Climate change and mycotoxin occurrence

Global warming affects food security and food safety at many levels. Higher temperatures and humidity influence the survival and multiplication rate of virus, bacteria and parasites. At the same time, climate change alters the distribution of both pathogen and food born diseases, stimulating microbial evolution and changing stress response mechanisms. The contamination of water may also be an issue of increased problems as the rate of inland floods is higher (Boutrif and Kenny, 2010, oral presentation).

Climate change has a direct impact on local weather conditions. As mentioned earlier, higher temperatures, humidity and more frequent storms, to name a few stress factors for plants, will increase the infection of crops by fungi and therefore increase the probability of mycotoxin occurrence. But what are the indirect impacts caused by, for example, the shifts in growing conditions for fungi and cereals?

In general, fungi have temperature ranges within which they perform better. Increasing average temperatures could lead to changes in the range of latitudes at which certain fungi are able to compete (Boutrif and Kenny, 2010, oral presentation). Will this global warming lead to fungal mutation and therefore to the development of more (new) mycotoxins and of a different worldwide mycotoxin pattern?

On the other hand, different crops respond differently to climate change. Crops such as winter wheat and barley decrease their yield with increased temperature. Grass yield, however, is increased by this same factor. As for grain maize, the suitability of lands to grow this crop is currently going up North (Van der Fels-Klerx, 2010, oral presentation). How will populations cope with this fact? Will this amplify the present issue of food shortage and widen the use of unsafe (and highly mycotoxin contaminated) feed and food?

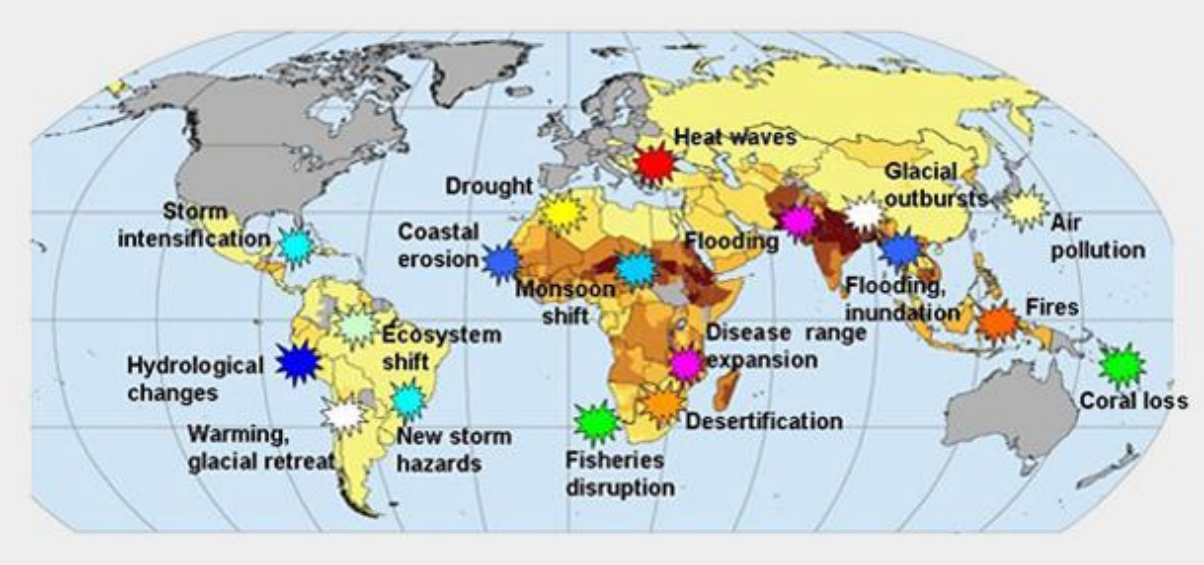

Figure 1 - Global distribution of hunger (as percent underweight children in 2000), overlaid with select climate change hazards (source: www.undp.org, CIESIN 2005)

These and many other questions are being raised at this moment by several agencies such as WHO, WFP, UNEP, WTO and others. While answers are still unknown it is important to avoid feeding mycotoxin-contaminated feedstuffs and feed to animals as they have a negative impact on animal performance and health. Mycotoxin risk assessment allows the understanding and acknowledgement of the problem. Mycotoxin risk management enables a proper handling of the problem and it is crucial to reduce the negative impacts of mycotoxins in animals.

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