



Making Decisions About
**Neonicotinoid Seed
Treatment Use in Iowa**

*Scouting & Field History Reports
for Early Season Corn and Soybean IPM*



Neonicotinoid seed treatments may provide control of some early season corn and soybean pests. When practicing integrated pest management (IPM), a chemical control strategy like neonicotinoid seed treatments should only be used when there is a demonstrated need. Scouting and monitoring records can provide the evidence needed to justify use of an insecticidal seed treatment. This fact sheet provides guidance on 1) which corn and soybean pests may be targeted effectively with neonicotinoid seed treatments, 2) when scouting should occur to inform future decisions on use of neonicotinoid seed treatments, and 3) how to scout for these early season pests.

**NEONICOTINOID SEED TREATMENTS
MAY BE USED FOR THE FOLLOWING PESTS:**

EARLY-SEASON INSECT PEST	CORN	SOYBEAN
Bean leaf beetle		X*
Seedcorn maggot	X*	X*
True white grubs	X*	X*
Wireworms	X*	X*

*Not a frequent economic pest in Iowa



Bean leaf beetle

Soybean

Bean leaf beetles infrequently cause significant economic early season soybean injury. Only in fields with a history of both bean leaf beetles and bean pod mottle virus (BPMV) would neonicotinoid seed treatments be recommended for early-season suppression. Previous year scouting records and field history reports that demonstrate the presence of both BPMV and bean leaf beetle adults would verify a potential need for seed treatments the following year.

Fields of Concern: Fields with persistent bean leaf beetle and BPMV issues.

Pest Injury: Feeding by overwintering adults can transmit BPMV to soybean seedlings; feeding on emerging seedlings at cotyledon stage can cause stand reduction; later season feeding can cause injury to foliage or developing pods; and second generation beetle feeding on the pods can cause pods to abort.

Economic Threshold: Thresholds vary by market value and cost of management. For foliar insecticide applications, a dynamic threshold calculator for 1st and 2nd generation beetles only was developed for Iowa and is available at <http://www.ipm.iastate.edu/fieldcropinsects>

Resources:

Bean pod mottle virus:

<http://crops.extension.iastate.edu/bean-pod-mottle>
<http://www.soybeanresearchinfo.com/diseases/beanpodmottlevirus.html>

Scouting Tips to Inform Next Season Seed Treatment Decisions:

- **Scouting Timing (for beetles):** Throughout growing season to verify presence of first generation (June and July) or second generation (August and September) adult beetles.
- **Scouting Technique (for adult beetles):** Using a sweep net, conduct 20 sweeps while walking a soybean row (1 sweep = 180-degree pass across two soybean rows or 3 linear feet within a single row).
- **Scouting Timing (for BPMV):** Throughout growing season to verify BPMV infection.
- **Scouting Technique (for BPMV):** Look for leaf symptoms on young leaves (see resources for details).

Bean leaf beetle:

http://crops.extension.iastate.edu/soybean/diseases_blb.html

<https://extension.entm.purdue.edu/fieldcropsipm/insects/bean-leaf-beetle.php>

<http://cropwatch.unl.edu/scout-early-emerging-soybeans-bean-leaf-beetles>

<http://crops.extension.iastate.edu/cropnews/2016/08/bean-leaf-beetle-activity-noted-2016>



Seedcorn maggot Corn/Soybean

Seedcorn maggot is not common and becomes an increased pest risk in soils with higher organic matter or where tillage prior to planting occurs. These conditions make a field more attractive to egg-laying female flies. This pest overwinters in the pupal stage and adult flies emerge in late April to early May. Seed treatments may be an effective control option in fields with prior persistent seedcorn maggot problems. Previous season scouting and field history reports would provide evidence of the pest and justification for use of a neonicotinoid seed treatment the following year.

Fields of Concern: The following conditions may contribute to persistent seedcorn maggot pest issues: fields where winter or spring manure applications occur; fields where green cover crop is incorporated prior to planting; recently tilled fields (within 14 days of planting); and fields where seed will be planted into cool, wet soil. Note that fields tilled in spring are more attractive to egg-laying females than no-till fields.

Pest Injury: Larvae feed on corn or soybean seed.

Economic Threshold: None. No rescue treatments exist for this pest because once damage is detected, treatment measures are not possible.

Scouting Tips to Inform Next Season Seed Treatment Decisions:

- **Scouting Timing:** Early spring (from planting to emergence of corn/soybean) to confirm crop damage is caused by seedcorn maggots.
- **Scouting Technique:** Examine field areas where plants have not emerged. Dig up seed, check for germination, and examine for injury and presence of maggots.

- Alternative management options:**
- Delayed planting date (gives seedcorn maggots time to complete their development)
 - No-till farming

Resources:
<https://extension.entm.purdue.edu/fieldcropsipm/insects/corn-seedcorn-maggot.php>
<http://corn.agronomy.wisc.edu/Management/pdfs/A3820.pdf>
<http://extension.missouri.edu/p/G7114>



True white grubs

Corn/Soybean

True white grubs are not a common pest in Iowa, but fields where soybean or corn are planted following pasture or grass may be at higher risk of developing true white grub issues. Since these grubs live in the soil for 3-4 years prior to adult emergence, neonicotinoid seed treatments may help suppress these pests in fields where their feeding damage has been documented. Past field records verifying presence of grubs can provide justification for use of seed treatments. Note that pest suppression by neonicotinoid seed treatments may be overwhelmed if grub numbers are high.

Fields of Concern: Fields where stand loss due to presence of true white grubs has been documented.

Pest Injury: Root feeding injury from grubs.

