funds appropriated to the OARDC–OSU and the USDA-ARS. The mention of firm names or trade products does not imply that they are endorsed or recommended by OSU or the USDA over other firms or similar products not mentioned. Registration by CSSA. Accepted 31 Mar. 1994. *Corresponding author.

Published in Crop Sci. 34:1418–1419 (1994).

Registration of OhS12(C1) Maize Germplasm

OhS12(C1) is a maize (*Zea mays* L.) synthetic population (Reg. no. GP-296, PI 573100) developed by the Ohio Agricultural Research and Development Center, The Ohio State University, Wooster, OH 44691. Date of release was 13 Dec. 1991.

OhS12(C1), a broad-based synthetic population, was developed by crossing OhS3267LAN with the Arizona Arid Environment Maize Germplasm population (AAEMG) (1). OhS3267LAN is an unreleased synthetic population comprised of 24 pre-1950 U.S. Corn Belt inbreds, primarily of 'Reid Yellow Dent' and 'Clarage' origin, and nine U.S. 'Lancaster Surecrop'-derived inbreds. The AAEMG population is a composite population consisting of diverse land races collected on the Hopi, Navajo, and Papago Indian reservations during the period 1950 to 1956. Individual plants of OhS3267LAN and AAEMG were selected for drought tolerance, low plant and ear height, grain moisture, resistance to root and stalk lodging, resistance to foliar and ear diseases, prolificacy, and minimal tillering, near Wooster, OH, in 1988 at approximately 1 and 5% selection intensity, respectively. Thirty-six full-sib (FS) progenies from selected OhS3267LAN plants, and 54 FS progenies from AAEMG were selected for the same traits, except drought tolerance, in Puerto Rico in 1988–1989. Thirty selected OhS3267LAN FS progenies and 22 FS AAEMG progenies were selected for intercrossing. Each AAEMG progeny row was crossed with at least one, and as many as four, OhS3267LAN FS progenies.

A total of 70 OhS3267LAN × AAEMG FS intercrosses were planted near Wooster, OH, in 1983, and selection pressure was exerted for the agronomic characteristics selected in the preceding winter nursery. A total of 32 FS intercrosses were crossed with Corn Belt adapted germplasm to increase the proportion of Corn Belt–adapted germplasm in the breeding material to 75%. Twenty-three intercrosses were made with inbred W552, and 31 intercrosses with the synthetic population [Early Lancaster × MOSQB (Cycle 1)] released by South Dakota State University. The hybrids were self-pollinated in the greenhouse, and 84 S_0 populations were evaluated in two replicated performance tests in 1990 near Wooster, OH. Forty-four populations were derived from crosses to the Early Lancaster synthetic and 40 were derived from crosses to inbred W552. Twelve S_0 populations were selected (15% intensity) for yield, lodging resistance and grain moisture. Five selected populations were derived from the Early Lancaster synthetic and seven were derived from the inbred W552. Five S_1 progenies of each S_0 population were produced by controlled self-pollination in a separate nursery.

In 1991, 60 S_1 progenies from the selected S_0 populations were planted in isolation near Wooster with two replications of short-row plots in a random complete block design. Preflowering selection of S_1 progenies was practiced against susceptibility to common smut [caused by *Ustilago zeae* (Beckm.) Unger] and sunscald by detasseling all plants within six inferior progenies. Severe drought had been experienced during the season so additional visual selection among and within S_1 progenies was practiced at harvest for ear size and filling. A total of 10 individual plants per selected S_1 progeny were selected (5 out of approximately 14 to 15 plants per short-row plot). Stalk lodging was evaluated at the Wooster site and also at two additional locations. The seven most lodging-prone selections were excluded from the final selections. Final selection intensity imposed on the S_1 lines was 62%. A composite population was produced to complete Cycle 1.

OhS12(C1) displays a vigorous plant type, intermediate to tall plant height, and ears at midplant height with predominantly yellow, but some white (5–6%), dent kernels. The synthetic has a maturity range of approximately AES 600 to AES 700. OhS12(C1) is intended for breeding of cultivars intended for production in heat and drought stress-prone production environments. Breeder seed will be distributed in 500-kernel samples by the Maize Germplasm Service, Department of Agronomy, OSU, OARDC, 1680 Madison Ave., Wooster, OH 44691. Recipients of seed are asked to make appropriate recognition of the source of the germplasm if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock.

RICHARD C. PRATT* (2)

References and Notes

1. Day, A.D., Thompson, R.K., and M.J. Ottman. 1986. Registration of Arizona arid environment maize germplasm. Crop Sci. 26:390–391.
2. R.C. Pratt, Dep. of Agronomy, Ohio Agric. Res. and Development Ctr., The Ohio State Univ. (OARDC–OSU), 1680 Madison Ave., Wooster, OH 44691. OARDC Journal Article no. 229-93. Salaries and research support provided by state and federal funds appropriated to the OARDC. The mention of firm names or trade products does not imply that they are endorsed or recommended by The Ohio State University over other firms or similar products not mentioned. Registration by CSSA. Accepted 31 Mar. 1994. *Corresponding author.

