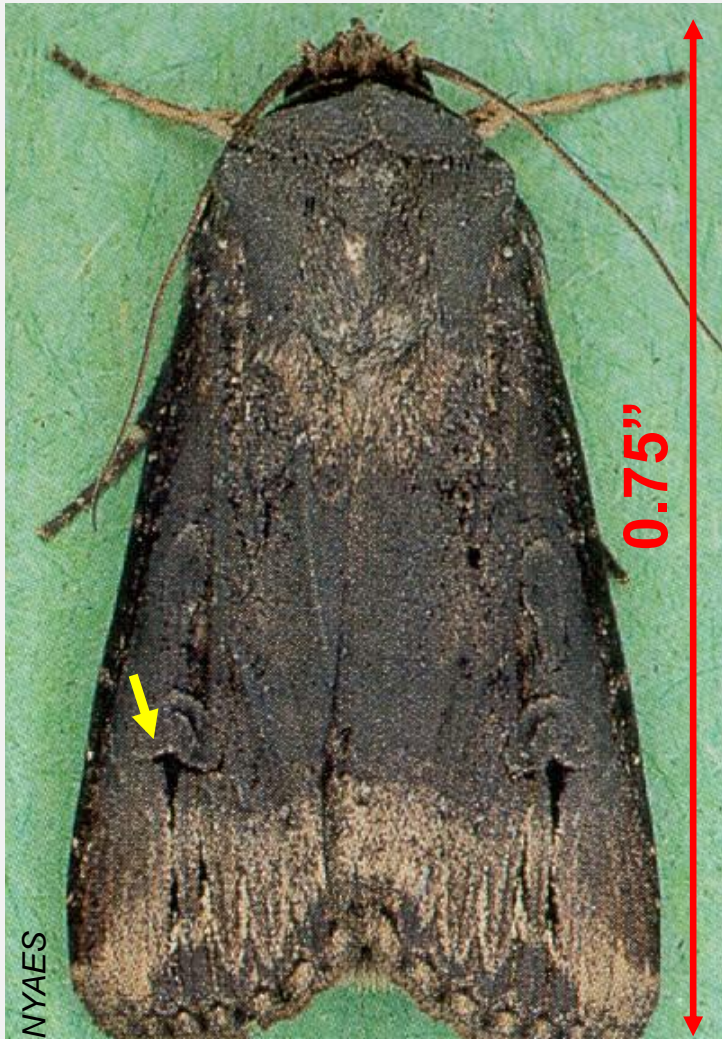
# Cutworm - Monitoring

- Pheromone traps for black cutworms
- Soap flushing solutions
- Treatment threshold for black cutworm  $\sim 0-10/y^2$



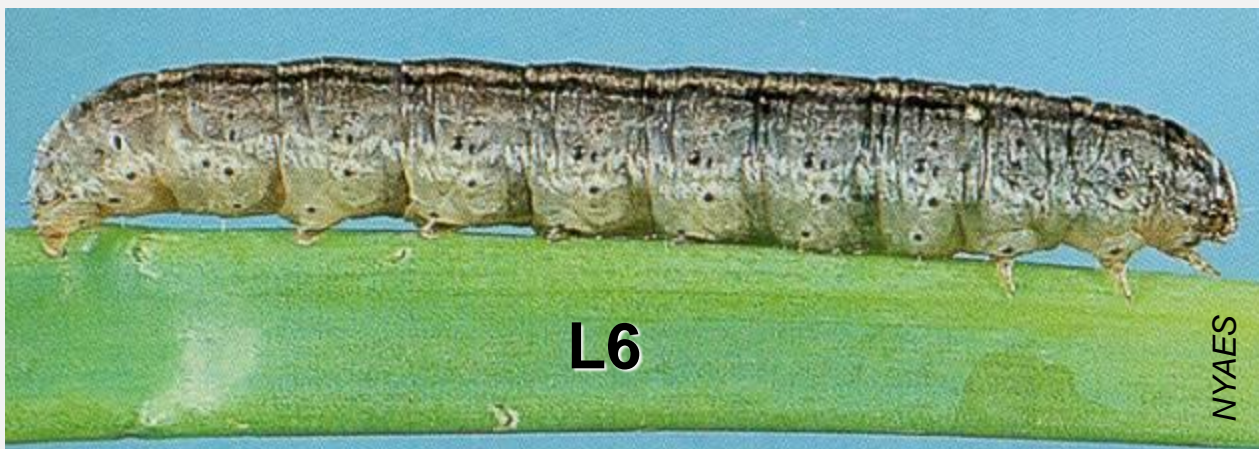
# Black cutworm Adult

- Forewing gray-black to dull brown, paler towards end, with black dagger-shaped mark in center
- Hindwings dirty white with darker veins
- Wingspan 1-1.75"



