

Soil Fumigation and Biodegradable Plastic Mulch Application

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Figure 1. Raspberry transplant being grown with soil-biodegradable plastic mulch.

Soil-biodegradable plastic mulches (BDMs; **Fig. 1**) are an alternative to traditional polyethylene (PE) mulch films and are designed to biodegrade in soil to carbon dioxide and microbial biomass through the metabolism of naturally occurring soil microorganisms. BDMs are increasingly being adopted in commercial production systems because they may be a more sustainable alternative than traditional PE mulch films, which have limited disposal options. However, many of these production systems undergo pre-plant soil fumigation for disease, nematode, and weed

management. Soil fumigation in conjunction with BDM application is a pending new practice and there is little research on the topic to guide practices for optimal fumigation efficacy and mulch performance. The objective of this factsheet is to clarify how BDMs may be legally used during fumigation and identify gaps in our knowledge regarding the performance of BDMs in fumigated systems.

High-barrier tarps, namely totally and virtually impermeable films (TIF and VIF, respectively; **Fig. 2**), are commonly used during soil fumigation to improve fumigation efficacy. They can also contribute to reducing buffer zones around the perimeter of a field, which can be important at field sites near inhabited structures. The Environmental Protection Agency has a list of tarps tested for permeability that qualify for buffer zone reduction credits by active ingredient (<https://www.epa.gov/soil-fumigants/tarps>). BDMs are not on this list. Therefore, the current interpretation for applicators and handlers to be legally consistent with fumigant labels is:

- BDMs can only be applied after the fumigant's REI has expired; *or*
- BDMs may be applied during fumigation but do not qualify for buffer zone reduction credits (i.e., similar to an untarped fumigation)

Research is underway to characterize the permeability of BDMs to soil fumigants. Concern has been expressed regarding the interaction between BDMs and soil fumigants, which may decrease mulch performance. Alternatively, there is concern that fumigation may alter the soil microbial community involved in BDM degradation. These questions are currently being explored so growers can have information to base their decisions on when it comes to BDM application and soil fumigation.



Figure 2. Strawberry being grown with a totally impermeable film (TIF).