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(54) **GLUCAN PHOSPHATASE VARIANTS FOR STARCH PHOSPHORYLATION**

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(58) **Field of Classification Search**  
None  
See application file for complete search history.

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(57) **ABSTRACT**

Glucan phosphatase nucleotide or polypeptide variants of the presently-disclosed subject matter can alter the biophysical properties of starch in vitro or in planta, as well as the total starch biomass production in planta as compared to plants expressing wild-type glucan phosphatases. Plants producing the polypeptide variants of the presently-disclosed subject matter can have increased starch accumulation, increased starched biomass, and/or starch having desired biophysical properties. A method of the presently-disclosed subject matter for producing altered starch includes providing a plant that produces a glucan phosphatase polypeptide variant that comprises an amino acid mutation and collecting starch from the plant.

**8 Claims, 23 Drawing Sheets**