REGISTRATION OF GENETIC STOCKS

Registration of Seven Multiple-Bud Genetic Stocks of Sugarcane

Seven sugarcane (interspecific hybrids of Saccharum spontaneum L., S. officinarum L., and S. barberi Jeswiet) genetic stocks were developed by the USDA-ARS at Houma, LA, and Canal Point, FL, and were released in 1997: CP 68-413, US 84-3065, US 89-23, US 90-28, US 93-13, US 93-14, and US 94-12 (Table 1).

The genetic stocks exhibited a multiple-bud phenotype characterized by two or more adjacent, apparently normal axillary buds instead of a single bud. Identified during routine, single plant selection in the breeding program, the stocks (clones) have not exhibited reversion to normal phenotype despite numerous cycles of vegetative propagation. Multiple-bud frequency, bud germination, sexual transmission, and yield components (in comparison with normal, single-bud cultivars CP 70-321 and LCP 82-89, and the other multiple-bud clones) were reported previously (1). Cultivars in that test produced stalks 1.82 to 2.28 m tall (1.08 to 1.38 kg per stalk) and yielded 118 to 144 g sucrose and 108 to 115 g fiber per kilogram of cane. As expected, multiple-bud clones were inferior to cultivars for one or more agronomic characteristics.

The clones averaged about two shoots per multiple-bud node, compared with one shoot per node for cultivars, except that US 94-12 produced 4.5 shoots per node. Numbers of shoots, millable stalks, stools, and shoots per stool varied among years, but tended to be lower in multiple-bud clones than cultivars.

CP 68-413, selected in 1968, expressed the multiple-bud phenotype in 65 to 85% of nodes. CP 68-413 produced a stalk about 2.1 m tall that weighed 1.50 to 1.65 kg. Sucrose concentration (106 to 110 g kg\(^{-1}\)) tended to be low, but fiber concentration (122 to 129 g kg\(^{-1}\)) was at commercial level. The clone was susceptible to ratoon stunting disease caused by Clavibacter xyli subsp. xyli Davis et al. CP 68-413 flowered (2), but usually produced few stainable pollen. The clone had 2\(n=106\) chromosomes.

US 84-3065 was previously referred to as MB 84-3065 (1). Selected in 1984, the multiple-bud phenotype was expressed in 51 to 56% of nodes. US 84-3065 produced a stalk that was 2.02 to 2.18 m tall weighing 0.79 to 1.18 kg. Stalks of this clone tended to lodge at the soil surface. Sucrose concentration (121 to 128 g kg\(^{-1}\)) was comparable to that of cultivars, while fiber concentration (134 to 147 g kg\(^{-1}\)) was higher. US 84-3065 flowered and pollen. The clone had 2\(n=106\) chromosomes.

US 89-23 was selected in 1989, and exhibited multiple buds in 96 to 100% of nodes. US 89-23 produced short (1.68 to 1.75 m), lightweight (0.60 to 0.89 kg) stalks with low sucrose (89 to 93 g kg\(^{-1}\)) and high fiber (120 to 129 g kg\(^{-1}\)). Despite repeated testing, US 89-23 failed to flower under the photoperiod treatment used at Houma (2).

US 90-28 was selected in 1990, expressed the multiple-bud phenotype in 81 to 99.5% of nodes. US 90-28 produced stalks 2.02 to 2.10 m tall weighing 0.79 to 1.18 kg. Stalks of this clone tended to have high fiber concentration (116 to 121 g kg\(^{-1}\)), but sucrose concentration (106 to 110 g kg\(^{-1}\)) tended to be lower than for cultivars, while fiber concentration (134 to 136 g kg\(^{-1}\)) was higher. US 90-28 failed to flower under the photoperiod treatment used at Houma.

US 93-14 was selected in 1993. The multiple-bud phenotype was expressed in 92 to 99% of nodes. US 93-14 was selected in 1993. The multiple-bud phenotype was characterized by apparently undifferentiated, callus-like tissue in nodal and internodal regions of the stalk. The clone produced about 4.5 shoots per node; one normal shoot from the main bud, and smaller shoots from the other buds. It was difficult to determine number of viable buds because of varying bud morphology. The clone failed to flower under the photoperiod treatment used at Houma.

US 94-12, selected in 1994, had a gall-forming, multiple-bud phenotype characterized by apparently undifferentiated, callus-like tissue in nodal and internodal regions of the stalk. The clone produced about 4.5 shoots per node; one normal shoot from the main bud, and smaller shoots from the other buds. It was difficult to determine number of viable buds because of varying bud morphology. US 94-12 flowered but usually produced few stainable pollen. The multiple-bud trait was sexually transmitted at low frequency, only 2.2% of progeny had the phenotype.

Genetic stocks will be maintained by the USDA-ARS-SRRC Sugarcane Research Unit at Houma, LA. Small quantities of stalks, stools, and shoots per stool will be available for 5 yr, upon writing to the corresponding author.

References and Notes

4. D. M. Burner,* B. L. Legendre, W. H. White, and J. D. Miller (4)