Economic Threshold: Though no early season rescue treatments exist for this pest, a threshold of one or more grub per cubic foot of soil can cause crop stand reductions.

Resources:

<http://crops.extension.iastate.edu/cropnews/2015/06/true-white-grub-identification-and-management>

<https://extension.entm.purdue.edu/fieldcropsipm/insects/corn-whitegrubs.php>

Scouting Tips to Inform Next Season Seed Treatment Decisions:

- **Scouting Timing:** Throughout growing season or early spring prior to planting to confirm damage due to grubs.
- **Scouting Technique:** Select five areas in field, randomly distributed. Dig up soil samples of 1 cubic foot (2 feet long by 1 foot wide by 6 inches deep) in each area. Place soil on dark cloth or plastic and examine for presence of true white grubs.
 - Identify grubs by looking at raster hair pattern. Identification is important because other white grubs, such as the annual white grub, may be present but are not problematic in Iowa corn and soybean.
 - Calculate number of true white grubs per cubic foot of soil.



Wireworms

Corn/Soybean

Wireworms infrequently cause early season problems in Iowa corn and soybean. Fields where a crop follows pasture, sod, or small grains have an increased risk of wireworm damage. Neonicotinoid seed treatments may help in suppression of wireworms, but high infestation rates may also overwhelm seed treatments. This insect is the larval form of click beetles, and some may live for years in the soil before emerging as adults. Scouting and past field records documenting presence of wireworms and their damage can provide justification for use of a seed treatment the following year.

Fields of Concern: Fields where presence of wireworms has been documented.

Pest Injury: Seed damage from larvae feeding on germ, or seedling damage from larvae feeding on underground plant parts. Symptoms of damage include wilted plants or gaps in rows after emergence.

Economic Threshold: Thresholds have been developed for control actions and are based on sampling method. If using a bait station, threshold would be an average of one live wireworm per bait station. If using soil samples, threshold would be an average of one live wireworm per cubic foot soil.

Scouting Tips to Inform Next Season Seed Treatment Decisions:

- **Scouting Timing:** Throughout growing season or early spring prior to planting to confirm damage due to wireworms.
- **Scouting Technique:** Two options are available to detect wireworms.

Option 1: Construct solar bait stations at rate of 5-10 stations per 40-acre field.

Option 2: Dig up soil samples of 1 cubic foot (2 feet long by 1 foot wide by 6 inches deep) in each of five randomly selected areas of field. Place soil on dark cloth or plastic and examine for presence of wireworms. Calculate number of wireworms per cubic foot.

Resources:

<https://extension.entm.purdue.edu/fieldcropsipm/insects/corn-wireworms.php>

<http://extension.cropsciences.illinois.edu/fieldcrops/insects/wireworms/>

<http://crops.extension.iastate.edu/cropnews/2015/05/check-wireworm-injury-when-assessing-corn-stands>

<http://ipm.missouri.edu/IPCM/2011/4/Wireworm-Baits-and-Preplant-Decisions-for-Corn/>



Neonicotinoid seed treatments are not recommended for the following pests:

Black Cutworm

Corn

Because black cutworm does not overwinter in Iowa, scouting the previous season does not inform about potential cutworm problems for the following spring. Research also indicates variable efficacy of seed treatments on suppressing this pest. Only early season scouting after corn emerges could inform whether a seed treatment is needed for this pest, and seed treatment decisions at this point are impossible. Other cultural and chemical control strategies should be pursued for this insect pest.

Corn Flea Beetle

Corn

Corn flea beetle is not often a serious early season economic pest of corn in Iowa. Only in combination with Stewart's wilt (a disease caused by a bacterium vectored by the corn flea beetle) does this insect become a cause for greater concern. Stewart's wilt has not been a significant problem in Iowa for over 10 years, and unless Stewart's disease becomes a more frequent issue in Iowa, seed treatments are not recommended for this insect. Iowa State University has developed prediction models for Stewart's wilt based on overwintering temperatures.

Corn Rootworms

Corn

Neonicotinoid concentration levels in corn are reduced after about three weeks. Seed treatments are not recommended because corn rootworms typically hatch in the soil after this 3-week period.

Additional Resources:

Corn and Soybean Field Guide. 2016. Iowa State University Extension and Outreach. <https://store.extension.iastate.edu/Product/14743>

Integrated Crop Management News. Iowa State University Extension and Outreach (latest info on pest presence and scouting in Iowa). <http://crops.extension.iastate.edu/cropnews>

Fields Crops – Insects. University of Illinois Extension and Outreach. <http://extension.cropsciences.illinois.edu/fieldcrops/insects/>

Fields Crops IPM. 2009. Purdue University. <https://extension.entm.purdue.edu/fieldcropsipm/corn.php>

Field Crop Insects. 2012. Iowa State University Extension and Outreach. <http://www.ipm.iastate.edu/fieldcropinsects>

Acknowledgements:

This document was developed by Thelma Heidel-Baker and Mace Vaughan, the Xerces Society and Kevin Kuhn and Martin Adkins, USDA-NRCS. Special thanks Erin Hodgson of Iowa State University for her careful review and significant feedback. Thanks also to Darren Mueller and Steven Bradbury at Iowa State University and Tom Rabaey at General Mills for their comments and feedback. This publication is made possible by support from the USDA Natural Resources Conservation Service and General Mills.

For more information about how NRCS can help in the adoption of Integrated Pest Management practices, please visit the Iowa state NRCS website (<https://www.nrcs.usda.gov/wps/portal/nrcs/site/ia/home/>) or contact your local USDA Service Center (<https://offices.sc.gov.usda.gov/locator/app?state=ia>).

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True white grub photo: Adam Varenhorst

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