New problems in GE maize cultivation

Risk of transgenes spreading into the environment higher than expected

29 October 2020 / Even though the insecticidal genetically engineered (GE) maize MON810 is controversial in Europe, it has been grown in Spain for about twenty years. However, the cultivation of the transgenic plants is now facing new problems: recent research shows that a weedy plant, teosinte, has changed its biological characteristics in ways that will facilitate further genetic exchange with maize plants. Therefore, the likelihood of hybridisation with the GE maize has strongly increased. As a result, a new super-weed might emerge.

Gene flow to conventionally bred maize in Europe has already been established. As a consequence there is a much a higher likelihood of teosinte acquiring MON810 transgene constructs and becoming insecticidal. Unlike maize, teosinte can overwinter in the fields and pass the new genetic information to offspring - from where it has the potential to spread and become a new European super-weed. These risks are not only a concern for farmers, but also for the environment and protected species.

Teosinte originated in Latin America and is the wild ancestor of maize; for several years it has been found growing in maize fields in Spain and France. Up until now, the risk of these plants crossing with European maize varieties was considered to be moderate. However, as a recent peer reviewed publication shows, the teosinte plants have already crossed with European maize varieties and acquired biological traits which will facilitate further gene flow from maize. For example, teosinte has now altered its flowering time. Furthermore, teosinte has already acquired herbicide resistance from conventional European maize varieties. Therefore, the scientists involved have explicitly warned that the risk of the plants becoming invasive should not be underestimated.

The risk of transgenes spreading could be increased in near future: industry has for many years continued to request that the cultivation of further insecticidal GE maize varieties (Bt11 and DAS1507) is allowed in the EU; these varieties are also herbicide-resistant. There are specific risks associated with the occurrence of gene flow from transgenic maize: the transfer of synthetic gene constructs may trigger unpredictable interactions between the genome and teosinte plant components which might, for example, considerably enhance insecticidal toxicity in comparison to the transgenic maize.

The risk of gene flow between maize and teosinte was already revealed in a previous research project supported by Testbiotech. This research has however been largely ignored by EU Commission, the European Food Safety Authority (EFSA) and industry. Testbiotech is now requesting that the cultivation of GE maize in the EU is stopped in order to prevent the uncontrolled spread of transgenes. This request is also based on further recent research showing that the insecticides (Bt toxins) produced by the transgenic maize are more toxic to European butterfly larvae than assumed thus far.

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Further information: The new publication on teosinte [2]
The previous publication on teosinte [3]
New publication on risks of Bt plants for European butterflies [4]

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