Indiana Crop & Weather Report

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CROP REPORT FOR WEEK ENDING JULY 25

Hot, dry weather conditions continued to place corn and soybeans under stress, according to the Indiana Agricultural Statistics Service. Showers helped, but many areas have received less than one inch of rain thus far during July. Major activities during the week included baling hay and straw, equipment repair, spraying, monitoring fields for insects, mowing roads and pastures, attending fairs and care of livestock.

CORN

Corn condition declined from last week with 56 percent of the crop rated good to excellent compared with 64 percent at this time last year. Ninety-two percent of the corn crop has **silked** compared with 67 percent last year and 51 percent for the 5-year average. Fifteen percent of the corn crop has reached the **dough** stage compared with 14 percent last year and 5 percent for the average. By region 11 percent of the corn acreage is in the dough stage in the north, 17 percent in the central and 17 percent in the south.

SOYBEANS

Soybean **condition** declined from last week and is rated 58 percent good to excellent compared with 65 percent last year. Ninety-two percent of the soybean acreage is **blooming** , far ahead of the 65 percent last year and the average of 58 percent. Thirty-eight percent of the soybean acreage is **settin g pods** compared with 20 percent last year and 11 percent for the 5-year average. By region 38 percent of the soybean acreage is setting pods in the north, 41 percent in the central and 35 percent in the south.

OTHER CROPS

Pasture condition declined from last week and was rated 3 percent excellent, 31 percent good, 41 percent fair, 21 percent poor and 4 percent very poor. Second cutting of **alfalfa** hay is virtually complete, compared with 80 percent last year and 67 percent for average.

DAYS SUITABLE and SOIL MOISTURE

For the week ending Friday, 6.1 days were rated **suitable for fieldwork** . **Topsoil moisture** was rated 21 percent very short, 44 percent short, 34 percent adequate and 1 percent surplus. **Subsoil moisture** was rated 14 percent very short, 49 percent short and 37 percent adequate.

CROP PROGRESS

Crop	This Week	Last Week	Last Year	5-Year Avg
	Percent			
Corn Silking	92	70	67	51
Corn in Dough	15	6	14	5
Soybeans Blooming	92	80	65	58
Soybeans Podding	38	22	20	11
Wheat Harvested	100	100	100	93
Alfalfa, Second Cutting	100	95	80	67

CROP CONDITION

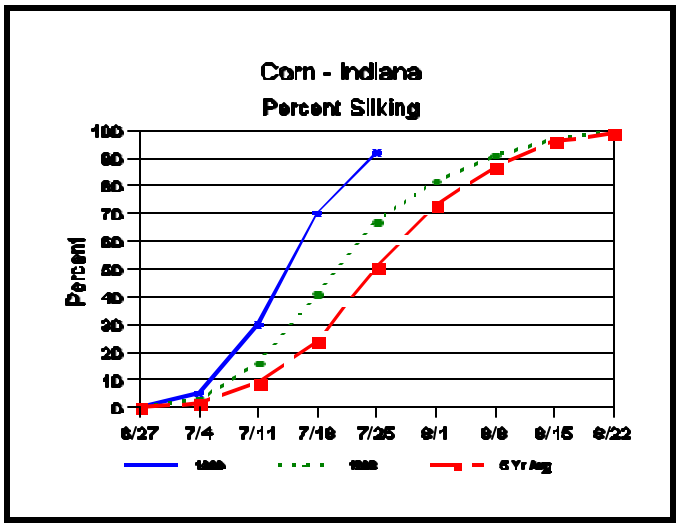
Crop	Very Poor	Poor	Fair	Good	Excel-lent
	Percent				
Corn	2	8	34	44	12
Soybeans	2	6	34	46	12
Pasture	4	21	41	31	3

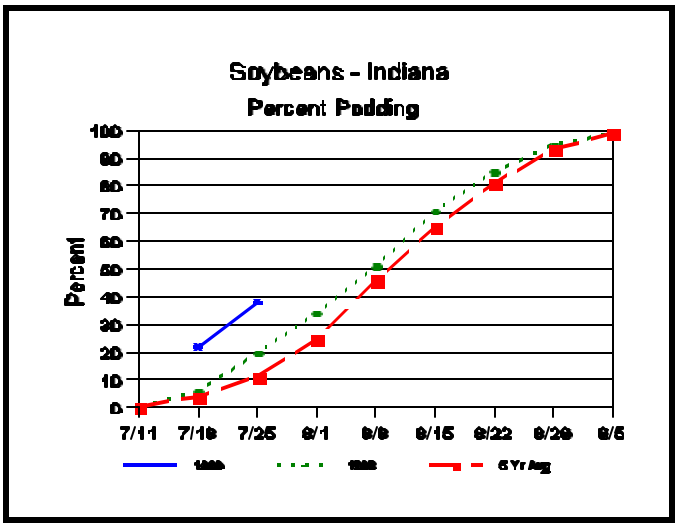
SOIL MOISTURE

	This Week	Last Week	Last Year
	Percent		
Topsoil			
Very Short	21	25	0
Short	44	46	5
Adequate	34	28	64
Surplus	1	1	31
Subsoil			
Very Short	14	14	0
Short	49	47	6
Adequate	37	37	68
Surplus	0	2	26

