



# AgVantage Green Notes



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## Impact of Heavy Rains on Corn

**Potential for Lodging and Ear Rot Development**—Kiersten Wise and Charles Woloshuk, Purdue. -The recent heavy rains and winds have caused extensive damage to areas of corn in northern IN. Many fields remain flooded with the likelihood that they will not drain quickly. What about the potential for diseases that may threaten this corn? At this late stage of development the two disease threats are stalk rots and ear rots, which can reduce grain quality.

The effects of standing water on stalk rot development are relatively unknown. However, root death and added stress caused by standing water will weaken late-planted corn and increase the likelihood that stalk rot pathogens will invade the plant. Plants that had stalk rot before flooding occurred may become more severely diseased and may readily lodge in windy conditions.

If the flood water was high enough to cover the

ears of if ears lay in water because of lodging, there is an increased risk of contamination from bacteria not commonly associated with corn kernels. Ears on upright plants that are not exposed to standing water are safe from these bacteria. The only possible concern would be prolonged exposure to the high humidity generated by the standing water. Such conditions could promote growth of fungal ear rot pathogens at the tips of the ears. Whether the rot spreads down the ear or results in mycotoxin contamination of the ears prior to the flood, the temperature in the days ahead, and how long until the flood water recedes and the ground dries.

Flooded areas as well as the entire field need to be monitored for stalk rot and ear rots. Fields or areas affected with significant amounts of ear rot should be harvested and handled separately. Grain should be harvested early and dried to 15% moisture or lower.

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## Harvesting Severely Lodged Corn

By Louis Chako, Technical Information Manager, Pioneer - Corn with high yield potential may be especially vulnerable to stalk or root lodging as the ear develops and becomes weight-bearing on the plant. A number of factors may lead to corn lodging, including the following:

- Root lodging from corn rootworm feeding on roots
- Diseases such as anthracnose, Gibberella, Fusarium and Diplodia causing stalk or root deterioration
- Wind blowing over corn plants that are weakened by rootworm feeding or stalk rots
- Strong winds blowing over green corn stalks before maturity

Harvesting and handling grain from a lodged corn crop may be difficult, especially if the lodging occurred early in the season, or is so severe that the crop is flat or nearly flat on the ground. When lodging occurs, growers should carefully assess plant and field conditions and schedule the worst fields for early harvest. Harvest speed and direction of travel may need to be modified. Equipment must be adjusted properly, and specialized reels and cones may be necessary to bring the stalks into the corn head. If grain quality is reduced, proper drying and handling can prevent additional deterioration.

**Harvest Considerations -Harvest timing.** Lodged fields should generally be harvested as soon as possible, which may be earlier than grain moisture would dictate. The goal is to gather the crop before further reduction of stalk integrity or grain quality. However, if stalks are green or wet it is usually beneficial to let them dry for seven to ten days if possible. This will help move the plant material through the combine and minimize the amount of vegetative plant material in the harvested grain. In some cases, grain may be allowed to mature before harvest if this can be done without further significant reduction in crop quality.

**Lodged or standing fields first?** In most situations, it is better to harvest lodged fields or field areas before the well-standing fields. This strategy must be evaluated on a case by case basis, however. If better-standing corn is ready for harvest it may be more efficient and cost effective in some cases to harvest it first, before lodging increases there.

**Speed and direction.** In order to pick up and save more ears from lodged plants, slower than normal ground speeds are required. A general recommendation is to harvest at speeds of two to three miles per hour. Under severe stalk lodging conditions, harvesting against the direction of the lodging is usually an advantage. For example, if the corn plants are lodged toward the east, begin harvesting from the east. Harvesting from the west in this example may further lodge the plants, making it almost impossible to pick up the ears.

# Prioritizing Fertilizer Applications—Fabian G. Fernandez, U of IL

The recent increase in cost of fertilizer and other agricultural commodities calls for conscientious planning and sound strategies to continue to produce high yields while maintaining profitability. At times of high input costs, there may not be enough resources to cover all the aspects of crop production, so prioritizing resources will be key. Soil fertility decisions such as fertilizer and lime applications must be weighed against other crop production needs and farmers' goals.

