The fastest GE tomato in the world

2 November 2018 / In a petition published in October 2018, around 75 experts, some of them representing European research institutes, called for crop plants derived from new methods of genetic engineering (or what they call ‚precision breeding') to be exempt from the EU GMO Directive. They argue that the risks are negligible and there is no alternative in ensuring food security. The petition directly contradicts the current Court of Justice of the European Union ruling issued in July 2018.

It is legitimate and even necessary to call for more research into the new methods of genetic engineering, also known as genome editing. Powerful tools such as CRISPR-Cas only became available a few years ago, and have opened up many new ways of genetically engineering the genome of plants and animals.

Regrettably, many valid questions remain about whether all the experts and research institutes that signed the petition are simply looking to explore and research the new methods, or whether they have their own vested interests in the development and application of these methods. It is often forgotten that even well-established scientific institutions are not just doing research, but are also following their own specific interests, such as public or private funding and patent applications.

In general, all players in the field have their own aims and interests and are seeking interpretational sovereignty. However, if one compares the aims and interests of environmental organisations with those of the research institutes, it is obvious there is an important difference: in most cases the environmental organisations act independently of the users and developers of genetic engineering methods, and of companies, such as Bayer. Furthermore, there are huge differences in regard to availability of resources or access to the media, regulatory authorities and political decision makers.

Viewed from their specific perspective, the research institutes want to participate in the run for funding and patents. This is what has to be expected, because this is how research is organised. Seen in the context of risk assessment and regulatory decision making, this framework clearly leads to conflicts of interest. That is why all the institutes that signed the petition should make their own interests more transparent, and not just use adaption to climate change as their main motivation. Contrary to what is implied in the petition, it is not the case that most research institutes work against the large biotech corporations and for independent research, but rather that they very often team up with industry in order to earn revenues from e.g. licence fees for patented seeds.

If climate change really was their top priority, then the question would arise as to what other methods are already available and what progress has been made in this respect. Indeed, there are in fact already many alternatives and plant breeding does not have to be completely re-invented. Genetic diversity – contrary to what is implied in the statement – is by no means a disadvantage.

The question of whether or not there may be good reasons – as stated in the EU court ruling – to regulate the new methods is also left aside. At the same time, the reasons for regulating these methods are obvious: the new methods can be used to make radical changes in the genome even if no new genes are inserted. One example: in 2018 it was reported that CRISPR-Cas had successfully been used in tomatoes to alter several genes in one step. Thereby, within short period of time, wild relatives of tomato plants, which only produced small fruit, were turned into plants which produce tomatoes similar in size to those which result from many years of conventional breeding. Even though no additional genes were inserted, the impact on growth, size and plant components were extraordinary. It could, indeed, be called ‘the fastest GE tomato’ in the world.

But as we all know, higher speeds need more and not less control. Whether these tomatoes just look like normal tomatoes or whether they are safe to eat can only be clarified in thorough investigations. If these new plants are marketed without regulation and risk assessment, no farmer or grower will know exactly what they are growing. Consumers would lose their freedom of choice. And not even the regulatory authorities would know which plants were being imported from which countries, or

what to look for if the genetically engineered plants did indeed spread uncontrolled and damage the environment.

In the very near future and in ever shorter time-scales, using tools like CRISPR-Cas may lead to a huge and increasing number of plants and animals with new biological traits being introduced into the food chain. Until now, traditional breeding has developed new varieties step by step over many years and thereby gained a wealth of experience. Now, however, the nuclease CRISPR-Cas can in just one step change multiple copies of a gene as well as change several different genes at the same time. This means that crop plants with many new traits can be produced within a very short time without growers being able to gain the same kind of experience as through the stepwise conventional methods. Furthermore, even if the genetically engineered plants are similar to those derived from conventional breeding, this does not mean that the risks are the same. To suggest that plants whose genome has been genetically engineered are in any case safer than conventionally bred plants is pure propaganda from which all scientists should clearly distance themselves. Nevertheless, this is what is stated in the petition.

Our conclusion: anyone wanting to market plants and animals derived from new methods of genetic engineering without mandatory risk assessment and labelling is not primarily interested in science, but in specific applications and associated revenues. Thus, these experts do not appear to be acting in the interests of the common good, but for their own particular interests.

Call of the research centers and institutes: http://www.vib.be/en/news/Pages/European-scientists-unite-to-safeguard-p... [1]

The publication on CRISPR tomato: https://www.nature.com/articles/nbt.4272 [2]

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[1] http://www.vib.be/en/news/Pages/European-scientists-unite-to-safeguard-precision-breeding-for-sustainable-agriculture.aspx
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