

Integrated Pest & Crop Management

2007 Missouri Corn Nematode Survey

By Bob Heinz, Melissa Mitchum, Manjula Nathan and Laura Sweets

Introduction

Over the past two years the MU Extension Nematology Lab has received an increasing number of soil samples from corn fields. Most of these soil samples have come from SE Missouri where agriculture is intensive, and the number of deleterious plant-parasitic nematodes are correspondingly numerous and varied in these well worked soils. With the advent of double-cropped potatoes the root-knot nematode (*Meloidogyne*) has become an increasing problem, even on corn, which is often described as a non-host. Other corn nematodes that have been found in Missouri include stubby root (*Paratrichodorus*), lesion (*Pratylenchus*), stunt (*Tylenchorhynchus*), dagger (*Xiphinema*), and spiral (*Helicotylenchus* and *Scutellonema*).

In 2006, the Missouri Extension Nematology Lab discovered a new species of corn cyst nematode from a sample collected in the NW corner of Tennessee. This site is only about 20 miles east of New Madrid County, Missouri and 15 miles south of Mississippi County, Missouri on the east side of the Mississippi River. The problem corn field had a large crescent shaped area of plants which were stunted with yellowing narrowed leaves, poor tasseling and poor ear formation. The exact identification of the cyst nematode recovered from this sample has not yet been determined. Initial greenhouse studies indicated that this new cyst nematode could reproduce on corn but not on soybean.

In 2007, the University of Missouri Plant Protection Program funded a research project designed to survey problem corn fields in the "Delta" counties of southeast Missouri for corn nematodes including the new species of cyst nematode, to conduct a greenhouse host-range study of the newly identified corn cyst nematode species on graminaceous plants, select dicots and a large collection of commercial corn hybrids and to conduct a greenhouse study of life cycle duration and temperature preferences of the newly identified corn cyst nematode.

During the summer of 2007, a total of 35 soil samples with corn roots were collected from symptomatic areas of corn fields in SE Missouri by regional extension specialists. These soil samples were processed for vermiform (worm stage) nematodes and the roots were processed for endo-parasitic nematodes as well as

for the presence of cysts. Any cysts found in samples underwent a bioassay on both corn and soybean to check for reproduction of corn cyst and/or soybean cyst nematode.

Results from survey for corn nematodes

The new corn cyst nematode was not detected in any of the 35 soil samples.

Fourteen of the 35 samples (40 percent) had no plant parasitic nematodes above the economic threshold (the economic threshold or action threshold is the nematode population level that may cause a economic loss at harvest; it is the point at which action may remediate the potential damage caused by nematodes).

Sixty percent of the corn samples had nematodes above the economic threshold broken down as follows: (some samples had more than one nematode above the threshold)

- 9 samples with root knot
- 8 samples with stubby root
- 7 samples with lesion
- 4 samples with spiral
- 2 samples with sting
- 1 sample with stunt

Six of the above samples had two genera of plant parasitic nematodes over the economic threshold,

Continued on page 6

Table of Contents

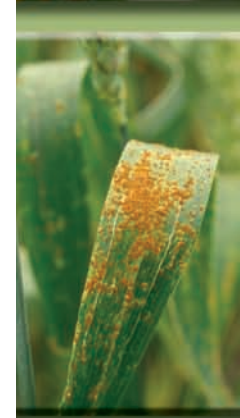
2007 Missouri Corn Nematode Survey
Page 5

Deadly Tornadoes Not an Omen of Missouri's 2008 Storm Season
Page 6

MU Guidesheet Gives Selling Tips for Local Food Producers
Page 7

MU Extension Program Untangles Missouri's Fence Laws
Page 7

Weather Data for the Week Ending February 12, 2008
Page 8



2007 Missouri Corn Nematode Survey *continued from page 5*

and one sample had three indicating compound damage.

Although the dagger nematode was found in low numbers; lance, ring, and needle nematodes were not found at all.

Preliminary Results of Greenhouse Tests

No dicotyledons were found to be hosts for this new corn cyst nematode.

Of the monocotyledons, tested only corn and goose grass were good hosts (barley did reproduce the nematode equal to the original inoculum).

All the different corn hybrids tested reproduced the nematode from 5 to 28 times the initial inoculum level in 30 days. Commercial hybrids with seed

treatments also were good hosts (even better hosts with the treatment washed off).

The corn cysts appear to mature a bit sooner than SCN at 81 degrees Fahrenheit. At day 23 the corn cysts had 86 percent of the egg number compared to day 31 (SCN had only 26 percent).

When inoculated with the same number of eggs, the corn cyst produced more cysts (25 percent) than SCN, the smaller cysts produced less eggs per cyst (33 percent) compared to SCN.

The corn cyst prefers a soil temperature of 81 degrees. At day 28 corn grown with a root temperature of 23 degrees produced corn cyst eggs at a

rate of only 3 percent of those grown at 27 degrees.