## Black cutworm – Larva

- 0.15 (L1) to 1.75” (L6/7) long
- Body hairless except scattered bristles
- Upper side gray to nearly black
- Lower side slightly lighter gray
- Indistinct pale stripe down middle of back
- Skin appears greasy



# Black cutworm - Pest status & injury

- Major, perennial pest of close-cut bentgrass
- Burrows into ground & thatch or occupies coring holes.
- Emerges at night to clip off grass.
- Circular spots of dead grass or depressed spots resembling ball marks



# Black Cutworm on Golf Courses

- Monitor flight with pheromone traps
- 2-3 wk after first sustained male captures start scouting
- First damage ~2 wk after peak flight
- Weekly soap flushes, best in late PM
- Treat after first small (0.5") larvae appear
- Areas surrounding greens/tees major source of larvae → Extend treatment 20-30' beyond green/tee to reduce immigration

# Black Cutworm – Cultural Control

- When larval damage expected, mowing very early in AM kills many larvae.
- Most eggs on green/tees laid near tips of grass blades, but survive mowing → remove clippings away from greens/tees.
- Greens/tees surrounded by Kentucky bluegrass at lower risk



# Cutworm - Management

- Conserve natural enemies
- Spray Provaunt, Sevin, pyrethroids, MACH2, Conserve, *Steinernema carpocapsae*.
- Bt and azadirachtin products vs. young larvae
- Acelepryn vs. young larvae and preventively  
→ 60-90 days control (2 generations)
- Apply late in day (feed at night)
- Don't water in, delay mowing and deep irrigation for 1-2 days.



# Sod webworms (Lepidoptera: Pyralidae)



0.3-0.7"

