
Field Comparison of Mustard Green Production on Paper Mulches Coated With Polymerized Vegetable Oil¹ 2002-01Robert C. Hochmuth, Eric H. Simonne, and Wayne E. Davis²**Material and Methods**

This paper mulch study was conducted during the winter 2001-2002 season at the North Florida Research and Education Center – Suwannee Valley, near Live Oak, FL on a Lakeland fine sand. Rototilling prepared the soil used for the experimental area. Beds were formed on 5-foot centers with each 24 inches wide at the top. On 31 October 2001, beds were fertilized and formed with a bedpress. Treatments included four paper mulches and one black polyethylene mulch. The black polyethylene mulch was a Sonoco high-density film (0.6 mil). The paper used was a brown Kraft paper coated with a polymerized vegetable oil provided by Randal Shogran, Plant Polymer Research Unit, National Center for Agricultural Utilization Research, ARS, USDA, Peoria, Illinois, 61604. All mulches were applied to the beds with Kennco mechanical mulch application machine. Plots were 30-ft long and each treatment was replicated four times. Plots were arranged in a randomized complete block design. Drip irrigation tubing was Roberts Ro Drip with an 8-mil wall thickness and emitters spaced 12 inches apart. Pre-bed fertilizer application was 500 lbs/A 10-10-10 (N-P₂O₅-K₂O). Remaining N and K₂O was fertigated weekly to result in N and K₂O rates for the season of 150 lbs/A.

On 8 November 2001, 5 week old mustard transplants, cultivar ‘Florida Broadleaf’, were planted in the field. Plants were placed in two rows on each bed with 12 inches between plants in a row. Transplants were planted with a mechanical-aid transplanter “water-wheel” and water was applied with each transplant for aid in transplant establishment. Mustard whole plant tops were harvested only once, on 3 January 2002. Plants were clipped at the ground level. All data was analyzed by analysis of variance and means were compared using Duncan’s Multiple Range Test.

¹ Trial conducted in cooperation with Dr. Randal L. Shogren, Plant Polymer Research Unit, National Center for Agricultural Utilization Research, ARS, USDA, Peoria, Illinois, 61604.

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Results and Discussion

Mulch application of polyethylene mulch was excellent and paper mulch was fair to good. The speed of the application was set at 2 miles per hour for paper mulch treatments.

Transplants were planted using a water-wheel transplanter. Holes were punched in the paper without any serious problems. The holes in the paper tended to tear an additional 1-2 inches, but no more. The paper mulch laid tightly to the bed and resulted in an acceptable mulched bed.

Rates of coatings relative to paper on the paper mulches were 40-50%. Paper mulches softened and began to degrade first in the area of the buried tuck. All papers had similar degradation rates at the buried tuck. There were no observable differences between paper mulches, in terms of degradation of the buried tuck. Observations on 16 November 2001 (16 days after application) showed advanced degradation of the buried tuck on all four paper mulches, and no degradation of the polyethylene mulch. On 16 November, the paper in the buried tuck area was soft and degraded to the extent the buried tuck area had separated from the rest of the paper sheet at the soil line. By early December, very little of the buried tuck was found in tact in any paper mulch treatment. A windstorm, in mid-December, displaced the paper mulch left on the bed, except for the paper held in place by the mustard plants.

Mustard yields (whole plant fresh weights) were in the range of 16,000 lbs/A for all treatments. There were no significant differences in yield found as a result of any mulch treatment.

Table 1. Effect of mulch type on mustard plant yields at Live Oak, Florida.

Mulch Type	Mustard Yield (lbs/A) ^z
Paper + soybean oil + catalyst + carbon black	16,335
Paper + soybean oil + soy wax + catalyst + carbon black	15,900
Paper + linseed oil + catalyst + carbon black	16,553
Paper + linseed oil + soy wax + catalyst + carbon black	16,335
Black polyethylene mulch	16,335
Significance (P=0.05) ^y	NS

^z Mustard yield is expressed in pounds per acre of a single whole plant harvest.

^y Significance was “not significant” (NS).