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In This Issue

Insects, Mites, And Nematodes

Spider Mites in Soybean, CORN, Trees, Flowers, Vegetables, Fruit... – (*Christian Krupke and John Obermeyer*) -

- Spider mites in Indiana field corn is uncommon.
- Use caution while interpreting spider mite information from western states.
- Mite species/environments vary considerably across the Corn Belt.
- While scouting, must go beyond the end rows to determine infestation.

If it's true that "misery loves company," then producers and homeowners can commiserate in the knowledge that spider mites are flourishing and attacking host plants of all kinds. The big difference is that producers have their livelihood at stake in these already drought-ravaged crops. There is clearly a range in how proactive producers have been in handling infestations, this is evidenced by variable severity in mite damage throughout the state. Timely treatment should pay dividends for those soybean fields that have recently gotten rains to help develop/fill pods. But, what about spider mites being found on field corn?

Levels of spider mite damage to corn leaves

Spider mite damage in field corn is a rarity in the Eastern Corn Belt, and very little is understood about their potential effect on yield in the Midwest. Most have been pulling infor-

Ear leaf showing slight spider mite stippling, indicating colonization

mation, via online newsletters, from Texas, Kansas, Colorado, and Nebraska for information on yield impacts and treatment decisions. Chemical companies have sent "educational" emails, giving efficacy results from these states out west for their products. We too are on a steep learning curve, but as we visit with, or read our colleagues information out west, we feel that we're comparing apples to oranges. Mite species and humidity levels are two of the glaring differences.

Two-spotted spider mites (*Tetranychus urticae*) are our enemy in field crops (and in many homeowner and greenhouse plants), while out in the Western Corn Belt, their primary species is the Bank's grass mite (*Oligonychus pratensis*) with some two-spotted mites mixed in. There are several subtle differences in identification, biology, and damage between the two species, but the primary one being two-spotted is less susceptible to pesticides. In addition, two-spotted is prone to building pesticide resistant populations. In short, we've got the tougher pest. And because of that, pesticide carrier volumes are recommended to be increased to at least 5 gpa by air and 20 gpa by ground.

Close-up of spider mites and their stippling damage to corn leaf

Though we have gone through "Texas-like" weather for many weeks of May, June and some of July, we certainly are in a different weather pattern now. Though not all areas of the state are getting rainfall, see weekly rainfall maps of this and past *Pest&Crop* issues, all counties have higher humidity. Though high humidity (>50%) doesn't stop spider mites, it certainly slows down water loss from plants, and therefore lowers plant stress and mite reproductive rates. It also makes mite populations prone to epizootics ("plagues" of fungal disease).

Spreading through a cornfield is not as easy for spider mites as in soybeans. Mites can either walk from plant to plant via touching leaves or they "balloon" with spun webs, allowing the wind to transport them. Certainly this must be a slow process, because wind movement in the lower canopy of cornfields is quite limited. One must make certain that spider mites have moved beyond the end rows, walking well into the field to determine their presence and colonization of leaves is crucial.

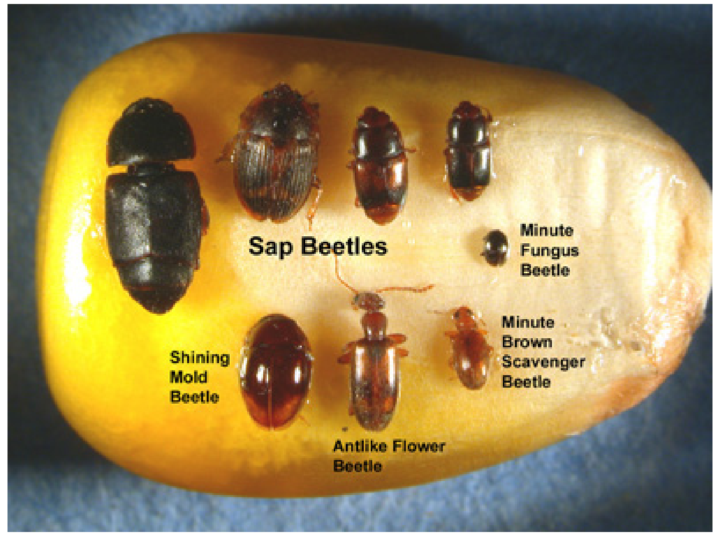
There are many natural enemies of spider mites, pictured here is a spider mite destroyer (tiny lady beetle) adult and larva

