Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 03 (MAY-JUNE, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Microplastics: A Growingly Significant Environmental Problem

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The decades 1930–1950 saw the invention of the plastic polymers that are widely used today. An industrial and economic revolution occurred with their large market debut at the close of the 1980s. These innovative, multipurpose materials are now essential and even nearly irreplaceable in our daily lives due to their increased durability, electrical resistance, plasticity, and especially their low cost of production. Approximately 50% of plastics have a service life of between 10 minutes and 30 days, and up to 40% of the over 359 million tons of plastics produced year are packaging and single-use materials. These pose significant environmental problems because changes in consumption patterns are still in their early phases and waste management technology has not advanced at the same rate as the manufacture and use of plastics. Thus, the effect of microplastics on soil biodiversity is a growing environmental concern that has to be addressed by soil scientists.

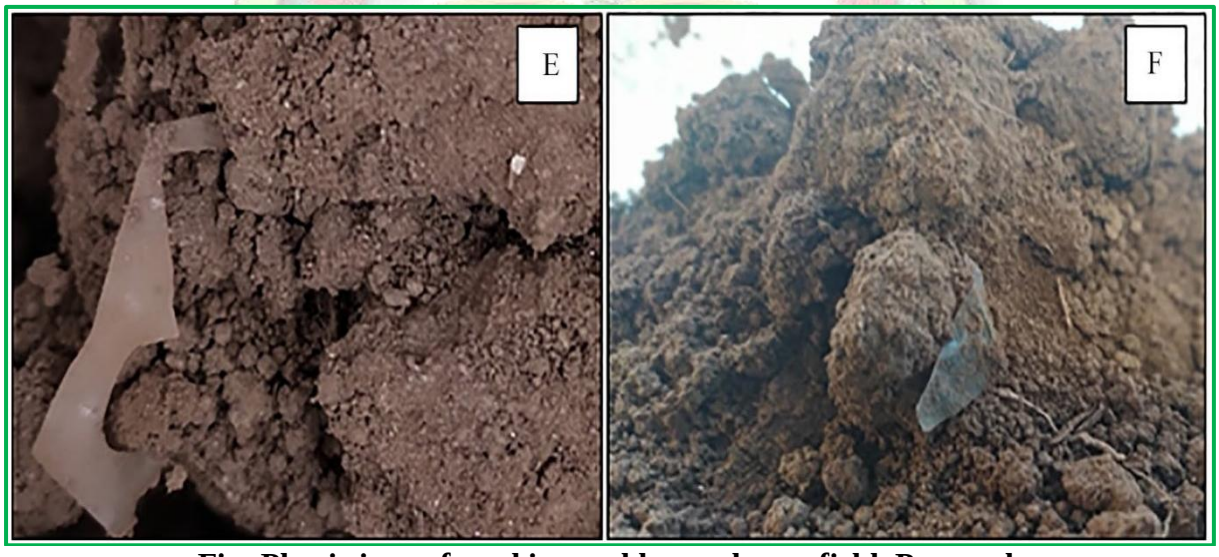
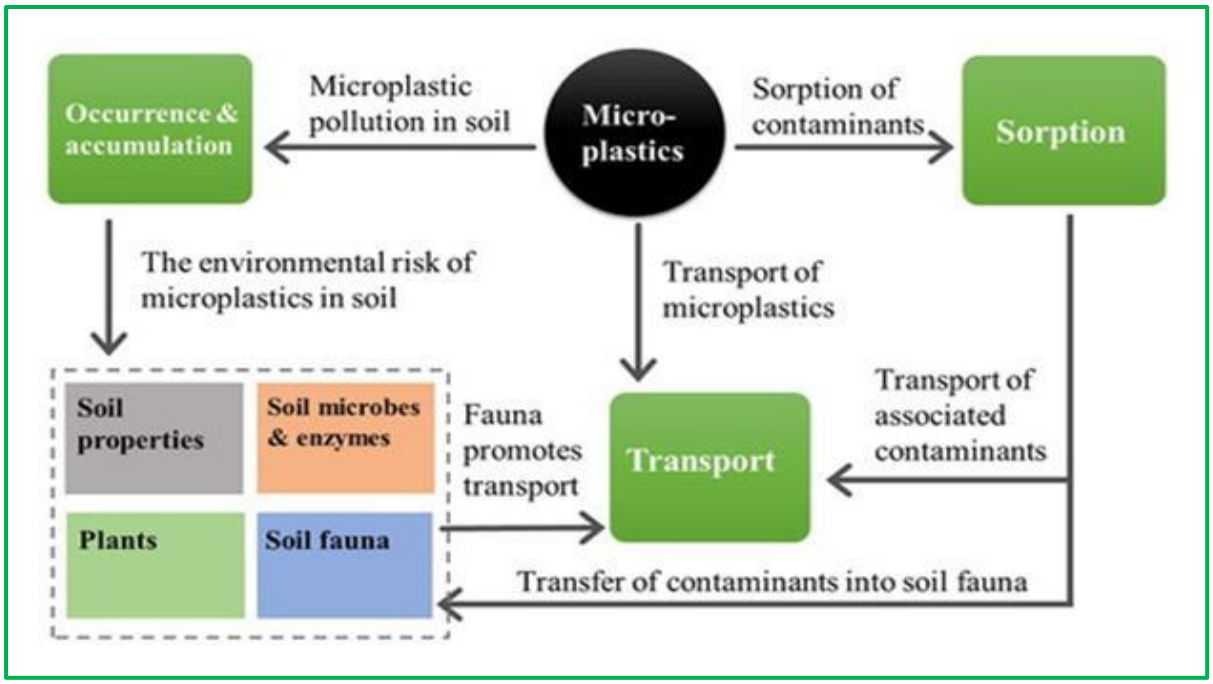