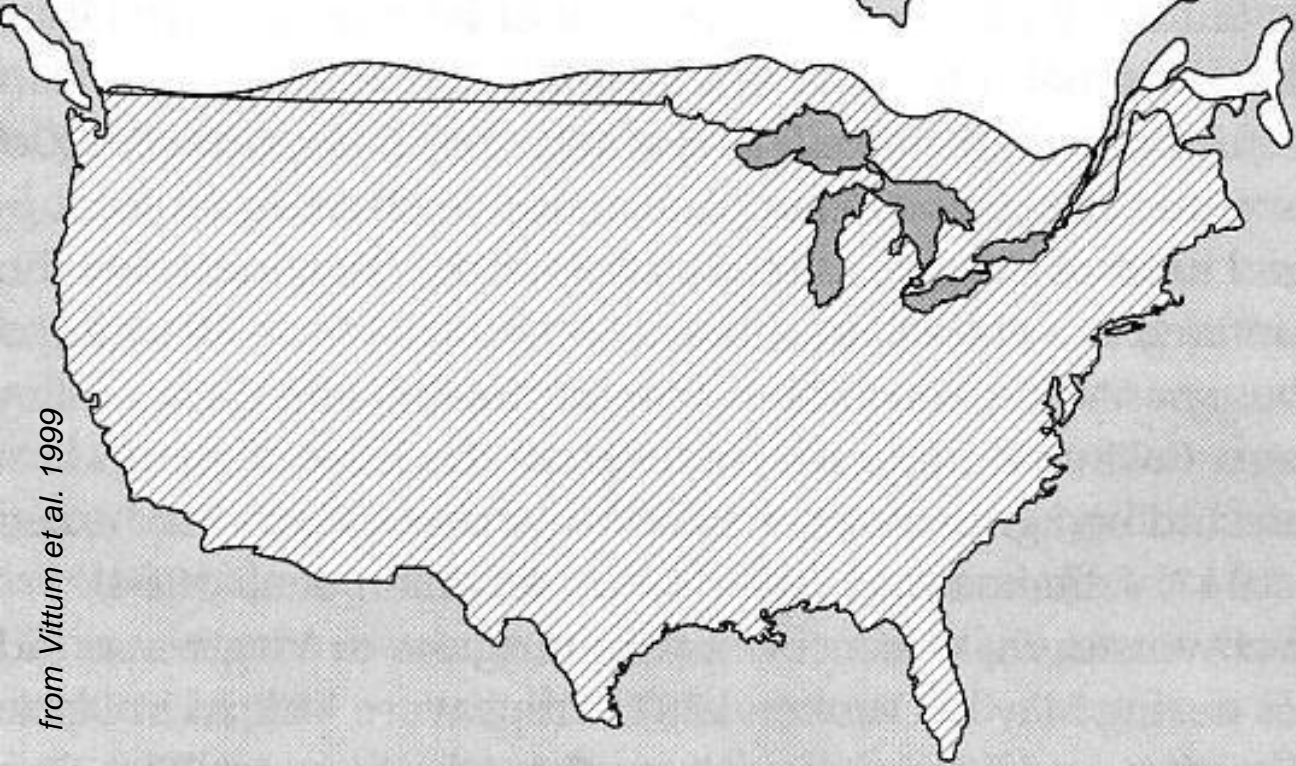
Lawn webworm

Striped sod webworm

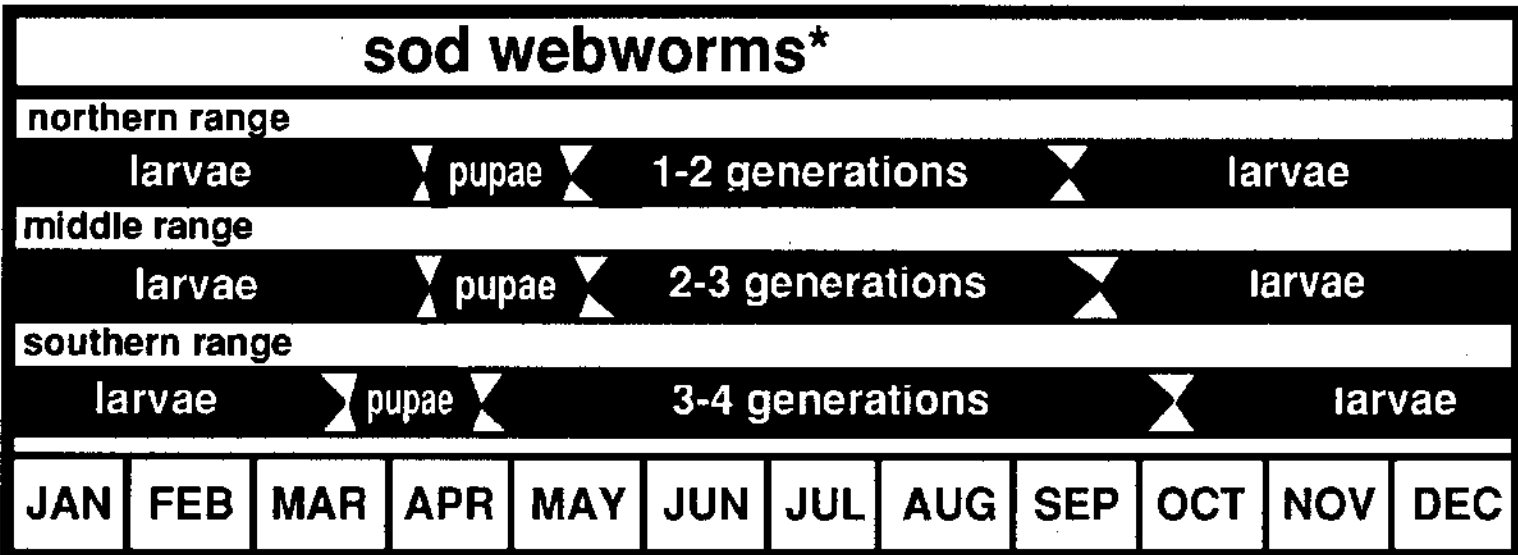
Bluegrass webworm

Sod webworm - larva

