

GMO meta-study: Pesticide use down 37%, yields up 22%, profits rise 68%

A meta-study published this week in PLOS ONE—[A Meta-Analysis of the Impacts of Genetically Modified Crops](#)—crunched data from 147 studies.

Despite the rapid adoption of genetically modified (GM) crops by farmers in many countries, public controversies about the risks and benefits continue. Numerous independent science academies and regulatory bodies have reviewed the evidence about risks, concluding that commercialized GM crops are safe for human consumption and the environment. There are also plenty of studies showing that GM crops cause benefits in terms of higher yields and cost savings in agricultural production [8]–[12], and welfare gains among adopting farm households. However, some argue that the evidence about impacts is mixed and that studies showing large benefits may have problems with the data and methods used. Uncertainty about GM crop impacts is one reason for the widespread public suspicion towards this technology. We have carried out a meta-analysis that may help to consolidate the evidence.

Our meta-analysis concentrates on the most important GM crops, including herbicide-tolerant (HT) soybean, maize, and cotton, as well as insect-resistant (IR) maize and cotton. For these crops, a sufficiently large number of original impact studies have been published to estimate meaningful average effect sizes.

This meta-analysis confirms that the average agronomic and economic benefits of GM crops are large and significant. Impacts vary especially by modified crop trait and geographic region. Yield gains and pesticide reductions are larger for insect resistant crops than for herbicide tolerant crops. Yield and farmer profit gains are higher in developing countries than in developed countries. Recent impact studies used better data and methods than earlier studies, but these improvements in study design did not reduce the estimates of GM crop advantages. Rather, NGO reports and other publications without scientific peer review seem to bias the impact estimates downward. But even with such biased estimates included, mean effects remain sizeable.

Read full, original paper: [A Meta-Analysis of the Impacts of Genetically Modified Crops](#)