

SUCKER-PRODUCING CHARACTERISTICS OF CERTAIN FLUE-CURED TOBACCO VARIETIES¹

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Number and weight of leaf axil suckers per plant of 15 varieties and one breeding line were studied in plantings at two locations and over 2 years. The range of performance and consistency across environments were measured in an effort to characterize the suckering characteristics of the varieties and to determine if genetic variation existed. Among the varieties tested, sucker weight varied 60% and sucker number 53%. Coker 319 appeared to produce more suckers than certain other varieties in number and weight, whereas Speight G-23 and Virginia 115 produced less.

INTRODUCTION

Axillary buds (suckers) are inherently part of the plant development of *Nicotiana tabacum* L. Potential for sucker development varies in the amount of growth per axil as well as the number of axils exhibiting growth. Data obtained from the 1972 North Carolina Official Variety Test show the range to be from 1.1 to 5.5 per plant for the number of 'ground' or basal suckers and from 16.6 to 28.1 per plant for leaf suckers (2).

Since 1972, leaf sucker information has not been obtained in the North Carolina Variety Performance Test and as a result information on current flue-cured varieties is lacking.

Sucker control through chemical or manual means represents a production expense; if control is not exercised a loss in yield, dollar value and certain chemical constituents is incurred (1). The use of chemicals can result in undesirable residues. Although breeders would like to develop varieties with few or no suckers while maintaining all other characteristics at desirable levels only limited emphasis has been devoted to modifying suckering characteristics. Information is needed on the suckering characteristics of currently popular flue-cured varieties and how these characteristics vary across different environments. The broad objective of this work is to study the genetic aspects of sucker production to determine if breeding activities are warranted. The specific objective of the work reported herein was to measure suckering characteristics in terms of number and weight of suckers produced by certain popular, flue-cured varieties (3) over two years and several locations.

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MATERIALS AND METHODS

Fifteen varieties and one breeding line were planted in a randomized complete block design with three replications at Rocky Mount and Oxford, North Carolina in 1976 and 1977. Entries tested are listed in **Table I**.

All entries were planted and grown according to standard flue-cured production practices until time for topping. Each test was topped on three successive dates separated by 1-week intervals. The first topping occurred when 20% of the plants were ready for topping. A plant was judged to be ready for topping when the tips of the corolla of the oldest blossom turned pink. Two weeks after each topping date, the plants topped at that particular date were hand suckered and the suckers (both ground and upstalk) from all leaf positions were counted and their fresh weight determined. After 2 more weeks, these same plants were again suckered and the numbers and weights of both counts were summed to give the overall sucker number and sucker weight. Plants that were not topped at any of the three dates were not used but these were very few. Data were expressed and analyzed as number and weight of suckers per plant.

RESULTS AND DISCUSSION

In the analysis of variance for weight of suckers, there were significant main effects (years, locations, varieties). For number of suckers, variety effects were significant. For both characters, there was a significant year by location effect. The only indication of inconsistency involving varieties was a variety by year interaction (.05) for both characters. There were no other significant interactions.

The data for sucker weight per plant and number per plant for each year and combined over years are presented in **Table I**. Coker 319 had the greatest weight in 1976 but Coker 86 had the greatest weight in 1977. Speight G-23 had the lowest weight in 1976 and for both years combined, whereas NC 79 had the lowest weight in 1977. In number of suckers, Coker 319 had the greatest each year, McNair 944 had the lowest in 1976 and Virginia 115 had the lowest in 1977 and over both years.

The two periods of measuring over the 4-week period after topping could possibly not include all the suckers that the plant would eventually produce. However, since the period for topping extended over a 3-week period and since each topping period was followed by a 4-week measuring period, it was felt

Table I. Average weight and number of suckers per plant at Rocky Mount and Oxford for 1976 and 1977.

Entry	Weight (g)			Number		
	1976	1977	Avg.	1976	1977	Avg.
Coker 319	625 a ⁺	291 abed	458 a	18.7 a	17.9 a	18.3 a
NC 15	518 ab	518 ab	418 ab	12.3 bcde	16.9 a	14.6 bcd
Speight G-28	617 a	195 de	406 abc	13.0 bcde	11.8 def	12.4 cdef
Coker 411	528 ab	279 abed	404 abc	11.9 bcde	12.9 def	12.0 cdef
NC 17	556 ab	261 abed	399 abc	13.4 bcde	12.8 cdef	13.1 cde
NC 25,6	484 abc	304 abc	394 abc	10.5 de	11.9 def	11.1 ef
NC 3139	547 ab	257 abede	392 abc	14.6 bc	13.4 bcde	14.0 bcde
Speight G-140	512 abc	216 cde	364 abed	14.1 bcde	13.9 bcde	14.0 bcde
Coker 86	399 bc	326 a	363 abed	11.9 ab	17.7 a	14.8 bc
Coker 317	506 abc	220 bcde	363 abed	16.0 bcd	16.1 abc	16.1 ab
Coker 294	450 abc	250 abed	350 abed	12.5 e	15.4 abcd	14.0 bcde
NC 98	477 abc	209 cde	343 bcd	13.5 bcde	13.6 bcde	13.6 bcde
McNair 944	430 abc	248 abed	339 bcd	10.0 e	13.4 bcde	11.7 ef
NC 79	481 abc	144 e	315 cd	11.8 cde	11.1 ef	11.5 ef
Virginia 115	399 bc	191 de	295 d	10.9 cde	9.4 f	10.2 f
Speight G-23	353 c	206 cde	280 d	10.9 cde	12.7 cdef	11.8 def
Means	491	243	368	12.9	13.8	13.3

Means with the same letter are not significantly different according to Duncan's multiple range test - .05 level

that most of the suckers that would be produced during a normal growing season were measured.

The consistency of performance of entries across locations was encouraging but the interaction across years was not. This indicates that testing for several years may be important in determining the true suckering characteristics of tobacco. The range of performance offered some encouragement as to the presence of genetic variation. In sucker weight the highest variety was 60% greater than the lowest and in sucker number the highest variety was 53% greater than the lowest. Based on the information in this study Coker 319 would be considered a variety with relatively high sucker production in terms of numbers and weights while Virginia 115 and Speight G-23 would be considered to have relatively low sucker production.

LITERATURE CITED

1. Marshall, H. V. and H. Seltmann. Time of topping and application studies with maleic hydrazide on flue-cured tobacco. **Tob. Sci.** 8:74-78, 1964.
2. Rice, J. C., D. T. Gooden, and E. L. Price. Measured crop performance—tobacco. **Research Report No. 44**. Department of Crop Science, North Carolina State University, 1972.
3. Todd, F. A. Extension research on wheels. **Summary report of 1976 data**. North Carolina Agricultural Extension Service, AG51. 1976.