Purdue Cooperative Extension Service

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In This Issue

Insects, Mites, And Nematodes

Aphids are Moving and Numbers are Suddenly Rising, Late-Planted Soybeans Throughout the State are Vulnerable - (*Christian Krupke and John Obermeyer*)

- Aphids are rapidly building in late-planted soybean fields.
- Southern Indiana should be watching for them the next couple weeks.

It is late in the season but there is still one important insect pest to watch for in the next few weeks and that is the dreaded soybean aphid. There are several factors that could lead to a late outbreak:

1) The weather has been perfect for aphid development – temps in the low to mid-80's with relatively low humidity present ideal conditions for aphid reproduction. During our sweltering July aphids likely shut down for the most part, as they do not reproduce as rapidly at temperatures over 90,

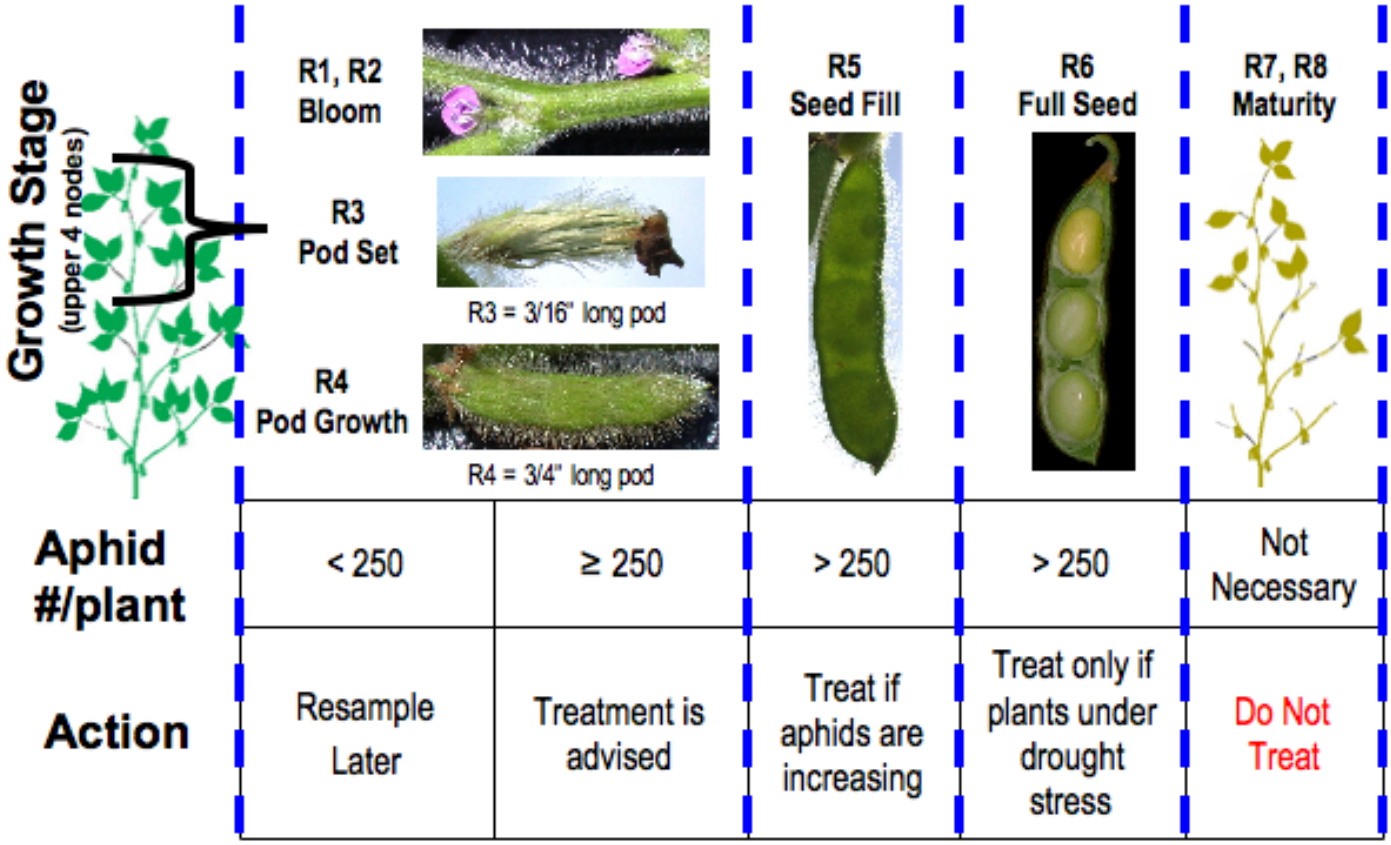
2) There are many fields over threshold in northern Indiana and Michigan, and suction traps are capturing large numbers of winged aphids. Thanks to Dr. David Voegtlin, emeritus of the Illinois Natural History survey, we know that our Indiana suction traps (30' tall PVC tubes that suck in flying insects from overhead) have been starting to catch large numbers of migrating aphids. This is how the aphids colonize new areas and move away from areas that are too "crowded."

