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In This Issue

Insects, Mites, and Nematodes

- Criteria for Treating First-Year Corn for Rootworm, 2002
- Perceived First-Year Corn Rootworm Risk Areas, 2002
- Coming Soon - The Seed Corn Pest Management Manual for the Midwest
- 2001 Western Corn Rootworm Sweep Net Survey in Soybean (Number / 100 Sweeps)
- Pre-Applied Insecticide Seed Treatments

Plant Diseases

- 2001 Indiana Ear Rot and Mycotoxin Survey

Weeds

- What's Up in the World of Weed Science

Bits & Pieces

- *Pest&Crop* Index 2001
- Crop Management Workshops Announcement
- *Pest&Crop* Subscription Form for 2002

Insects, Mites, and Nematodes

Criteria for Treating First-Year Corn for Rootworm, 2002 – (John Obermeyer, Rich Edwards, and Larry Bledsoe) –

- Rootworm management guidelines for corn following soybean are given by region of Indiana
- Rootworm beetle numbers in 2001 were highest in northwestern counties, a mixed bag in other northern counties, and lowest in the southern half of the state

When one uses a soil insecticide it is important to remember that protection of the primary portion of the root system from larval attack is the goal. Also, one needs to understand that products do not provide 100% control and occasionally some damage may occur depending on the larval population, weather, product performance, planting date, plant development, and time of larval hatch. All of these factors can ultimately impact product performance and must be considered when using a soil insecticide. The important thing for producers to understand is the positive and negative aspects of each product, and determine which one(s) fits best under their farming

system. Also, one needs to understand what the warranty for each product really means. Additionally, it makes sense to have untreated check strips in fields to gauge the performance and economics of the products used.

The following guidelines, formulated from 2001 research and observations, should be taken into consideration when making rootworm management decisions for 2002 corn following 2001 soybean.

Northern Indiana (approx. north of Interstate 70):

- A soil insecticide is not needed for rootworm larval control where *no, or very few*, rootworm beetles were observed in 2001 soybean (see discussion below on other soil insect pests).
- Where numbers of western corn rootworm beetles on Pherocon® AM yellow sticky traps in soybean fields in 2001 averaged five (5) or more beetles/trap/day during any trapping week, the application of an insecticide in these fields in 2002 is likely needed. NOTE: In research fields where at least 5 WCR beetles/trap/day in soybean were observed, >95%



of the cornfields reached economic root damage the following year.

- In areas where rootworm larvae have caused damage in corn and one *did not monitor* for western rootworm beetles in 2001, a soil insecticide may be needed in 2002 (see the enclosed map "Perceived First-Year Corn Rootworm Risk Areas, 2002")
- In 2002, where the average number of larvae in 2002 soil samples is 2 or more per plant by hand sorting or 8 or more per plant by washing/ floatation methods, a soil insecticide may be needed before lay-by. Apply a soil insecticide according to cultivation application instructions on the product label.

Southern Indiana (approx. south of Interstate 70):

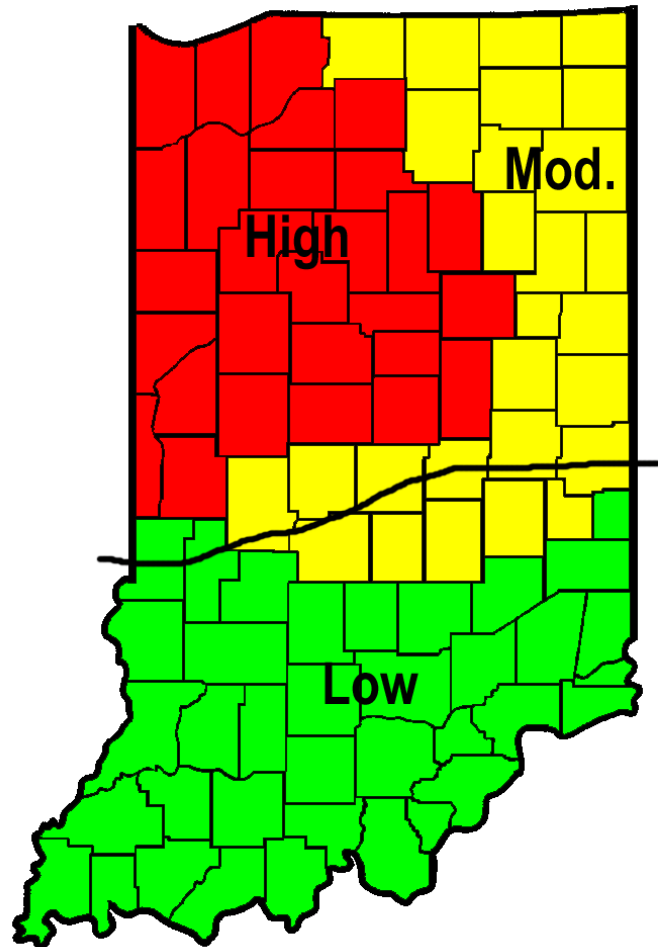
Presently we are not observing high numbers of western rootworm beetles in fields other than corn below approximately Interstate 70. Therefore, most 2001 soybean fields going to corn in 2002 will not need to be treated with a soil insecticide for rootworm larval control (see discussion below on other soil insect pests). The exception would be where producers sampled with Pherocon® AM yellow sticky traps and beetle numbers reached or exceeded thresholds given above or where high numbers of western beetles were observed during any time from late July through August 2001.

