



Performance and Adoptability Biodegradable Mulch

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Summary:

Following a trial of four types of mulches, the farm operators of Cloudview Farm concluded that biodegradable plastic mulches were a useful alternative to polyethylene mulch, but they had concerns about aesthetics and soil health over time.



Katherine Dentzman

Watermelon planted into Organix A.G. Film (biodegradable plastic mulch) at Cloudview Farm, June 2018.

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On-Farm Biodegradable Mulch Case Study: Cloudview Farm – Washington State

Farm Profile

Cloudview Farm, located in the Columbia Basin of central Washington State, is a diversified fruit, vegetable, and livestock operation founded by Jim Baird in 2006. It is a non-profit organization that operates a teaching farm, with community events and educational tours, and offers a

Community Supported Agriculture (CSA) program to local residents. Cloudview Farm spans 18 acres of land and has an average of 2 acres in production each year. Although not certified organic, soil health and environmental sustainability are central to production practices at Cloudview Farm. The farm operators avoid the use of synthetic fertilizers and pesticides. Their previous experience with mulching includes small trials employing both polyethylene (PE) mulch and paper mulch.



Jessica Goldberger

The farm on a cloudy March afternoon. A school bus waits for students to finish their farm tour.

On-Farm Activities

During the 2017 growing season, two black biodegradable plastic mulches (BDMs)—BioAgri from *Biobag Americas* and Organix A.G. Film from *Organix Solutions*—were trialed on four rows of squash and pumpkins; one black PE mulch (from *FilmTech Corp*) was trialed on one row of pumpkins; and one paper mulch (*WeedGuardPlus* from *Sunshine Paper Co.*) was trialed on two rows of summer squash and sweet potatoes.

Two experiential field days were held: one for laying the mulches (5/25/17) and one for tilling the mulches into the soil (10/13/17).

Farm visits and interviews were conducted four times throughout the trial—in March 2017 before laying, in early September 2017 during the trial, in October 2017 at till-down, and in June 2018 after the trial.

Farmer Perceptions

Prior to starting the trial, the farm owner and managers at Cloudview Farm were cautiously optimistic about the potential of BDMs. In particular, they were interested in saving labor and money on mulch removal, obtaining effective weed control during the growing season, and providing a learning opportunity for other farmers. Additionally, BDMs were seen as a possible alternative to PE mulch, which was disliked by the farm owner and operators. They saw PE mulch as a serious environmental health concern that did not align with their sustainable farming philosophy.

During the field trial, the farm operators were concerned with the appearance of the BDMs, which they felt looked similar to PE mulch (black and shiny). This similarity made the breakdown of BDMs concerning, as the mulch fragments looked like scraps of non-biodegradable plastic.

A similar concern persisted during the till-down of the BDMs in the fall. While the farm operators were pleased with the crop quality and yield associated with BDM use (compared with paper mulch and bare ground), the appearance of scraps in the soil prompted significant concerns about soil health and aesthetics. The operators agreed that they would reserve final judgment until they had seen how the BDMs biodegraded in the soil over the winter and into the spring.

The following spring, Cloudview Farm's owner and operators were pleased with how the BDMs had broken down. They found few scraps remaining in the soil, and perceived that soil health and productivity remained high.

Looking to the Future

The farmers at Cloudview Farm were generally pleased with the agronomic performance and degradation of the BDMs as compared to paper mulch. In fact, they elected to use extra biodegradable plastic mulch left over from the trial the following season for production of watermelon and sweet potato. However, they concluded that they would not use BDMs regularly in the future because of aesthetic issues, the worry about potential build-up of fragments in the soil when BDMs are applied for several consecutive years, high cost, and the inability to meet National Organic Program (NOP) standards. Nonetheless, they supported the use of BDMs by other farmers. In particular, they saw BDMs as a useful alternative for farmers who would otherwise use PE mulch and dispose of it in a landfill.



Above: From left – BioAgri (a), Organix A.G. Film (b, c), PE (d), and WeedGuardPlus (e, f) mulches immediately after laying at Cloudview Farm.



Above: Field day attendees help lay a row of Organix A.G. Film.



Above: Field day attendees handle biodegradable mulch film pieces remaining in the soil following till-down.



Above: The trial plot 13 months after biodegradable mulches were first laid. Note the small piece of mulch.