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Wool is Biodegradable

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Nature - the original circular economy

In nature, one life nourishes the next - all biological products are recycled life. In this "original circular economy," the carbon, oxygen, and other molecules which make up all biological life forms, cycle from one form of life to the next.

The key to this continuous recycling process is biodegradation. Through biodegradation micro-organisms in soil or water break down matter, turning a former life form into a new life form.

This cycle has operated since life on Earth began around 3.5 billion years ago, and underpins the fertility of our soils, the cleanliness of our water, and the enormous diversity of life forms on our planet.

Wool – a life fibre

Wool, a renewable fibre which grows naturally on sheep, is made of a special protein called keratin.

Keratin is part of a unique family of structural proteins that provides the foundations for the hair, fur, feathers, scales and claws of all mammals, birds and reptiles.

Rich in carbon, nitrogen, and sulphur, keratins readily biodegrade, particularly when warm, damp, and in the presence of oxygen - such as in healthy soil or compost.

Initially, naturally-occurring fungi colonise the outside of the fibre, weakening it. Then bacteria digest the fibre.[1]

When wool is kept dry however, or in the absence of oxygen, it is extremely durable. Archaeologists have found well preserved wool samples dating back thousands of years.[2,3]

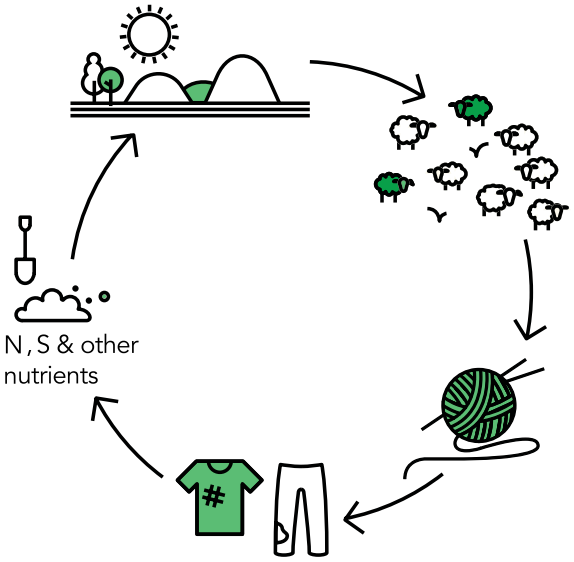
Wool and microplastics

Ready biodegradability is a key difference between wool and the oil-based synthetic fibres which dominate apparel and household textiles:

- Wool readily composts. Research has shown it functions as an effective soil conditioner and fertiliser, slowly releasing sulphur, nitrogen, phosphorous and potassium[4]. Tests show that with the ideal conditions, wool products are almost completely degraded after six months in the ground.
- Synthetic fibres do not readily biodegrade. Unlike wool, polyesters, nylons, and acrylics have been created by chemists, and only in the last 50 years. These synthetic chemical structures are new to nature, which has not evolved means to recycle them.
- Unlike wool, they do not naturally biodegrade. Instead, they miniaturise to micro- and nano-scale, and bio-accumulate. It is these micro- and nanoparticles of plastic which are causing great concern to the medical community[5], and to environmentalists and mindful consumers around the world.

Naturally biodegradable, wool is the obvious choice for anyone concerned about the health of our planet.

Biodegradation of Wool



About IWTO

With a world-wide membership encompassing the wool pipeline from sheep to shop, the International Wool Textile Organisation represents the interests of the global wool trade. By facilitating research and development and maintaining textile industry standards, IWTO ensures a sustainable future for wool.
To learn more about IWTO and its activities, visit www.iwto.org.

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[2]Antoinette Rast-Eicher, & Lise Bender Jørgensen (2013), Sheep wool in Bronze Age and Iron Age Europe, Journal of Archaeological Science 40 (2013) 1224- 1241, DOI: 10.1016/j.jas.2012.09.030.
[3]Irene Skals, Margarita Gleba, Michelle Taube & Ulla Mannering (2018): Wool textiles and archaeometry: testing reliability of archaeological wool fibre diameter measurements, Danish Journal of Archaeology, DOI: 10.1080/21662282.2018.1495917.
[4]Valtcho D. Jeliazkov (2005), Assessment of Wool Waste and Hair Waste as Soil Amendment and Nutrient Source, Journal of Environmental Quality, 34(6), 2310-17, DOI: 10.2134/jeq2004.0332.
[5]Johnny Gasperi, Stephanie L. Wright, Rachid Dris, France Collard, Corinne Mandin, Mohamed Guerrouache, Valérie Langlois, Frank J. Kelly and Bruno Tassin (2018), Microplastics in air: Are we breathing it in? Current Opinion in Environmental Science and Health, 1:1-5. DOI: 10.1016/j.coesh.2017.10.002