Wool and Biodegradability

Fact Sheet

Key Points

- Wool is a natural fibre that grows on sheep
- Due to its high percentage of nitrogen, wool will biodegrade within one year
- Synthetic fibres such as polyester and nylon can take up to 40 years to biodegrade
- Naturally biodegradable, choosing wool minimizes the amount of waste that sits in landfills

What does ‘biodegradable’ mean?
A biodegradable product can be broken down biologically into natural raw materials such as carbon dioxide, water and naturally occurring minerals. These are then reintegrated into the nutrient cycle. Conditions needed for products to biodegrade are oxygen, warm temperatures and humidity.

How does wool biodegrade?
Wool grows naturally on sheep, and is made of a protein called keratin – the same protein that is in human hair. During the biodegradation process, fungi first destroy the ends of the wool fibre. Bacteria then digest the weakened fibre by secreting enzymes. The carbon-to-nitrogen-ratio of wool is quite narrow, meaning that wool has a high percentage of nitrogen. This high percentage of nitrogen is the reason wool biodegrades so well.

How is wool’s biodegradability tested?
In most tests, a wool product such as a jacket is buried in soil, which provides the necessary microbes, moisture, temperature and pH-value. To retrieve the garment more easily, it is placed between two wire grids. After a certain period of time, the test garment is dug up in order to observe and document the decay. Tests show that with the ideal conditions wool products are almost completely degraded after six months in the ground. Seams may not degrade as easily as the rest of a garment, because they consist of a double (hence thicker) layer of fabric and are often sewn with polyester thread. The dyes used on a wool product do not impact the results.

Why is biodegradability an advantage?
Products that are biodegradable are part of a natural cycle. They come from nature and go back to nature, enriching the soil and nourishing new life. In the UK alone, around 350,000 tonnes of used clothing and 370,000 tonnes of carpets go to landfill every year. The numbers are similar for other developed countries. Products made out of synthetic fibres can take 30-40 years to degrade, contributing to the ever-increasing piles of waste in landfills. Because it naturally degrades in a fraction of that time, wool is the obvious choice for anyone concerned about the health of our planet.

Will wool biodegrade while being worn?
Rest assured, wool will not biodegrade while being worn or used under normal conditions. Moreover, because wool is a durable and high-quality performing fibre, it will last for years before this final stage is even a consideration.

Where can I learn more?
For more information about wool and its natural properties, contact:
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Or visit the IWTO website, www.iwto.org
About IWTO
The International Wool Textile Organisation (IWTO) is an independent non-profit organisation representing the wool industry at the international level. Our mission is to connect all parts of the wool supply chain in order to strengthen wool’s credentials as the world’s leading sustainable fibre.

References:
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- YouTube: Icebreaker, Nature’s Technology: Biodegradable Marino Video, [http://www.youtube.com/watch?v=u2dsG6P0QxI](http://www.youtube.com/watch?v=u2dsG6P0QxI); retrieved 29/09/2014.