# Sod Webworms - Geographic & Seasonal Distribution



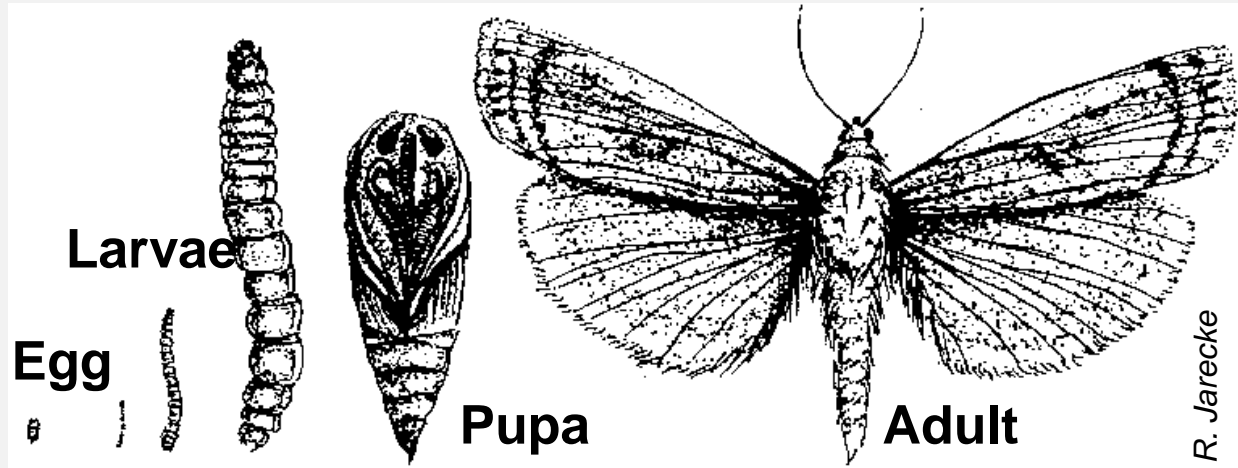
from Vittum et al. 1999



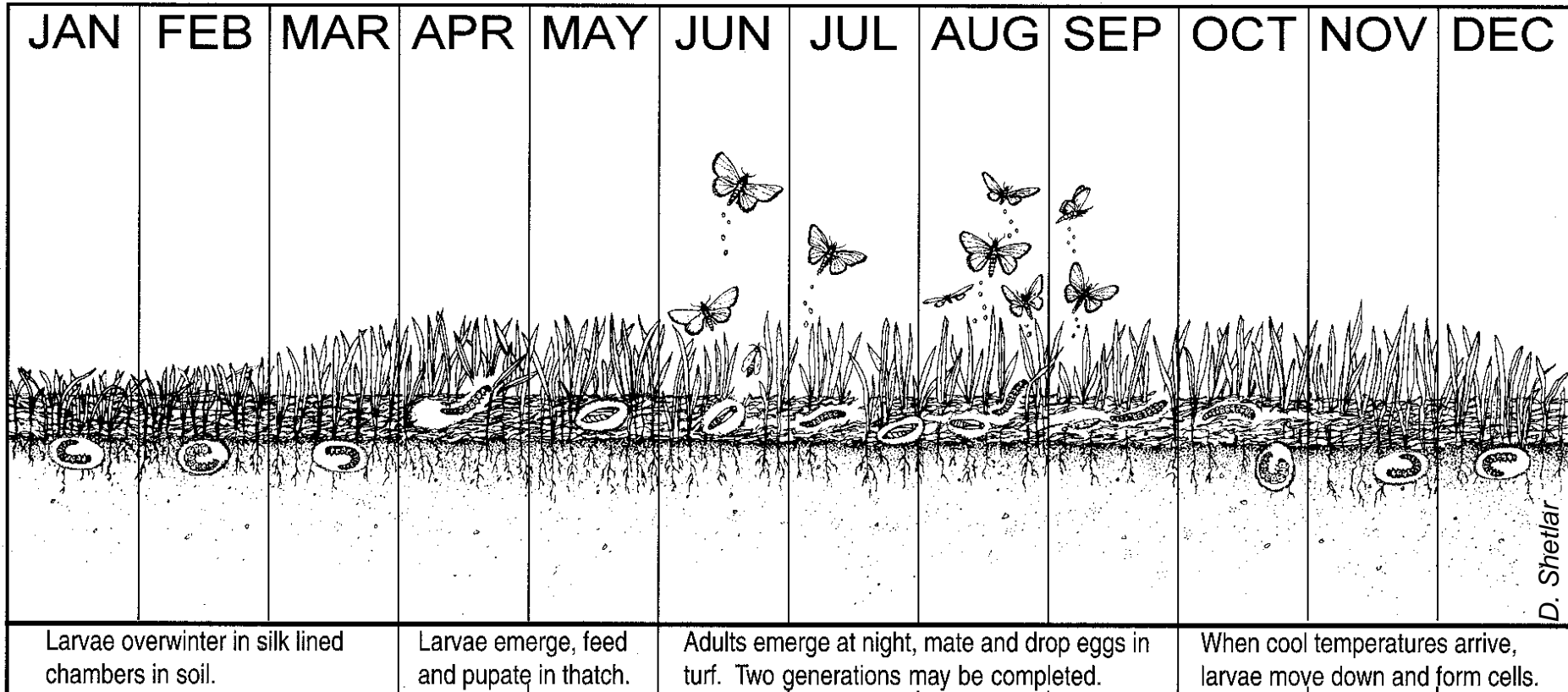
\*General, and except tropical sod webworm

