

Maryland 40 Tobacco Variety

Development

The development of the tobacco variety known as Maryland 40 (MD 40) began in 1981 with the original cross of A911 (a Maryland tobacco breeding line) with MD 609. In the greenhouse that winter, the original cross generation (F_1) was backcrossed with MD 609. The breeding line was then advanced by self-crossing and selection for several years, and the variety was released in 1992 in the F_8 generation. Each year during its development, MD 40 was screened for tobacco mosaic virus, wildfire, and black shank resistance. From 1986 through 1990, MD 40, known then as A40, was evaluated in the Maryland tobacco variety trials, which are conducted in three locations each year in southern Maryland. Information was obtained from these trials on agronomic performance, chemical content, and physical characteristics of MD 40 and several other standard varieties and breeding lines.

Description

MD 40 has long leaves that are medium to broad in width with pointed tips. Growth after transplanting appears to be relatively rapid and uniform with a spready growth habit. As the plant reaches maturity, the leaves develop a slightly droopy appearance. MD 40 appears to maintain a slightly darker green color than MD 609 during the growing season.

Plant characteristics of MD 40 and the three standard Maryland tobacco varieties are shown in Table 1. MD 40 is taller than the standard varieties. The number of leaves per plant for MD 40 is similar to MD 609 but less than MD 201 and MD 341. The low number of leaves coupled with a tall plant result in a wider leaf spacing on the stalk for MD 40. As measured by days from transplanting to flower, MD 40 is similar to MD 609, MD 201, and MD 341 for maturity.

Field observations throughout the tobacco area of Maryland indicate that MD 609, currently the most popular variety, is very susceptible to lodging. Grower observations and research studies indicate that MD 40 has slightly better resistance to lodging than MD 609 but not as good as MD 341 and MD 201.

Table 1. Plant characteristics of Maryland tobacco variety MD 40 and three previously released varieties from data collected at three locations* per year over 5 years, 1986-1990.

Variety	Plant Height (in inches)	Leaves per Plant	Interlude Length (in Inches)	Days to Flower**
MD 40	36.1	21.7	1.66	71.3
MD 609	33.1	20.9	1.59	72.3
MD 201	33.6	23.4	1.44	72.4
MD 341	33.9	23.5	1.44	71.1

* The data presented in Table 1 through 3 were collected from field tests conducted at Upper Marlboro, Davidsonville and Leonardtown.

** In 1990, flowering data were collected only at the Upper Marlboro location.

Yield and Quality Characteristics

The yield, value, price, and quality indexes of MD 40 and other Maryland tobacco varieties are presented in Table 2. The data in this table show the average performance of the varieties listed for a 5-year period (1986-90) and grown at three locations each year.

Overall, the yield and value per acre of MD 40 were similar to those of the other varieties. Compared with MD 609, MD 40 produced 107 pounds and \$154 more per acre. MD 40 had a higher average price per hundredweight than MD 201 and MD 341, indicating superior quality similar to MD 609.

Chemical and physical characteristics of MD 40 are presented in Table 3. Of the varieties currently in production, MD 609 generally produces the highest level of total alkaloids. These data show that MD 40 produces a level of total alkaloids similar to MD 609, both of which are well within the acceptable range for Maryland tobacco. The percentage of total nitrogen for MD 40 is also similar to that of MD 609. MD 40 is similar to the other standard varieties for duration of burn and filling capacity. Smoke and aroma evaluations are made each year by foreign and domestic tobacco companies. Evaluations are based on a scale of 1.0 to 5.0, with 1.0 being poor and 5.0 being excellent. The 2-year overall rating for smoke and aroma evaluations of MD 40 was 1.8. Compared to the overall rating of 2.8 for MD 609 for the same evaluations, MD 40 appears to be slightly lower in quality for these characteristics.

Table 2. Yield and value characteristics of Maryland tobacco variety MD 40 and three previously released varieties from data collected at three locations* per year over 5 years, 1986-1990.

Variety	Yield (pounds/acre)	Value (dollars/acre)	Price (dollars/cwt)	Quality Index (5-100)
MD 40	1,917	2,600	137.06	39.6
MD 609	1,810	2,446	136.12	41.5
MD 201	2,040	2,611	130.93	33.2
MD 341	2,045	2,660	132.08	34.1

Table 3. Chemical and physical characteristics of Maryland tobacco variety MD 40 and three previously released varieties from data collected at three locations* per year over 5 years, 1986-1990.

Variety	Total Alkaloids (percent)	Total Nitrogen (percent)	Duration of Burn (seconds/leaf)	Filling Capacity* (cm ³ /g)
MD 40	2.67	3.36	14.5	8.15
MD 609	2.53	3.34	16.4	7.66
MD 201	2.39	3.10	13.7	7.90
MD 341	2.38	3.16	15.1	7.99

* These data entries cover only a 3-year average, 1986-1988.

Disease Resistance

MD 40 is the first variety in Maryland to be developed and released with resistance to tobacco mosaic virus, wildfire, and black shank (Table 4). Based on greenhouse and field evaluations for black shank resistance, MD 40 is rated as having medium to high resistance. In the greenhouse test, MD 40 scored 1.5 for tops and roots compared to 0.5 and 1.0 for tops and roots, respectively, for MD 609. In a field test, MD 40 had 85 percent surviving plants compared to 97.6 percent for MD 609. Older varieties Catterton and Wilson are both susceptible to black shank, with a field survival rate of 5.4 and 10.5 percent, respectively. MD 40 is the fifth variety released with tobacco mosaic resistance, and the third variety with wildfire resistance.

Table 4. Disease resistance* of Maryland tobacco variety MD 40 and three previously released varieties.

Variety	Disease			
	Tobacco Mosaic Virus	Wildfire	Black Shank	Fusarium Wilt
MD 40	High	High	Medium to High	N/A
MD 609	Susceptible	Susceptible	High	High
MD 201	High	Susceptible	Susceptible	High
MD 341	High	High	Susceptible	Medium

* Levels or resistance are classified as high, medium, low and susceptible.

Management

The management practices for MD 40 from plant bed to market should be similar to those normally used in the production of good-quality Maryland tobacco. Because MD 40 flowers at about the same time as MD 609, topping of these varieties also should occur at about the same time. MD 40 requires about 85 to 92 days in the field to mature when harvesting 2 to 3 weeks after topping. Because MD 40 appears to wilt faster than MD 609, minimum time is required between cutting and spearing. Also, MD 40 does not seem to be as brittle at harvest as MD 609. These two factors may cause MD 40 to houseburn in the barn faster than MD 609. (The rigid midrib of MD 609 contributes to its brittleness and slow wilting characteristics.) The cured leaf of MD 40 normally has a good Maryland color but can develop lighter shades of color under some conditions.

Conclusion

MD 40 has compared very favorably with the standard varieties for yield and quality characteristics. Because MD 40 has a high level of resistance to tobacco mosaic and wildfire, as well as an adequate level of black shank resistance for most field conditions, growers have a greater choice of varieties with good disease resistance to produce an excellent crop. The performance of MD 40 for the past several years at three test locations suggests that this new variety should be well suited to a wide range of soil types and climatic conditions in Maryland.

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