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Published July, 2002

REGISTRATIONS OF CULTIVARS

Registration of 'UC 937' Barley

'UC 937' barley (*Hordeum vulgare* L.) (Reg. no. CV-296, PI 608667) is a six-rowed spring feed barley released by the California Agricultural Experiment Station in 1998. UC 937 was selected from the cross 'Sma1'/'Sunbar 401'/3/'Gus'/'Kombyne'//Sma1 (Matchett and Cantu, 1978). Sma1 has the parentage 'Steptoe'/2*'Diamant'/3/Minn Dwarf 64.98-8/'Briggs'/4/'Asse' (Muir and Nylan, 1973; Schaller and Prato, 1968). The final cross was made at Woodland, CA, in 1983 by Robert Matchett. Subsequent generations were handled in a pedigree selection program. An F_3-derived seed sample in the F_6 generation (86Woodland 41233) was received for testing by the University of California, Davis, from Robert Matchett in 1987. A head row was selected for agronomic appearance in 1992 by Lynn Gallagher and designated UCD 92-10,615 for preliminary yield trials. In 1993, it was designated UC 937 and placed in California regional yield trials for statewide evaluation. Over 32 yield trials, UC 937 averaged 4688 kg ha^{-1} and was superior to other varieties with an increase of 14.8% more than 'UC 476' (Schaller et al., 1990), 22.2% more than 'UC 603' (Schaller et al., 1990), 11.4% more than 'Nebula', 104.2% more than 'Max', and 23.6% more than 'Patti'.

UC 937 is short statured, averaging 88.9 cm, as a result of the *sdw* gene, but averages 5 cm taller than 'UC 828' (Gallagher et al., 1996). UC 937 is intended for late fall to early winter (November-December) sowing in the Central Valley of California. Heading time of UC 937 is 2 to 5 d later than UC 828, with mid-November to mid-December emergence under short daylengths in California.

UC 937 is moderately resistant to Barley yellow dwarf virus, leaf rust (caused by *Puccinia hordei* Otth.), powdery mildew [caused by *Erysiphe graminis* DC. f. sp. *hordei* Em. Marchal; syn. *Blumeria graminis* (DC.) E. O. Speer], net blotch (caused by *Pyrenophera teres* Drechs.) and scald [caused by *Rhynchosporium secalis* (Oudem.) J.J. Davis]. UC 937 is resistant to races of stripe rust (*Puccinia striiformis* f. sp. *hordei*) existing in the Central Valley of California. In 2 yr of stripe rust observations at Cochabamba, Bolivia, in 1994 and 1995 (W.M. Brown, V. Velasco, and J.P. Hill, personal communication, 1994 and 1995), UC 937 was scored TrR and 5MS compared with 100S and 90S, respectively, for UC 828.

The spike of UC 937 is semi-smooth awned, mid-dense, waxy, and semi-erect. The kernels are beige with a white aleurone and covered. Kernel weight averages about 43 mg and is similar to UC 828, but heavier than UC 337 (Schaller et al., 1990) in the absence of stripe rust.

Breeder and Foundation seed classes are maintained by the Foundation Seed and Certification Services, Univ. of California, Davis CA 95616.

L.W. Gallagher,* L.F. Jackson, R.W. Matchett, Y.P. Puri, and H.E. Vogt

References

Gallagher, L.W., L.F. Jackson, C.W. Schaller, Y.P. Puri, and H.E. Vogt. 1996. Registration of 'UC 828' barley. Crop Sci. 36: 466.

Matchett, R.W., and O.P. Cantu. 1978. Registration of Kombyne barley. Crop Sci. 18:692.

Muir, C.E., and R.A. Nilan. 1973. Registration of Steptoe barley. Crop Sci. 13:770.

Schaller, C.W., L.F. Jackson, and L. Prato. 1990. Registration of 'UC 337' barley. Crop Sci. 30:1154.