3) Many late-planted beans are still in vulnerable stages. Aphids will seek out the youngest beans they can find. These are the most nutritious for them, and the plants of course are most sensitive at these earlier development points. Southern Indiana producers, many of whom have many acres of late-planted beans, should be particularly vigilant.

Sampling: Count aphids, primarily on the undersides of leaves, on at least 20 plants in various areas of the field. When aphids are just beginning to colonize soybean plants, they will be concentrated on the most active growing points – the newest unrolled leaves and the developing pods. Shortcuts: if aphids are observed on the petioles and stems, that plant is over 250 aphids. If honeydew and sooty-mold are obvious as you walk the field, the threshold has been exceeded.

Aphid Number: Should you find an average of 250 or more aphids/plant during the pod and seed development stages (R3-R4), a treatment is justified. Threshold of ≥250 aphids/plant includes a week to get field sprayed. During the seed-fill stages (R5-R6), treatment is not as clear-cut. If aphid numbers are increasing and plants are under stress, however, a treatment is justified, see accompanying threshold graphic. Do NOT treat soybean beyond the R6 stage of growth, the plant is already beginning to senesce and any aphids that are there will not impact yield.

Soybean aphid threshold treatment guide



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

County/Cooperator	8/2/11 - 8/8/11							8/9/11 - 8/15/11						
	VC	BCW	ECB	WBC	CEW	FAW	AW	VC	BCW	ECB	WBC	CEW	FAW	AW
Dubois/SIPAC Ag Center	0	3	0	0	0	0	0	0	4	0	0	1	0	2
Jennings/SEPAC Ag Center	0	4	0	0	1	0	0	0	2	0	0	0	0	5
Knox/SWPAC Ag Center	0	2	0	0	0	0	0	0	1	0	0	1	0	2
LaPorte/Pinney Ag Center	0	0	18	8	4	0	3	0	5	3	3	2	0	14
Lawrence/Feldun Ag Center	2	5	0	0	0	0	2	0	5	0	0	0	0	1
Randolph/Davis Ag Center	0	3	0	0	0	0	6	0	2	0	0	0	0	4
Tippecanoe/TPAC Ag Center	2	8	0	0	3	0	6	0	3	0	0	2	0	1
Whitley/NEPAC Ag Center	0	0	0	0	0	0	0	0	1	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

Agronomy Tips

VIDEOS: Late Season Hail Damage Assessment - (*Shaun Casteel*)

The 2011 growing season has presented numerous challenges including heavy rainfall in April and May, delayed planting in June, and drought stress in July. Moderate temperatures and summer thunderstorms have provided some relief from the heat and dry conditions. However, recent thunderstorms brought rain, wind, and hail with a great force. We will assess late season hail damage of soybean in the following videos.

