# Field crop insects:

## 2009 Summary and 2010 Predictions

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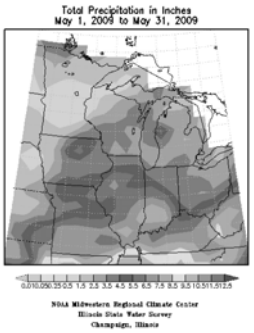
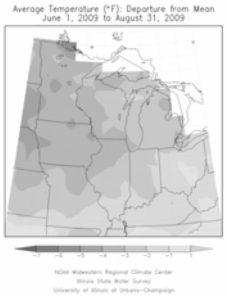
## 2009: From a wet spring…




## … to a cool summer




## *Early heavy rains = changes in pest complex*

- **Redistribution of soil & everything in it…including insects**

## Flooding Effects on Soil

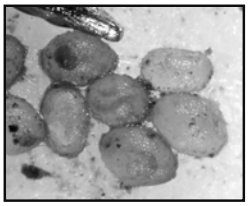
- **Saturated pore space…leads to anaerobic conditions**
- **Kills plants, insects, promotes some micro-organisms**

## Flooding = Late planting (or replanting)

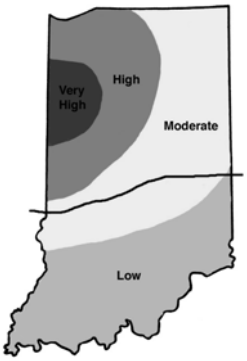
- **Corn pests: generally reduce RW attack – plants are small or not yet germinated when larvae need food**
- **Soybean pests: soybean aphids from areas with "old" beans late in summer are more likely to colonize late-planted, green beans…**

## Flooding: Corn rootworms

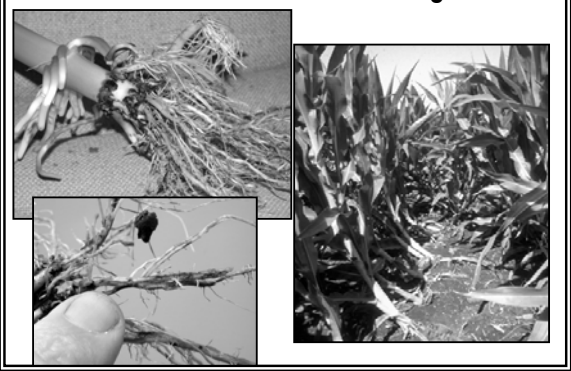
- Egg (rootworm)
  - Withstands drowning
    - low oxygen needs, so can survive underwater
  - High mortality if exposed to soil surface
    - dessication



## Perceived First-Year Corn Rootworm Risk Areas




## Corn Rootworm - Damage

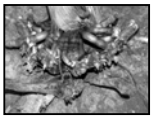


## Root Lodging is NOT always CRW!

High Winds and/or Heavy Rains

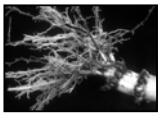
Poor Root System

Herbicide



Compaction*

CRW

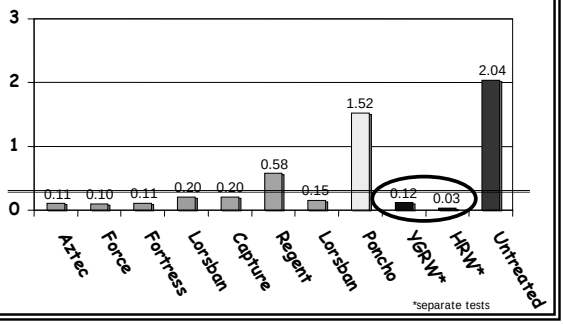


## Factors increasing risks

- Late planted/late pollinating corn
  - replanted area
- Grassy weeds
- Continuous corn