- The potential for a rootworm problem is minimal or nonexistent if very few beetles were observed in soybean the previous year.
- If a field is being planted to corn following a soybean crop that had a high population of volunteer corn (in excess of approximately 4,000 corn plants per acre) and rootworm beetles were present, treatment may be needed.
- If planting after May 1, applying a reduced rate (75% rate) of some rootworm insecticide may be a cost-saving, yet efficacious, option (see discussion below on other soil insect pests).
- In 2002, where the average number of larvae in 2002 soil samples is 2 or more per plant by hand sorting or 8 or more per plant by washing/ floatation methods, a soil insecticide may be needed before lay-by. Apply a soil insecticide according to cultivation application instructions on the product label.

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

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Perceived First-Year Corn Rootworm Risk Areas, 2002

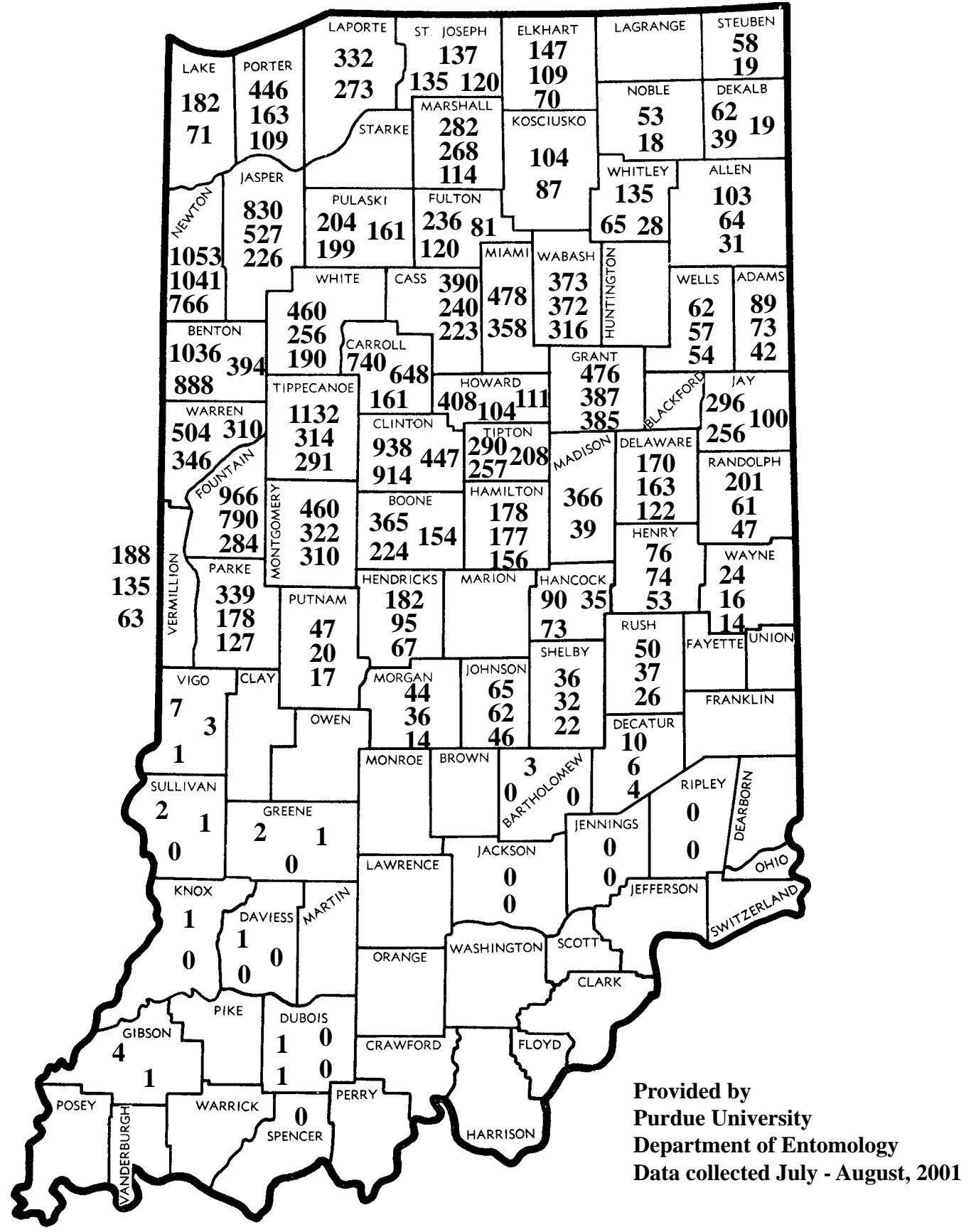


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COMING SOON - The Seed Corn Pest Management Manual for the Midwest (IPM-2) -