We still remain doubtful that spider mite treatments in yellow-dent corn are warranted. However, if fields with decent yield potential (100+ bu/a) have spider mite colonies established on lower leaves (discolored), and spreading to the ear leaf or above, then treating before the dent stage may be justified. As previously mentioned, high amount of carrier (5 by air, 20+ by ground) is strongly recommended. Consider that spider mites are usually most actively colonizing the underside of lower leaves so canopy penetration is necessary. We have no experience to draw from in treating corn for spider mites, but we would suggest dimethoate or propargite (Comite) as first choices. Chlorpyrifos is labeled for corn, but spider mite is not a targeted pest.

Picnic Beetles in Corn Ears - (*John Obermeyer*)

It is obvious folks are out looking at corn ears to determine the damage done by the drought. Some have found "picnic beetles" or other small brownish beetles feeding on kernels in tips of ears. These are also often called "beer bugs." The family of insects, Nitidulidae, has a range of size and colored beetles that are attracted to fermenting organic matter (alcohol!) and this is the reason they turn up in your beer. Their presence is in response to previous damage to those upper kernels, which includes insect (e.g., western bean cutworm) and/or bird feeding. In addition, hybrids with short ear husks seem to be more prone to exposing kernels, making easy access for rootworm and Japanese beetles to compromise ear tip kernels while feeding on silks. Please don't waste time and effort considering treating fields for these opportunistic insects, as what they eat wouldn't make it through the harvest process.

Picnic beetle feasting on earworm leftovers



Assortment of sap and mold beetles that could be found in the ear of damaged kernels

Black Light Trap Catch Report - (*John Obermeyer*)

County/Cooperator	7/17/12 - 7/23/12							7/24/12 - 7/30/12						
	VC	BCW	ECB	WBC	CEW	FAW	AW	VC	BCW	ECB	WBC	CEW	FAW	AW
Dubois/SIPAC Ag Center	0	0	0	0	0	0	4	0	0	0	0	0	0	2
Jennings/SEPAC Ag Center	0	0	9	0	0	0	7	0	0	0	0	0	0	2
Knox/SWPAC Ag Center	0	0	0	0	3	0	6	0	0	0	0	8	0	6
LaPorte/Pinney Ag Center	2	0	6	11	2	0	2	1	0	3	0	0	0	2
Lawrence/Feldun Ag Center	0	1	0	0	0	0	6	0	0	0	0	1	0	0
Randolph/Davis Ag Center	1	2	0	0	0	0	47	2	1	0	0	1	0	24
Tippecanoe/TPAC Ag Center	1	0	2	1	6	0	8	1	1	3	1	57	0	10
Whitley/NEPAC Ag Center	0	0	0	0	0	0	4	1	0	0	0	0	0	0

VC = Variegated Cutworm, BCW = Black Cutworm, ECB = European Corn Borer, WBC = Western Bean Cutworm, CEW = Corn Earworm, FAW = Fall Armyworm, AW = Armyworm

Western Bean Cutworm Adult Pheromone Trap Report
Week 1 = 6/7/12 - 6/13/12 Week 2 = 6/14/12 - 6/20/12 Week 3 = 6/21/12 - 6/27/12 Week 4 = 6/28/12 - 7/4/12 Week 5 = 7/5/12 - 7/11/12 Week 6 = 7/12/12 - 7/18/12 Week 7 = 7/19/12 - 7/25/12 Week 8 = 7/26/12 - 8/1/12

