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In This Issue

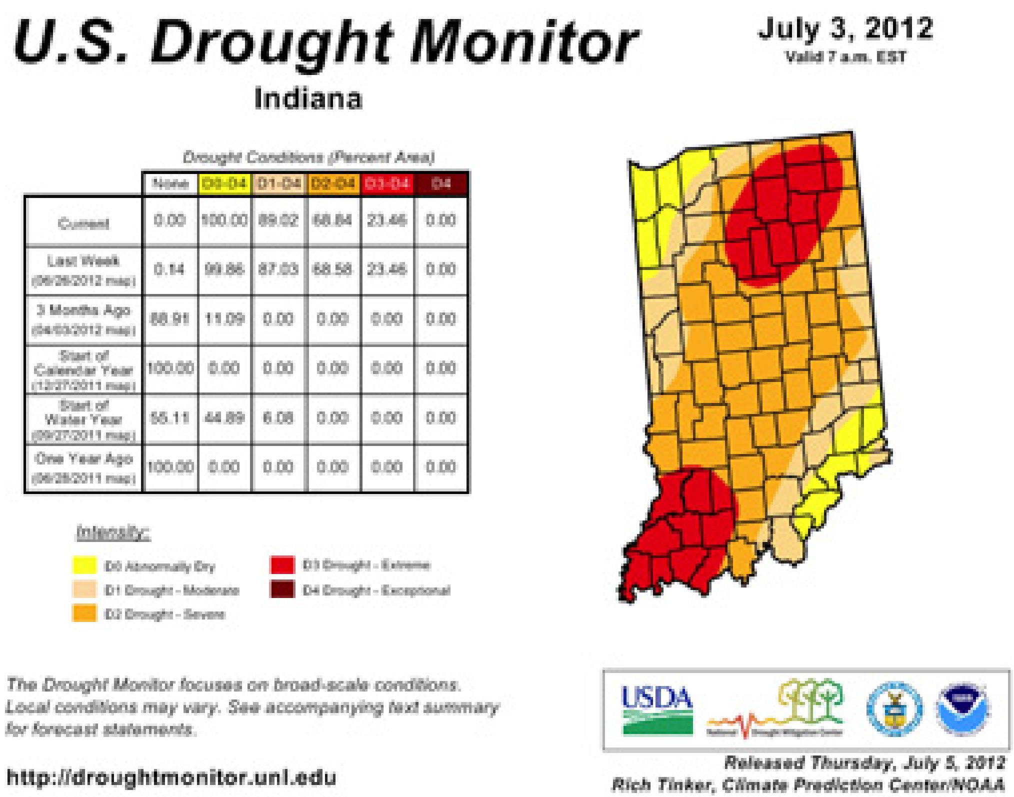
Insects, Mites, and Nematodes
- U.S. Drought Monitor Map
- Misplaced Insects
- Blacklight Trap Catch Report
- Western Bean Cutworm Adult Pheromone Trap Report

Plant Diseases
- Tobacco Growers May Need to Manage Disease

Agronomy Tips
- VIDEO: Potassium Deficient Corn and Soybean During Drought
- Nitrate Analysis is Important for Drought-Stressed Corn Plants Destined for Forage
- Million Dollar Rain for Some Fields: Not All
- Recovery From Hail Damage to Young Corn

Weather Update
- Moisture and Temperature Accumulations

Insects, Mites, And Nematodes



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	89.02	68.84	23.46	0.00
Last Week (06/26/2012 map)	0.14	99.86	87.03	68.58	23.46	0.00
3 Months Ago (04/03/2012 map)	88.91	11.09	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 (06/28/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00

Misplaced Insects - (*John Obermeyer*)

We've had a couple calls of "flea beetles on steroids" feeding on corn and soybean leaves. A call this week of these beetles feeding on corn silks prompts this reminder. During extreme conditions, e.g., drought, loss of food, insects, like any animal, will be found feeding where normally they wouldn't. In this case, the redheaded flea beetle (*Systena frontalis*) was found in spots of fields in fairly large numbers feeding on the crops. Normally, this larger flea beetle feeds on weed species, especially giant ragweed. Either the weeds have died from herbicide or lack of moisture, now the beetles are looking for alternatives. This feeding, which catches attention is nothing more than superficial and certainly doesn't warrant treatment. Let's hope they don't take a liking to our crops in the future! Happy Scouting!!!