The 2001 revision of the *Seed Corn Pest Management Manual for the Midwest (IPM-2)* has been dramatically improved to aid field personnel in crop troubleshooting, field scouting, and pest identification in seed corn production fields in the Midwest. This manual contains descriptions, scouting procedures, and management guidelines (just developed) for the major insect, weed, disease, nematode, and vertebrate pests of seed corn. A problem diagnostic guide, as well as keys to the identification of insect and weed pests are also included. Numerous color and black and white pictures, and line drawings have been added to aid the user in pest identification and diagnosis. The *Seed Corn Pest Management Manual for the Midwest* can be purchased through the Media Distribution Center at Purdue University <www.agcom.purdue.edu/AgCom/Pubs/index.html>.

2001 Western Corn Rootworm Sweep Net Survey in Soybean (Number/100 Sweeps)



Pre-Applied Insecticide Seed Treatments – (John Obermeyer, Rich Edwards, and Larry Bledsoe) -

With new pre-applied insecticide seed treatments available for corn, producers have been asking questions about the validity of using such products. At this time, we are not recommending using seed applied insecticides for corn rootworm control, i.e., Prescribe® and ProShield® in areas where risk to rootworm injury to corn is high. This is because of the inconsistencies that have observed in university trials throughout the Midwest. For producers in areas with low to moderate rootworm pressure, these seed treatments may be beneficial and may also offer protection from other soil insect pests, e.g., wireworms, seedcorn maggots, etc.

Industry and university trials have shown some promising results with Cruiser® and Gaucho® against wireworms and seedcorn maggot. The systemic activity of these products results in some early suppression/control of corn flea beetle as well, although this insect is not a major pest of yellow dent corn. Certainly the biggest question for producers and researchers is how effective these products are against white grubs. Limited trials have shown a mixed bag of results, as is true with many granular soil insecticides. Most likely there will be some suppression of grubs, but not control.

Should one use the pre-applied seed treatments where rootworm is NOT a consideration? There is no simple answer. Return on investment of seed applied treatments will improve if:

- field is planted early
- field has a recent history of wireworm damage
- field is no-tilled into dying vegetation
- field has recently been spread with animal manure
- yields of 160+ bu/A are expected

Below are rootworm efficacy trial results for pre-applied insecticide seed treatments from Indiana, Illinois, and Iowa for 2001:

Root-Rating Performance ¹ , 2001				
Location	Best ² Rating	Prescribe	ProShield	Check
Lafayette, IN	2.00	2.55	2.60	4.60
Farmland, IN	1.45	2.15	2.15	4.65
Columbia City, IN	1.25	1.35	1.60	2.75
DeKalb, IL	2.93	3.60	3.60	5.23
Monmouth, IL	2.30	3.67	3.05	5.43
Urbana, IL	2.20	4.50	3.90	5.50
Ames, IA	2.40	4.25	4.40	5.15
Cedar Rapids, IA	2.33	4.00	3.60	4.40
Southerland, IA	3.05	4.45	4.05	4.85

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

Plant Diseases

2001 Indiana Ear Rot and Mycotoxin Survey - (Charles P. Woloshuk, Department of Botany and Plant Pathology) -

- Lack of ear rots suggest that Indiana corn is in excellent shape for storage

In response to a severe drought in 1988 that resulted in high levels of aflatoxin in the Indiana corn crop, Purdue University launched a program in 1989 to survey Indiana corn fields to determine the level of pre-harvest ear rots and mycotoxins. Each year, the Indiana Agricultural Statistics Service (IASS) selects the fields to be sampled and two sites within each field are sampled during the fall prior to harvest. Samples consist of the primary ears from five consecutive plants in a single row. The ears with the husks intact are placed in cloth bags and mailed to Purdue University. Upon arrival, the husks are removed and the ears examined for ear rot symptoms. Each year, we examine samples from about 160 fields. Data are recorded for the percentage of kernels with symptoms of the following diseases: Fusarium ear/kernel rot, Gibberella ear rot, Aspergillus ear rot, Diplodia ear rot, and ear rots caused by *Alternaria*, *Nigrospora*, *Penicillium* and *Trichoderma*. Samples having disease severity of 10 percent or greater are tested for mycotoxins (aflatoxin, ochratoxin, zearalenone, deoxynivalenol

and fumonisin) by the Animal Disease Diagnostic Laboratory at Purdue.

