Plant Protection Programs University of Missouri

Integrated Pest & Crop Management

Fall Nematode Sampling - Especially for Soybean Cyst Nematode

By Laura Sweets

Fall Nematode Sampling- Especially for Soybean Cyst Nematode

Although root-knot nematode is becoming a more serious problem on both soybean and corn in areas of Missouri, particularly southeast Missouri, and there are other nematodes that can cause losses on corn in Missouri, fall is not the best time to sample for the "worm" or vermiform stage of these nematodes. Cold soil temperatures will reduce the numbers of vermiform nematodes so samples taken after soil temperatures have decreased in the fall/winter may not give accurate information on the levels of vermiform nematodes in a field. However, fall can be a very good time to sample for soybean cyst nematode (SCN) because the cyst protects the eggs and fairly accurate counts can be obtained even after soil temperatures drop.

Soybean cyst nematode continues to be the most serious disease of soybean in Missouri as well as much of the rest of the United States. Although Missouri soybean producers can help protect their crop against SCN by planting soybean varieties that have some resistance to SCN and by rotating soybean with corn, grain sorghum, wheat and other non-host crops, the first step toward protecting against SCN is to test the soil in a field for the presence of SCN.

Although soil samples for SCN may be collected at any time, a convenient time to sample is immediately after soybean harvest. SCN numbers tend to be highest when the plants are almost mature to shortly after harvest. Sampling after harvest is easier to do because the plants have been removed making it easier to move through the field. And sampling in the fall allows sufficient time for the University of Missouri Plant Nematology Laboratory to process samples and provide results so that information can be used in making variety selections for the coming season, planning field rotations or deciding which crop to plant in which field.

The University of Missouri Plant Nematology Laboratory provides nematode identification, population levels and management information on samples submitted. The SCN egg count test is the test that most soybean producers need. Because SCN egg counts are only as good as the sample taken, here are some suggestions to improve sampling for SCN:

1. Limit the size of the area being sampled: 10 acres is a good target.
2. With your bucket and probe or shovel, walk the area in a W or Z pattern, sampling between the rows. Take about 20 cores (each core should be about 8 inches deep). When using a shovel take about ¼ cup of soil from near the shovel tip. Mix the cores well into a composite sample, and place about a pint of the soil into a plastic bag for submission.
3. Label the plastic bag, avoid storing the bag in the sun and ship it as soon as possible.
4. Fill out a submission form available from the Web site http://soilplantlab.missouri.edu/nematode/ or your local county extension office.
5. Please be sure to include your name, address,

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2008 Pest Monitoring Highlights

By Steven Kirk

The 2008 insect monitoring season has come to a close for this year. Pest monitoring is an essential part of a successful Integrated Pest Management program and is the first line of defense in determining the potential for insect problems. The MU IPM Pest Monitoring Network provides up-to-date information on a variety of insect pests that can have a serious impact on Missouri's agriculture.

By visiting our website (http://ppp.missouri.edu/pestmonitoring/index.htm) farmers and landowners can find out if pest populations are present or increasing in there areas, and be alerted to the need to begin scouting there own fields.

This past season has seen an increase in trapping participants with over thirty trappers helping us monitor insect populations at over 40 trap locations throughout the state. Currently we are trapping ten moths and one beetle using pheromone lures and a variety of insect traps.

The following table highlights total trap counts from five of the most economically important of these insect pests (Black cutworm, European corn borer, Japanese beetle, True Armyworm and Corn earworm) trapped and reported during the 2008 season along with the location (extension region, county and closest town or landmark) of each trap, the number of times the trap was monitored and the average number of days the trap was checked between each count.

