

Flemish researchers develop revolutionary technology for use in plant breeding

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In collaboration with researchers at VIB-UGent and the University of Antwerp (Belgium), scientists at the BioScience business group of Bayer CropScience AG in Gent have developed a technology that can significantly increase crop yields as well as make them more resistant to unfavorable growing conditions. It is based on selecting plants that make more efficient use of energy.

One of the greatest challenges of this century is making the food supply secure in a world that finds itself under increasing pressure from the growing population, changing food patterns and changing climate. The use of new molecular technologies for [plant breeding](#) is essential to increase both yield and stress tolerance in our crops.

The new technology is based on insights in epigenetics. The 'epigenetic' component is like an extra dimension on top of the [genetic code](#) of a living organism that is affected by the environment and in turn changes the activity of the genes. The efficiency of [energy production](#) is strongly related to its epigenetic code. By using a 'smart' selection adapting the epigenetic code, Bayer BioScience's hope is to use the technology in breeding and to develop improved yield varieties.

Using this method in rapeseed it has been proved that rapeseed varieties can be selected yielding between 8% and 20% more than the common varieties. With the help of researchers at VIB-UGent and UA, the underlying mechanism was unraveled and the technology further developed. The result is a very efficient technology based on

mechanisms such as energy metabolism and epigenetic regulation, which occur in all plants. The applicability of the selection system is also confirmed in rice, but should in principle be applicable to all crops and should provide the possibility to make selection processes more efficient. Another quite important advantage is that the more energy-efficient varieties do not require more water or fertilizer to produce higher yields.

More information: The results of the research are published in the leading journal *Proceedings of the National Academy of Sciences* (Hauben et al., 'Energy use efficiency is characterized by an epigenetic component that can be directed through artificial selection to increase yield').

Source: VIB (the Flanders Institute for Biotechnology)

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