The 2001 survey is nearly complete, and as a general assessment, the Indiana crop looks excellent. We have examined 1455 ears from 291 samples. No sample had more than 5 percent ear rot. The incidence and severity of Fusarium ear/kernel rot was low. We have seen a decline in this disease in our survey since the severe outbreak of 1991. We expect no problems with fumonisin contamination in the 2001 corn crop. However, we are analyzing 20 samples for fumonisin, because fumonisin contamination does not always correlate with disease severity. The incidence of Diplodia ear rot in our survey was also low. Last year, the disease was found in 55 samples from 30 of the 60 counties surveyed. This year we observed just six samples with Diplodia ear rot, which is similar to what we observed in 1997, 1998 and 1999.

While the survey data indicate that the quality of Indiana corn is excellent, there are isolated fields with major ear rot damage. There have been several reports of Diplodia ear rot and Trichoderma ear rot affecting more than 50 percent of the ears. It is likely that factors such as hybrid genetics, insect or bird damage, and above normal rain during silking may have contributed to these localized outbreaks.

Weeds

What's Up in the World of Weed Science – (Glenn Nice and Thomas Bauman) -

- Company tally
- BASF
- DuPont
- FMC
- Syngenta
- United Ag. Products
- Valent
- Glyphosate Products

Company tally

Keeping an eye on ag. chem. companies is almost a full time job in itself. In the past several years weed science has seen an ever decreasing number of companies due to what has been called "merger madness." I thought that for that last *Pest&Crop* issue for the year a little run down on which primary companies are still here and some scoop on new products would be interesting.

In the domestic arena, we have Dow AgroSciences, DuPont, FMC, and Monsanto. In the foreign owned arena there are Bayer-Aventis (acquisition still in the works), BASF, Syngenta, and Valent. Annual sales reported by these companies rank them in the order Syngenta, Bayer-Aventis, Monsanto, DuPont, BASF, and Dow AgroSciences.

Some of the products listed below may have been available this year. If you are familiar with them, then this will be just a reminder.

BASF

Two products introduced this year are **Outlook** and **Guardsman Max**. They both contain the active isomer of **Frontier** (dimethenamid). However, **Guardsman Max** has the addition of atrazine. In the **Guardsman Max**, the rate of dimethenamid-p has been decreased from the **Guardsman** to 1.7 lb ai./gal and atrazine has been increased to 3.3 lb ai./gal

Outlook can be used PRE in corn (field, popcorn, sweet and seed), soybean, grain sorghum, dry beans, and peanuts to control annual grasses, some annual broadleaves and sedges. **Outlook** is a 6 lb ai/gal EC formulation and has a 10 to 21 fluid oz/A use rate.

Guardsman Max is labeled to be used PRE in field corn, popcorn, sweet corn, seed corn, and grain sorghum. Due to the mix with atrazine, **Guardsman Max** is a restricted use product. Also because of atrazine, the use rates are soil specific. See label for rates for your soil type.

DuPont

Three products obtained fall application labels for soybeans, **Canopy XL** (sulfentrazone + chlorimuron ethyl), **Express** (tribenuron methyl), and **Basis** (rimsulfuron + thifensulfuron methyl).

Fairly new product called **Steadfast** consisting of 50% nicosulfuron and 25% rimsulfuron. It is labeled for POST residual grass control and broadleaf suppression in field corn at a rate of 3/4 oz/A. However, be aware that it has a 12" corn height restriction.

DuPont has dropped the production of **Canopy** (metribuzin + chlorimuron ethyl) and **Pinnacle** (thifensulfuron-methyl). However, the soybean uses have been added to **Harmony GT** label to fill any gap.

FMC

Soybean has been added to **Aim's** (carfentrazone) label. It now has a label for corn (field, sweet, pop, seed and silage), soybean, grain sorghum, rice, wheat, barley, and oats. Soybean applications can be made 30 days prior to planting up to the third trifoliolate at rates of 1/3 to 1 oz/A.

Command Xtra, composed of **Command** (clomozone) and **Authority** (sulfentrazone) packaged separately as a "B" and "G" co-pack, is labeled for PRE in soybeans. This is being marketed as a "one-pass" PRE program.

Gauntlet which consists of **Authority** + **FirstRate** (cloransulam) also in a co-pack is labeled for PRE control of grasses and broadleaves in soybean.

Syngenta

A new formulation of **Touchdown**, being termed "IQ Technology" is expected to reduce yellow flash in RR soybean. This will contain 3 lb glyphosate acid/gal and will be labeled for several situations including glyphosate tolerant soybean and corn.

Gramoxone Extra's 2.5 lb ai/gal (paraquat) has been concentrated a little to a 3 lb ai/gal, so be aware of the rate changes. The new product, available last year, is called **Gramoxone Max**. This is a restricted use herbicide.

Last, but definitely not least in Syngenta's new products list is **Callisto**. With a new compound called mesotrione (4 lb ai/gal) it is being marketed as a PRE and POST in field, seed, and silage corn. Mesotrione works by inhibiting the HPPD enzyme in plants, which in general terms causes a bleaching effect. **Callisto** can be applied alone at 6 to 7.7 oz/A PRE or 3 oz/A POST.