Region	Trap Location: (County / City)	Total # caught:	Times trap monitored:	Average # of days between count:
Corn Earworm				
C	Callaway County - Fulton, MO	1774	35	3.3
C	Boone County (Bradford Farm) Columbia, MO	726	26	3.0
C	Audrain County - Mexico, MO	2463	34	3.4
EC	Franklin County - Union, MO	64	6	6.5
NE	Linn County - Linneus, MO	5	1	4.0
NW	Buchanan County - St. Joseph, MO	4	2	9.5
SE	Stoddard County - Bloomfield, MO	8812	31	4.3
SE	Dunklin County - Kennett, MO	13	18	6.9
SE	New Madrid County - (Delta Center) Portageville	9061	60	2.1
European Corn Borer				
C	Callaway County - Fulton, MO	32	38	3.2
C	Morgan County - Versailles, MO	5	17	4.4
C	Audrain County - Mexico, MO	17	29	3.3
C	Boone County - (South Farm) Columbia, MO	17	12	2.7
NE	Knox County (Greenley Center) - Novelty, MO	4	7	3.1
NW	Holt County - Oregon, MO	0	10	3.6
SE	Stoddard County - Bloomfield, MO	1	27	4.1
SE	Scott County - Benton, MO	34	10	4.2
SE	New Madrid County - (Delta Center) Portageville	3	40	2.6
SW	Barton County - Lamar, MO	0	1	4.0
WC	Ray County - Orrick, MO	1	1	13.0
WC	Vernon County - Nevada, MO	0	12	9.1

Region	Trap Location: (County / City)	Total # caught:	Times trap monitored:	Average # of days between count:
True Armyworm				
C	Callaway County - Fulton, MO	2	47	3.2
C	Morgan County - Versailles, MO	70	31	4.0
C	Audrain County - Mexico, MO	7	56	3.0
C	Boone County - Ashland, MO	0	17	2.3
C	Boone County - (Bradford Farm) Columbia, MO	2	31	2.6
C	Boone County - Wilton, MO	0	23	2.3
EC	Frankling County - Union, MO	13	14	6.4
NE	Knox County - (Greenley Center) Novelty, MO	102	18	2.6
NW	Buchanan County - St. Joseph, MO	222	13	5.7
NW	Holt County - Oregon, MO	37	15	3.6
SE	Mississippi County - Charleston, MO	21	6	7.2
SE	Scott County - Benton, MO	14	11	5.7
SE	New Madrid County - (Delta Center) Portageville	15	31	3.3
SW	Barton County - Lamar, MO	65	22	5.0
SW	Stone County - Galena, MO	85	19	6.1
WC	Ray County - Orrick, MO	0	3	5.3
WC	Vernon County - Nevada, MO	8	12	1.8
WC	Henry County - Clinton, MO	0	7	8.6

Continued on page 116

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2008 Pest Monitoring Highlights *continued from page 116*

Region	Trap Location: (County / City)	Total # caught:	Times trap monitored:	Average # of days between count:
Black Cutworm				
C	Callaway County - Fulton, MO	155	30	2.9
C	Morgan County - Versailles, MO	26	20	2.6
C	Audrain County - Mexico, MO	364	36	2.5
C	Boone County - (Bradford Farm) Columbia, MO	264	37	2.4
C	Boone County - (South Farm) Columbia, MO	32	25	2.3
C	Boone County - Wilton, MO	29	35	2.3
C	Henry County - Clinton, MO	26	13	5.8
C	Saline County - Saline County	10	20	2.7
C	Chariton County - Keytesville, MO	7	21	2.6
EC	Franklin County - Union, MO	66	9	4.6
NE	Marion County - Palmyra, MO	105	4	4.5
NE	Knox County - (Greenley Center) Novelty, MO	553	31	2.5
NE	Linn County - Linneus, MO	303	17	4.7
NW	Andrew County, Fillmore, MO	27	6	4.3
NW	Andrew County - Rosendale, MO	15	5	3.6
NW	Andrew County - Bolckow, MO	36	6	4.3
NW	Buchanan County - Buchanan County, MO	85	9	3.6
NW	Holt County - Oregon, MO	74	10	3.6
SC	Crawford County - Steelville, MO	3	1	6.0
SW	Barton County - Lamar, MO	48	18	4.0
SW	New Madrid County - (Delta Center) Portageville	37	522	3.1
WC	Ray County - Orrick, MO	26	9	3.6
WC	Vernon County - Nevada, MO	21	11	2.0