from Brandenburg & Villani 1995

# Bluegrass Webworm life cycle (NJ latitude)



R. Jarecke



D. Shetlar

## Sod webworm – Adult

- Dull-colored moths; wingspan 0.6 – 1.4”
- Forewing mostly whitish, dull-gray or tan, often lengthwise stripes in silver, gold, yellow, brown, or black
- Hindwings usually whitish or light gray, delicate fringes on outer margin
- Prominent snout-like protrusion on head → labial palps



**Bluegrass webworm**  
*Parapediasia teterrella*

NYAES



**Larger sod webworm**  
*Pediasia trisecta*

NYAES

# Sod webworm – Larva

- Mature larvae 0.6 – 1.1” long
- Body beige, gray, brown or greenish
- Usually with dark, circular spots & scattered coarse hair
- brownish head
- Curl into ball when disturbed



# Sod webworm - Pest status & injury

- > 20 species throughout USA
- Damage greatest in Midwest & eastern USA
- Prefer new sod field and lawns
- Larvae feed at night from silken tunnels in thatch or surface soil; chew off leaves and stems just above crown.



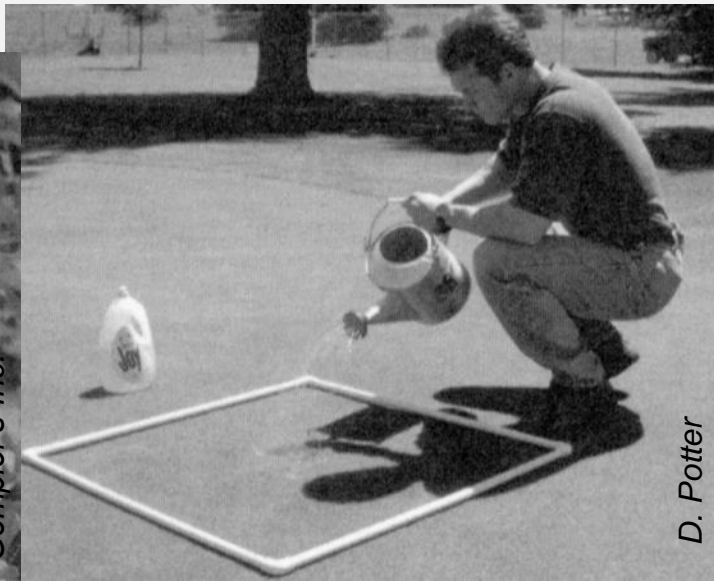
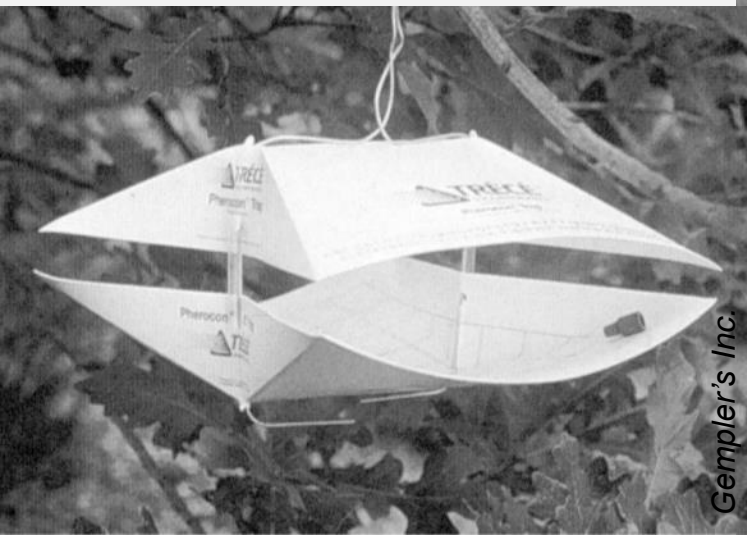
# Sod webworm - Injury

