

Biobased mulch spray curbs weeds in vegetable crops

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Biobased sprayable mulch (BSM) films are a potential alternative to herbicides, polyethylene plastic mulch film, and hand weeding for specialty crops. Researchers at the American Society for Horticultural

Science have developed a series of BSM films using locally available biomaterials and tested their effects on weeds and crop yield during a total of seven greenhouse or field trials between 2017 and 2019 in Nebraska, U.S..

The paper is [published](#) in the journal *HortTechnology*.

The overall goal of this research was to develop novel BSM films using locally available biomaterials that are optimized for [weed suppression](#) and vegetable crop performance. To accomplish this goal, the team embarked on a [design process](#) whereby BSM films were developed, tested on [weeds](#) and crops in the greenhouse and field, reformulated to address observed pitfalls, and tested again.

Application rates of BSM films applied in pots (greenhouse), planting holes in plastic film (field), or bed tops (field) were applied before and after the emergence of weeds. Weed control efficacy was variable, and results of greenhouse pots were rarely replicated under field conditions. The results demonstrated the potential for postemergence applications of BSM films, which increase application timing flexibility for growers. Further research is needed to explore the effects of BSM films on soil properties and crop physiology and yield.

Overall, the results of this study highlight the important relationship between BSM viscosity and weed control efficacy. Many of the early BSM films tested were not viscous enough to consistently form a weed-limiting barrier on the soil surface, particularly under field conditions. The results also demonstrate the potential for postemergence applications of BSM films, which could increase application timing flexibility for growers.

Weed control efficacy of postemergence BSM applications was comparable to preemergence applications in most trials, particularly if

the weeds were at the cotyledon growth stage. Further research of the effects of BSM films on soil chemical, biological, and physical properties is needed to determine why crop yield benefits are rarely proportional to other agronomic benefits. Additionally, future BSM development efforts should aim to increase [cost efficiency](#) because many of the biomaterials tested during this study (e.g., cornstarch, zein, and isolated soy protein) and others are expensive, especially compared with polyethylene plastic mulch film.

Dr. Sam Wortman is an Associate Professor in the Department of Agronomy and Horticulture, University of Nebraska–Lincoln. He specializes in Horticulture, Turf & Landscape Systems. Dr. Wortman, observed, "Specialty crop growers are seeking sustainable alternatives to polyethylene plastic mulch film and hand weeding, but their options are limited. Given my ongoing interest and research on biobased and biodegradable mulches... Our team's goal was to contribute to development of new weed management tools for specialty crop growers while also promoting a biobased, circular economy in Nebraska and beyond."

More information: Elliott Gloeb et al, Biobased Sprayable Mulch Films Suppressed Annual Weeds in Vegetable Crops, *HortTechnology* (2022). [DOI: 10.21273/HORTTECH05112-22](https://doi.org/10.21273/HORTTECH05112-22)

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