Callisto can be applied to corn up to 30" tall or to the 8 leaf stage. Do not apply to pop, sweet, or ornamental corn. Atrazine can be tank mixed with **Callisto** to broaden control. **Callisto** rates decrease a little and atrazine use restrictions apply.

Callisto has good control (80% and up) of pigweed, lambsquarters, velvetleaf, tall waterhemp, and common ragweed, with fair (60 to 70%) control of morningglory species, common cocklebur, and giant ragweed PRE. POST applications show better control of morningglory and giant ragweed.

United Ag. Products

Mirage, a 4 lb ai/gal formulation of glyphosate, has been labeled for glyphosate tolerant soybean and corn varieties.

Glyphosate Products

Formulation of glyphosate	Trade name*	Amount of glyphosate (lb. a.i./gal. or % a.i./lb.)	Company
Isoproylamine salt			
	Aquamaster	5.4	Monsanto
	Backdraft	1.25+imazaquin	BASF
	Campaign	1.2+2,4-D	Monsanto
	Credit	4.0	Nufarm
	Credit Systemic	4.0	Nufarm
	Extreme	2+imazethapyr	BASF
	Fallow Master	2.2+dicamba	Monsanto
	Field Master RU	0.75+acetochlor+atrazine	Monsanto
	Foresters	5.4	Riverdale
	Glyphomax	4.0	Dow AgroSci
	Glyphomax Plus	4.0	Dow AgroSci
	Glyphosate	4.0	DuPont
	Glyphosate Original	4.0	Griffin
	Glypro	5.4	Dow AgroSci
	Mirage	4.0	UAP
	Rattler	4.0	Helena
	Razor	4.0	Riverdale
	Ready Master ATZ	2.0+atrazine	Monsanto
	Rodeo	5.4	Monsanto
	Roundup Custom	5.4	Monsanto
	Roundup D-Pak	6.42	Monsanto
	Roundup Original	4.0	Monsanto
	Roundup Pro	4.0	Monsanto
	Roundup Ultra	4.0	Monsanto
	Roundup Ultra Max	5.0	Monsanto
	Silhouette	4.0	Agrilience
	Staple Plus	40+2%+pyrithrobac	DuPont
Monoammonium Salt			
	Roundup Ultra Dry	1.2	Monsanto
Diammonium Salt			
	Touchdown	3.0 ae**	Syngenta
	Touchdown Pro	3.0 ae**	Syngenta
*These all have different labels and may not be suitable for glyphosate tolerant soybean or corn. **Acid equivalent of glyphosate.			

Valent

Valent has two new products, **Valor** (51% flumioxazin) and **Pheonix** (lactofen). Valor has been labeled as a PRE in soybean. Valor has good control (80% and above) control of pigweed, lambsquarters, velvetleaf, black nightshade, tall waterhemp, jimsonweed, and common ragweed. **Valor** provides fair control (60% - 70%) of morningglory and cocklebur. Rates are soil specific and the label should be consulted for you situation.

Phoenix is labeled as a POST in soybean. A new surfactant system results in less of the soybean injury that was sometimes seen in **Cobra**. Formulation is a 2 lb ai/gal EC, using a rate of 8 to 12.5 oz/A + NIS (0.25%). **Phoenix** is most effective on smaller weeds and has good waterhemp activity.

Insects, Mites, and Nematodes

Alfalfa Weevil

Cold Hasn't Stopped Alfalfa Weevil-5
Insecticides for Alfalfa Weevil Larvae Control-5
High Alfalfa Weevil Numbers and Damage Noted-6
Alfalfa Weevil Larval Survey-6, 7
Severe Alfalfa Weevil Damage Continues Through Northern Indiana-7
Inspect Alfalfa New Growth for Weevil Damage-8

Armyworm

Armyworm Can March Through Corn-7
Armyworm in Wheat-8
Armyworms Marching Big Time, This is NO Parade-9
More "Worm" Reports-9
Armyworm...Get out the Camera, You May Never See This Again! -10
Armyworm, Natural Control to the Rescue? -11
Lots of Moths, They're Likely Armyworm-12
All Quiet On the Armyworm Front-14

Bean Leaf Beetle

Potential for Problems with Bean Leaf Beetle Highly Variable-2
Bean Leaf Beetle-7
Bean Leaf Beetle at Low Levels-18
Bean Leaf Beetle Returning for Late Season Feast-23

Black Cutworm

As Always, Black Cutworm Moths are Beginning to Arrive-3
Black Cutworm Adult Pheromone Trap Report-3, 4, 5, 6, 7, 8
2001 Black Cutworm Pheromone Trap Locations-3
Black Cutworm Update-5
Black Cutworm Damage Noted in Southern Indiana-7
Black Cutworm Active, Scout Now-8

