

Landscape Fabric versus plastic mulch

- why our flower farm is selling our mulch layer

Introduction:

The past several years have seen a rapid increase in the use of landscape fabric by small scale and urban ag producers, and is promoted by leaders in the growing local flower movement, as well as many intensive vegetable producers.

Previously landscape fabric was more commonly used for ornamental landscape purposes, or for perennial crops. Nowadays it is being more commonly used for annual crop production, and is being removed from the field at the end of the season, allowing soil amendments to be applied, and crops to be rotated.

Although our farm relied on the use of black plastic mulch for many years, I found weed control between rows to be an ongoing challenge. We tried mulching with straw, seeding cover crops, mowing and even tillage in the walkways, and found none of them to be effective. Due to ever increasing environmental concerns with the use of plastic mulch, I began the switch to using landscape fabric. But like many growers I spoke with, I still had ongoing questions about how it would affect my soil.

In 2020 I started a NESARE farmer research project to monitor how the soil reacted differently under landscape fabric (DeWitt brand) versus black plastic mulch, on our own as well as a nearby produce farm. With underground soil sensors I compared soil temperatures and moisture, and also tracked time spent installing and removing the fabric and mulch. Soil respiration was also measured twice with a Solvita system, indicating soil health through microbial activity.

Soil parameters:

Data collected indicated that soil temperature is generally close to 1-2 degrees warmer under the plastic mulch than the landscape fabric. Our soil moisture data was inconclusive. I was happy to see that the Nitrogen mineralization, indicated by soil respiration and microbial activity was the highest in the landscape fabric treatment, with 53# N/Acre, bare ground control was 49.5#/Acre and the plastic mulch showed the least microbial activity with 35.5# N/Acre.

Planting prep and Installation:

While holes in the plastic mulch can easily be punched at time of planting, landscape fabric required the use of a template for hole spacing as well as a small handheld propane burner to melt holes into the fabric. I'm glad I was outside on a breezy day where the smell of melting plastic could disperse. But it's also a task that only needs to be completed once, and by using different templates I was able to create units for specific crops. My 6" by 6", 9" by 9" and 12" by 12" spacing templates proved to be very useful for cut flower production

So as not to damage plant stems, it is not only important to make hole sizes big enough but also to secure landscape with plenty of landscape staples to prevent shifting during high winds.

Installing the plastic mulch was quick and easy, but required the use of our tractor and plastic mulch layer, which not everyone has access to. Installing the landscape fabric only required manual labor, and landscape staples to hold it in place.

Weed control:

Weed control effectiveness was increased with the use of landscape fabric, as we were able to overlap pieces, minimizing bare earth exposure. Our control plastic mulch row required a walkway that was seeded with a cover crop mix, but due to drought conditions stand establishment was poor, and weed pressure became problematic in that area.

The growing season:

Even during wet weeks our landscape fabric paths were passable and clean. Having a larger fabric area at times got hot during summer, until plant leaf cover increased and created more shade. Fabric could always be lightly covered with straw if a temp reduction was needed, especially the walkways. We experienced no difference in pest pressures between treatments, and many days we found both toads and garter snakes taking shelter under the fabric. Landscape fabric is not intended to be left on after the growing season, and should be removed as soon as possible to seed a winter cover or apply compost and soil amendment as needed before or after the growing season as needed.

Resource use:

Plastic mulch can only be used one season, and must then be taken to a landfill for disposal. There are currently no local facilities in Central Pennsylvania that accept plastic mulch for recycling. Although the DeWitt landscape fabric is also based on the use of fossil fuels, it has an average lifespan of at least 7 years, even longer if stored out of the weather when not in use.

Conclusion:

We've decided to sell the plastic mulch layer. Our landscape fabric is ready to go ready for the start of the planting season, with spacing exactly as I need it for my specific crops. There is no need to till just to prepare the soil for the discs of the plastic layer. Storing the rolled fabric inside over the winter, I anticipate being able to use these rolls for many years to come. With improved weed control, reduced tillage and cleaner field conditions on wet days, I see no reason to ever return to plastic mulch. I'm relieved to know that microbial soil health appears vibrant, and that even garter snakes have taken up residence under its cover.

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number FNE20-949.