When considering the nutritional needs of a crop, the goal should be to obtain the greatest return on investment by focusing on inputs that will result in the greatest profit. This concept is known as the Liebig law of the minimum. This law likens plant growth or yield to a barrel with staves of unequal lengths, in which the shortest stave determines the capacity of the barrel. In terms of soil fertility, the staves could represent soil pH, nitrogen (N), phosphorus (P), potassium (K), or other nutrients needed by the crop. Thus, the first step in assigning priorities should be to determine what is limiting the crop. While high fertilizer prices do not allow for nutrient rate applications beyond those strictly needed by the crop, high crop prices call for adequate soil fertility to maximize yield. ***In light of current commodity and crop prices and the relatively inexpensive cost of soil analysis, soil testing for pH, P, and K is probably the single most important step toward increasing profit margins.***

Once factors that likely would limit the crop have been determined, the obvious next step is to correct the potential limitation. For instance, if K levels are low and all other nutrients are in adequate supply, adding more P will not help increase yield since the crop is being limited by K. This sounds very simple, but often this concept is overlooked when people go ahead and apply "a typical rate" without first determining what is actually needed. ***Supplying the nutrient in shortest supply not only helps to maximize yield, but it also makes it possible to optimize the fertility already present in the soil. Often more than one nutrient is limiting the crop. In those situations applying at least a portion of every limiting nutrient will be a better strategy than focusing on only one of them.***

## Reminders on Seeding Wheat

**Plant after the fly free date.** The fly free date is Oct 2 in the Terre Haute area and Oct 5-6 in the Vincennes area.

**Prepare a clean even seed bed.** Wheat after soybeans can easily be no-tilled or conventional tilled. If planting wheat after wheat, corn or grassy weeds till to limit potential diseased crop residue at the soil surface. Previously diseased wheat or corn residues can increase potential for head scab at wheat flowering.

**Properly check the drill and adjust if necessary.** Check the drill's drive wheel tire pressure, disc bearings, and seed tubes and run seed through all the units to see if they are functioning normally. Calibrate and adjust the drill if necessary.

**If you plan to save seed, get your seed cleaned and treated.** Seed can be treated at any location. Seed can be treated with Incentive RTA, or Cruiser or NitroShield or both. Please call your local branch for more details.

**Select a well adapted high yielding varieties** with good powdery mildew, Stagonospora leaf blotch resistance and if you can tolerance to Fusarium head scab.

**Plant 1-1.5" deep.** Planting a consistent 1-1.5" depth allows good fall root development, reduces potential winter kill, and reduces potential yield loss in too deep or shallow wheat.

**Increase seeding rates.** Ideal seeding rates range between 1.4-1.6 million seeds/A.

**Optimize soil fertility.** Soil pH should range between 6.0-6.4, soil P between 50-70 lb/A, soil K between 250-300 lb/A.

***Soil pH has an important impact on the availability of nutrients, so checking and adjusting soil pH should be one of the first steps to consider.*** It is recommended that pH be maintained at least at 6.0 for corn and soybean. If resources allow it, it is always better to bring pH to 6.5. In a practical sense, adjusting soil pH means that if the same amount of fertilizer were to be applied at a pH below 6.0, the availability of that application would be lower than if the amount were to be applied at a pH slightly above 6.0.

Additional strategies that can help increase the efficiency of the fertilizer application include these:

- ***Applying nutrients to the portions of the field with highest likelihood of response, instead of doing an average application across an entire area*** (Editors note: - Intensive soil sampling using the Ceres Solutions AgVantage Program allows you to do this.)
- Maximizing the efficiency of the nutrient by minimizing losses and by increasing its availability
- Accounting for all nutrient sources and nutrient pools already present in the cropping system before making an application
- Determining which crop will perform better under the given conditions. For instance, if limited resources do not allow for a full rate of lime application to bring pH to the desired level, corn may be a better planting option than soybean because corn is less sensitive to lower pHs. If you plant wheat this fall, it is critical to have adequate P available. If a full P rate cannot be afforded, supply as much as possible at planting and possibly do so by seed-banding the fertilizer so the young wheat plant has access to large amounts of P during establishment.
- Not being afraid to cut or eliminate an application if soil test levels are well above the point where a response is expected. Doing this will allow resources to be used where they are truly needed.

**Apply 15-20 lb/A actual N at planting.** Applying nitrogen (N) at planting with P and K ensures good fall root development and plant health. Nitrogen can be applied at planting after wheat emergence.

**Consider applying 10-15 lb/A of actual sulfur** to wheat grown in sandy soils. Sulfur can be applied in the spring with nitrogen or part of it can be applied in the fall with the plowdown fertilizer.

