Integrated Pest & Crop Management

Soybean Cyst Nematode Management in 2013: Take the Test: Beat the Pest

By J. Allen Wrather

Here is the situation: Soybean cyst nematode (SCN) is the worst pest of soybeans in the U. S. A. including Missouri.

Fortunately, this pest can be managed, but **farmers must take steps before planting soybean this year to protect against soybean cyst nematode**.

The first step is to test the soil for SCN. This step must soon be completed so the soil test results will be available by mid-April, and the information can then be used to select varieties for planting this year. University of Missouri Extension Regional Agronomists have information about taking and submitting soil samples for SCN analysis, and more information is available at the University of Missouri web site http://soilplantlab.missouri.edu/nematode.

The second step is to make decisions about crops and soybean varieties to plant in 2013. Farmers should plant corn or another crop resistant to SCN in fields that have a high population of SCN. Crop rotation is a great SCN management method because nematode numbers decline during years when crops such as corn, grain sorghum, a forage crop, or cotton are planted. The number of years these crops should be planted before again planting soybean will depend on the number of SCN in the soil. Soybean may be planted in fields that have a low population of SCN in the soil, but farmers should only plant varieties with some type resistance to SCN. Soybean cyst nematode resistant varieties are available and most yield well. Very few varieties are resistant to all types of SCN so selecting the best variety to plant is difficult. The University of Missouri Variety Testing web site, http://varietytesting.missouri.edu/soybean, shows information about SCN resistance source in varieties they test for yield (information provided by seed companies). Visitors to this site should select "Soybean", and then select "Characteristics" to see SCN source of resistance. Farmers should also ask representatives for the soybean seed companies they buy from about the best SCN resistant varieties to plant in each field.

More information about SCN management is available in the University of Missouri Extension Guide titled, *Soybean Cyst Nematode: Diagnosis and Management*. This guide is available at http://muextension.missouri.edu/xplor/agguides/crops/g04450.htm.

The Missouri soybean farmer checkoff managed by the Missouri Soybean Merchandising Council funded much of the research by University of Missouri scientists to develop SCN resistant varieties and determine that crop rotation is a great SCN management tool.

Following these suggested procedures will give soybean farmers a better chance of producing a profitable soybean crop in 2013.

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In This Issue

Check Wheat Fields for Early Season Diseases

By Laura Sweets

After a record low number of wheat acres in 2012, the wheat acreage in the state has been estimated at close to one million acres for 2013. However, 2012 was unusually dry in many parts of the state so wheat emergence and growth last fall was slow in many fields. The unusually dry conditions resulted in some thin or uneven stands and slow plant development. The mild conditions until mid-February may have aided in overwintering of wheat but the recent fluctuations in both temperature and precipitation could cause damage to weak plants. As the most recent snow melts and temperatures begin to warm up, it may be possible to access stands for winter survival, uniformity and the presence of wheat diseases such as virus diseases and powdery mildew.

There have been calls from the southwestern region of the state about powdery mildew. Digital images of infected plants show typical symptoms of this disease. Powdery mildew infections begin as light-green to yellow flecks on the leaf surface. As powdery mildew develops the leaf surfaces become covered with patches of cottony white mold growth of Erysiphe graminis f. sp. tritici, the causal fungus. These patches eventually turn a grayish-white to grayish-brown in color and small black fungal fruiting bodies may be visible within the patches of mildew growth.

Powdery mildew is not usually a problem on soft red winter wheat in Missouri. Disease development is favored by moderate temperatures in the range of 59-72 F and prolonged periods of cloudy weather. Powdery mildew is also favored by high nitrogen levels, lush growth and dense canopies. It is more severe on susceptible varieties and when plants are lodged. In talking with individuals who are seeing powdery mildew in southwest Missouri wheat fields, it appears that the higher incidence of powdery mildew this season could be related to wheat planted after harvesting low-yielding corn and/or to higher than usual seeding rates. In the first situation there may be residual nitrogen left over from the low-yielding corn that the wheat is utilizing. If normal nitrogen rates are applied in addition to residual nitrogen in the field this could favor powdery mildew development. Then, because of the extremely dry conditions last fall, seeding rates may have been increased in an attempt to guarantee a stand. If the stand is dense or if plants are in clumps, powdery mildew might be present.

