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'The unbearable Lightness of Partial knowledge'

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By Klaus Ammann

The plant ecologist, Klaus Ammann, is "calling on heavy scientific ammunition" with regards to the Swiss initiative that calls for a moratorium on green biotechnology.

This is his means of opposing what he considers a systematic campaign of disinformation led by certain organizations against genetically engineered crops. He makes no claim that science has absolute proof, but he refers to scientific studies showing that genetically modified foods are safe.

We still hear from the biochemist, Arpad Pusztai, who asserted that rats were harmed by genetically manipulated potatoes. We have heard him complain about how he was mobbed by the "bad" biotech industry. That he was dismissed from his last research project (after appointment as an Emeritus) certainly remains questionable. For many, this is reason enough to accept his experiments on rats and genetically modified plants, done in 1998, without criticism. The reason being that in the meantime he, like Canadian farmer Percy Schmeiser, who is regularly promoted by Greenpeace because his rapeseed was allegedly "contaminated" by genetically modified "rapeseed", has been transformed into European and worldwide folk heroes.

Hysteria without reason

In both of the above cases it would be quite disturbing to examine the scientific literature, because it would soon become clear what the facts are. Between then and now the numbers of publications relating to Pusztai's statements have grown to above 400.

The number of major studies concerning the safety of these kinds of foods published by experts in peer-reviewed journals has grown to about 30. And they all convey the same message: genetically modified foods are harmless'.

These "doom-sayers" should finally acknowledge that several reports, based on millions of dollars of research by the World Health Organization and the European Union, all came to that same result. The source material is easily obtained through Google. The problem here is that the average European, who thoroughly rejects American politics (but not their culture), is too eager to fall for these presumptions of disaster. One prefers to remain in the realm of partial knowledge.

Among nutritional science experts, the experiments done by Pusztai are being unanimously judged as inconclusive and incorrectly designed. This is a paradox when one considers that Pusztai normally has an excellent reputation where publications are concerned.

In the case of the rapeseed farmer, Percy Schmeiser, one cannot help but notice that, according to the publicly available court transcripts, he changed his story three times. First he pleaded not guilty because the contamination was a consequence of pollen spread. Then he said he had inadvertently mixed up the bags of seeds. In the third version he was found guilty of sowing huge quantities of genetically modified rapeseed. In all proceedings he was pronounced guilty. The opponents of biotechnology do not seem to grasp this and are locked in to their world of partial knowledge because the plaintiff and the firm that was proven right is Monsanto and therefore so Schmeiser must be their innocent victim.

“Bio” and “GM” crops are healthy

All foods offered in Switzerland are healthy and harmless. This is also valid for the products of organic farming, including “Bio” milk that has come under recent scrutiny. However, further detailed research into this product has not given proof of anything negative. The announcement of the “Bio” milk study follows the same pattern, which resonates with our population that loves to think about disaster scenarios: “It just could be, that....!”. This resurrected hysteria being celebrated amongst spoiled and systematically frightened consumers is causing a dramatic drop in the consumption of poultry – as if the avian flu transmittable from man to man already existed.

A study by Kurt Bodenmueller (www.internutrition.ch) shows that products obtained through different farming methods in Switzerland show no systematic quality difference. This is equally true when comparing genetically modified corn and non-GMO corn, because our storage conditions are impeccable. This can not be said for several third world countries. In their case, several measurements and statistics show a correlation between certain corn-diet disease patterns, which in the case of poor storage conditions show a higher level of the dangerous carcinogen, Mycotoxin, in the non-GMO corn. (Johnny Gressel in “Crop Protection” Volume 23, Page, 661-689,2004)².

The knowledge gap of certain Development-Aid Organizations

Even Swiss council member Sommaruga (SP) prefers to remain in the realm of partial knowledge and asserts in a presidential newsletter of Swissaid, over which she presides, that genetically engineered plants have but one purpose in developing countries, which is to secure the profits of big companies.

For her to make such reckless announcement might be the result of the encouragement of her assistant, Tina Goethe, whose pamphlets can be read in “Konkret” (7, 2005).

The fact that the FAO (Food and Agriculture Organization) publications and reputed scientific journals say the opposite does not seem to bother this politician and her assistant. The fact is that 86percent of green biotech projects are supported by public funding; whereas private funding accounts for about 1 percent worldwide³.

GM Free Switzerland – a fairy tale

What is particularly irritating about the current moratorium initiative up for vote in Switzerland, is the resounding name: GM free initiative. It conjures up a fairy tale image of a GM free Switzerland. The fact that all imported foods are excluded from this initiative only becomes clear in reading the fine print as well as the clarifications by some of the initiative’s proponents, not to mention all the genetically engineered ingredients that enter the country through the back door.

Many foods can only be produced worldwide thanks to the efficiency of genetically engineered additives. Further, in the realm of livestock feed, agricultural biotechnology can hardly be avoided. Consequently, the “purists” among the opposition to agricultural biotechnology are now demanding transparent labeling. However, transparency in labeling requires evidence, which, in the case of animals fed with genetically-engineered foodstuffs, is impossible.

Numerous studies have shown that bioengineering leaves no detectable traces in either milk or other foods. Here again, the wonderful conundrum of partial knowledge among consumers, wholesalers, and a few laboratories still prevails. Indeed, one wants to take consumers seriously, but one nonetheless insists on mandatory labeling of biotechnology despite its absurdity and impossibility.