- General thinning → patches of brown closely cropped grass → if severe, coalesce into large irregular patches.
- Weak or drought stressed grass may die due to sun exposure of crowns.
- Damage often on south-facing slopes and other warm areas



# Sod webworm - Monitoring

- Visual inspection for flying adults
- Bird activity + 'Hand-and-knees' to check for larvae
- Pheromone traps for some species
- Soap flushing: best in early morning, small larvae may take 20 min
- Treatment threshold ~ 10-15/y<sup>2</sup>





# Sod webworms - Management

- Balanced irrigation + fertilization during dry periods increases tolerance and recovery
- Endophytic grasses relatively resistant
- Natural enemies can take heavy toll on eggs and larvae → Conserve natural enemies
- Apply only curative spot treatments as needed

# Control timing & choices (Avg. NJ timing)



- Apply treatments as sprays late in day.
- Delay irrigation and mowing for 1-2 d

<b>Sod webworms</b>	Stage	Apr	May	June	July	Aug	Sept	Oct	
	Pu								
	Ad								
	Egg								
L1-7									
<b>Damage</b>	L4-7								
<b>Acelepryn</b>	L								
<b>Tetrino</b>	L								
<b>Arena#</b>	L								
<b>Provaunt</b>	L								
<b>Conserve</b>	L								
<b>Suprado</b>	L								
<b>Pyrethroid.*</b>	L								
<b>Sevin</b>	L								
<b>S.carpocap</b>	L								
<b>Insecticide</b>	<b>Target</b>	<b>Apr</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>	

\*, incl. combo products (Triple Crown, Aloft, Allectus)

#, not in NY

# Control timing & choices (Avg. NJ timing)



- Apply treatments as sprays late in day.
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<b>Sod web-worms</b>	Stage	Apr	May	June	July	Aug	Sept	Oct	
	Pu								
	Ad								
	Egg								
	L1-7								
<b>Damage</b>	L4-7								
<b>Acelepryn</b>	L								
<b>Tetrino</b>	L								
<b>Provaunt</b>	L								
<b>Conserve</b>	L								
<b>Suprado</b>	L								
<b>Pyrethroids</b>	L								
<b>Sevin</b>	L								
<b>S.carpocap</b>	L								
<b>Insecticide</b>	<b>Target</b>	<b>Apr</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>	

