



# Field Challenges Around Kentucky 2012

Around Kentucky

Last update: June 28, 2012

# CORN





## Irrigating after Corn Seeding

Irrigation occurring soon after corn seeding: Hopkins County, KY, April 17, 2012. Photo: Bill Meacham, Pioneer.





## Corn Defoliation

This corn was defoliated with a weed trimmer on 5/14/2012 for a demonstration plot at Princeton. Corn was at V5 when the defoliation occurred. Photo: Amanda Martin.





## Corn Defoliation Demo

“Untreated corn” in the defoliation demonstration. Other corn was defoliated on 5/14/2012.  
Photo: Amanda Martin.





## Cutworm Damage

1<sup>st</sup> and 2<sup>nd</sup> instars of cutworm will cause the irregular leaf feeding damage. If more than 3% of plants are damaged, an insecticide spray may be worthwhile. Photo: 5/3/2012, Chad Lee





## Insect or Slug Damage

Possibly slug damage. A lot of slugs were found in the field. Photo: 5/21/2012, Chad Lee.





## Anhydrous Burn on Corn

This corn in Ballard County, Kentucky was suffering from dry weather and anhydrous burn.  
Photo: 5/17/2012, Tom Miller.





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## Corn Drought Stress

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Uniform interveinal chlorosis across the leaf blade could be Mn or Mg, but Mg is more commonly observed in Kentucky. Mn deficiency is very rarely observed in Kentucky. Mg deficiency is much more common when pH is above 7.5. Mg deficiency is much less common at lower pH values. The soil test from this field indicated a Zn deficiency as well. This may be a combination of both Zn and Mg.

## Mg Deficiency





## Zn Deficiency

More typical symptoms of Zn deficiency.





## Clubbed Corn Roots

Clubbed corn roots, most likely from Prowl carryover. Photo: Jay Hettmansperger





## Clubbed Corn Roots

Clubbed corn roots, most likely from Prowl carryover. A high rate of Prowl and very little rain from the previous season most likely resulted in this carryover. Prowl carryover is not a common occurrence in Kentucky. Photo: Jay Hettmansperger





## Clubbed Corn Roots

Corn injury, most likely from Prowl carryover. A high rate of Prowl and very little rain from the previous season most likely resulted in this carryover. Prowl carryover is not a common occurrence in Kentucky. (Note: K deficiency is apparent, but that is from the clubbed roots, not a lack of K in the soil.) Photo: Jay Hettmansperger





## Clubbed Corn Roots

Corn injury, most likely from Prowl carryover. There appears to be some “hot spots” in the field where the symptoms are more prevalent. These types of patterns in the field are characteristic of carryover. Photo: Jay Hettmansperger





## Clubbed Corn Roots

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## Poor Stand

Corn, poor stand, Madison County, May 16, 2012. Corn plants died in these rows. We were in the field too late to identify the cause of death.





Corn, poor stand, Madison County, May 16, 2012





## Purple Corn

Corn, purple leaves and sheaths, Madison County, May 16, 2012; indicates P deficiency, but often root restrictions or excess water lead to these issues. Some hybrids will display this purpling, so the symptoms may be genetic rather than P.





## Wet Feet

Water-logged corn roots in parts of the field may explain purple leaves, but other areas of the field were not water-logged and purple leaves were there as well. Madison County, May 16, 2012.





## Stunted Corn

Roots appear to have been clipped by grubs. Daviess County, May 18, 2012. Photo: Clint Hardy





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## Stunted Corn

May 18, 2012. Daviess County. Some of the roots appear to have been clipped by grubs. The layering of the soil indicates minimal compaction. Photo: Clint Hardy





## P Deficiency?

May 21, 2012. This corn is displaying symptoms (purple on leaf margins and on the veins) similar to P deficiency. Herbicide was applied in this field that may have slowed growth for a while and a compaction layer about 2 inches deep was impeding growth. Corn roots are breaking through the compaction layer and should be just fine. Also, some hybrids will display this when there is no deficiency at all.





## Odd Symptoms

Pulaski County. May 23, 2012. Lower leaves initially look somewhat similar to K deficiency, but soil test K was high and there are no root restrictions. Also, the coloration includes more red than yellow or brown.