Redheaded flea beetle feeding scars to soybean leaves

Close-up of redheaded flea beetle

Redheaded flea beetles on corn silk (*Photo credit: Sara Alford, Helena Chemical*)

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

County/Cooperator	6/19/12 - 6/25/12							6/26/12 - 7/2/12						
	VC	BCW	ECB	WBC	CEW	FAW	AW	VC	BCW	ECB	WBC	CEW	FAW	AW
Dubois/SIPAC Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jennings/SEPAC Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knox/SWPAC Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	2
LaPorte/Pinney Ag Center	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Lawrence/Feldun Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Randolph/Davis Ag Center	1	0	0	0	0	0	0	3	2	0	0	0	0	11
Tippecanoe/TPAC Ag Center	0	0	0	0	0	0	1	2	2	0	0	0	0	8
Whitley/NEPAC Ag Center	0	0	0	0	0	0	3	0	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

County	Cooperator	WBC Trapped			
		Week 1	Week 2	Week 3	Week 4
Adams	Kaminsky/New Era Ag - Monroe	0	7	5	11
Adams	Roe/Mercer Landmark - Pleasant Mills	0	0	3	2
Allen	Anderson/Garst Seed - Churubusco	2	0	16	7
Allen	Gynn/Southwind Farms - Ft. Wayne	0	5	13	7
Benton	Babcock/Ceres Solutions - Boswell	0	2	7	9
Boone	Dennis Carrell - Lebanon	0	3	5	1
Clay	Bower/Ceres Solutions - Clay City	0	1	0	0
Clay	Bower/Ceres Solutions - Brazil	0	0	0	0
Clinton	Foster/Purdue Entomology - Rossville	1	9	5	
DeKalb	Hoffman/ATA Solutions	3	3	7	17
DuBois	Eck/Purdue CES - Jasper	0	0	0	0
Elkhart	Kaufmann/Crop Tech - Elkhart	6	9	16	22
Fayette	Schelle/Falmouth Farm Supply - Falmouth	0	0	0	0
Fountain	Mroczkiewicz/Syngenta - Rob Roy	5	22	52	43
Fulton	Childs/Specialty Hybrids	144	234	123	52
Fulton	Jenkins/North Central Co-op - Kewanna	27	153	298	246
Fulton	Jenkins/North Central Co-op - Rochester	26	96	80	108
Hamilton	Campbell/Beck's Hybrids - Atlanta	0	1	0	2
Hamilton	Campbell/Beck's Hybrids - Sheridan	0	0	1	0
Hendricks	Nicholson/Nicholson Consulting - Danville	1	2	2	1
Henry	Schelle/Falmouth Farm Supply - New Castle	0	0	0	1
Henry	Schelle/Falmouth Farm Supply - Millville	0	0	0	3
Jasper	Overstreet/Purdue CES - Wheatfield	20	100	49	84
Jasper	Parker/Purdue - Stanley		157	196	39
Jasper	Parker/Purdue - Green		58	124	24
Jasper	Parker/Purdue - Hamstra		68	38	41
Jasper	Parker/Purdue - Kikkert		166	163	59
Jasper	Parker/Purdue - Fair Oaks		576	432	246
Jasper	Parker/Purdue - Rodibaugh		50	93	40
Jay	Shrack/Ran Del Agri Svc - Dunkirk	0	0	0	1
Jennings	Bauerle/SEPAC - North Vernon	0	0	0	0
Knox	Bowers/Ceres Solutions/Frichton	0	0	0	0
Knox	Bowers/Ceres Solutions/Vincennes	0	0	0	0
Knox	Hoke/SWPAC - Vincennes N	0	0	0	0
Lake	Kleine/Kleine Farms - Cedar Lake	4	34	27	28
Lake	Moyer - Schneider	45	185	222	201
Lake	Moyer - Shelby	11	63	124	195
LaPorte	Barry/Kingsbury Elevator		12	28	43
LaPorte	Rocke/Agri Mgmt Solutions - Wanatah SE	17	140	229	350
LaPorte	Rocke/Agri Mgmt Solutions/LaCrosse E	25	108	146	155
Miami	Early/Pioneer	2	11	23	16
Montgomery	Stine - Wingate	3	2	0	15
Montgomery	Stine - Alamo	0	1	0	0

