Indiana Crop & Weather Report

INDIANA AGRICULTURAL STATISTICS
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CROP REPORT FOR WEEK ENDING AUGUST 2

Crops continue to develop ahead of normal, according to the Indiana Agricultural Statistics Service. There was plenty of warm sunny weather across the state during the past week, with no district recording fewer than 4 days suitable for fieldwork. Days *not* suitable were primarily early in the week and the result of excessive moisture received during the previous week.

CORN

Corn condition is rated 65 percent good to excellent, compared to 64 percent last week, and 57 percent last year. Eighty-four percent of the crop is **silked**, ahead of the 75 percent average. By region, 90 percent of the crop is silked in the north, 84 percent in the central, and 71 percent in the south. Twenty-three percent of the corn is in the **dough** stage, well ahead of only 10 percent last year and the 12 percent average. By region, 22 percent is in the dough stage in the north, 26 percent in the central, and 20 percent in the south.

SOYBEANS

Soybean condition is rated 66 percent good to excellent, compared to 65 percent last week, and 59 percent last year. Seventy-seven percent of the soybeans are **blooming**, equal to last year and slightly ahead of average. By region, 86 percent are blooming in the north, 78 percent in the central, and 57 percent in the south. Thirty-six percent of the soybean crop is **setting pods**, ahead of the 25 percent average. By region, 41 percent of the crop is setting pods in the north, 35 percent in the central, and 32 percent in the south.

OTHER CROPS

Pasture condition is rated 16 percent excellent, 57 percent good, 22 percent fair, 4 percent poor and 1 percent very poor. **Second cutting** of **alfalfa** is 89 percent complete. **Third cutting** is 15 percent complete.

DAYS SUITABLE and SOIL MOISTURE

For the week ending Friday, 5.9 days were rated **suitable for fieldwork**. **Topsoil moisture** was rated 3 percent very short, 15 percent short, 72 percent adequate and 10 percent surplus. **Subsoil moisture** was rated 2 percent very short, 13 percent short, 75 percent adequate and 10 percent surplus.

CROP PROGRESS

Crop	This Week	Last Week	Last Year	5-Year Avg
	Percent			
Alfalfa 2nd Cutting	89	81	75	82
Corn Silked	84	71	72	75
Corn Dough	23	15	10	12
Soybeans Blooming	77	68	77	75
Soybeans Podding	36	22	30	25

CROP CONDITION

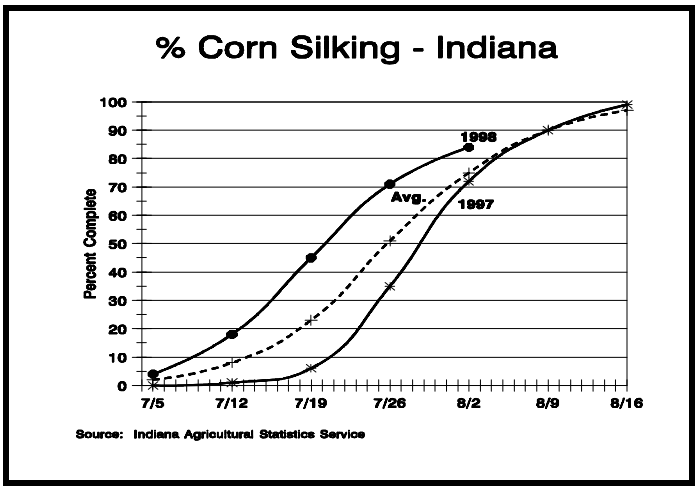
Crop	Very Poor	Poor	Fair	Good	Excel-lent
	Percent				
Corn	3	7	25	52	13
Soybeans	3	7	24	49	17
Pasture	1	4	22	57	16

