

Pollution from pesticides



Spraying a rice field with powdered pesticide. Photo:FAO/Florita Botts.

Plant pests are often regarded as an external, introduced factor in crop production. That is a misperception, as in most cases pest species occur naturally within the agro-ecosystem. Pests and accompanying species—such as predators, parasites, pollinators, competitors and decomposers—are components of crop-associated agro-biodiversity that perform a wide range of ecosystem functions. Pest upsurges or outbreaks usually occur following the breakdown of natural processes of pest regulation.

Although populations of potential pests are present in every crop field, every day, regular practices, such as crop monitoring and spot control measures, usually keep them in check. In fact, the total eradication of an insect pest would reduce the food supply of the pest's natural enemies, undermining a key element in system resilience. The aim, therefore, should be to manage insect pest populations to the point where natural predation operates in a balanced way and crop losses to pests are kept to an acceptable minimum.

When that approach does not seem sufficient, farmers often respond by seeking additional protection for their crops against perceived threats. The pest management decisions taken by each farmer are based on his or her individual objectives and experiences. While some may apply labour-intensive control measures, the majority turn to pesticides. In 2010, worldwide sales of pesticides were exceeded US\$40 billion. Herbicides represent the largest market segment, while the share of insecticides has shrunk and that of fungicides has grown over the past ten years.

As a control tactic, over-reliance on pesticides impairs the natural crop ecosystem balance. It disrupts parasitoid and predator populations, thereby causing outbreaks of secondary pests. It also contributes to a vicious cycle of resistance in pests, which leads to further investment in pesticide development but little change in crop losses to pests, which are estimated today at 30–40%, similar to those of 50 years ago. As a result, induced pest outbreaks, caused by inappropriate pesticide use, have increased.

Excessive use of pesticide also exposes farmers to serious health risks and has negative consequences for the environment, and sometimes for crop yields. Often less than one percent of

pesticides applied actually reaches a target pest organism; the rest contaminates the air, soil and water.

Consumers have grown increasingly concerned about pesticide residues in food. Rapid urbanization has resulted in the expansion of urban and peri-urban horticulture, where pesticide use is more evident and its overuse even less acceptable to the public. The serious consequences of pesticide-related occupational exposure have been amply documented among farming communities, heightening social sensitivity towards agricultural workers' rights and welfare.

Public concerns are being translated into more rigorous standards both domestically and in international trade. Major retailers and supermarket chains have endorsed stricter worker welfare, food safety, traceability and environmental requirements. However, weak regulation and management of pesticides continue to undermine efforts to broaden and sustain ecologically-based pest management strategies. That is because pesticides are aggressively marketed and, therefore, often seen as the cheapest and quickest option for pest control.

Farmers would benefit from a better understanding of the functioning and dynamics of ecosystems, and the role of pests as an integral part of agro-biodiversity. Policymakers, who are often targets of complex information regarding crop pests, would also benefit from a better understanding of the real impact of pests and diseases in cropping ecosystems.

Internationally pesticides are being regulated by several Conventions, including [the Rotterdam Convention on the Prior informed consent procedure for certain hazardous chemicals and pesticides in international trade](#) and [The Stockholm Convention on Persistent organic pollutants](#).

Source: adapted from [FAO. 2011. Plant protection in Save and Grow. FAO, Rome.](#) Information for slide has also been taken from [FAO. 1996. Control of water pollution from agriculture. FAO irrigation and drainage paper 55. FAO, Rome.](#)

Other resources:

[FAO's pest and pesticide management website](#)

[FAO's Prevention and disposal of obsolete pesticides website](#)

[Website of the Rotterdam Convention on Prior Informed Consent Procedure for certain hazardous Chemicals and Pesticides in international trade](#)

[ILO website on Safety and health in agriculture](#)

[UNITAR and ILO Chemical hazard communication and GHS capacity building library](#)