LETTER

The burden of proof: A response to Rosi-Marshall *et al.*

To the Editor: A recent paper in PNAS (1) purports to show that insect-resistant crops have unexpected effects on nontarget insects in streams. A sentence in the Abstract reads "Stream insects are important prey for aquatic and riparian predators, and widespread planting of Bt crops has unexpected ecosystems-scale consequences." The data presented in the paper do not support this statement.

Because previous studies reported no significant effects on caddisflies (2), the topic of the present study leads the reader to reconsider the issue. However, the authors of the recent paper made fundamental errors in experimental design that make it impossible to draw the conclusion that Bt crops have impacts on aquatic insects: (*i*) They failed to use proper control materials, which would have to have been isogenic, nontransgenic tissues. It is well known that the chemical composition of leaves varies widely between different maize genotypes. It is possible that the claimed negative impacts on larval growth were attributable to chemical components in the tissue and not to the Bt protein. (*ii*) They failed to identify and to quantify the Bt protein, other leaf chemicals, and agricultural chemicals in stream waters, making it impossible to repeat the study or to draw conclusions from the data.

Publications that report studies lacking appropriate controls and include unfounded summary statements on a topic such as this can cause significant damage. It is unfortunate that this paper, like the previous claim of effects on Monarch butterflies (3, 4), is being used to fuel the contentious debate over the safety of genetically modified crops.

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3. Losey JE, Raynor LS, Carter LE (1999). Transgenic pollen harms monarch larvae. *Nature* 399:214.
4. Hellmich RL, *et al.* (2001) Monarch larvae sensitivity to *Bacillus thuringiensis*-purified proteins and pollen. *Proc Natl Acad Sci USA* 98:11925–11930.

The authors declare no conflict of interest.

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