

Biodegradable Mulch – Meadow Gate Vista



Harold Weaver runs Meadow Gate Vista in Bowers, PA. He grows tomatoes, pumpkins, sweet corn and other vegetable crops working with his father James Weaver.

Area in plastic mulch: 25 acres.

Date biodegradable mulch laid: May 5, 2011 for tomatoes.

Plastic layer used to lay mulch: Rainflo 2550 raised bed layer-with auto row track.

Crop: Tomatoes, early sweet corn.

LAYING BIODEGRADABLE MULCH

Harold felt that, “[Biotelo and Eco-1] laid similar to plastic mulch.” Next time he might adjust the tension. Beds seemed a bit loose. Even though the wind picked it up in the middle a little, “It did not blow up and once plants were in seemed fine.”

Time to lay it? There was no difference compared to laying plastic.

Mid July: There were very few tears or holes. Harold Weaver covers his paths with a thick layer of mulch. This seems to cushion the edges which can sometimes rip.

August: The mulch for early sweet corn laid in early April is breaking down nicely.

When did the weeds start breaking through? With all the wet weather in last few weeks, no weeds yet (Sept 1).



Thick straw mulch between rows protected biodegradable mulch, which had few tears at the soil line compared to other sites. Photo 8.15.2011.



Small holes in biodegradable mulch had only a few tiny weeds poking through. Perhaps due to significant canopy cover from vigorous tomato plants. Photo 8.15.2011.

Any problems? It flops around a little which might be a problem on small seedlings. Harold did not notice a problem this year with sweet corn and tomatoes, but transplants were large.

Potential end of season time/\$ savings: Harold has not tracked it but estimates that when he does half an acre alone it takes ½ a day, so it would take an acre/day/person. At \$10 an hour that is \$80-100/acre.

Potential plastic disposal savings: \$50-100/A.

Biodegradable Mulch – Barefoot Gardens



Eric Vanderhyde testing hilling disks on his new SARE funded easy change-out tool bar.

Eric and Linda Vanderhyde run Barefoot Gardens in Doylestown, PA.

Date biodegradable mulch laid: May 3rd, 2011.

Plastic layer used to lay mulch: Nolts.

Crop: Summer squash, cukes, melons, tomato, pepper.

LAYING BIODEGRADABLE MULCH

Eric said that, “[Eco-1] laid down really well and was great to work with.” Biotelo worked, it was just slightly more difficult. He also tried a paper mulch from Sunshine Paper that was not possible to lay without help.



Biotelo (left) and Eco-1 (right) both performed fine. Biotelo was more fragile than Eco-1. Photo taken Sept 2, 2011 four months after it was laid.

Observations

Mid July: Minimal differences between Eco-1 and Biotelo.

Mulch break down:

In mid August it began to break down. This did not cause a problem.

When did the weeds start breaking through?

No weeds broke through the mulch.

Mid Aug: Crops were finishing. There was no in row weed pressure in mulch, only between rows.



Biotelo for melons at end of the season.



Starch based biodegradable mulches tend to break down on edges first where mulch has more contact with soil and microbes are able to attack it.

Biodegradable Mulch – Stouts Valley Farm



Sept. 9, 2011. Eco-1 (left) has small tears in some places and a long tear close to the soil in others, similar to Biotelo.

Steve Bandi runs Stouts Valley Farm in Raubsville, PA. He grows 12 acres of tomatoes and peppers in plasticulture plus pumpkins, cabbage, hay and wheat.

Area in plastic mulch: 12 Acres.

Date biodegradable mulch laid: June 10th, 2011.

Plastic layer used to lay mulch: Rainflo rasied bed layer with tension all the way out.

Crop: Tomatoes.

Between plastic weed control: Gramaxon.

LAYING BIODEGRADABLE MULCH

“Did not lay as well as plastic, we had to go back and cover the edges in some places.”

Observations

Mid July: Minimal differences.

Mulch break down: It started to break down in September 3 months after laid.

When did the weeds start breaking through? In Sept. there are tiny henbit growing in the tears.

September: This was a late planting so the mulch has only been out 3 months. It seems to be starting to break down.



July 17, 2011: nylon (left), biotelo (center). There was perforation along the edges. It looks like the hillers were hitting it and nicking it. Other than that looks good.



