Outline of Protecting Pollinators with Smart Lawns

- Why are some people worried about bees and why are some asking for a ban on the use of neonicotinoid insecticides?
- Healthy lawns and grounds are tolerant of insect turf pests. How to grow healthy lawns.
- What can I use to control grubs, chinch Bugs and billbugs without harming bees and other pollinators?

Which Turfgrass Insecticide Products are Neonicotinoids?

Technically, according The IRAC mode of action classification system, it is all insecticides in the 4A category. This includes :

- thiomethoxam (**Meridian**)
- chlothianidin (**Aloft, Arena**)
- imidacloprid (**Merit, Allectus** and many others products with imidacloprid listed as an active ingredient).

How to Grow Bee-Friendly Lawns Without Pest Problems

MSU Extension: Smart Gardening

Smart Lawns: Raise the mower height to the highest setting and return grass clippings and chopped trees leaves to the lawn.

Smart Plants: Trees and shrubs planted for landscaping should be native to Michigan or well-adapted to Michigan. Problem-prone plants should be avoided.

Smart Soils: Soil from lawns, shrub beds, flower beds and gardens should be tested using a standard MSU Extension soil test kit. Application of fertilizers, mulches, and pH modifiers should follow recommendations from soil test results.

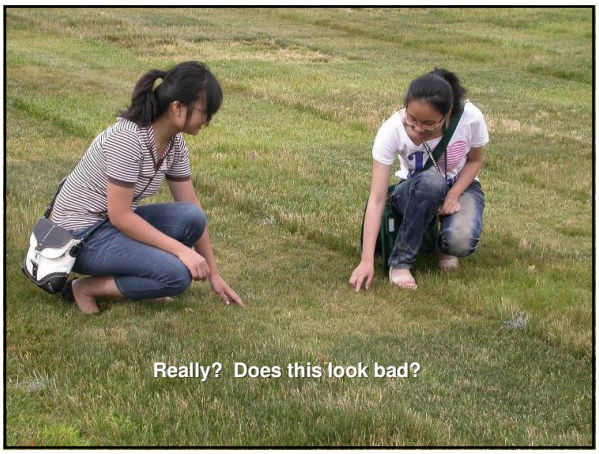
Smart Lawns Tip Sheet:

Mow High for Weed and Grub Control

What height do you mow at?
Tip sheet explains how to measure mowing height.

What mowing height is best for my lawn?
The highest setting on your mower!

"But then my lawn looks bad"



Why is mowing high good for my lawn?
(5 good reasons)

- It makes scalping (turf damage from mowing too short) much less likely to happen
- It allows you to clip about 30% of the leaf blade each time you mow (the optimum proportion)
- It promotes establishment of a larger root system which is more drought tolerant
- It provides broadleaf weed and crabgrass control by shading the soil surface
- It establishes a grub-tolerant lawn because of the larger root mass and more predators

Smart Lawns:

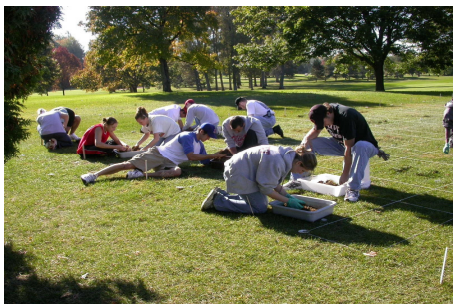
- Raise the mower height to the highest setting
- Return grass clippings to lawn
- Return chopped tree leaves to the lawn.

Why are insecticides used on lawns in Michigan? Mostly because of grub damage.

Garden center products tend to be marketed for use against white grubs; some work, some don't.

Dense lawns are tolerant of grubs

Research Base on How to Avoid Grub Damage Without Using an Insecticide



Daily irrigation will prevent EC damage, but most home lawns are not irrigated

Problem:

How do we grow home lawns tolerant enough of grubs to avoid unacceptable turf injury

- Are there turf types that are resistant to grubs- **No**

  (Potter et al. 1992, Influence of turfgrass species on feeding ecology of Japanese beetle and southern masked chafer grubs, JEE)

Research Question: How useful are cultural practices for preventing grub damage?