## Root Rating Performance, 2007

Wanatah, IN - Moderate/High Pressure



### *Bt* Corn Registrations for 2010

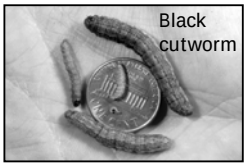
| Company | Crystalline Protein | Trade Name |
|---|---|---|
| Monsanto | Cry3Bb1<br>Cry1Ab<br>ALL OF ABOVE+RR | *YieldGard RW*<br>*Yieldgard*<br>*Yieldgard VT Triple* |
| Dow AgroSciences & Pioneer Hi-Bred | Cry34Ab1 /Cry35Ab1<br>Cry1F<br>ALL OF ABOVE | *Herculex RW*<br><br>*Herculex I*<br>*Herculex XTRA* |
| Syngenta | mCry3A<br>Cry1ab<br>ALL OF ABOVE | *Agrisure RW*<br>*Agrisure CB*<br>*Agrisure CB/RW* |

***ALL the above require planting the 20% non-Bt refuge:**
**- within or adjacent field for RW hybrids**
**- Within ½ mile for CB hybrids**

### *Bt* Corn Registrations 2010: New offerings

| Company | Crystalline Proteins | Trade Name | Refuge? | Status for 2010 planting |
|---|---|---|---|---|
| Monsanto+Dow | Cry1F<br>Cry34Ab1<br>Cry35Ab1<br>Cry3Bb1<br>Cry1A.105<br>Cry2Ab<br>RoundupReady<br>LibertyLink | *SmartStax* | **5%, must be within or adjacent to field** | **Registered and approved for sale** |
| Pioneer Hi-Bred | Cry34Ab1<br>Cry35Ab1<br>Cry1F | *Optimum Acremax* | **Seed is mixed at 2-5%, no additional refuge required** | *Registration pending, stay tuned…* |

### Secondary Soil Insect Pest

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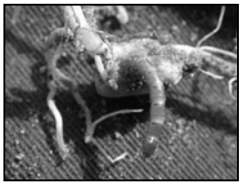
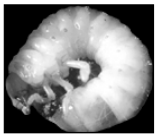


Wireworms/Click beetle

### Secondary Soil Insect Pest



White Grub

June bug

Masked chafer

Japanese beetle

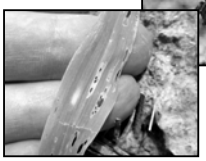
### Secondary Soil Insect Pest

Seedcorn maggot

Adult

## Secondary Soil Pests

Adult gray slug



Slug damage

## Insecticide-Treated Seed Efficacy Ratings

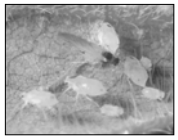
| Product | CRW | WG | WW | SCM | BCW |
|---|---|---|---|---|---|
| (thiamethoxam) Cruiser (0.25 mg) | n/a | F | F | E | F |
| Cruiser (1.25 mg) | F | G | G | E | F |
| (clothianidin) Poncho 250 (0.25mg) | n/a | F | F | E | F |
| Poncho 1250 (1.25 mg) | F/G | G | G | E | F |

E=Excellent, G=Good, F=Fair, P=Poor

CRW=corn rootworm
WG=white grub
WW=wireworm
SCM=seedcorn maggot
BCW=black cutworm

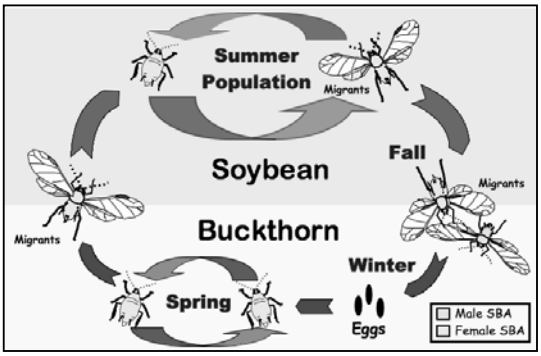
## Soybean Aphid 2009: What happened, forecast for 2010