Black Light Catch Report

Black Light Catch Report-6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 24, 25

Corn Earworm

Continue to Monitor High Value Crops Susceptible to Earworm and Corn Borer-21

Corn Flea Beetle

Winter Temperatures, Corn Flea Beetle Survival, and Potential for Stewart's Wilt-2

Corn Rootworm

Criteria for Treating First-Year Corn for Rootworm, 2001-1

Western Corn Rootworm Winter Survival-3
Rootworm Digging Time! -13
How's Your Rootworm Insecticide Doing? -13
Western Corn Rootworm Beetles Emerging-14
Corn Lodging, It's that Time of Year-16
Corn Rootworm and Japanese Beetle Survey in Pollinating Corn Fields-17, 18
Yellow Sticky Trap Time-18
Last Chance to Sample for Rootworm Beetles in Soybean Fields-22
Criteria for Treating First-Year Corn for Rootworm, 2002 - 27
Perceived First-Year Corn Rootworm Risk Areas, 2002 - 27
2001 Western Corn Rootworm Sweep New Survey in Soybean (Number / 100 Sweeps) - 27

European Corn Borer

European Corn Borer Moths Flying-10
European Corn Borer Survey-11, 12, 13, 14, 15
Corn Borer Moths Still Flying-13
European Corn Borer, Time to Wait and See-15
Continue to Monitor High Value Crops Susceptible to Earworm and Corn Borer-21
Survey of Overwintering European Corn Borer, Management Considerations for 2002-26
European Corn Borer Survey Results, Fall 2001-26
1999-2001 Overwintering ECB Larvae-26
Indiana Fall Corn Borer Survey 1992-2001-26
Indiana Fall Corn Borer Survey 1961-2001-26

Green Cloverworm

Cloverworms and Thistle Caterpillars, the "Year of the Lepidoptera" Continues-22
Black Moths Flying-24

Hessian Fly

Hessian Fly Infestation Should be Monitored This Fall Even Though Populations Remained Low in Indiana Wheat in 2001-25
Purdue Wheat Variety Provides Excellent Control of Hessian Fly Populations From the Eastern United States-25

Insecticides

Some of the Newer Rootworm Larval Control Products-2
Soybean Foliar Insecticides, Perhaps a Big Mistake-19
Harvest Restrictions for Soybean Insecticides-23
Pre-Applied Insecticide Seed Treatments - 27

Insects (Miscellaneous)

Variiegated Cutworm in Soybean-10
Lots of Little Red Bugs-11

A Homeless Insect Story-15
Stinging Caterpillars-21
Cloverworms and Thistle Caterpillars, the "Year of the Lepidoptera" Continues-22
Black Moths Flying-24

Japanese Beetle

Japanese Beetle Already! -11
Japanese Beetle Becoming a Common Sight-14
Japanese Beetle, To Treat or Not-15
Silk Damage, Not Beetle Numbers-17
Corn Rootworm and Japanese Beetle Survey in Pollinating Corn Fields-17
Japanese Beetle High In Some Fields-18

Other

Grain Bin Clean-Up-24

Potato Leafhopper

Warmer Temperatures Should Increase Potato Leafhopper Numbers-12
Potato Leafhopper Survey in Alfalfa-13
Potato Leafhopper Populations Increasing-15
Potato Leafhopper Numbers High, Natural Reductions Are Possible-19

Southwestern Corn Borer

Southwestern Corn Borer Spring Survey-3
Southwestern Corn Borer Moths Flying in Southern Counties-11

Soybean Aphid

Soybean Aphid Showing Up in Indiana Soybean Fields-17
What's Going On With Soybean Aphid? -21

Spider Mites

Yellow Beans, Rain, and Spider Mites-16

Stalk Borers

Stalk Borer Hatch, Migration, and Damage-6
Stalk Borer Hatching and Damaging Corn-8

White Grubs

Grubs, a Secondary Pest? -4
Products Labeled for Grubs at Planting-4

Weeds

Control

Managing Weed Problems in Alfalfa-3
Controlling Johnsongrass-4
Controlling Canada Thistle-4

Herbicides

New Corn and Soybean Herbicides for Year 2001-1
Herbicide Resistant Weed Problems Increasing in Indiana: Add Shattercane to the List-2

It's Never Too Early to be Concerned About Spray Drift-3
What to Expect from Your Soil-Applied Herbicide Program-9
Herbicide Applications on Stressed Corn-12
The Use of Fall Applied Herbicides-25

Other

Wild Garlic, Wild Onion, and Star of Bethlehem-3
Getting Off to a Good Start-3
The Verdict From a 15-Year Study at Purdue-5
Guidelines for Use of a Rotary Hoe-8
Help Us Welcome Aboard a New Extension Weed Scientist-9
Poisonous Plants of Indiana-10
More Than You Wanted to Know About Giant Ragweed-11
How Big is Big Enough? -14
The Mighty Marestalk-15
Catch the Drift-16
After Thought-16
Foxtail Soup-17
Soybean Leaf Cupping and Strapping-17
Indiana's Most Unwanted-18
Good Luck to Case Medlin-18
What's Up in the World of Weed Science - 27

