

Eco-Friendly Alternatives in Agrotextiles: Needle punched nonwovens obtained from Viscose and Tencel vs. Polyester fibres

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Abstract: Needle-punched nonwovens are widely used in agrotextile applications due to their versatility, remarkable strength, and porous structure. Polyester fibres have been dominantly used in nonwovens agrotextile applications due to their durability and cost-effectiveness. However, they pose a risk of microplastic accumulation in the soil which may cause adverse effect on crop cultivation and human health [1]. Viscose and Tencel fibres are cellulosic man-made fibres obtained from renewable sources. They are noted for their biodegradability and hygroscopic nature. Thus, they have the potential to serve as eco-friendly alternatives to conventional polyester fibres in agrotextile applications. Bending stiffness and absorbent properties are critical mechanical and physical properties that affect fabric flexibility, ease of installation, soil conformity, moisture management and soil-water interactions[2]. This study investigates the absorptive and bending stiffness properties of needle-punched nonwovens prepared from Viscose and Tencel compared to those prepared from polyester fibres. The findings of these studies indicate that the nonwovens obtained from Tencel and Viscose exhibited superior absorptive properties compared to those obtained from polyester. Additionally, the nonwovens obtained from polyester and viscose fibres exhibited shorter bending lengths than those obtained from polyester fibres, thus indicating higher flexibility.

This research aims to shed more light on the performance differences between the studied nonwovens obtained from viscose, tencel and polyester fibres.

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