

YIELD RESPONSE OF FLUE-CURED TOBACCO TO AN ANTI-TRANSPIRANT APPLIED TO TRANSPLANTS¹

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Tobacco transplants undergo considerable "shock" when pulled from the plant bed and planted into the field. Firstly, the root system is essentially destroyed when the plant is removed from the ideal environment of the bed; secondly, the plant is usually exposed to a harsher environment conducive to high transpirational stresses after being planted in the field. These conditions often cause wilting and desiccation with ensuing death of leaf tissue during the first week after transplanting. Theoretically, if wilting and desiccation could be reduced or prevented, early plant establishment and growth would be promoted.

In 1968, nine on-farm tests distributed throughout the flue-cured tobacco producing area of North Carolina were conducted to study the effect of an anti-transpirant on plant survival, yield per acre, value per acre and value per hundred weight of cured tobacco. The treatments consisted of (1) dipping and swishing only the leaves of plants for 5 to 10 seconds in a solution of 5 parts water and 1 part of MOBILEAF², an anti-transpirant developed by Mobil Oil Corporation, and (2) untreated plants, referred to hereafter as check. Plants were transplanted with a combination fertilizer-distributor transplanter and no replanting was done. Each treatment was replicated twice in a randomized block design at each location. Individual plot size was .033 acre. Analyses of variance were computed for yield per acre, value per acre and value per hundred weight.

Results from the 9 tests are summarized in Table 1. MOBILEAF was found to be associated with an 83-pound per acre increase in yield and statistically significant at the .15 level of probability. The average difference in stands in the tests based on stand counts was less than 1%. The lack of difference in plant population indicates that the response observed cannot be related to stand *per se*. It is believed that the increase in yield was related to the protection that MOBILEAF provided leaf tissue. Leaves of the treated plants usually stayed more turgid presumably because of less water loss than from leaves of the check plants. The latter frequently wilted and deteriorated. If this hypothesis is true, MOBILEAF treated plants would have an initial growth advantage that is related to the 83-pound per acre increase in yield. Early growth of tobacco in North Carolina is usually associated with increased yields and values per acre.

MOBILEAF was found to be associated with a \$63

per acre increase which was statistically significant at the .10 level of probability. The increase in value per acre is due to the increase in yield and a small increase, although not significant, in value per hundred weight.

In comparisons by location of the treatments, the MOBILEAF treated tobacco was superior in yield to the check tobacco at 8 of the 9 locations. The value per acre and value per hundred weight of MOBILEAF treated tobacco were superior to those of the check tobacco at 7 of the 9 locations. These comparisons are meaningful in view of the results of the statistical analyses and they indicate that the responses were general and associated with most of the tests.

Field notes recorded at transplanting indicate that most of the tests were transplanted under desirable weather conditions; however, the rainfall after transplanting at most of the tests was deficient. This fact probably favored the tobacco treated with MOBILEAF. The general weather conditions for tobacco growth in North Carolina in 1968 were considered relatively poor. Early growth such as that apparently enhanced by MOBILEAF is usually advantageous under adverse weather conditions. These conditions may not occur another year and, therefore, a general response to MOBILEAF similar to that found in 1968 may not be observed in other years.

The \$63 per acre gain in income from the use of MOBILEAF cannot be considered all net returns but rather a gross return attributable mainly to an increase in yield of 83 pounds per acre. There are certain variable production costs such as harvesting, curing and marketing. These are approximately 20¢ per pound³. Cost of the treatment also should be subtracted from gross returns before a realistic assessment may be made of the gains from using MOBILEAF. In this case, \$16.80 should be subtracted from the \$63 gain for a figure of \$46.20 less the purchase price and application cost of MOBILEAF.

³ Bradford, Garnett L., and Nelson, Larry A. Labor costs in conventional production of flue-cured tobacco; their magnitude and variability. North Carolina Agricultural Experiment Station Technical Bulletin No. 190. 1968.

Table 1. Effect of An Anti-Transpirant (MOBILEAF) on Yield Per Acre, Value Per Acre, Value Per Hundred Weight^a

	YIELD LBS/A	VALUE \$/A	VALUE \$/CWT.
Check	2179	1470	66.98
MOBILEAF	2262	1533	67.77
Increase	83	63	.79
Significant at	.15	.10	NS

^a Values are means from nine on farm tests.

¹ Contribution from Crop Science Department, North Carolina Agricultural Extension Service, Raleigh, N. C.

² The use of a product is for scientific purposes only and does not constitute endorsement.