Plant Diseases

Corn

Diplodia Ear and Stalk Rot of Corn-2
Mother's Day Frost Causes Some Damage to Indiana Corn and Soybean-9
Corn Anthracnose-12
Gray Leaf Spot and Common Rust of Corn-16
2001 Indiana Ear Rot and Mycotoxin Survey-27

Soybeans

Fungicide Seed Treatment for Soybeans-2
Soybean Sudden Death Syndrome-3
Mother's Day Frost Causes Some Damage to Indiana Corn and Soybean-9
Brown Spot of Soybean-12
Sudden Death Syndrome-16, 18
Virus Complex Showing Up-16
Soybean Viruses and the Soybean Aphid 2001 Survey-21

Wheat

Risk of Yellow Dwarf in Wheat-2
Growth Stages of Wheat-3
Yellowing of Wheat-3
Leaf Blotches of Wheat-4
Growing Points of Interest-9
Update on Wheat Diseases-10, 12

Other

Welcome to a New Extension Specialist in Plant Pathology at Purdue University-26

Agronomy Tips

Corn

Optimizing Nitrogen Fertilizer Decisions-1
GMO Issues Facing Indiana Farmers in 2001-2
Tips for Corn Planter Tune-ups-2
Thoughts on Corn Planting Dates-2
Will Starter Fertilizer Increase Corn Yield? -3
Starter Fertilizer Additives (Fact or Fiction)-4
Frost and Low Temperature Injury to Corn and Soybean-5
Corn Replant Decision-Making-5
Be on the Lookout for Corkscrewed Corn Seedlings-5
Predicting Leaf Stages in Corn-6
What Exactly Do You Mean by 'Leaf'? -6
What Exactly Do you Mean by 'Growing Degree Day'? -6
Corn Root Development-8
Be Alert for Floppy Corn-8
Pasture Recovery from Armyworm Damage-10
A Preponderance of Purple Plants Problematic for Producers-11
When Good Corn Fields Turn Bad-11
A Recipe for Crappy Stands of Corn-11
Hybrid Performance: Take Notes Now-12
FEARMONGER ALERT! Be Alert for Twisted Whorls in Corn-12
Hail Damage in Corn: Moving Beyond Grief to Damage Assessment-12
Commonly Asked Questions on "Late" Applications of Nitrogen to Corn-12
Ear Initiation and Size Determination in Corn-14
Weather Conditions Favorable for "Green Snap"-14
Sex in the Corn Field: Tassel Emergence and Pollen Shed-15
Sex in the Corn Field: Silk Emergence-15
A Fast and Accurate Pregnancy Test for Corn-15
Short Corn At Tasseling-17
Grain Fill Stages in Corn-18
Yield Loss During Grain Fill-18
Fearmonger Alert: Scout Fields for Stalk Rots-22
Assessing Potential for Nitrate Problems in Corn-22
Sexual Dysfunction in the Corn Field-23
Late-Season Hail Damage to Corn-23
Post-Maturity Grain Drydown in the Field-24
'Beer Can' Ear Syndrome-2001-25
Segregated Marketing of Grain from Glyphosate Tolerant Corn-25
Transgenic Corn Harvest Reminders-26

Soybeans

Soybean Seed Quality for 2001 Planting-1
Soybean Seed Quality and Planting Date-4
Soybeans After Soybeans in 2001-4
Frost and Low Temperature Injury to Corn and Soybean-5
Yellow Soybeans After Glyphosate Applications-21
Soybean Flowering and Flower Abscission-21

Wheat

Status of Indiana Wheat Crop-1
The Impact of Cold Temperatures on the Wheat Plant-5
Wheat Conditions Update-7
Protect Wheat's Flag Leaf-10
Winter Wheat Decisions 2001- I. Rotation-24
Benefits Resulting from Winter Wheat-24

Bits and Pieces

Miscellaneous

Greetings from the New Entomology Department Head-2
ARS Releases New Insect-Resistant Corn Germplasma Line-3
Manure Locator Site-3
Armyworms March On; Farmers May Apply for Assistance-10
Moth Invasions Around Homes at Night? -13
Spring 2001 Might Well Go Down in History as the Year of the "Moth"-13
Indiana Pesticide Clean Sweep Project-19
Unwanted Pesticide Form-19
New Field Crops Web Site-26
2002 Subscription Form-26, 27

Upcoming Events

Crop Conference Offers Timely Tips, Future Forecast-25

Workshops

Hands-on Post Harvest Training and Recertification Workshop-26
Crop Management Workshops Announcement-27