Schaller, C.W., L.F. Jackson, M.J. Smith, L. Prato. 1990. Registration of UC 476 barley. Crop Sci. 30:1154.

Schaller, C.W., L.F. Jackson, and L. Prato. 1990. Registration of UC 603 barley. Crop Sci. 30:1154.

Schaller, C.W., and J.D. Prato. 1968. Registration of Briggs barley. Crop Sci. 8:776.

L.W. Gallagher, L.F.Jackson, Y.P. Puri (retired), and H.E. Vogt, Dep. of Agronomy and Range Science, Univ. of California, Davis, CA 95616; R.W. Matchett, Resource Seeds, Zamora, CA 95698. Registration by CSSA. Accepted 31 Jan. 2001. *Corresponding author (lwgallagher@ucdavis.edu).

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Registration of 'UC 960' Barley

'UC 960' barley (*Hordeum vulgare* L.) (Reg. no. CV-297, PI 608668) is a six-rowed spring, feed barley released by the California Agricultural Experiment Station in 1998. UC 960 was selected from the cross 'Sma1'/'Sunbar 401'/3/'Gus'/'Kombyne'//Sma1 (Matchett and Cantu, 1978). Sma1 has the parentage 'Steptoe'/2*'Diamant'/3/Minn Dwarf 64.98-8/'Briggs'/4/'Asse' (Muir and Nilan, 1973; Schaller and Prato, 1968). The final cross was made at Woodland, CA, in 1983 by Robert Matchett. Subsequent generations were handled in a pedigree selection program. An F_3-derived seed sample designated as NK 2867 (86Woodland 41017) was received for testing in the F_6 generation by the University of California from Robert Matchett in 1987. A single head row was selected and bulked by Y.P. Puri in the 1987-1988 growing season. NK 2867 was selected for agronomic appearance and resistance to barley stripe rust (caused by *Puccinia striiformis* f. sp. *hordei*) in 1995 at Tulelake, CA, by Lynn W. Gallagher, and was designated UC 960. UC960 was subsequently evaluated for grain yield in the northern intermountain areas of California from 1996 through 1998. Over 3 yr, UC 960 yielded 7866 kg ha^{-1} compared with 6266 kg ha^{-1} for Steptoe and 5288 kg ha^{-1} for 'Gustoe' at Tulelake in the Klamath Basin. No differences were observed among varieties for grain yield at the Lassen or Siskiyou locations outside the Klamath Basin.

UC 960 is short statured, averaging 71.1 cm, and similar to 'Gustoe' for height, presumably as a result of the sdw gene either from Diamant or Minn Dwarf 64.988. UC 960 is about 1 wk earlier than Gustoe and similar to Steptoe for time to heading at Tulelake. UC 960 is intended primarily for spring planting under long daylengths in the southern Klamath Basin.

UC 960 is moderately resistant to Barley yellow dwarf virus, leaf rust (caused by *Puccinia hordei* Otth.), net blotch (caused by *Pyrenophera teres* Drechs.), and scald [caused by *Rhynchosporium secalis* (Oudem.) J.J. Davis]. UC 960 is resistant to races of barley stripe rust existing in the Central Valley of California and the Klamath Basin. In 2 yr of stripe rust observations at Cochabamba, Bolivia, in 1994 and 1995 (W.M. Brown, V. Velasco, and J.F. Hill, personal communication, 1994 and 1995), UC 960 was scored 10MS and 5MS compared with 100S and 90S, respectively, for 'UC 828' (Gallagher et al., 1996).

The spike of UC 960 is rough awned, mid-dense, waxy, and semi-erect. The kernels are beige with a white aleurone and covered. Kernel weight averages about 42.4 mg and is heavier

than that of Gustoe (36.4 mg), but lighter than that of Steptoe (45.1 mg).

Breeder and Foundation seed classes are maintained by the Foundation Seed and Certification Services, Univ. of California, Davis, CA 95616.

