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**COVERS FOR PRODUCING TOBACCO TRANSPLANTS**  
 BLACKSBURG, VIRGINIA  
 P. Jones\*



Tobacco producers have historically used some type of protective covering on tobacco seed beds. During the last century the most commonly used covering has been a coarsely woven cotton or cheesecloth. The cover has served two major purposes -- provide warmth and reduce the rate at which the top layer of soil is dried. Many growers are turning to other types of plant bed covers to hasten plant growth and to reduce costs.

Plastic covers offer some advantages over cotton in producing plants. Since air and soil temperatures are considerably higher under plastic than <sup>1</sup> under cotton covers, plants will grow faster. Research conducted at Chatham in 1963 showed that seed germinated one week earlier under plastic than under cheesecloth and plants were ready to set three weeks earlier.

Even though there are some advantages from growing plants under plastic, there are also disadvantages. Plastic covered beds require more careful management (ventilation and soil moisture are critical). Perforated plastic covers reduce the risks of high temperatures and low soil moisture to some degree.

Management problems associated with plastic covers have encouraged researchers and manufacturers to develop alternative materials that have the advantages of plastic but not the disadvantages. Two new types of covers (Chix-Nylon and DuPont-Reemay) offer some advantages over cotton and plastic covers. They are porous enough for penetration of air, water and pesticides, and the buildup of excessively high temperatures is not a problem. Soil and air temperatures under the nylon and Reemay are intermediate between plastic and cotton.

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<sup>1</sup>LaPrade, J. L., J. G. Petty, and W. H. Wills., Use of Plastic Film in Production of Tobacco Seedlings. Va. Agr. Expt. Sta. Tech. Bul. 167. Jan. 1964.

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On-farm tests designed to determine the influence of different types of plant bed covers on stand and the number of plants ready for transplanting at the first and second pulling were conducted in 1974-1977. Location, year of test, cooperating growers, and Extension Agents are presented below.

<u>Location</u>	<u>Grower</u>	<u>Extension Agent</u>	<u>Year</u>
Halifax	W. T. Epps	R. L. Shaw	1974,75
Lunenburg	Hardy Barnes	Richard Lacks	1974,75,76,77
Nottoway	Southern Piedmont Center		1974,75,76,77
Sussex	C. Holloway	S. Jennings	1975
Charlotte	Roy May	R. L. Shaw	1976,77
Charlotte	Ralph May	R. L. Shaw	1976
Pittsylvania	E. Scarce	W. F. Brown	1976
Nottoway	R. Payne	R. Leslie	1977

#### EXPERIMENTAL PROCEDURE

The tests were conducted under farm conditions utilizing recommended fumigation, seeding, fertilization, and other management practices. The covers were placed flat on the bed and were supported by a thin layer of fumigated small grain straw or pine needles (about 15-20 pounds per 100 sq. yds.) Bed size was 4 yds x 5 yds. Total stand counts and numbers of transplants at the first and second plant-pulling were determined for each treatment. The accompanying tables show the effects of the different covers on plant stands and earliness of transplants.

#### RESULTS AND DISCUSSION

A summary of the results of the tests for the years 1974-1977 is shown in Table 1. The average performance of the cotton, nylon and perforated plastic covers over 16 tests is presented in Table 2. The difference in plant production among treatments shown in Table 1 was closely associated with moisture and temperature conditions during the growing season.

In 1974 and 1975 the transplant production season was characterized by adequate to excessive moisture and normal to below normal temperatures. These conditions favored the production of plants under perforated plastic and nylon. More early and total transplants were produced under perforated plastic and nylon than under cotton. Even under the moderate climatic conditions in 1974, excessively high temperatures resulted in severely reduced stands under the solid plastic cover. Because of problems with excessive temperatures and insufficient soil moisture, solid plastic covers should not be used in the production of tobacco transplants.

Table 1. Results of Plant Bed Cover Tests Conducted in Virginia 1974-77.

Cover	Transplants per sq. yd.			
	Total Stand	1st Pulling	2nd Pulling	Total 1st & 2nd
<u>3 Locations 1974</u>				
Cotton	208	44	66	110
Solid Plastic	137	42	44	86
Perforated Plastic	193	57	71	128
Nylon	189	66	56	122
<u>4 Locations 1975</u>				
Cotton	165	47	61	108
Perforated Plastic	221	98	52	150
Nylon	224	79	86	165
<u>5 Locations 1976</u>				
Cotton	324	73	79	152
Perforated Plastic	222	49	54	103
Nylon	310	68	72	140
Reemay	307	69	95	164
<u>4 Locations 1977</u>				
Cotton	342	70	110	180
Perforated Plastic	321	110	78	188
Nylon	343	108	77	185
Reemay	314	113	93	216

Table 2. Comparison of Cotton, Nylon, and Perforated Plastic Plant Bed Covers (16 Locations, 1974-77).

Cover	Transplants per sq. yd.			
	Total Stand	1st Pulling	2nd Pulling	Total 1st & 2nd
Cotton	260	59	79	138
Perforated Plastic	239	79	64	143
Nylon	267	80	73	153

Inadequate soil moisture and damage from wind resulted in reduced stands and poor plant growth with the perforated plastic cover in 1976. Although perforated plastic covers do reduce the risks of excessive temperatures and low soil moisture associated with solid plastic, dry soil and high temperatures can be a problem especially if too few holes are used. It is important to perforate the plastic early and have holes a minimum of 1/4 inch in diameter about 2 inches apart. Adequate soil moisture is necessary for good seed germination and prevention of fertilizer salt injury. Very little water moves through plastic covers even when properly perforated. Therefore, 1/4 to one inch of water (depending upon soil moisture) should be applied to beds prior to covering with plastic.

A summary of the results from 16 tests over a four year period (Table 2) shows that perforated plastic and nylon covers produced a greater number of transplants at the first pulling than the cotton cover. The results of the tests in 1976 and 1977 indicate that the nylon and Reemay are very similar in performance.

#### SUMMARY

Results from 16 plant bed cover on-farm tests indicate that transplants can be successfully produced under perforated plastic, nylon and Reemay covers provided good management practices are followed. Differences in plant production among the different covers tested was greatly affected by moisture and temperature conditions during the growing season. On the average more transplants were produced at the first pulling under the perforated plastic, nylon, and Reemay covers than under the cotton cover.

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