Region	Trap Location: (County / City)	Total # caught:	Times trap monitored:	Average # of days between count:
Japanese Beetle				
C	Callaway County - Fulton, MO	423	44	3.0
C	Morgan County - Versailles, MO	1	18	4.3
C	Audrain, County - Mexico, MO	0	41	3.2
C	Boone County - (MU Campus)	6155	10	7.0
C	Boone County - Ashland, MO	738	2	7.0
C	Boone County - (South Farm) Columbia, MO	611	24	3.3
C	Boone County - (Shelter Gardens) Columbia, MO	287	9	7.0
C	Boone County - Wilton, MO	1525	23	3.2
C	Saline County - Saline County	157	9	7.9
C	Chariton County - Keytesville, MO	0	9	7.9
EC	Franklin County - Union, MO	245	7	8.3
EC	St. Charles County - St. Peters, MO	1715	26	2.5
NE	Marion County - Palmyra, MO	8	12	6.2
NE	Knox County - (Greenley Center) Novelty, MO	0	5	5.8
NE	Linn County - Linneus, MO	0	2	5.5
NW	Holt County - Oregon, MO	0	10	3.6
SC	Miller County - Tuscumbia, MO	0	3	4.0
SE	Mississippi County - Charleston, MO	35667	13	6.4
SE	Scott County - Benton, MO	14000	9	6.6
SE	New Madrid County - (Delta Center) Portageville	3	30	3.2
SW	Barton County - Lamar, MO	14	10	6.7
SW	Stone County - Galena, MO	4358	11	7.6
WC	Ray County - Camden, MO	7361	11	11.0
WC	Vernon County - Nevada, MO	0	13	6.5
WC	Henry County - Clinton, MO	2	0	14.5

Crop Management Conference

December 3-4 • Holiday Inn Select, Columbia, MO

Contact **Peter Scharf** - scharfp@missouri.edu / 573-882-0777

Soybean Seed Size Does Not Affect Yield Performance

By Bill Wiebold

Seed industry personnel have been discussing selling soybean seed by count rather than by weight for several years. A few companies already offer soybean seed by count, but the practice is far from standard. Indications from the seed industry are that soybean varieties that possess the new Roundup Ready 2 Yield™ trait will be sold by seed count and not weight.

Although details may change, the seed unit for pricing purposes of Roundup Ready 2 Yield™ will be 140,000 seeds. The common unit for soybean seed pricing has been the 50-pound bag. Bulk soybean seed sales have become common, but these large units are also priced on weight. A 50-pound bag will contain 140,000 seeds if seed weight is 2800 seeds/pound. A seed size of 2800 seeds/pound is about average, but seed size varies considerably among varieties and is also influenced by the weather conditions during seed-filling. Under current market practices, changes in seed size meant changes in the number seeds in the bag. If seed size was slightly smaller than normal at 3200 seeds/pound, a 50-pound bag would contain 160,000 seeds. Under the new market practice, a seed size of 3200 seeds/pound would mean that 140,000 seeds would weigh 43.8 pounds.

Soybean seeds.

Some soybean farmers may have purposely chosen varieties with a small seed size because they would purchase more seeds for the same price. This lowers seed costs per acre if they remember to calibrate planters by seed count and not weight. For this reason farmers may resist soybean seed purchases by seed count.

I cannot advocate either method of marketing soybean seed, but there is at least one advantage of purchasing soybean seed by seed count. Farmers recognize the value of accurately calibrating planters to precise seed numbers rather than some general seed weight. Knowing the seeding rate in seed number and purchasing seed by count allow growers to accurately determine the amount of seed of each selected variety needed to plant their land area, regardless of seed size. Accurately purchasing the correct amount of seed saves money and effort and may reduce the amount of returned seed. Although many companies allow seed returns, these returns add hidden costs to seed prices. Returning treated seed is much more difficult because there are limitations to uses other than planting for treated seed. As soybean seeds become more expensive, protecting the seeds with seed treatments is more common.

