Soil biodegradable mulch
An alternative to conventional plastic mulches

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Soil-biodegradable plastic mulches (BDMs) are designed to biodegrade in soil upon tillage through the activity of native soil microorganisms. Functionally, BDMs should be 100% biodegradable and provide the same horticultural benefits as non-degradable mulches (weed suppression, soil temperature moderation, moisture retention, greater yields and crop quality). BDMs should biodegrade with tilling or by composting; however, decomposition over reasonable timeframes within fields remain a concern.

BDMs are commercially available, and typically made of at least 75% polymeric feedstocks that are either biobased, derived from fossil fuels, or blend both. Other additives in BDMs include plasticizers and colorants. Note that paper BDMs (e.g., WeedGuardPlus^{TM}) are 100% cellulose.

Why consider soil biodegradable plastic mulches?

We found **5,454 - 88,272** polyethylene and **1,545 - 13,939** PVC visible fragments per hectare in CA strawberry fields: this plastic buildup reflects fragmentation in the field that accumulates during standard removal practices over time.

How does this plastic accumulation affect soil health?

- Polyethylene plastic fragments that are accumulating in mulched fields support a novel microbial habitat with greater, more efficient microbial biomass, and larger labile nutrient pools than the surrounding bulk soil.

- Plastic fragments are creating microbial hotspots—small soil volume characterized by significantly greater biological activity than the average soil.

- Implications for soil quality continue to be studied.

What's Next?

- How plastic-contaminated are CA agricultural fields?
- Connecting macro- and microplastic fragments to ecosystem function.
- Biodegradable mulch field study – viable plasticulture alternative?
- Biodegradable mulch – does exposure increase decomposability?