# Pest&Crop

November 24, 2000 - No. 28

## In This Issue



**2000 *Pest&Crop* Index and Subscription Form are included in this issue!**

## Insects, Mites, and Nematodes

**First-Year Corn Rootworm Management Guidelines for 2001** - (*John Obermeyer, Rich Edwards, and Larry Bledsoe*)

- Guidelines for 2001 rootworm management in first-year corn are given below in two risk categories (high and low) by areas of Indiana
- Rootworm beetle numbers in 2000 were highest in northwestern and west central counties, a mixed bag in other northern counties
- Your rootworm beetle observations from 2000 soybean fields should be used to assess your risk for damage to 2001's corn

The accompanying map "2000 Western Corn Rootworm Sweep Net Survey in Soybean," developed by Ron Blackwell, on page 3, provides relative numbers of beetles in fields observed between July 25 and August 22, 2000. Differences in beetle numbers vary from field to field, so use caution when interpreting county data. Unless one sampled his/her field several times during the egg-laying period (sweep net, sticky traps, or visual), there is a risk in applying our numbers to your specific field. This map, research data, and observations reported to us from producers, county educators, crop consultants, and ag chem dealers have helped us formulate the following rootworm management guidelines for 2001 in first-year corn.

**Highest Risk - Northern Indiana**: The highest beetle populations in 2000 were observed in this area of Indiana.

- A soil insecticide is not needed for rootworm larval control in a field where *no, or very few, rootworm beetles* were observed in 2000 soybean.
- Where *rootworm beetles were consistently observed* in 2000 soybean, the application of a soil insecticide is probably justified in corn in 2001.
- In areas where rootworms have caused problems in first-year corn and one *did not monitor for rootworm beetles* in 2000, a soil insecticide is needed in 2001.

**Lowest Risk - Southern Indiana:** Significant rootworm damage to first-year corn has yet to occur much below Interstate 70.

- A soil insecticide is not needed for rootworm larval control in 2001 first-year corn, with the following exception:
  - A few isolated first-year cornfields in southern Indiana have been damaged by corn rootworm. Producers that observed a significant number of rootworm beetles in 2000 soybean, may need to apply a soil insecticide in corn in 2001. If planting after May 1, applying a reduced rate (75% rate) of a rootworm insecticide may be a cost-savings, yet efficacious, option.*

The above discussion is based on assessment of risk of damage from the western corn rootworm variant. An insecticide may be needed if other insect pests are present in economic numbers. Whenever soil insecticides are used, we encourage producers to leave untreated strips in order to evaluate product performance and the economics of treating.

*Producers who experiment with reduced rates do so with the understanding that they are solely responsible for the performance of the product. The soil insecticide manufacturer is under no legal obligation when their product is applied at less than labeled rates. Other soil insect pests may not be controlled with reduced insecticide rates.

• • P&C • •

**Seed-Applied Insecticides and Efficacy** – (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) –

- Novel soil insecticide delivery is attracting producer's attention
- ProShield and Prescribe seed treatments are labeled for rootworm control
- University efficacy trials for 2000 show that rootworm control is marginal

Insecticide coated seed corn that controls rootworms and secondary soil insects is quite appealing to producers. The recent testing and market release of seed-delivered insect control is not surprising. Most granular soil insecticides are now under the watchful eye of EPA, which leads to speculation that it is just a matter of time before they are no longer available. This leaves the door wide open for new chemistries, technologies and/or delivery mechanisms to fill this possible void in soil insect control.

Limited supplies of NK brand seed with ProShield was available for the 2000 growing season. ProShield; a concentrate of Force insecticide (tefluthrin) attached to corn seed is a joint venture between Zeneca Ag Products and Novartis Seeds (both have since merged and renamed Syngenta). Force 3G granular soil insecticide has been a consistent performer through many years of testing. But since tefluthrin is not systemic and has relatively little horizontal movement in the soil, one cannot but wonder how a seed applied insecticide will protect the roots several inches away. The company explanation is that the patented process of micro-encapsulation and polymers gets it there. Unrelated to ProShield treated seeds efficacy was its plantability. Several producers experienced problems with the treated seed not flowing correctly, causing planter monitors to light up even with the addition of talc. We've been assured by Syngenta personnel that this "bug" is being worked out for next year.

