Indiana Crop & Weather Report

INDIANA AGRICULTURAL STATISTICS
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CROP REPORT FOR WEEK ENDING JULY 5

Farmers took full advantage of good weather this past week, according to the Indiana Agricultural Statistics Service. Wheat harvest was in full swing all across Indiana with the best progress made in the southern two-thirds of the state. Soybean planting made modest progress, although many southern areas remain too wet for tillage activities. Other activities during the week included spraying and cultivating crops, baling alfalfa, and baling straw.

CORN AND SOYBEANS

Corn condition improved slightly from last week, with 59 percent rated good to excellent. Four percent of the crop is **silked**, ahead of the 2 percent average. **Soybean planting** is 96 percent complete, behind both last year and the average for this date. Nearly all of the remaining acreage is in the southern region of the state. Ninety-three percent of the soybean crop is **emerged**. Nine percent of the soybeans are **blooming**, ahead of 5 percent last year and the 6 percent average.

WINTER WHEAT

Winter wheat condition is rated 58 percent good to excellent, an increase of 3 percent from last week. Wheat **harvest** advanced to 73 percent complete, 60 percent ahead of last year and about two weeks ahead of average. By region, 51 percent is harvested in the north, 83 percent in the central, and 84 percent cut in the south.

OTHER CROPS

Pasture condition is rated 14 percent excellent, 61 percent good, 22 percent fair, 2 percent poor and 1 percent very poor. **Second cutting** of **alfalfa** is 33 percent complete.

DAYS SUITABLE and SOIL MOISTURE

For the week ending Friday, 5.0 days were rated **suitable for fieldwork**. **Topsoil moisture** was rated 1 percent very short, 6 percent short, 64 percent adequate and 29 percent surplus. **Subsoil moisture** was rated 4 percent short, 68 percent adequate and 28 percent surplus.

CROP PROGRESS

Crop	This Week	Last Week	Last Year	5-Year Avg
	Percent			
Corn Silked	4	0	0	2
Soybeans Planted	96	92	99	99
Soybeans Emerged	93	89	NA	NA
Soybeans Blooming	9	0	5	6
Winter Wheat Harvested	73	26	13	27

CROP CONDITION

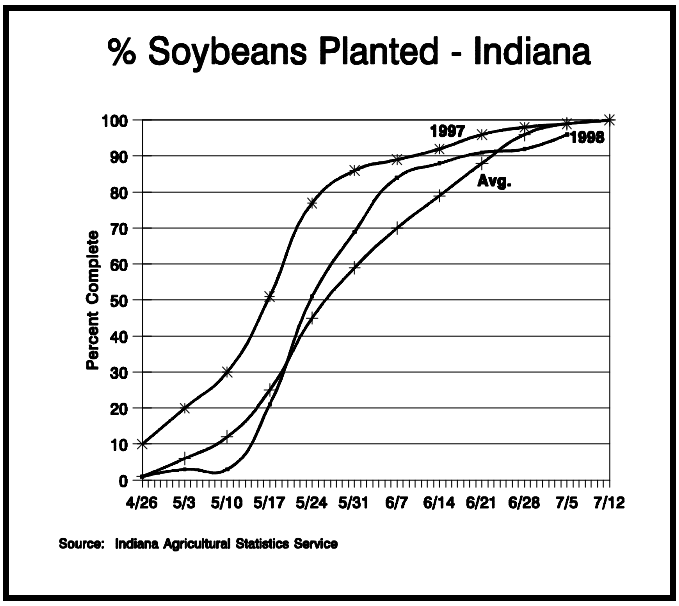
Crop	Very Poor	Poor	Fair	Good	Excel-lent
	Percent				
Corn	4	9	28	46	13
Soybeans	4	7	28	51	10
Winter Wheat 7/5	3	11	28	44	14
Winter Wheat 1997	1	4	23	58	14
Pasture	1	2	22	61	14