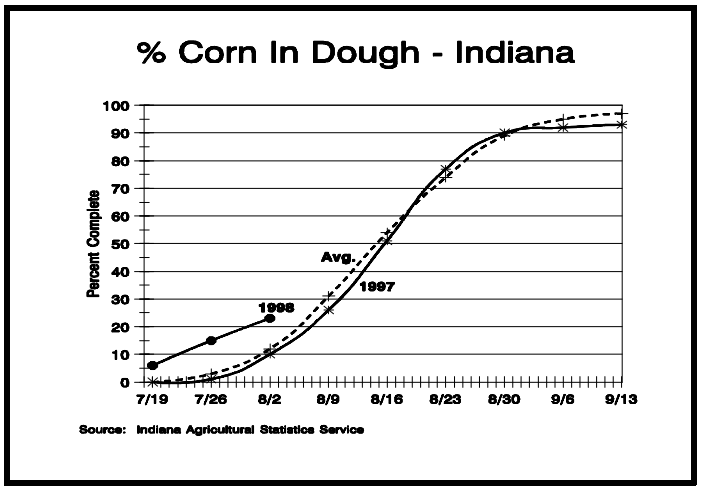
SOIL MOISTURE

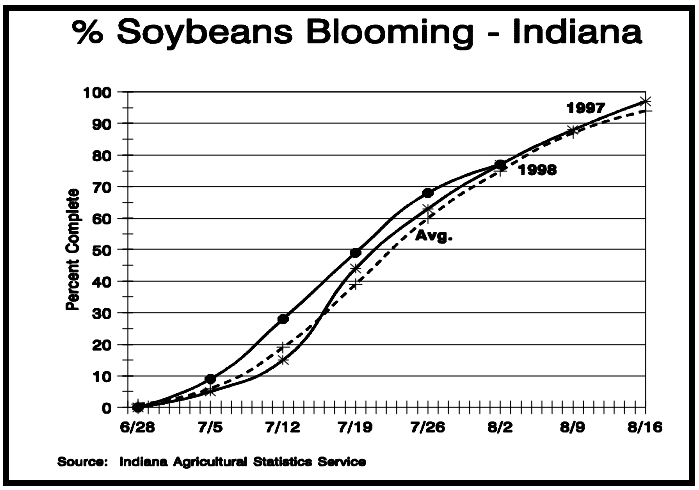
	This Week	Last Week	Last Year
	Percent		
Topsoil			
Very Short	3	0	20
Short	15	5	32
Adequate	72	64	45
Surplus	10	31	3
Subsoil			
Very Short	2	0	13
Short	13	6	31
Adequate	75	68	54
Surplus	10	26	2

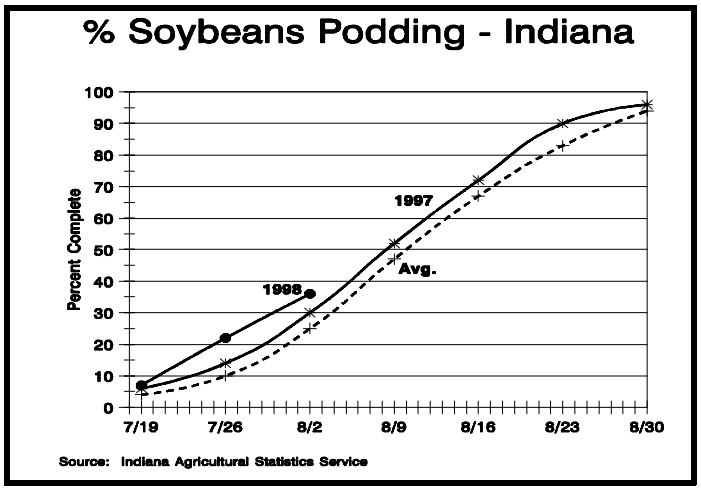
--Ralph W. Gann, State Statistician
--Lance Honig, Agricultural Statistician
E-Mail Address: nass-in@nass.usda.gov
http://info.aes.purdue.edu/agstat/nass.html

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 (see P&C Newsletter, July 2), severe stress on the corn plant during the grain fill period can also result in dramatic yield loss. Grain fill stages in corn were described in last week's newsletter (P&C Newsletter, July 24). Yield loss during grain fill can occur from 1) stand loss, 2) incomplete kernel set, 3) lightweight kernels, and 4) premature plant death.

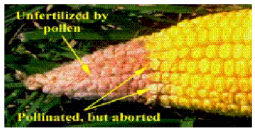
Stand Loss During Grain Fill

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 will 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 desiccate and become non-receptive to pollen germination.

(Continued on Page 4.)

