

Direct effects

- Physical barrier
- Soil temperature and moisture control
- Water savings
- Weed control

Short
term

Higher yields and fruit quality
Early marketing of seasonal crops

Reduced soil quality and soil functions
Impaired ecosystem services

Long
term

Ecosystem services

- Sustainable agriculture
 - Impaired supporting and provisioning services due to decreased soil quality
 - Recreational (aesthetic) and cultural impact on society
- Long-term profitability: Impact on public goods
- Public awareness and farmers' perceptions

Soil quality

- Induced soil water repellency
- Accelerated C/N turnover
 - Preferential formation of labile soil organic matter (SOM)
 - Long-term decrease in stable and humified SOM pools
- Depletion of micro- and macronutrients
- Release of greenhouse gases

Reduced water and gas exchange
Need for irrigation
Increased soil microbial activity
Shifts in soil microbial communities

Environmental pollution

- Accumulation of plastic residues
- Microplastic formation
- Leaching of toxic additives
- Removal and recycling of used films difficult
- Incineration / landfills

No degradation
Pesticide runoff from mulch surfaces

Long-term soil degradation
Impaired soil functioning
Reduced biodiversity

Aesthetic pollution
Pollution with plastics, phthalates and pesticides
Costly waste management