**Scout fields for pests.** What pests? **Weeds and aphids** are our most yield damaging pests. Remember that aphids can vector the barley yellow dwarf virus. The weeds cheat, downy brome and chickweed are tremendous competitors to yield. **Cheat and downy brome** can easily choke out emerging wheat resulting in lower tiller numbers. And cheat and downy brome are more easily controlled in the fall. **But what about wild garlic?** Wild garlic is best controlled in the spring.

**Apply at least 90-120 lb/A actual N during spring.** Think about 1.25-1.5 lb/A total actual N per bushel wheat. Consider split application to ensure ample available N for grain fill.

If **no-tilling wheat** (assumed into soybean stubble) use combine straw choppers and set chaff spreaders when combining beans to evenly distribute residue. Select varieties that have good winter hardiness. Once you begin drilling check the field several times to ensure uniform planting depth and good seed to soil contact. **Apply a burndown before or immediately following the drill.** Again Winter annuals such as cheat, downy brome and chickweed strongly compete with wheat.

# Weed Problems in '08—Consider a Fall Weed Management Program in '09

September rains have stimulated germination and emergence of winter annual weeds. Now is the time to plan which fields are good candidates for fall herbicide applications.

So why apply a post harvest residual herbicide? If you would ask several growers why they use residual herbicides in the fall the answers would be varied. The following are common advantages:

**Warmer and improved seed bed in the spring**—Universities and crop protection companies have documented as much as 12-13 increased degrees in weed free environments compared to weedy environments in mid May. Weed free environments measured in the high 60's F whereas weedy environments measured in the mid 50's F. Those tremendous differences in soil temperatures could translate into quicker emergence and the potential for increased yield.

**Optimizing yield through more timely and improve seed to soil contact.** Both of these go hand in hand. More timely planting in conjunction with good seed to soil contact could have a huge impact on improved yield when the whole field emerges earlier and at the same time.

**Reduced spring workload**—Think of all those springs where we have one to two days of good planting followed by rain followed by a few single days of planting and more rain (**Spring 2008 ring a bell?**). Just imagine how timely you could plant if some of your workload was handled with the previous falls residual herbicide application. ***Even if you plan to till before planting, the tillage passes could be reduced down to one shallow pass immediately followed by planting.***

**Reduce soybean cyst nematode weed hosts**—Purdue recently

## Just Stuff

Update on Soybean Rust—By Kiersten Wise and Greg Shaner, Purdue—The recent hurricane activity in the Gulf has increased soybean rust spread in the southern U.S. There is now concern that rains from hurricanes may have transported spores into the Midwest. Whether soybean rust will develop in Indiana over the next few weeks depends on whether viable soybean rust spores were deposited in the area from Hurricanes Gustav and Ike, and if conditions in Indiana remain favorable for spore germination and infection (high humidity and rainy weather).

Soybean rust is economically damaging to soybeans in [growth stages R1 to R5](#). Once the plant is at R6, there is usually no need to manage soybean rust. Currently in Indiana, most of our soybean acreage is at R6 or later, and to these growers soybean rust is a non-issue for 2008. There is some acreage of double-cropped soybean (and late planted soybeans) in the southern part of the state that is still at R4 to R5, and growers may need to deal with rust in these fields.

We are continuing to monitor sentinel plots and late-planted commercial fields in the state for soybean rust and will post updates on our findings throughout the remainder of the growing season. If you suspect a soybean field is infected with rust, please contact Kiersten Wise at (765) 496-2170. For the most recent information, please call the Purdue Soybean Rust Extension Hotline at 1-866-458-RUST (7878) or go to the USDA Soybean Rust website at [www.sbrusa.net](http://www.sbrusa.net).

**Bean Leaf Beetle Pod Feeding on Late Soybeans**—John Obermeyer and Larry Bledsoe, Purdue—Soybeans grown for seed or especially late-planted or late-maturing beans should be monitored for bean leaf beetle damage as leaves begin to yellow and pods remain green. Bean leaf beetles scar the surface of pods, but only occasionally feed through the pod to the developing beans. During pod maturation, this scar often cracks leaving an entry hole for airborne plant pathogens that may cause discolored, moldy, shriveled, or diseased beans that show no outward signs of the pathogen.

documented in the field and lab several winter annual weeds such as henbit, purple deadnettle and shepherds purse that can serve as strong to moderate hosts for SCN (we can find some henbit or deadnettle in 90% of fields). And a 2005 U of IL survey indicated 83% of IL fields have soybean cyst nematode populations high enough to significantly hurt yield. One of the best ways to manage cyst nematodes is to manage the soil population. Consider fall applied residuals as one management tool.

