

Registration of Germplasms

REGISTRATION OF TWO- AND SIX-ROWED ISOGENIC BONNEVILLE BARLEY GERMPLASM

FOUR two-rowed and four six-rowed isogenic barley (*Hordeum vulgare* L.) lines; CI 16173 (GP-68), CI 16174 (GP-69), CI 16175 (GP-70), CI 16176 (GP-71), CI 16177 (GP-72), CI 16178 (GP-73), CI 16179 (GP-74), and CI 16180 (GP-75), respectively, were developed cooperatively by USDA-ARS and the Montana Agricultural Experiment Station and released on 1 Mar. 1984. The eight lines were developed by crossing 'Compana', CI 5438, with 'Bonneville', CI 7248, followed by six backcrosses to Bonneville. Selection in the segregating backcross generations was made for the genes *V* and *v* (two- and six-rowed, respectively), *I* and *i* (with and without lateral floret fertility, respectively), and *L* and *l* (lax and dense spikes, respectively), (2, 4). The nonrecurrent Compana parent furnished the *V*, *i*, and *L* alleles and the recurrent Bonneville parent furnished the *v*, *I*, and *l* alleles. The interaction of the row type and lateral floret fertility genes was described by Gymer (1).

The isolines are described in Table 1. Except for the genes described for each isolate, these eight lines are phenotypically very similar to Bonneville (3). Small samples of seed are available upon request from USDA-ARS, Plant and Soil Sci. Dep., Montana State Univ., Bozeman, MT 59717.

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Table 1. Genotypes and descriptions (two/six row, lateral floral fertility, and spike type) of eight isogenic barley lines.

CI and GP number	Genotype	Row type	Lateral florets	Spike
CI 16173 (GP-68)	VVllll	two	sterile, large	dense
CI 16174 (GP-69)	VVllLL	two	sterile, large	lax
CI 16175 (GP-70)	VVllll	two	sterile, small	dense
CI 16176 (GP-71)	VVllLL	two	sterile, small	lax
CI 16177 (GP-72)	vvllll	six	fertile, sessile	dense
CI 16178 (GP-73)	vvllLL	six	fertile, sessile	lax
CI 16179 (GP-74)	vviill	six	red. fertility, pedicelate	dense
CI 16180 (GP-75)	vviill	six	red. fertility, pedicelate	lax

References and Notes

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REGISTRATION OF SEVEN COTTON GERMPLASM LINES

SEVEN germplasm lines of cotton (*Gossypium hirsutum* L.) (Reg. nos GP 248 to GP 254) were released by USDA-ARS and the South Carolina Agricultural Experiment Station in 1984. These germplasm lines combine high yield potential, extra fiber strength, wide adaptation, and unusual combinations of fiber properties.

Pee Dee 6044 (Reg. no. GP 248) is from the increase of the bulked seed of the progeny of a single F_3 plant selected from the cross of 'Delcot 277' (6) \times Pee Dee 9223 (2). It produces slightly finer fiber and stronger yarns than 'SC-1', the first cultivar with extra-fiber-strength genes from triple hybrid origin that produced yields equal to commercial cultivars in South Carolina (1).

Pee Dee 6132 (Reg. no. GP 249) and Pee Dee 6142 (Reg. no. GP 250) are from the bulked seed increase of individual F_3 plants selected from the cross of Pee Dee 9232 (2) \times SC-1 (1). These two germplasm lines have higher lint percentages, smaller bolls, and smaller seed than SC-1. Pee Dee 6132, compared with Pee Dee 6142, produces coarser and stronger fiber that process into stronger yarns.

Pee Dee 6179 (Reg. no. GP 251) and Pee Dee 6186 (Reg. no. GP 252) are from similar F_3 bulked seed increases selected from the cross of SC-1 \times Pee Dee 8619 (3). Pee Dee 6186, compared with SC-1, has a higher lint percentage, smaller bolls, smaller seed, coarser and stronger fiber that has extremely high elongation and gives stronger yarns. Pee Dee 6179 has a lower lint percentage, larger bolls, larger seed, and longer fiber than Pee Dee 6186. It has seeds per boll equal to those of commercial cultivars.

Pee Dee 6208 (Reg. no. GP 253) is from an F_3 seed increase of Pee Dee 9363 (2) \times Pee Dee 9240 (a sister selection of SC-1). It has a high lint percentage and produces yarns similar in strength to that of SC-1.

Pee Dee 6992 (Reg. no. GP 254) is from an F_3 seed increase from the cross of two F_1 hybrids (SC-1 \times Pee Dee 8619) \times 'Coker 310' \times Pee Dee 7396. Coker 310 was developed by Coker's Pedigreed Seed Company from the cross of 'Coker 100 Staple' \times 'Deltapine 15'. Pee Dee 7396 was derived from a series of complex crosses similar to those of Pee Dee 9223 (2). Pee Dee 6992 has fiber and yarn properties similar to those of SC-1; however, it has significantly larger seed and more seed per boll which may give a yield advantage.

Since all germplasm lines produced equivalent yields and several produced significantly stronger fiber and yarn, compared with SC-1, a new plateau in fiber strength and yield combination has been reached. The rare combination of high yield potential, high fiber strength, high fiber elongation, high micronaire, and high yarn tenacity may better meet the demands of producers and textile manufacturers.