County	Cooperator	WBC Trapped							
		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Adams	Kaminsky/New Era Ag - Monroe	0	7	5	11	3		8	
Adams	Roe/Mercer Landmark - Pleasant Mills	0	0	3	2	5	2	0	0
Allen	Anderson/Syngenta - Churubusco	2	0	16	7	5	30	10	
Allen	Gynn/Southwind Farms - Ft. Wayne	0	5	13	7	28	23	0	3
Benton	Babcock/Ceres Solutions - Boswell	0	2	7	9				
Boone	Dennis Carrell - Lebanon	0	3	5	1	0	0	0	
Clay	Bower/Ceres Solutions - Clay City	0	1	0	0	0	0	0	
Clay	Bower/Ceres Solutions - Brazil	0	0	0	0	0	0	0	
Clinton	Foster/Purdue Entomology - Rossville	1	9	5	14	1	0	0	
DeKalb	Hoffman/ATA Solutions	3	3	7	17	25	15	2	1
DuBois	Eck/Purdue CES - Jasper	0	0	0	0	1	0	0	0
Elkhart	Kaufmann/Crop Tech - Elkhart	6	9	16	22	36	16	18	3
Fayette	Schelle/Falmouth Farm Supply - Falmouth	0	0	0	0	0	0	0	0
Fountain	Mroczkiewicz/Syngenta - Rob Roy	5	22	52	43	38	3	0	0
Fulton	Childs/Specialty Hybrids	144	234	123	93	42	14	5	
Fulton	Jenkins/North Central Co-op - Kewanna	27	153	298	246	169	31	5	1
Fulton	Jenkins/North Central Co-op - Rochester	26	96	80	108	121	24	2	4
Hamilton	Campbell/Beck's Hybrids - Atlanta	0	1	0	2	0	1	0	0
Hamilton	Campbell/Beck's Hybrids - Sheridan	0	0	1	0	0	0	0	0
Hendricks	Nicholson/Nicholson Consulting - Danville	1	2	2	1	0		0	
Henry	Schelle/Falmouth Farm Supply - New Castle	0	0	0	1	0	0	0	0
Henry	Schelle/Falmouth Farm Supply - Millville	0	0	0	3	4	0	0	0
Jasper	Overstreet/Purdue CES - Wheatfield	20	100	49	84	69	15	3	0
Jasper	Parker/Purdue - Stanley		157	196	39	50	2	0	
Jasper	Parker/Purdue - Green		58	124	24	13	0	0	
Jasper	Parker/Purdue - Hamstra		68	38	41	42	2	0	
Jasper	Parker/Purdue - Kikkert		166	163	59	122	9	2	
Jasper	Parker/Purdue - Fair Oaks		576	432	246	33	16	3	
Jasper	Parker/Purdue - Rodibaugh		50	93	40	36	4	3	
Jay	Shrack/Ran Del Agri Svc - Dunkirk	0	0	0	1	3	0	0	
Jennings	Bauerle/SEPAC - North Vernon	0	0	0	0	0	0	0	0
Knox	Bowers/Ceres Solutions/Frichton	0	0	0	0	0	0	0	
Knox	Bowers/Ceres Solutions/Vincennes	0	0	0	0	0	0	0	
Knox	Hoke/SWPAC - Vincennes N	0	0	0	0	0	0	0	0
Lake	Kleine/Kleine Farms - Cedar Lake	4	34	27	28	16	8	4	4
Lake	Moyer - Schneider	45	185	222	201	218	20	14	8
Lake	Moyer - Shelby	11	63	124	195	136	13	13	5
LaPorte	Barry/Kingsbury Elevator		12	28	43	17	10	0	
LaPorte	Rocke/Agri Mgmt Solutions - Wanatah SE	17	140	229	350	179	66	10	10

