CRISPR could help immunize Africa’s staple crop sorghum against destructive witchweed parasite

Sorghum crops in areas where the agricultural parasite striga, also known as witchweed, is common are more likely to have genetic adaptations to help them resist the parasite, according to new research led by Penn State scientists.

Changes to the LGS1 gene affect some of the crop’s hormones, making it harder for parasites to find in the soil, at least in some regions. The changes, however, may come at a cost, affecting photosynthesis-related systems and perhaps growth.

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[M]embers of the research team at Corteva Agriscience used CRISPR-Cas9 gene-editing technology to replicate the mutations in the lab. The loss of LGS1 function did appear to confer resistance to witchweed in their experiments, as parasites had germination rates that were low or even zero, suggesting the parasites were not as successful at finding the crop to reproduce. But parasites collected from different geographic locations in Africa were affected in different ways.
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The new study by an international team of researchers appears online Feb. 11, in the journal Proceedings of the National Academy of Sciences, and may eventually inform strategies for managing the parasite.

Witchweed is one of the greatest threats to food security in Africa, causing billions of dollars in crop losses annually. It has a variety of hosts, including sorghum, the world’s fifth most important cereal crop.

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