Newton	Childs/Specialty Hybrids	18	97	74	17
Newton	Childs/Specialty Hybrids	8	19	37	6
Newton	Childs/Specialty Hybrids	0	5	5	3
Newton	Moyer - Lake Village	15	123	194	137
Porter	Leuck/PPAC - Wanatah N	4	18	19	24
Porter	Rocke/Agri Mgmt Solutions - Francesville	20	73	201	193
Pulaski	Childs/Specialty Hybrids	35	122	137	36
Pulaski	Childs/Specialty Hybrids	71	110	81	21
Pulaski	Childs/Specialty Hybrids	50	71	83	20
Pulaski	Childs/Specialty Hybrids	9	52	25	6
Pulaski	Childs/Specialty Hybrids	8	28	18	5
Pulaski	Childs/Specialty Hybrids	4	48	48	
Putnam	Nicholson/Nicholson Consulting - Greencastle	1	1	1	1
Randolph	Boyer/DPAC - Farmland	0	0	14	3
Rush	Schelle/Falmouth Farm Supply - Carthage	0	0	1	0
Starke	Childs/Specialty Hybrids	69	150	139	28
Starke	Childs/Specialty Hybrids	48	74	83	15
Starke	Childs/Specialty Hybrids	70	95	89	20
Starke	Wickert/Wickert Agronomy Services - N. Judson	2	11	12	9
Sullivan	Bower/Ceres Solutions - Sullivan E	0	0	1	1
Tippecanoe	Bower/Ceres Solutions - Sullivan W	0	0	6	3
Tippecanoe	Bower/Ceres Solutions - New Lebanon	0		0	
Tippecanoe	Bower/Ceres Solutions - Farmersburg	3	3	0	0
Tippecanoe	Bower/Ceres Solutions	4	39	6	6
Tippecanoe	Nagel/Ceres Solutions - Otterbein	0	5	8	7
Tippecanoe	Obermeyer/Purdue Entomology - Agry Farm	1	2	4	3
Tippecanoe	Westerfeld/Monsanto	9	9	8	11
White	Childs/Specialty Hybrids	0	7	12	0
White	Childs/Specialty Hybrids	8	32	12	4
Whitley	Walker/NEPAC - Columbia City	0	4	5	2

Plant Diseases

Tobacco Growers May Need to Manage Disease – (*Kiersten Wise*)

Reports from Kentucky indicate that the disease black shank is prevalent in tobacco. Indiana tobacco growers should also be aware of this problem and decide if rescue applications of fungicide are needed. Kenny Seebold from the University of Kentucky has prepared disease management recommendations for Kentucky that will also apply to Indiana tobacco growers. Please read his article from the Kentucky Pest News for more information about black shank and fungicide applications in tobacco: <http://www.ca.uky.edu/agcollege/plantpathology/extension/KPN%20Site%20Files/kpn_12/pn_120626.html>

Agronomy Tips

VIDEO: Potassium Deficient Corn and Soybean During Drought - (*Jim Camberato*) -

Potassium deficiency in corn and soybean is prevalent this year due to dry soil conditions. Potassium availability is reduced by dry soil and its movement to the root is also hindered thereby reducing plant uptake. Unfortunately, potassium's role in the plant is heightened when moisture is limiting further affecting plant growth and yield. To see the symptoms of potassium deficiency and more details on the role of potassium in plant growth see this video.

Nitrate Analysis is Important for Drought-Stressed Corn Plants Destined for Forage – (*Jim Camberato and Keith Johnson*)

Pastures are not growing, hay production to date is below average and there is no expectation of another harvest this season, and the corn crop that looked so promising in May is not going to make much grain. The drought-stricken corn could be harvested to feed livestock, but there are concerns about nitrate levels in the corn vegetation that can impact the wellbeing of the livestock. It is imperative that your crop insurance agent be contacted about the possibility of using the corn as a forage resource before any harvest is made.