LaPorte	Rocke/Agri Mgmt Solutions/LaCrosse E	25	108	146	155	24	3	6	1
Miami	Early/Pioneer	2	11	23	16	6	8	4	0
Montgomery	Stine - Wingate	3	2	0	15	31	0	0	
Montgomery	Stine - Alamo	0	1	0	0	0	0	0	
Newton	Childs/Specialty Hybrids	18	97	74	35	5	0	0	
Newton	Childs/Specialty Hybrids	8	19	37	16	15	10	1	
Newton	Childs/Specialty Hybrids	0	5	5	4	1	1	0	
Newton	Moyer - Lake Village	15	123	194	137	247	71	35	12
Porter	Leuck/PPAC - Wanatah N	4	18	19	24	55	12	2	1
Porter	Rocke/Agri Mgmt Solutions - Francesville	20	73	201	193	36		4	5
Pulaski	Childs/Specialty Hybrids	35	122	137	96	86	36	4	
Pulaski	Childs/Specialty Hybrids	71	110	81	44	38	4	0	
Pulaski	Childs/Specialty Hybrids	50	71	83	35	22	8	0	
Pulaski	Childs/Specialty Hybrids	9	52	25	11	4	8	0	
Pulaski	Childs/Specialty Hybrids	8	28	18	9	5	1	0	
Pulaski	Childs/Specialty Hybrids	14	48	44	21	5	0	0	
Putnam	Nicholson/Nicholson Consulting - Greencastle	1	1	1	1	0	0	1	0
Randolph	Boyer/DPAC - Farmland	0	0	14	3	6	14	8	5
Rush	Schelle/Falmouth Farm Supply - Carthage	0	0	1	0	0	0	0	0
Starke	Childs/Specialty Hybrids	69	150	139	57	20	10	0	
Starke	Childs/Specialty Hybrids	48	74	83	35	46	24	1	
Starke	Childs/Specialty Hybrids	70	95	89	41	35	25	0	
Starke	Wickert/Wickert Agronomy Services - N. Judson	2	11	12	9	47	3	0	0
Sullivan	Bower/Ceres Solutions - Sullivan E	0	0	1	1	1	0	0	
Tippecanoe	Bower/Ceres Solutions - Sullivan W	0	0	6	3	1	1	0	
Tippecanoe	Bower/Ceres Solutions - New Lebanon	0		0	0	0	3	0	
Tippecanoe	Bower/Ceres Solutions - Farmersburg	3	3	0	0	1	0	0	
Tippecanoe	Bower/Ceres Solutions	4	39	6	6	7	4	0	
Tippecanoe	Nagel/Ceres Solutions - Otterbein	0	5	8	7	8	0	0	
Tippecanoe	Obermeyer/Purdue Entomology - Agry Farm	1	2	4	3	1	3	1	0
Tippecanoe	Westerfeld/Monsanto	9	9	8	11	8		0	
White	Childs/Specialty Hybrids	0	7	12	2	3	2	0	
White	Childs/Specialty Hybrids	8	32	12	5	0	8	0	
Whitley	Walker/NEPAC - Columbia City	0	4	5	2	14	6	1	1

Plant Diseases

Begin Scouting for Aspergillus Ear Rot – (*Kiersten Wise and Charles Woloshuk*) -

Symptoms of Aspergillus ear rot have been reported in corn in southern Indiana. Weather conditions have been favorable for Aspergillus ear rot development and producers should plan to scout fields to determine if this ear rot is present. This ear rot is caused by the fungus *Aspergillus flavus*, which produces a mycotoxin known as aflatoxin. Aflatoxin is a very toxic carcinogen, and livestock that consume contaminated grain or silage may be at risk for many health problems. Two weeks ago we released an article describing how to scout for and identify Aspergillus ear rot, test for aflatoxin, and harvest and store affected grain. Please refer to the article: "Preparing for Aspergillus ear rot in corn grain and silage" for more information. <http://extension.entm.purdue.edu/pestcrop/2012/issue17/index.html#preparing>.

Fungicide Applications in Soybean—Risk vs. Reward – (*Kiersten Wise*) -

Soybeans are beginning to form pods (R3) in Indiana, and farmers are deciding whether or not to apply fungicides to soybean in the hopes of increasing or protecting yield. Currently there is low foliar disease pressure in Indiana soybeans, and our standard recommendation is that fungicides should be applied only when foliar disease pressure is potentially yield-limiting. However, many growers are interested in applying fungicides for other benefits, including improving water use efficiency, and retention of green leaf area which may lead to an extended period of seed fill and higher yields. This question was addressed recently in an article released by the University of Illinois: "Do Dry-Weather Crops Still Need Fungicides" by Dr. Carl Bradley: <http://bulletin.ipm.illinois.edu/article.php?id=1689>. In this article, Dr. Bradley summarizes soybean fungicide trials across Illinois and found that a yield benefit from a fungicide application was not observed on soybeans grown under very water-stressed conditions.