**Biology and life cycle**



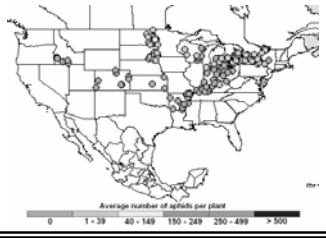
**Factors influencing 2009 populations**

**2010 forecast and treatment options**




## Soybean Aphid Sentinel network

- www.sbrusa.net, 13 IN sites
- Almost no aphids reported until late August of 2009
- BUT, lots of green late-planted beans available in September



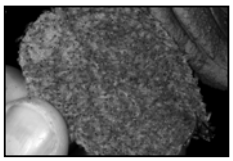

## Soybean Aphid: 2009 review

- **SBA late summer migration to green, growing beans (i.e. southern IN)**
- **Cool temps, no predators**

**= OUTBREAK!**

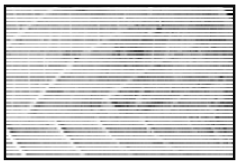
## Fall Flight 2009: Lots of aphids, few survivors

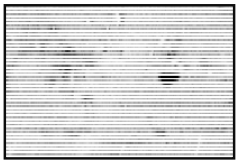
- Unprecedented fall flight, mostly from south (soybeans) to north (buckthorn)
- BUT: most did not find a home (or a mate)



## Buckthorn observations: Predictions for 2010

- Disease killed most aphids on buckthorn
- Very few males, very little mating
  = almost no eggs for overwintering

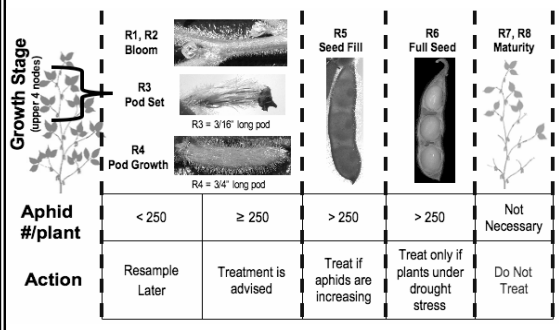




## Suction traps: Predictions for 2010

- Enormous numbers of aphids going into overwintering in fall
- BUT: very few males found
- Suggests very low spring aphid populations

## SBA Treatment Threshold Guide




| | | | | | |
|---|---|---|---|---|---|
| Aphid #/plant | < 250 | ≥ 250 | > 250 | > 250 | Not Necessary |
| Action | Resample Later | Treatment is advised | Treat if aphids are increasing | Treat only if plants under drought stress | Do Not Treat |

## Treatment Threshold

- Many fields treated in 2009 may have been sprayed unnecessarily/too late
- Economic threshold of 250 aphids/plant is *robust*, especially at R5 and above (larger plant, less critical period of growth etc.)
- Actual threshold for R5-R6 plants is probably much higher (over 1000)

➔ SCOUT FIELDS REGULARLY!

## Treated Soybean Seed Efficacy

**Wanatah, IN - 2005**
**Soybean Aphid**

| Treatment | SBA 30 DAP | SBA 37 DAP | SBA 44 DAP | SBA 64 DAP | SBA 79 DAP | SBA 86 DAP | Yield |
|---|---|---|---|---|---|---|---|
| Apron Max | 0 | 6 b | 127 a | 46 a | 26 ab | 11 a | 49.4 a |
| Apron Max & Cruiser | 0 | 1 b | 18 a | 12 a | 13 b | 4 a | 49.4 a |
| Soygard & Gaucho | 0 | 3 b | 20 a | 6 a | 14 b | 11 a | 49.0 a |
| Untreated | 0 | 32 a | 65 a | 34 a | 43 a | 12 a | 47.0 a |

