Registration of ‘TCP89-3505’ Sugarcane

‘TCP89-3505’ sugarcane (a complex hybrid of Saccharum officinarum L., S. spontaneum L., S. barberi Jeswiet, and S. sinense Roxb.) (Reg. no. CV-125, PI 638504) was developed by the Texas Agricultural Experiment Station (TAES) Weslaco Center in collaboration with the Rio Grande Valley Sugar Growers (RGVSG) and Rio Farms.

‘TCP89-3505’ was selected from the cross between ‘CP70-321’ (Fanguy et al., 1979) × CP78-304 made in 1984 at the USDA-ARS Sugarcane Field Station at Canal Point, FL. CP70-321 was used in the cross for its early maturity. CP78-304 is an elite germplasm obtained from the basic breeding program and was used for its high cane yield and its resistance to main diseases (J. Irvine, 2002, personal communication).

The seeds were germinated in 1985 at the USDA-ARS Southern Regional Research Center (SRRC) Sugarcane Research Unit in Houma, LA, and following seedling selection, seedlings were vegetatively propagated and tested cooperatively with the Texas A&M Agricultural Experiment Station. Clones of the selected seedlings were introduced to Texas after a 2-yr quarantine period. Main criteria for selection of clones were high sugar content, high cane yield, ratooning ability, and upright stool type.

In Texas, a sugarcane crop cycle usually consists of a fall-planted crop and two or more ratoon crops. The region has a short growing season, resulting in the crop being relatively immature at the beginning of harvest. Some sugar growers, as in Louisiana, circumvent this problem with the application of chemical ripeners (Legendre et al., 2002) or the use of early maturing varieties. In Texas, however, chemical ripeners are not used by growers, which makes the industry highly dependent on early maturing cultivars.

TCP89-3505 was tested in 16 outfield cultivar trials (eight in plant cane, four in first ratoon, and four in second ratoon) of the TAES sugarcane cultivar improvement program, on seven sites during 1992 to 1995 and 2001 to 2003. It has a moderate population of medium-sized stalks that are covered with a white waxy coating. The stalks are of yellow color, with mid-size conoidal internodes and gold-colored growth rings that are touched by the buds. The new cultivar’s stalk weight is similar to TCP87-3388 and CP70-321. Its leaf curvature is surrounded at the apex of the canopy. The leaf sheath has no pubescence, a brown dewlap, and no auricle. The leaves are not tightly attached to the stalk, which, combined with its erect growth habit, makes it suitable for mechanical harvesting.

The primary advantage of TCP89-3505 is its high sucrose content early in the season (October through November). Results from outfield cultivar trials on five sites show that TCP89-3505 is equal to or better than the early maturing cultivars CP70-321 and TCP87-3388 (Irvine et al., 1997). In plant cane, TCP89-3505 maintains its sugar content until the end of harvest in April. Its ratooning ability is equal to TCP87-3388 and better than CP70-321. Under field conditions, TCP89-3505 has shown no symptoms of leaf scald [caused by Xanthomonas albilineans (Ashby) Dowson], or smut (caused by Ustilago scitaminea Syd. & P. Syd.), but slight symptoms of common rust (caused by Puccinia melanocephala Syd. & P. Syd.). The new cultivar has some cold tolerance and the same level of resistance to the Mexican Rice Borer [Eoreuma loftini (Dyar)] as compared with the other commercially grown cultivars in the Rio Grande Valley of Texas. Its reaction to ratoon stunting disease (caused by Leifsonia xyliphila subsp. xyliphila) was not formally tested but, like most other cultivars, it may sustain significant reductions in yields of total recoverable sugar and cane in ratoon crops from this disease. For this reason, it is essential that seed cane of this cultivar be free of this disease.

Microsatellite markers have been produced from TCP89-3505 DNA for fingerprinting purposes. These markers were obtained from sugarcane expressed sequence tags, as described by da Silva (2001), and genomic DNA, as described by Cordeiro et al. (2003). The following markers were produced: three fragments of EST-SSR501 (250, 280, and 400 base pairs (bp) in size), four fragments of SMC872CG (160, 180, 250, and 280 bp), and three fragments from SMC869CG (200, 220, and 280 bp).

Seed cane will be maintained for 5 yr at the Texas A&M Research and Extension Center, Weslaco, TX, and at the Rio Grande Valley Sugar Growers, Santa Rosa, TX.

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