In a greenhouse study of soil type preference, the corn cyst reproduced best in sandy soil, then clay soil, and least well in loamy soil.

To test how the corn cyst nematode might survive winter temperatures, corn cyst infested soil was buried outdoors for 3 weeks in soil temperatures of 18 degrees to 57 degrees. This soil had a lower reproduction rate (26 percent) compared to infested soil kept at room temperature.

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Deadly Tornadoes Not an Omen of Missouri's 2008 Storm Season

COLUMBIA, Mo. – An outbreak of devastating tornadoes killed dozens in Arkansas, Tennessee, Alabama and Kentucky on Feb. 5, but this episode of unusually deadly winter tornadoes doesn't mean Missourians are necessarily in for a rough storm season, according to a University of Missouri climatologist.

"The Feb. 5 outbreak presents no indication of what the future storm season may be like for Missouri," said Pat Guinan, an MU Extension climatologist with the MU Commercial Agriculture Program. "Fortunately, the conditions that favor tornado outbreaks occur infrequently and are typically short-lived—generally, a day or two."

While the Feb. 5 outbreak looks to be the deadliest in the U.S. in more than 20 years, Guinan said, winter tornadoes in that region are not uncommon. "Winter tornadoes are most likely to occur in the southeastern U.S., where moister and warmer temperature environments reside."

Guinan also noted that because the jet stream—a high-altitude air current that steers storm systems—tends to flow across the southern U.S. in the winter, "unstable scenarios are more likely to emerge across this part of the country when cold frontal boundaries

sweep into the region and interact with warm, moist surface conditions."

Guinan said that while most tornadoes appear in the four-month period running from March through June, tornadoes can and do appear during any time of year under the right conditions.

According to Guinan, Missouri sees an average of 32 tornadoes each year, with 70 percent of them appearing between March and June.

The deadliest tornado outbreak in Missouri history killed 152 people in central and southwestern Missouri when eight tornadoes struck on April 18, 1880.

The state's deadliest single tornado, a category F-4 with wind speeds up to 260 mph, killed 137 people and injured 800 in St. Louis on May 27, 1896.

The state's deadliest February tornado also struck St. Louis, killing 21 and injuring 345 on Feb. 10, 1959.

In March 1925 a tornado touched down in southeastern Missouri and traveled 219 miles through Illinois and part of Indiana. The "Tri-State Tornado" left almost 700 confirmed fatalities in its wake, making it the single deadliest tornado in U.S. history.

While it may be too early to forecast what Missouri's 2008 storm season will

have in store, MU Extension emergency management specialist Eric Evans tells people that it's never too early to prepare for the worst.

To avoid being caught by surprise, Evans recommends that households purchase a National Oceanic and Atmospheric Administration weather radio, which provides timely and frequent alerts during severe weather conditions. If a weather radio is not an option, Evans advises people to stay informed of weather conditions by tuning into local radio and television stations, and to take all severe weather watches and warnings seriously. "People just need to be aware of what's going on," Evans said.

For more information from Evans on tornado preparedness, visit <http://extension.missouri.edu/cemp/tornado/tornado101.html>. For information on disaster preparedness and emergency response in general, see <http://outreach.missouri.edu/cemp/>.

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MU Guidesheet Gives Selling Tips for Local Food Producers

COLUMBIA, Mo. – The growing popularity of local markets for fresh food presents farm families with opportunities to increase profits, said a University of Missouri Extension community food specialist, but the challenges of marketing and selling directly to consumers can be daunting to some.

“While many farmers may be intimidated by the idea of selling, it is important to remember that selling skills can be learned,” said Bill McKelvey of the MU Extension’s Community Food Systems and Sustainable Agriculture Program.

McKelvey, along with MU Extension sociologist Mary Hendrickson and Joe Parcell, an MU Extension economist and director of the Missouri Value Added Development Center, have written an eight-page guidesheet, “Selling Strategies for Local Food Producers.”

The guidesheet describes ethical, customer-friendly selling techniques and offers practical advice on building relationships with customers, discovering customers’ needs and preferences, advocating for one’s products and providing quality service.

The number of farmers markets in Missouri has doubled in the past decade to more than 130. In addition, farmers also have opportunities to sell at roadside stands, through cooperatives and to institutions and supermarkets, he said.

“Customers are looking for food that is fresh and local. They also want to get to know the people who grow their food,” said McKelvey.

However, it takes strong selling skills to attract and keep local customers,” he said. Sellers also need to do their homework to assess the competition and stay abreast of consumer trends and new developments in direct marketing and farming.

Customers are willing to pay for food products that are clean and of a high quality, McKelvey said. They also are willing to pay more to have the opportunity to get to know the farmer and be a part of the community.

“People consider price, but they also take value into consideration. The stereotype that farmers markets are the place to get cheap food is not accurate,” he said.

The guidesheet includes an extensive list of resources, including publications, Web sites and contacts.