The impact on soybean yield depends on the growth stage, percent leaf defoliation, broken or bent stems, missing terminals, stem bruising, and pod loss. As a general rule, leaf defoliation has the greatest impact on yield with soybeans in the R5 (beginning seed fill) development stage. Younger and older soybeans (relative to R5) are less affected from the same percent defoliation. Similarly, younger soybeans recover or have less yield impacts from broken and missing terminals than older soybeans. In the recent storm that ripped through corn and soybean fields, younger soybean plants (R3 to R4) sustained greater leaf defoliation (upwards of 80%) and broken/missing terminals due to more tender tissue. More advanced soybean plants (R5) were defoliated at a lower percentage due stronger stems and leaves, but the pod loss was more severe.

Additional resources for assessing potential yield loss due to hail damage can be found in the Corn and Soybean Field Guide (ID-179) <https://mdc.itap.purdue.edu/item.asp?item_number=ID-179> and Evaluating Hail Damage to Soybean (EC128) publication <http://www.ianrpubs.unl.edu/sendit/ec128.pdf>. Please contact your crop adjuster for further assessment of potential yield losses from hail.

VIDEO: Shaun Casteel, Purdue Extension Soybean Agronomist, describes and shows the components of yield loss to R4 soybean (pod growth) from hail damage in mid-August. These components are growth stage, percent leaf defoliation, broken or bent stems, missing terminals, stem bruisig, and pod loss.

VIDEO: Shaun Casteel, Purdue Extension Soybean Agronomist, describes and shows the components of yield loss to R5 soybean (beginning seed) from hail damage in mid-August. These components are growth stage, percent leaf defoliation, stem bruising, and pod damage/loss.

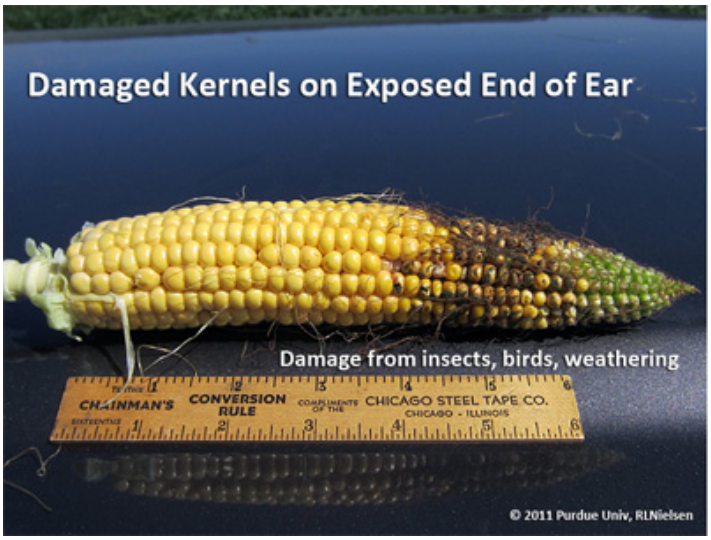
Short Husks & Exposed Ears – (*Bob Nielsen*)

Periods of severe stress can do all sorts of strange things to crops. One oddity that has been reported by a number of folks this year is often described as “ears outgrowing their husks.” The phenomenon is the result of stunted husk leaf development combined with fairly normal ear (cob) elongation.

The primary symptom is that the ears elongate beyond the end of the stunted husk leaves, resulting in exposed kernels that are subject to insects, birds, and weathering effects. Kernels damaged by these factors are subject to fungal infection and the development of ear molds. If high percentages of ears are thus affected, then overall grain quality can be compromised to the point that grain buyers may discount or “dock” their prices accordingly.