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## Odd symptoms

Pulaski County. May 23, 2012. Pulaski County. Lower leaves initially look somewhat similar to K deficiency, but soil test K was high and there are no root restrictions. Also, the coloration includes more red than yellow or brown. Overall stand looks great from a distance.





**Short corn, lower leaves yellow**

Mimics K deficiency. The corn is shorter as well. June 5, 2012. Areas of the field had injured corn. The majority of the field looked fine. What was going on here?





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### Short corn, lower leaves yellow

Mimics K deficiency. The corn is shorter as well. June 5, 2012. Digging up some injured plants to examine roots is always a good idea.





**Short corn, lower leaves yellow**

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### Short corn, lower leaves yellow

Mimics K deficiency. The corn is shorter as well. June 5, 2012. The seed coat is about ½-inch from the soil surface. The shallow placement hurt root growth in this field. The shallow placement was a result of poor row closure, not seeding depth.





## Paraquat Injury

Casey County, May 31, 2012. The farmer sprayed paraquat in another field. Then, he mixed a tank of glyphosate. This was the area of the field that was first sprayed with the tank of glyphosate... and paraquat.





## Paraquat Injury

Casey County, June 5, 2012. The farmer sprayed paraquat in another field. Then, he mixed a tank of glyphosate. The corn on the left was sprayed with that tank. He mixed a second tank of glyphosate. The corn on the right was sprayed with the second tank. There should be no yield loss from the injury on this corn.

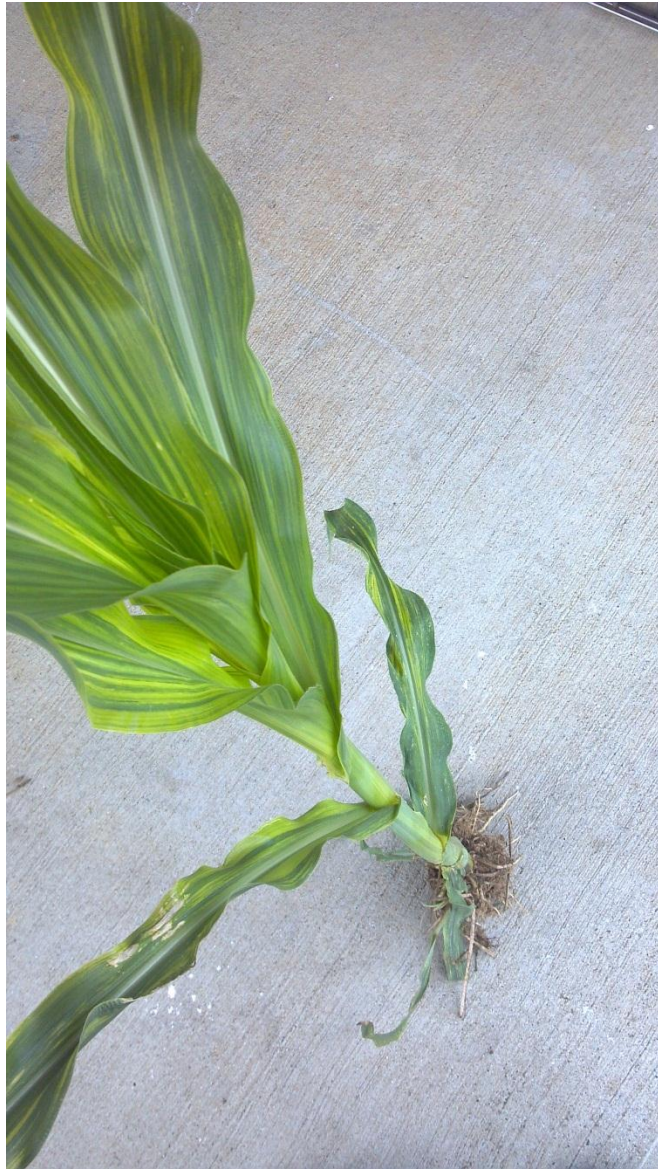




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Adair County: The yellow striping was seen on one plant in the field. It may be due to a genetic anomaly, or it may be a complex of nutrient deficiencies. June 7, 2012 photo: Nick Roy





## K Deficiency and Compaction

Fleming County, June 8, 2012. Corn showing symptoms of K deficiency. Sidewall compaction in most areas and sub-soil compaction at about 3 to 4 inches are restricting root growth.





