

Extreme Weather: What Illinois Farmers Need to Know

High Winds and Derechos



What Is a High Wind Event?

The National Weather Service (NWS) characterizes a high wind event as sustained winds of approximately 40 mph (64 km/h) or greater for one hour or longer. It also includes events with gusts of 58 mph (93 km/h) or greater for any duration, which are strong enough to cause infrastructure and crop damage. High winds are often caused by strong convective storms but can also occur without storms or precipitation at any time of the year.

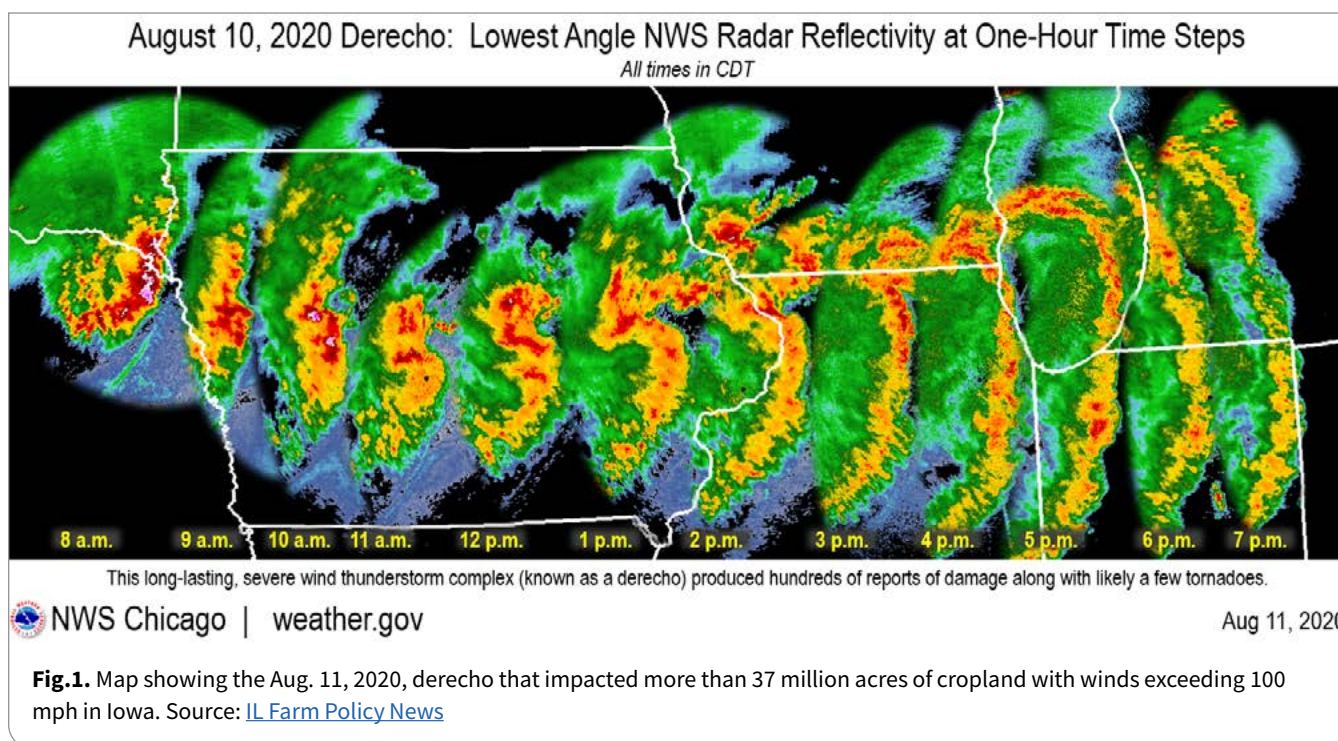
What Is a Derecho?

A derecho is a particular kind of severe convective windstorm that is a long-lived, fast-moving band of thunderstorms that produces widespread, straight-line wind damage. The National Oceanic and Atmospheric Administration's Storm Prediction Center classifies a wind event as a derecho if it produces a damage swath hundreds of miles wide and includes widespread wind gusts of at least 58 mph (93 km/h) along much of its path.

Derechos commonly contain numerous [downbursts/microbursts](#) and can cause damage similar to tornadoes but in a straight line. The NWS storm path timestamp image in Figure 1 shows an example from 2020.

Impacts of High Winds and Derechos

- People and animal health and safety can be threatened by increased dust, reduced vision, and flying debris.
- High winds can contribute to significant soil erosion and nutrient loss.
- Crops can be directly damaged by strong winds. See the photos below and watch this [video](#), listed first in sources, about assessing corn damage from derechos.
- Fallen power lines and/or broken gas connections can create hazardous conditions, result in power outages lasting from hours to weeks, and cause damage to critical infrastructure.