Pest Management Tips

You can Track Heat Units for Black Cutworm in Your Area-6
Is That a Cutworm? -7

Gleaning The Fields of Agriculture

Transgenics and Cross-Pollination-A Problem? -3

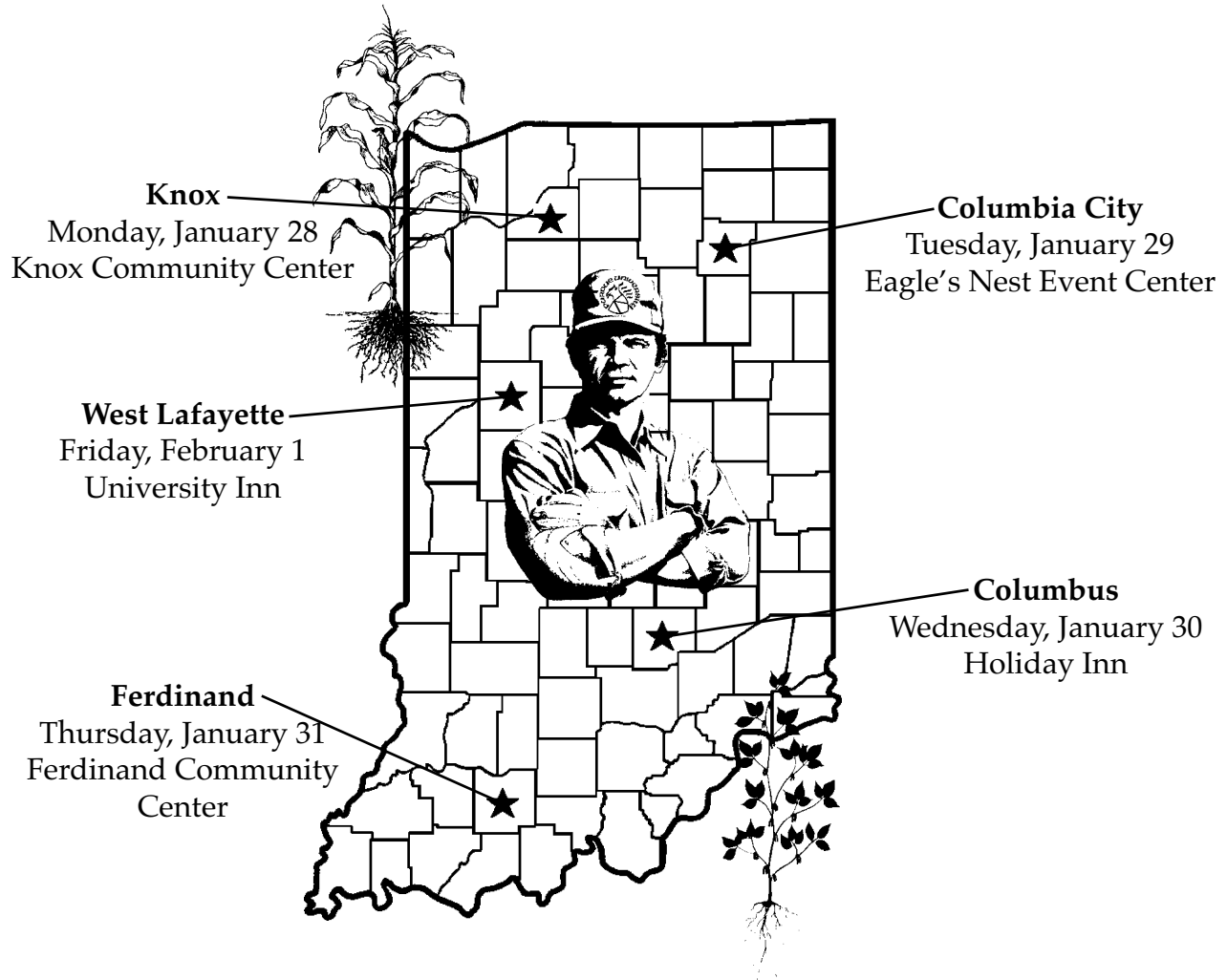
Weather Update

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

Mark Your Calendars...

January 28 to February 1, 2002

2002 CROP MANAGEMENT WORKSHOPS



Sponsored by the
Purdue Pest Management Program

in cooperation with the Departments of
Botany and Plant Pathology
and Entomology

Schedule

(times listed are Eastern Standard Time)

8:30-9	Registration
9-11:50	Morning Presentations
11:50-12:50	Lunch Provided
12:50-4:30	Afternoon Presentations
4:30	CCH/CEU Forms

Topics

(for each location)

Disease, Insect, and Weed Control Strategies
State and Federal Pesticide Regulations
Understanding Pesticide Precautions
Early Soybean Planting Considerations

Registration Information Forthcoming...



2002 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 2002 issue will be mailed **mid February**.

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:

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The *Pest&Crop* staff wish
you all a safe and happy
holiday season!

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.

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