



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

Hardin County Extension News Release

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Cold Weather Impact on Corn and Soybean

Hardin County - In Ohio, between May 9 and 10, temperatures were as low as 26°F with some areas even receiving snow. The effect on corn and soybean depends on both temperature, duration of low temperature, and growth stage of the plant. The soil can provide some temperature buffering capacity, especially if soil is wet. Water is approximately 4 times more resistant to temperature changes than air or dry soil, and thus will buffer the soil from experiencing large temperature changes as air temperatures drop. Deeper planted seeds may also be more resistant to large temperature swings.

Imbibitional chilling: Imbibitional chilling may occur in corn and soybean seeds if the soil temperature is below 50°F when the seed imbibes (rapidly takes up water from the soil, usually 24 hours after planting). Imbibitional chilling can cause reductions in stand and seedling vigor. If seeds were planted into soil at least 50°F (and have imbibed), the temperature drop is not likely a problem if the plants have not yet emerged from the soil.

Corn after germination: The growing point of corn is below the soil surface until the V6 growth stage, and therefore is protected from low temperatures to some extent. However, if the soil temperature falls below 28°F, this can be lethal to corn. Temperatures between 28 to 32°F may result in frost damage, and both the temperature and duration will affect the severity of damage. Between May 9 and May 10, the minimum soil temperature at a 2-inch depth was 38°F at the Northwest Agricultural Research Station in Wood County, 44°F at the Ohio Agricultural Research and Development Center in Wayne County, and 58°F at the Western Agricultural Research Station in Clark County.

Soybean after germination: The growing point of soybean is above the ground when the cotyledons are above the soil surface. If damage occurs above the cotyledons, the plant will likely recover. If damage occurs below the cotyledons, the plant will die. Look for a discolored hypocotyl (the “crook” of the soybean that first emerges from the ground), which indicates that damage occurred below the cotyledons.

Assessing your fields: It is best to assess damage to plants or seeds 48 to 96 hours after the temperature drop, as symptoms may take a few days to appear. Additionally, cold temperatures slow Growing Degree Day (GDD) accumulation and may further delay crop emergence. For corn, recent work suggests 50% emergence can be expected following accumulation of 130-170 soil GDDs (using soil temperature to calculate GDD rather than air temperatures) from planting, which may take 5-7 days to accumulate under normal weather conditions.

Article written by Alexander Lindsey - OSU Extension, Corn Research and Laura Lindsey – OSU Extension, Soybean Specialist. Edited by Mark Badertscher-OSU Extension, Hardin County.