## K Deficiency and Compaction

Fleming County, June 8, 2012. Compaction at about 2 inches deep is very visible in this root ball. The layering of the soil at the 2-inch line indicates the compaction.





## K Deficiency and Compaction

Fleming County, June 8, 2012. Imprints from an aerator indicate that the field was worked too wet. Compaction was a problem at about 2 inches deep.





## Corn Defoliation

Corn defoliated 100% on June 4, 2012. Each of the fully emerged leaves were clipped back to the sheath. This image was taken on June 6, 2012.





## Defoliation Trial

This corn was at V7 and defoliated 100% about one week ago. The leaf growth seen here is from the leaves that were packed into the whorl. Photo: June 11, 2012.





### Short corn tasseling

Ballard County, June 14, 2012. Corn is tasseling at a very short height. The nodes are there, but the height is not. Given the lack of rain in that area, corn reaching this stage is remarkable.  
Photo: Tom Miller.





## Variable Corn

Ballard County, June 12, 2012. Corn in the lower areas of the field is taller and about four leaves ahead of corn on the eroded slopes. Photo: Tom Miller





## K Deficiency

June 12, 2012. Ballard County. Corn is displaying corn K deficiency. Lack of water is the reason for the symptoms. There is plenty of K<sub>2</sub>O in the soil. Water is needed to get it to the roots. Photo: Tom Miller.





## Paraquat Drift

Ballard County, June 12, 2012. Corn leaves are speckled from drift of paraquat. The damage is superficial and no yield losses are expected. Photo: Tom Miller.





## N Deficient Corn

The corn is displaying some nitrogen deficiency. There appears to be two problems: 1) slight compaction at about 2 inches deep, and 2) late control of wheat re-growth. All wheat is dead, now, and one more rain should improve this corn greatly. June 14, 2012. Pulaski County. Photo: Chad Lee





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## Corn Odd Areas

June 15, 2012. Corn appears to be K deficient. Root growth appears normal. Fertility levels are adequate. No good answer yet. Photo: Richard Whitis





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## Herbicide Damage

June 13, 2012. Chaparral damage on corn from spray tank contamination. Photo: Adam Probst.





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## Drought Corn & Irrigated Corn

Daviess County: Non-irrigated corn (left) and irrigated corn (right) from the same field. Both photos were taken from the same point, one looking left and the other looking right. June 25, 2012. Photo; Chad Lee





## Drought Corn

Henderson County. This soil does not hold water very well and most of the field is irrigated. Farmers in this area have already watered as much as they normally do all season. We have about 30 days of seed fill to complete. Corn here is at blister (R2). June 25, 2012. Photo: Chad Lee





## Drought Corn & Irrigated Corn

Henderson County. Both ears are from the same hybrid, same field. The bottom ear was not irrigated and the top ear was irrigated. Corn is at the milk stage (R3). June 25, 2012. Photo: Chad Lee.





## Drought Corn

Larue County: This corn is at R1 and on a Nolin soil with no restrictions for several feet. Two passes of vertical tillage this spring removed soil moisture from the upper two inches of soil. June 26, 2012. Photo: Chad Lee





## Drought Corn and Populations

Hardin County. This corn is part of a population study. The higher populations are showing the greatest drought stress. June 26, 2012. Photo: Chad Lee





## Dew in the Morning

Fayette County. About the only water this corn has seen the last few weeks has come in the form of dew. June 27, 2012. Photo: Chad Lee





## Pineapple Corn

June 27, 2012. Caldwell County. Photo: Lloyd Murdock.





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June 27, 2012. Caldwell County. Photo: Lloyd Murdock.





