

# Biodegradable Mulch Film For Organic Production Systems

Biodegradable mulched row of tomatoes  
at WSU Mount Vernon NWREC



## Introduction

Biodegradable mulch film has the potential to be a sustainable technology with several advantages over traditional plastic mulch, such as reduced labor costs for removal, disposal, and reduced landfill waste.

If mulch could biodegrade into constituents that do not harm the soil ecology or environment, then its sustainability would be even greater.



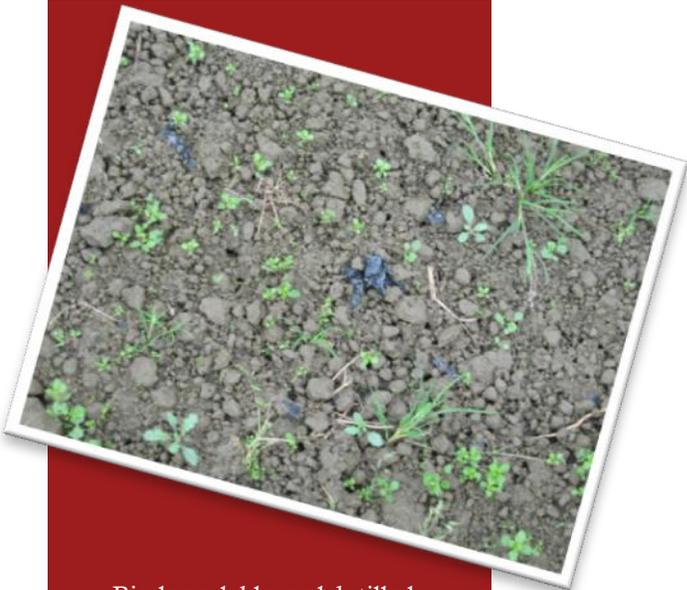
Biodegradable mulched row of broccoli at WSU Mount Vernon (September 2013)

## Biodegradable Biobased Mulch Film

Effective October 30, 2014, the **USDA-AMS National Organic Program (NOP)** passed a final rule which added biodegradable biobased mulch film to their list of allowed substances for organic crop production. The USDA organic regulation is “7 Code of Federal Regulations (CFR) section 205” and is available at <http://www.regulations.gov/#!documentDetail;D=AMS-NOP-13-0011-0125>. Primary points of this new rule are:

- ❖ **To be considered biodegradable and biobased, a mulch film MUST:**
  1. Reach at least 90% degradation in the soil within two years or less in accordance with ISO 17556 or ASTM D5988.
  2. Be biobased in accordance with ASTM D6866.
  3. Meet compostability specifications of one of the following standards: ASTM D6400, ASTM D6868, EN 13432, EN 14995, or ISO 17088. (*Section 205.2*)
- ❖ A biodegradable biobased mulch film must be produced without organisms or feedstock derived from excluded methods. [*Section 205.601(b)(2)(iii)*]
- ❖ A biodegradable biobased mulch film must be produced without the use of non-biobased synthetic polymers. Minor additives such as colorants and processing aids are not required to be biobased. (*NOP Policy Memo 15-1*)





Biodegradable mulch tilled into soil after harvest (WSU Mount Vernon June 2012)

Research continues to develop improved performance in biodegradable mulch systems.



Biodegradable mulch in pumpkin field trial at season end (WSU Mount Vernon, September 2014)

### PRODUCT COMPLIANCE:

There are several biodegradable mulch films available in the U.S. **Currently, no biodegradable mulch film has been approved for use in certified organic production because, so far, none meet the requirement of using only biobased feedstock composed of biological products or renewable agricultural or forestry materials.** Non-biobased synthetic polymer feedstocks, such as petrochemical resins, are not permitted. It is important to note that biodegradable paper mulches are allowable in certified organic production system. Before using any product in a certified organic production system, check with your organic certifier to ensure that such use is in compliance with your certification.

### PRODUCT BIODEGRADATION:

Biodegradation of mulch film depends upon its feedstock and prevailing environmental conditions. Factors affecting degradation include climate, soil type, pH, microbes, irrigation, and other production practices. Growers will need to take appropriate action to ensure that proper degradation of the mulch is occurring; these actions may be site specific. If an operation or grower uses practices that do not promote degradation and allow accumulation of mulch over time, they may be in non-compliance with the existing requirements.

### ON-GOING RESEARCH:

University research programs are investigating the use and biodegradation of biobased mulch films in crop production. An overall goal of research is to provide manufacturers with new information so they can develop biodegradable mulches that use only biobased feedstocks and so have the potential to be used in organic production systems. Research results will also provide growers with a guide of best management practices for the use of biodegradable mulch. Additionally, a convenient protocol for testing mulch biodegradation after incorporation into soil will be developed.

For more information regarding biodegradable mulch research see the website <https://biodegradablemulch.org>.