Areas at Most Risk for High Winds and Derechos

High winds and derechos have historically been most likely to occur in northern Illinois (among the highest frequencies in the world), but still are possible in central and southern portions of the state. Most derechos occur in the summer, between June and August. It is not yet known whether high winds and derechos are likely to become more common or more severe with changing climate conditions. However, derechos are a common part of Illinois' climate, and they will continue to occur in the future.



Fig. 2. Wind damage to wheat. Photo by Hans Schmitz



Fig. 3. Wind damage to corn. Photo by Hans Schmitz

Farm Management Recommendations

Plant Windbreaks and Buffer Strips

- Permanent vegetation can reduce near-surface wind speeds, lowering wind stress on crops and farm buildings.
- Multi-row windbreak designs can provide substantially greater protection.
- Especially on highly erodible lands or marginal croplands, buffer strips can support greater soil stability, disrupt wind and reduce wind speeds, and trap sediment that does get dislodged by wind.



Fig. 4. Derecho damage to grain bins. Source: [National Weather Service](#)

Maintain Surface Residues and Soil Covers

- Reduce tillage and increase surface residues to reduce wind erosion and evaporative losses to help maintain soil moisture.
- Plant cover crops and other living covers, add canopy, and increase surface roughness to intercept wind, provide root structures that bind soils, and reduce dust, soil erosion, and plant uprooting.

Protect Farm Personnel, Infrastructure, and Animals with Sturdy Structural Shelters and Regular Maintenance Checks

- Annually check any agricultural structures that are not visited or used on a regular basis. Check for any damages to latches, doors, or components that are misshapen or warped that would prevent secure closing.
- Before storm season, proactively develop an inventory of all items that need to be secured quickly when high winds occur. Make a storm-readiness plan and talk with family, neighbors, landowners, and farm management personnel to determine who is responsible for specific storm-preparedness actions in advance of a storm.
- Before storms hit, check structures for any loose-fitting lids, vents, etc., that need to be secured. Secure unattached objects or move

them indoors. Doors and windows should be tightly shut. Mobile structures, such as shade structures for livestock, should be anchored or taken down to ensure the protection of livestock and the structures.

- Once the storm passes, and it is safe to go outside, check for electrical or water damage and turn off any breakers if needed. Avoid live electricity or downed power lines. Assess the property for damage promptly and notify your insurance company if necessary..

Resilience of Grain Bins to High Winds

The following information summarizes findings by researchers at Texas A&M University based on an assessment of hundreds of grain bins following the 2020 derecho in Iowa and computational modeling.

- Taller bins and bins more exposed to wind speed or not located near other buildings or other windbreaks are more vulnerable.
- Bins are most resilient when filled with product that is distributed evenly throughout the structure. However, even full bins can fail at the wall-roof connection, resulting in partial or complete roof tear-off damage. Non-structural damage can often be included on the stairs.
- Vented bins are more vulnerable than bins without vents.
- Steel grain bins with vertical stiffeners tend to perform significantly better during windstorms than unstiffened bins.
- Wind rings around bins do not appear to make the bins significantly more resilient.

Be Part of the Solution

- Check with a local Illinois Extension office to learn about field days and how to integrate recommended practices in an operation.
- Check out the Illinois Nutrient Loss Reduction Strategy ([NLRs](#)) newsletter, blogs,

and podcasts to learn more and hear about program opportunities across the state.

- Reach out to local Natural Resources Conservation Service (NRCS) or Soil and Water Conservation District (SWCD) offices to learn more about available funding and technical assistance programs to establish practices.
- Investigate private and non-profit organizations that provide technical, financial, and peer-to-peer learning resources for soil conservation practices, such as the [Savanna Institute](#), the [Illinois Sustainable Ag Partnership \(ISAP\) Soil Health Leadership Program](#), and [American Farmland Trust's Farmer-Led Advances in Soil Health \(FLASH\) Program](#).

Sources

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About Extreme Weather: What Illinois Farmers Need to Know

Extreme weather events, like dust storms, heavy precipitation, and high winds, have become more common in recent years. These extreme weather events delay timely field operations, including crop planting, alter growing seasons, and can cause dramatic soil and nutrient loss, negatively affecting farm economics. As these impacts continue to grow, the Illinois agricultural community needs resources to support adapting to these conditions and farming through extremes. This series of fact sheets was developed by Illinois Extension to review available research and provide evidence-based recommendations for best practices to build farm resilience to extreme conditions. Access series glossary and additional fact sheets at go.illinois.edu/CropsFactSheets.

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