

# Most plant species important in various and varying ecosystems: study

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Brian Wilsey, associate professor, in Iowa State University's Department of Ecology, Evolution and Organismal Biology, stands in Iowa's Loess Hills where a portion of the research was done. Credit: Courtesy

From the kinds that people sneeze at, to the kinds that have prickly seeds that stick to pant legs, there are many different types of plants in grasslands around the world.

According to a new analysis of plants in grassland ecosystems around the world, it turns out that most of those [plant species](#) are important.

Brian Wilsey, associate professor, and Stanley Harpole, assistant professor, both in Iowa State University's Department of Ecology, Evolution and Organismal Biology, are authors of a study on [plant diversity](#) published in today's issue of the journal *Nature*. The study's

lead author, Forest Isbell, is a former graduate student of Wilsey who now works at McGill University, Canada.

Their findings show that most species promoted ecosystem functioning in at least some years, sites and environmental conditions. In all, 84 percent of the grassland species are important to the ecosystem at some point.

Prior to this multi-year, multi-context research, Wilsey said that the argument for diversity was more difficult.

"In any single context, only about 27 percent of plant species were seen as important," he said.

Since previous research had shown that such a small number of plant species were important to ecosystem processes, there was less reason to be concerned if [grasslands](#) lost different species and diversity lessened, according to Wilsey.

Now, the value of diversity is very apparent.

The species needed to provide one function during multiple years were not the same as those needed to provide multiple functions within one year, the report said.

"If you look at any one year at one site, you might say that species A or species B are really important," said Wilsey. "But what we found was that if you run the analysis over several years, sites or environmental-change contexts, many different species become important. This study really brought everything together."

Isbell and other authors looked at data from 17 grassland studies around the world, including two done in Iowa's Loess Hills at the Western

Research Farm and another done in Texas by Wilsey's group.

"Under multiple contexts, many different plant species become really important," Wilsey added. "For instance, certain plant species are important on east-facing slopes and others are important on west-facing slopes. Some plant species are important on grazing lands because they help grasslands recover quickly.

Some plants are vital for nitrogen uptake, which is important because it keeps nitrogen out of water bodies." This study may have further value as researchers look to the future.

As climates change, Wilsey said, some plants may become more important because levels of precipitation and atmospheric CO<sub>2</sub> change.

"The results suggest that many more species are needed than previously thought for maintaining ecosystem services in a changing world," he added. "So this study suggests that it is crucial to keep as much diversity as we can."

Provided by Iowa State University

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