Fig: Plastic items found in an old greenhouse field, Portugal
(Source: *Air, Soil and Water Research*)

Plastics degrade in the environment when they come into contact with physical, chemical, or biological elements (such as UV light, mechanical wear and tear, moisture, temperature, and redox conditions). The primary form of plastic debris found in the environment is known as "microplastics" (MP), which are microscopic, irregularly shaped plastic particles (typically less than 5 mm) that are the consequence of degradation. These MP can spread quickly, harm creatures by getting into food webs, and possibly have an impact on a number of environmental processes.

Studies on the effects of MP on soil physicochemical properties (bulk density, soil structure, etc.) or soil fauna (e.g., earthworms, collembolan) have been conducted; adverse impacts on terrestrial plants and soil microbial activities have recently been reviewed; however, knowledge of the effects of MP on soil systems is still relatively new (less than 10 years). Because the activity of the enzymes involved in the C, N, and P biogeochemical cycles changes, long-term contamination by plastic film residues has generally been linked to the inhibition of soil microbial activity and fertility. Nevertheless, there hasn't been much focus on the investigation of MP's interaction with the soil microbial population. Additionally, it has been noted that plastics may release organic and inorganic toxins into the ecosystem at the water-soil interface, influencing soil (micro-)organisms and hurting the food web.



Source: Critical Reviews in Environmental Science and Technology

Using disposable face masks made of polymers is one of the most significant preventive strategies during the COVID-19 epidemic. According to the most current publications, there is a significant increase in plastic and plastic particle trash being released into the environment by the increased manufacturing and consumption of this commodity, which is ending up in the surrounding soils and freshwater and marine habitats through streams.This will present the scientific community with yet another significant difficulty in the context of microplastics and soil pollution in this new era.

Conclusion

By enacting laws and policies governing the manufacture, use, and disposal of plastics, environmental legislation and regulation and Increasing consumer consciousness can help limit the amount of microplastics released into the environment by informing people about the dangers of microplastics and the significance of responsible plastic usage and disposal. We can strive toward limiting the negative effects of microplastics on soil pollution and aggressively pursue these tactics in order to promote a shared commitment to environmental protection.

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