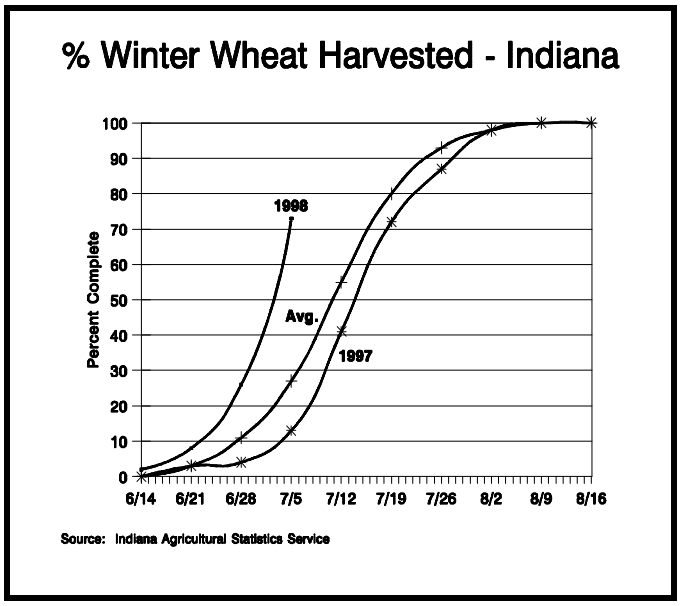
SOIL MOISTURE

	This Week	Last Week	Last Year
	Percent		
Topsoil			
Very Short	1	2	0
Short	6	8	9
Adequate	64	51	78
Surplus	29	39	13
Subsoil			
Very Short	0	1	0
Short	4	7	6
Adequate	68	55	80
Surplus	28	37	14

--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





Intimate Relations in the Cornfield: How Does It Happen?

Tassels and silks are beginning to appear throughout Indiana on those fields planted back in April. Pollen shed and silk emergence represent the most critical period for corn growth and development in terms of fulfilling grain yield potential. Severe stress during the pollination period will cause more yield loss than at any other time of the growing season. To better understand potential problems that can occur during pollination, you should first understand how the pollination process is orchestrated.

For those of you hung up on semantics, let's review two definitions relevant to sex in the corn field. Pollination is the act of transferring the pollen grains to the silks by wind or insects. Fertilization is the union of the male gametes from the pollen with the female gametes from the ovary. Technically, pollination usually occurs successfully (i.e., the pollen reaches the silks), but unsuccessful fertilization results in poor kernel set on the ears.

ANTHERS AND POLLEN

Remember that corn has both male flowers and female flowers on the same plant (a flowering habit called monoecious for you trivia fans.) When the male flowers in the tassel mature, anthers emerge from the spikelet flowers, and pollen is dispersed through pores that open at the tips of the anthers.

The yellow 'dust-like' pollen that falls from a tassel represents two to five million individual, nearly microscopic, spherical, yellowish-translucent pollen grains. Pollen grains contain the male genetic material that unites with the female genetic material of the ovule and produces an embryo.

Pollen develops in and is dispersed from the anthers of the tassel. The anthers are those 'double-barrelled' structures that hang from the tassel during pollination. Anthers emerge from the glumes of each of the two flowers from each spikelet of the tassel. Anthers typically emerge from the upper flower first, while those from lower flower typically emerge later the same day or on following days. Spent anthers eventually drop from the tassel and are sometimes mistaken for the pollen itself when observed on the leaves or ground.

The outer membrane of a pollen grain is very thin. Once dispersed into the atmosphere, pollen grains remain viable for only a few minutes before they dessicate.

Pollen shed usually begins in the mid-portion of the central tassel spike, then progresses upward, downward and outward over time. Pollen is dispersed through pores at the anther tips which open when moisture and temperature conditions are suitable.

Weather conditions influence pollen shed. If the anthers are wet, the pores remain closed and pollen will not be released. Therefore, pollen shed typically begins after tassels dry from a heavy morning dew. Anther pores also do not open during rainy weather, therefore pollen does not wash off tassels. Cool, humid temperatures delay pollen shed, while hot, dry conditions hasten pollen shed.

Peak pollen shed usually occurs in mid-morning. Some research indicates that pollen shed decreases after temperatures surpass 86 degrees Fahrenheit. A second 'flush' of pollen often occurs in late afternoon or evening as temperatures cool. Pollen shed may occur throughout most of the day under relatively cool, cloudy conditions.

(Continued on Page 4.)