Sept. 2, 2011. Biotelo (left), plastic (right) three months after mulch was laid.



Sept. 2, 2011. Small weeds are just starting to grow where biotelo mulch has torn.

Cost Comparison: Steve uses about 7,000 feet of plastic per acre. One 8,000 ft roll at **\$349/ A of biodegradable mulch (Eco-1)**. Regular plastic runs him \$95/ 4,000 ft roll. At two rolls/ A it costs him **\$200/ A for plastic mulch**. Add in labor – plastic removal for an acre takes two hours for three guys, plus the tractor operator or about \$100/A acre. Disposal in this area is about \$50/ Ton. For 400 lbs of plastic/ A, another \$10/ A. Including these extra costs that is **\$310/ A for plastic mulch plus removal and disposal**. That does not include the time and hassle to dispose of it.

Biodegradable Mulch – Little Peace



Michael Scheidel runs Little Peace Farm, a family farm located near Schuylkill Haven, PA. They grow chemical-free, seasonal vegetables for their CSA members, restaurants, and farm market customers.

Date biodegradable mulch laid: May 6, 2011.

Plastic Layer used to lay mulch: Standard older model.

Crop: Tomatoes, peppers, melons.

Linear feet biodegradable mulch: 2,000 total.

Potential time savings: 2hrs/1,000 feet – 14 hrs/A

Potential disposal cost savings: \$30-50/yr -overtime with normal trash pickup.

LAYING BIODEGRADABLE MULCH: Both laid fine, no problems, nothing more to adjust.

When did the weeds start breaking through?

Sedge grass began breaking through almost immediately, but most other weeds held off until the mulch was punctured or torn.

Did the resulting weed pressure seem to affect yield? "Because of the extreme dry conditions [July] early pepper yield was down due to competition with weeds but other than that I think my yields weren't affected."

Soil heating: "I did not notice much of a difference in when crops came in compared to conventional plastic but it was definitely earlier than bare ground or straw mulch."



June 30, 2011. Biotelo (left), Eco-1 (right). Biotelo and Eco-1 were in different fields. Note that Eco-1 ripped down the center, sometimes a problem when mulch is laid too tightly. Sedge, a perennial with sharp tips was able to pierce through the mulch.



Biotelo- Aug 30th



Biotelo

"Eco-1 broke down very quickly on smaller transplants like peppers. By the time the peppers began to size up and put on foliage the mulch had already gotten brittle and began to shred. By fruit set, weeds were already coming through the tattered mulch. It also was breaking down quickly on my watermelon transplants. In both the peppers and the melons it became completely in-effective in controlling weeds by the middle of the season. It seemed that both Bio-telo and Eco-1 perform better when used with crops that put on foliage or shade fast; summer squash, tomatoes in my case. I used Eco-1 on my first summer squash and zucchini and it held up better than the other crops I had on the same product."

Eco-1 Aug 30, 2011, four months after mulch was laid.



Eco-1



Eco-1

Biodegradable Mulch – Frankenfield Farm Market



Andrew tells field day participants at Trauger Farm Market about biodegradable mulch to his left.

Andrew Frankenfield, Penn State Extension, runs Frankenfield Farm Market with his family in Elroy, PA. They produce pumpkins, sweet corn, tomatoes, hay, soybeans, and flowers.

Date biodegradable mulch laid: June 1st, 2011.

Plastic layer used to lay mulch: Rainflo 2550 raised bed mulch layer and a old flat bed mulch layer trailer type.

Crop: Peppers, eggplants, tomatoes, zinnias.

LAYING BIODEGRADABLE MULCH “It laid fine, no issues. One time with the flat bed layer the mulch tore and we had to back up and overlap.”

ADVICE: “When it got hot it got loose and actually wrinkled. Try to avoid planting in the heat of the day. Keep the tension at the lowest setting to avoid tearing it. Cover the edges well. Don’t walk on it and keep it tight to the ground.”

How did the mulch look in July? One row of the Biotelo started to tear at the side of the bed and as the wind got under it, progressed down the row. Both types started to get small holes in the plastic, it almost looked like birds were pecking at it, for the most part it stayed in place and provided good weed suppression.

