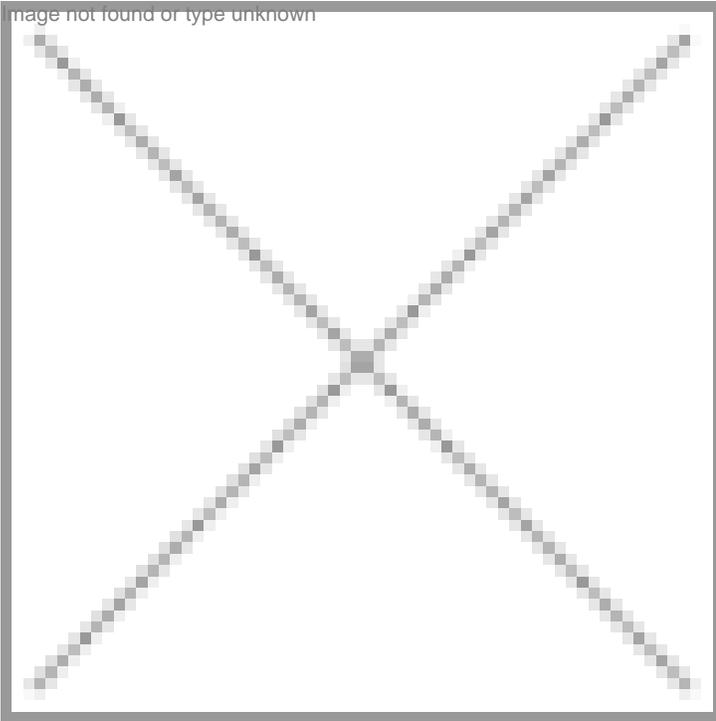
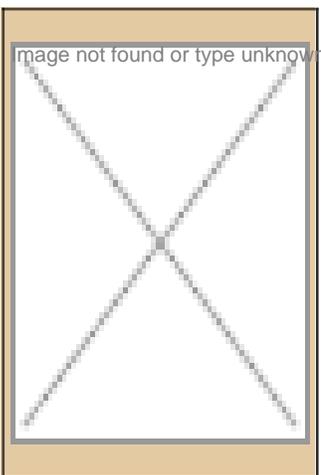


GM Crops and Biodiversity: What's The Fuss All About?

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Anti-GM crop activists are of the strong belief that GM crops pose a threat to biodiversity but this is far from truth and is yet to be proven scientifically.



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There is an urban myth bandied around by many critics of biotechnology that GM crops are a threat to natural biodiversity. If you take GM crops and biodiversity in the same breath, many opponents of GM crops get all worked up about a doomsday scenario where the biodiversity (as however we understand it) will be "contaminated" or "polluted" or "destroyed" beyond redemption by the introduction of GM genes. For that reason alone, they argue that the introduction of GM crops in the centers of origin and diversity must not be allowed. It is nobody's case that that biodiversity is not under threat around the world, and all steps must be taken to prevent further erosion of biodiversity. There are ever so many national and international efforts under the aegis of Convention on Biological Diversity (CBD) to just do that. In fact, millions of dollars are being spent on a global scale to tackle the problem. The DIVERSITAS program is one of the outstanding global research programs on protecting tropical biodiversity with the help of some of the best qualified scientific professionals. Still, whatever efforts that is under is not enough to cope with the speed of biodiversity erosion. There is no question more must be done to conserve biodiversity, and what it takes are strong political will and resources.

The allegation that modern day GM crops will negatively impact biodiversity has no scientific basis. It is charged that GM crops will reduce on-farm diversity. Some even suggest that those valuable and delicate land races will be lost forever due to GM crops. When the first report of a technology to control gene expression later dubbed the "terminator" technology to a devastating effect came along, some leading lights of Indian agriculture at the time scared the public by suggesting that these "terminator" genes would escape from GM crops and render the country's biodiversity sterile. Most never understood the basic mechanism of the "terminator" technology then and most don't understand it even now. But, all and sundry who had to have a say in the matter did not hesitate to invoke the "dangers" of terminator technology and do so even now just to keep the pot stirred. To date there is not a single GM crop that is endowed with the so-called "terminator" growing genes anywhere in the world. The issue has been politicized so much that the industry was compelled to pledge not to deploy the technology. Many still pander the fear that the commercialized Bt cotton contains the "terminator" genes and some implicitly believe that GM seeds mean they necessarily contain the deadly "terminator" genes. Activism against GMOs is so dishonest and disingenuous that truth and facts do not seem to matter. What matters is to just keep scaring the gullible, the innocent and the ignorant to keep the activism alive. The media promptly reports these propaganda and scientists who should and do know better do precious little to challenge this mischievous propaganda. Lies repeated thousand times become the truth.