Similarly, published research that examines the effects of strobilurin fungicides on water use efficiency found that strobilurin fungicides could slightly increase water use efficiency in well-watered plants, but both water-use efficiency and photosynthesis were reduced in water-stressed plants. These research results indicate that fungicides applied to drought-stressed plants may actually have a negative impact on plant physiological processes. See the following article for more information on this study: Nason, M.A., J. Farrar, and D. Bartlett. 2007. Strobilurin fungicides induce changes in photosynthetic gas exchange that do not improve water use efficiency of plants grown under conditions of water stress. Pest Management Science 63:1191-1200.

Economic analysis of two years of soybean fungicide research data across six sites in Indiana from 2009 to 2011 indicate that fungicide applications do not consistently result in a profit if they are applied in the absence of disease, even under adequate moisture for the crop.

Table 1 shows the average net returns for treatments applied to soybean from 2009 to 2011. Our soybean management program in these trials consisted of 22 fl oz glyphosate at growth stage V3 or R2, 6 fl oz of the strobilurin fungicide Headline® fungicide at R2 or R4, and 3 fl oz of the insecticide Warrior® at R4. Trials were rated for disease and insect pressure throughout the season; however, no significant pressure was found in any trial location in any year. Economic analysis was calculated based on the five-year historical soybean price, yield data from the aforementioned study, and averaged pesticide costs for 2011-12. Prices for input costs are based on estimates from the 2011 Purdue Crop Cost & Return Guide (ID-166-W). The net returns do not include factors such as rent, taxes, labor, premiums, etc. The economic analysis software SIMETAR was used to generate this data.

Table 1. Net returns for soybean fungicide and insecticide treatments from 2009 to 2011 in Indiana.

Treatment	Timing	Mean Return ($/Acre)
Glyphosate	Standard	$435
Glyphosate followed by Headline	R2	$406 (-29)
Glyphosate followed by Headline	R4	$420 (-15)
Glyphosate followed by Warrior	R4	$385 (-50)
Glyphosate followed by Headline followed by Warrior	R2 fb R4	$381 (-54)
Glyphosate followed by Headline + Warrior	R4	$384 (-51)

The highest return per acre was obtained with a standard weed management program. Additional inputs did not consistently provide an economic benefit when compared to the potential net returns from the standard glyphosate program.

The bottom line is that growers who are applying fungicides in the absence of disease and/or for physiological benefits should manage expectations about yield increases that may result from these fungicide applications. Although 2012 soybean prices are at record highs, and the ability to break-even on the cost of a fungicide application may be as low as one bushel/acre, **research data indicate that applications to water-stressed plants may not increase yield, and that fungicide applications are not always profitable, even under less water-stressed conditions**.

Agronomy Tips

Opportunities to Assess Yield Potential of Drought-Stressed Corn – (*Bob Nielsen*) -

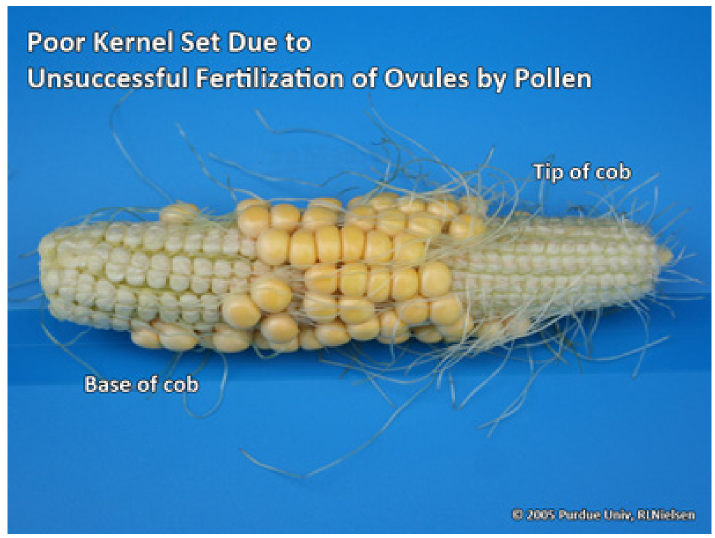
As the Great Drought of 2012 continues to wreak havoc with the corn crop throughout Indiana and elsewhere in the Midwest, there are several opportunities to assess the yield potential of individual damaged fields. In "normal" years, I would tell growers that the simple plant/ear/kernel count method for estimating grain yield prior to harvest (Nielsen, 2011b) is probably all they need to do to estimate the relative yield potential of their fields. However, the severity, duration, and variability of the stress of the current drought ranks among the worst in recent Indiana history. Combined with the additional stress imposed by days of excessively high temperatures, the consequences are already severe in many fields and will yet become so in more fields in the coming weeks.............. All at a point in the growing season that is way earlier than the traditional kernel count method was designed for.