Weather Data

Average Daily Values for week ending Monday morning July 6, 1998

Area	Station	Air Temperature			Precipitation			Growing Degree Days		
		Max	Min	DN	Past Week	Since April 1	DN Since April 1	Past Week	Since April 1	DN Since April 1
NW	Wanatah	80	58	-2	2.80	14.28	+2.19	138	1369	+242
	Kentland	83	62	-2	1.05	16.88	+4.68	136	1485	+213
	Winamac	82	61	-1	1.82	14.20	+2.21	155	1442	+209
NC	South Bend	81	63	+0	.97	11.96	+.20	156	1384	+228
	Waterford Mills	83	60	-1	.88	11.52	+.60	152	1438	+238
NE	Prairie Heights	82	61	+1	1.30	11.07	-.24	130	1427	+398
	Columbia City	81	60	-1	1.50	12.73	+1.01	127	1391	+274
	Fort Wayne	82	63	-1	2.98	14.36	+3.40	160	1461	+231
	Bluffton	82	62	-1	2.74	13.52	+1.42	160	1484	+207
WC	West Lafayette	83	62	+0	1.61	19.45	+7.51	159	1539	+293
	Perrysville	84	64	-1	.95	20.47	+7.04	171	1569	+85
	Crawfordsville	84	62	+0	1.13	18.06	+6.14	165	1484	+229
	Terre Haute 8s	86	66	+1	2.09	19.57	+6.75	184	1694	+279
C	Tipton	82	62	-1	1.73	19.18	+7.28	156	1403	+184
	Indianapolis	84	66	+0	1.48	22.71	+10.72	177	1588	+184
	Indian Creek	84	65	+1	.76	19.67	+7.29	150	1583	+266
EC	Farmland	83	62	+0	.79	17.43	+5.45	137	1453	+298
	Liberty	84	63	+0	1.06	19.51	+6.61	165	1507	+187
SW	Vincennes	85	66	+0	.81	24.13	+10.75	181	1665	+192
	Dubois	86	65	+1	1.69	18.85	+4.73	181	1634	+216
	Evansville	88	70	+1	.97	18.75	+5.74	201	1803	+171
SC	Bedford	84	63	+0	.11	28.09	+14.63	146	1551	+202
	Louisville	87	69	+2	1.68	18.67	+5.54	196	1827	+238
SE	Butlerville	84	63	-1	1.61	23.78	+10.90	168	1585	+90

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

Weather Maps for 7-6-98 Unavailable

The above information is provided by Ken Scheeringa, Indiana State Climatologist (765)494-8105
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All of the pollen from a single anther may be released in as little as three minutes. Pollen shed for an individual tassel typically requires two to seven days to complete. Pollen shed for a field typically requires one to two weeks to complete due to field variability in development among plants. Approximately two to five thousand pollen grains are produced for each silk. Therefore, the amount of viable pollen available is almost never a limiting factor during pollination.

SILK EMERGENCE: GROWTH STAGE R1

The silks that emerge from the ear shoot are the functional stigmas of the female flowers. Every potential kernel (ovule) on an ear develops its own silk. Each silk must be pollinated in order for the ovule to be fertilized and develop into a kernel. Typically, up to 1000 ovules form per ear, even though we typically harvest only 400 to 600 actual kernels per ear.

Technically, growth stage R1 for a given ear is defined when even a single silk strand is visible from the tip of the husk. A field is defined as being at growth stage R1 when silks have emerged on at least 50 percent of the plants.

Silks begin to elongate from the ovules about 7 to 10 days prior to silk emergence from the husk. Dissection of young developing ears will reveal silk elongation beginning first from the basal ovules of the cob, then proceeding up the ear over time.

Similarly, silks from the basal (butt) portion of the ear typically emerge first from the husk, while the tip silks generally emerge last. Complete silk emergence from an ear generally occurs within four to eight days after the first silks appear.

As silks first emerge from husk, they lengthen as much as 1 inch per day for the first day or two, but gradually slow over the next several days. Silk elongation occurs by expansion of existing cells, so elongation rate slows as more and more cells reach maximum size.

Silk elongation stops about 10 days after silk emergence, regardless of whether pollination occurs, due to senescence of the silk tissue. Unusually long silks can be a diagnostic symptom that the ear was not successfully pollinated.

Silks remain receptive to pollen grain germination up to 10 days after silk emergence. After 10 days without being pollinated, silk receptivity decreases rapidly. Natural senescence of silk over time results in collapsed tissue that restricts continued growth of the pollen tube. Silk emergence usually occurs in close synchrony with pollen shed, so that duration of silk receptivity is normally not a concern.

POLLINATION AND FERTILIZATION

Pollen grain germination occurs within minutes after a pollen grain lands on a receptive silk. Pollen grains are 'captured' by the 'hairs' of the silks. Some people mistakenly believe that the pollen must land at the very tip of the silk to be effective.

A pollen grain germinates on a receptive silk and develops a pollen tube, containing the male genetic material, that grows inside the length of the silk and fertilizes the ovule within 24 hours. While many pollen grains may land and germinate on an individual silk, only one will fertilize the ovule. A pollen grain can land and germinate anywhere along the length of an exposed, receptive silk.

Silk clipping by certain insects not only removes viable silk tissue, but also injures a certain length of the remaining silk. Generally, silk length on injured ear shoots must be at least 1/2 inch in order that a sufficient length of viable silk tissue be exposed for pollen germination.

--Bob Nielsen, Purdue University

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