Foliar fungicides can be used to control powdery mildew but it would be wise to scout fields first to determine the level and extent of the problem. The recent snow events and dip in temperatures may also influence the decision to spray. It is important to protect the flag leaf and the first leaf below the flag leaf and to keep them free of disease. If a fungicide is applied to control mildew at jointing and conditions favorable for disease development continue, it may be necessary to make a second fungicide application.

Green-up is the time of the year when symptoms of wheat spindle streak mosaic, wheat soilborne mosaic and barley yellow dwarf may become evident in winter wheat fields. Both wheat spindle streak mosaic and wheat soilborne mosaic tend to be more severe when wet conditions occur after planting in the fall or in the late winter/early spring months. Cool spring temperatures also enhance symptom development of both wheat spindle streak mosaic and wheat soilborne mosaic. Most of the state was dry last fall but late February and March

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Check Wheat Fields for Early Season Diseases

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have seen near record snowfalls. So it will be interesting to see how prevalent and severe wheat spindle streak and wheat soilborne are this season. Although there are no rescue treatments for wheat virus diseases, it is still a good idea to scout fields for plants showing virus symptoms and to send in samples to identify the virus or combination of viruses that are present so that proper preventative management measures can be used the next time wheat is planted in that field.

Descriptions of the wheat virus diseases most likely to occur on winter wheat in Missouri are given in the following paragraphs.

Symptoms of wheat spindle streak mosaic appear in early spring as yellow-green streaks or dashes on the dark green background of the leaves. These lesions usually run parallel to the leaf veins and tend to be tapered at the ends giving the lesions a spindle shaped appearance. Foliage symptoms are most obvious when air temperatures are about 50°F. As temperatures warm-up, foliage symptoms of wheat spindle streak mosaic tend to fade. Plants may be slightly stunted and have fewer tillers than normal. Wheat spindle streak mosaic tends to be more prevalent in lower, wetter areas of a field. The virus which causes this disease is soilborne and is spread by the soil fungus Polymyxa graminis. Wet falls tend to favor outbreaks of wheat spindle streak mosaic the following spring.

Wheat soilborne mosaic causes light green to yellow green to bright yellow mosaic patterns in leaf tissues. Symptoms are most evident on early spring growth, and warmer temperatures later in the season slow disease development. Symptoms of wheat soilborne mosaic are not always particularly distinctive and might occur as a more general yellowing similar to that caused by nitrogen deficiency. Infected plants may be stunted. This disease may be more severe in low lying, wet areas of a field. The soilborne wheat mosaic virus survives in the soil and is spread by the soil fungus Polymyxa graminis. Again, wet falls tend to favor outbreaks of wheat soilborne mosaic the following spring.

Barley yellow dwarf is an extremely widespread virus disease of cereals. Symptoms include leaf discoloration ranging from a light green or yellowing of leaf tissue to a red or purple discoloration of leaf tissue. Discoloration tends to be from the leaf tip down and the leaf margin in towards the center of the leaf. Plants may be stunted or may have a rigid, upright growth form. Symptoms are most pronounced when temperatures are in the range of 50-65°F. The barley yellow dwarf virus persists in small grains, corn and perennial and annual weed grasses. More than twenty species of aphids can transmit the barley yellow dwarf virus. Symptoms may be more severe and yield losses higher if plants are infected in the fall or early in the spring. Infections developing in late spring or summer may cause discoloration of upper leaves but little stunting of plants or yield loss.

