

## Effects of Plastic Mulch Type on Tomato Vigor and Yield

### Final Report

**Objective:** To evaluate and compare the potential effects of selected plastic mulch types or caged systems on fresh market tomatoes.

**Materials and Methods:** The trial was conducted during 2004 at the Carolyn Lanier Youth Farm operated by the South Plains Food Bank in Lubbock, TX. In early May soil at the trial site was disced and prepared for laying of the Black, Red and SRM Silver plastic mulches (Figure 1). Six-week old tomato seedlings (Var. "Celebrity") were transplanted in the field on May 22. Within one week caged tomatoes were covered with a Spun-web cloth material that allowed 85% sunlight transmission, and these remained covered for 6 weeks. Permanent sub-surface drip was used to irrigate and fertilize the tomato plants. All pest management control measures were conducted throughout the duration of the trial to ensure adequate crop growth. Crop vigor was recorded during mid-season growth and yields were harvested weekly beginning August 5 through September 30. The trial was designed as a randomized complete block with 5 treatments (Table 1) replicated 8 times. Individual plots measured 8'x 25' and contained 8 plants each.

Table 1. The Effects of Plastic Mulch Type and Caging on Tomato (Var. "Celebrity") Vigor and Yield

Treatment (Plastic Type)	Vigor <sup>A</sup> (7/03)	Vigor (7/27)	Marketable Yield (lbs/acre)	% Increase Compared to Control
Bare Ground (Control)	3.4	4.1	25,627	0
Caged (with Spun web)	4.0	4.6	50,536	49.3
Red	3.1	3.5	29,511	13.2
Black	3.8	4.0	29,834	14.2
SRM Silver	4.1	4.1	33,707	24.0
<b>LSD (0.05)</b>	<b>0.6</b>	<b>0.6</b>	<b>7,888</b>	

<sup>A</sup> Crop vigor (health) ranking: 1 = poor; 2 = fair; 3 = average; 4 = good; 5 = excellent.

**Results and Discussion:** Excellent growing conditions (rainfall and seasonal temperatures) occurred throughout the duration of the trial. Early (July 3) crop vigor was greatest in tomatoes grown on SRM silver mulch and in cages, though only significantly different ( $\alpha= 0.05$ ) from the bareground and red plastic mulch treatments (Table 2). By July 27 tomato growth in cages was superior to all others, but only significantly better than those grown on red plastic film. Tomato yields were significantly higher when grown in cages compared to all other treatments (Table 1). This was likely due to a lower percentage of culls from caged treatments when compared to bare ground and plastic mulch treatments where the fruit would lay on the soil or plastic surfaces. When compared to the bare ground control, marketable yields from caged tomatoes increased 49%. Tomatoes grown on SRM Silver mulch significantly increased yields 24% compared to the bare ground treatment, while Red and Black mulches produced higher though non-significant increases. The results of this trial indicate that caged (plus Spun Web for 6 weeks) tomatoes were superior in crop vigor and marketable yields, followed by SRM Silver, Black and Red plastic mulches when compared to bare ground treatments. The results of this trial suggest that both the caged and SRM Silver plastic mulch are good options for smaller acreage farmers and home gardeners in the Texas High Plains region.

**Note:** Thanks to cooperators at the South Plains Food Bank for all of their support and assistance including Debbie Cline, Roy Riddle, Cedric Maupin and many of the G.R.U.B. youth participants.



Figure 1. Plastic mulch types used in tomato trial at Carolyn Lanier Youth Farm, Lubbock, TX



Figure 2. Early growth of tomatoes in plastic mulch and caged tomato trial