GROWMORE. Plant growth more resistant to stress

Biotechnological solution to enhance seed germination and plant growth under stress conditions.

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Centre for Biotechnology and Plant Genomics, CBPG

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Brief description of the technology solution and the added value it provides

A research team from the Centre for Plant Biotechnology and Genomics (CBGP) at the Universidad Politécnica de Madrid has found several genes that, when are subjected to a specific modification, enhance seed germination under standard as well as under stress growth conditions. Plants produced by these seeds are indistinguishable from their parental wild type lines except for the increased growth observed under specific stress conditions. These studies have been carried out in the model plant Arabidopsis thaliana (model for oil seed crops).

For the next decades there is a clear need to increase plant yield (food) and biomass (energy) from the same area of land to sustain world population. Also the amount of non-arable land is estimated to raise, in part due to lack of water or/and salinization (climate change), pollution and urban settlements. To meet this demand, enhancing crop performance under stress conditions will boost plant productivity.

Description of the technological base

In the presence of adverse conditions seeds greatly reduce their germination potential and plants stop growth. Although this natural strategy allows for reallocation of resources to increase plant survival, it severely reduces yield and biomass.

By modifying the activity of specific genes we have increased seed germination under stress (salinity) by 15 to 35 % without compromising plant survival.

Some of these plants also show increased biomass when compared to non-modified controls.