Why are nitrate levels high? Drought reduces both crop nitrate uptake from the soil and the conversion of nitrate to protein in the crop. If the effects of drought are greater on protein formation than on nitrate uptake, high concentrations of nitrate can accumulate in the crop. Even worse, rainfall on a drought stricken crop can result in a surge of nitrate uptake that may be poorly assimilated into protein for several days.

Nitrate is not evenly distributed in the corn plant. Stalks contain far more nitrate than leaves. The lower stalk has a higher concentration of nitrate than the upper stalk. However, in extremely severe cases even the nitrate concentration of the upper stalk can be high enough to limit utilization as a feed.

Drought stress on corn just beginning to tassel may result in little grain production because of barren plants. In some cases plant nitrate may be high, requiring a forage analysis to effectively utilize the corn plant as a feedstuff.

It is impossible to guess whether or not nitrate is high in forage. The only way to know the amount of nitrate in the forage is to have it analyzed. Reviewing information collected from the drought year of 1988 supports this conclusion. Based on 70 fresh corn samples, only 18% contained toxic levels of nitrate. In contrast, 71% of the sorghum-sudangrass samples collected contained toxic levels of nitrate.

Obtaining a representative sample of the forage is the most important step in determining forage nitrate. The results received from the laboratory will be meaningful only if you have collected a sample that represents the corn to be harvested. Contact the laboratories that you use for soil testing, tissue testing and/or feedstuff testing to see if they analyze nitrate content in plant tissue. Also inquire about price for an analysis, where to get a sample submission form, what the expected turn-a-round time will be, and their suggestions on sampling procedure. A list of National Forage Testing Association Certified Laboratories can be found at: http://www.foragetesting.org/index.php?page=certified_labs. Agricultural laboratories that perform soil tests may also do forage testing. A list of these facilities can be found at: <http://urbanext.illinois.edu/soiltest/>.

Leaving a foot or more of the lower stem un-harvested will reduce the risk of nitrate toxicity, but reduces per acre yield. If corn acreage is abundant and livestock number to be fed in comparison is small, it may be advisable to cut more acres at a higher cutting height to get the desired amount needed so nitrate level is reduced. If stalks are mostly barren, an estimate of yield is one ton of 35 percent dry matter forage per foot of stalk, excluding the tassel.

The best approach to obtain a representative sample is to cut a swath at the desired cutting height through a representative area of the field with a forage harvester. Composite a dozen or so handfuls from the chopped corn, mix thoroughly, and fill a half gallon-sized plastic bag that will be sent to the laboratory.

If a forage harvester is not available, sample at least 25 plants by cutting them at the intended harvest height. Chop and mix them in order to get a representative sample to fill a half gallon-sized plastic bag to send to the laboratory. A yard waste chipper/shredder can be used to chop the sample.

If relatively dry keep samples cold and ship to the laboratory immediately. Avoid shipments late in the week to avoid delayed arrival. If samples have high moisture, they should be frozen before shipping and shipped overnight or taken to the laboratory in a cooler.

Nitrate levels higher than 3,400 to 4,500 micrograms per gram (same as parts per million) are considered potentially dangerous to feed. Levels in green-chopped (direct cut and immediately fed) corn can be reduced by ensiling. During the fermentation process, 40 to 60 percent of the nitrates will be eliminated. Caution is advised as various nitrogen oxide gases produced during the fermentation process are highly toxic to humans and livestock. For the first three to four weeks after ensiling, do not enter a silo without first running the blower for 15 to 30 minutes. Nitrate levels will not be reduced if the corn is baled as hay. Test the forage for moisture content before cutting the corn to make sure that it will store properly. Forage moisture should be approximately 65 percent when harvested for silage. If wanting to make hay, cut the crop and allow to wilt in the field to less than 20 percent moisture. If not dry enough the hay may mold or spontaneously combust.

If nitrate levels are high in the samples submitted, work with a livestock nutritionist to develop rations that can utilize the corn by blending it with low-nitrate containing feed resources.

