

Prescribed fires effects on flowering and pollen production

Recommendations

Management: Our investigation shows that in purple coneflower, fire increases pollen available for bees by increasing the number of plants flowering and the number of heads per plant, but it doesn't alter the amount of pollen per flower. We recommend conducting prescribed burns to increase flowering in prairie plants and pollen for bees.

Policy: none.

Synopsis

Understanding how prescribed fire influences pollen production is important because pollen is a critical food resource for native bees. Fire induces flowering in many perennial prairie plants, including the native purple coneflower, *Echinacea angustifolia*, a model organism for native prairie perennials with generalized pollination syndrome. However, it is generally not known if increased flowering leads to more or less pollen produced per flower. A research paper from the Echinacea Project investigated whether pollen production per flower was affected by fire in the purple coneflower. Researchers conducted experimental prescribed fires in 2023 and 2024 made detailed measurements of 129 plants in 12 prairie remnants over two years.

The main conclusion from this paper is that fire increases total annual pollen production in purple coneflower plants by boosting the proportion of plants that flower and the number of heads they produce. We found no evidence that fire alters the number of pollen grains or the mass of pollen per flower and no evidence that fire alters flowers per head. In sum, fire increases the amount of pollen, a critical food resource for native bees, on the landscape. It is helpful for managers to know that the amount of pollen on the landscape is accurately estimated by the number of flowering heads. The amount of pollen on the landscape was higher in 2024 than 2023, and fire effects were consistent in both years. Although the quantity of pollen is relevant for bees, it is important to note that fire might also affect nutritional qualities of pollen, which was not included in this study. Other plant species may experience fire induced changes in pollen per flower.

Authors Team Echinacea, including Grace Hirzel, Wyatt Mosiman, Jared Beck, and Stuart Wagenius. Posted 30 November 2025: <https://echinaceaproject.org/prescribed-fire-pollen/>

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