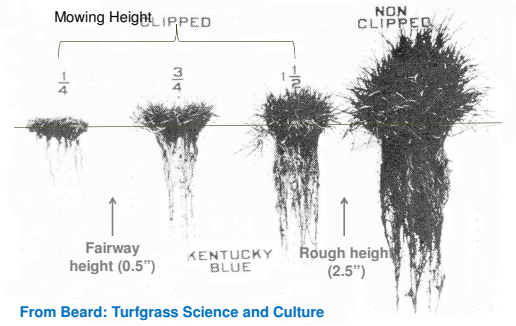
- Tolerant turf types
- Fertility
- Mowing

Turf Tolerance to Grubs

- 15 cm diam. plastic cylinders placed into the soil and the soil leveled before seeding turf types.
- 10 turf types seeded in replicated plots (6 reps)
- After 2 years of establishment, EC grubs put into cylinders (66 per ft^2)

Turf Type	Grubs	Control (no grubs) root wt	Grubs added root wt	Root loss (%)	Damage rating (% dead)
Tall Fescue 'KY31'	4.5	110	15	87	5.0
Tall Fescue 'Bonsai'	5.6	114	18	84	5.3
Tall Fescue 'Falcon'	5.8	81	22	73	5.8
Ryegrass 'Palmer III	7.7	156	15	91	5.1
Ryegrass 'Premier'	6.2	88	17	72	6.0
Ryegrass 'Affinity'	6.8	146	27	81	4.4
Ky Bl 'Brilliant'	9.0	190	97	49	2.8
Ky Bl 'Midnite'	7.2	195	60	69	5.1
Ky Bl 'Champaign'	7.0	187	56	70	2.2
Fine Fescue 'Dawson	7.2	133	33	75	3.4

Influence of Mowing Height on Root Mass



From Beard: Turfgrass Science and Culture

More than 50% of roots must be consumed before damage is visible

Prevent grub damage with a 'Smart Lawn'

Smart Lawns: Seed with Kentucky bluegrass or fine fescue, moderate fertility, raise the mower height to the highest setting, return grass clippings and chopped leaves to the lawn, and water during dry periods.

How Can I Grow a Grub-Tolerant Sports Field Without Using an Insecticide?

Growing a Grub-Tolerant Lawns and Sports Fields Without Insecticides

Establish turf with the largest root mass possible:

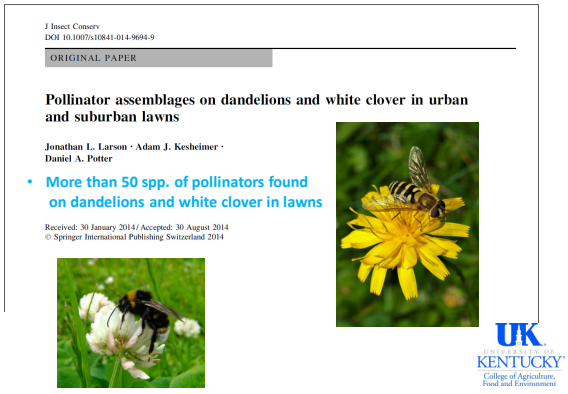
- Seed with Kentucky bluegrass
- Irrigation
- Good fertility
- Mowing Height:
  - Cut at 3.5" in the off-season
  - Cut at 3.5" between games (if possible) or as much as possible

How to Use an Insecticide for Grub Control Without Harming Pollinators

A type of sweat bee, one of 4,000 species of native bees in North America

Larson and Potter, Kentucky lawns

Published Sept. 2014



J Insect Conserv
DOI 10.1007/s10841-014-9694-9

ORIGINAL PAPER

Pollinator assemblages on dandelions and white clover in urban and suburban lawns