Most people who rave and rant about biodiversity have very little understanding of what it is. For most, it is just a romantic notion (feel good factor!), and for many it is a tool for political activism, and for a few it serves to rake in grants. It is only those who work in the field of bio-prospecting and enumerating living organisms (taxonomists and ecologists) have some clues to what biodiversity means and how complicated it is and what its real worth is. The general public is completely clueless about biodiversity. The gullible public is taken for ride on biodiversity by activists and sloganeers. Biodiversity is a complex entity. Only a fraction of natural biodiversity is really known. It is really uncertain if we will ever fully understand and characterize biodiversity. That is a dream of scientists. There are as many definitions of biodiversity as there are experts, and suffice it to say that biodiversity is what is in the eyes of the beholder. Biodiversity is a dynamic mix of all living species with their genes and genomes interacting with the environment and each other and in a state of constant flux. At the lowest level, it is made up of nucleic acids, proteins, lipids, and carbohydrate sequences that give them a form, structure and function. Distinction must be made between on-farm diversity and natural (wild) biodiversity as on-farm biodiversity is still an artificial construct. Biodiversity is also highly resilient and quite a few endangered and threatened species have been restored both by human intervention using modern scientific approaches and natural process. Biotechnologically is eminently suited to play a significant role in conserving and restoring biodiversity and can also aid in sustainable (non-destructive) utilization of biodiversity.

But how true is that GM crops really present a threat to biodiversity? After all, every one of us should value biodiversity as it is the basis of life as we know it and it would be foolhardy to design ways and means to destroy whatever is left of it. There is no question that ever since humans started to dominate the earth and improve their living, they started using (exploiting) natural resources and most important of them being plants and animals around them. But, the scale and range of exploitation has increased with time (due population growth) and this is now known as destruction of the habitat. By an expert reckoning, destruction of habitats is the number one cause of loss of biodiversity. The second important reason is due to introduction of alien and invasive species (again a part of human activity) through travel, trade and commerce through the ages. Agricultural tillage, intensive use of chemicals and fertilizers are linked to decline of on-farm biodiversity and agri-ecosystems. It was just reconfirmed by a Royal Society publication on a three-year field scale evaluation of HR GM crops in UK over three years. This deliberate destruction has done some enormous good and done some very bad things to our environment. Overall, it has benefited the humanity in terms improving the living standards, food supply and health care. Some may not agree with this view, and perhaps for some good reasons. It is a question of value judgment! But, there is no way we would come to enjoy today's living standards without such utilization (exploitation) of natural resources.

Most agree that our planet's environment is degrading due to human activities. There is no doubt that global warming is not helping the situation. Agriculture happens to be one of the oldest of human activities that has caused considerable habitat

destruction to convert natural landscape into arable land. To improve agricultural productivity, people started selecting crops and animals which they deemed most desirable and started improving them through breeding and now through biotechnology. As the productivity increased, the population increased and that fed into the cycle of producing more and more. That cycle broke down intermittently due to natural calamities like drought and famine. The net result was increasing the arable land, selecting a few dozen staple crops and animals and breeding them to be more and more productive (reduction of on-farm biodiversity). One thing is for certain that new and improved crops have always replaced old and inefficient varieties in succession. For example, Bt cotton in India is poised to replace non Bt cotton within the next few years just for the simple reason that it is economically beneficial.

With hind sight, we can see how some aspects of green revolution technologies have caused environmental degradation, and that should be instructive for all of us to learn from those experiences and see how we don't repeat those mistakes with new technologies like biotechnology. To the extent we ask such pertinent questions as we do during biosafety and environmental impact assessments of GM crops the potential impact of GM crops on biodiversity is addressed with the best possible knowledge and information and data then, we should be able to take proper precaution to deploy new technologies safely. In modern agriculture, we certainly produced more food and at the same time caused some unavoidable environmental degradation. In fact, agriculture is known to be one of the most environmentally destructive of human activities. But, the question is did we have a choice? We need to produce sufficient food for all and modern intensive cultivation methods became that choice. According to many, there were other choices, and still there are many (alternatives like organic farming, SRI and diversified agriculture) only if the stranglehold on the agricultural by the industry is pried off, and return to natural way of growing food. Many experts engaged in food production disagree. Just last week the venerable Norman Borlaug said as much in India. There is not sufficient organic matter to produce enough food for all on this planet and chemicals will and must be the mainstay of modern agriculture. Debates are raging all over the world, and suffice it to say any agreement on these issues is still long ways in coming.

(To be continued)