



British Wool fact sheets

# Wool is... Biodegradable

## Biodegradability is crucial to sustainability

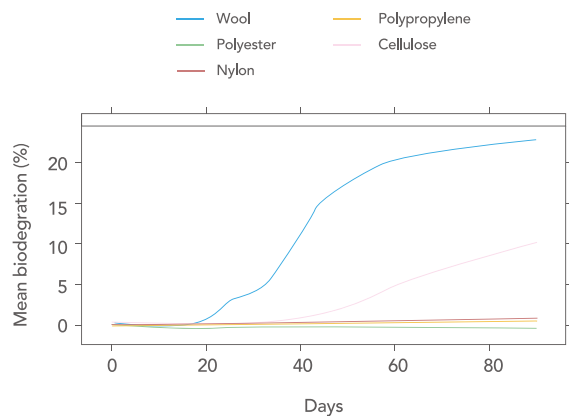
Wool is made of keratin, the same protein as human hair. Wool grows naturally on sheep just like our hair grows, producing 2-3kg per fleece, every year.

When wool is disposed of, it will naturally decompose in soil in a matter of months or years, slowly releasing valuable nutrients into the earth. Synthetic fibres, on the other hand, can be extremely slow to degrade and significantly contributes to the world's overflowing landfills.

Through biodegradation, micro-organisms in soil or water break down matter and consume it. Research shows that with the ideal conditions, wool products are almost completely degraded after six months in the ground<sup>1</sup>.

Because of wool's unique structure and its water-repellent outer membrane, when a wool garment is being worn and cared for, the wool fibres are resilient and long lasting. It is only in moist, warm conditions that wool biodegrades.

## Biodegradation of textile fibres



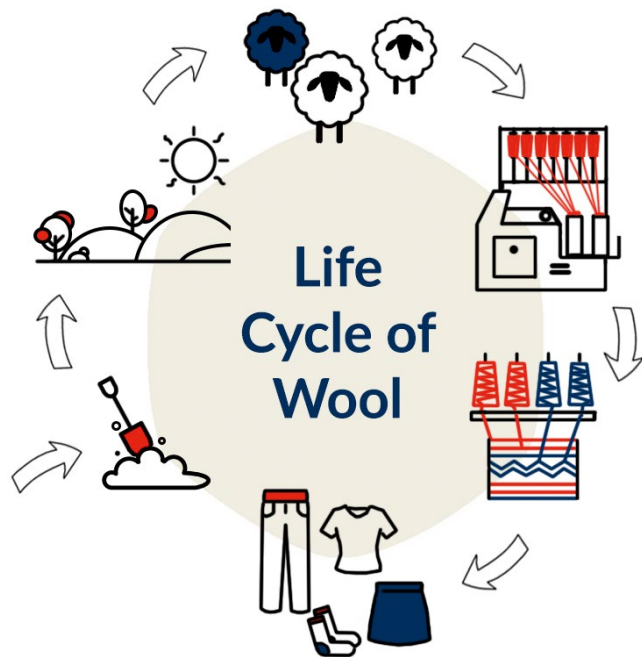
Source: IWTO



## Marine biodegradation

Wool also biodegrades in aquatic environments<sup>1</sup>. Results shows that in as little as 90 days in salt water, different types of wool had biodegraded by about 20%<sup>2</sup>. Research continues to determine how quickly wool biodegrades at different sea levels and temperatures.

Bacteria, not fungi, were observed to play an important role in marine degradation. The bacteria found were in the groups *Alteromonas* and *Oceanospirillum*. After 7 to 8 months the deterioration is quite advanced.



## Wool readily composts

Research shows that wool functions as an effective soil conditioner and fertiliser, slowly releasing sulphur, nitrogen, phosphorous and potassium as it biodegrades<sup>3</sup>.

Moreover, wool fibres have been shown to biodegrade at a significantly faster rate in soil, composting and marine environments than synthetic fibre.

Research carried out to date, investigates the influence of modern wool fibre processes, indicates that typical dyes and standard machine washable treatments do not substantially reduce relative rates of biodegradation between wool and synthetic fibres .

In addition, we now know that not only are synthetic textiles extremely slow to biodegrade, they can also disintegrate into fragments known as microplastics. A single polyester fleece garment can produce more than 1900 fibres per wash.<sup>4</sup>



## References

- <sup>1</sup> Brown, R. The Microbial Degradation of Wool in the Marine Environment. University of Canterbury, 1994 <https://ir.canterbury.ac.nz/handle/10092/16802>
- <sup>2</sup> Ranford, Steve (April 2019). Wool Biodegradation: Presented at 88th IWTO Congress in Venice.
- <sup>3</sup> Valtcho D. Jeliakov (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.
- <sup>4</sup> Browne, M.A., Crump, P., Niven, S.J., Teuten, E., Tonkin, A., Galloway, T., Thompson, R., 2011. Accumulation of microplastic on shorelines worldwide: sources and sinks. Environ. Sci. Technol. 45, 9175-9179.