MU Extension Guide G6222, “Selling Strategies for Local Food Producers,” is online at <http://extension.missouri.edu/explore/agguides/hort/g06222.htm> and available through your local Extension county office.

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MU Extension Program Untangles Missouri’s Fence Laws

COLUMBIA, Mo. - Robert Frost’s wisdom — “Good fences make good neighbors” — has endured for more than 100 years.

In Missouri, that depends on where you live.

Joe Koenen, University of Missouri Extension ag business specialist, will explain state statutes governing fences during two upcoming workshops that will run from 7 to 9:30 p.m.

On Feb 21, workshops will be available in Kirksville, Park Hills, Poplar Bluff, St. Joseph, Reeds Spring, Grant City, Chillicothe, Maryville and Blue Springs.

On March 19, the program can be seen in Kirksville, Palmyra, Salem, Mexico, Pilot Grove, Lincoln and Osage Beach.

“Missouri continues to have a very complicated fence law, due in large part to two separate laws covering the state, depending on the county that your land is in,” Koenen said. “Another

problem is that both laws are subject to interpretation,” he said.

Koenen will provide an overview of both laws, as well as the landowners rights and responsibilities.

The program will originate from the Kirksville Telecommunications Community Resource Center and broadcast to other locations via interactive video. Participants at all locations will be able to ask questions and interact with one another.

The cost is \$5 per person, which includes materials. Individuals should preregister by contacting MU Extension in Unionville at 660-947-2705 or by e-mail at koenanj@missouri.edu.

Feb. 21 locations

Kirksville - TCRC, 315 S. Franklin, Park Hills - TCRC, 5270 Flat River Road, Poplar Bluff - TCRC, 200 E.K. Porter Building, 2080 Three Rivers Blvd., St. Joseph - MU Extension, 4125 Mitchell Ave., Reeds Spring - TCRC, Reeds Spring High School, 20277 State

Highway 413, Chillicothe - Grand River Technical School, 1200 Fair St., Grant City - Worth County R-III School, 510 East Ave., Maryville - McKemy Center, 800 University Drive, Blue Springs - MU Extension, 1501 N.W. Jefferson, Suite 110

March 19 locations

Kirksville - TCRC, Palmyra - MU Extension-NE Region, 400 S. Main, Suite 2200, Salem - TCRC, 1200 W. Rolla Road, Mexico - TCRC, 2900 Doreli Lane, Pilot Grove - C-4 School, 107 School St., Lincoln - Lincoln High School, 101 W. Lamine St., Osage Beach - State Fair Community College, 3797 Highway 54.

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Weather Data for the Week Ending February 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.	Feb 1-11-Feb	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	29	12	44	4	22	-2	0.12	-0.17	*	*
St. Joseph	Buchanan	29	14	40	4	22	-5	0.86	0.52	*	*
Brunswick	Chariton	33	21	46	10	27	0	1.12	0.74	*	*
Albany	Gentry	29	9	40	2	20	-5	0.6	0.3	*	*
Auxvasse	Audrain	36	23	49	10	29	2	1.46	0.93	*	*
Columbia	Boone	36	23	49	11	29	0	1.45	0.81	*	*
Sanborn Field	Boone	37	24	50	11	30	1	1.47	0.82	*	*
Williamsburg	Callaway	37	24	51	11	30	2	2.15	1.38	*	*
Novelty	Knox	31	18	43	6	25	-1	1.58	1.18	*	*
Linneus	Linn	31	18	42	8	25	-1	1.45	1.05	*	*
Monroe City	Monroe	34	21	47	7	27	-1	2.21	1.94	*	*
Versailles	Morgan	37	24	51	13	30	-1	2.03	1.49	*	*
Green Ridge	Pettis	35	23	49	13	29	1	1.32	0.78	*	*
Lamar	Barton	41	25	53	18	32	0	1.14	0.61	*	*
Cook Station	Crawford	45	25	70	15	34	1	2.1	1.4	*	*
Alley Spring	Shannon	49	26	73	19	36	4	1.59	0.84	*	*
Round Spring	Shannon	48	25	72	19	36	4	1.79	1.05	*	*
Mountain Grove	Wright	45	25	70	18	35	4	1.84	0.91	*	*
Della	Cape Girardeau	49	32	71	19	40	7	2.68	1.71	*	*
Cardwell	Dunklin	53	35	73	24	43	7	0.81	-0.49	*	*
Clarkton	Dunklin	52	33	73	22	42	8	0.91	-0.03	*	*
Glennonville	Dunklin	52	34	73	23	42	7	1.04	0.1	*	*
Charleston	Mississippi	51	32	74	21	41	8	1.3	0.01	*	*
Portageville-Delta Center	Pemiscot	52	34	74	23	43	8	0.73	-0.35	*	*
Portageville-Lee Farm	Pemiscot	52	34	75	23	43	8	0.79	-0.28	*	*
Steele	Pemiscot	53	36	73	25	44	9	0.88	-0.41	*	*

* 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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