
Health Threats of Genetically Engineered Trees

The human health risks associated with plantations of genetically engineered trees, though virtually unstudied, are significant and further legitimize the call to globally ban GE trees.

The health risks can be broken down into the following categories: exposure to hazardous chemicals (such as the herbicide RoundUp) applied to the plantations; the harmful effects of inhaling pollen from trees that produce the bacterial toxin Bt; the risks associated with consumption of fruit from GE trees; and the threats of using antibiotic resistant markers in the development of GE trees.

The two traits in genetically engineered trees that are closest to commercial use are also the two traits that may have the most dangerous effects on health: herbicide resistance and insect resistance.

Trees are being genetically engineered to withstand applications of Monsanto's herbicide RoundUp. In agriculture, the use of so-called "RoundUp ready" crop plants has led to massive increases in the use of the herbicide of 300 to 600%. While most of the studies of the impacts of this herbicide have focused on its active ingredient, glyphosate, scientific studies have shown that the additional ingredients in RoundUp make it twice as toxic as glyphosate alone.

The Institute of Science in Society reported in July of this year that, "an epidemiological study in the Ontario farming populations showed that glyphosate exposure nearly doubled the risk of late term spontaneous abortions." They continued, reporting that several recent studies "suggested an association between glyphosate use and the risk of the cancers non-Hodgkins lymphoma... and multiple myeloma."

The environmental persistence demonstrated by RoundUp of up to 360 days in some ecosystems, coupled with the fact that it is commonly found as a contaminant in rivers lead to concerns for the health of people or wildlife that would live adjacent to future RoundUp Ready tree plantations. Even more serious, however, are the threats from inhaling the herbicide. Numerous studies have found that inhaling RoundUp is much more dangerous than ingesting it orally. RoundUp Ready GE tree plantations are anticipated to be sprayed with RoundUp from the air, where it would drift into nearby communities who would be thus seriously impacted on their health.

Trees are also being engineered to kill insects by producing the bacterial toxin Bt in every cell of the tree. Dr. Terje Traavik of Norway reports that on the island of Mindanao in the Philippines, an entire village living adjacent to genetically engineered Bt maize fields came down with "respiratory, intestinal and skin reactions and fever," during the time that the maize plants were pollinating. Antibodies indicating an immune reaction to the Bt maize pollen was found in their blood. When the people left the area, their symptoms subsided, but upon return to the village, the ailments also returned.

Engineering trees to produce Bt toxin could be far more dangerous. Pines, for example, are known for their extremely heavy pollination. They are also known to spread their pollen for hundreds of kilometers. The establishment of plantations of pines that produce Bt pollen could lead to widespread

outbreaks of sickness.

Dr. Traavik further reports that scientific studies have also identified Bt as an “enabling agent, which increases a person’s susceptibility to other allergens and immunogens.” He questions if this fact may be related to the incredible increases in recent years of the numbers of people experiencing allergy symptoms in countries where GE foods are consumed. An additional concern arises from animal studies of the effects of Bt that found that Bt remains active in mammals that have eaten it and may in fact bind to the intestines, leading to “significant structural disturbances and intestinal growth.”

Further concerns about allergic reactions from GE trees come from consuming the fruits from those trees. In Hawaii and Thailand, for example, papaya trees have been engineered to resist the devastating ring spot virus. However, a study published in BioMed Central Structure Biology found that these GE papaya contain a ringspot virus coat protein that includes a string of amino acids identical to a known allergen. Because the GE papaya on the Big Island of Hawaii have contaminated over 50% of wild and organic papaya trees there, people have no way of knowing if the papaya they are eating has been contaminated by this potential allergen.

The final health concern this article will address is the threat from using antibiotic resistant markers to identify GE plants. In genetic engineering, antibiotic resistant markers are included in the genetic material inserted into the engineered organism. This enables scientists to easily determine if the genetic material has been successfully incorporated into the organism by applying antibiotics. If the organism survives, it means that it contains the genetic material with the antibiotic resistant marker.

The British Medical Association (BMA), in a November, 2002 report stated, “There is a significant risk that antibiotic resistance markers may progress through the food chain, possibly into pathogenic organisms causing human disease.” Already doctors are being challenged by the emergence of contagious viruses that are resistant to antibiotics. The use of antibiotic resistant markers in genetic engineering threatens to exacerbate this already deadly situation. The BMA continues, stating, “the use of antibiotic resistant markers in GM foodstuffs is a completely unacceptable risk ... and we therefore believe that the use of antibiotic resistant markers in GMOs be prohibited immediately.”

In a sweeping statement that could apply to all of the risks of GE trees listed above, the British Medical Association concludes, “We believe there is a greater need for more comprehensive risk assessment which include interactions between GMOs and the long term effects on health and the environment before field trials are taken any further.”

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