Clearly, the yield potential of fields whose plants are already dead is pretty easy to determine. The more uncertain situations are those fields that appear to be less than disastrous based on windshield surveys.

1st Opportunity: In another article (Nielsen, 2012), I described the "ear shake" technique that can be used to assess the success or failure of pollination. Normally, this technique falls into the category of "casual interest" because the pollination process is usually not a problematic issue. However, this year the combination of severe drought and excessive heat during pollination has seriously compromised that process in quite a few fields. The "ear shake" technique can be used as early as 5 to 6 days after silks are pollinated by pollen and, thus, represents an early assessment of relative yield potential; i.e., good, bad, or in between. Most of Indiana's corn crop is beyond this point, but there are a few fields just now attempting to pollinate or have recently pollinated, so there may be a few opportunities to use this method yet this season.

2nd Opportunity: Even if pollination occurred successfully, subsequent severe drought and excessive heat can cause significant kernel abortion throughout the developing ear during the blister and milk stages of kernel development (Nielsen, 2008). The younger kernels on an ear are most susceptible to photosynthetic stress and thus are at most risk of kernel abortion.

Much of the state's corn crop is still in this vulnerable stage of kernel development with only 22% of the crop statewide estimated to have reached the dough stage of kernel development as of 22 July (USDA-NASS, 2012). This fact is also why rainfall now may indeed have dramatic benefits to the corn crop if it prevents significant rates of kernel abortion.



With "normal" stress following pollination, kernel abortion typically occurs near the tip of the developing ear because those kernels are usually younger. Silks from those ovules usually emerge later than those from the ovules lower on the cob and, thus, are last to be fertilized by pollen.

When severe stress exists prior to and during pollination, silk emergence may be somewhat more random or pollen fertilization more erratic. Consequently, kernel “age” may be more random throughout the ear and kernel abortion thus also more random in its pattern (Nielsen, 2011c; Nielsen, 2011d). Assessing the degree of kernel abortion shortly after the milk stage of development can help you assess relative yield potential; i.e., good, bad, or in between.

3rd Opportunity: The last opportunity to assess yield potential prior to harvest is near physiological maturity (kernel black layer, Nielsen, 2008) using the so-called yield component method (Nielsen, 2011b). Technically, you can use this method at the dough or dent stages of kernel development, but waiting until physiological maturity allows you to assess kernel depth (aka size or weight). This allows you to “fine-tune” the yield estimate by tweaking the kernel weight “fudge factor” in the formula. Even so, this yield estimation method probably is no more accurate than about 20-30 bu/ac.

Recognize that estimates of grain yield under drought conditions are difficult at best because of the challenge of assessing the spatial variability for drought stress within fields. It is not easy or enjoyable to thoroughly walk a large field to collect reliable ear samples. However, any opportunity to assess yield potential of stressed fields will help identify the severity of the yield losses and may help you modify your grain marketing decisions this fall.

Related Reading

Nafziger, Emerson. 2012. Estimating Yields of Stressed Corn. The Bulletin, Univ of Illinois. <http://bulletin.ipm.illinois.edu/article.php?id=1695> [URL checked July 2012].

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Nielsen, RL (Bob). 2011a. Effects of Stress During Grain Filling in Corn. Corny News Network, Purdue Extension. <http://www.kingcorn.org/news/timeless/GrainFillStress.html> [URL checked July 2012].

Nielsen, RL (Bob). 2011b. Estimating Corn Grain Yield Prior to Harvest. Corny News Network, Purdue University. <http://www.agry.purdue.edu/ext/corn/news/timeless/YldEstMethod.html>. (URL checked July 2012).

