season types in that they are more determinate and diminutive than most of the cultivars presently grown in central and southern Texas. Lint yields of several lines (CS-8603, CS-8608, and CS-8610) compared favorably with full-season 'Stonerville 213', while all lines equaled or exceeded the yield of 'TAMCOT SP-37H', the short-season check.

These lines, designated CS-8601 through CS-8614, were divided into three groups, mainly on the basis of general phenotype and potential utilization by breeders interested in developing cultivars (Table 1). Lines CS-8601 through CS-8607 are more determinate in fruiting pattern and are more compact than Stonerville 213 or TAMCOT SP-37H. These lines have a rapid rate of blooming, early maturity, and produce medium to large bolls similar to Stonerville 213 with storm resistance equal to that of TAMCOT SP-37H.

Lines CS-8608 through CS-8611 are glandless. These germplasm lines resulted from efforts to combine rapid fruiting, relatively compact plant types suitable for stripper harvest with the glandless trait.

Lines CS-8612 through CS-8614 combine early maturity with improved fiber characteristics, especially increased fiber strength. These lines represent the first cycle of selection for early-maturing, compact plant types with improved fiber strength.

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References and Notes
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REGISTRATION OF FOUR FLAX GERMPLASM LINES

FOUR FLAX (Linum usitatissimum L.) germplasm lines (Reg. no. GP-1 through GP-4, (PI 512292 through PI 512295) jointly developed by the USDA-ARS Oilseeds Research Unit and the Agricultural Experiment Station, North Dakota State University, at Fargo, ND, were released in February 1987. 'Culbert M3P3', 'Linott M3P3', 'Wishek M3P3', and 'Nored M3P3' were developed for use in flax breeding and research programs.

The four germplasm lines carry the $M^mP^mP^p$ multiple-gene resistance to flax rust (caused by Melampsora lini) (Ehrenb. Lev.). Both genes convey resistance to presently known races of flax rust in North America. The lines are blue-flowered, brown-seeded selections derived by the backcross method of breeding with 'Culbert', 'Linott', 'Wishek', and 'Nored' used as recurrent parents. The $M^mP^mP^p$ were derived from the nonrecurrent parent, CI 7506 $M^M^mP^pP^p$, a line developed by H.H. Flor with multiple-gene resistance to flax rust. Nored and Culbert were developed in Minnesota and released as cultivars in 1968 and 1975, respectively. Linott was developed in Canada and released as a cultivar in 1966. Wishek was developed in North Dakota and released as a cultivar in 1979. All cultivars have been grown on substantial acreage in areas of North Dakota, Minnesota, South Dakota, and/or Canada. Each line is a single plant selection from the BC$_2$F$_2$ generation. Single plant selections were made after each backcross, and seedlings from these selections were inoculated with the rust cultures 218-S48 and X36, developed by G.D. Statler (1). These two cultures are virulent on flax lines carrying rust resistant genes, other than $M^m$ and $P^m$, and were used to identify the combination of these two genes even if other genes were present. Single plants selected in the BC$_2$F$_2$, BC$_2$F$_3$, and BC$_2$F$_4$ generations were tested for resistance. A single resistant plant from the BC$_2$F$_2$ generation from each cross was increased and grown in paired comparison trials with the recurrent parent to test for agronomic and morphologic similarity. Three replications of 50 seedlings were inoculated to verify that each line was homozygous resistant to the two races. Line one from each backcross program was selected for release.

Culbert M3P3, Linott M3P3, Wishek M3P3, and Nored M3P3 flowered 50, 49, 51, and 55 d after sowing; were 61, 60, 62, and 67 cm in height; and had oil percentages of 40.6, 40.7, 40.2, and 40.6, respectively, when grown in trials at Fargo, ND; Morden, Manitoba; and Brookings, SD, in 1986. Culbert, Linott, Wishek, and Nored cultivars flowered 49, 49, 51, and 55 d after sowing; were 60, 59, 62, and 67 cm in height; and had oil percentages of 40.6, 40.6, 40.4, and 40.6, respectively, in the same trials.

The intent of the registration of the four lines is that breeders can utilize the germplasm in crosses with other cultivars or introductions that possess the same $M^mP^mP^p$ multiple-gene resistance. The germplasm lines provide protection against a major rust development in the natural rust population, a highly unlikely event that would require spontaneous mutations for two genes in the pathogen.

Limited quantities of seed of each germplasm source are available from the USDA Flax Collection maintained by J.F. Miller, USDA-ARS, and J.J. Hammond, Agronomy Department, North Dakota State University, Fargo, ND 58105.

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References and Notes


REGISTRATION OF FOLIAR NEAR ISOLINE GERMPLASMS OF AF, ST, AND TL IN THREE CULTIVARS AND ONE BREEDING LINE OF WINTER PEA

Eight combinations of the three genes af, st, and tl were backcrossed into three cultivars and one breeding line of pea (Pisum sativum L.) (Reg. no. GP-37 through GP-68) (PI 512056 through PI 512087). The resulting near isolines were released by the University of Idaho Agricultural Experiment Station in September of 1987. In the homozygous recessive condition, the genes af, st, and tl modify the pea canopy into seven different foliage types (3). The af gene replaces leaflets with tendrils, producing the afila phenotype; st reduces stipule size; and tl replaces tendrils with leaflets, producing the acacia phenotype. Plants homozygous recessive for both af and st (afaf stst) result in a plant with small stipules and a proliferation of tendrils but no leaflets. The interaction of af with tl (afaf tltl) results in a plant with highly branched petioles and many small leaflets. When st and tl are combined (stst tl) the plant has small stipules, and the tendrils are