Wisconsin Crop Manager

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Early Season Insect Calendar: Seed Corn Maggot

Eileen Cullen, Extension Entomologist

Please see last week's Wisconsin Crop Manager Vol. 18(8) for a black cutworm scouting alert in corn from emergence through V5 stage. Remember to scout Bt corn hybrids for black cutworm as well since heavy black cutworm populations may overwhelm some Bt hybrids.

This week, I provide a few reminders about seedcorn maggot, another potential early season insect pest of corn and soybean.

Most conventional and all Bt corn seed, and a significant portion of soybean seed is sold with nicotinoid insecticide seed treatment. This seed treatment provides excellent seedcorn maggot control. Some hopper box seed treatments are also available.

The following cropping system scenarios can increase likelihood of seedcorn maggot damage to germinating seeds and seedlings. These scenarios are important for organic and conventional growers who incorporate a grass or legume cover crop ahead of planting and/or who do not have insecticide treated soybean or corn seed.

- Adult female seedcorn maggot flies are attracted to fields with decomposing organic matter. Fields where animal or green manure cover crops or weed tillage have recently been incorporated in spring are more susceptible to seedcorn maggot. The longer the time between incorporation of green plant material and planting, the lower the risk of attracting adult flies. A 2-3 week window usually allows decomposing plant organic matter to become less attractive to flies. Of course, weather conditions do not always allow growers to wait 2-3 weeks between cover crop or weed tillage and corn and soybean planting.
- Conditions that delay emergence, such as soil crusting or cold, wet weather will increase the likelihood of damage because seedlings take longer to emerge allowing more time during which seed is susceptible below ground to feeding injury.
- Seedcorn maggot can be an issue for untreated corn and soybean seed, however damage is not usually as severe in corn as when found in soybean. On soybean, maggots burrow into germinating seed. If the seed germinates, maggots feed in and on the cotyledons leaving brown feeding scars. Shoots may also emerge as "snakehead" seedlings, missing cotyledons altogether. On corn, all parts of the sprouting seed can be fed on. When it occurs (on soybeans or corn), seedcorn maggot damage is usually more widespread than spotty in field distribution.

Seedcorn maggot overwinters as a pupa in the soil. We can use insect degree-days to predict adult fly emergence in spring. Beginning January 1, degree-days are accumulated using the seedcorn maggot base temperature of 3.9°C (39°F). Peak emergence of the first generation of adult flies from the overwintering pupae will occur at 200 degree-days C (approx. 342 degree-days F). Peak emergence indicates that the population is increasing and egg-laying is occurring, thus planting during peak seedcorn maggot fly emergence can increase risk.

Seedcorn maggot pupa in soil.
Photo: Sarah Schramm, UW Madison Entomology Dept.

Adult seedcorn maggot fly.
Photo: Sarah Schramm, UW Madison Entomology Dept.

Seedcorn maggot typically has three generations per year in Wisconsin, but it is the first generation in May that is of importance to corn and soybean. Pupae are small brown, cylindrical 'cocoons' in the soil. Adults are small dark flies with bristles on the thorax. Larvae are yellowish-white, 1/5-inch long when fully grown, legless and wedge shaped.

Seedcorn maggot damage to soybean.
Photo: Sarah Schramm, UW Madison Entomology Dept.

"Snakehead" soybean seedling missing cotyledons.
Photo: Sarah Schramm, UW Madison Entomology Dept.

Seedcorn maggot damage to corn seed.
Photo: Sarah Schramm, UW Madison Entomology Dept.

There are no economic thresholds for seedcorn maggot. If seed treatments are not part of a cropping system plan, knowledge of seedcorn maggot life cycle and degree-days can help minimize damage by planting as close to possible during "fly free" periods outside of the peak flight emergence.

To learn more about using insect degree-days, and seedcorn maggot degree-days in particular, please visit eXtension's eOrganic webinar series archived recording from March 29, 2011 titled Integrated Pest Management in Organic Field Crops Webinar. In the second presentation (Cullen beginning at 12:12 minute mark) I cover the topic of using seedcorn maggot degree-days to plant around peak fly emergence.

Four Issues of Vegetable Crop Updates Now Available

Vegetable Crop Updates are back to their weekly schedule!

The latest Vegetable Crop Updates are now available-including updates on Vegetable Crop Disease. To access these updates click here.

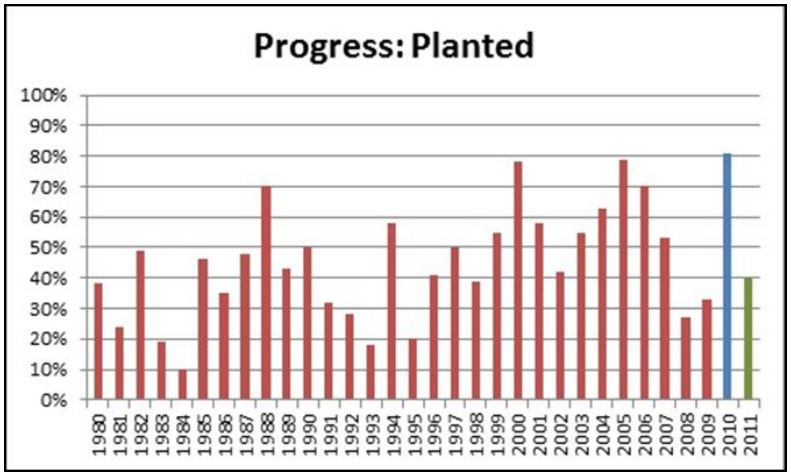
USDA Corn Planting Progress

David Moll, Outreach Specialist, Agricultural & Applied Economics

With recent attention on delayed planting, this year will continue to be behind last year's record-setting planting pace. However, quite a bit of corn was planted across the country last week. About 40% of the US Corn crop is now in the ground, according this week's USDA weekly crop progress report. Most of the planting has been done primarily in the south and western Corn Belt. The biggest increase in planting was in Iowa with 61% of the crop being planted in just one week (between May 1 and May 8). On May 1, Iowa had a mere 8% planted and are now 69% planted. Across Wisconsin, 16% of the projected corn crop is planted, a 15% increase over the previous week.