The high yield potential of these germplasm lines may be related to their resistance to the fusarium wilt-rootknot nematode complex caused by *Fusarium oxysporum* Schlecht. f. *vasinfectum* (Atk.) Snyder and Hans. and *Meloidogyne incognita* (Kofoid and White) Chitwood. All of these germplasm lines are more resistant to the complex than SC-1. Pee Dee 6044, Pee Dee 6208, and Pee Dee 6992 appear as resistant as the resistant as the resistant check, 'McNair 235' (4, 5). Pee Dee 6142 and Pee Dee 6186 are almost as resistant while Pee Dee 6132 and Pee Dee 6179 fall in an intermediate class. Cultivars with an intermediate reaction to

the fusarium wilt-rootknot nematode complex usually give satisfactory yields in the Southeast.

Breeder seed may be obtained by bonafide seed breeders upon written request to USDA-ARS, Pee Dee Res. and Educ. Ctr., P. O. Box 271, Florence, SC 29503.

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REGISTRATION OF NGSDCRW1(S2)C4 MAIZE GERMPLASM

NGSDCRW1 (S2)C4 MAIZE (*Zea mays* L.) (Reg. no. GP 137) germplasm was released jointly by the USDA-ARS and the Agricultural Experiment Station, South Dakota State University, Brookings, in 1984.

The parent SDCRW1SYN population was synthesized in 1965 by mixing equal amounts of single-cross hybrid seed from selected matings (primarily based on flowering times) among 57 diverse germplasm stocks. The stocks included mid-season and early Corn Belt inbred lines and hybrids, germplasm from Pioneer HiBred International (including West Indian lines, broad-based Mexican lines, Zapote lines, and Corn Belt lines with good stalk quality), unreleased breeding lines, and early inbred lines selected for root-rot resistance in South Dakota. In 1967, single-cross hybrid R802 × R109B was interplanted into the open-pollinated population to introduce the opaque-2 gene. The population was grown in isolation without conscious selection for five generations and released as early maturing "corn-rootworm composite" SDCRW1CO in 1970. This released germplasm was predominantly yellow dent. Subsequently, the population has undergone one cycle of S1 family selection [NGSDCRW1(S1)C1] followed by two cycles of S2 family selection [NGSDCRW1(2)C2 and C3] for large root size as determined by anchorage ("wiggly test") ratings (2) and by root-pull resistance measurement (1). NGSDCRW1(S2)C4 was produced by selecting S2 lines from C3 on the basis of both root-damage caused by western corn rootworm (WCR, *Diabrotica virgifera virgifera* LeConte) larvae and root-pull resistance in previously fallowed plots that had been infested uniformly with about 600 viable WCR eggs per lineal 0.3 m of row. Roots were classified for feeding damage on a 1 to 9 scale with 1 = no damage and 9 = 3 or more whorls of nodal roots destroyed (2). Twenty selected S2 lines (10%) were pair-crossed to produce 10 F₁ hybrids. The F₁ hybrids were diallel-crossed to produce 45 hybrid crosses, and an equal amount of seed

from each cross was composited to produce NGSDCRW1(S2)C4.

In 1983, evaluation trials at Brookings showed that root pull resistance increased with recurrent selection. Mean root-pull measurements tended to be greater in later cycles in both uninfested (225.8 ± 4.5 in CO and 241.5 ± 3.9 in C4) and infested (199.3 ± 5.4 in CO and 229.6 ± 3.8 in C4) plots. Mean root ratings of plants from infested plots ranged from 4.8 ± 0.2 in C1 to 3.7 ± 0.1 in C4. The mean root rating for the check hybrid A619 × A632 was 5.9 ± 0.2 .

The results suggest that population NGSDCRW1(S2)C4 has potential for further improvement with respect to root pull resistance. It is expected to be a useful, early (AES 300-500 maturity) germplasm source for plants with good root systems, good potential for new compensatory root growth which results in good standability after root damage by WCR larvae, and for plants with good resistance (tolerance) to feeding damage caused by WCR.

Seeds of randomly mated plants of NGSDCRW(S2)C4 grown in isolation will be maintained and distributed in 500 seed-lot samples by the USDA-ARS, Northern Grain Insects Res. Lab., Brookings, SD 57006. Smaller seed-lots (200 seeds each) of the diallel-hybrid composite also will be provided until the available seed supply is exhausted.

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References and Notes

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REGISTRATION OF ND304W GERMPLASM LINE OF MAIZE

ND304W (Reg. no. GP-138) is a white, dent, germplasm line of maize (*Zea mays* L.) developed at the Agricultural Experiment Station, North Dakota State University, Fargo.

ND304W was selected from a cross of (ND408 × B73) × W23yy. It was self-pollinated for six generations with selection for desired plant and ear traits. This inbred silks about 1 day later than CM105 and about the same time as ND408 at Fargo, ND. ND304W typically produces medium-tall plants with ears borne on short shanks about midway up the stalk. The medium-long ears are thick and have 18 to 22 rows of kernels borne on a white cob. Kernels have white endosperm of a medium-hard, dent texture. ND304W is AES300 maturity.

This line was evaluated in four hybrid combinations with yellow, dent inbreds (ND245, CM105, ND301, and ND230) for yield and agronomic performance at three locations in 1983. Based on its general combining ability for high yield (similar to ND474), low grain moisture at harvest (similar to ND474), and low stalk lodging percentage (significantly