



Fall Flooding Damage to Corn

Although spring flooding of crops is a much more common problem, heavy rainfall in late summer and fall occasionally leads to flooding of fields at or near crop maturity. The extent of damage from fall flooding depends on the crop, stage of maturity, depth of flood waters, period of flooding, amount of lodging caused by flowing water, and other environmental factors. This *Field Facts* will discuss fall flooding damage to corn.

Flooding Damage is Variable

By virtue of ear height alone, corn fields at maturity are tolerant to moderate levels of flooding. However, flood waters that encompass the ear can cause severe grain quality reductions. Flowing flood waters can also cause lodging of corn plants or weaken roots and stalks so that future lodging is a risk.



Immature corn – If corn kernels have not reached physiological maturity, prolonged flooding may slow further yield accumulation. Yield losses would be similar to those caused by other weather conditions that result in premature plant death, including drought, frost or disease (Figure 1). In such cases, yield loss is closely tied to the stage of maturity when damage occurs, and the extent of damage to the plant as a whole. In many cases, damaged plants can still accumulate yield by translocating carbohydrates from stalks, leaves and roots to developing kernels.

Lodging – Few objects in nature can resist flowing water, including corn roots and stalks. Lodging may be evident immediately when flood waters recede, or it may occur later as weakened roots or stalks eventually succumb to fall wind and weather events. Diseases may be transmitted to roots and stalks

during even moderate flooding. In addition, lodging places the ear near ground level where it may be submerged and subject to deterioration of grain quality. Where flooding results in lodging, fields should be monitored closely and harvested as soon as practical.

Grain Quality – If ears are submerged by flood waters, grain quality will likely be the primary concern for growers. In addition to period of submersion, corn stage of maturity and weather conditions following flooding determine effect on grain quality. If corn ears that have reached maturity are soaked by flood waters or constant rainfall, “premature sprouting” or “vivipary” of kernels may result (Figure 2).



Stage R5
Beginning Dent
Milk line just starting to appear.
Grain Moist. ~50-55%
~400 GDU's remaining to maturity
Yield Loss ~ 30-40%



Stage R5.5
1/2 milk line
Grain Moist. ~40-45%
~200 GDU's remaining to maturity
Yield loss ~ 10-15%



Stage R6
Black Layer or “No Milk Line”
Grain Moist. ~30-35%
0 GDU's remaining to maturity
Yield loss = 0%

Figure 1. Kernel growth stages and approximate grain moisture, GDU's to maturity (black layer or “no milk line”), and yield losses when photosynthesis ceases due to plant damage.



Figure 2. Corn ear with sprouted kernels.

Harvest of Flooded Fields

Scouting fields and scheduling harvest based on crop condition as well as grain moisture are essential in flooded fields. Harvesting some fields early, at grain moistures near 25%, may be necessary to prevent further deterioration of grain quality. On other fields that have retained root, stalk and grain quality, compaction can be prevented by harvesting later, allowing fields to adequately dry.



When grain quality is low, adjust combine settings to minimize trash and broken kernels. Check with the combine manufacturer for machine-specific recommendations. (Combine mechanics or other dealership staff are often a good source for this information.)

Drying and Storage of Lower Quality Grain

Proper storing, drying and maintaining grain quality will minimize problems of flood damaged and sprouted grain.

- In badly damaged fields with significant ear rots:
 - Begin harvest when grain is at 25% moisture and dry to 15% or lower within 24 to 48 hours.
 - Harvest and store grain from these fields separately.
 - Test grain for mycotoxins to determine marketing channels.
- Clean bins, areas around bins and all grain handling equipment before putting grain in storage.
- Clean grain going into storage by screening or gravity separator to remove lightweight and broken kernels, foreign material and fines.
- Corn going into long-term storage should be dried to 13% moisture and cooled to 30°F.
- Aerate grain to equalized temperatures throughout the grain mass.
- When using in-bin drying systems, limit grain depth to quickly dry corn.
- Check stored grain regularly and aerate to maintain low moisture and proper temperatures.
- Hot spots need to be eliminated by stirring and cooling or removing grain from the bin.

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September 2010