

PRACTICE ABSTRACT n°6

Authors: Pieter Ravaglia, Alessandro D’Elicio, Novamont S.p.A.

How to use Biodegradable in Soil Mulch Films in case of manual laying

This abstract provides comprehensive guidelines for the effective use of biodegradable mulch films, encompassing soil preparation, film installation, crop setup, and end-of-life management thanks to the experimental season trials carried out at the Tunisian and Tanzanian Food hubs under Foodland project.

Soil Preparation

Preparation of the soil is critical for optimal film performance in terms of weed control and the mechanical performance of biodegradable mulch films. The soil should be refined and free of sharp objects like rocks or crop residues to avoid damaging the film. Organic fertilisers, particularly manure, should not be applied immediately before laying the film to prevent premature degradation caused by microbial activity.



Prepared soil for mulching operation

Film Installation

The films laid manually, especially for small plots, ensuring minimal stress and avoiding damage such as punctures or tears; it is also advisable don't step on layed mulch film and avoiding mechanical damages (breaks, punctures...) during the hilling the land around the film. Since it is very thin, biodegradable mulch film will stick to the ground perfectly after a few days. In windy areas, anchoring the film with small amounts of soil at intervals is advised.



Manually laid mulch film

Crop Setup

Perforation of the mulch film is typically performed during installation. For manual perforation, tools should produce clean edges, with cross-shaped or cylindrical cuts being the most effective. Biodegradable films are compatible with all standard irrigation systems. Fertilisers and agricultural inputs used with traditional films are also suitable for biodegradable alternatives, as no adverse interactions have been reported.

Controlling weeds and duration of the film

Field tests demonstrate that biodegradable mulch films are as effective in weed suppression as traditional black plastic mulches. However, specific weeds like horsetail (*Equisetum sp.*) and sedge (*Cyperus sp.*) may damage the films. The duration of biodegradable mulch film in the field depends greatly on environmental factors (rain, thermal regimes, solar irradiation, etc.) and therefore it does not depend solely on the action of micro-organisms in the soil. Films with a thickness of 15 μm perform well for crops with cycles of 2–6 months, such as lettuce or solanaceae. Thicker films (18–20 μm) are suited for longer cycles, like strawberries, while those exceeding 40 μm are ideal for perennials like raspberries or vineyard applications. Film performance is typically enhanced during cooler seasons due to reduced microbial activity and solar irradiation.

End-of-Cycle Management

Unlike traditional plastic mulches that require removal and disposal, biodegradable mulch films are integrated into the soil at the end of the crop cycle. This process fosters microbial activity, converting the material into water, carbon dioxide, and biomass, completing a sustainable life cycle.

