

The plant that only grows when the going's good

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Scientists have identified a new mutant plant that accumulates excessive amounts of starch, which could help to boost crop yields and increase the productivity of plants grown for biofuels.

Researchers from the Max Planck Institute of Molecular Plant Physiology looked for excessive starch accumulators in the model plant *Arabidopsis thaliana* that had been mutated using *Agrobacterium tumefaciens*. In one of the mutant plants, the starch granules were significantly larger compared to the controls. Christened NEX1 (meaning NOVEL STARCH EXCESS 1), the researchers believe that the mutation may have affected an enzyme involved in starch degradation. Alternatively, the starch granules themselves may be abnormal and resistant to being broken down for fuel.

Usually, plants that store excessive amounts of starch are much smaller, as less sucrose is available to fuel growth. Remarkably, nex1 mutants are a similar size to normal, non-mutagenised plants.

Dr Maria Grazia Annunziata, who led the study says: "In appearance, the nex1 mutant does not differ from normal plants however the starch granules are generally larger". It also appears that nex1 plants restrict their growing period to the daytime, allowing them to retain their starch reserves. Normally, plants draw on their starch reserves at night, causing the granules to shrink. In the nex1 mutant, the starch granules remain the same size throughout the night, suggesting that growth is suspended until the daytime. Combining high growth rates with large starch reserves is

highly desirable for crops that are used both as silage and to feed humans, such as maize.

The researchers are currently investigating the secret of the nex1 mutant by comparing the expression of genes involved in starch metabolism in nex1 and normal [plants](#).

This work is to be presented at the Society for Experimental Biology Annual Meeting 2014 in Manchester on Thursday 3rd July.

Provided by Society for Experimental Biology

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