# Armyworms (Lepidoptera: Noctuidae)



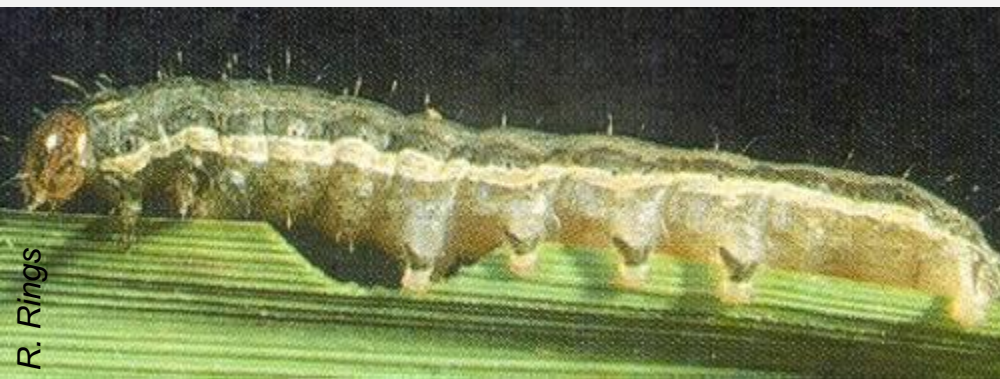
D. Shetlar

**Common armyworm**  
*Pseudaletia unipuncta*



NYAES

**Fall armyworm**  
*Spodoptera frugiperda*

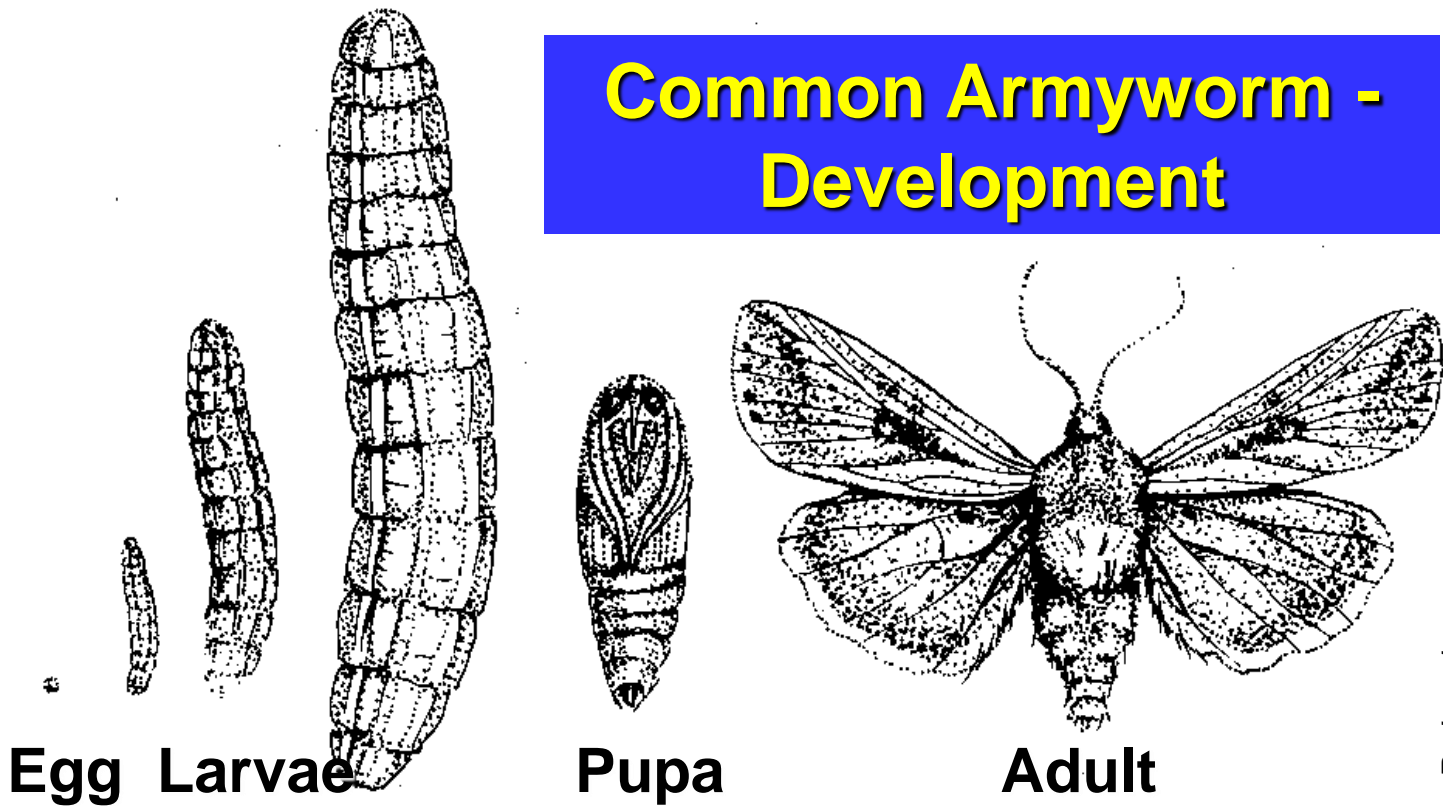


R. Rings

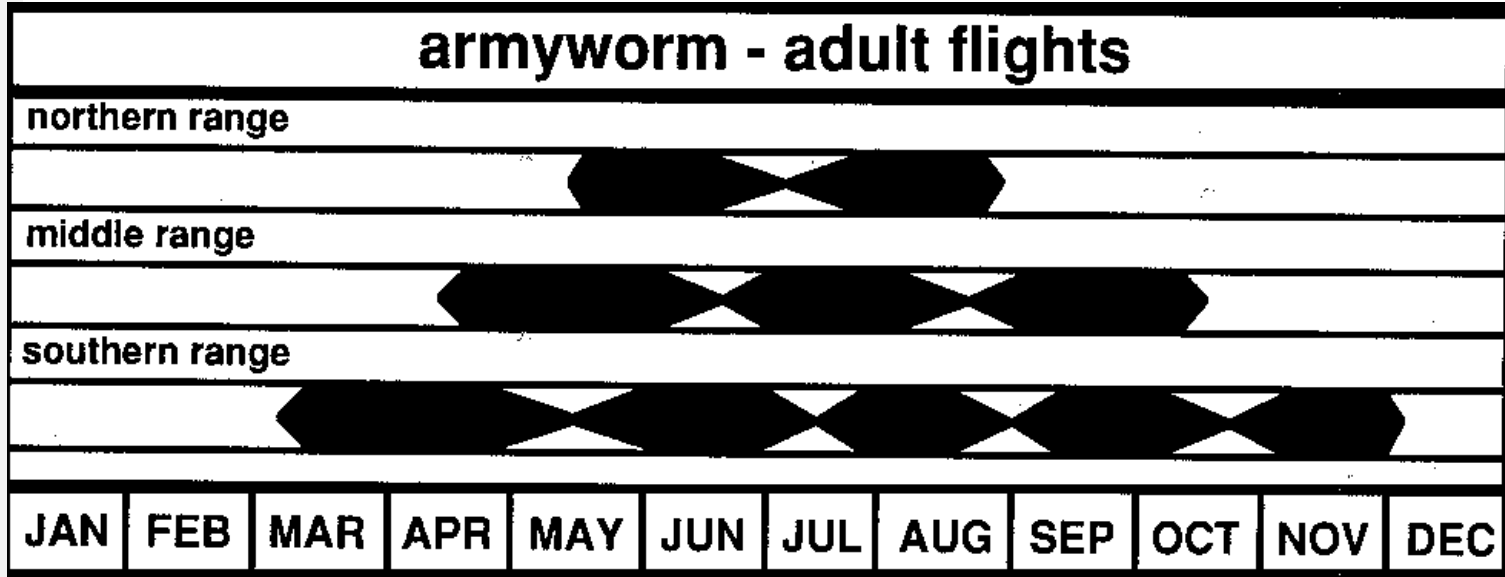


NYAES

# Common Armyworm - Development



R. Jarecke



# Common Armyworm - Pest status & injury

- Prefers corn and small grain; only occasionally damages cool-season turf.
- Areas near preferred food plants at greater risk
- Larvae consume entire green matter, but not crowns. Feed and move in 'armies'.



# Common Armyworm – Pest Status & Injury

- Mild winters followed by moderate, moist spring and early summer conditions favor outbreaks.
- 2<sup>nd</sup> (June/July) and 3<sup>rd</sup> (Aug) generation most likely to cause damage to turf.



# Armyworm - Monitoring

- Keep your eyes and ears open.
- Try to catch worms early.
- Watch for skeletonized, chewed leaves, piles of frass, or the worms.
- Watch for flocks of birds or holes pecked in the turf.
- Use soap flushing solutions to flush larvae out of thatch.





# Armyworm - Management

- Preventive applications useless  
→ conserve natural enemies.
- Pyrethroids, Sevin, Address/Orthene.