I argue that consumers should really be taken seriously, that is, that they should be told that this will only incur higher costs due to complicated and unwieldy procedures. The label “GM free” only has a meaning for its adherents and should instead be handled like kosher foods, for example.

The hypocrisy around the notion of freedom of research

The slogan that research will not be affected by the moratorium sounds good but is unreliable. In the text of the Initiative, this is not explicitly stated and part of the initiators are strong adversaries of biotechnology- the same people – with arguments later proven wrong – who strongly opposed the successful experiment with genetically modified wheat done by the ETH Zurich. One can read about the efforts to derail the experiment on the website, Swiss Federal Department for Environment, Forests and Countryside (BUWAL).

The courageous Head of Research, Christof Sauter, after fighting for years and after completing a successful experiment in the field, has given up, discouraged. For example, he was forced to conduct an individual protocol on each of the 1,600 wheat seeds, and to dig up every single seed that did not germinate. A humiliation forced upon him by the fundamentalists and the Buwal. This discouragement is experienced by many young researchers who either leaves the science of plant biotechnology or their country. Should this moratorium pass it would give yet another negative signal.

A digression from scientific knowledge

If heavy scientific ammunition is brought forth here it is only with the objective to counter the systematic campaign of disinformation advocated by some organizations, and not to advance any absolute scientific certainty. However, it is striking to see how easily one notes the lack of any scientific evidence in a situation where many serious studies would be available.

The distrust existing in the population, due to, among other things, the scandal of mad cow's disease makes it easy for many opponents to claim, endowed with a certain "trust bonus" from the public, that research, where security is concerned, is insufficiently advanced.

Further, we can add those who, in their own interest, would like to implement expensive research projects. These ecologists plead for investigations that may elicit scientific interest but that have very little to do with security in agricultural production. I suggest that the security issue be clarified based on the scientific literature that already exists in abundance (cp. Overview of the consequences of agricultural biotechnology on biodiversity in: "Trends of Biotechnology", volume 23, 8, Pages 388-394⁴).

The effects of genetically engineered plants on the environment and food are among the best researched security questions in science – it would be about time for the opponents of genetic engineering to acknowledge this fact.

For a fair and balanced assessment of risk

This certainly does not imply that we should discontinue investigating security questions, rather that we should learn to distinguish between necessary applied security research and basic research, which though interesting, is irrelevant where the effect on agriculture and nutrition is concerned. In addition, the time has come to compare the risks with other agricultural strategies. Only then will we get a fair assessment of the risk. It would also be urgently necessary to investigate the negative effects of "organic" pest control, because in this field, proven irreversible damage has already been done: a parasite deposited on a known pest agent surprisingly jumped host, in this case to a rare, consequently now extinct, type of moth⁵. One can only imagine the howling and grinding of teeth by the fundamentalists if the blame could be laid on a genetically modified plant.

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¹<http://www.agbioworld.org/biotech-info/articles/biotech-art/peer-reviewed-pubs.htmlart/peer-reviewed-pubs.html>

²Gressel, J., Hanafi, A., Head, G., Marasas, W., Obilana, B., Ochanda, J., Souissi, T., & Tzotzos, G. (2004) Major heretofore intractable biotic constraints to African food security that may be amenable to novel biotechnological solutions. *Crop Protection*, 23, 8, pp 661-689.
<http://www.botanischergarten.ch/Mycotoxins/Gressel-African-bioconstraints.pdf>

³Diese Sachlage hat der Schreibende nachgeprüft und auf der öffentlich zugänglichen Website der neuen Nichtregierungsorganisation «Public Research and Regulation Initiative» zusammengestellt, diese Tabelle wächst noch ständig (<http://pubresreg.org/> > Working Groups, > Information, oder direkt: <http://pubresreg.org/Members/Kim/working%20groups/Aarhus/information/>) Dazu noch zwei wichtige Hintergrund-Publikationen:

Cohen, J.I. (2005) Poorer nations turn to publicly developed GM crops (vol 23, pg 27, 2005). *Nature Biotechnology*, 23, 3, p 366. <http://www.botanischergarten.ch/PublicSector-Danforth-20050304/Cohen-Naturebiotech-2005.pdf>

Dhlamini, Z., Spillane, C., Moss, J., Ruane, J., Urquia, J., & Sonnino, A. (2005). Status of Research and Application of Crop Technologies in Developing Countries, Preliminary Assessment, FAO pp 62 FAO Reports Rome.
<http://www.botanischergarten.ch/FAO/Status-FAO-GMcrops-2005.pdf>

⁴Ammann, K. (2005) Effects of biotechnology on biodiversity: herbicide-tolerant and insect-resistant GM crops. *Trends in Biotechnology*, 23, 8, pp 388-394.
<http://www.botanischergarten.ch/TIBTECH/Ammann-TIBTECH-Biodiversity-2005.pdf>

⁵http://news.nationalgeographic.com/news/2001/08/0821_biocontrol.html und: Henneman, M.L. & Memmott, J. (2001) Infiltration of a Hawaiian Community by Introduced Biological Control Agents. *Science*, 293, 5533, pp 1314-1316
<http://www.botanischergarten.ch/BioControl/Hennemann-Science-2001.pdf>
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