A genetically modified, drought tolerant plant with higher seed yield

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Technology Summary

The Penn State inventors have identified a gene and/or protein, which, when rendered inactive, results in rice having higher seed production and yield under drought conditions. The Penn State researchers identified this phenotype in a publicly available rice cultivar, known to harbor a non-functional mutant gene; this gene (RGA1) in wild-type plants encodes the alpha subunit of a heterotrimeric G protein. This is a spontaneous dwarf mutant with reduced height and shorter, erect, thicker, broad, dark green leaves, compact panicles, and short, round grains.

Application & Market Utility

Experiments performed demonstrated that the plants present higher photosynthetic rates, stomatal conductance, and $\mu$-leaf than wild type during both moderate and severe water limitation. The mutants containing the non-functional gene showed increased grain yield under both moderate and severe drought stress relative to wild-type.

The invention has immediate commercial utility as germplasm to improve existing rice cultivars. As noted above, cultivars containing the non-functional gene can be produced via traditional breeding and/or through the use of genetic transformation.

Next Steps

Seeking licensing opportunities.

TECHNOLOGY READINESS LEVEL 4-7

Seeking
Investment | Licensing | Research

Keywords
- Drought tolerant and drought resistant
- rice, maize, cotton, soybean, wheat
- G-protein
- plant breeding and higher seed yields
- U.S. Patent No. 9,434,957

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