Ask for forage quality values, too, while you are getting a nitrate test done if the sample submitted (green chop, silage or hay) is the feedstuff to be fed. A basic nutrient analysis should contain the amount of dry matter (DM), energy (TDN or NE), crude protein (adjusted for heat damage), neutral detergent fiber (NDF), calcium, phosphorus, potassium, and magnesium. From this nutrient profile, a diet can be formulated to meet the animals' requirements in a cost-effective manner to optimize performance. Share the nitrate and forage quality results with a trained livestock nutritionist so a safe ration can be formulated.

If utilizing the corn as green chop there are some items to consider. To further reduce the chances of nitrate toxicity and founder (another animal disorder that is caused by an abrupt change in diet with increased energy) (1) raise the cutter bar to 12 inches the first few days of chopping, (2) gradually introduce animals to green chop, (3) use other feeds that are low in nitrate as part of the ration, (4) feed green chop in small quantities throughout the day rather than large quantities once per day, (5) don't allow green-chop forage to set on a wagon overnight, (6) feed two to three pounds of grain with high nitrate feeds, (7) nitrate levels tend to increase for two to three days following rain, thus take extra precautions during this time period, (8) as plants mature, nitrate levels decline; also, animals become acclimated, thus chances for toxicity decrease with time.

Million Dollar Rain for Some Fields; Not All – (*Bob Nielsen*)

This past weekend, storms rumbling through the state left behind much-needed rainfall. The rainfall amounts varied quite a bit as is typical of summer thunderstorm patterns, but some areas of the state have received 1 to 2 inches over the past seven days (Fig. 1).

In the midst of a severe drought, any chance rainfall is welcomed with open arms. However, the optimism generated by the rainfall needs to be tempered by the severity of the drought throughout Indiana (Fig. 2) and the continued short-term forecast for excessively hot temperatures for much of the state during a period of time when many of the acres will be pollinating.

There is no question that, for some fields, the recent rains have been "million dollar" rains from the standpoint that they offered some relief for fields coming into the pollination period. However, the drought has not yet been "broken" and the state's corn crop will require timely rainfall in meaningful amounts to avoid serious yield losses this fall.

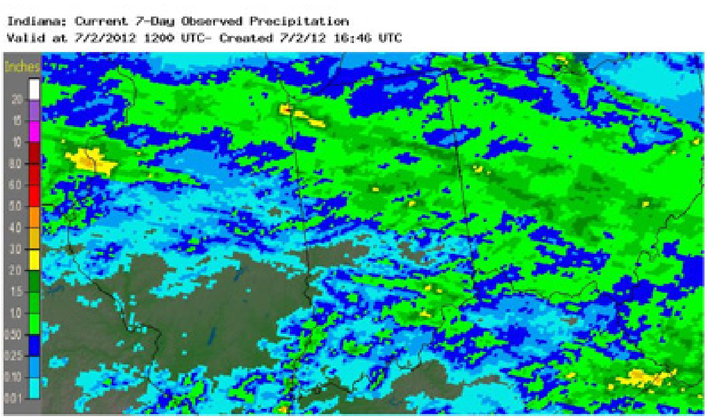


Figure 1. Seven-day cumulative rainfall throughout Indiana; as of 7am on 2 July 2012. Source of rainfall estimates: <http://water.weather.gov/precip>

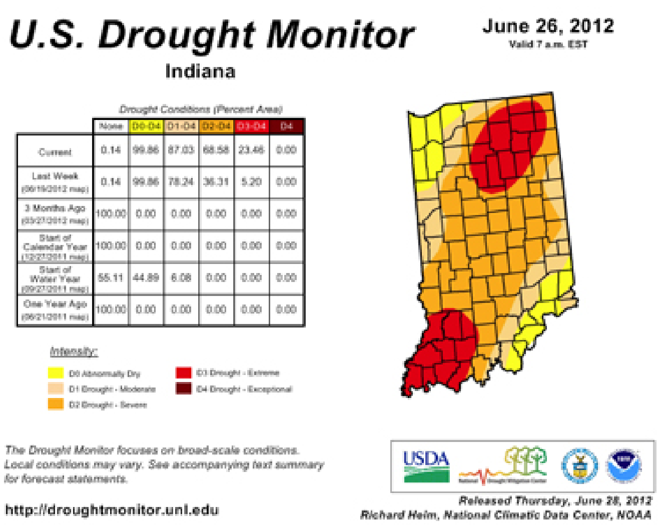


Figure 2. U.S. Drought Monitor map of Indiana drought severity; as of 6/26/12. Source of image: <http://droughtmonitor.unl.edu>

Corny Trivia: A million dollars does not go far in terms of Indiana's most important row crop. One million dollars divided by $6.50 corn equals roughly 154,000 bushels. Take that result and divide by the acres of corn produced in, say, White County and that "million dollar" rain equals a yield increase of about 1 bushel per acre (bpa) for every acre in White County. A lot of money in total, but not much of a yield increase in the big scheme of things.

