Biodegradable mulch films on the horizon

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Biodegradeable mulch films studies by researchers for tomato production. Photo by Mathieu Ngouajio

In 1999, more than 30 million acres of agricultural land worldwide were covered with plastic mulch, and those numbers have been increasing significantly since then. With the recent trend toward "going green", researchers are seeking environmentally friendlier alternatives to conventional plastic mulch.

Plastic mulch can provide earlier crop maturity, higher yields, increased quality, improved disease and insect resistance, and more efficient water and fertilizer use, but carries a high cost financially and environmentally when it comes to removing the estimated one million tons of mulch film used internationally each year.

Mathieu Ngouajio, of the Department of Horticulture at Michigan State

University, led a study comparing black and white biodegradable mulch films in two thicknesses to traditional plastic mulch in the production of tomato. The results of the study were published in the American Society for Horticultural Science journal *HortTechnology*.

The lowest soil temperatures were identified with the white films, which is also associated with the white film's higher rate of degradation. Breakdown of white mulch occurred early and exposed the bed for weed growth, creating competition for nutrients between weeds and tomato. As the weeds grew, they tore the mulch, leading to further degradation. Furthermore, the weeds hosted a large insect population that reduced the quality of the tomato.

"The [conventional] LDPE mulch provided 100% weed control in both years, which confirms why this is the preferred mulch used by most vegetable growers," Ngouajio remarked. Weed control levels for both thicknesses of the black biodegradable mulch were more than 90%. Black biodegradable mulch performed well in the field, producing tomato crops similar to conventional mulch during both years of the study.

The study authors explain that there are three factors to be resolved before black biodegradable mulch can be seen as a viable replacement for conventional methods. First, more research is needed to produce mulch that can fully break down in the field. Second, biodegradable mulch must be able to withstand the stresses of being applied to fields by machine. Last, the price of biodegradable mulch needs to be economically acceptable compared to conventional mulch after factoring in the savings for removal and disposal.

More information: The complete study and abstract are available on the ASHS HortTechnology electronic journal web site: horttech.ashspublications.org/ … nt/abstract/18/4/605

Source: American Society for Horticultural Science