

# Extreme Weather: What Illinois Farmers Need to Know

## Dust Storms



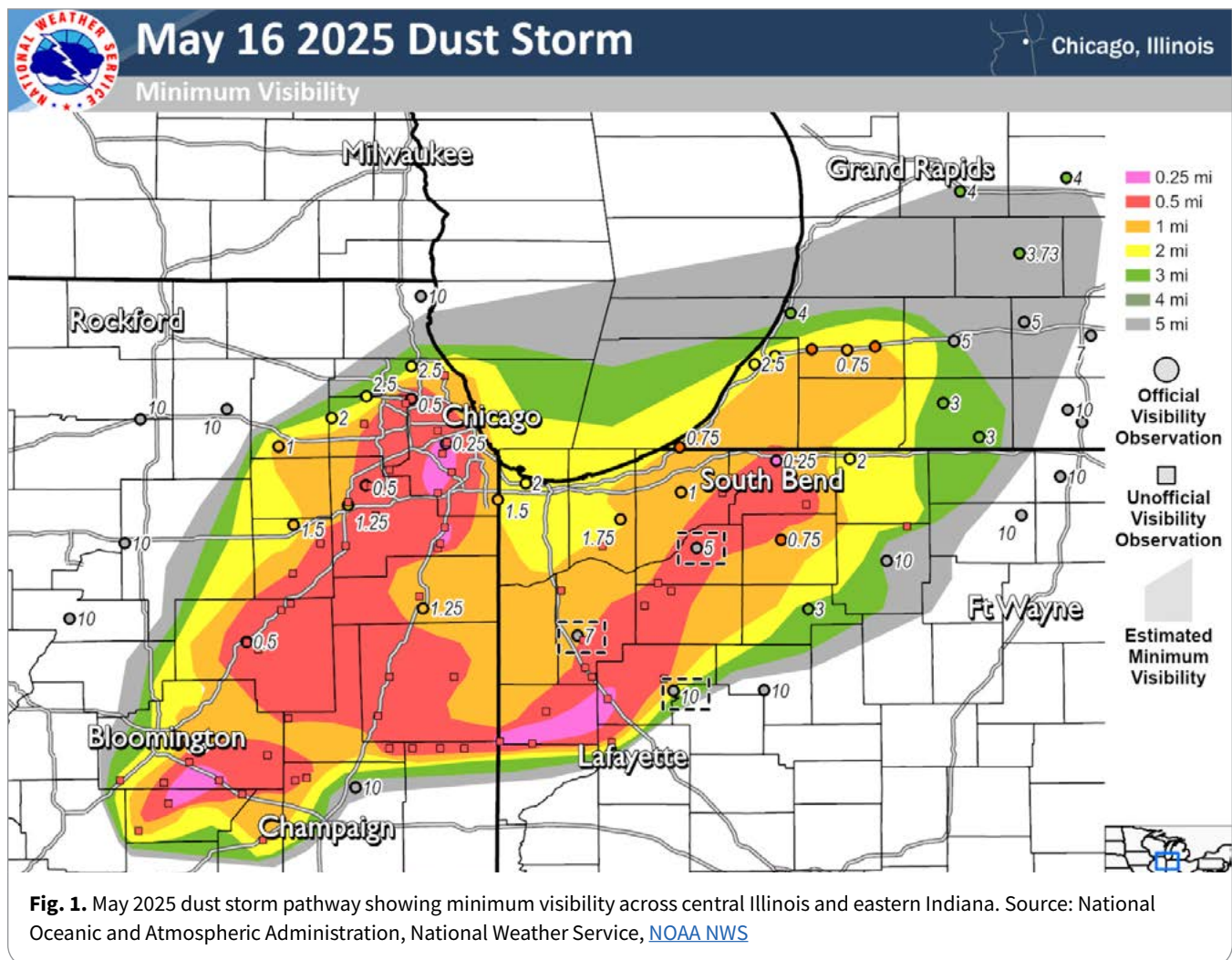
### What Is a Dust Storm?

A dust storm occurs when strong winds lift large amounts of loose sand, silt, and other soil components from dry surfaces into the air, creating a dense cloud that can travel long distances.

Dust storms severely reduce visibility and can result in topsoil and nutrient loss, negatively impacting farms, surrounding communities, and the environment. The highest risk of severe wind erosion occurs when hot and dry, or very cold and dry, conditions coincide with bare, recently tilled topsoil.

