Northern Ohio Field Notes

August 10, 2023 John Schoenhals, Pioneer Field Agronomist

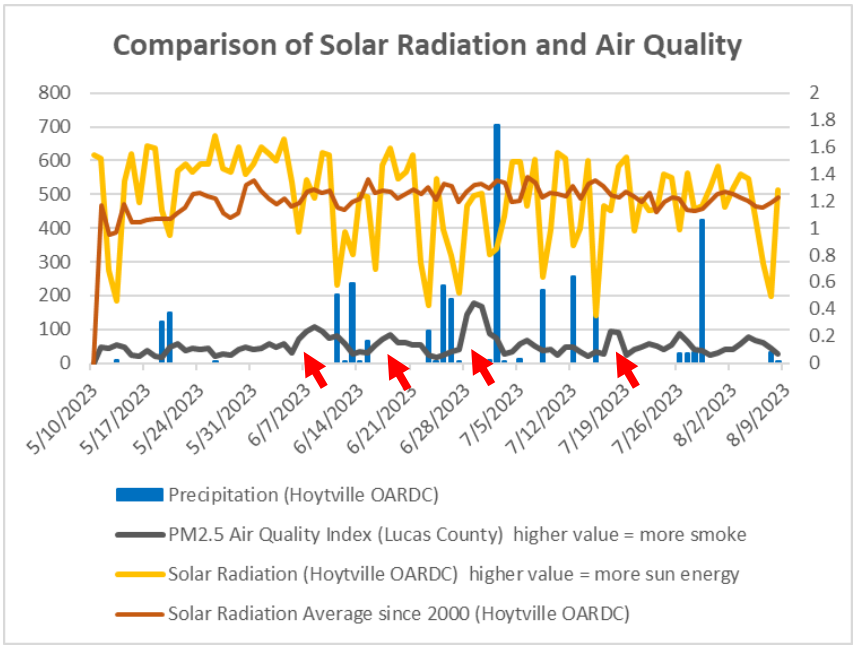
GDU Accumulation and Solar Radiation Update

As has been the case throughout the season, accumulated GDUs are running slightly behind the 30-year average, and significantly behind recent experiences in the last 5 years.

Aprx. Northern Ohio GDU Accumulation since planting (as of August 9)			
Planting Date	**April 15**	**May 15**	**May 25**
Accumulated GDU	1,820	1,600	1,480
Difference from 30 year average	-110	-80	-70
Difference from 5 year average	-205	-225	-215
data from https://mygeohub.org/groups/u2u/purdue_gdd			

Slower accumulation of GDUs has been driven mainly by cool nighttime temperatures through the summer. Based on data from Defiance, OH, June and July 2023 have had more low temperatures of 65° or less than any year since at least 2009. It is also notable that the number of 90°+ days so far this summer has been much less than recent years (only 4 days so far).

Slower GDU accumulation leads to slower crop development (especially for corn); however, cooler temperatures during very dry stretches earlier in the summer helped to maintain crop conditions. Cool temperatures throughout grainfill can lead to larger kernel size and increased yields. Concern for a killing frost before blacklayer is currently low, due to timely planting in most cases.



Lingering effects of wildfire smoke continue to be investigated. At this time, most data sources show that solar radiation throughout the summer is running near to slightly above normal. The graphic included here shows that solar radiation is much more strongly reduced on cloudy and/or rainy days than on most hazy/smokey days.

Fungicide Application to Corn – FAQs

How has disease pressure changed in the last several weeks? Gray leaf spot continues to be the most significant disease found, but tar spot and northern corn leaf blight are increasing. Overall disease severity is currently low, but is increasing with cool temperatures and heavy dews.

When is too late to apply a fungicide? Preventative fungicides are ideally applied by mid-R3 (milk stage). If heavy disease pressure is found, it can make sense to apply through R4 (dough stage). Once corn reaches R5 (denting), the probability of fungicide ROI rapidly decreases.

If I find black tar spots, is it too late for a fungicide? No. Fungicides are primarily protective (little curative activity on existing disease), but diseases like tar spot continue to sporulate and cause new infections. Preventing further spread of disease by protecting the plant with a fungicide is important.