Purchasing seed by count may allow attention to shift from seed size to more important variety characteristics. Yield potential and pest resistance are far more important than seed size in determining profitability from soybean production. In most situations, seed size does not affect emergence percentage, seedling vigor, or yield potential. Smaller seeds have less stored reserves and planting depth control may be more important. Seeds that are small because of premature maturity due to extreme late-season stress may be less vigorous than normal because physiological systems required for germination did not develop properly. Except for these extremes, seed size should not be a factor in variety selection or seed purchases.

Soybean seeds.

Bill Wiebold
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Commercial Pesticide Applicator Training

COMING JANUARY 2009

Pesticide applicator training helps reduce the harmful effects of improper pesticide use. The University of Missouri Extension Commercial Pesticide Program provides educational outreach for individuals who wish to become licensed commercial pesticide applicators. Licensed applicators must pass an exam and participate in continuing education courses on environmentally sound uses of pesticides.

For more information on training dates and registration, visit us at http://ppp.missouri.edu/pat

Fall Nematode Sampling - Especially for Soybean Cyst Nematode *continued from page 115*

phone number and e-mail address if you have one. Also include county and cropping history.

6. Mail samples early in the week. Always use at least first-class mail.
7. There is a $15.00 fee for the SCN egg count test to determine the SCN population level in a sample.
8. Mail samples to the Extension Nematology Lab, 23 Mumford Hall, University of Missouri, Columbia, MO 65211.

The Extension Nematology Laboratory Web site gives more information of how to sample, the tests available, and how samples are actually run in the lab. A submission for can also be downloaded from the site http://soilplantlab.missouri.edu/nematode/. Questions may also be sent to Bob Heinz at e-mail: heinzr@missouri.edu, phone number 573-884-9118 or fax number 573-884-4288.

Laura Sweets
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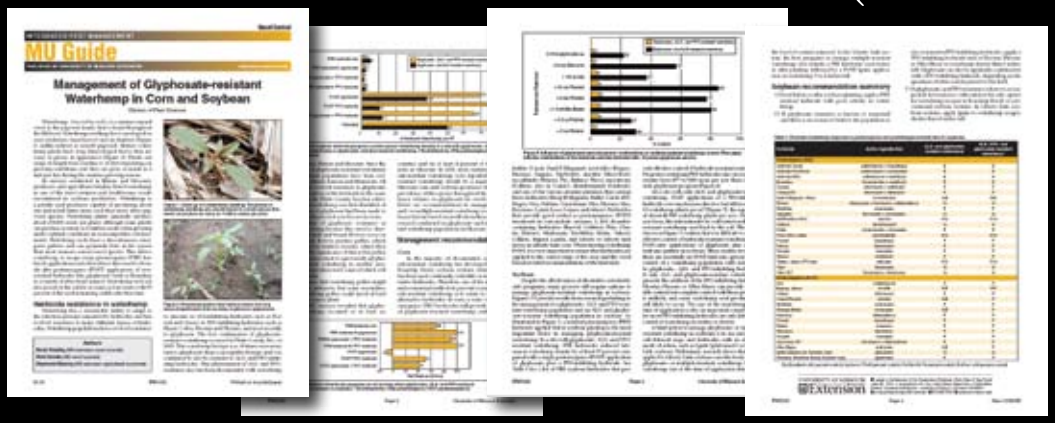
NEW!

Management of Glyphosate-resistant Waterhemp in Corn and Soybean (IPM 1030)



This publication is a short, color guide sheet that contains information helpful to farmers, retailers, and crop consultants who are having problems with glyphosate-resistant waterhemp in either corn or soybean. The information and recommendations within this publication are based on three years of field research conducted on glyphosate- and multiple-resistant waterhemp populations within Missouri.