### Impacts of Dust Storms

- **Public safety**, particularly reduced visibility for drivers, creates hazardous road conditions. Recent dust storms in Illinois have led to hazardous road conditions and fatal crashes.
- **Air quality** impacts can cause respiratory problems for sensitive individuals, outdoor laborers, and animals.
- **Topsoil erosion** and associated nutrient loss impact field productivity and crop yields, as wind erosion selectively removes fine particles rich in organic matter, which can hold twice as much nitrogen and phosphorus, and up to 20% more potassium than heavier soil particles left behind.



These nutrient losses reduce soil moisture retention and increase demand for additional costly nutrient inputs (estimated ~\$114 per acre, per year).

## Areas at Most Risk for Dust Storms

Many people associate dust storms with arid and semi-arid regions like the American Southwest. However, dust storms can occur anywhere there is wind and loose soil, such as fallow farmlands, construction sites, and dry landscapes. Dust storms were common across the Midwest during the Dust Bowl Era in the 1930s and in Illinois during the 1960s and 1970s when mechanical tillage rapidly expanded. As reduced tillage practices returned in the 1970s, the occurrence of dust storms in Illinois declined. In recent years, however, more dust storms have been on the rise across the Midwestern United States, including in Illinois, despite a general decrease in average wind speeds statewide.

The recent rise in dust storms likely results from several interacting factors:

- Intensive tillage practices and earlier-season tillage and planting leaves soils loose and uncovered during spring — the windiest time of year.
- Drought and higher evapotranspiration increase soil susceptibility to erosion.
- Winter winds can freeze-dry soils, leaving susceptible to erosion. When moisture levels become too low to hold soil particles together, the soil becomes vulnerable to wind erosion.

In Illinois, dust storms tend to cluster around the I-55 corridor from St. Louis to Chicago, especially in south-central and central Illinois. Virtually all recorded dust storms in Illinois have occurred in April and May, a time of year when there are bare, uncovered, tilled, and/or dry soils.



**Fig. 2.** Dust storm approaching the National Weather Service Chicago Office in Romeoville, Illinois. Source: National Oceanic and Atmospheric Administration, [NOAA NWS](#)

## Farm Management Recommendations

### Use Responsible Tillage Practices

- Avoid frequent or intensive tillage, including repeated vertical tillage, which breaks down soil aggregates, reduces residue, and leaves fine particles vulnerable to wind erosion.
- Eliminate fall tillage on soybean stubble to preserve crop residue that helps hold soil particles in place.
- Use no-till, strip-till, or conservation tillage systems, which research suggests have the potential to be as or more profitable than more intensive tillage practices while also improving soil protection.

### Maintain Continuous Ground Cover

- Plant cover crops such as cereal rye, winter wheat, or legumes to protect soil from wind shear and trap moving particles.
- Leave crop residues on the soil surface to increase soil surface roughness and protect soil organic matter, which binds soil particles together.

### Establish Windbreaks, Hedgerows, and Field-Edge Buffers

- Install tree and shrub windbreaks to slow wind speeds across fields and reduce the wind's ability to lift and transport soil particles. Windbreaks can also trap and stop dust that has become airborne.
- Use grassed filter strips, prairie strips, and field borders to interrupt wind flow, trap sediment, and stabilize vulnerable field edges.



**Fig. 4.** Healthy soybeans growing in a terminated cover crop. Photo by Talon Becker, University of Illinois Extension

### Carefully Manage Soil and Irrigation During High-Risk Periods

- Minimize tillage on exposed soil in early spring (April through May) when high winds and dust storm conditions are most common.
- Where irrigation is available, maintain surface or near-surface soil moisture during high-risk seasons to reduce soil particle detachment and airborne transport.
- Talk to neighbors to share ideas and collaborate on responsible management around property lines. See the conversation guide developed by Iowa Corn and The Nature Conservancy to help you navigate these conversations.



**Fig. 3.** Windbreaks helping mitigate dust travel. Photo by Dennis Bowman, University of Illinois Extension

### How to 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 Extension Nutrient Loss Reduction Strategy (NLRS) newsletter, blogs, and podcasts to learn more about event 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](#).

### 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](http://go.illinois.edu/CropsFactSheets).

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Access series glossary and fact sheets

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