



# Integrated Pest & Crop Management

## Wet Weather Can Cause Seeds to Sprout on the Plant

by Bill Wiebold

Corn and soybean seeds possess several mechanisms that prevent sprouting before maturity. The primary mechanism is a balance between two growth hormones, gibberellic acid (GA) and abscisic acid (ABA). In general, GA promotes germination and ABA inhibits germination. The concentrations of ABA in corn and soybean seeds peak during the middle of seed filling and begin to decrease as the seeds near maturity. Before maturity, seeds are prevented from germinating even though water content and other factors would stimulate germination. After maturing, seeds of most of our grain crops are capable of germinating if conditions are favorable. Unfortunately, this also means that, seeds from normal corn and soybean plants can germinate on the ear or in the pod if certain weather events occur.

The two primary requirements for seed germination are temperature and moisture. The minimum temperature for corn and soybean seed germination is about 50°F or a little cooler. Germination can occur within a couple of days with temperatures in the 80s. This year has provided abundant number of days with temperatures conducive to rapid germination. So, the primary factor that should reduce seed germination on the plant is moisture. Critical grain moistures that stimulate germination are 30 to 50%, depending on crop. In normal years, grain dries as it matures to moisture percentages far below requirements for germination. Unfortunately, weather in late summer and early fall has included heavy rain events and heavy, long-lasting dews.

Normally, corn husks protect mature kernels from moisture that may cause germination. If the ear turns downward at maturity, the husks shed water and the

chances of kernels sprouting on the ear are almost eliminated. But, if the ear remains upward, water from rain or even a heavy dew may run down the inside of the husks and pool at the butt end of the ear. Husks trap water near the kernels and if temperatures are above 50°F kernels will likely germinate. Sprouting on the ear is almost always limited to several rows of kernels at the butt end of the ear because this is where water is trapped. But, this year occurrences of rainfalls greater than several inches may have allowed water levels in upright ears to rise higher on the ear.



For soybean, the pod wall helps prevent mature soybean seeds from absorbing water by shedding rain water. Frequent rains, continuous drizzle, or foggy days and nights can bathe the soybean pod in enough water that the water soaks through the pod wall and wets the soybean seed.

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## Wet Weather can cause Seeds to Sprout on the Plant

A more common reason for soybean seeds sprouting in the pod is that the pod wall has separated or broken. This allows water access to the seeds. During wetting and drying cycles, mature soybean seeds expand and contract. Expanding seeds exert heavy pressure on the soybean pod wall. Soybean pod walls do not expand as much as soybean seeds. The two halves of the pod wall are sutured together and these sutures can rupture if enough pressure is provided by expanding seeds. If the two halves of the pod wall separate and the seed dries and shrinks, the seed may fall from the pod. This is called shattering.



Under wet conditions, the soybean seed remains swollen and will not fall from the pod. But, the now exposed seed will likely germinate if it remains wet long enough and if the temperature is above the minimum.

Premature sprouting is quite damaging to grain quality and reduces safe storage time. During germination, seeds release enzymes that break down carbohydrates, proteins and fats. This breakdown releases free sugars, amino acids, and fatty acids. These simple compounds spoil easily in storage and stimulate fungal growth. The soybean seed coat and the corn kernel pericarp rupture during germination, and this makes the grain vulnerable to invasion by fungi and insects. Germinated seeds will crack during combining. Debris from sprouted seeds will often accumulate in the center of a bin and may be a fire hazard.

Unfortunately, sprouted seeds is a permanent damage to grain. Spread of the damage can be reduced by timely harvest and quick drying of grain to stop germination and grain deterioration. If possible, grain should be screened to remove debris before storage. Be aware that dockage at the point of sale may reduce grain price. 🌱

current Pest Alerts



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# Weather Data for the Week Ending Sept. 30, 2016

Station	County	Weekly Temperature (°F)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	Sept 1 - 30	Departure from long term avg.	Accumulated Since Apr 1	Departure from long term avg.
Corning	Atchison	74	48	81	44	60	-2	2.9	-0.35	3830	504
St. Joseph	Buchanan	71	52	78	49	61	-1	8.3	4.19	3699	386
Brunswick	Carroll	73	52	81	48	62	1	3.17	-0.22	3871	518
Albany	Gentry	71	48	77	43	59	-2	5.98	2.62	3358	111
Auxvasse	Audrain	72	54	79	49	62	0	4.42	0.53	3687	283
Vandalia	Audrain	71	54	79	50	62	0	3.48	-0.23	3679	322
Columbia-Bradford Research and Extension Center	Boone	71	53	78	48	61	-1	5.61	1.79	3595	102
Columbia-Capen Park	Boone	74	52	82	45	62	-1	4.53	0.76	3699	88
Columbia-Jefferson Farm and Gardens	Boone	72	53	79	48	62	0	6.18	2.44	3796	292
Columbia-Sanborn Field	Boone	72	55	80	50	63	0	5.53	1.7	3983	364
Columbia-South Farms	Boone	71	53	79	49	62	0	6.48	2.65	3747	249
Williamsburg	Callaway	71	52	78	47	61	-1	6.62	2.39	3545	201
Novelty	Knox	69	52	76	48	60	-1	1.78	-1.96	3438	155
Mosow Mills	Lincoln	71	54	78	49	62	0	3.67	0.06	3749	269
Linneus	Linn	70	50	78	47	60	-1	3.09	-0.32	3525	288
Monroe City	Monroe	71	53	77	50	62	1	3.59	-0.3	3636	297
Versailles	Morgan	74	52	80	48	62	-1	5.9	1.79	3913	335
Green Ridge	Pettis	73	49	80	46	60	-2	4.83	0.23	3755	381
Unionville	Putnam	68	51	74	47	59	-1	1.43	-2.89	3328	300
Lamar	Barton	74	48	79	46	61	-3	5.27	0.07	3922	188
Butler	Bates	74	49	80	47	61	-3	4.36	-0.5	3850	62
Cook Station	Crawford	71	49	77	43	60	-2	4.06	-0.2	3642	80
Round Spring	Shannon	72	48	78	44	59	-2	2.54	-1.4	3569	146
Mountain Grove	Wright	72	47	76	44	60	-1	2.74	-1.79	3552	151
Delta	Cape Girardeau	73	52	80	45	62	-2	4.05	0.65	3957	18
Cardwell	Dunklin	78	54	83	49	66	0	2.77	-0.41	4388	119
Clarkton	Dunklin	78	52	83	47	64	-2	1.56	-1.68	4306	95
Glennonville	Dunklin	77	51	81	46	64	-2	1.59	-1.58	4300	119
Charleston	Mississippi	74	52	80	47	63	-2	0.97	-2.18	4290	309
Hayward	Pemiscot	75	52	81	47	63	-3	1.15	-2.23	4214	6
Portageville	Pemiscot	77	54	82	48	65	-1	1	-2.32	4490	251
Steele	Pemiscot	79	51	84	46	65	-1	1.43	-1.77	4424	180

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

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