

Review of: "Identifying and characterizing pesticide use on 9,000 fields of organic agriculture"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

I appreciate the authors hard work for collecting data from huge number of famer's fields in conducting the study focusing on the thrust area i.e. organic versus conventional farming. Furthermore, the authors have rightly mentioned about the two hurdles, the decision to spray and the decision how much to spray.

Organic fields may not be interpreted with 'zero chemical pesticides', as it depends on the size of the farmland, water and soil quality, and the crop type. Contrarily, the organic agriculture uses less pesticides than conventional i.e. with lower probability of using pesticides.

The study is quite complicated and needs justification, as the same field may be used for crop rotation, and pesticide requirements depends on the type of crop. Moreover, there are chances of pesticides spray drift, run-off or leaching.

Although the study is quite interesting; however, few more points/parameters would have been supplemented the study. For calculation of Pesticide toxicity index, authors have followed Nowell et al approach focusing on fish, due to unavailability of other endpoints. For toxicity considerations, other environmental parameters such as pesticide toxicity to birds, pollinators, arthropods, half-life, leaching potential, and its plant surface residues are required besides fish end point. Several other models are available for toxicity considerations like Kovach's EIQ tool, which could have been applied for the same. Though the authors have followed pesticides labels regulated by EPA, which mentions potential hazards to non-target organisms based on pesticides toxicity to birds, fish, invertebrates, bees and mammals. Moreover, the pesticides with higher inherent toxicity may not have higher environmental impact depending on its dosage, and frequency of applications. If toxicity of pesticides is considered, their inherent toxicity is extremely important. The authors have used kg of pesticides products which are formulated with different concentrations of active ingredients. Hence, in depth toxicological analysis would be extremely valuable.