Jonathan L. Larson · Adam J. Kesheimer · Daniel A. Potter

- More than 50 spp. of pollinators found on dandelions and white clover in lawns

Received: 30 January 2014 / Accepted: 30 August 2014
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UK KENTUCKY College of Agriculture, Food and Environment

Objectives of Potter Study

- Evaluate hazards of lawn insecticides to bees in the field
- Find ways to reduce the risks of harm

Assessing Insecticide Hazard to Bumble Bees Foraging on Flowering Weeds in Treated Lawns

Jonathan L. Larson, Carl T. Redmond, Daniel A. Potter*
Department of Entomology, University of Kentucky

1. PLoS ONE 8(6): e66375. doi:10.1371/journal.pone.0066375
2. Larson, Redmond & Potter 2014; *Environ. Tox. Chem.*

naturespotted.wordpress.com

Results of Kentucky Study

When bumble colonies were caged over insecticide-sprayed turfgrass with clover (at 24 h after spraying), and kept their for 2 weeks:

- **For Clothianidin- the number of foraging bees was reduced by 75% and no new queens produced (compared with 35 queens in control plots)**
- **For chlorantraniliprole (Acelepryn)- No difference from control treatment**
- **For lawns mowed before spraying- No effect on the bees**

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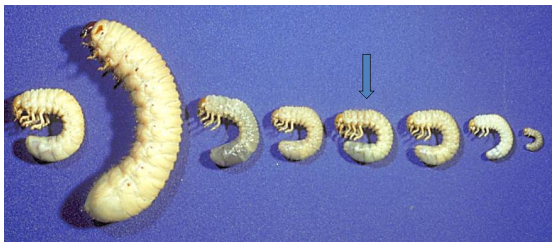
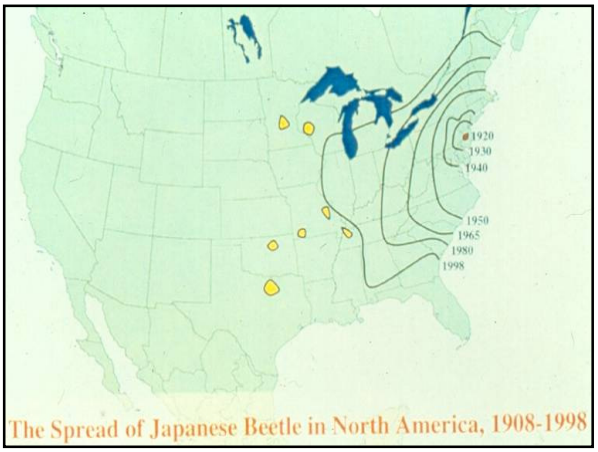
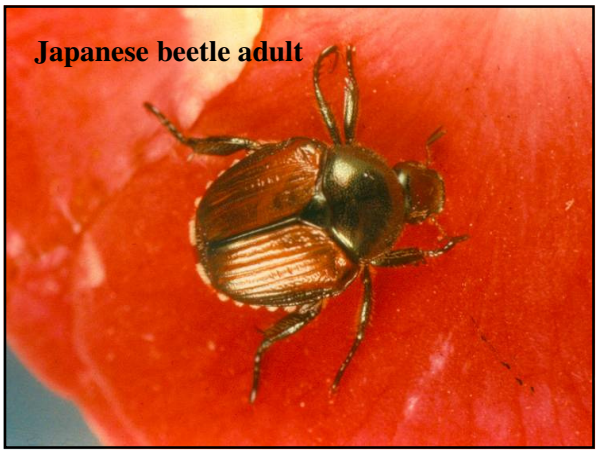
Japanese beetle

- First found in New Jersey about 1920
- Has spread westward as far as the Mississippi River by 2000.
- Considered the most damaging pest of turf in the Eastern United States





The Spread of Japanese Beetle in North America, 1908-1998



Scouting for Japanese beetle

- Japanese beetle traps to see if JB is in your area.
- Cup-cutter samples for grubs starting in September
- Action thresholds: 5/ft^2 in dry turf
  10/ft^2 in irrigated turf

