STIFF FLAX CAN SELF POLLINATE AND EXPERIENCES LIMITED HARM FROM POLLEN OF AN INTRODUCED NEIGHBOR

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For self-compatible plant species, individuals can use their own pollen to fertilize their ovules, but self-incompatible plant species have mechanisms that prevent this from occurring In this study we tested whether the prairie wildflower stiff flax is self-compatible and whether it requires pollinator for seed production. Another study goal was to test whether receipt of pollen from the introduced plant leafy spurge (*Euphorbia esula*) interfered with the stiff flax's pollination. We found that for two populations of stiff flax, flowers were equally able to make seeds regardless of whether they were pollinated with their own pollen or that of another individual, indicating self-compatibility. We additionally found that flowers enclosed in pollinator-exclusion bags made seeds, through at a lower rate than hand-pollinated flowers. This finding indicates that the plants can self-pollinate without pollinators.

We additionally found that pollen transfer from leafy spurge, a common non-native plant on some prairies, can interfere with the pollination of stiff flax under some conditions. Pollen from leafy spurge successfully germinated and grew a short distance into the styles of stiff flax flowers. When we applied a large quantity of leafy spurge pollen to stigmas of stiff flax flowers and waited for 2 – 4 hours before applying pollen from stiff flax itself, we found that stiff flax's seed production was reduced. However, when we reduced the amount of leafy spurge pollen we transferred to amounts more similar to what is naturally transferred, then the harmful effect was no longer detectable. Similarly, when we applied stiff flax pollen immediately after applying leafy spurge pollen, the harmful effect was again removed. These findings lead us to conclude that natural transfer of leafy spurge pollen to flowers of stiff flax is not likely to interfere with stiff flax's reproduction.

In conclusion, stiff flax is self compatible and has a mechanism to transfer pollen from anthers to stigmas without pollinators. Additionally, we conclude that pollen of leafy spurge is unlikely to interfere with stiff flax's pollination under natural conditions.

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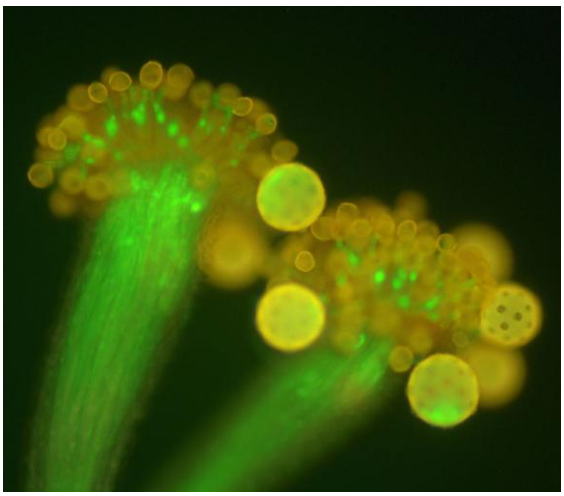
*A flower of the prairie wildflower stiff flax (*Linum rigidum)



Stigmas of stiff flax with leafy spurge pollen (smaller spheres) and stiff flax pollen (large spheres). Leafy spurge pollen tubes are visible as bright green lines in the stigmas and upper portions of the styles.