Published in Crop Sci. 34:1419 (1994).

Registration of 19 Second-Cycle Tropical Midaltitude Maize Germplasm Lines

Nineteen tropical midaltitude maize (*Zea mays* L.) second-cycle germplasm lines (Reg. no. GP-270 to GP-288, PI 561600 to PI 561618) (Table 1) were jointly developed by the International Institute of Tropical Agriculture (IITA) and the Cameroon

Table 1. Parentage, grain texture, and disease reactions of tropical midaltitude maize inbred lines.†

Inbred	Reg. no.	PI no.	Parentage	Grain texture‡	Host response§		
					Et	Czm	Pm
					score¶		
90113	GP-270	561600	SynA1 × 87004	F	R	MR	R
90143	GP-271	561601	SynA1 × 87004	F/D	R	S	MR
90147	GP-272	561602	SynA1 × 87004	F/D	MR	R	R
90156	GP-273	561603	SynA1 × 87004	F	R	R	R
90176	GP-274	561604	SynA1 × 87004	F	MR	MR	S
90183	GP-275	561605	SynA1 × 87014	F/D	R	MR	R
90188	GP-276	561606	SynA1 × 87014	F/D	R	R	R
90204	GP-277	561607	SynA1 × 87014	D/F	MR	R	MR
90219	GP-278	561608	SynA1 × 87014	F/D	MR	R	MR
90220	GP-279	561609	SynA1 × 87014	F/D	R	MR	MR
90263	GP-280	561610	SynA1 × 87036	F	R	MR	MR
90267	GP-281	561611	SynA1 × 87036	F	R	MR	MR
89320	GP-282	561612	M131 × S62	F/D	R	MR	MR
90301	GP-283	561613	SynB1 × 87036	D	MR	R	MR
90313	GP-284	561614	SynB1 × 87036	F/D	R	R	R
90323	GP-285	561615	SynB1 × 87036	F/D	MR	MR	MR
90332	GP-286	561616	SynB1 × 87036	F/D	MR	R	R
89343	GP-287	561617	S85 × C70	F/D	MR	R	R
89365	GP-288	561618	S85 × C70	F/D	R	R	R

† Host response recorded at Jos, Nigeria, 1991.
‡ Grain texture: D = dent; F = flint, D/F = intermediate dent; F/D = intermediate flint.
§ Et = *Exserohilum turcicum*; Czm = *Cercospora zeae-maydis*; Pm = *Physoderma maydis*.
¶ R = resistant; MR = moderately resistant; S = susceptible.

Institute of Agronomic Research (IRA) as part of the USAID-financed National Cereals Research and Extension Project. They were released in 1991 for use as source germplasm or as parental lines, principally in the high-rainfall tropical midaltitudes. Few internationally available inbred lines have been developed for this ecology.

The principal nursery and testing sites for development of these lines were located in the Western and Adamawa Plateaus of Cameroon (5° to 8° N lat, 1000 to 1500 m altitude, 1500 to 2200 mm monomodal season precipitation). Resistance to *Exserohilum turcicum* (Pass.) K.J. Leonard & E.G. Suggs, *Cercospora zeae-maydis* Tehon & E.Y. Daniels, and *Physoderma maydis* (Miyabe) Miyabe were rated on the Jos Plateau of Nigeria (9° to 10° N lat, 1350 m altitude, 1300 mm annual monomodal season precipitation). Maize streak virus (MSV) evaluation was performed at IITA, Ibadan, Nigeria (tropical lowland), using artificial field infestation with viruliferous leafhoppers (*Cicadulina* spp.).

Sixteen second-cycle lines were developed from first cycle inbred lines crossed with one of two reciprocal synthetics (SynA1 and SynB1). The inbred lines were derived in Cameroon from the IITA Midaltitude Streak Resistant (TZMSR) population (2,3). SynA1 and SynB1 had been formed from inbreds initiated in Nigeria from crosses of streak resistant lowland cultivars with East African midaltitude cultivars and hybrids. Three lines were extracted from single crosses between midaltitude lines. These 19 lines are therefore the first recycled lines in the midaltitude program (1). The principal selection procedures included disease nursery and per se selection at S_1 to S_3 stages, testcross selection (with a single-cross tester) at the S_3 stage. Testing as parents of single-cross hybrids was begun at the S_4 stage of inbreeding. All lines listed have been used as a parent of at least one outstanding or commercially acceptable single-cross hybrid in Cameroon or Nigeria in 1991. Subline selection in disease nurseries was continued until at least S_5 stage, and selected sublines were bulked within the original S_3 line parent of the testcross selection to maintain vigor.

Predominant leaf pathogens in the Cameroon selection environments were *E. turcicum* and *Puccinia sorghi* Schwein., with occasional pressure from *Bipolaris maydis* (Nisikado & Miyake) Shoemaker, *Pucc. polysora* Underw., and *Phys. maydis*. A higher pressure (or different race) of *E. turcicum*, as well as a *Cercospora* sp., was observed during rating at Jos, Nigeria, in 1991 (Table 1).