Imidacloprid, the active ingredient of new Gaucho and Prescribe seed treatments, is a new chemistry for commercial corn. Bayer's Gaucho has been used on seed corn for a couple years in the Midwest to reduce corn flea beetle feeding and subsequent transmission of Stewart's disease on susceptible inbreds. This chemistry is used in the urban market for various uses, e.g., Merit for turf insects. Now Gustafson is working with some seed companies to pretreat their varieties with one of two rates of imidacloprid. The lower rate, Gaucho, is touted as protecting seed from wireworms and seedcorn maggots. The higher rate, Prescribe, in addition to wireworm and seedcorn maggots is claiming to protect seed from rootworms and corn flea beetle. Please note that white grub is **not** on the label or in advertisements for Gaucho or Prescribe! In contrast, previously mentioned Merit is an excellent turf insecticide for grub control. The difference is that Merit is applied in the fall when annual grubs (i.e., Japanese beetle) are small and susceptible to this chemistry. Japanese beetle grubs in the spring are larger and difficult if not impossible to control with most insecticides.

Root ratings of seed-applied insecticides for 2000 from Purdue, Illinois and Iowa State Universities' rootworm efficacy trials are shown below:

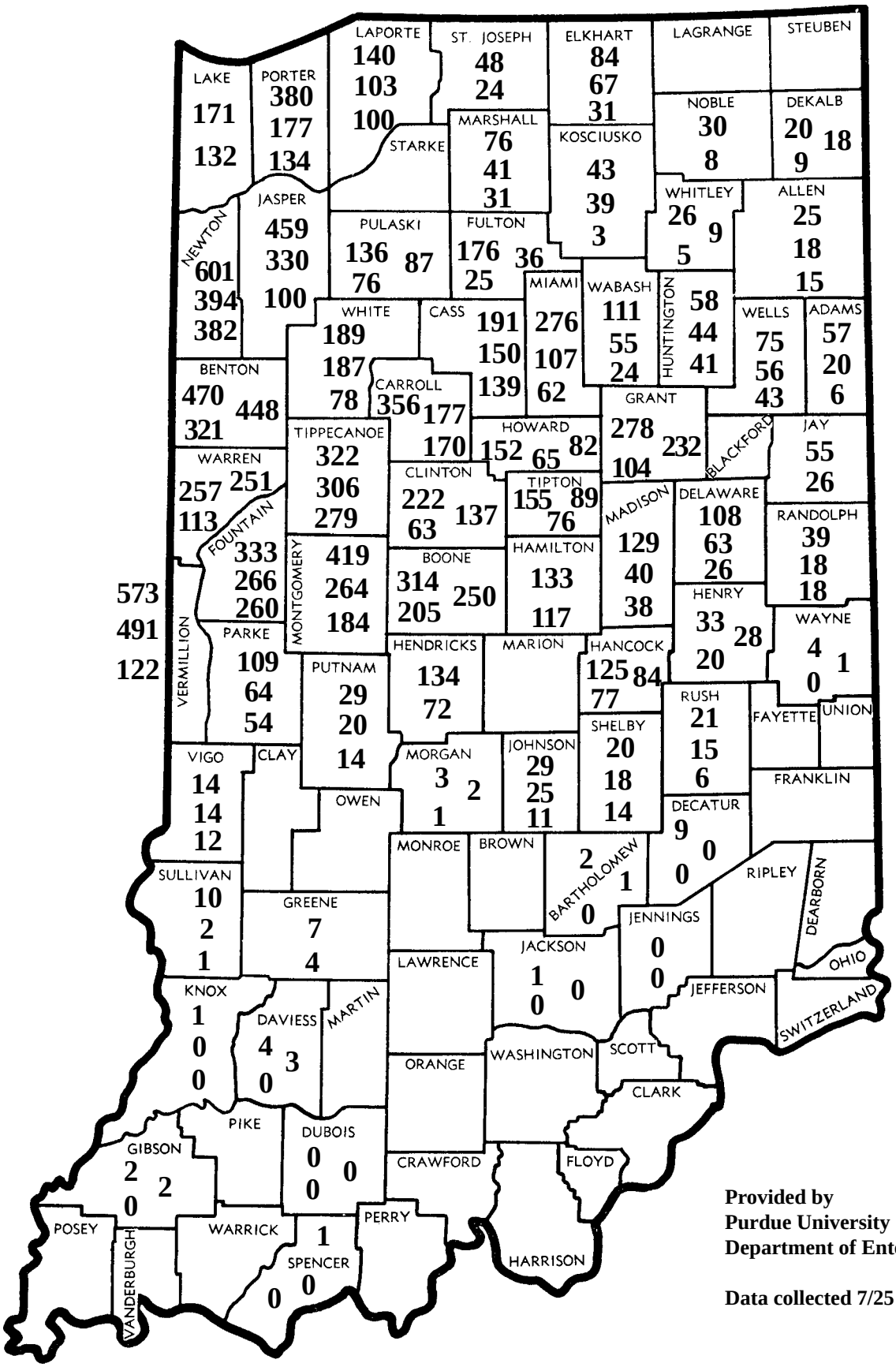
Root-Rating Performance[1], 2000

| Location | Best2 Rating | ProShield | Prescribe | Check |
|---|---|---|---|---|
| Farmland, IN | 1.20 | 1.95 | 1.95 | 2.80 |
| Wanatah, IN | 1.35 | 2.55 | 3.55 | 4.80 |
| Lafayette, IN | 1.25 | 3.55 | 2.05 | 3.40 |
| Dekalb, IL | 1.85 | 4.35 | 3.90 | 4.33 |
| Monmouth, IL | 1.20 | 3.75 | 3.20 | 4.14 |
| Urbana, IL | 2.00 | 3.55 | 3.65 | 5.03 |
| Ames, IA | 2.23 | 4.00 | 4.07 | 4.05 |
| Cedar Rapids, IA | 1.22 | 4.11 | 4.55 | 5.11 |
| Sutherland, IA | 1.92 | 4.00 | 3.75 | 4.30 |

[1]Root-rating (1-6 scale) 1=none to litle damage, 6=severe root pruning, 3.5 or greater=economic damage likely