The other virus disease likely to occur on winter wheat in Missouri is wheat streak mosaic, but symptoms of this disease are not usually evident until later in the season when air temperatures increase. Wheat streak mosaic causes a light green to yellow green mottling and streaking of leaves. Symptoms may vary with variety, virus strain, stage of wheat growth when plants are infected and environmental conditions. Plants may be stunted. As temperatures increase later in the spring, yellowing of leaf tissue and stunting of plants may become more obvious. The wheat streak mosaic virus is spread by the wheat curl mite. Symptoms are frequently found along the edges of fields where the mite vector first entered the field. Both the wheat streak mosaic virus and the wheat curl mite survive in susceptible crop and weed hosts. Thus, the destruction of volunteer wheat and weed control are important management options for wheat streak mosaic.

A management program for virus diseases of wheat should include the following steps.

- Plant good quality seed of resistant varieties.
- Avoid planting too early in the fall to minimize opportunity for insect vectors to transmit viruses to young plants.
- Destroy volunteer wheat and control weed grasses.
- Maintain good plant vigor with adequate fertility.

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Weather Data for the Week Ending March 27, 2013

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.	March 1-27	Departure from long term avg.	Accumulated Since Apr.1	Departure from long term avg.
Corning	Atchison	39	24	54	15	31	-14	0.32	-1.48	*	*
St. Joseph	Buchanan	37	24	50	21	30	-16	1.30	-0.54	*	*
Brunswick	Carroll	38	25	46	16	32	-15	2.26	+0.23	*	*
Albany	Gentry	39	25	48	17	31	-14	1.03	-0.94	*	*
Auxvasse	Audrain	39	25	50	17	32	-14	2.44	0.00	*	*
Vandalia	Audrain	39	25	51	18	32	-13	2.12	-0.40	*	*
Columbia-Bradford Research and Extension Center	Boone	40	24	50	15	32	-15	1.94	-0.64	*	*
Columbia-Capen Park	Boone	42	25	51	14	33	-15	3.01	+0.54	*	*
Columbia-Jefferson Farm and Gardens	Boone	39	25	48	16	32	-16	2.21	-0.36	*	*
Columbia-Sanborn Field	Boone	40	26	49	18	33	-15	2.87	+0.33	*	*
Columbia-South Farms	Boone	39	25	49	17	32	-16	2.49	-0.13	*	*
Williamsburg	Callaway	40	25	49	18	33	-13	2.13	-0.46	*	*
Novelty	Knox	38	24	46	15	31	-15	2.08	-0.08	*	*
Linneus	Linn	39	24	47	14	31	-14	2.13	+0.09	*	*
Monroe City	Monroe	39	24	49	16	32	-15	2.31	+0.06	*	*
Versailles	Morgan	40	27	49	20	33	-16	2.83	+0.32	*	*
Green Ridge	Pettis	38	24	47	19	31	-16	1.90	-0.48	*	*
Lamar	Barton	39	28	53	22	33	-16	2.16	-0.85	*	*
Cook Station	Crawford	42	26	52	16	34	-15	5.46	+2.35	*	*
Round Spring	Shannon	45	26	56	16	35	-13	3.35	+0.16	*	*
Mountain Grove	Wright	39	25	52	20	32	-15	3.27	-0.04	*	*
Delta	Cape Girardeau	45	30	53	24	37	-13	2.42	-1.23	*	*
Cardwell	Dunklin	47	31	53	24	39	-13	1.60	-2.06	*	*
Clarkton	Dunklin	46	31	53	22	38	-13	1.97	-1.30	*	*
Glennonville	Dunklin	46	32	53	25	39	-12	1.83	-1.34	*	*
Charleston	Mississippi	45	31	53	23	38	-12	1.95	-1.36	*	*
Portageville-Delta Center	Pemiscot	47	33	53	26	40	-12	2.42	-1.02	*	*
Portageville-Lee Farm	Pemiscot	47	32	54	26	39	-13	2.54	-0.89	*	*
Steele	Pemiscot	48	32	55	24	40	-12	1.73	-1.91	*	*

‡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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