



Evaluation of Organic Biodegradable Mulch in Cantaloupe Production

WeedGuardPlus®, an OMRI listed biodegradable paper mulch, was evaluated as an alternative to conventional black plastic mulch for weed control in organic cantaloupe production. Previous biodegradable mulches commercially available were not OMRI approved and were developed using plant starches not paper. Previous trials with biodegradable paper mulch were shown not to be as effective as biodegradable plastic mulch in regard to crop production. The trial was established in the Organic Block at the Long Island Horticulture Research and Extension Center in Riverhead, NY which has been under organic management since 2001. The experiment was arranged as a randomized complete block design with four replications. Each plot consisted of a single row, or a 68” bed, 40 feet long. Plants were spaced 2 feet apart within the row. Data was collected from the center 20 feet of each plot and included yield, fruit quality, and soil temperatures readings under the different mulch treatments. Visual assessments on weed suppression and product breakdown were also documented.

‘Wrangler’ cantaloupe was seeded into 36-cell trays in the greenhouse on May 14. At first true leaf, transplants were fertilized with Biolink 3-3-3 organic liquid fertilizer once per week until transplanting. One week prior to field setting, transplants were moved outdoors and allowed to harden off to reduce transplant shock. The field was prepared on June 5 by broadcast applying 1500 lbs/acre Pro-Grow organic granular fertilizer (5-3-4) and disking in. Conventional black plastic mulch and biodegradable WeedGuardPlus® paper mulch were laid over the beds with a commercial mulch layer also on June 5 with drip tape under both. Transplant holes were made using a water wheel transplanter. Transplants were field planted on June 7. Pyganic insecticide was applied for cucumber beetle management and no fungicides were used for disease control. Plots were drip irrigated 2-3 times per week from transplanting until harvest. Temperatures under the plastic and paper mulches were taken five times on June 12, 18, 26, July 11, and August 16 to a depth of about 4”. Visual assessments on weed suppression were taken regularly. Plots were harvested three times and data on yield and fruit quality were recorded. The WeedGuardPlus® remained in the field until September 10 to evaluate product breakdown at which point it was then lightly disked and breakdown assessed again 2 weeks later.

Results from the trial show that there were no statistical differences in cantaloupe yield and fruit quality when grown under black plastic mulch or WeedGuardPlus® paper mulch (Table 1). Numerically, early yields were greater with the black plastic mulch compared to the WeedGuardPlus® which is likely due to the increased soil temperatures achieved with black plastic mulch (Table 2). However, the greatest total marketable yields were attained with the WeedGuardPlus®. Although the total yields were not statistically significant, the numeric difference could have a significant impact on profit potential depending on input costs. Average weight per fruit was slightly greater under black plastic mulch compared to the WeedGuardPlus® paper mulch and % Brix readings were similar between the two.

In conclusion, the WeedGuardPlus® paper mulch did not significantly differ from the standard black plastic mulch in regard to yield and fruit quality. Early yields were slightly lower with the WeedGuardPlus® in comparison to black plastic mulch but total yields were numerically greater. Temperatures under the black plastic mulch were on average 5-10 °F warmer. The warmer temperatures helped promote greater earlier yields but did not help to maintain yields over time. The water wheel transplanter used to punch the holes in both the plastic and paper mulches did not present any difficulty in either situation. Also, there was no tearing of the paper mulch associated with the punching of holes. Weed control was similar among the treatments. Both mulches did a great job preventing weeds within the bed. The only challenge was keeping the weeds down between the row middles but this was true for both the plastic and WeedGuardPlus® mulches. Post-trial the WeedGuardPlus® degraded without difficulty and by October no traces of the WeedGuardPlus® could be found in the field. The WeedGuardPlus® biodegradable mulch offers an effective environmentally sound alternative to conventional black plastic mulch.

Treatment	Marketable Fruit				Average	
	Early Yield ¹		Total Yield		Wt/Fruit (lbs)	Brix (%)
	(No./A)	(cwt/A)	(No./A)	(cwt/A)		
Black Plastic Mulch	3,556	145	4,710	198	4.2	10.5
WeedGuardPlus®	2,307	87	6,248	225	3.6	10.5
<i>Fisher's Protected LSD (0.05)</i>	<i>(ns)</i>	<i>(ns)</i>	<i>(ns)</i>	<i>(ns)</i>		<i>(ns)</i>

¹ Early season marketable fruit includes data collected on 8/16

Treatment	Soil Temperature (°F) ¹				
	6/12	6/18	6/26	7/11	8/16
Black Plastic Mulch	80	85	85	85	90
WeedGuardPlus®	75	75	75	85	80

¹ Soil temperatures readings were taken to a 4" depth

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