[2]The "Best Rating" is the least amount of rootworm damage for any soil insecticide in the plot

Overall, these root ratings don't look favorable when compared to standard granular soil insecticides. In most cases they do perform better than the untreated check, indicating there is some control, albeit marginal. Where one anticipates moderate to heavy rootworm pressure (see previous article) these seed-delivered insecticides would be an unwise choice.

# 2000 Western Corn Rootworm Sweep Net Survey in Soybean (Number/100 Sweeps)




**Provided by**
**Purdue University**
**Department of Entomology**

**Data collected 7/25 - 8/22/00**

**2000 Indiana Ear Rot Survey** - (*Charles Woloshuk, Dept. Botany and Plant Pathology and Ralph Gann, Indiana Agricultural Statistics Service*) –

- Diplodia ear rot a problem statewide

We have sampled the Indiana corn crop every year since 1989 for ear rot diseases and mycotoxins. Indiana Agricultural Statistics Service (IASS) randomly selects the field to be sampled. Corn acres throughout the state have an equal probability of being selected. IASS personnel sample fields during the last week in September through October. Two sampling sites are located in each field, and samples consist of the primary ears from five consecutive plants in a single row. The five ear samples are placed in cloth bags and mailed to Purdue University. The husks are left on the ears during the mailing. Upon arriving at Purdue, ears are husked and examined for symptoms and signs of ear rots. Data are recorded for the percentage of kernels visibly infected by each type of ear rot. Occurrence of the following ear rots are noted: Fusarium ear rot (*Gibberella fujikoroi*), Gibberella ear rot (*Gibberella zeae*), Aspergillus ear rot (*Aspergillus flavus*), Diplodia ear rot (*Stenocarpella zeae*), and minor ear rots (species of *Trichoderma, Alternaria, Penicillium, Nigrospora,* and unindentified fungi). In the survey for the year 2000, 318 samples were collected from 159 fields, resulting in a total of 1590 ears examined for ear rots.