The latest USDA estimates of corn crop condition indicates the crop is continuing to slide downhill (USDA-NASS, 2 July 2012). As of July 1, only 19 percent of Indiana's corn crop was rated as good to excellent. That estimate of statewide crop condition is as low as it has been for this time of the season since the "Great Drought of 1988" (Fig. 3).

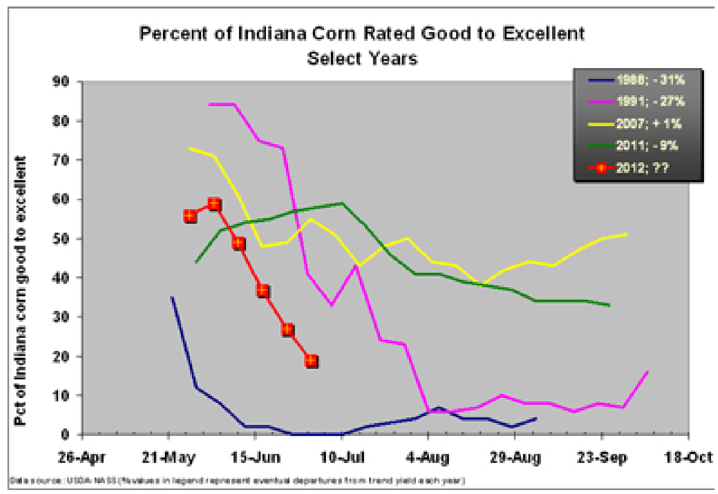


Figure 3. Percent of Indiana corn rated as good to excellent for select years including 2012 (as of 1 July). Data source: USDA-NASS.

The decrease in corn crop conditions around the state reflected in the July 1 estimates, combined with the crop conditions throughout June, would suggest that statewide corn grain yield could average only 140 bpa or 13% below the estimated 2012 trend yield of 162 bpa. That departure from trend, if it comes to pass, would be the sixth worst departure from trend since 1980. For comparison, the five other worst years were 1983 (-34%, drought), 1988 (-31%, drought), 1991 (-27%, drought), 1995 (-15%, drought), and 2002 (-16%, late planting, cool summer and fall).

RLN Note: The estimated trend yield of 162 bpa for Indiana in 2012 is based on a historical trend line beginning in 1955 (R^2 = 0.82). The estimate of yield loss is based a simple linear relationship between 19 years of crop condition ratings in June/July (including 1988 and 1991) and the associated grain yields statewide (R^2 = 0.51).

As I indicated last week (Nielsen, 2012b), the stress of this year's "big hot and dry" on the corn crop escalated greatly with the advent of the excessive temperatures in mid-June. The resumption of those hot temperatures in the coming days will continue to pressure this crop, especially in areas that did not receive the welcome rains of this past weekend. Where rainfall was received, pollination may technically succeed, but the risk of kernel abortion in the few weeks following the end of pollination will be high for those fields where severe drought stress continues or resumes.

I also remind growers they can assess the relative degree of success of pollination in individual fields shortly after pollen shed is complete by sampling ears and conducting the simple "ear shake" test (Nielsen, 2012a). Later in the season, growers can estimate grain yield in individual fields by estimating ears per acre and kernels per ear (Nielsen, 2011b). Pray for rain or turn on the irrigation.

Related Reading

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USDA-NASS. 2012. Crop Progress. USDA Nat'l Ag Statistics Service. <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1048> [URL verified June 2012].

Recovery From Hail Damage to Young Corn – (*Bob Nielsen*)

- Yield loss from hail damage is based on reductions in plant population and leaf area.
- Allow a damaged field enough time to demonstrate the degree to which it may recover from hail damage.