**Improve in-crop Roundup Original Max/ PowerMax activity on tough to control weeds.** Were emerged weeds harder to control this year compared to years past? Did marehail, lambsquarter, morningglory, giant ragweed, barnyardgrass or fall panicum give you fits? Fall or early spring residual herbicides can help your in-season weed control products work better.

**Minimize the field's attraction to black cutworms and armyworms.** Residual herbicides will reduce the number of winter annual weeds and thus fields will not be attractive to these pests.

Ceres Solutions has several tried and true weed control programs with residual herbicides for fields going to corn or soybeans in 2009. We can start applying soil residuals now.

In September concentrate on corn stalks rotating to soybeans first and use the highest recommended rates of Scepter or Canopy EX for your given area. Be sure to add 2,4-D to all applications. Simazine applications on fields rotating to corn would be best started in October, however be scout before application to ensure that no grass has started to emerge. Burndown programs with no residuals should be applied in late October. See your Ceres Solutions Professionals for product and rate recommendations

It is important for pest managers to be able to predict whether economic damage will occur based on the types and numbers of beetles that are present and the stage of pod development (i.e. green, yellow, yellow-brown, or brown pods). Once the pods turn yellow to yellow-brown they become less attractive and less susceptible to damage. Control is normally not warranted from this point on.

To check for damage and the need for control randomly select 2 plants in each to 5 areas of the field and count the number of pods per plant and the number that show damage (10 total plants). Calculate the percentage of damaged pods per plant for the field as a whole. Note if the pods are green, beginning to turn yellow, or are yellow/brown. Also determine the number of beetles per sweep using and insect sweep net. Take 5 sets of 20 sweeps in the field. Determine the number of bean leaf beetles per sweep. Additionally, note whether beetles are still actively feeding while surveying the field.

There has been considerable interest in bean leaf beetle and its association with bean pod mottle virus (BPMV). Bean leaf beetle is one of the major beetle-vectors of this disease. They spread the virus by feeding on infected plants, ingesting the virus with plant tissue, and then regurgitating gut content after moving to and feeding on an uninfected plant.

Treat for bean leaf beetle pod feeding if: pod injury is greater than 12%, beetles are greater than 3 per sweep and pods are still green, or if pod injury level is 8-12% and beetles range from 3-5 per sweep and pods are still green or if pod injury level is less than 8%, beetle sweep number is greater than 5 and pods are still green.

As you sweep for bean leaf beetles count the number of green stink bugs. Control is warranted if greater 40 beetles per 100 sweeps are found.

# Grain Update

Soybeans

Fall 08 -1.14 10.29  
Jan 09 -1.10 10.49

## USDA Summary—Aug 12, 2008

Estimates in Million Bushels

	Aug USDA—08/09	Aug USDA-08/09
<b>Corn</b>		
Carry-in	1576	1576
Production	12,072	12,288
Total Supply	13,663	13,878
Feed and Residual	5200	5,300
Ethanol	4100	4100
Exports	2,000	2,000
Total Use	12,645	12,745
Carry-out	1,018	1,133
<b>Soybeans</b>		
Carry-in	140	135
Production	2,934	2,973
Total Supply	3,084	3,116
Crush	1,785	1,815
Exports	1,000	1,000
Seed	90	90
Residual	74	76
Total Use	2,949	2,980
Carry-out	135	135
<b>Wheat</b>		
Carry-in	306	306
Production	2,462	2,462
Total Supply	2,868	2,868
Food	960	960
Seed	84	84
Feed & Resid	250	250
Exports	1000	1,000
Total Use	2,294	2,294
Carry-out	574	574

Delivery, Basis and Cash Bids for Ceres Solutions Elevators as of Friday July 11th.

