

The top 5 GMO misconceptions and falsehoods

Much apparent uncertainty prevails regarding GMOs in the general media. Although the root cause of this probably lies in the technical nature of the subject matter, the situation is intentionally exacerbated by the misrepresentation of information by a variety of special-interest groups to further their own agendas. Here we therefore endeavour to present the top 5 GMO misinterpretations and falsehoods in an unbiased manner that does not present you with a conclusion, but rather allow you to better understand the many different issues that should be considered before you can make your own, sound judgement – in much the same way professional biosafety practitioners and regulators around the world do it.

1. Inaccurately generalising GM issues.

Genetic modification is a tool that can be used in many different ways by different developers to yield diverse and variable products, e.g. an insect resistant tomato plant developed by an agriculture student vs. a therapeutic protein developed by a pharmaceutical company. Every GMO and/or GM product that is eventually commercialised is a unique individual/product with a unique combination of particular characteristics. No generalisations can therefore be made regarding all GMOs' or GM products' safety, utility, value, effectivity or any other attributes. Sweeping statements like "GMOs are unsafe" or "we don't need GMOs" are inaccurate, in the same way statements like "birds are blue" or "a mobile phone is your best option" are, as they lack context and do not recognise the possible vast differences between very diverse entities, requirements and/or applications.

2. GM technology and its products are in principle different from related, older genetic technologies and their products.

Although recombinant DNA technology is relatively young (40 years) and for the first time allows the routine transfer of genetic material between unrelated species, the exact same underlying genetic principles still apply to GM genes and GMOs. GM genes do not behave differently or are not "unique" or "unnatural" as a matter of principle – GM technology is only the focussed application of what we've learnt from nature (and happens in nature) and a natural continuation of age old genetic determination technologies such as selective breeding, hybrid development, polyploidy, etc. GM genes can, however, change the phenotypic traits of the resulting GMO in a novel way and are for this reason subject to regulation, which necessitates confirmation that the new trait(s) does not introduce any biosafety (food/feed or environmental safety) concerns, before the GMO can be commercialised.

The basis of this discussion therefore rather lies in the subjective value judgement of an individual, i.e. what you consider to be a "principle issue", e.g. the transfer of genes between unrelated species, rather than "principled scientific differences" on a genetic level.

3. GMOs and their products are not safe.

The crux of why such a general statement on "GMOs" cannot be correct was already discussed in point 1. Here we'll therefore only focus on the more technical reasons why you can be sure the GMOs you are likely to be exposed to, i.e. those that have regulatory approval, are safe.

BEFORE a particular GMO is made commercially available it has to pass strict food/feed and environmental risk assessments. Relevant research data has to be generated and submitted to the country's regulatory authorities, including a technical review panel of independent scientists, for evaluation and approval. Potential food safety issues of the GMO such as allergenicity and nutrient value are therefore not left to chance, but are critically evaluated and managed proactively to protect the consumer. The same is true for guarding against potential environmental impacts such as increased weediness, non-target effects, etc. Because GMO regulations are based on national laws it also means that this process has to be followed in every country where the GMO is used - commercially available GMOs have therefore passed this rigorous process in several countries under scrutiny of many different and diverse experts.

Finally, commercial GMOs are continuously monitored after release in South Africa to ensure the original risk analysis conclusions remain relevant. The robustness of this system is confirmed by fact that there has been no credible evidence of approved GMO crops having any unforeseen or undesirable impacts after 20 years of application around the world, growing on many millions of hectares and being incorporated in more than a trillion individual meals.

4. GM technology offers no value, is inappropriate and/or expensive.

Again the first problem with such a sweeping statement is that GM technology is only the tool that is used to develop a great diversity of potential final products. Basing its perceived value or appropriateness on only a very limited context (few products) is therefore similar to suggesting solar power generation is not viable because the sun doesn't shine when it is raining! If you can appreciate the diversity of all biological systems and the potential imbedded in their genes, the value and diversity of the ability to selectively utilise these genetic traits should be self-evident. GM technology offers the promise of (and already does) curing disease, increase yields, reduce environmental impact and much more. Of course this doesn't suggest everybody will benefit in the same way from all possible applications - just like the limited number of GM products that are currently on the market cannot satisfy all possible requirements of all possible markets.

The main contributors to the current, relative high cost of developing (especially agricultural) GM applications, are the lack of an economy of scale and disproportionately high regulatory complexity and costs. As the technology matures it will not only develop in a technical sense, e.g. becoming more efficient and precise, but it will also become less expensive to apply. This will, amongst others, enable the public sector to effectively develop locally relevant GM products that are focused on local needs and requirements rather than international commodity markets. In addition, our cumulative risk management experience will inform the development of more relevant and efficient regulatory frameworks as the sector evolves.

5. GM technology leave you with no choice and no rights.

These and similar comments that relate to personal and societal liberties are not unique to GM technology and rather relate to the technology's current association with issues such as globalisation, intellectual property rights and food sovereignty, than the technology itself. The simplest way in which to allay these fears is to emphasise that GM technology is not monopolised and that government and the public innovation system in particular has a very important role to play in ensuring the potential benefits of this powerful technology is realised for all its people and to ensure GM technology, as any other technology, is used in a way that always leaves citizens with an acceptable level of responsible choice.