How did the mulch perform through the whole season? It performed as it should have. It is still mostly in place and is now breaking down.

Did the resulting weed pressure seem to affect yield? No



July, 11 2011. Tanner, Andrew's son with Biotelo on left, Eco-1 on right. White clover cover crop was seeded in centers.



Notice that a little over one month after being laid sedge, a perennial with a sharp tip, can poke through biodegradable mulch.

When did the weeds start breaking through? Other than some annual weeds around the transplant hole and the edge of the plastic weed coming through the plastic was not an issue. Now in early September winter annual weeds are germinating where the plastic is coming off.

Any other problems? Not with this study, I used Eco-1 last year and I used the same plastic this year. It seems to break down quick and is more brittle the second year. The rolls are too long for me to use 8,000’ in one season.

Biodegradable Mulch – Shooting Star Farms



Shooting Start Farms is a tiny CSA operation serving 15 families.
Date biodegradable mulch laid: May 5th and May 28th.
Method to lay mulch: By hand.

LAYING BIODEGRADABLE MULCH: Little difference to plastic.

ADVICE: Don't lay it too tight. Even by hand I laid it too tight the first year. It ripped right down the center.

Does not store well. It is quite brittle the second year.



Biotelo (left), Eco-1(right) laid by hand May 5, 2011.

How did the mulch look in July? In the first planting it was starting to break down. In the second it did not start to degrade until August.

How did the mulch perform through the whole season? I am happy with the performance. However I did hand pull some sedge that breaks through the mulch.

Did the resulting weed pressure seem to affect yield? No effect.



August 14, 2011. Eco-one (left), Biotelo (right). Laid May 28th.



Sept .9, 2011. Biotelo (left), Eco-1 (right). Laid May 28th.



Photo: April 4, 2011. Biotelo laid mid 2010 degraded on the surface over winter. Once it was turned under it completely disappeared.



Aug 14, 2011. Weeds did not immediately germinate after mulch started to break down.

Differences between the mulches?

Biotelo is definitely more delicate. But this also seems to make it break down well. I hope Eco-one breaks down totally.

Any other problems? In one area where it blew up before plants were in it glued itself together and could not be re-laid.

It tends to wrap around the rototiller if it has not been allowed to sit and break down sufficiently.

Biodegradable Mulch – Raub's Farm Market



Area in Plastic Mulch: Testing out plastic for the first time this year.

Date biodegradable mulch laid: May 9, 2011.

Plastic Layer used to lay mulch: Nolts.

Crop: Tomatoes, peppers, eggplants.

LAYING BIODEGRADABLE MULCH: We had a hard time laying the mulch. The plastic layer was not set correctly and the mulch did not get buried well enough and was too slack. Edges that were not buried well enough blew up in the wind a few days later. There seemed to be a different flexibility between plastic, Eco-1 and Biotelo.

When did the weeds start breaking through? The weeds started breaking through in July, but it was difficult to tell due to a lot of weed pressure in between the beds.

Did the resulting weed pressure seem to affect yield? Yes. But it was hard to distinguish if it was in the bed or between.

Soil heating: Kathy was pleased with how much quicker eggplants came on compared to bare ground.



July 1, 2011.



Problems with the layer meant the mulch pulled up in places and did not cover beds well.



July 1, 2011. *Johnson grass (above) and thistles (right) are already becoming problems, bad tidings for what is to come.*



Aug. 24, 2011. *Mulch is still holding back in row weeds in SOME places.*



Aug. 24, 2011. *Johnson grass thistles, and foxtail overtook plots.*



Biodegradable Mulch – Carl Wenger Farm

Carl Wenger runs Carl Wenger Farm in Liverpool PA.

Date biodegradable mulch laid: May 30.

Method to lay mulch: Plastic layer.

At the end of July both biodegradable mulches were holding up well. In July they were brittle and cracked when walked on. The cucumber harvest in that field will conclude in early August. There were a few more weeds in the biodegradable mulch due to small holes that formed about a month after laying. Overall he did not feel there was a significant difference between the mulches.



Standard black plastic, June 15.



Eco-1, June 15



Biotelo, June 15

August 11, 2011 End of season after cucumbers.



Plastic



Eco-1



Biotelo