Synthetic Mulching Experiment

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Investigations of the use of synthetic mulches during 1963 indicated that yields could be increased substantially through the use of heat-absorbing films, such as black polyethylene and a petroleum emulsion, particularly if used early in the season.

In 1964 a test was devised to secure additional information about synthetic mulches. The treatments were: (1) Petroleum mulch applied over a strip tilled band, (2) Petroleum mulch without strip tilling, (3) Black polyethylene mulch in an eight-inch exposed band, (4) Kraft paper applied the same as the polyethylene, (5) Normal planted check, using the "capping" method, and (6) Strip tilling without the petroleum mulch.

Three dates of planting were used, March 20th, March 31st, and April 20th. Plots were two rows by 600 feet and replicated three times. A temperature recorder was set up to read thermocouples in the center of the rows at the two-inch depth in each of the treatments in the second date of planting, D2. The recorder was started on April 8th and ran continuously for 75 days. The temperature in each plot was recorded once every 24 minutes. The temperature data was transferred to data cards and processed through a computer. The readings were converted to degree-hours above and below 65 degrees, F., and the difference was used to indicate the heat absorption in each treatment.

The plots were cultivated one time with a rolling cultivator equipped with furrowing sweeps. Karmex, used as a foliar spray with a surfactant, was applied at the rate of 2.4 pounds per acre to kill grass on June 23. No other cultivations were used.

The dates of harvest were staggered so that each date of planting treatment was harvested at approximately the same length of time after planting. The two earlier planted treatments were bottom defoliated, and the D3 planting was completely defoliated before first picking.

Results are presented in Table I.

TABLE I. PLOT SEED COTTON YIELDS AND HEAT ABSORPTION IN DEGREE-HOURS ABOVE 65 DEGREES WHEN USING SYNTHETIC MULCHES

Treatment	Pounds S/C per plot			Avg. for	Deg-Hrs.	Mean
Planting Date	3/20	3/31	4/20	Treatments	Per Day	Temp.
Petr. Mulch with Strip Tillage	264	259	266	263	1,361	87.7
Petr. Mulch w/o Strip Tillage	244	255	283	260	1,351	87.5
Black Plastic	287	291	280	286	1,390	88.2
Strip Tillage, No Mulch	238	254	274	255	1,282	86.4
Normal Planted Check	231	226	271	243	1,289	86.5
Paper Mulch	222	226	272	240	1,219	85.3
Avg. for dates	238	252	275			

Conclusions

There was a significant difference in yield due to both the mulch treatment and date of planting. Yield differences due to the mulch were not as significant as in 1963. Very poor stands were secured on the two earlier plantings under the petroleum mulch. Fifteen-foot sections of rows having equivalent stands were hand picked for yield, and in this case the petroleum mulched plots outyielded the black plastic. The yield results from date of planting treatments were completely opposite from what one would expect; the later planted plots outyielded the earlier ones. This may have been due to the unusually long, cool spring in 1964.

The temperature records show that there was a greater uptake of heat under the plots having petroleum and plastic mulch, and that the paper caused a reduction in temperature. The temperature differences were much greater during the early part of the test period. Later, the plants began to shade the ground and cut off the radiant energy input to the surface. A fairly good straight line regression equation can be written for yield on heat uptake and takes the following form: $Y = 0.136\ H + 78.92$ where, Y represents lint yield, and H is degree-hours per day.

Since there was so great a variance in results from 1963 and 1964 the test should be repeated for at least one more year with a view toward improving the stand under the petroleum mulch.

Synthetic Mulch for Cotton Still of Interest

(W. E. Larsen)

Growers are looking for methods to improve the germination, emergence and early growth of cotton. Getting cotton off to a good start early in the spring does increase yields. Synthetic mulches of the asphalt spray or plastic type do help. Mulches show little advantage with late planted cotton. Growers and commercial companies are attempting to develop methods and materials that will allow them to use mulch without too much additional expense.