

Report: Plastic pollution is also pervasive in our agricultural soils

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Credit: FAO/Cristina Aldehuela

The scourge of unsightly images of plastic refuse littering our beaches and oceans always receives much attention. But a new report by the Food and Agriculture Organization of the United Nations (FAO) suggests that

the land we use to grow our food is contaminated with far larger quantities of plastic pollution, posing an even greater threat to food security, people's health, and the environment.

The report, "[Assessment of agricultural plastics and their sustainability: a call for action](#)," is the first global report of its kind by FAO and contains some startling numbers.

According to data collated by the agency's experts, agricultural value chains each year use 12.5 million tons of [plastic](#) products. A further 37.3 million tons are used in food packaging. The [crop production](#) and livestock sectors were found to be the largest users, accounting for 10.2 million tons per year collectively, followed by fisheries and aquaculture with 2.1 million tons, and forestry with 0.2 million tons. Asia was estimated to be the largest user of plastics in [agricultural production](#), accounting for almost half of global usage. In the absence of viable alternatives, demand for plastic in agriculture is only set to increase.

According to industry experts, for instance, [global demand](#) for greenhouse, mulching and silage films will increase by 50 percent, from 6.1 million tons in 2018 to 9.5 million tons in 2030.

Such trends make it essential to balance the costs and benefits of plastic. Of increasing concern are microplastics, which have the potential of adversely affecting human health. While there are gaps in the data, they shouldn't be used as an excuse not to act, FAO warned.

"This report serves as a loud call to coordinated and decisive action to facilitate good management practices and curb the disastrous use of plastics across the agricultural sectors," FAO Deputy Director-General Maria Helena Semedo said in the report's forward.

The report was presented today at a virtual event in conjunction with

World Soil Day.

The good

Plastics have become ubiquitous since their widespread introduction in the 1950s, and it is difficult today to envisage life without them.

In agriculture, plastic products greatly help productivity. Mulch films, for instance, are used to cover the soil to reduce weed growth, the need for pesticides, fertilizer and irrigation; tunnel and greenhouse films and nets protect and boost plant growth, extend cropping seasons and increase yields; coatings on fertilizers, pesticides and seeds control the rate of release of chemicals or improve germination; tree guards protect young seedlings and saplings against damage by animals and provide a microclimate that enhances growth.

Moreover, plastic products help reduce food losses and waste, and maintain its nutritional qualities throughout a myriad of value chains, thereby improving [food security](#) and reducing greenhouse gas (GHG) emissions.

The bad and the ugly

Unfortunately, the very properties that make plastics so useful create problems when they reach the end of their intended lives.

The diversity of polymers and additives blended into plastics make their sorting and recycling more difficult. Being man-made, there are few microorganisms capable of degrading polymers, meaning that once in the environment, they may fragment and remain there for decades. Of the estimated 6.3 billion tons of plastics produced up to 2015, almost 80 percent has not been disposed of properly.

Once in the natural environment, plastics can cause harm in several ways. The effects of large plastic items on marine fauna have been well documented. However, as these plastics begin to disintegrate and degrade, their impacts begin to be exerted at the cellular level, affecting not only individual organisms but also, potentially, entire ecosystems.

Microplastics (plastics less than 5 mm in size) are thought to present specific risks to animal health, but recent studies have detected traces of microplastic particles in human feces and placentas. There is also evidence of mother-to-fetus transmission of much smaller nanoplastics in rats.

While most scientific research on plastics pollution has been directed at aquatic ecosystems, especially oceans, FAO experts found that agricultural soils are thought to receive far greater quantities of microplastics. Since 93 percent of global agricultural activities take place on land, there is an obvious need for further investigation in this area.

Key recommendations

The absence of viable alternatives makes it impossible for plastics to be banned. And there are no silver bullets for eliminating their drawbacks.

Instead, the report identifies several solutions based on the 6R model (Refuse, Redesign, Reduce, Reuse, Recycle, and Recover). Agricultural plastic products identified as having a high potential for environmental harm that should be targeted as a matter of priority include non-biodegradable polymer coated fertilizers and mulching films.

The report also recommends developing a comprehensive voluntary code of conduct to cover all aspects of plastics throughout agrifood value chains and calls for more research, especially on the health impact of micro- and nanoplastics.

"FAO will continue to play an important role in dealing with the issue of agricultural plastics holistically within the context of food security, nutrition, food safety, biodiversity and sustainable agriculture," Semedo said.

Provided by Food and Agriculture Organization of the United Nations

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