--Ralph W. Gann, State Statistician
--Bud Bever, Agricultural Statistician
E-Mail Address: nass-in@nass.usda.gov
http://info.aes.purdue.edu/agstat/nass.html

Crop Progress





Effects of Stress During Grain Fill in Corn

While the pollination period is considered to be the most critical yield-determining interval in the corn plant's life cycle, severe stress on the corn plant during the grain fill period can also result in dramatic yield loss. Yield loss during grain fill can occur from 1) stand loss, 2) incomplete kernel set, 3) lightweight kernels, and 4) premature plant death.

Stand Loss During Grain Fill

Yield loss due to stand loss during grain fill is usually greater than that due to stand loss that occurs during the vegetative phase. When stand loss occurs prior to pollination, ear size (number of kernels) on surviving plants may compensate in response to the lesser competition of a thinner stand. Additional compensation may occur during grain fill in terms of greater kernel weight. When stand loss occurs during grain fill, ear size has already been set. Only kernel weight can compensate in response to the lesser competition of a thinner stand.

Incomplete Kernel Set in Corn

Kernel set refers to the degree to which kernels have developed up and down the cob. Incomplete kernel set is not always apparent from 'windshield' surveys of a corn field. Husks and cob will continue to lengthen even if kernel set is incomplete. A wonderfully long, robust-looking, healthy green ear shoot can completely mask even a 100 percent failure of pollination or severe kernel abortion.

One of the causes of incomplete kernel set is unsuccessful pollination. Unsuccessful pollination results in ovules that are never fertilized and, subsequently, ears with varying degrees and patterns of incomplete kernel set. Many factors can cause incomplete pollination and distinguishing between them can be very difficult.

Certain insects like corn rootworm beetles and Japanese beetles can interfere with pollination and fertilization by their silk clipping action. These insects feed on pollen and subsequently clip silks as they feed on the pollen that has been captured by the silks. Unusually early or late pollinating fields are often particularly attractive to these insects.

Drought stress may delay silk emergence until pollen shed is nearly or completely finished. During periods of high temperatures, low relative humidities, and inadequate soil moisture levels, exposed silks may also dessicate and become non-receptive to pollen germination.

Unusually favorable conditions prior to pollination that favor ear size determination can result in ears with an unusually high number of potential kernels per row. Remember that silk elongation begins near the butt of the ear and progresses up toward the tip. The tip silks are typically the last to emerge from the husk leaves. If ears are unusually long (many kernels per row), the final silks from the tip of the ear may emerge after all the pollen has been shed.

Another cause of incomplete kernel set is abortion of fertilized ovules. Aborted kernels are distinguished from unfertilized ovules in that aborted kernels had actually begun development. Aborted kernels will be shrunken, mostly white, often with the yellow embryo visible; compared to normal plump yellow kernels.

(Continued on Page 4.)