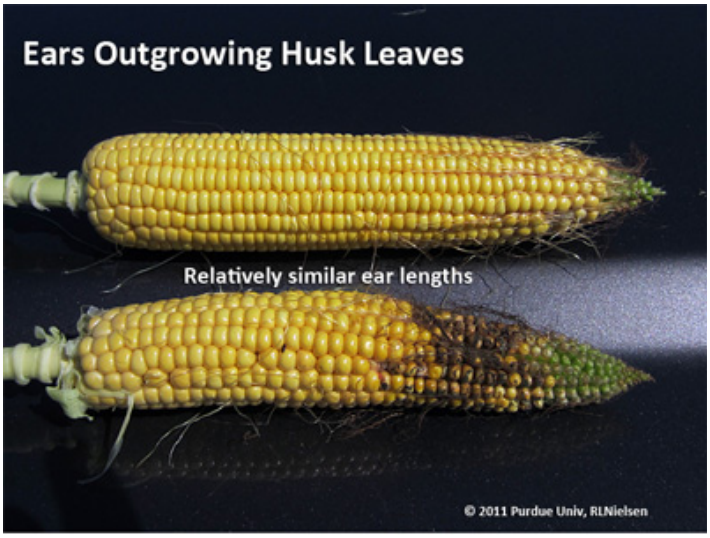
The development of stunted husk leaves and exposed ears seems to be related to combination of severe stress before or during pollination that is then relieved in the initial weeks following pollination. The most common combination of conditions that results in this oddity is severe heat and drought stress that is then relieved by cooler temperatures and rainfall.

The stunting of the husk leaves is akin to that which can occur in the whole plant when subjected to lengthy periods of heat and drought stress. The potential for husk leaf expansion and elongation seems to be permanently restricted while the ear (cob) is able to continue elongation upon relief of the stress.



While the combination of heat/drought stress relieved by cooler temperatures/rainfall seems to be the common thread among reports of ears outgrowing their husk leaves, other combinations of severe stress followed by sudden relief may also result in the stunting of husk leaves.

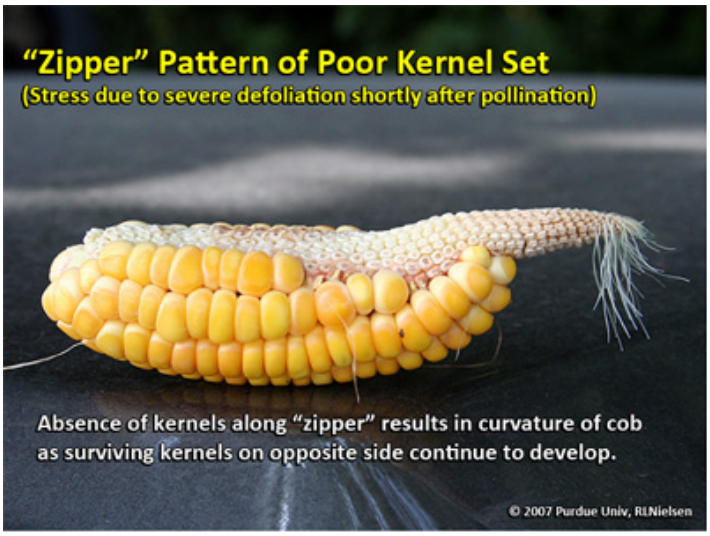
The photos that accompany this article illustrate an example of stunted husk leaves. The affected ears were found in an area of a field in eastern Indiana that was particularly drought-stricken compared to other, less stressed areas of the field. This field had also experienced severe root lodging about 10 days prior to pollination, which likely added additional stress on the developing ears for a period of time. Husk leaves of affected plants were about 2/3 the length of the ear itself and about half that of the husk leaves of the "normal" ears. Ear (cob) lengths of the "normal" and "stressed" ears were relatively similar; though kernel number and size were smaller on the "stressed" ears.



The "Zipper" Pattern of Poor Kernel Set in Corn – (*Bob Nielsen*)

The process of estimating yield potential in corn fields prior to grain harvest includes an assessment of the success of "kernel set" on the ears. Poor tip fill on ears, resulting from a combination of pollination failure and kernel abortion, is not uncommon in fields where severe crop stress has occurred during pollination or in the early weeks following pollination.

The absence of kernels on the tips of ears as a result of stress "makes sense" from the standpoint that most agronomists will tell you that the tip silks are the last to emerge from the husk during pollination and, thus, are usually the last to receive pollen if pollen is still available. If pollen is no longer available, then the tip ovules are never fertilized (in a sexual context) and no kernels develop.



