

sandy soils with high populations of several species of nematode, UC-PX 1971 had the best stand of all entries in three production years.

In a 5-year yield trial at Davis, forage yields of UC-PX 1971 were 114% of Lahontan and 102% of 'Moapa 69.' In a 4-year forage yield trial at the West Side Field Station, Five Points, California UC-PX 1971 yielded 109% of Moapa 69, 110% of Lahontan, and 111% of 'El Unico.' In a 4-year forage yield trial at the UC Riverside Moreno farm, UC-PX 1971 yielded 107% of El Unico. Fall dormancy of UC-PX 1971 is similar to that of Moapa, whereas spring recovery is slightly later.

One hundred grams of UC-PX 1971 seed are available upon written request and agreement to make appropriate recognition of its source a matter of open record when this germplasm contributes to the development of a new cultivar, hybrid, or germplasm. Request seed from either L. R. Teuber, Agronomy and Range Science, Univ. of California, Davis, CA 95616 or W. F. Lehman, P.O. Box 1004, E. Holton Rd., El Centro, CA 92243.

REGISTRATION OF TRIAZINE-RESISTANT *BRASSICA CAMPESTRIS* GERMPLASM¹

(Reg. No. GP 1)

W. D. Beversdorf, J. Weiss-Lerman, and L. R. Erickson²

SUMMER turnip rape (*Brassica campestris* L.) germplasm with cytoplasmically inherited triazine resistance was released by the Crop Science Dep., Univ. of Guelph in 1979. The germplasm, referred to as ATR-5Ca, was derived from bulked seeds from the fourth backcross between a triazine resistant *B. campestris* weed biotype called bird's rape³ (donor parent) and 'Candle' (recurrent pollen parent), a triple zero (low erucic acid, low thioglucosinolate, low fiber) Canadian cultivar.

ATR-5Ca is resistant to atrazine (3.0 kg/ha) and cyanazine (3.0 kg/ha) and tolerant of metribuzin (0.5 kg/ha) applied preplant incorporated, preemergence, or post emergence, whereas Candle is killed by any of the above herbicide applications.

Seeds which were bulked to produce ATR-5Ca were similar to Candle in erucic acid content (less than 1% of total fatty acids) and seed coat color (yellow to brown). Glucose test strip assays indicate ATR-5Ca was also similar to Candle in thioglucosinolate content although no quantitative measurements have been completed. No deleterious effect from the cytoplasm of the weed biotype has been observed in ATR-5Ca.

Small quantities (2 to 4 g) of ATR-5Ca are available from the Crop Science Dep., University of Guelph, Guelph, Ontario, Canada, N1G 2W1.

¹ Registered by the Crop Sci. Soc. Am. Accepted 8 Nov. 1979.

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³ Maltais, B., and C. J. Bouchard. 1978. Une moutarde des oiseaux (*Brassica rapa* L.) resistente a' L'atrazine. Phytoprotection 59:117-119.

REGISTRATION OF TRIAZINE RESISTANT *BRASSICA NAPUS* GERMPLASM¹

(Reg. No. GP 2)

W. D. Beversdorf, J. Weiss-Lerman, and L. R. Erickson²

TRIAZINE resistant *Brassica napus* L. germplasm hereafter referred to as ATR-5Tw was released by the Crop Science Dep., Univ. of Guelph in 1979. Cytoplasmically inherited triazine resistance was incorporated into ATR-5Tw through a backcrossing program between a triazine resistant *Brassica campestris* L. weed biotype known as bird's rape³ or wild turnip (2n = 20) and Tower (2n = 38), a double zero (low erucic acid and low thioglucosino-

late content) Canadian *B. napus* cultivar. In the backcross program, Tower was used as a recurrent pollen parent.

Hybrids of the initial cross (bird's rape × Tower) were triploids (2n = 29). Among backcross (BC₁) progeny, three 38-chromosome plants were identified by root-tip chromosome number determinations. These were resistant to a 3.0 kg/ha application of triazine (postemergence) and used as females in the next cycle of backcrossing. Resulting progeny (BC₂s) contained 38 chromosomes and were resistant to atrazine. Subsequent cycles of backcrossing were continued with progeny from each cycle subjected to a post-emergence application of atrazine (3.0 kg/ha). All progeny carrying cytoplasm derived from the bird's rape donor parent were resistant to the atrazine application.

