

Greenpeace Bt-report on GM-Maize raises scientific controversion

Reply to the criticism of Drs. Tebbe and Schuphan

After the publication of the German version "Gift im Gen-Mais" two German scientists claimed that we had misrepresented the results of a research project in Germany.

It was not our intention to misrepresent anybody or take any results out of context, and we are convinced that we have not done so. However we disagree with the interpretation of some of the results.

Dr. Tebbe's study (Baumgarte & Tebbe 2005¹) is referred to twice in our study: once in regard to Bt concentrations found in soil after harvest, and once in regard to possible effects of Bt maize on non-target organisms in the soil.²

Under the heading "How long does the Bt toxin stay in the soil?" a reference is given to the fact that Baumgarte & Tebbe (2005) recorded Bt toxin in the soil after harvest: "Baumgarte & Tebbe (2005) observed that the surface roots of MON810 maize still contained 12% of the toxin level of intact roots seven months after the harvest, that is shortly before the next sowing. This level dropped then in the following two months."

Dr. Tebbe critiqued that we did not mention he does not consider these levels to be sufficient to cause toxic effects on non-target organisms. In our report we came back to that question at a later chapter - this chapter only summarized the existing data about how long Bt toxin has

been recorded to persist in soil.

In the second chapter we quote Baumgarte & Tebbe (2005) regarding the effects of Bt maize on micro-organisms in the field. To avoid any misunderstanding, we quoted the exact words from Baumgarte & Tebbe (2005): "There is presumably an effect of the presence of the Cry1Ab protein on the structure of the bacterial community but this effect was masked by more selective factors." We understand this quote to mean the possibility of effects of Bt maize on bacteria in the soil cannot be excluded. We agree with Baumgarte & Tebbe's (2005) conclusion that "the persistence of Cry1Ab protein emphasizes the importance of considering post-harvest effects on non-target organisms."

In our study, we also looked into the different parts of a 3-year long project on Bt-maize in Germany. The results of several groups were then published on the website³. For most of them the final reports were publicly available, but there were no peer-reviewed articles (yet) .

In his statement, Dr Schuphan summarized the results of the research project, stating that Bt maize had "no negative effects" on the studied arthropods, with the exception of sciarids where he states that Bt maize has "inconsistent effects". However, we consider that Dr Schuphan's summary of the project omits observations that could be important and we reaffirm the conclusions drawn in our report on bees and sciarids.

1 Baumgarte, S. & Tebbe, C.C. (2005) Field studies on the environmental fate of the Cry1Ab Bt-toxin produced by transgenic maize (MON810) and its effect on bacterial communities in the maize rhizosphere. *Molecular Ecology* 14: 2539–2551.

2 Press release of FAL/Dr Tebbe: http://www.gmo-safety.eu/pdf/englisch/FAL_Pressrelease_Greenpeace_0607.pdf
Position of Dr Schuphan: http://www.gmo-safety.eu/pdf/englisch/Bt-Maize_NTO_Position_RWTH_0607.pdf

3 <http://www.biosicherheit.de/de/mais/zuensler/317.doku.html>

Bees: Significant negative effects of Bt maize were found in one year when bees were accidentally infected with parasites. In the following year, the bees were treated prophylactic with antibiotics. No significant results were recorded then. In our report we quote the scientific results from the website: "In the first year the bee colonies happened to be infested with parasites (microsporidia). This infestation led to a reduction in the number of bees and subsequently to reduced broods in the Bt-fed colonies as well as in the colonies fed on Bt-toxin-free pollen. The trial was therefore discontinued at an early stage. This effect was significantly more marked in the Bt-fed colonies. (The significant differences indicate an interaction of toxin and pathogen on the epithelial cells of the honeybee intestine. The underlying mechanism which causes this effect is unknown.)"⁴

As we point out in our report, under the heading " Bees illustrate research difficulties", this illustrates an important gap in the environmental risk assessment of all Bt crops. Studies on non-target organism are usually done with healthy organisms under favourable conditions. This study showed - accidentally - that organisms under stress in the field (such as parasitism infection) can react differently to the Bt toxin than healthy organisms.

Sciarids: Dr Schuphan agrees with the fact that sciarid larvae feeding on MON810 needed significantly longer to pupate, and he agrees with the fact that beetle larvae feeding on these sciarid larvae also showed delayed development.⁵

However, Dr Schuphan considers the results inconsistent because in the first year of the 3-year field trial the sciarid larvae were positively affected. However, the trend changed to a negative one in the second and third year.⁶ We agree with the authors of this study, Dr Büchs and his colleagues as we quote in our report: "Particularly if Bt maize is grown over

years on the same field, the decomposers' community can be altered, affecting the formation of compost and soil development (Langenbruch et al. 2006).⁷

We think that the studies undertaken in this Bt maize project show relevant results that highlight inadequacies in the risk assessment and the risk assessment process for Bt maize. We conclude that a number of those studies quoted in our report ask questions that are unanswered and, given the complexity of the agro-ecosystem, are unlikely to be answered. These questions should not be discarded, but used as basis to halt the cultivation of MON810 GE Bt maize in Germany.

4 http://www.gmo-safety.eu/en/safety_science/68.docu.html

5 http://www.gmo-safety.eu/en/safety_science/14.docu.html

6 http://www.bmvel-forschung.de/FORSCHUNGSREPORTRESSORT/DDD/R9_2006-1_0004.pdf

7 Langenbruch G-A, Hassan S A, Büchs W, Burgermeister W, Freier B & Hommel B (2006): Biologische Sicherheitsforschung mit Bt-Mais. ForschungsReport 1/2006, 8-12. Translation by Greenpeace.