



# Agronomic Alert

## Corn Management in Flooded Fields

- Heavy rains have caused flooding in corn fields, which could negatively affect yield potential and cause other problems.
- Plant survival, potential nitrogen loss, and soil crusting should be considered when deciding on management options.
- Removing a poor corn stand and reseeding with corn or soybeans may be desirable if there is adequate time in the growing season, soils are dry, and herbicide labels have an allowable re-cropping interval.

### Survival of Corn Plants

The effects of flooding on yield potential depend on the growth stage of the corn plant, length of time the flooding occurs, and temperature.

In order for a corn plant to survive, it needs oxygen. Once a corn field has been flooded, it takes only about 48 hours for the corn plant to be depleted of oxygen.<sup>1,2</sup>

Corn plants at or below the soil surface are at the highest risk of dying when the field is flooded. Submerged seedlings that are at or below the soil surface can survive for 2 to 4 days.<sup>2</sup> Emerged corn and corn with a growing point above water have a better chance of survival.

Temperature is one of the most critical components of plant survival while the field is flooded. If temperatures are above 70° F, the plant may not survive 24 hours beneath water.<sup>1</sup> If temperatures are cooler (<70° F), corn with fewer than six leaves can survive approximately 4 days of flooding.<sup>1</sup>

### Potential Flooding Problems

Corn fields that are submerged for more than two days could suffer significant loss of nitrogen (N) through denitrification or leaching. Saturated soils result in denitrification, which tends to be more prevalent in heavier-textured soils, whereas leaching is more prevalent in sandy soils.

Soil moisture can increase N losses due to denitrification. Research conducted in Nebraska indicated approximately a 10% and 25% nitrate loss when soil is saturated for 5 and 10 days, respectively. This was reported while soil temperatures were between 55 and 60° F.<sup>3</sup> If a considerable amount of N was lost in your field, then sidedressing more N is a possible solution.

Soil crusting could also be an issue. As wet soils dry, a crust layer can form on the soil surface. The crust layer can delay or prevent seedling emergence. Crusting may be more common in fields with fine textured soils, low organic matter, and little surface residue, especially where excessive tillage has taken place.<sup>4</sup> A rotary hoe can break up the crust and aid seedling emergence. Timing is essential, and breaking the crust as soon as possible is most beneficial. If seeds are not infected with disease, cooler soils can allow seedlings to survive longer when trying to break through the crust.

### Scouting and Replanting Options

It is important to scout corn fields 3 to 5 days after the water has receded.<sup>1,2</sup> Pull up seedlings and look at the growing point. A white or cream-colored growing point that is still firm means the plant is recovering. Growing points that are darkening and soft are beginning to die.<sup>2</sup> Stand counts need to be taken to see if a desirable plant stand survived.

Several options are available if you need to replant a field. More geography and timing specific information on stand evaluation and replant decisions can be found from state Extension offices. If replanting with corn, minimum or no tillage is recommended to maintain efficacy of any herbicides and/or soil insecticides already applied to the field.

Switching to alternative crops when replanting corn fields must be carefully considered. Before replanting with soybeans, check your herbicide label and consult local experts to determine if the previously applied corn herbicides could damage the replanted crop. It is important to scout fields entirely before making the decision to replant.

**Sources:** <sup>1</sup> Elmore, R. Daugherty, R.B. and Mueller, N. 2015. Corn and soybean survival in saturated and flooded soils. University of Nebraska—Lincoln. [cropwatch.unl.edu](http://cropwatch.unl.edu).  
<sup>2</sup> Thomison, P. Ponding effects on corn. May 15, 2006. Corn Newsletter. Ohio State University Extension.  
<sup>3</sup> 2014. Estimating nitrogen fertilizer losses. University of Nebraska—Lincoln.  
<sup>4</sup> Al-Kaisi, M. and Pedersen, P. 2007. Wet conditions: challenges and opportunities. Iowa State University Extension. Integrated Crop Management. ICM > 2007 > IC-498 (9).  
Web sources verified 05/14/15



Figure 1. Some corn younger than the 6-leaf stage can survive 4 days of flooding.<sup>1</sup>

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology, Development & Agronomy by Monsanto.

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