Seeds bulked to form ATR-5Tw were from the fourth backcross (bird's rape × Tower⁵). ATR-5Tw is resistant to atrazine (3.0 kg/ha) and cyanazine (3.0 kg/ha) and tolerant (5 to 15% leaf area damage) of metribuzin (0.5 kg/ha) applied preplant incorporated, preemergence, or postemergence. Tower is killed by any of the above herbicide applications.

ATR-5Tw is similar to Tower in erucic acid content (less than 1% of total fatty acids). Glucose test strip assays indicate that ATR-5Tw is similar to Tower in thioglucosinolate content, although no quantitative determination has been completed.

ATR-5Tw has been released because of its potential as a source of triazine resistance and the potential value of such resistance in weed control programs for rapeseed. Small quantities (2 to 4 g) of ATR-5Tw are available from the Crop Science Dep., Univ. of Guelph, Guelph, Ontario, Canada, N1G 2W1.

REGISTRATION OF THREE GERMPLASM LINES OF COTTON¹

(Reg. No. GP141 to GP143)

T. W. Culp and D. C. Harrell²

THREE breeding lines of cotton (*Gossypium hirsutum* L.), Pee Dee 0109 (GP 141), Pee Dee 0111 (GP 142), and Pee Dee 0113 (GP 143), were released by AR-SEA-USDA and the South Carolina Agric. Exp. Stn. in 1975 (1). These breeding lines represent a significant step in overcoming the adverse association among lint yield, fiber quality, and disease resistance.

These lines were developed from the cross Pee Dee 4381 × Pee Dee 2165, and each is from a single plant selected in the F₃ generation. Pee Dee 4381 was developed from the cross AC 239 × 'Auburn 56.' AC 239 was derived from a series of crosses involving Triple Hybrid 171, Sealand 7, Earlistaple 7, and C 6-5. Pee Dee 2165 was derived from similar crosses involving Triple Hybrid 108 and 171, AHA 6-1-4, Earlistaple 7, Sealand 542, and C 6-5. Auburn 56 is a commercial cultivar developed by the Alabama Agric. Exp. Stn. that possesses resistance to the fusarium wilt rootknot-nematode complex caused by *Fusarium oxysporum* f. spp. *vasinfectum* (Atk.) Synd. and Hans. and *Meloidogyne* spp. (5).

Pee Dee 0109, Pee Dee 0111, and Pee Dee 0113 generally produce yields equivalent to those of commercial cultivars in the Southeast. Pee Dee 0113 is the most consistently high producer and has shorter and weaker fibers than the other two lines; however, its yarn strength is equal to that of the high fiber strength check, Pee Dee 2165. Pee Dee 0113 is the first PD line derived from Triple Hybrid material to possess seeds per boll approaching that of Coker 201 and most southeastern cultivars (2). Pee Dee 0109 has significantly longer and coarser fiber than Pee Dee 0111; however, both are in a higher fiber and yarn strength range than is Pee Dee 2165.

Pee Dee 0111 and Pee Dee 0113 are highly resistant to fusarium wilt (3, 4). Pee Dee 0109, while more susceptible than its sister lines, may have sufficient resistance to withstand most field attacks of the pathogen. All breeding lines exhibited some resistance to verticillium wilt caused by *Verticillium* spp. at Rohwer, Ark., and Scott, Stoneville, and Tunica, Miss., in 1974.

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³ Maltais, B., and C. J. Bouchard. 1978. Une moutarde des oiseaux (*Brassica rapa* L.) resistente a' L'atrazine. Phytoprotection 59:117-119.

Disease resistance may be a major factor responsible for the apparent wide range in adaptability of Pee Dee 0109, Pee Dee 0111, and Pee Dee 0113.

Seed (25 g) of these germplasm lines may be obtained from AR-SEA-USDA, Pee Dee Exp. Stn., Florence, SC 29503.

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3. Kappelman, A. J., Jr. 1972. Regional cotton fusarium wilt screening test. USDA Report No. 21.
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5. Smith, A. L. 1964. Registration of Auburn 56 cotton. Crop Sci. 4:445-446.

REGISTRATION OF FERTILITY RESTORER DEMETER II COTTON GERMPLASM¹

(Reg. No. GP 144)

James B. Weaver, Jr.²

DEMETER II cotton (*Gossypium hirsutum* L.) germplasm was developed by the College Experiment Station, Univ. of Georgia and released to scientists in March 1979.