This 4-page publication is available at a cost of $1 per copy, or $0.80 per copy if purchased in bulk. This publication can be purchased by calling 573-882-7216 or can also be ordered online at **http://extension.missouri.edu/explore/shop/product_add.asp?intProdID=IPM1030.**

More information about IPM 1030 as well as a free PDF version of the publication available online at: **http://extension.missouri.edu/explorepdf/agguides/pests/ipm1030.pdf.**

Now available for purchase through **MU Extension**

Safeguarding Missouri's Citizens and Agriculture Through Pesticide Applicator Training

By Steven Kirk

The safe and responsible use of pesticides is of up-most importance to Missouri's agricultural sector and its citizens. All pesticides used in the U.S. must be registered (licensed) by the Environmental Protection Agency (EPA). Registration of pesticides assures they will be properly labeled and if used in accordance with specifications, will not cause unreasonable harm to the environment.

During the decade that made up the nineteen-sixties, there arose a new awareness of ecology and the environmental resulting in an outcry of public concern over all types of environmental contamination from smoking, belching chimneys and smog; foul water, rivers and streams, as well as pollution from pesticides. Up until that time the old adage of "if a little works, a lot will work better!" was the major premise for applying chemicals to address pest problems on the farm and around the home.

As a result of this public outcry, the EPA and Congress enacted a "new" pesticide law, *the Federal Insecticide, Fungicide, Rodenticide Act* (FIFRA) in the early 1970s that provided the impetus to establish a national program of federal/state certification of pesticide applicators. The primary focus of this new law was to provide federal control of pesticide distribution, sales, and use. Under FIFRA, the EPA was given authority not only to study the consequences of pesticide usage but also to require users to register when purchasing restricted use pesticides. One of the goals of this program would be to provide the quantity and quality of information needed for various levels of persons using pesticides, ranging from structural pest control specialist to farm laborers.

Because of continuing public concerns over potential effects of pesticides on human health and the environment, new laws and regulations that govern pesticides and their use make an intensive training program essential. For example, there were several changes in the recently implemented Worker Protection Standard. Additional new legislation which provides training opportunities for this program includes the Endangered Species Program and the Federal Record keeping Requirement.

The University of Missouri along with the Missouri Department of Agriculture provides certification and recertification for this diverse sector of individuals involved in the pesticide industry. Since the inception of Missouri's pesticide training program, over 6,000 commercial pesticide applicators have received at least initial training. Every three years, these applicators must be recertified by training programs conducted by University Extension as mandated by the Missouri Department of Agriculture's Bureau of Pesticide Control.

The University of Missouri Extension Pesticide Program provides educational outreach for individuals aspiring to become licensed commercial pesticide applicators as well as private applicators. If you engage in the application of a restricted-use pesticide for hire you are considered a commercial applicator. If you engage in pesticide application for the purposes of producing an agricultural commodity on property you or your employer owns, or rent without compensation other than trading of personal services between producers of agricultural commodities you are considered a private applicator. Private pesticide applicator training is available at the local level through your regional extension offices. It requires no exam to be certified or recertified.

The commercial applicator program involves two areas of instruction: a core training session in which all trainees attend and the specialty category section in which the attendees conduct their business activities. The core training session provides basic pesticide knowledge which impacts all pesticide applicators. The instruction is provided by persons representing several agencies including the Missouri Department of Agriculture, Missouri Department of Natural Resources and University Extension.

Missourians wishing to become licensed commercial applicators must pass a core exam, as well as a category exam tailored to the specific area in which they wish to become certified. There are 11 different specialty categories within the commercial PAT program (category 1 has two sections: 1A: Agricultural Plant, and 1B: Ag. Animal Pest Control and category 7 has three sections: 7A: General Structural Pest; 7B: Termite; and 7B: Fumigation Pest Control).

Applicators can certify in one or more of the following categories depending on which area of expertise you are qualifying for.