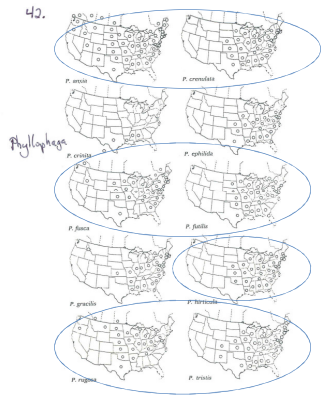
Management of Japanese Beetle

- Prevention in problem-prone areas, where turf has been damaged in past (before Aug 15)- Use sprayable or granular formulations
  - Merit, and other imidacloprid products
  - Mach 2, Meridian
  - Arena, Aloft
  - Allectus, Acelepryn
- Curative insecticide where grubs exceed threshold-
  - Dylox or Sevin (until Oct. 15), Arena (until Oct. 1)

June beetle larva, pupa and adult

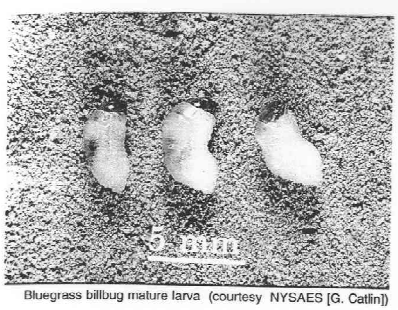
***May or June Beetle (Phyllophaga)* in NA**

- Several species in Colorado

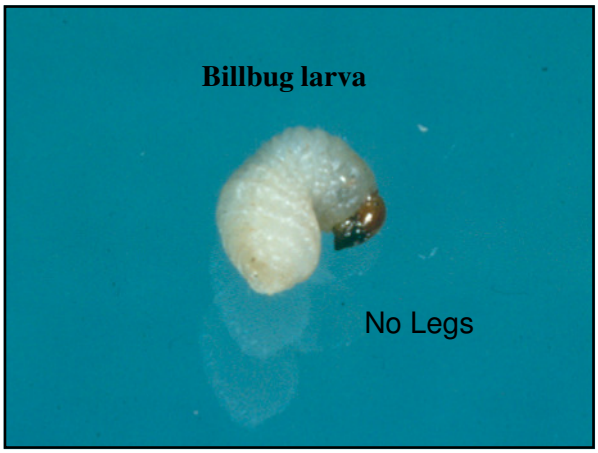


Billbug adult

Billbug larvae



Bluegrass billbug mature larva (courtesy NYSAES [G. Catlin])



2007 Ohio Billbug Test

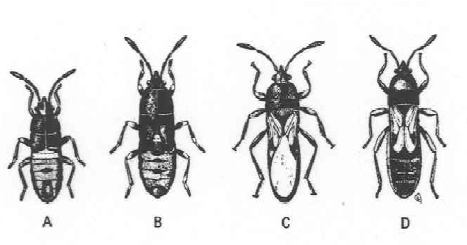
Treatment	Rate	Billbug % Control	Grub % Control
Aloft SC	0.12/0.06 lb.	100.0	68.0
Aloft SC	0.24/0.12 lb.	95.5	100.0
Aloft G	0.25/0.13 lb.	77.3	100.0
Bifenthrin SC	24oz/A	68.2	80.0
Meridian 25WDG	0.20	100.0	84.0
Merit 75 WP	0.25	77.3	72.0

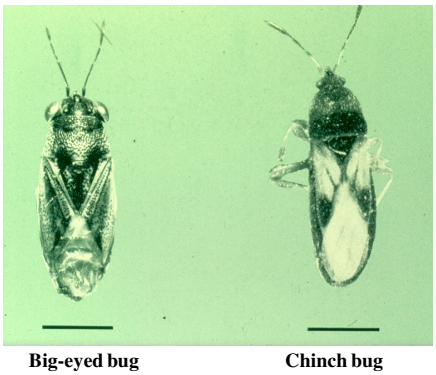
Test data from Dr. Dave Shetlar, OSU. appl - 9 May; Columbus, OH; billbug read 28 June, 18.6/sq.ft. check; JB adults caged in July, grubs read - 28 Sept, 17.9/sq.ft. checks