## Seed treatments and SBA in Indiana

**Cruiser (thiamethoxam):** Demonstrated field activity of 35 days, usually not enough for majority of IN soybeans

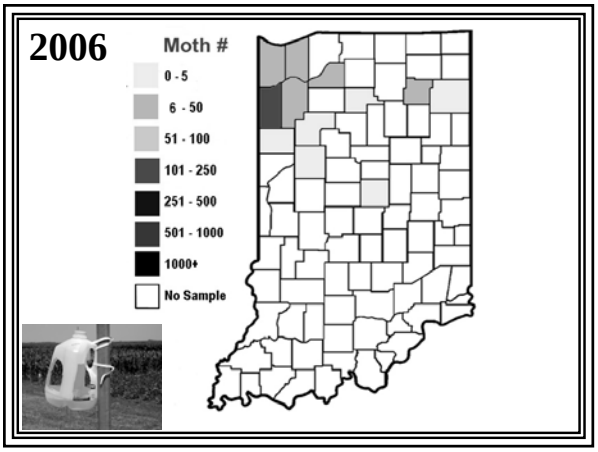
**Gaucho (imidacloprid):** Claims 60+ days of activity against aphid, not widely used – no IN data yet

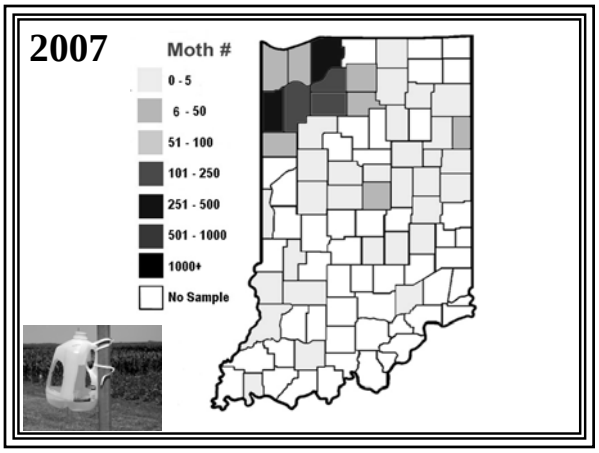
*BOTTOM LINE:*

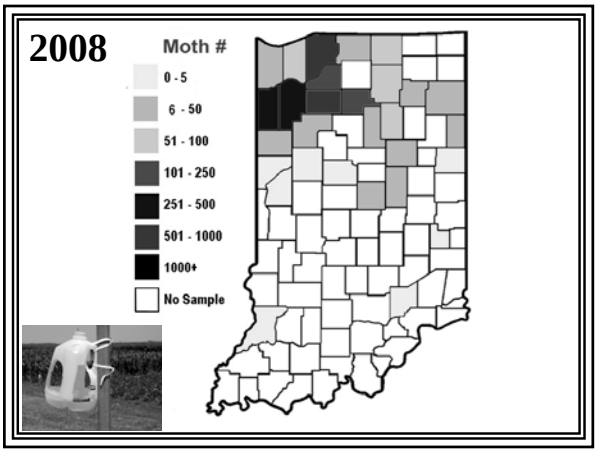
Indiana receives most of its aphid pressure later in season (minimum: 35-45 days after planting), so Cruiser is not best option for most producers

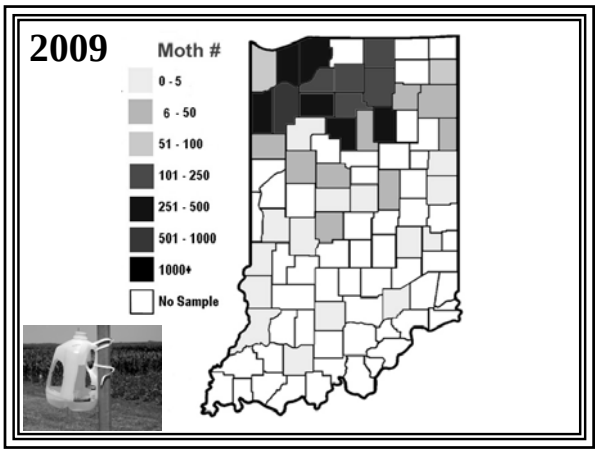
## SBA Insecticides

- Pre-Harvest Interval (Days) NOT same as residual!!
  - Products with SBA on label:
    - Asana - 21
    - Baythroid - 45
    - DECIS - 21
    - Lorsban 4E - 28
    - Mustang Max - 21
    - Penncap - 20
    - Proaxis - 45
    - Warrior - 45

