

AGRONOMIC ALERT



Corn Management in Flooded Fields

Recent heavy rains have caused flooding in corn fields, which could negatively affect yield potential and cause other problems. Plant survival and potential nitrogen loss should be considered when deciding what management actions to take.

Survival of Corn Plants

The effects of flooding on yield potential depend on the developmental 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 your corn field has been flooded, it takes only about 48 hours for the corn plant to be depleted of oxygen.

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; however, some plants can be killed after being submerged in water for only a few hours. 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 77° F, the plant may not survive 24 hours beneath water. Cooler temperatures, below 77° F, help the seedlings survive longer.



Potential Flooding Problems

Corn fields that are submerged for more than two days could suffer significant loss of nitrogen 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 nitrogen (N) losses due to denitrification. Research conducted in Illinois¹ indicated approximately a 4 to 5% nitrate nitrogen loss via denitrification for each day that soils were saturated, when soil temperatures are above 65° F to 70° F. In this study, an all-nitrate fertilizer was applied when corn was in the V1 to V3 growth stage. If a considerable amount of N was lost in your field, then sidedressing more N is a possible solution.

Generally, a corn plant can survive 2 to 4 days of flooding prior to the 6-leaf stage.

Scouting and Replanting Options

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

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Several options are available if you need to replant your field. Please refer to the [Agronomic ALERT - "Corn Replanting Decisions"](#) for more information on stand evaluation and replant decisions. 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 your local experts to determine if the previously applied corn herbicides will hurt the replanted crop. It is important to scout your fields entirely before making the decision to replant.

If the decision is made to replant, consider no-tilling into these fields after the water recedes and soil has dried. Often, warmer temperatures improve surface drying, but underneath the soil is still heavy and easily compacted by tillage equipment. This compaction can show up later in the year in the form of restricted rooting that can be especially harmful to a late-planted crop. No-till can reduce compaction from tillage equipment and allow earlier planting by focusing labor and equipment into planting. Additionally, emergence issues sometimes associated with no-till are not much of a concern when planting into warm, moist soils.

If you have questions about corn management in flooded fields this spring, contact your local agronomist.



Sources: ¹H. Torbert and others. 1993. Short-term excess water impact on corn yield and nitrogen recovery. *Journal of Production Agriculture* 6:337-344.

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