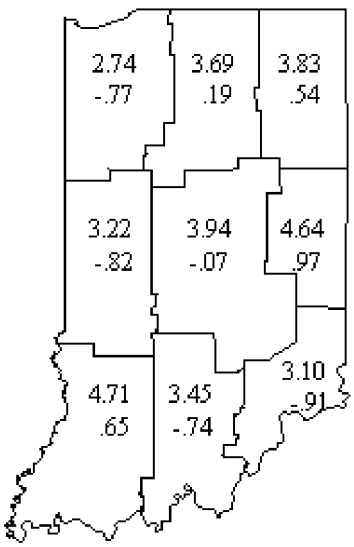
Weather Data

Average Daily Values for week ending Monday morning August 3, 1998

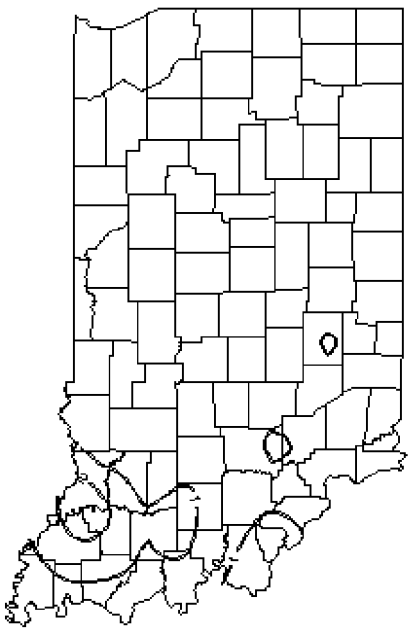
Area	Station	Air Temperature Max	Air Temperature Min	Air Temperature DN	Precipitation Past Week	Precipitation Since April 1	Precipitation DN Since April 1	Growing Degree Days Past Week	Growing Degree Days Since April 1	Growing Degree Days DN Since April 1
NW	Wanatah	83	53	-3	.00	16.56	+.71	134	1953	+211
	Kentland	82	59	-3	.11	20.23	+4.23	146	2132	+195
	Winamac	82	60	-1	.00	17.74	+2.21	150	2082	+214
NC	South Bend	84	61	+0	.00	13.30	-1.92	158	2039	+240
	Waterford Mills	83	58	-2	.00	14.24	-.01	147	2066	+225
NE	Prairie Heights	82	59	-1	.00	14.12	-.62	146	2057	+440
	Columbia City	81	57	-3	.00	16.12	+1.03	138	1999	+267
	Fort Wayne	80	58	-4	.00	19.26	+5.13	139	2077	+181
	Bluffton	80	60	-3	.00	20.58	+5.34	145	2128	+180
WC	West Lafayette	81	57	-4	.00	23.72	+8.16	137	2163	+273
	Perrysville	81	62	-4	.41	24.28	+6.54	153	2241	+57
	Crawfordsville	81	59	-3	.62	22.97	+7.51	142	2112	+206
	Terre Haute 8s	83	66	-1	.48	22.46	+5.34	174	2423	+308
C	Tipton	80	58	-4	.04	23.72	+7.96	135	2007	+149
	Indianapolis	83	64	-1	.51	25.76	+9.77	167	2295	+191
	Indian Creek	82	63	-1	.68	22.70	+6.31	164	2280	+291
EC	Farmland	83	59	-1	.09	23.20	+7.80	151	2109	+322
	Liberty	83	61	-2	.58	22.62	+5.55	157	2153	+164
SW	Vincennes	83	61	-4	.82	29.11	+11.93	156	2359	+186
	Dubois	83	62	-3	1.97	22.83	+4.42	161	2327	+209
	Evansville	83	66	-3	.97	22.31	+5.73	176	2556	+172
SC	Bedford	83	64	-1	.86	31.56	+13.99	167	2245	+211
	Louisville	85	68	-1	1.21	24.93	+7.80	185	2606	+265
SE	Butlerville	83	63	-2	.96	29.43	+12.41	165	2256	+61

DN = departure from normal.
Growing Degree Days = daily mean - 50 (below 50 adjusted to 50, above 86 adjusted to 86.)

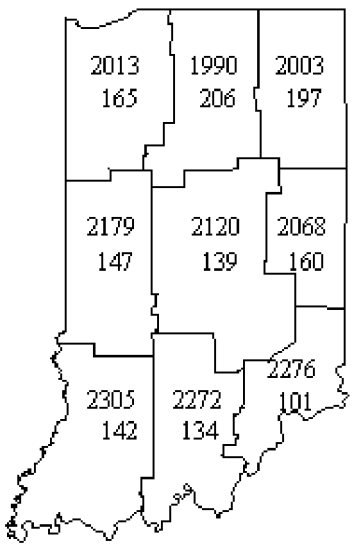
Rainfall for Past 4 Weeks
and Departure from Normal



Rainfall of 1 Inch or More
for Past 7 Days
as of Monday morning



Growing Degree Days
and Departure since April 1



The above information is provided by Ken Scheeringa, Indiana State Climatologist (765)494-8105
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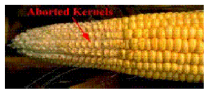
Effects of Stress (continued)

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.



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. Don't forget, this and other timely information about corn can be viewed at the Chat n Chew Café on the World Wide Web at http://www.agry.purdue.edu/agronomy/ext/corn/chatchew.htm. For other information about corn, take a look at the Corn Growers' Guidebook on the World Wide Web at http://www.agry.purdue.edu/agronomy/ext/corn/

--Bob Nielsen, Purdue University Corn Specialist

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