

COMPARISON OF VARIOUS PLASTIC MULCH FILM RESINS IN FALL CUCUMBER PRODUCTION

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Introduction

Cucumbers are often produced, particularly as a second crop, on plastic mulch in Georgia. However, the technologies in plastic mulch film production have changed substantially over time and continue to develop. Ampacet Corporation produces many of the resins from which the mulches are made. Various plastics will differ in color, strength, longevity and many other characteristics. This test was conducted to evaluate the effects of some experimental plastic mulch films on the yield of slicing cucumbers planted as a second crop behind bell pepper. The company also did additional testing on the plastics themselves from samples taken from the test at monthly intervals during the season.

Methods

Because the nature of installation of relatively small plots of plastic mulches using in combination with fumigation might pose a health risk to workers, the experimental area was fumigated in conventional fashion with methyl bromide (67% methyl bromide:33% chloropicrin) two weeks prior to laying the test plastics. The plastic installed at fumigation was removed before installing the experimental plastics.

Thirteen different plastic mulch films were installed on April 4, 2004. The plastic rolls were 48 inches wide and were installed using a Kennco Blue Boy Plastic Mulch Layer. Plots consisted of 30 row feet of mulch with each mulch replicated four times in the field. Beds were spaced 72 inches apart from center to center with a bed top of approximately 24 inches.

Bell pepper (“Camelot”, Seminis Seed Co.) was produced as a spring crop on the plastic with the final harvest occurring on July 21, 2003. The crop was terminated using metam sodium and paraquat and the plants were pulled out of the beds. Cucumber variety “Thunder” (Seminis Seed Co.) was direct seeded into the plastic mulch-covered beds on August 26, 2003. The soil type was a Tifton sandy loam (fine-loamy siliceous thermic Plinthic Kandiudults) soil. Elevation at the CPES is 382 feet. Cucumbers were planted in an arrangement of one row per bed. Plots consisted of one row of 20 plants per row spaced nine inches apart.

Peppers had received a pre plant granular fertilizer application of 500 pounds/acre 10-10-10. Additional fertilization was applied through the drip irrigation system amounting to approximately 100 pounds nitrogen and potassium per acre. Applications were made with a 7-0-7 liquid fertilizer material. An additional 100 lbs/A of N and K were applied through the drip

irrigation system on the cucumber crop. Injections were made either once or twice each week. Plots were treated with recommended insecticide sprays as needed. Irrigation was applied daily through the drip system.

Cucumbers were harvested approximately two times weekly between November 4 and November 25, 2003. Data was taken on yield by grade.

Results

There were some differences between the plastics for yield in some grades. Yields were lower than would be expected overall due to a later planting date. The FL-24, FL-8 and FL-12 plastics produced a significantly higher yield of marketable fruit per acre than several of the other plastics. FL-2 produced a significantly greater percentage of marketable cucumbers than FL-11 and FL-16. Complete results are presented in Table 1.

Table 1. Average 30-pound boxes of Super, Carton, Small and Select grades per acre,

total boxes per acre, boxes per acre of super + small and percentage of super + small of slicing cucumbers grown on various plastic mulches in Tifton, Georgia in 2003.

Plastic	Boxes Supers/A (30 #)	Boxes Carton/A (30 #)	Boxes Small/A (30#)	Boxes Select/A (30#)	Total Boxes/A (30 #)	Boxes Super + Small/A (30 #)	Percent Super + Small
FL-15	69	68	61	48	246	130	50.7
FL-3	34	39	50	21	144	84	55.7
FL-16	77	50	11	98	236	89	33.2
FL-1	23	26	29	21	98	52	51.1
FL-24	137	192	69	69	468	207	44.8
FL-12	198	123	27	65	413	226	52.4
FL-4	53	35	27	48	165	81	45.4
FL-10	77	147	42	42	308	119	41.2
Silver	63	98	36	79	276	98	34.1
FL-2	50	42	50	34	176	100	73.0
FL-11	87	129	26	119	361	113	28.2
FL-8	171	84	76	61	392	247	59.0
FL-17	134	232	42	31	439	176	40.1
Mean	90	97	42	57	286	132	46.8
CV (%)	59.5	59.1	59.6	71.2	29.4	41.8	42.4
L.S.D. (0.05)	90.7	96.9	42.2	68.0	142.0	93.3	33.4