



Biotechnology

Genetically modified (GM) plants can result in crops with positive effects on the climate compared to the crops we cultivate today. In addition, it is possible to develop crops that are better adapted to changing climate conditions, with higher temperatures and more droughts and the increased risk of attack by pests and crop diseases.

Pesticide-tolerant maize and sugar beet

GM crops that can tolerate new weed-killers can be cultivated using reduced soil treatment, which results in a cut in fuel costs and thus in CO₂ emissions.

Types of maize that are tolerant to Roundup and Basta are grown in many countries outside the EU and have been grown experimentally in Denmark. Life-cycle analyses have shown that cultivating Roundup-tolerant GM sugar beets gives a number of environmental advantages compared to conventional cultivation – including lower greenhouse gas emissions resulting from a reduced use of agricultural machinery.

Rapeseed with better nitrogen uptake

Producing and using nitrogenous fertiliser cause large emissions of greenhouse gases. Arcadia Bio-sciences in the US has developed GM rapeseed that absorbs nitrogen from the soil more efficiently, thereby reducing the need for nitrogenous fertiliser. Cultivating this type of rapeseed can therefore

reduce emissions considerably compared to traditional rapeseed cultivation.

The GM rapeseed has been grown experimentally in five growing seasons to date and it can be launched on the market within the coming five years.

Ongoing work aims at introducing the same nitrogen uptake property in other crops, including wheat.

Drought-tolerant maize and wheat

GM crops that can withstand periods of drought are now being developed. Examples are drought-tolerant maize, which is being developed by Monsanto, and drought-tolerant wheat being developed by the Department of Primary Industries in Australia. Drought-tolerant maize is close to being finalised and can be launched in four to five years. Work is ongoing to develop GM crops that can use water more efficiently and can e.g. manage on half as much water as traditional crops.

Crops for soil with high salt concentration

A warmer climate also means higher evaporation from agricultural soil. In some areas this results in an increase in the salt concentration in the soil, which makes it difficult for traditional crops to grow there. Arcadia Bio-sciences in the US is developing GM crops that can grow in soil with high concentrations of salt.

Crops with enhanced feeding properties

A number of plants are being developed with a better nutritional composition. This can result in a reduction of the current energy-intensive production and transport of additives and enzymes that are added to feeds today to ensure that they are used optimally. For example, China is close to commercialising maize that uses phosphates better, and Monsanto has developed another type of maize that needs fewer amino acids added. Barley and wheat with enhanced nutritional properties in phosphates and proteins are being developed in Denmark.

Maize resistant to corn borer

Several companies have developed GM maize that can resist attacks of the European corn borer. In recent years the corn borer has been moving slowly northwards and has resulted in a lower yield in southern and central Germany and Poland.

Maize resistant to corn rootworm

GM maize has also been developed with resistance to corn rootworm, which attacks the corn's roots, with a lower yield as a result. The corn rootworm is also spreading in Europe and is expected to reach Denmark as the climate gets warmer.

Monsanto has developed GM potatoes that are resistant to attacks by Colorado beetles. The warmer winters of recent years have enabled the Colorado beetle to establish itself more permanently in the southern parts of Denmark. With an even warmer climate, it will become a serious pest for Denmark's potato crops.



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