Corn Planting Progress
Source: USDA Crop Progress Report

	May 1, 2011	May 8, 2011
Colorado	18	51
Illinois	10	34
Indiana	2	4
Iowa	8	69
Kansas	41	66
Kentucky	17	19
Michigan	1	8
Minnesota	1	28
Missouri	32	59
Nebraska	15	57
North Carolina	88	95
Ohio	1	2
Pennsylvania	1	10
South Dakota	2	17
Tennessee	38	42
Texas	79	87
Wisconsin	1	16
Total US Planted	13%	40%



Longevity of S Availability from Large Gypsum Applications

Dick Wolkowski, Extension Soil Scientist

The recent interest in the use of FGD gypsum as a soil amendment has resulted in some questions about the longevity of the S supply to crops because of the high rates of application. This material is often applied at rates of 1 – 2 ton/a, which supplies may times crop S requirement. Fifteen years ago I conducted a study that examined the efficacy of land applying crushed gypsum wallboard to alfalfa at several locations in Wisconsin.

The objective of that study was to examine the benefit of land application as opposed to landfilling. The wallboard had a S content of 13.4 %, which would supply 268 lb S/ton, or approximately 10 X UW guidelines per ton for alfalfa. Study rates included 1, 4 and 16 ton/a, which were applied and incorporated prior to seeding alfalfa. Studies were conducted at four UW Agricultural Research Stations on a range of soil types. More detail on the use of crushed wallboard for crop production can be found in UWEX Publication A3782.

Some suggest that because the plant available form of S is SO_4^{2-}, an anion, it is subject to leaching and will quickly be depleted from the rootzone. Sulfur, like nitrogen, is cycled in the soil and will become a component of the soil organic matter in the plowlayer, where it will not be detected by a soil test. Over time this S will be mineralized as plant available S. Therefore, while some S is expected to leach, a substantial amount may be retained in the soil organic matter. This is why soil test S by itself is not necessarily a good predictor of S nutrition and currently other factors are used to predict S need via the Sulfur Availability Index.

Table 1 (next page) shows the effect of wallboard application rate on the soil test S and forage S concentration. Materials were applied and incorporated prior to seeding in late April and early May of 1995. Soil samples were collected each July and the forage S values are for the second cutting each year. The annual precipitation received in the study years was either at or below average, with the exception of somewhat higher values at Spooner in 1995 (35.3 in.) and Ashland in 1996 (38.1 in.). These data show the rapid increase in soil test S in 1995, which moderated in 1996, and for the 1 ton/a rate were similar to the control in 1997. The S concentration of the harvested forage responded to the application of S and responses were greater at the sites in northwestern Wisconsin, where historically S response has been more common. A tissue concentration in the range of 0.25 – 0.50 is considered sufficient for the top six inches of alfalfa sampled at the late bud to early flower growth stage. The only significant yield responses observed in the study were at Ashland and Spooner in 1997 (data not shown), which had relatively low forage S concentrations.

These data suggest that large gypsum applications will initially cause a large increase soil test S, which over a period of two years return close to background when applied rates of 1 – 2 ton/a. Rates greater than this are not economical and creates a risk on lighter soils where the excessive Ca displaces other cations such as K and Mg, which may be leached from the plowlayer. The plant analysis data shows the potential supply of S is still high and likely comes from S mineralized from organic matter. Over the years since the wallboard research was conducted S deposition in precipitation has decreased, increasing the potential for S response in crops. Applications of 1 – 2 ton gypsum/a should supply adequate S for alfalfa grown in normal rotations. Producers concerned about S nutrition should use a combination of plant analysis and soil testing to confirm the need for S.

Table 1. Effect of large applications of crushed gypsum wallboard on the soil test S and S concentration of harvested alfalfa forage at four Wisconsin locations, 1995 – 1997.

Site	Wallboard Rate	Soil test S			Forage S		
		1995	1996	1997	1995	1996	1997
	ton/a	ppm			%		
Arlington	0	6	3	7	0.36	0.37	0.28
	1	44	15	8	0.42	0.42	0.30
	4	146	45	8	0.44	0.40	0.30
	16	313	291	174	0.39	0.46	0.35
Ashland	0	57	16	2	0.33	0.32	0.26
	1	97	27	1	0.34	0.32	0.31
	4	254	55	10	0.34	0.39	0.36
	16	331	198	244	0.37	0.43	0.46
Lancaster	0	14	23	9	0.45	0.43	0.28
	1	46	17	7	0.49	0.42	0.28
	4	104	40	27	0.49	0.45	0.30
	16	285	207	149	0.53	0.47	0.32
Spooner	0	14	1	6	0.24	0.30	0.28
	1	77	5	9	0.33	0.38	0.37
	4	116	32	12	0.34	0.46	0.45
	16	164	138	120	0.34	0.54	0.52

UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, Amanda Zimmerman and Adam Greene, Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant samples from around the state. The following diseases/disorders have been identified at the PDDC from May 4, 2011 through May 10, 2011:

PLANT/SAMPLE TYPE	DISEASE /DISORDER	PATHOGEN	COUNTY
VEGETABLES			
Miscellaneous. Vegetable Seedlings	Sunburn	None	Dane
Potato Tubers	Hollow Heart	None	Dane

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.