- When small also Bt, *Steinernema carpocapsae*, MACH2, Conserve, Sevin.
- Spray late in day.
- No irrigation and mowing for 1-2 days.
- Irrigation and moderate fertilization to help turf recovery (+ patience).

<http://njaes.rutgers.edu/pubs/>

→ Gardening and landscaping → 'Lawns' or  
'All gardening and landscaping fact sheets.'

FS1007 - sod webworms

FS1008 - hairy chinch bug

FS1009 - white grubs

FS1013 - black cutworm

FS1014 – nematodes (plant-parasitic)

FS1015 - billbugs

FS1016 - annual bluegrass weevil (*Hyperodes*)

FS013 - ants

FS0025 - moles

## **My Rutgers Entomology Webpage:**

**<http://entomology.rutgers.edu/personnel/albrecht-koppenhofer/>**

**→ Extension presentations**

**→ Extension publications**

- Niemczyk H.D., Shetlar D.J. 2000. Destructive turf insects, 2<sup>nd</sup> edition. H.D.N. Books. 148pp.**
- Vittum P.J., Villani M.G., Tashiro H. 1999. Turfgrass insects of the United States and Canada. Cornell University Press. 496pp.**
- Potter D.A. 1998. Destructive turfgrass insects. Ann Arbor Press. 344pp.**
- Brandenburg R.L., Freeman C.P. 2012. Handbook of turfgrass insect pests, 2<sup>nd</sup> edn. Entomological Society of America. 136pp.**
- Watschke T.L., Dernoeden P.H., Shetlar D.J. 1994. Managing turfgrass pest. Lewis Publishers. 361pp.**