Development of this germplasm was begun in 1973 when a single plant of DES HAF 277³ was crossed as the female parent with 'Pima S-4' (*G. barbadense* L.). DES HAF 277 had the genome of *G. hirsutum* in *G. harknessii* Brandagee cytoplasm and carried a restorer gene *Rf*⁴. The *Rf* gene behaves as an incomplete dominant gene in crosses of cytoplasmic male sterile upland × upland strains that have the restorer gene. However, it behaves as a complete dominant gene in crosses of cytoplasmic male sterile upland × *G. barbadense* strains with the restorer gene. Sheetz and Weaver⁴ found that Pima has a dominant gene, *E*, that enhances pollen fertility but is not a restorer per se.

F₂ seed of the DES HAF 277 × Pima S-4 were grown at Iguala, Mexico, where the most fertile segregates were selected and backcrossed (BC₁) as females to upland non-restorer strains. The most fertile plants in the BC₁ generation were again backcrossed to non-restorer upland strains (BC₂). A third backcross was made in the same manner and the most fertile BC₃ plants were self pollinated. Individual plants in the BC₃ F₂ generation were crossed onto several cytoplasmic male sterile upland strains in 1977. The BC₄ test cross generation was grown in 1978 and scored for weak fertile and strong fertile hybrid plants. Demeter II is the open pollinated seed from BC₄ progeny rows which has both the *Rf* gene and the "enhancer factor" *E*⁴. Approximately 1/16 of the plants in the BC₄ F₂ generation should be of the genotype *Rf Rf E E* and all plants should have acceptable agronomic properties.

Our research indicates that the fertility enhancer gene *E* must be present in order to obtain adequate fertility in cytoplasmic male-sterile upland × restorer upland crosses. Pure lines of *Rf Rf E E* will be released in the near future. Demeter II can

¹ Registered by the Crop Science Society of America. Accepted 15 Oct. 1979.

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³ Meyer, V. G. 1973. Registration of sixteen germplasm lines of upland cotton. Crop Sci. 13:778.

⁴ Sheetz, R. H., and J. B. Weaver, Jr. 1980. Inheritance of a fertility enhancer factor from Pima cotton when transferred into Upland cotton with *Gossypium harknessii* Brandagee cytoplasm. Crop Sci. 20:272-275.

serve as a valuable source of germplasm for scientists who are developing restorer lines of upland cotton. Seed of Demeter II may be obtained from the Agronomy Dep., Univ. of Georgia, Athens, GA 30602.

REGISTRATION OF MEDIUM STAPLE COTTON GERMPLASM¹

(Reg. No. GP 145 to GP 149)

T. W. Culp and D. C. Harrell²

THE adverse relationship between extra fiber strength and low lint percentage has been a persistent problem in cotton (*Gossypium hirsutum* L.) improvement programs. Low lint percentage was overcome in the PD breeding program with the introduction of the California breeding line C 6-5 (3). AC 239 (GP 145) and AC 241 (GP 146), F₄ selections from the cross of Hybrid 313 or Line A × C 6-5, have shown a 12% increase in lint yield over that in previously developed PD lines. These lines have genes for extra fiber strength and a lint percentage of 39, which is an increase of 15% from the base lint percentage of 33. AC 239 has extra-large bolls and seeds, which probably reduce its range of adaptability. AC 241 has seeds and bolls about 8% smaller than those of other AC strains, and it has been used profusely in crosses to eliminate low lint percentage in PD material. Hybrid 313 or line A was developed from a complex series of crosses involving Triple Hybrid 171, Sealand 7, and Earlistaple.

These AC lines have been combined with the extra-long staple PD lines FJA and FTA (3) to give the superior germplasm lines PD 2164 (GP 147), PD 3246 (GP 148), and PD 3249 (GP 149). The FJA and FTA lines were developed from a complex series of crosses involving Triple Hybrids 108 and 171, AHA 6-1-4, Sealand, and Earlistaple.

PD 2164 is from the increase of the bulk seed of the progeny of a single F₃ plant selection from the cross of AC 239 × FJA 348. Although this strain produces 25% less lint than 'Coker 100 W,' it has excellent fiber properties and has combined with high fiber-strength lines and southeastern cultivars to produce superior upland cotton (1, 4).

PD 3246 and PD 3249 are from the increase of the bulk seed of the progeny of single F₃ plant selections from the cross of AC 239 × FTA 266. Both strains have excellent fiber properties and combine with high fiber strength lines to produce superior hybrids and progenies (2). PD 3246 is resistant to defoliation with organic phosphate defoliant.

These breeding lines were released by AR-SEA-USDA and the South Carolina Agric. Exp. Stn. in 1979.

Seed (25 g) of each breeding stock may be obtained from AR-SEA-USDA, Pee Dee Exp. Stn., Florence, SC 29503.

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