Weather Data

Week ending Sunday July 25, 1999

Station	Past Week Weather Summary Data							Accumulation*				
								April 1, 1999 thru July 25, 1999				
	Air Temperature				Precip.		Avg 4 in Soil	Precipitation		GDD Base 50°F		
	Hi	Lo	Avg	DFN	Total	Days	Temp	Total	DFN	Days	Total	DFN
Northwest(1)												
Valparaiso_Ag	93	67	80	+8	1.62	4		15.41	+0.09	44	1812	+257
Wanatah	93	62	77	+6	1.55	5	85	16.20	+1.37	47	1570	+85
Wheatfield	94	70	81	+9	1.06	4		19.53	+5.02	41	1841	+311
Winamac	93	68	81	+9	0.91	3		14.21	-0.32	37	1846	+255
North Central(2)												
Logansport	94	69	81	+8	0.85	4		14.59	+0.61	48	1867	+242
Plymouth	95	65	80	+7	0.24	4		16.50	+1.26	47	1815	+156
South_Bend	96	69	81	+9	0.00	0		13.51	-0.74	39	1889	+351
Young_America	M	I	S	S	I	N	G					
Northeast(3)												
Bluffton	95	68	82	+8	0.58	2	83	10.68	-3.73	38	1895	+231
Fort_Wayne	95	65	81	+8	0.13	1		11.99	-1.21	42	1859	+244
West Central(4)												
Crawfordsville	94	66	79	+5	0.44	2	80	12.62	-3.18	46	1737	-27
Perrysville	92	67	80	+6	0.70	3	86	13.54	-2.21	44	1911	+185
Terre_Haute_Ag	98	69	84	+9	0.74	4	82	15.37	-0.57	49	2142	+300
W_Lafayette_6NW	94	69	81	+8	1.86	3	85	16.10	+1.62	45	1916	+289
Central(5)												
Castleton	94	70	81	+6	1.81	5		14.95	-0.41	54	1964	+162
Greenfield	95	67	81	+7	0.70	2		11.98	-4.19	49	1952	+215
Indianapolis_AP	94	68	82	+7	1.32	3		13.49	-1.33	47	2092	+268
Indianapolis_SE	93	65	80	+5	0.95	2		12.73	-2.63	51	1894	+92
Tipton_Ag	93	66	79	+7	0.48	2	78	11.76	-2.84	40	1739	+166
East Central(6)												
Farmland	94	65	81	+9	1.16	7	75	13.32	-1.22	52	1851	+322
New_Castle	92	64	79	+6	0.17	3		12.37	-3.56	48	1684	+121
Southwest(7)												
Dubois_Ag	95	65	81	+6	0.76	2	89	17.35	+0.25	45	2065	+215
Evansville	94	70	83	+5	0.60	2		17.97	+2.42	47	2249	+101
Freelandville	93	69	82	+7	0.39	2		20.06	+3.99	45	2052	+145
Shoals	94	67	81	+6	0.39	3		16.51	-0.85	40	1965	+133
Vincennes_5NE	95	69	83	+7	0.99	4	85	18.90	+2.83	58	2131	+224
South Central(8)												
Bloomington	96	70	83	+7	0.09	2		14.46	-1.61	42	2079	+219
Tell_City	96	71	84	+7	0.38	5		15.75	-1.70	42	2281	+249
Southeast(9)												
Butlerville	94	67	81	+6	0.72	3	82	14.81	-0.95	52	2015	+115
Scottsburg	96	66	82	+7	0.61	2		13.25	-3.00	38	2139	+249

* AWIS revised last week's data after press time. This week's accumulations will reflect those revisions. Bluffton, Young America, W_Lafayette _6NW and Winamac are the stations affected.

DFN = Departure From Normal (Using 1961-90 Normals Period).
GDD = Growing Degree Days.
Precipitation (rain or melted snow/ice) in inches.
Precipitation Days = Days with precipitation of 0.01 inch or more.
Air Temperatures in Degrees Fahrenheit.

The above weather information is provided by AWIS, Inc.
For detailed ag weather forecasts and data visit the AWIS home page at www.awis.com or call toll free at 1-888-798-9955.

Kernels are most susceptible to abortion during the first 2 weeks following pollination, particularly kernels near the tip of the ear. Tip kernels are generally last to be fertilized, less vigorous than the rest, and are most susceptible to abortion. Once kernels have reached the dough stage of development, further yield losses will occur mainly from reductions in kernel dry weight accumulation.

Severe drought stress that continues into the early stages of kernel development (blister and milk stages) can easily abort developing kernels. Severe nutrient deficiencies (especially nitrogen) can also abort kernels if enough of the photosynthetic 'factory' is damaged. Extensive loss of green leaf tissue by certain leaf diseases, such as grey leaf spot, by the time pollination occurs may limit photosynthate production enough to cause kernel abortion. Consecutive days of heavily overcast, cloudy conditions may also reduce photosynthesis enough to cause abortion in recently fertilized ovules.

Decreased Kernel Weight

Severe stress during dough and dent stages of grain fill decreases grain yield primarily due to decreased kernel weights and is often caused by premature black layer formation in the kernels. Decreased kernel weight can result from severe drought and heat stress during grain fill; extensive European corn borer tunneling (especially in the ear shanks); loss of photosynthetic leaf area by hail, insects, or disease early in grain fill; and killing fall frosts prior to normal black layer development.

Once grain has reached physiological maturity, stress will have no further physiological effect on final yield, because final yield is already achieved. Stalk and ear rots, however, can continue to develop after corn has reached physiological maturity and indirectly reduce grain yield.

Premature Plant Death

A killing fall frost prior to physiological maturity can cause premature leaf death or whole plant death. Premature death of leaves results in yield losses because the photosynthetic 'factory' output is greatly reduced. The plant may remobilize stored carbohydrates from the leaves or stalk tissue to the developing ears, but yield potential will still be lost.

Premature death of whole plants results in greater yield losses than if only leaves are killed. Death of all plant tissue prevents any further remobilization of stored carbohydrates to the developing ear. Whole plant death that occurs before normal black layer formation will cause premature black layer development, resulting in incomplete grain fill and lightweight, chaffy grain. Grain moisture will be greater than 35%, requiring substantial field drydown before harvest.

–Bob Nielsen, Agronomy Dept., Purdue University

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