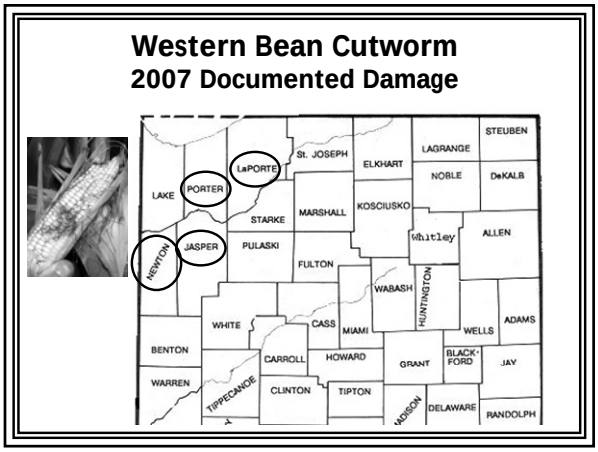



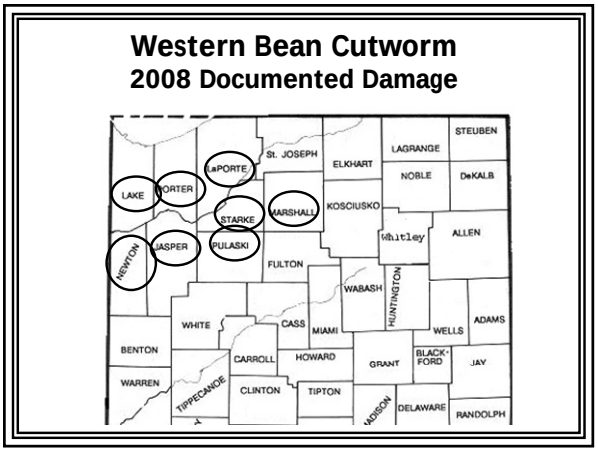



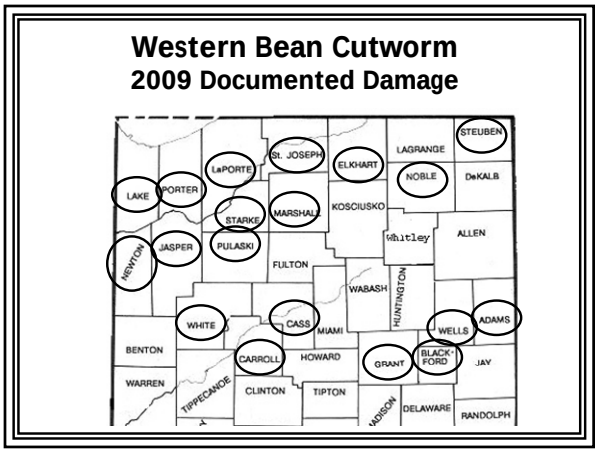






## Western Bean Cutworm - Damage

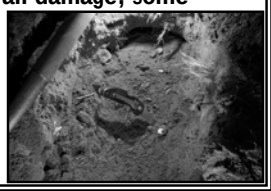



## Western Bean Cutworm – Expectations

- **Higher Risk**
  - **Sandier soils**
  - **Continuous corn**
- **Expanded eastern range**
- **Slight increase in overall damage, some fields significant**



## Western Bean Cutworm: Treatment

**2 treatment options:**

- **Foliar sprays: "Easy to kill, but hard to hit"**
  - **Must scout within egg-laying period (late July – early August)**
  - **Treatments must hit newly-emerged larvae**
- **Bt corn: *But* not all "Bt corn" will work**

  **Herculex and SmartStax hybrids have good efficacy (must have Cry1F gene)**