## Trapped Tassel

June 27, 2012. Corn tassels are trapped in the whorl and shedding pollen. This corn is irrigated, so water stress is not as bad here. But, the heat still causes stress such as trapped tassels. Fayette County. Photo: Chad Lee





## Trapped Tassels

June 27, 2012. Corn tassels are trapped in the whorl and shedding pollen. This corn is irrigated, so water stress is not as bad here. But, the heat still causes stress such as trapped tassels. Fayette County. Photo: Chad Lee





## Long Silks

June 27, 2012. Silks stop growing once pollen has nicked the silk and travels to the ovule. The longer silks indicate pollination has not occurred yet. Fayette County. Photo: Chad Lee





## Fired Leaves

July 6, 2012. The lower leaves are firing up. This could be a lack of N or a lack of water... in this climate a lack of N because of a lack of water. Oldham County. Traci Missun.





## Fired Leaves

July 6, 2012. Nitrogen deficiency. This could be a lack of N because of a lack of water. Oldham County. Traci Missun.





### Signs of Pollination and Seed Fill

July 8, 2012. Corn ears with various levels of pollination and kernel development. There appears to be some kernel abortion on near the tips of these ears. On other ears, there was no pollination at all on the tips. Graves County. Photo: David Harrison



# Sugar Demand of the Crop

Crop	Glucose Needed to produce one Bushel
	lbs of Glucose
Corn	77.9
Soybean	119.3

- **50** bushels of soybeans requires about 5,965 lbs of glucose
- **200** bushels of corn requires about 15,580 lbs of glucose

Some people are promoting the application of sugar to a field to help overcome drought conditions. Here are some calculations to help make that decision.

Connor, Loomis and Cassman. 2011. Crop Ecology: Productivity and Management in Agricultural Systems. Cambridge University Press. New York. (p. 297-299)



# The sugar will help the soil microbes

- Bacteria: there may be 2,000 lbs of bacteria in each acre of soil. †
- Fungi: mychorrhizal fungi help bring nutrients (P, N, and some micronutrients) to the plant. †
- One foliar product recommends 16 to 24 ounces of sugar. Is that enough sugar to feed all the bacteria and fungi?

†Ingham, E.R. [Soil Biology. The Soil Biology Primer.](http://soils.usda.gov/sqi/concepts/soil_biology/bacteria.html)  
[http://soils.usda.gov/sqi/concepts/soil\\_biology/bacteria.html](http://soils.usda.gov/sqi/concepts/soil_biology/bacteria.html)



# The cost of sugar

- \$6.00/acre
  - Foliar product (34% sugar) is marketing 16 fl oz of product (5.44 oz of sugar) for \$6/acre.
- \$11.26/acre
  - Karo corn syrup (10% sugar) at 54.4 fl oz (5.44 oz of sugar) is about \$11.26/acre. (based on \$26.50/gallon)
- \$0.12/acre
  - Corn sugar, HFCS is 76% sugar. 6 fl oz/A of corn sugar (or 12 fl oz of 38% sugar) = \$0.12/A



# Calculations for bulk Corn Sugar

- Bulk Price:
  - Corn Sugar (HFCS) in bulk (24% water + 55% fructose + 42% glucose) costs up to \$700 / Metric Ton
  - 1 metric ton = 1,000 kg  $\approx$  1,000 L  $\approx$  33,814 fl oz
  - So, \$700 Metric Ton  $\approx$  \$0.02 / fl oz of corn sugar
- Per Acre Rate:
  - Corn sugar is 76% sugar. If cut in half with water, the solution is 38% sugar
  - 6 fl oz/A of corn sugar (or 12 fl oz of 38% sugar) = \$0.12/A



# SOYBEAN





## Large Weeds at Burndown

These weeds were very large at burndown with glyphosate. Ideally, weeds would be burned down before planting. Photo taken: May 9, 2012.





## Marestail in Soybean

May 30, 2012. Marestail surviving after a glyphosate application. The burndown was applied the day after planting. This field should have been treated with 2,4-D a month BEFORE planting.





## Soybean in Clover

Soybeans were planted into a pasture/hay field. The control of the clover is less than adequate. Image taken on May 16, 2012.