Treating for Billbugs

- **Aloft, Arena, Meridian, Merit, Allectus**
- **Apply in mid to late May to lawns damaged in previous year by billbugs**
- The above treatments will also prevent injury from Chinch bugs, Japanese beetle and European chafer

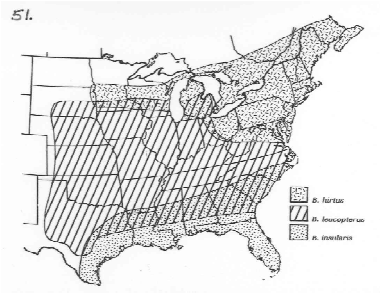
Chinch bugs



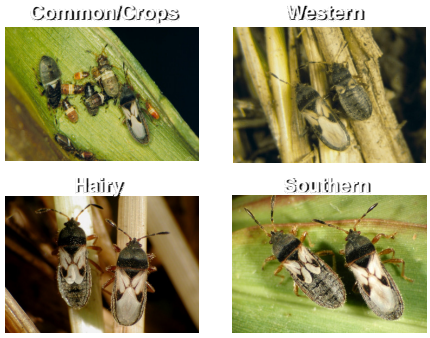


Big-eyed bug Chinch bug

Chinch bugs in Eastern North America



Turfgrass Chinch Bugs



Dr. Fred Baxendale, University of Nebraska

Chinch bugs

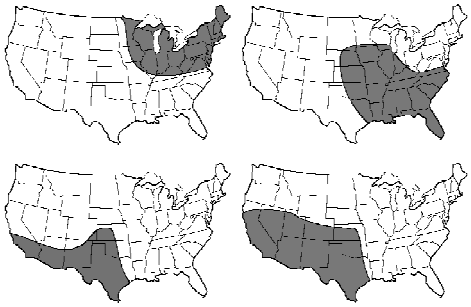
Most likely to be a problem on:

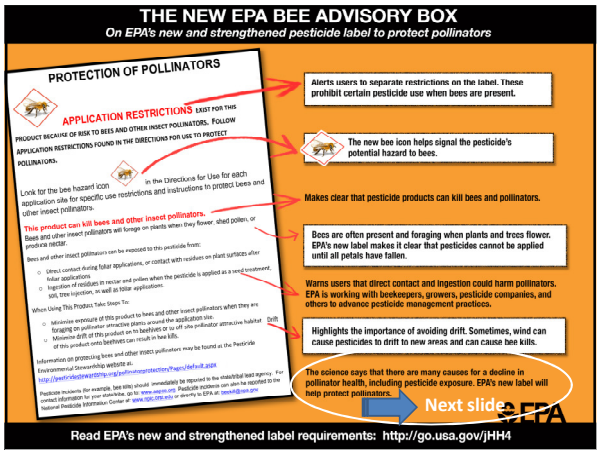
- Lawns with thick thatch
- Dry lawns
- Mixture of Kentucky blue grass and fine fescue

Chinch Bug Management

- Irrigation: daily irrigation of >1" per week
- Merit, Aloft, Meridian, Arena or Allectus in June
- One of the above products when chinch bugs and damage are first found, **June – August.** Allow two weeks to work.
- **Use a threshold of 20 chinch bugs in 2 minutes of searching (on a dry, warm afternoon)**
- Endophytic perennial ryegrass is resistant

Masked Chafer Distribution Maps





From the new 'bee box' on EPA pesticide labels:

"The science says that there are many causes for a decline in pollinator health, including pesticide exposure. EPA's new label will help protect pollinators".

A similar Power Point file can be downloaded at:
http://www.ent.msu.edu/directory/david_smitley