The only ear rot of significance this year was Diplodia ear rot. Infection by Diplodia is enhanced by dry weather prior to silking followed by wet conditions at and just after silking. Ears are most susceptible to this disease during the first 21 days after silking. When infection occurs within two weeks after silking, husks prematurely become bleached or straw colored, and entire ears are white to grayish or grayish brown, shrunken, and lightweight. Lightweight ears generally stand upright with the inner husks adhering tightly to each other. Black specks (tiny fruiting bodies of the fungus, called pycnidia) may be scattered on the husks, cobs and sides of kernels. Ears infected later in the growing season generally have a somewhat uniform whitish to grayish mold growth over and between the kernels starting at the base of the ear and progressing towards the tip. Infected kernel tips are discolored.

The survey data allowed calculation of the percentage of samples that showed ear rot, and calculation of the severity of ear rot (the percentage of kernels per ear that were affected).

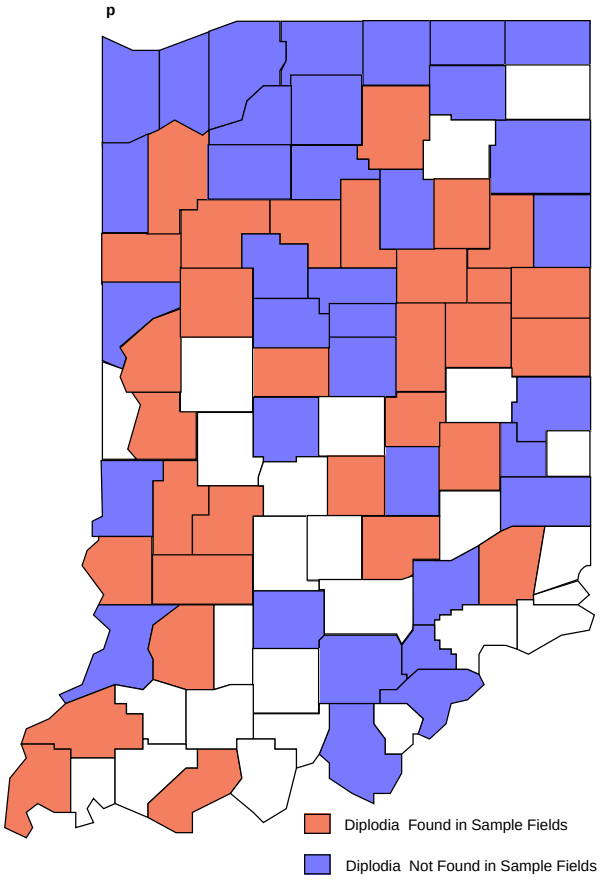
Here are the numbers.

- Diplodia ear rot was found in at least one sample fields in 30 of 66 counties surveyed (see map).
- 55 (17%) of the 318 samples examined had at least one ear with Diplodia ear rot.
- 64 (4%) of the 1590 ears examined had Diplodia ear rot.
- The severity of Diplodia rot was 50% or greater on 44 of the 64 ears.

These numbers reflect what people are reporting throughout Indiana. For a perspective of how this year is different from the past, 2 samples with Diplodia ear rot were obtained in 1999, 7 in 1998 and 6 in 1997. What was different about this year? We can speculate that the dry subsoil moisture may have contributed as well as other factors such as an increase in no-till fields, hybrid genetics, and above normal rain during silking.