L.W. Gallagher,* L.F. Jackson, R.W. Matchett, Y.P. Puri, and H.E. Vogt

References

Gallagher, L.W., L.F. Jackson, C.W. Schaller, Y.P. Puri, and H.E. Vogt. 1996. Registration of 'UC 828' barley. Crop Sci. 36:466.
Matchett, R.W., and O.P. Cantu. 1978. Registration of Kombyne barley. Crop Sci. 18:692.
Muir, C.E., and R.A. Nilan. 1973. Registration of Steptoe barley. Crop Sci. 13:770
Schaller, C.W., and J.D. Prato. 1968. Registration of Briggs barley. Crop Sci. 8:776.

L.W. Gallagher, L.F. Jackson, Y.P. Puri (retired), and H.E. Vogt, Dep. of Agronomy and Range Science, Univ. of California, Davis, CA 95616; R.W. Matchett, Resource Seeds, Zamora, CA 95698. Registration by CSSA. Accepted 31 Jan. 2001. *Corresponding author (lwgallagher@ucdavis.edu).

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Registration of 'LS93-0375' Soybean

'LS93-0375' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-436, PI 620883) was developed by Southern Illinois University Carbondale and released as a maturity Group IV cultivar with resistance to soybean cyst nematode (SCN) (*Heterodera glycines* Ichinohe) Races 3 and 14 and moderate resistance to SCN Race 4 (Riggs and Schmitt, 1988). LS93-0375 is a nonexclusive release for nonspecific brand labeling.

LS93-0375 originated from an individual F_5 plant selection from the cross 'Asgrow A3935' × 'Pioneer 9402' (Asgrow Seed Company; Pioneer Hi-Bred International, Inc.). The F_2 and subsequent generations were advanced by the single-pod bulk method. A single F_5 plant was selected on an SCN Race 3 infested field. Soybean cyst nematode resistance was determined in subsequent generations by greenhouse evaluation utilizing SCN Race 3 infested soil collected from a field near Elkville, IL, and SCN Race 4 infested soil collected from a field near Sandridge, IL. Resistance was confirmed at the University of Missouri by greenhouse evaluation against SCN Races 3 and 14. The Race 3 culture was maintained on 'Hutcheson' and the race 14 culture was maintained on 'Forrest' (Buss et al., 1988; Hartwig and Epps, 1973).

LS93-0375 was evaluated in the Regional SCN Tests and the Uniform Soybean Tests–Northern Region from 1996 to 1998 (Cary et al., 1998; Wilcox, 1998). Seed yield of LS93-0375 was 4.6% higher than 'Mustang' (Schmidt et al., 1997).

LS93-0375 is indeterminate in growth habit. It has purple flowers, tawny pubescence, brown pod walls. It has a relative maturity of 4.2 and matures 1 d earlier than Mustang in a full season planting. Its range of adaptation is from approximately 37 to 40° N lat. Plant height averages 81 cm, compared with 91 cm for Mustang. Lodging score averages 1.2 (where, 1 = all plants upright to 5 = all plants prostrate), compared with 1.3 for Mustang. Seedcoats are shiny yellow with black hila. Seed quality scores average 1.5 (where, 1 = excellent to 5 = poor) for LS93-0375 compared with 1.7 for Mustang. Seed size is approximately 159 mg seed^{-1}, compared with 137 mg seed^{-1} for Mustang. Seed composition averages 422 g kg^{-1} protein and 200 g kg^{-1} oil on a dry weight basis.

LS93-0375 is moderately resistant to soybean sudden death syndrome [caused by *Fusarium solani* (Mart.) Sacc. f. sp. *glycines*] and is resistant to stem canker [caused by *Diaporthe phaseolorum* (Cook & Ellis) Sacc. var. *caulivora* K.L. Athow & R.M. Caldwell], and frogeye leafspot (caused by *Cercospora sojina* K. Hara). It is susceptible to races 1 and 4 of Phytophthora rot (caused by *Phytophthora sojae* M.J.Kaufmann & J.W. Gerdemann) and *Soybean mosaic virus* (Wilcox, 1998).