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Nielsen, RL (Bob). 2011d. The “Zipper” Pattern of Poor Kernel Set in Corn. Corny News Network, Purdue Extension. <http://www.kingcorn.org/news/timeless/Zipper.html>. [URL checked July 2012].

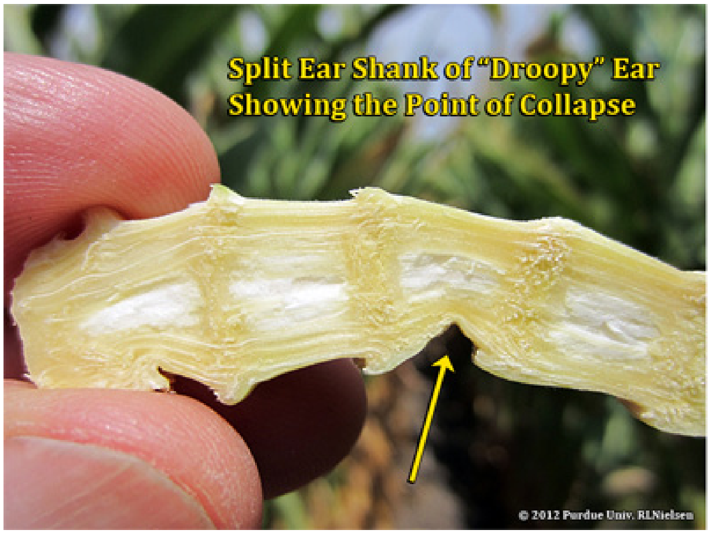
Nielsen, RL (Bob). 2012. A Fast & Accurate Pregnancy Test for Corn. Corny News Network, Purdue University. <http://www.agry.purdue.edu/ext/corn/news/timeless/EarShake.html>. (URL checked July 2012).

Do Your Ears Hang Low? (Premature Ear Declination in Corn) – (*Bob Nielsen*) -

Droopy ears are cute on certain breeds of dogs, but droopy ears on corn plants prior to physiological maturity are a signal that grain fill has slowed or halted. Ears of corn normally remain erect until some time after physiological maturity (black layer development) has occurred, after which the ear shanks eventually collapse and the ears decline or “droop” down. The normal declination of the ears after maturity is desirable from the perspective of shedding rainfall prior to harvest and avoiding re-wetting of the grain. Premature ear declination, however, results in premature black layer formation, lightweight grain, and ultimately lower grain yield per acre.

What Causes Premature Droopy Ears? The most common contributing factor seems to be severe drought stress that extends late into the grain filling period. The “droopy” symptom suggests a loss of turgidity in the ear shank with stress, possibly combined with some cannibalization of the ear shank similar to what can occur with the stored reserves of the main stalk in response to severe photosynthetic stress. Eventually, the ear shank collapses and the ear droops down.

Flashback: In hybrids without the Bt-corn borer trait, collapsed ear shanks can also result from extensive tunneling by European corn borer larvae. Such tunneling weakens the ear shank, allowing it to collapse, and can ultimately also cause the ear to literally drop from the plant.

