Using Biofilm to Reduce Herbicide Use and Hand Weeding Labor in New Small Fruit Plantings

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The Problem:
Weed control in berry plantings during the establishment year is challenging. Weeds compete with plants for nutrients, moisture and sunlight. Dense weed growth creates an atmosphere conducive to disease. Organic mulch is often applied in blueberry and raspberry plantings. Additional nitrogen applications may be needed to replace N that is tied up as organic mulch decomposes.

What else did growers learn?:
Plants for nutrients, moisture and sunlight. Dense weed growth creates an atmosphere conducive to disease. Growers that planted raspberries into the biofilm were pleased with the results. These growers installed trickle irrigation under the biofilm. One grower applied wood chip mulch over the biofilm and one did not.

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Strawberries grown in a matted row system have the most formidable weed pressure. Bare ground allows more runners to root during the first summer of growth - to keep the field free of weeds, some combination of herbicides, hand weeding, shallow cultivation and traditional plastic mulch is required.

A Possible Solution?:
Biodegradable 'biofilm' provides an alternative for growers:

- Biofilm could provide the first year weed control benefit of conventional plastic mulches with potentially insignificant plant runner or cane interference.
- Biofilm would eliminate removal and disposal problems inherent with plastic mulch.
- Biofilm reduces reliance on a fossil fuel product.
- Biofilm may reduce chemical residue from herbicides.
- Biofilm may reduce hand labor for weed control.

What we used:
For the demonstrations, we used a .6 mil Biotelo mulch film. The rolls were 48" wide and 5000' long. As of November 2008, the cost is $400/roll.

Important Tips for Success with Biodegradable Mulch

Storage
- Cool and dry: this product will start to degrade if stored warm and moist.
- Buy what you need each year.
- Store upright on ends to avoid getting holes in the roll.

Application
- Do not stretch as tight as standard black plastic - stretching starts the degradation and will increase rate of breakdown.
- Apply right before planting - Sunlight and moisture will start breakdown so don’t fit fields in advance.
- Do not apply in very warm temperatures - avoid the middle of the day if possible.

Sources of Biofilm

Biobag USA
www.biobagusa.com
1-800-959-2244

Dubois Agrination
www.DuboisAg.com
1-800-667-6279

Nolts Produce Supplies
Phone: 717-566-9764
Fax: 717-556-0700

Biofilm in strawberry planting after about 10 weeks.

What is Biofilm?
The Biotelo mulch film used in this project is made of Mater-Bi, a thermoplastic material mainly derived from corn starch. The mulch is certified compostable and is IFOAM approved for use by European organic farms. Novamont, the maker, has not yet pursued approval for use in U.S. organic systems.

The Mater-Bi mulch is an embossed mulch film, manufactured using the same technologies used to produce conventional plastic mulch film. Mater-Bi’s physical and chemical properties are similar to those of traditional plastics, but Mater-Bi mulches biodegrade at a rate similar to pure cellulose. Biofilms degrade as soon as they are stretched during field application and continue to break down in soil after incorporation.

For more information, www.materbiagro.com/ing/home.html

Conventional mulch layer used to install biofilm

Additional Insights:
A northern NY grower used the biofilm in a new blueberry planting, and then covered it with wood chip mulch. This grower was happy with the level of weed suppression and reported that the biofilm did not interfere with cane emergence.

One grower applied the mulch in early June when temperatures exceeded 100°F. Within 6 weeks significant breakdown had started resulting in poor weed control in the row. This confirms that the biofilm is indeed a unique, biologically “active” product and farmers should anticipate a learning curve.

Biofilm adhered to soil

Biofilm in newly planted strawberry field

Biofilm in strawberry planting after about 10 weeks.

Biofilm degrading after ~14 weeks in silty loam soil.

Biofilm tended to degrade below the “tuck” – contact with organic matter accelerates decomposition.

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What was done:
Several NYS strawberry and raspberry growers tried the biofilm in 2008. Results were mixed throughout the state. Biofilm decomposes more quickly when applied to soils with high organic matter content, so growers with plantings on sandy soil thought breakdown was slow. One Long Island grower in particular saw very little decomposition after 16 weeks. This is a problem as strawberry runners could not root through the intact biofilm.

Growers with more organic soils were happier with the rate of decomposition and the degree of weed suppression. These growers reported that they did not need additional in-row herbicides, tillage, or hand labor during the first year growing season. Further, they felt that the berries grown on biofilm were more vigorous than the conventional matted row plant.

One grower reported that first year costs were $116/row for the “biofilm berries” versus $175/row of conventionally grown berries.

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