Proper storage of Diplodia infected corn is crucial. For more information on this topic read CORN EAR ROTS IN INDIANA, ***Pest&Crop Newletter*** *No. 24* September 1, 2000.

**Counties with Diplodia Ear Rot in 2000**



**Areawide Pest Management Program** - (*Corey Gerber, Areawide PM Coordinator*) -

***What is the Areawide Corn Rootworm Pest Management study?***

The Indiana / Illinois Corn Rootworm Areawide Pest Management (AWPM) Program is a coordinated effort that links a group of producers together with crop consultants, applicators, and university and government researchers to manage the western corn rootworm (WCR), *Diabrotica virgifera virgifera* LeConte, over a large, well-defined area. The summer of 2000 marked the fourth year of this 5-year study.

This study was designed to test the feasibility of using the areawide concept in the eastern Midwest for managing the WCR. The underlying principle of areawide management is to manage rootworm beetle populations at levels that will not cause economic injury to corn and to prevent beetles from reinfesting the area in which these low population levels have been established. In the study area, unlike the other midwestern areawide management study sites, WCR have adapted to the corn/soybean rotational system. This development virtually eliminates crop rotation as an effective tool for managing WCR. The areawide rootworm management concept is based upon the use of semiochemical insecticidal-baits as the primary rootworm management tool. As the program was being established, it is anticipated that rootworm beetle populations will be brought down to a level that will greatly diminish, or perhaps eliminate, the need for soil insecticide at the end of this 5-year period.

***The areawide program site:***

The study site was established as a 16-square-mile area located southeast of Sheldon, Illinois, and west of Raub, Indiana. This location was selected based on the close proximity to the institutions (Purdue University and the University of Illinois) coordinating the study, as well as being located in the "heart" of an area in which rootworm beetles have exhibited a dramatic change in behavior by laying a high number of eggs in soybean fields. An increasing number of growers in this affected area have resorted, understandably, to the use of soil insecticides to protect their first-year corn fields. The continuation of this rootworm management practice will put a significant financial burden on farmers and may result in undesirable environmental and public health effects.

This program enlists the partnership of 41 growers and approximately 10,700 acres of corn and soybean in the managed and control areas. The 9,300 acre managed area is treated with an insecticidal-bait whenever populations of rootworm beetles exceed set levels. Treatments are made to fields by aircraft. Several fields either adjoining or within 0.75 miles of the managed area are also monitored for rootworm beetle populations; however, if treatment levels are exceeded, adult-control treatments are not applied. These fields represent the control fields. Comparisons between the managed fields and control fields are used to determine the effectiveness of treatment applications.

***How are spray applications determined?***

In order to determine the need and proper timing of an insecticidal-bait treatment, hired crop scouts monitor corn and soybean fields on a weekly basis from the time adult rootworm beetles emerged until the population dwindled in late summer.

WCR populations in corn are sampled by counting the number of beetles infesting two plants approximately 3-5 feet apart in each of ten locations within a field. Beetle populations are estimated in soybean fields using Pherocon AM® yellow sticky cards. Sticky cards are distributed through a field in two rows of four cards each. Individual sticky cards are positioned so that one half of each card was above the soybean canopy. New sticky cards were placed in the field immediately after cards, which had been in the soybean field for 1 week, were removed for beetle counting.

While monitoring the soybean fields, if a soybean field within the managed area reached threshold, the entire region within which that particular field was located was treated. The decision to treat for WCR beetles was arbitrarily determined in soybean as 2 beetles/sticky trap/day.

Careful scouting of corn and soybean fields is necessary to determine the proper timing of insecticidal-bait applications within the areawide pest management site. Treatments are applied to corn and soybean fields on a region by region basis (large block areas) whenever a set number of adult rootworm beetles is observed.

***What has been learned?***

To determine the effectiveness of insecticidal-baits used in the areawide program, corn roots are evaluated

for rootworm larval damage. During 1999-2000, The average rootworm larval damage (based on the Hills & Peters 1-6 root-rating scale) within the managed area, was 1.75 in treated strips and 2.13 in untreated strips (no soil insecticides). Outside of the managed area, the average root rating was 2.76 in treated strips and 3.80 in untreated strips (no soil insecticides).

