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## Mid-Season Flooding: Impact on Corn Ear Fill

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**Abstract**

Severe, localized flooding has occurred recently in eastern Iowa specifically Delaware, Jones, and Jackson counties. For some producers, their corn fields had flood waters up to the tassel. The impact on the corn crop is in question and possible outcomes are discussed here.

**Keywords**

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### Mid-Season Flooding: Impact on Corn Ear Fill

By Roger Elmore and Lori Abendroth, Department of Agronomy

Severe, localized flooding has occurred recently in eastern Iowa specifically Delaware, Jones, and Jackson counties. For some producers, their corn fields had flood waters up to the tassel. The impact on the corn crop is in question and possible outcomes are discussed here.

At the time of the flooding, most corn in these areas ranged in development from tasseling (VT) to blister stage (R2). One question is what impact the sudden, short-term flooding will have on corn grain yield? This type of flooding is extremely rare so the information available and our personal experiences with it are limited. A report published in 2004 by Dr. Peter Thomison, Extension Corn Agronomist at Ohio State University, provides some information on what may occur. Dr. Thomison discussed the impact following a flood that occurred at the dent stage (R5):

*"...The impact of this flood damage on corn will be highly dependent on kernel stage of development, length of the flooding period, how much of the corn plant was immersed during flooding, and subsequent weather conditions...A major concern is the impact of flooding on grain and silage quality. In past reports, when corn in the dent stage was covered by flood water for six hours or more and nearly completely caked with mud for up to two weeks, damage from ear rots and premature kernel sprouting was extensive in those areas of fields where water had covered the ears the longest. Although such damage may be negligible in fields where water never covered the ears, prolonged flooding may cause significant injury to the roots, if not premature root death. Such plants will be more vulnerable to stalk rots thereby increasing the likelihood of stalk lodging..."*

With this in mind, we can speculate on the situation in eastern Iowa:

#### Damage depends on the crops developmental stage

- The crop was at tasseling (VT) or silking (R1). Tasseling may proceed with little or no delay but silking will be delayed. This comes from the fact that silk emergence is affected by stress more than tasseling, which is related more to heat-unit accumulation. If the delay in silking is great, pollen may not be available when silks emerge. Kernel set could be limited and yield losses severe. On the other hand, if silks are not delayed and tassels unaffected, kernel set may occur normally.
- The crop was at blister stage (R2) or later. If flood waters penetrated the husk and warm temperatures follow the flood, as they have done, expect ear rots and lower yield potential. Dr. Thomison, 1995, states, "Research indicates that the oxygen concentration approaches zero after 24-hours in a flooded soil. Without oxygen, the plant cannot perform critical life sustaining functions, such as nutrient and water uptake is impaired, root growth is inhibited, etc. Even if flooding doesn't kill plants outright it may have a long term negative impact on crop performance."

### **Length of flooding**

The longer the period of submersion, the more chance of yield losses. Plants under water and roots in saturated soils are limited in their ability to function.

### **Water level**

If the ears were not covered with flood water, we expect less yield loss. However, if the ears were covered the loss will be greater since we expect water to have penetrated the husks. Once corn reaches silking, shallow depths of flooding will not cause noticeable damage.

### **Type of materials deposited**

If silt and sand are deposited onto the plants during the flood this will hamper recovery. If the flood waters contained less debris and/or significant rain falls on the crop soon after, this should help significantly as there will be less potential for disease infection. If the crop needs to be cut for silage, having the plants silt-free will be necessary.

### **Plant standability**

Stalk and root lodging will likely increase in flooded fields; monitor these fields closely as harvest approaches.

Remember that at blister stage (R2) less than 10 percent of the grain dry matter is accumulated. Stresses experienced recently by flooded corn can reduce yield significantly. When the waters recede and the crop has a chance to recover, examine plant and ear status as soon as possible.

### **References**

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