

REGISTRATION OF 'NC 729' TOBACCO

'NC 729' FLUE-CURED TOBACCO (*Nicotiana tabacum* L.) (Reg. no. CV-102, PI 558512) was developed cooperatively by the USDA-ARS, Oxford, NC, and the North Carolina Agricultural Research Service and was released jointly in 1991. NC 729 was released for its high resistance to bacterial wilt, caused by *Pseudomonas solanacearum* E.F. Smith, combined with good yield and quality characteristics.

NC 729 was developed from the cross 'K326'/'K399' (1) using the pedigree breeding method with initial selection in the F₂ generation. Selections were made in different years on separate black shank [caused by *Phytophthora nicotianae* Breda de Haan var. *parasitica* (Dastur) G.M. Waterhouse] and bacterial wilt field nurseries. Seeds were bulked beginning with the F₅ generation. It was tested as breeding line NC 7029 USDA in the North Carolina Official Variety Test in 1988 (2), in the Flue-cured Tobacco Regional Small Plot Test in 1989 and 1990 (3), and in the Regional Farm Test in 1990 (3). It will be in the F₁₀ generation when it becomes available to growers.

NC 729 exhibits some of the highest resistance to bacterial wilt among cultivars currently available. It has moderate resistance to black shank and is resistant to the common strain of Southern root-knot nematode, races 1 and 3, *Meloidogyne incognita* (Kofoid & White) Chitwood. Brown spot caused by *Alternaria alternata* (Fr.:Fr.) Keissl. and weather fleck caused by air pollutants have not been observed in this cultivar.

Days to flower for NC 729 is similar to 'NC 95', averaging 65 d after transplanting. NC 729 is normally topped at a height of 90 cm, and produces an average of 19 leaves. Leaves are of medium length and width. The yield of NC 729 averaged 3348 kg ha⁻¹, vs. 2728 kg ha⁻¹ for 'NC 2326' and 2888 kg ha⁻¹ for NC 95 in the 1990 Regional Farm Test (3). The Regional Farm Test encompasses 13 farms across a five-state area. Price per pound and quality index were equal to or better than currently grown cultivars. NC 729 produces very few ground suckers and premature flowering was not observed.

Cured leaf of NC 729 is predominantly orange in color, medium to thin bodied, and smooth textured. NC 729 met all standards for chemical content, smoke flavor, filling value, and usability established under the Minimum Standards Program for Flue-cured Tobacco.

NC 729 should be widely adapted to the flue-cured tobacco growing region and will be of particular value in areas where bacterial wilt disease is a persistent problem. Breeder seed of NC 729 will be maintained at the USDA-ARS, Crops Research Laboratory, Oxford NC. Foundation seed will be distributed by the North Carolina Foundation Seed Producers, Raleigh, NC 27650.

V. A. SISSON* (4)

References and Notes

1. The original cross and selections were made by Dr. G.R. Gwynn, former research agronomist, USDA-ARS, Oxford, NC.
2. Bowman, D., and G. Tart. 1988. Measured crop performance: Tobacco. Res. Rep. 116. Dep. of Crop Sci., North Carolina State Univ., Raleigh, NC.
3. Flue-cured Tobacco Variety Evaluation Committee Report. 1989, 1990. Dep. of Crop Sci., North Carolina State Univ., Raleigh, NC.
4. Crops Res. Lab., USDA-ARS, Oxford, NC 27565, and Dep. of Crop Science, North Carolina State Univ., Raleigh, NC 27695. Registration by CSSA. Accepted 31 Dec. 1991. *Corresponding author.

REGISTRATION OF 'C8' AND 'C9', FUSARIUM WILT RESISTANT BROADLEAF TOBACCO CULTIVARS

'C8' (Reg. no. CV-103, PI 556976), and 'C9' (Reg. no. CV-104, PI 556977), two Connecticut broadleaf tobacco (*Nicotiana tabacum* L.) cultivars resistant to fusarium wilt (*Fusarium oxysporum* Schlechtend. : Fr. f. sp. *nicotianae* (J. Johnson) W.C. Snyder & H.N. Hanson., were developed at the Connecticut Agricultural Experiment Station's Valley Laboratory and released in 1991. These cultivars were developed for their resistance to fusarium wilt and to allow broadleaf tobacco production in fields heavily infested with *F. oxysporum*. Yields and sorting quality of these cultivars are comparable to high-quality wilt-susceptible broadleaf. C8 resulted from a cross between 'C2' (a wilt-resistant broadleaf cultivar) and 'Winn' (a wilt-susceptible broadleaf line). C9 was developed from a hybrid between C2 and the wilt-susceptible 'Sperry.' C2 resulted from crosses between 'Kentucky NN', 'Hartman' broadleaf, and 'Kupchunos' broadleaf (3). C2 contains the dominant hypersensitive gene for tobacco mosaic virus (TMV) resistance derived from *N. glutinosa* L. and incorporated into Kentucky NN. Kupchunos broadleaf is resistant to fusarium wilt, but neither C2 nor Kupchunos are agronomically acceptable types. C8 and C9 originated as single plants selected in the F₂ generation and were developed by pedigree selection through the F₇ generation. Selfed seed from multiple plants was bulked in the F₆ and F₇ generation. Plants were repeatedly selected for wilt and TMV resistance as well as for agronomic characters.

Wilt resistance was expressed in reduced wilt incidence and severity in plants artificially inoculated with *F. oxysporum* in the greenhouse and in plants grown in soils naturally infested with the fusarium wilt fungus. Percent wilt incidence in greenhouse-grown seedlings artificially infested with *F. oxysporum* in the presence of wounded roots was 29.6% for C8, 27.8% for C9, and 66.7% for a wilt-susceptible genotype. Plants grown in paired rows of 10 plants each in 24 replicate plots in *F. oxysporum*-infested soil had mean wilt incidences of 11.2% for C8 and 77.1% for the susceptible genotype. Green leaf weight per 100 plants in this field test was 117.1 kg for C8 and 14.2 kg for wilt-susceptible tobacco. In the absence of *F. oxysporum*, yields of C8, C9, and wilt-susceptible broadleaf were 628.5, 678.0, and 574.5 g cured leaf per plant, and percent wrapper leaf grades were 70.1, 62.3, and 64.3%, respectively.

Wilt-resistant plants were not immune to the disease and developed some symptoms, but the severity of symptom expression was typically mild (2). Fusarium resistance in tobacco appears to be conditioned by several genes (1), and resistance in C8 and C9 does not exclude *F. oxysporum* infection, as the pathogen was isolated from stems of asymptomatic plants grown in infested soil (2).

Seed of C8 and C9 are available to plant breeders, Agricultural Experiment Stations, and other organizations. Small lots of seed are available to commercial broadleaf tobacco growers. Stock seed will be maintained and distributed by the Connecticut Agricultural Experimental Station.

J. A. LAMONDIS* AND G. S. TAYLOR (4)

References and Notes

1. Gritton, E.T., G.L. Jones, N.T. Powell, and D.F. Matzinger. 1965.