

ANR-0151

Managing Corn in Response to Severe Storms and Short-Term Stressors

Table 1. Summary of short-term weather stresses, corn injury/concern, and management responses. Adapted from [Lindsey et al., 2024](#).

Stress Source	Corn Injury/Concern	Management Responses
<p>Cold Temperatures (Early-Season and Late-Season)</p>	<p>Imbibition of cold water can damage seed and prevent crop emergence.</p>	<p>Avoid cold water uptake and soil temperatures below 46°F in the first 24hrs post-planting (plant once low temps are greater than 46°F).</p>
	<p>Delaying emergence after germination can lead to cold damage of coleoptile, delayed mesocotyl elongation, and potential damage from pests and herbicide injury.</p>	<p>Choose planting dates to avoid soil temperatures <39°F during the crop emergence window. Conduct a seedling vigor assay on seed lots prior to planting if cold damage is a concern. Increase planting depth slightly to minimize wide temperature fluctuations to avoid leafing out underground. Consider soil tillage and residue management to balance water management and temperature fluctuations.</p>
	<p>Death of leaf tissue or entire plants during vegetative stages, followed by delays in flowering date and increased grain moisture at harvest.</p>	<p>Stagger planting dates and relative maturities to counteract changes in developmental stage progression and mitigate effects of cold stress. Assess survival 3-5 days after cold events. Consider re-planting based on stand loss, original planting date, forecasted weather and potential re-plant date. Avoid clipping desiccated tissue to alleviate unfurling leaf restriction. Consider P fertilizer at planting to encourage early-season growth. Consider tillage, crop residue, and weed management options to minimize cooler temperatures.</p>
	<p>Death of leaf tissue or entire plants during grain filling stages; kernel quality (e.g., test weight) declines; kernels will be more prone to damage and post-harvest issues during marketing and storage.</p>	<p>Select planting dates and relative maturities to minimize likelihood of occurrence of cold damage events. Adjust harvesting settings to reduce kernel damage or losses. Store frost-killed grain at lower temperatures. Watch for diseases prior to and after harvest. Adjust harvest equipment to reduce fines if grain quality is a concern.</p>
<p>Excess Water (Waterlogged and/or Flooded) (cont.)</p>	<p>Warm temperatures (>68°F) and duration of flooding (>48hr) can decrease seed survival and emergence.</p>	<p>Avoid planting before a heavy rain. Employ practices that increase soil water infiltration. Alleviate surface compaction. Consider replanting if stand reduction and new planting date would result in yield gain or faster canopy closure.</p>
	<p>Flooding during vegetative stages is more detrimental to yield than during pollination or grain filling.</p>	<p>Improve soil water infiltration and drainage (e.g., tile drainage, tillage to alleviate soil compaction). Consider delaying N applications until V4-V6 stages to reduce losses and improve crop nutrient uptake. Foliar sprays of some hormones or signaling molecules may help with crop recovery post-waterlogging but limited field-testing data is available.</p>

continued next page

Stress Source	Corn Injury/Concern	Management Responses
Excess Water (Waterlogged and/or Flooded)	Soil particulate deposition on tissue can limit photosynthesis, heat tissue and cause death, and cause contamination issues affecting quality and marketability (e.g., silage).	Improve edge of field waterways to minimize flooding occurrence, especially in moderate to high-risk areas (e.g., river bottoms, heavy clay areas). Irrigate crop with lower volume applications to wash particulates off tissue (if available).
Hail and Defoliation	Reduction in plant stands and increased weed competition; yield loss before the V5 stage can be low.	Replanting with corn or other shorter-season crops is an option. Accurate assessments at least one week after the storm and consulting with the crop insurance agent and an agronomist is recommended. Use residual herbicides to extend weed control window.
	Leaf defoliation and stalk damage from V10 stage to tasseling or silking; yield losses up to 100% can occur and tassel deformation is possible, which can affect pollination and yields	Select hybrids with canopy structure less prone to damage. Consider altering row spacing and relative maturity to spread risk for damage. Use of the leaf collar method for staging corn to estimate losses due to hail as the horizontal leaf method (commonly used by crop adjustors) can be difficult to use when leaves are shredded.
	From tasseling until maturity, yield losses decrease over time as kernels become more numerous and better established. Defoliation can also affect grain and silage quality (starch, oil, protein, mycotoxins).	Foliar fungicide at VT (or later) do not usually help with recovery but can protect against disease if pressure is high (minimal effect with low disease pressure on preserving yield). If corn use is feed, some species may be more tolerant to poorer grain quality issues than others. Harvesting for silage earlier in the season can be a possibility to avoid further disease development and preserve quality.
Wind Damage and Lodging (cont.)	Lodging prior to V10 stage caused by poor root development can affect early season growth and potentially crop stands.	Ensure adequate planting depth to moisture, and good seed furrow and closure is present; assess recovery of lodged plants and determine remaining stand when deciding on replanting. There may be a range in lodging susceptibility for hybrids and should be considered when selecting them.

continued next page

Stress Source	Corn Injury/Concern	Management Responses
Wind Damage and Lodging	Root lodging severity and stage can affect recovery and yield losses.	Hybrid selection is important for prevention/recovery (e.g., short-statured). Increased seeding rates are more susceptible to lodging (reports on 1.4% increase per 1000 seed/ac increase). Assess root systems for damage after event to determine other potential causes (e.g., rootworm feeding, soil compaction). Harvesting lodged corn may require specialized equipment (e.g., reel attachment on header). Consider insurance classes that account for harvest losses following lodging.
	Greensnap can result in late-vegetative stand reductions that could affect grain yield production; willowing is a newer phenomenon with little documentation in peer-reviewed literature.	Lower seeding rates (<36,000 plants/ac) are more prone to yield losses. Hybrid selection for tolerance can help minimize issues. Consider varying row orientations from field to field to spread risk. Follow label directions for crop height when using growth regulator herbicides to reduce likelihood of stem brittleness or snapping.
	Stalk lodging can cause issues with harvest logistics, yield loss, and grain quality.	Harvest lodging susceptible hybrids first. Consider an in-season fungicide application to prevent end of season stalk quality diseases. May need to adjust harvest direction and speed if lodging is present. Consider insurance options to account for ear losses at harvest due to lodging.