As is usual in Indiana, early summer thunderstorms rumbling across the state often include damaging hail. Looking out the kitchen window the morning after such a storm can be one of the most disheartening feelings in the world to a corn grower.

Yield loss in corn due to hail damage results primarily from 1) stand reduction caused by plant death and 2) leaf area reduction caused by hail damage to the leaves (Vorst, 1993). Assessing the yield consequences of hail damage in corn therefore requires that the severity of each of these factors be estimated.

Click for Hail Damage Photo Gallery

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Assessing Plant Survival

As with most early-season problems, evaluation of hail-damaged fields should not be attempted the day after the storm occurs because it can be very difficult to predict survivability of damaged plants by simply looking at the damage itself. Young corn has an amazing capacity to recover from early season damage but patience is required to allow the damaged plants enough time to visibly demonstrate whether they will recover or not. Damaged but viable plants will usually show noticeable recovery from the whorl within 3 to 5 days with favorable weather and moisture conditions.

One thing you can do shortly after the storm, however, is to evaluate the relative condition of the main growing point area of the stalk. The growing point, or apical meristem, of a young corn plant is an area of active cell division located near the tip of the pyramid-shaped top of the stalk tissue inside the stem of the plant (Nielsen, 2008a). The growing point region is important because it is responsible for creating all the leaves and the tassel of a corn plant.

Initially, the growing point is located below ground but soon elevates above ground beginning at about the 5th leaf collar stage. Slicing a stalk down the middle and looking for the pyramid-shaped upper stalk tissue can identify the vertical position of the growing point. If hail has damaged the growing point or cut off the stalks below the growing point, then those plants should be counted as victims and not survivors.

Remember that yield loss in corn is not directly proportional to the reduction in the number of plants per acre when the damage occurs early in the growing season (Table 1). The surviving plants surrounding an absent plant can compensate by increasing their potential ear size or by developing a second ear. A 25 percent reduction in plant population should reduce yield by less than 10 percent. A 50 percent reduction in plant population should reduce yield by less than 25 percent.

Click for Hail Damage Photo Gallery

Assessing Defoliation Severity

Leaf damage by hail usually looks worse than it really is. Tattered leaves that remain green and connected to the plant will continue photosynthesizing. It takes a practiced eye to accurately estimate percent leaf death by hail. With that caution in mind, percent damage to those leaves exposed at the time of the hailstorm can be estimated and used to estimate yield loss due to defoliation alone.

The effects of leaf death on yield increases as the plants near silking, and then decreases throughout grain fill. Therefore, the grower needs to determine the leaf stage of the crop when the hail damage occurred.

Remember that leaf staging for the purposes of hail damage assessment is slightly different than the usual leaf collar method. The yield loss estimates listed in Table 2 are based on leaf stages as defined by the "droopy leaf" method (Nielsen, 2010). If you are walking damaged fields many days after the storm, you can stage the crop that day and backtrack to the day of the storm by assuming that leaf emergence in corn occurs at the rate of about 1 leaf every 80 GDDs from emergence to V10 (ten fully visible leaf collars) or every 50 GDDs from V10 to the final leaf (Nielsen, 2008c).

Once percent leaf damage and crop growth stage have been determined, yield loss can be estimated by using the defoliation chart provided below in Table 2. This table is a condensed version of the season-long table published in the Purdue Extension publication ID-179, Corn and Soybean Field Guide or in NCH-1, Assessing Hail Damage in Corn (Vorst, 1993).

Click for Hail Damage Photo Gallery

Assessing Consequences of Whorl & Stem Bruising

The eventual yield effects of severe bruising of leaf tissue in the whorl or the stalk tissue itself in older plants are quite difficult to predict. Consequently, it can be difficult to determine whether to count severely bruised plants as survivors or whether they should be voted off the field. The good news is that observations reported from an Ohio on-farm study suggest that bruising from hail early in the season does NOT typically result in increased stalk lodging or stalk rot development later in the season (Mangen & Thomison, 2001).

