



# Performance and Adoptability Biodegradable Mulch

biodegradablemulch.org

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## Summary:

Biodegradable plastic mulch, polyethylene plastic mulch, and paper mulch were trialed during a season of cut flower production at Boxx Berry Farm. The operators felt that the biodegradable and polyethylene mulches both performed well, but the paper mulch deteriorated too early.



Katherine Dentzman – 5/8/18

Laying biodegradable plastic mulch at Boxx Berry Farm, May 2018.

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## On-Farm Biodegradable Mulch Case Study: Boxx Berry Farm – Washington State

### Farm Profile

Boxx Berry Farm, located in western Washington State, is a fruit, vegetable, and cut flower operation established by Bill and Charlene Boxx in 1960. It is family-owned and operated, selling directly from an on-farm storefront as well as from various

partners in the cut flower business in Seattle. Boxx Berry Farm is well known in the community and a popular wedding venue. The farm is just over 100 acres with four acres in cut flower production. The operation is not certified organic, although the operators limit their use of pesticides. Using herbicides in their cut flower operation is particularly tricky, as some flowers are very delicate and easily harmed. The Boxx family used polyethylene (PE) plastic mulch on cut flowers for one growing season in the 2010s, but they were dissatisfied with the mulch because of perceived irrigation challenges and the labor associated with mulch removal.



Chris Beredjic - 9/11/18

Field day attendees stand among the flower field trials of biodegradable mulch film at Boxx Berry Farm.

### On-Farm Activities

During the 2018 growing season, a black biodegradable plastic mulch (BDM) (*Organix Solutions*), a black PE mulch (*FilmTech Corp*), and a paper mulch (*WeedGuardPlus*, *Sunshine Paper Co.*) were used on Boxx Berry Farm's mixed cut flower beds. The PE and paper mulches were trialed on four rows each, with the remaining four acres planted in BDM.

Two experiential field days were held for local interested parties. The first focused on laying the mulches (5/8/18) and the second took place after the mulches had biodegraded to a noticeable degree (9/11/18).

Farm visits and interviews were conducted three times throughout the trial—in April 2018 before the mulches were machine-laid, in July 2018 during the middle of the trial, and in December 2019 after till-down of the mulches.

## Farmer Perceptions

The Boxx Berry Farm operators participated in this study because they wanted to see if mulching would help control water consumption and reduce weeds, thereby reducing labor time and herbicide use. In particular, they hoped that mulch would limit growth of troublesome purslane. Farm operators were especially interested in BDM because they believed it would provide the same benefits as PE mulch (e.g., water retention) without the added labor of removing it from the field and disposing of it via landfilling. However, they were also slightly concerned that BDM would not biodegrade quickly or completely enough, resulting in clogged fine tillage machinery and/or negative impacts on flower growth the following season due to reduction of soil fertility.

During the field trial, the farm operators had difficulties with the paper mulch—although it laid well, it subsequently tore easily and blew away in the wind, sometimes taking plants with it. PE mulch and BDM, however, were perceived as being very effective. Operators reported that both mulches controlled purslane, retained soil moisture, aided plant growth, and kept flowers free of soil particles and debris. At mid-season, they perceived few differences between the PE mulch and BDM. Their main difficulty was controlling weeds on the open ground between rows; but they considered this challenge to be manageable.

At the end of the season the PE mulch was removed manually and the BDM was tilled into the soil. Till-down went smoothly, although there were some concerns that the remaining small BDM fragments would degrade slowly.

## Looking to the Future

Boxx Berry Farm was put up for sale in March 2019, and the farm's future is uncertain. However, operators said they would use BDM again if they were to continue farming. Significant agronomic advantages were observed from both the PE mulch and BDM. The use of BDM saved on labor and disposal fees associated with employment of PE mulch, which was sufficient to compensate for BDM's higher price. However, if the BDM produced fragments in the soil that adhered to tillage machinery or impacted future flower growth through reducing soil fertility, they would prefer to use PE mulch and manage the inconvenience of removal and disposal. Paper mulch was not considered a viable option because of its fragility and propensity to tear and blow away.



Above: Flower starts planted into BDM at Boxx Berry Farm



Above: BDM (seen here) and PE mulch encouraged plant growth, helped control weeds, and retained moisture



Above: Flowers, grown on BDM, ready for market