Fungicide Applications to Soybeans - Recap

Ideal application timing is mid-R3 through early-R4 growth stage. Significant advantages to applying fungicide/insecticide to soybeans this year are expected, both from a disease/insect management perspective, as well as overall plant health benefits. Fungicide applications through the R4 and as late as the R5 growth stage can still provide ROI.

Understanding Corn Growth Stages

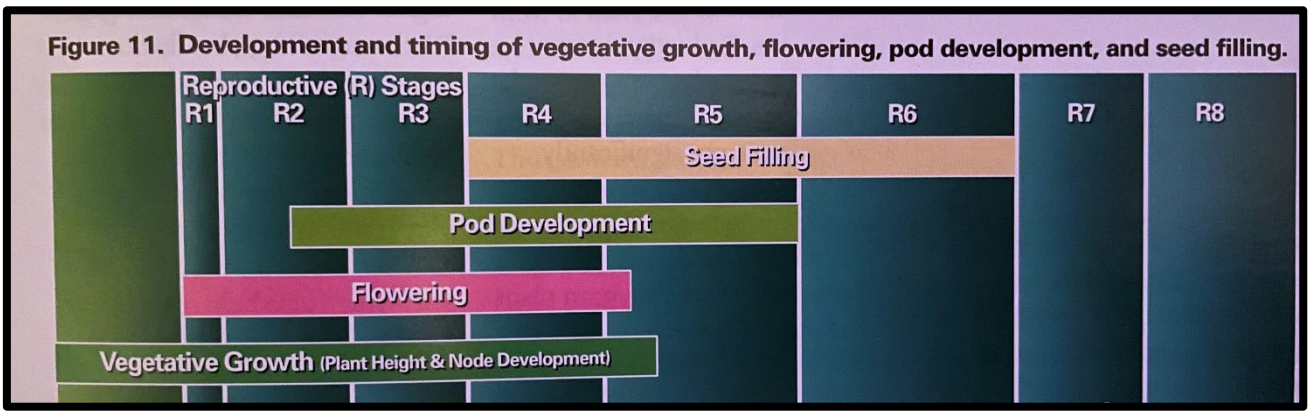
Kernel Development. The embryo and non-embryo sides of each kernel.

Tassel (VT) – bottom-most branch of tassel completely visible.
Silking (R1) – silks visible outside the husks.
Blister (R2) – kernels white on outside, clear liquid inside.
Milk (R3) – kernel yellow outside, milky white fluid inside.
Dough (R4) – kernel fluid thick/pasty, cob color observed
Dent (R5) – 50% of kernels at least partially dented. Milk line begins to progress.
Physiological Maturity (R6) – milk line no longer evident, black layer formed. Maximum dry weight achieved.

Kernel Growth Stage	Aprx. Days After Pollination	% of total kernel dry weight accumulated	Impact of stress at this stage
Silking (R1)			Poor pollination, fewer kernels
Blister (R2)	10-12		Kernel abortion, fewer kernels
Milk (R3)	18-20		Kernel abortion possible
Dough (R4)	24-26	33%	Smaller kernel size (abortion unlikely)
Early Dent (R5)	31-33	45%	Smaller kernel size/weight
¼ Milk Line	35-38	65%	Smaller kernel size/weight
½ Milk Line (R5.5)	41-44	90%	Smaller kernel size/weight
¾ Milk Line	50-54	97%	Smaller kernel size/weight (minimal impacts)
Black Layer (R6)	60-65	100%	No Impacts

Understanding Soybean Growth Stages

Stage	Description
R1: Beginning Bloom	One flower open at any node on main stem
R2: Full Bloom	Open flower at one of the two uppermost nodes with a fully developed leaf
R3: Beginning Pod	Pod 3/16" long at one of the four uppermost nodes with a fully developed leaf
R4: Full Pod	Pod ¾" long at one of the four uppermost nodes with a fully developed leaf
R5: Beginning Seed	Seed 1/8" long in a pod at one of the four uppermost nodes with a fully developed leaf
R6: Full Seed	Pod with a seed that fills pod cavity at one of the four uppermost nodes
R7: Beginning Maturity	One normal pod on the main stem that has reached its mature color
R8: Full Maturity	95% of the pods have reached their mature color



From "Soybean Growth and Development," Iowa State University

Soybeans continue to flower and add nodes until early R5 growth stage. Pod development continues throughout R5. For Soybeans, R5 and R6 are typically the most sensitive to yield declines due to heat/dry stress.