## Soybean in Clover

A double rate of glyphosate (3 qts/acre) was applied here and the suppression of the clover is much better. Image taken on May 16, 2012.





## Soybean in Clover

Soybean were seeded into this field of fescue and clover. The clover is barely affected from the herbicide application. Image taken on May 16, 2012.





### Poor soybean stand

Fleming County, May 25, 2012, The poor stand in heavy residue. Not the open seed slit. This field was too wet when it was planted. Sidewall compaction may be part of the problem. Insect and slug feeding may be problems as well. Photo: Jeff Smith.





## Poor Soybean Stand

Fleming County, May 25, 2012, The poor stand in heavy residue. Note the open seed slit. This field was too wet when it was planted. Sidewall compaction may be part of the problem. Insect and slug feeding may be problems as well. Photo: Jeff Smith.





## Leaf Burn

May 31, 2012. Mason County/Fleming County. There may be two things, at least, in this field. The poor stand could be insect/slug damage, wireworm damage, improper seeding depth or all of those. The speckling is more difficult to define. Photo: Tad Campbell





**Poor soybean stand,  
speckled leaves**

May 31, 2012. Mason County/Fleming County. There may be two things, at least, in this field. The poor stand could be insect/slug damage, wireworm damage, improper seeding depth or all of those. The speckling is more difficult to define. Photo: Tad Campbell





## N Burn on Soybean Roots?

Manure was injected into these fields and would have included a lot of nitrogen. The dry conditions contributed to the burn. Also, the slits created by the injector would have dried out the soil in those parts of the field. June 7, 2012. Photo: Cam Kenimer





## N Burn on Soybean Roots?

Fulton County. Manure was injected into these fields and would have included a lot of nitrogen. The dry conditions contributed to the burn. Also, the slits created by the injector would have dried out that soil in those parts of the field. June 7, 2012. Photo: Cam Kenimer





## N Burn on Soybean?

Fulton County. Root growth appears limited, but based on this image alone, it would be difficult to determine the culprit. The other images from this field point to the manure injection. June 7, 2012. Photo: Cam Kenimer





June 14, 2012. Lincoln County. Speckled leaves on the lower trifoliolate leaves. The speckling resembles herbicides such as Cobra or Flexstar, or ozone damage, or even salt damage. No herbicide similar to Cobra or Flexstar was applied. No foliar products were applied. The growing points are good and the soybeans should escape this injury.

## Speckled Leaves





## Speckled and Yellow Leaves

Pulaski County. Speckled leaves. Not a disease. No signs of webs and spider mites. No foliar herbicides, fertilizers, etc. We are seeing a lot of speckling on soybean leaves, even in fields where nothing has been sprayed over the top. Most all of these fields have “grown out” of the injury. So, we wait and see what develops here. June 27, 2012.  
Photo: Jeff Hawk





## Drought Soybeans

June 27, 2012. Leaves are turning upside down. The lighter bottom of the leaf reflects more light in an attempt to mitigate heat. Caldwell County. Photo: Lloyd Murdock



# WHEAT





## Wheat Damage

April 16, 2012: Wayne County, KY, Photo Courtesy: Danny Adams. Our best guess: too high of a liquid N application on the wheat.





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## Wheat Damage





## “Burned Wheat”

April 17, 2012: Wayne County, Kentucky: Our best guess: too high of a liquid N application on the wheat.





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## “Burned Wheat”

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**Wheat Field, BYD?**

April 17, 2012: Clinton County, KY: BYDV





**“Healthy” Wheat**

April 17, 2012: Clinton County, KY





**Bleached Head, Freeze Damage**

April 17, 2012: Clinton County, KY





**“Bleached” Head, Freeze Damage**

April 17, 2012: Clinton County, KY: Low area of the field, probably 60% or more of the heads in this area were bleached





## Wheat Damage

April 19, 2012: Nelson County, KY. Confirmed BYDV.





## Wheat Damage

April 19, 2012: Nelson County. Confirmed BYDV.





## Damaged Wheat

April 19, 2012: Nelson County. Confirmed BYDV.





April 19, 2012: Nelson County, KY. Confirmed BYDV and Wheat Streak Mosaic.