LS93-0375 is released for nonexclusive licencing to seedmen for brand labeling. Parent seed maintenance and distribution will be handled by Gateway Seed Company, Van Buren Road, Nashville, IL. A research assessment fee of $0.60 per 50-pound unit (22.7 kg) of the commercial class of seed sold will be collected. Breeders seed will be maintained by Southern Illinois University Carbondale. Small quantities of seed for breeding and research purposes may be obtained for a minimum of 5 yr from the date of this publication by writing the corresponding author. U.S. Plant Variety Protection will not be applied for.

M.E. Schmidt* and J.H. Klein

Acknowledgments

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References

Buss, G.R., H.M. Camper, Jr., and C.W. Roane. 1988. Registration of 'Hutcheson' soybean. Crop Sci. 28:1024–1025.
Hartwig, E.E., and J.M. Epps. 1973. Registration of 'Forrest' soybeans. Crop Sci. 13:287.
Cary, T.R., B. Diers, and C.D. Nickell. 1998. Northern Regional Soybean Cyst Nematode Test Report I-IV. Univ. of Illinois, Urbana, IL.
Riggs, R.D., and D.P. Schmitt. 1988. Complete characterization of the race scheme for *Heterodera glycines*. J. Nematol. 20:392-395.
Schmidt, M.E., P.A. Owen, K.M. Clark, and D.A. Sleper. 1997. Registration of 'Mustang' soybean. Crop Sci. 37:1383.
Wilcox, J.R. 1998. Uniform soybean tests, northern states. USDA-ARS, Purdue Univ., West LaFayette, IN.

Dep. of Plant, Soil and General Agriculture, Mailcode 4415, Southern Illinois Univ. Carbondale, Carbondale, IL 62901. A Center of Excellence for Soybean Research, Teaching, and Outreach publication. Registration by CSSA. Accepted 31 Dec. 2001. *Corresponding author (mesch@siu.edu).

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Registration of 'Sabbe' Wheat

'Sabbe' soft red winter wheat (*Triticum aestivum* L.) (Reg. no. CV- 916, PI 614729) was developed by the Arkansas Agricultural Experiment Station. It was released in 2000 because of its excellent straw strength and yield potential under Arkansas conditions. Sabbe was named in honor of Dr. Wayne Sabbe, former professor of agronomy, University of Arkansas. Dr. Sabbe, who grew up on a farm in North Dakota, maintained a strong interest in wheat during his 36 yr of service to the university as a faculty member and director of the Soil Test and Diagnostic Laboratories.

Sabbe was developed from a cross made in 1989 of 'Corin'/AR 584. AR 584 was an F_1 from the cross 'Florida 302'//'Coker 833'/'Hunter'. Corin is a soft red winter cultivar that was obtained from Jean-Pierre Jaubertie with Semences Cargill in France and was developed by Nickerson RPB, Ltd. of England. The phenotype of Sabbe is more typical of Northern

European wheat cultivars than southern U.S. soft red winter wheat cultivars. Compared with typical Arkansas cultivars, the culm is thicker, number of tillers is fewer, spikes are blocky, and the leaves are shorter and wider. The population was grown as a bulk during the F_2 and F_3 generations. Single head selections were made in the F_4 and the F_5 generations and the resulting F_5 selection was designated as AR 656-5-1. Sabbe was tested in the Arkansas Small-Grain Cultivar Performance Trials in 1998, 1999 and 2000. It was tested in the USDA-ARS Uniform Southern and Uniform Eastern Soft Red Winter Wheat regional trials in 2000.