It is expected that the primary utility of these lines will be as parents in varietal synthetics, and in inbred source synthetics and crosses for the high-rainfall tropical midaltitudes. The lines all have white kernels, with a range of textures. All lines are resistant to maize streak virus. Maturity classification is late midaltitude, flowering 4 to 9 d later than TZMSR (77 d) and the Zimbabwe Seed Coop hybrid ZS206 (76 d) at Jos, Nigeria, in 1991.

Small quantities (40 kernels) of seed will be provided to crop researchers upon written request. Requests should be sent to the Maize Improvement Program Leader, IITA, PMB 5320, Ibadan, Nigeria. We ask that appropriate recognition of source be given when this germplasm contributes to an improved cultivar or germplasm.

L. A. EVERETT,* J. T. ETA-NDU, M. NDIORO, I. TABI, AND S. K. KIM (4)

References and Notes

1. Everett, L.A., J. Eta-Ndu, M. Ndioro, and I. Tabi. 1990. Maize inbred development for the midaltitude zone of Cameroon. p. 88. *In* Agronomy abstracts. ASA, Madison, WI.
2. IITA. 1983. Disease resistant maize varieties for midaltitude ecology in Africa. p. 38–40. *In* IITA research highlights, 1983. IITA, Ibadan, Nigeria.
3. Kim, S.K., F. Khadr, J. Fajemisin, Y. Efron, and L. Everett. 1985. Disease resistance maize breeding for mid-altitude ecology in Africa. p. 75. *In* Agronomy abstracts. ASA, Madison, WI.
4. L.A. Everett, Dep. of Agronomy and Plant Genetics, Univ. of Minnesota, St. Paul, MN 55108; J.T. Eta-Ndu, M. Ndioro, and I. Tabi, IRA Bambui Stn., Box 80, Bamenda, Cameroon; and S.K. Kim, MIP, IITA, PMB 5320, Ibadan, Nigeria. Registration by CSSA. Accepted 28 Feb. 1994. *Corresponding author.

Published in Crop Sci. 34:1419–1420 (1994).

Registration of Four Tropical Midaltitude Maize Germplasm Populations

Four tropical midaltitude maize (*Zea mays* L.) populations, ATP (Reg. no. GP-289, PI 561620), Early White (Reg. no. GP-290, PI 561621), and Synthetic 4-White (Reg. no. GP-291, PI 561622) field types and sweet corn MSR-su (Reg. no. GP-292, PI 561623), were jointly developed by the International Institute of Tropical Agriculture (IITA) and the Cameroon Institute of Agronomic Research (IRA) as part of the USAID-financed National Cereals Research and Extension Project. They were released in 1991 for use as source germplasm or as cultivars, principally in the high-rainfall tropical midaltitudes of Africa. Few populations have been developed by the international research centers for this ecology.

The principal nursery and testing sites for development of these populations were in the Western and Adamawa Plateaus of Cameroon, and the Jos Plateau of Nigeria. These sites are located between 5° and 10° N lat at 1000 to 1500 m altitude, and receive 1300 to 2200 mm annual monomodal season precipitation. Maize streak virus (MSV) screening was performed at IITA, Ibadan, Nigeria (tropical lowland), using artificial field infestation with viruliferous leafhoppers (*Cicadulina* spp.).

ATP is a flinty-grained, tall midaltitude population, selected primarily on acid volcanic soils of western Cameroon. Grain color is primarily yellow, with some segregation for white. It is late maturing, requiring an average of 75 d to 50% silk emergence across the Cameroon and Nigerian midaltitude test sites in 1991, approximately the same as the IITA TZMSR population (1) and the Zimbabwe Seed Coop hybrid ZS206. It is resistant to ear rots and *Exserohilum turcicum* (Pass.) Leonard & Suggs, and is moderately resistant to MSV and *Puccinia sorghi* Schwein. Tropical lowland and midaltitude populations and hybrids were screened on acid soils in a split block design with lime (3 Mg ha^{-1}) and no lime treatments in order to separate effects of climatic adaptation from that of tolerance to acid soil. The best 11 populations and hybrids across treatments and locations were selected as parents. These were hybrids HE1066 and 1049 (Limagrain Genetics, France), and populations 'ESALQ YF3', 'ESALQ 5VF1', 'CMS 36', and 'CMS 201x' (Brazil national program, through IITA), 'Suwan-1' (Thailand national program), 'Across 7728' (CIMMYT), 'Shaba' (Zaire national program), 'COCA' (Cameroon national program), and TZMSR. The parents were recombined three times, and the resulting population received four cycles of half-sib family selection for yield, lodging resistance, leaf disease resistance, and yellow flinty grain. Selection intensity was ≈10% in the 200 to 300 families evaluated across two sites per cycle. Following recombination of Cycle 4, 350 MSV resistant plants were selected in the screening nursery and selfed. More than 300 S_1 plants were selected and recombined in the MSV nursery the following season to reconstitute the population. In 1991 trials across five midaltitude sites in Cameroon and Nigeria, ATP yielded an average of 7.0 Mg ha^{-1} at 150 g kg^{-1} grain moisture, 0.5 Mg ha^{-1} greater than entries derived from TZMSR.