

Mulching Cantaloupes with Plastic at Yuma, 1996

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Abstract

Six mulches were compared to no mulch on cantaloupes at Yuma in the Spring of 1996. The IRT film and black mulches caused "Mission" cantaloupes to produce significantly higher early yields than white mulch or no mulch. Silver mulch gave good early and total yields. All mulches seemed to favor total production but in this test differences for total yields between mulched and non-mulched plots were not significant.

Introduction

Mulching is a practice where a covering is placed on the soil around the crop plant to enhance crop production. This covering, as a mulch, helps to control weeds, conserve moisture, regulate soil temperature and keeps fruit clean and free from disease. The mulch can be an organic and a synthetic material. Leaves, grass clippings, sawdust, straw and paper have been used in the past for vegetables and strawberries. With the advent of polythene film in the 1950's plastic was tested for mulching in high value row crops. In the 1970's this technique was adapted to tomatoes and other vegetables in Florida where now it is a universal practice. In California mulching with plastic is a standard practice for strawberries.

Until recently mulching was not used much in vegetables in Arizona. Tests were made at the Yuma Valley Agricultural on cantaloupes in the 60's but the technique did not seem compatible with furrow irrigation. About five years ago and when buried drip irrigation was perfected and accepted for vegetable production in Arizona, plastic mulch began to get attention, especially for melon production.

Mulching, especially in combination with drip irrigation, offers many benefits for Arizona vegetable growers. Increased yields and improved quality can result. Harvests can be extended early or late. Water and fertilizers are used more efficiently. Pesticides can be applied more effectively. Mulch can aid in controlling weeds, insects and diseases. However, there are these limitations: a) increased investment and costs, b) removal and disposal of the plastic in the field after the crop and c) the higher level of management required.

Many types and colors of plastic mulch are available. The purpose of the experiment reported here was to see how some of these mulches affected spring cantaloupe production at Yuma.

Materials and Methods

Six plastic mulches were compared to bare soil (no mulch) in cantaloupes at the Yuma Valley Agricultural Center, Yuma, Arizona. All mulches (60" wide) were applied on an 80" bed where a drip line was placed 8" deep in the center of the bed. The mulches were laid and well anchored by a Kennco mulch layer. The treatments were:

1. Control (no mulch)
2. IRT 76 (infrared transmitting film) - AEP Industries.
3. Silver (1.25 mil) - AEP Industries
4. Black embossed (1.25 mil) - Consolidated Thermoplastics
5. White/Black embossed (1.40 mil) - Consolidated Thermoplastics
6. Black - Sonoco
7. White/Black - Sonoco

All treatments were 150 feet long and replicated four times. Seed of cantaloupe cv. 'Mission' (Asgrow) was planted by hand through the plastic and spaced so single plants would be one foot apart in the center of the bed and over the drip line.

The mulch was laid on March 7, 1996 and planting took place on March 7 and 8 with the first watering on March 11. The drip tubing was T-Tape (8 mil wall, 12" spacing). Irrigation needs were estimated based on AZMET generated ET values. Admire was applied through the drip lines. Fertilizer was broadcasted before bedding (500 lbs of 11-52-0/A). An additional 150 lbs of nitrogen was applied through the drip at weekly intervals.

Harvests were on June 4, 7, 10, and 14. Marketable fruits were counted and weighed for each treatment on 25 feet of row in each replication.

Results and Discussion

The type of mulch used made a difference in cantaloupe response, particularly in the early part of the season (Table 1). The IRT film and the black mulches produced early yields that were significantly greater than those from the white mulches or no mulch at all. Also, silver mulch produced good early yields.

In regard to total yields all mulches seem to have a favorable effect, although statistically the differences between mulches and non-mulched plots were not significant. The cantaloupes on white mulches tended to catch up with the other treatments over the whole harvesting period. The white mulch appears not to favor early production, but has merit for total production and later plantings.

It should be mentioned that all treatments received the same amount of water during the growing period based on the needs of the mulched plants; this placed the non-mulched plots at a disadvantage since the plastic on mulched plots prevented moisture loss from evaporation from the soil. Although this situation produces an unfair comparison between mulched and non-mulch plots, it does point out a value of mulches.

The silver mulch is advertised as a deterrent for aphid and whitefly. Observations indicated less whitefly on silver mulched melons, but because the number of insects was still significant and to save the other treatments, Admire was applied through the drip irrigation. Indications are that silver mulch may be an aid in reducing a whitefly problem.

The average fruit size did vary slightly between treatments but difference in fruit weight was not significant.

Black mulches appear to have a place in early cantaloupe production. The silver mulch is worthy of a trial. White/black mulch should be tried for mid-season and late plantings where melons may benefit from a cooler soil caused by the white surface.

Trials with the different mulches are encouraged so that an evaluation of the feasibility and economics of the practice of mulching can be made.

Table 1. Early and total yields of 'Mission' cantaloupes mulched with plastic at Yuma, Spring, 1996.

Treatment	Yield*				
	Early		Total		Average
	No of fruit	Wt (lb)	No of fruit	Wt (lb)	Fruit Wt (lb)
1. No mulch	0.3	0.9	63.0	191.0	3.03
2. IRT film (AEP)	14.5	42.8	81.0	230.6	2.85
3. Silver (AEP)	12.5	38.5	76.8	221.8	1.88
4. Black (CT)	15.2	44.4	75.8	217.8	2.87
5. White (CT)	3.2	11.6	71.0	213.4	3.00
6. Black (Sonoco)	15.2	46.8	68.0	198.1	2.91
7. White (Sonoco)	10.0	32.2	79.8	240.0	3.00
LSD .05	9.8	31.1	20.8	69.7	

*Average for 25' plots: early yield - harvested June 4; total yield - harvested June 4, 7, 10 and 14