Sabbe is most similar to 'AgriPro Shiloh' in appearance. Both are approximately 94 cm tall and have a plant color of 147A in the yellow-green group (as referenced by the Royal Horticultural Society Color Chart). Sabbe has flag leaves approximately 0.6 cm wider than Shiloh. At maturity, Sabbe has spikes which are awnless, mid-dense, oblong and erect at maturity. Depending on environmental influence, the apical rachis internodes may be shortened giving the spike a slightly clavate appearance or the end of the spike may taper resulting in a somewhat fusiform shape. The white glumes are glabrous, short (9 mm) and midwide with oblique shoulders and acute beaks. Kernels are red, short to midlong and ovate, with a midsize germ; the kernel brush is midsized and short to midlong; the kernel crease is narrow in width and is mid-deep with rounded cheeks. Kernels on average are 6.3 mm long and 3.4 mm wide with a kernel weight of 33 mg.

Sabbe has excellent adaptation in Arkansas test sites. Compared with 'Jaypee' (Bacon et al., 1998) in 29 Arkansas Small Grain Cultivar Performance Tests from 1998 to 2000, Sabbe yielded 9% higher (Standard Input Tests only), had approximately 14 kg m^{-3} lighter grain volume weight, was 3 d later in maturity, and was 6 cm taller. Sabbe is responsive to intensive management as evidenced by its relatively higher yield performance in the High Input Tests within the Arkansas Small Grain Cultivar Performance Tests. In these tests, which use additional (56 kg ha^{-1}) nitrogen and a foliar fungicide, the yield of Sabbe was 17% higher than Jaypee. Data (not shown) also indicate a yield response to high seeding rates (202 kg ha^{-1}).

Sabbe has good winterhardiness for its area of adaptation. It has excellent straw strength; data from two sites in the 1998-1999 Arkansas Small-Grain Cultivar Performance Trials with significant lodging indicated 2% for Sabbe vs. 19% for Coker 9663. Field tests indicate that Sabbe is resistant to populations of powdery mildew (caused by *Blumeria graminis* DC. f. sp. *tritici* Ém. Marchal) found in Arkansas. It is resistant to Septoria leaf blotch (caused by *Septoria tritici* Roberge in Desmaz.); moderately resistant to *Soil-borne wheat mosaic virus* (SBWMV) and stripe rust (caused by *Puccinia striiformis* Westend.); moderately susceptible to *Wheatspindle streak mosaic virus* (WSSMV); and susceptible to leaf rust (caused by *Puccinia triticina* Eriks.). According to seedling tests conducted by the USDA Cereal Disease Lab, St. Paul, MN, Sabbe contains the genes *Lr2a*, *Lr10*, and *Lr11* for leaf rust resistance. Results from the USDA Soft Wheat Quality Laboratory at Wooster, OH, indicate soft wheat end-use quality characteristics similar to 'Mason' (milling score of 100 for both and baking score of 103.6 for Sabbe vs. 100 for the quality check Mason).

U.S. Plant Variety Protection for Sabbe is pending. Classes of seed production are limited to Breeder, Foundation, and Certified. Breeder and Foundation seed is maintained by the Arkansas Agricultural Experiment Station, Fayetteville, AR 72701. Small quantities of seed will be available from the breeder.

R.K. Bacon,* J.T. Kelly, E.A. Milus, and C.E. Parsons

References

Bacon, R.K., J.T. Kelly, and E.A. Milus. 1998. Registration of 'Jaypee' wheat. Crop Sci. 38:1723.

R.K. Bacon and J.T. Kelly, Dep. of Crop, Soil and Environmental Sciences; E.A. Milus, Dep. of Plant Pathology, Univ. of Arkansas, Fayetteville, AR 72701; C.E. Parsons, Dep. of Crop, Soil and Environmental Sciences, Lonoke, AR 72086. Published with the approval of the Director, Arkansas Agric. Exp. Stn., manuscript #01030. The research was supported in part by grants from the Arkansas Wheat Promotion Board. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (rbacon@uark.edu).