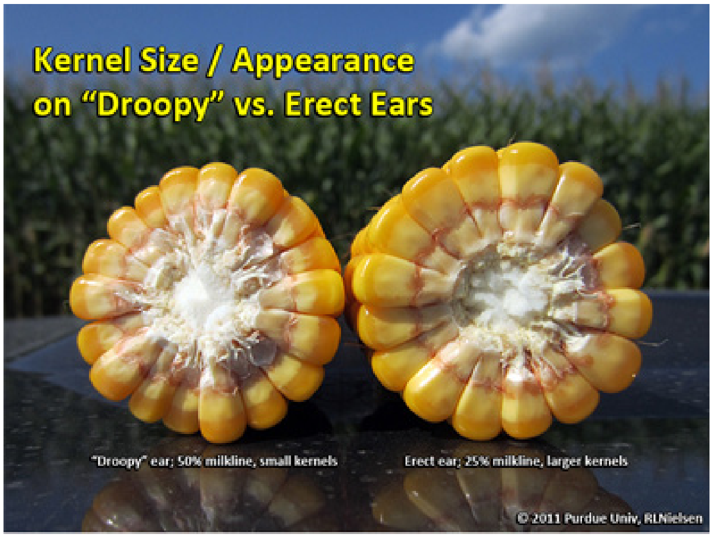


Impact on Yield? Remember that the ear shank is the final "pipeline" for the flow of photosynthates into the developing ear. An ear shank that collapses prior to physiological maturity will greatly restrict, if not totally prevent, the completion of grain fill for that ear and will likely cause premature black layer development in the grain. If the droopy ears you've looked have not yet black layered, they will black layer prematurely; sooner than neighboring erect ears.

The timing of the onset of the collapsed ear shanks determines the magnitude of the expected yield loss. If grain fill were totally shut down at the full dent stage of grain development (milk line barely visible at dent of kernels), the yield loss would be as much as 40 percent. If grain fill were totally shut down at the late dent stage of grain development (milk line halfway between dent and tip), yield losses for the affected ears would equal about 12 percent.

Multiplying the percentage of affected ears in a field by the estimated yield loss per ear will give you an estimate of whole field loss. For example, if ten percent of the field contained plants whose ears drooped prematurely at the late dent stage, whole field loss would be estimated at 1.2 percent (10 percent of the ears multiplied by 12 percent yield loss per ear).

Final thought: While it is never enjoyable assessing the yield potential of drought-stressed fields, it does serve a purpose in helping you develop your grain marketing strategy. Let this article serve as a reminder that the proverbial "windshield survey" often fails to provide an accurate assessment of crop condition.

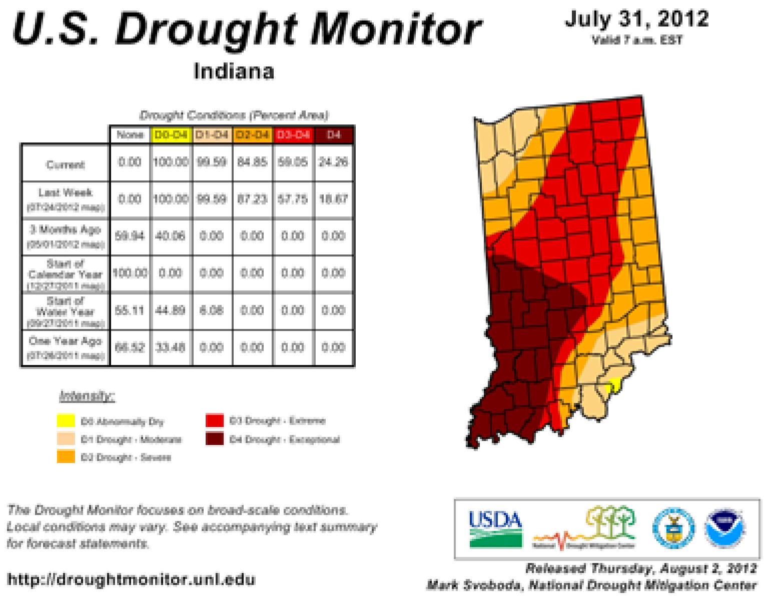


Related Reading

Nielsen, RL (Bob). 2008. Grain Fill Stages in Corn. Corny News Network, Purdue University. <http://www.agry.purdue.edu/ext/corn/news/timeless/grainfill.html>. [URL checked July 2012].

Nielsen, RL (Bob). 2012. Opportunities to Assess Yield Potential of Drought-Stressed Corn. Corny News Network, Purdue Univ. <http://www.kingcorn.org/news/articles.12/YldAssessment-0727.html> [URL checked Aug 2012].

Weather Update



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.59	84.85	59.05	24.26
Last Week (07/24/2012 map)	0.00	100.00	99.59	87.23	57.75	18.67
3 Months Ago (05/01/2012 map)	59.94	40.06	0.00	0.00	0.00	0.00
Start of Calendar Year (12/27/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year (09/27/2011 map)	55.11	44.89	6.08	0.00	0.00	0.00
One Year Ago (07/26/2011 map)	66.52	33.48	0.00	0.00	0.00	0.00