BS4 (Reg. No. GP 27). This breeding population, developed as a companion to BS5, was formed in a similar manner with 21 entries; BSAA; BS2; BS11 (FR)/C1; BSBC1 (R)/C5; BSK (S)/C5; Nebraska Krug; BSBC7; BSLE; Nebraska Hays Golden [M]C14; M14, (M)C9; Iowa Early Rootworm Synthetic; B32 x B57; B14 x B57; SD-ClW; Illinois Stalk Rot Synthetic; B14H; Illinois Ht-DM Synthetic; BS7; bulk of B70, B72, B74, W153R, CI.624; OhS7; bulk of Mo5, Mo6, Moli1, Mo17, Mo19; and a bulk of H49, H95, N22A. The first five generations, plants from each of the 21 entries were hand-crossed to a bulk derived from all entries. Subsequently, one cycle of full-sib selection for resistance to leaf feeding by the first-brood European corn borer was completed; 16 of 105 families selected with a leaf-feeding rating of 5 or less in normal cytoplasm, and 35 of 59 families with a leaf-feeding rating of 7 or less in sterile cytoplasms (1 = resistant, 9 = susceptible). Mass selection (10% selection intensity) within full-sib families (60 plants) for prolificacy was also completed.

The population is available in four cytoplasts (normal, T, C, and S), where the cytoplastic sources were the cms RfRf version of the following lines: W153R, TX11727, KY31, BS4, BS56, G31A, AS27, B42 and B46 for T cms; W709 for C cms; and M14 for S cms. Restorer genes are present at a low frequency, but in a population-improvement program involving all four cytoplasts, this population homozygous for a restorer factor could be developed, so that inbred lines extracted would be restorer lines for any of the three sterile cytoplasts without further conversion. Selection for disease and insect resistance, as well as yield, seems desirable in the sterile cytoplasm as part of the population-improvement program.

BS10(FR)/C2 (Reg. No. GP 28). This breeding population was developed by two cycles of reciprocal full-sib selection, primarily for yield, from Iowa Two-ear Synthetic #1, with Pioneer Two-ear Composite as the tester (Hallauer, 1973). Eighteen Sj lines of the superior-yielding Sj x Sj crosses (full-sibs) and 6 additional lines from Iowa Corn Borer Synthetic that had greatest stalk quality and resistance to leaf feeding by the first-brood European corn borer were intermated to form the C1 population. The C2 population was developed by intermating 20 Sj lines, parents of the 20 superior-yielding Sj x Sj crosses (full-sibs), originating from the C1 populations. BS10(FR)/C2 is superior to Iowa Two-ear Synthetic #1 in yield, prolificacy, and stalk quality.

BS11(FR)/C2 (Reg. No. GP 29). This is a breeding population developed by two cycles of reciprocal full-sib selection, primarily for yield, from Pioneer Two-ear Composite, with Iowa Two-ear Synthetic #1 as the tester (Hallauer, 1973). Eighteen Sj lines of the superior-yielding Sj x Sj crosses (full-sibs) were intermated to form the C1 population. The C2 population was developed by intermating 20 Sj lines, parents of the 20 superior-yielding Sj x Sj crosses (full-sibs), originating from the C1 population. BS11(FR)/C2 is superior to Pioneer Two-ear Composite in yield, prolificacy, and stalk quality and is about 5 days earlier in flowering.

BS12(HI)/C5 (Reg. No. GP 30). This improved breeding population was derived from an open-pollinated variety, 'Alph,' by five cycles of recurrent selection for specific combining ability, with inbred B14 as the tester (Russell, Eberhart, and Vego O., 1973). Alph is an extremely variable, long-eared variety which does not resemble any open-pollinated variety grown in southern Iowa, where it was collected 30 years ago. Selection has been mainly on the basis of testcross yields, with mild selection for root and stalk strength. Also, selection in the population per se has been used to improve plant and ear type. The hybrid performance of BS12(HI)/C5 x B14 is comparable to that of commercial single crosses. General combining ability, as measured by the SSB R tester, also was improved. Since the performance of BS12(HI)/C5 x B14 results from an average genetic contribution from BS12(HI)/C5, inbred selections could be developed from it that, in single crosses with B14, would be better than BS12(HI)/C5 x B14. BS12(HI)/C5 will add valuable genetic diversity to the maize germplasm pool of the north-central Corn Belt.

BS14 (Reg. No. GP 31). This breeding population developed from combining six inbred selections related to B14 and B15, will add some potential to develop two ears per plant. Controlled mating among plants and selection for two-eared plants were used for six generations. Also, selection for resistance to corn leaf rust, Puccinia sorghi Schw., has increased the gene frequency for Rs to greater than 0.80. Plant and ear types are similar to those of B14, but BS14 produces two ears on most plants in a moderate plant density. In hybrid combinations, BS14 has better yields than B14, similar maturity and root strength, but less stalk strength.

BS15 (Reg. No. GP 32). This breeding population was developed by crossing BS12(HI)/C5 to B14 and backcrossing once to BS12(HI)/C5. Twenty-five generations of random mating were made after the backcross. Because of the combining ability of BS12(HI)/C5 with B14, yields of BS15 are considerably higher than those of BS12(HI)/C5, with slightly less lodging. The combining ability with B14 is less than for BS12(HI)/C5, but the combining ability with SSS(R)/C5 and BS10(FR)/C1 was extremely good in preliminary tests (unpublished data).

BS15(R)/C6 (Reg. No. GP 35). This improved breeding population was developed from Iowa Stiff Stalk Synthetic (BS55) by six cycles of reciprocal recurrent selection, with BSBC1 (R) as the tester (Penny and Eberhart, 1971). BSBC1 was synthesized from 12 lines: Ind. A6H5, A5S-5-1-5, F.1-1-7-1, Ill. Hf. 1-11, 1a. I224A2, LE231-6-2, Ohio S1367B, Og. 1a. IT10, 1a. WD456, CI.187-2, Ind. 461-5, CI.340, and CI.617-3-4 (Sprague, 1946). Selection was primarily for yield. Eberhart, Debela, and Hallauer selected 21% higher yield for the BS12(R)/C5 x BSBC1(R)/C5 than for the original unimproved variety, although no improvement was detected in BS15(R)/C5 itself. Some selection for resistance to lodging, first-brood corn borer feeding, and Diplodia zeta (Schw.) Lev. was done in the last cycle of selection.

BSBC1(R)/C6 (Reg. No. GP 34). This improved breeding population was developed from Iowa Corn Borer Synthetic No. 1 (BSBC1) by six cycles of reciprocal recurrent selection, with BSBC1 (R) as the tester (Penny and Eberhart, 1971). BSBC1 was synthesized from 12 lines: A360, CC3HY, I205, K230, LS17, Oh07, Oh53, Oh32, Oh51A, F3, and R4. Although stalk lodging is higher in BSBC1(R)/C5 than in BS15(R)/C5 (Eberhart et al., 1975), it lodes less than the original variety, BSBC1.

REFERENCES


REGISTRATION OF MN6616M WHEAT GERMPLASM

(Reg. No. GP 56)

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MN6616M (Triticum aestivum L. em Thell.) CI 17241, is a hard red spring semidwarf wheat that was released as a new dwarfing source for use by wheat breeders. This line was de-