Predicting how native plants return to abandoned farm fields

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Movement is one of the most common processes in all biology—mice forage for food and geese migrate with the seasons. While plants may be rooted in one spot for most of their lives, movement also plays a key role in their ecology—especially when it comes to seeds.

Tracking how seeds move—or disperse—can be difficult because of a seed's small size. However, in a study published in *Ecology*, researchers at the University of Minnesota's College of Biological Sciences found a solution for tracking seed movement by using electrical engineering and mathematical models.

"We created a device that measures seed terminal velocity," said Adam Clark, a study co-author and former graduate student at the University of Minnesota. "In this case, terminal velocity describes the maximum speed at which a seed can travel through the air. If we combine this information with other data such as plant height and local wind conditions, we are able to approximate just how far these seeds can travel."

Researchers specifically collected this data for 50 prairie plant species—including big bluestem, rough blazing star and lupine—at the Cedar Creek Ecosystem Science Reserve, a biological field station north of Minneapolis-Saint Paul in Anoka County. The researchers then used that data to examine how natural plant communities recover after agricultural fields are abandoned, based on surveys that cover almost 90 years of changes at Cedar Creek across 23 fields.

As a result of this study, researchers found their estimates of dispersal ability were able to correctly predict the likelihood of colonization, as well as the spatial establishment patterns of many species across these abandoned fields.

"Understanding how seeds move is critical to understanding how plants escape plant-eating animals, find favorable environments away from competition or track changing climates," said Lauren Sullivan, a postdoctoral researcher at the University of Minnesota and the study's lead author.

This method of tracking seed dispersal will allow other researchers to measure dispersal and develop predictions about the importance of plant movement for other commonly studied ecological processes, such as competition, establishment, succession and recovery from disturbance.

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