If pollen is available and the tip ovules are fertilized, then the resulting tip kernels are younger relative to the others on the cob and so are more vulnerable to abortion if severe photosynthetic stress occurs early in the grain fill process that greatly limits the availability of photosynthate to the developing kernels. The causes of severe photosynthetic stress are varied and include drought stress, heat stress, severe defoliation (e.g., hail damage), and nutrient deficiencies (e.g., nitrogen).

A less common pattern of poor kernel set is one that is often described as the "zipper" pattern wherein 1 or more entire rows of kernels along one side of a cob are absent due to some combination of pollination failure and kernel abortion. A subsequent symptom that often develops on such "zipper ears" is a noticeable curvature of the cob, sometimes to the extent that folks describe it as a "banana ear". These curved ears are a consequence of the absence of kernels on one side of the cob coupled with the continued development of kernels on the other side that "force" the cob to bend or curve.

While most recognize that the absence of kernels down one side of the ear is the result of severe photosynthetic stress, it is less obvious why the pollination failure or kernel abortion occurred along that side of the ear rather than being localized at the tip of the ear. Silk development typically begins with the basal ovules at the butt of the ear and progresses up the ear which means that the first silks to emerge and be fertilized are primarily from the basal half of the ear. This acropetal progression of silk elongation is thought to occur uniformly from base to tip such that silk emergence occurs uniformly around the circumference of the ear at any particular position on the ear. If this is true, then what is the cause of the "zipper" pattern of poor kernel set?

I can only offer an opinion based on observations. Most of the time when I have discovered "zipper" ears, the side of the ear with the kernel set problem is the same side over which the silks draped during the pollen shed period. This leads me to speculate that perhaps the draping of the silks resulted in the underlying silks being "shaded" from initial

contact with pollen with the result being those silks never coming into contact with pollen (ovules not fertilized) or those silks being pollinated later than the rest (delayed kernel development, more vulnerable to abortion under stress).

Related Reading

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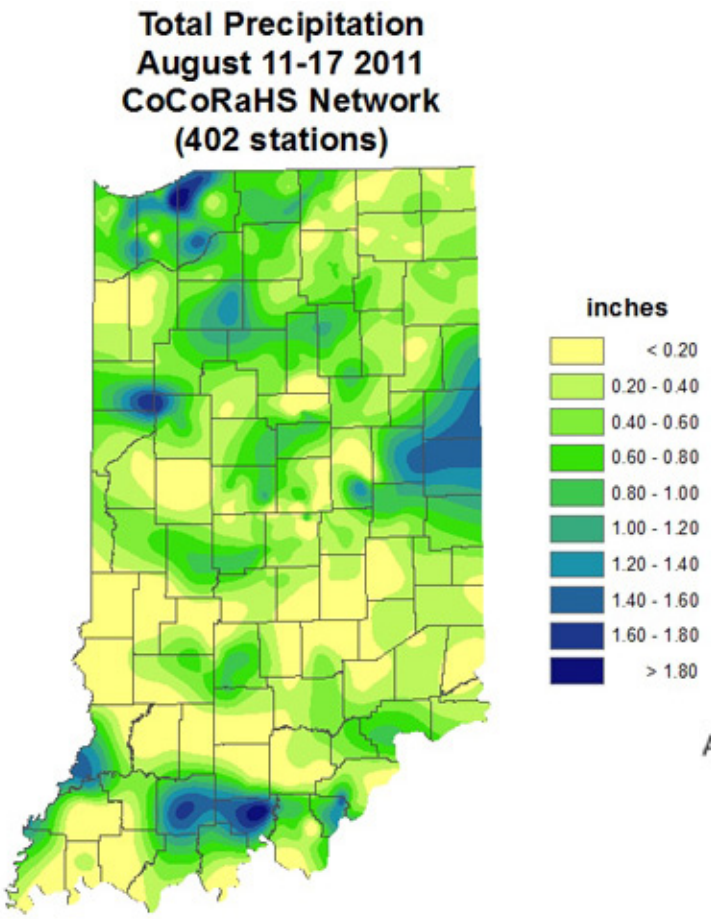
Weather Update



Analysis by Indiana State Climate Office
Web: http://www.iclimate.org