Commercial Pesticide Applicator Categories:

Category 1A: Agricultural Plant Pest Control
Category 1B: Agricultural Animal Pest Control
Category 2: Forest Pest Control
Category 3: Ornamental and Turf Pest Control
Category 4: Seed Treatment Pest Control
Category 5: Aquatic Pest Control
Category 6: Right-of-Way Pest Control
Category 7A: General Structural Pest Control
Category 7B: Termite Pest Control
Category 7C: Fumigation Pest Control
Category 8: Public Health Pest Control
Category 9: Regulatory Pest Control
Category 10: Demonstration and Research Pest Control
Category 11a: Wood Products Pest Control

Training programs are conducted every January in Springfield, Kansas City, Cape Girardeau, St. Louis and Columbia. For dates and locations check out the Plant Protection Programs web site at: http://ppp.missouri.edu/pat/training.htm.

(Information used in this article came in part from MU Extension publications and Purdue Extension)

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Pesticide Recertification

& Missouri Green industry Conference

The Missouri Turf & Ornamental Council will be offering pesticide recertification for those licensed in Category 3 (Ornamental & Turf). The Missouri Green Industry Conference (Sponsored by MoTOC) will be held December 3-4 at the St. Charles Convention Center in St. Charles, Missouri. Information and online registration is available at **http://www.motoc.org/index**. If you wish to be recertified and attend other educational seminars in your area of expertise, this is the conference for you.

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QUESTIONS? E-MAIL *durborawj@missouri.edu* OR CALL (573) 884-6361

Weather Data for the Week Ending November 12, 2008

By Pat Guinan

Station	County	Weekly Temperature (oF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	Sep 1-22-Sep	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	43	33	52	27	38	-5	0.76	-0.26	3539	+153
St. Joseph	Buchanan	44	33	53	27	38	-6	0.78	-0.03	3353	-89
Brunswick	Carroll	46	34	58	27	41	-4	1.69	+0.53	3425	-71
Albany	Gentry	43	33	54	26	38	-5	0.80	-0.21	3268	-120
Auxvasse	Audrain	48	34	65	23	42	-3	0.49	-0.95	3373	-161
Columbia-Sanborn Field	Boone	49	36	66	27	43	-4	0.49	-0.77	3667	-130
Columbia-South Farms	Boone	48	35	66	26	43	-3	0.50	-0.75	3471	-221
Williamsburg	Callaway	48	35	65	23	43	-2	0.33	-1.31	3396	-94
Novelty	Knox	45	32	63	22	40	-4	0.92	-0.46	3120	-314
Linneus	Linn	44	31	57	22	39	-4	1.57	+0.43	3221	-112
Monroe City	Monroe	46	33	64	21	41	-3	0.41	-0.92	3262	-234
Versailles	Morgan	50	37	66	31	44	-3	0.55	-0.75	3664	-109
Green Ridge	Pettis	48	36	59	31	43	-3	1.31	+0.12	3532	+75
Lamar	Barton	51	36	61	28	44	-4	1.04	-0.40	3762	-205
Cook Station	Crawford	52	34	65	23	44	-4	0.45	-1.17	3414	-385
Alley Spring	Shannon	54	33	69	24	44	-3	0.98	-0.69	3445	-159
Round Spring	Shannon	53	33	67	26	44	-3	1.07	-0.59	3415	-192
Mountain Grove	Wright	50	36	63	31	43	-4	1.03	-0.69	3423	-187
Delta	Cape Girardeau	52	34	66	24	45	-4	1.20	-0.39	3880	-301
Cardwell	Dunklin	56	38	67	27	48	-3	0.69	-0.62	4377	-169
Clarkton	Dunklin	55	38	67	25	47	-3	1.00	-0.59	4242	-248
Glennonville	Dunklin	55	39	67	27	47	-3	0.67	-0.92	4273	-186
Charleston	Mississippi	54	39	68	25	47	-2	1.16	-0.08	4162	+3
Portageville-Delta Center	Pemiscot	56	41	69	31	49	-1	1.16	-0.27	4494	+3
Portageville-Lee Farm	Pemiscot	56	41	69	29	49	-2	1.26	-0.13	4473	+15
Steele	Pemiscot	58	40	69	30	49	-2	1.00	-0.38	4547	+52

* Complete data not available for report

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

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