This root rating data indicates that the areawide suppression approach is having an adverse effect on the beetle population within the areawide site. This statement is based on the fact that the check strip root rating value (2.13) within the managed area versus the check strip root rating value (3.80) in the control area were significantly different. The primary factor involved with this difference was the aerial application of insecticidal-baits. In addition, the root rating value within the managed area was below the economic threshold damage rating of 3.5, and the root rating value in the check strips located outside of the managed area was higher than this economic threshold damage rating. Therefore, preliminary results suggest that this suppression approach is having an impact on the beetle population within the areawide site.

# PEST&CROP NEWSLETTER INDEX 2000

**Insects, Mites, and Nematodes**

## Agronomy Tips

***Corn***



***Miscellaneous***



***Soybeans***



***Wheat***



## Bits and Pieces

***Miscellaneous***



***Upcoming Events***



***Workshops***



## Pest Management Tips



## Editorial



## Weather Update

Heat Unit Accumulations, Indiana Weather Summary and Heat Unit Forecasts appear in most issues of the newsletter.

# Pest&Crop

## 2001 Subscription Form

The ***Pest&Crop*** newsletter provides up-to-date information on pests (insect and mites, weeds, plant diseases, nematodes, and vertebrates) and their impact on field crops throughout the state. Graphics to aid in pest identification, scouting procedures, management guidelines, and control materials and techniques, are also presented. Crop fertility and production information, weather updates, changes in pesticide regulations and/or status, and opportunities for continuing education are also included.

The ***Pest&Crop*** newsletter is published weekly during the growing season (off season schedule: monthly - February, March, October, and November) by specialists in the Departments of: Agronomy, Botany and Plant Pathology, and Entomology at Purdue University. The first 2001 issue will be mailed **February 16th.**

If you prefer an electronic PDF copy of the *Pest&Crop*, it is available at no charge on our web site: <http://www.entm.purdue.edu/Entomology/ext/targets/newslett.htm>. If you prefer a printed, first-class mailed subscription, please complete the form below and return with a **$42.00*** **(Indiana resident) or $40.00 (non-resident)** check or money order *(made payable to Purdue University)* to:

***Extension Entomology Office, Pest&Crop***
***1158 Smith Hall, Purdue University, West Lafayette, IN 47907-1158***

For previous subscribers: If payment is not received by Feb. 9, 2001 your name will be removed from the mailing list. If you have questions concerning this newsletter or subscription information, please contact the Extension Entomology Office at (765) 494-8761.

***NOTE:** Indiana residents are subject to 5% sales tax **UNLESS a Tax Exempt #** is provided.
Please remit **$40.00** ($40.00 + $2.00 = $42.00).

---

**Subscription Form - *Pest&Crop***

Mail to: Extension Entomology Office, 1158 Smith Hall
Purdue University, West Lafayette, IN 47907-1158
Please enclose a check or money order for **$42.00 (Indiana residents, includes sales tax) or $40.00 (non-residents)** made payable to Purdue University.

Name _____

Company _____

Address _____

City, State, Zip _____

Telephone - Please include area code _____ FAX # _____

E-mail: _____

Tax Exempt # _____

***Purdue Cooperative Extension Service***

**Pest Management and Crop Production Newsletter**
Extension Entomology Office
Department of Entomology
Purdue University
1158 Smith Hall
West Lafayette, IN 47907-1158

**http://www.entm.purdue.edu/Entomology/ext/targets/newslett.htm**


The ***Pest Management and Crop Production Newsletter*** is produced by the Departments of Agronomy, Botany and Plant Pathology, and Entomology at Purdue University. The Newsletter is published monthly February, March, October, and November. Weekly publication begins the first week of April and continues through mid-September. If there are questions or problems, contact the Extension Entomology Office at (765) 494-8761.