Early season bruising of leaf tissue or stem tissue may, however, have other consequences on subsequent plant development; the occurrences of which are hard to predict. Areas of bruised whorl leaf tissue often die and can then restrict continued expansion of whorl leaves, resulting in the type of 'knotted' whorl reminiscent of frost damaged plants. These same bruised leaves would be more susceptible to secondary invasion by bacteria contained in splashed soil that might have been introduced into the damaged whorls if the hailstorm was accompanied by driving rains.

If the plant tissue bruising extends as deep as the plant's growing point, that important meristematic area may die; thus killing the main stalk and encouraging the development of tillers. If the plant tissue bruising extends into the area near, but not into, the growing point; subsequent plant development may be deformed in a fashion similar to any physical damage near the hormonally active growing point (stinkbug, stalk borer, drill bits used by malicious agronomists).

Click for Hail Damage Photo Gallery

Example of Assessing Damage

Let's say that your field of corn was at the 7-leaf stage (approximately V5 by the leaf collar method) when hail damage occurs. After walking the field several days later, you determine only 20,000 of your original 30,000 plants per acre will survive the hail damage. Let's further assume that your original planting date was 25 April. Your surviving stand of 20,000 now has an upper yield potential of 92% of "normal" (Table 1). Therefore, the yield loss due to plant death itself would be about 8%.

Let's also assume that you estimate the average percent leaf death by defoliation to be 50% (which to most of us would look devastating). The combination of leaf stage and percent defoliation would translate into an additional 2% yield loss (Table 2), resulting in a total estimated yield loss due to both stand reduction and defoliation of approximately 10%.

Table 1. Expected grain yield due to various planting dates and final plant populations.

Planting date	Plant population (final) per acre													
	10,000	12,000	14,000	16,000	18,000	20,000	22,000	24,000	26,000	28,000	30,000	32,000	34,000	36,000
	Percent of optimum yield													
10-Apr	62	68	73	78	82	85	88	91	92	93	94	94	93	91
15-Apr	65	71	76	81	85	88	91	94	95	96	97	96	96	94
20-Apr	67	73	78	83	87	90	93	96	97	98	99	98	98	96
25-Apr	68	74	79	84	88	92	94	97	98	99	100	100	99	97
30-Apr	68	74	79	84	88	92	95	97	99	100	100	100	99	97
5-May	67	73	79	83	87	91	94	96	98	99	99	99	98	97
10-May	65	71	77	82	86	89	92	94	96	97	97	97	96	95
15-May	63	69	74	79	83	87	89	92	93	94	95	95	94	92
20-May	59	65	71	75	80	83	86	88	90	91	91	91	90	89
25-May	55	61	66	71	75	79	81	84	85	86	87	87	86	84
30-May	49	55	61	65	70	73	76	78	80	81	81	81	80	79
4-Jun	43	49	54	59	63	67	70	72	74	75	75	75	74	73
9-Jun	36	42	47	52	56	60	62	65	66	67	68	68	67	65

Source: Nafziger. 1994. J. Prod. Ag 7:59-62. Yield response to planting date extrapolated beyond May 25 with concurrence of author.

Note: The highlighted area represents the optimum ranges (98 to100% yield) of plant populations and planting dates for productivity levels greater than about 125 bushels per acre. Optimum plant populations for soils with historical yields less than about 100 bushels per acre will likely not respond to final plant populations greater than about 24,000 plants per acre. (RLNielsen, Purdue Agronomy)

Table 2. Estimates of percent yield loss in corn due to leaf defoliation at selected leaf stages.

Leaf Stage[a]	Percent Leaf Defoliation			
	25	50	75	100
	Approximate% Yield Loss			
7-leaf	0	2	5	9
8-leaf	0	3	6	11
9-leaf	1	4	7	13
10-leaf	1	6	9	16
11-leaf	1	7	12	22
12-leaf	2	9	16	28
13-leaf	2	10	19	34
14-leaf	3	13	25	44

[a]Leaf stage according to the "droopy leaf" method (see Nielsen, 2004a). The corresponding leaf stage according to the leaf collar method would be approximately 2 less than the "droopy leaf" values shown above (e.g., 7-leaf~V5).
Adapted from the National Crop Insurance Association's "Corn Loss Instruction" (Rev. 1994).

Related References

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Weather Update