	Delivery	Basis	Cash
<b>Pleasant Ridge</b>			
# 2 Yellow Corn	Fall 08	-0.46	5.14
	Dec 08	-0.42	5.18
Soybeans	Fall 08	-0.90	11.07
	Jan 09	-0.90	11.24
<b>Kersey</b>			
# 2 Yellow Corn	Fall 08	-0.58	5.02
	Dec 08	-0.54	5.06
Soybeans	Fall 08	-1.02	10.95
	Jan 09	-1.02	11.12
<b>Roselawn</b>			
# 2 Yellow Corn	Fall 08	-0.58	5.02
	Dec 08	-0.54	5.06
Soybeans	Fall 08	-1.02	10.95
	Jan 09	-1.02	11.12
<b>Teft</b>			
# 2 Yellow Corn	Fall 08	-0.59	5.01
	Dec 08	-0.55	5.05
Soybeans	Fall 08	-0.21	11.91
	Dec 08	-1.18	10.94
<b>Ade</b>			
# 2 Yellow Corn	Fall 08	-0.56	5.02
	Dec 08	-0.67	5.06
Soybeans	Fall 08	-1.03	10.94
	Jan 09	-1.03	11.11
<b>Cherry &amp; Whitesville</b>			
# 2 Yellow Corn	Fall 08	-0.55	4.87
	Jan 09	-0.41	5.18
Soybeans	Fall 08	-0.86	10.58
	Dec 08	-0.80	10.79
<b>Wingate</b>			
# 2 Yellow Corn	Fall 08	-0.58	4.84
	Jan 09	-0.49	5.10
Soybeans	Fall 08	-0.88	10.55
	Jan 09	-0.81	10.78
<b>Browns Valley</b>			
# 2 Yellow Corn	Fall 08	-0.63	4.79
	Jan 09	-0.53	5.06
Soybeans	Fall 08	-0.94	10.49
	Jan 09	-0.86	10.73
<b>Brazil</b>			
# 2 Yellow Corn	Fall 08	-0.65	4.77
	Dec 08	-0.73	4.86
Soybeans	Fall 08	-1.20	10.24
	Jan 09	-1.10	10.49
<b>Clay City</b>			
# 2 Yellow Corn	Fall 08	-0.67	4.75
	Dec 08	-0.74	4.85

## Harvesting Down Corn Cont.

**Strategies for flat fields.** If the crop or ears are eight to ten inches or more above ground level then it will likely dry to some extent and the corn can be harvested with a low profile corn head. If the crop or ears are 4-6 inches or less above ground level than the corn will not likely dry and a reel mounted on a corn head or a soybean platform may need to be used to get the crop harvested. Some fields may lodge worse as time progresses, especially if a stalk rotting disease such as anthracnose is present. Watch these fields closely. You may need to compromise between letting the corn dry and harvesting before stalk lodging becomes worse.

**Soybean platform head may help.** If plants are extremely lodged and stalks and roots are badly deteriorated, a high number of ears may be lost over the outside snouts of a regular corn head. This is especially true if roots are easily pulled from the soil during harvest. In such cases another harvest option is to use a soybean platform head to completely cut the plants off. This may reduce the instances of corn trash plugging the head as well.

### Yield Losses From Lodging

The earlier that lodging occurs in the development of the plant, the greater the resulting yield losses. This is because lodging disrupts the flow of water and nutrients from the soil to the ear.

There are no reliable studies that have measured yield losses from corn lodging that occurs between pollination and maturity. However, when lodging occurs while stalks and plants are still green ("green crimping"), the effects may be similar to that of frost or other premature death of the corn plant. It is therefore worth reviewing two pieces of information that may provide some indication of yield loss when plant death occurs before maturity.

The chart below shows the amount of expected yield loss if plant death or nutrient and water flow is completely disrupted in the plant such as with a severe frost. Note that if plants have kernels with 1/2 milk line (R5.5) the plant still may produce 88% of "normal" yield.

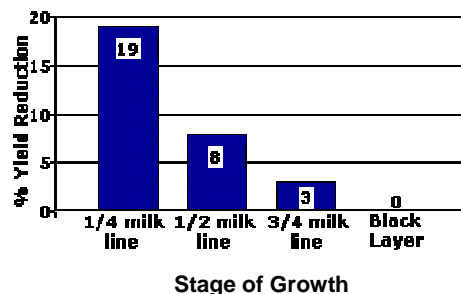
**Table 1.** Potential grain yield losses after killing frost (both leaves and stalk killed).

Corn Development Stage	Percent Yield Loss
R4 (Soft dough)	55
R5 (Dent)	40
R6 (50% kernel milk)	12
R6 (Black Layer)	0

Derived from Afuakwa and Crookston, 1984.

In a second study corn plants were killed by cutting off the stalk above the ear and removing the living leaves at and below the ear. Yield loss ranged from three to nineteen percent, depending on the stage of plant development when the plants were killed.

**Yield Reduction Due to Premature Plant Death**



**Figure 1.** Yield reduction due to premature plant death. Avg. for 6 hybrids over 3 years. PHII - Plains Sales Area.