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Registration of 'Golden Spike' Wheat

'Golden Spike' hard white winter wheat (*Triticum aestivum* L.) (Reg. no. CV-917, PI 614813) was developed by the Utah Agricultural Experiment Station (UAES) and released in 1999. Previous designations for Golden Spike were UT1944-158 and UT944158. Golden Spike was released to provide a high-quality, hard white winter wheat with high yields when grown under dryland conditions, where dwarf bunt (caused by *Tilletia controversa* Kühn in Rabenh.) can be severe. Golden Spike was named to commemorate the uniting of the Union Pacific and Central Pacific railroads at Promontory Point, UT, in 1869.

Golden Spike is derived from the 1984 cross 'Arbon'/'Hansel'//Hansel/ID0281. ID0281 has the pedigree; 'CItr14106'/'Columbia'//'McCall' and is a sib of Arbon (Sunderman et al., 1980). The F_2 through F_5 generations were grown as bulk populations with selection for agronomic types including height, maturity, vigor, and resistance to common bunt [caused by *Tilletia tritici* (Bjerk.) G. Wint. in Rabenh.]. Two individual heads from each selected F_5 plants were harvested. One $F_{5:6}$ head from each selected plant was planted in 1990 at the Greenville Experimental Farm, Logan, UT, and the other head, with the same selection number, was planted at the Blue Creek Experimental Farm, Blue Creek, UT. The plants in headrows at the Greenville Experimental Farm were inoculated with dwarf bunt spores (composite of races) in the fall and selected for resistance and agronomic characteristics. Superior headrows were selected for agronomic traits at Blue Creek and resistance to dwarf bunt was determined for these selections in the Logan nursery. The resulting $F_{5:7}$ lines were evaluated for yield and agronomic traits in an un-replicated plot nursery at Blue Creek in 1991, and in a replicated yield trial at Blue Creek in 1992. From 1992 through 1999, Golden Spike was tested in replicated nurseries in six locations throughout Utah and was evaluated for yield, maturity, test weight, lodging, winter survival, protein content, and bread quality. The lines continued to be tested for resistance to dwarf bunt in Logan. Golden Spike was also evaluated in the Western Regional Hard Winter Wheat Nursery from 1996 through 1999. In 1994, 250 heads were selected from F_{11} plants and grown as head rows in 1995. After roguing to remove off-type rows, approximately 200 $F_{11:12}$ lines were harvested and bulked as breeder seed.

The juvenile growth habit of Golden Spike is semierect and coleoptile anthocyanin is absent. Heading date is the same as 'Boundary' (Souza et al., 1999), and the flag leaf is erect and twisted. Stems are hollow, and the mature plant, at an average height of 78 cm, is generally about 5 cm taller than Boundary and 12 cm shorter than 'Weston' (Sunderman and Jennings, 1977). Golden Spike has awned, bronze chaffed (10YR/7/6 Munsell), tapering, mid-dense, and inclined spike characteristics. The kernel is elliptical, has rounded creeks, with a mid-wide, mid-deep seed crease, and medium-sized brush that is

not collared. The kernel phenol reaction is fawn except for the ends of the kernels, which are light brown.

Golden Spike has a high level of resistance to dwarf bunt derived from PI178383, one of the parents of Hansel (Dewey, 1975), and from CItr14106, which is also in the pedigree of Arbon (Sunderman et al., 1980). PI178383 and CItr14106 are also likely sources of Golden Spike's intermediate resistance to snowmolds caused by *Typhula* spp. (Sunderman et al., 1986). In dwarf bunt evaluations nurseries, 'Wanser' (Nelson and Nagamitsu, 1972) was grown as a susceptible check and generally averaged over 85% infection while Golden Spike never had any detectable infected heads. In the same tests, 'Cache' (Dewey, 1967) averaged 30% infected heads. In greenhouse seedling tests with stripe rust (caused by *Puccinia striiformis* Westend.), Golden Spike was resistant to races CDL-17, CDL-37, and CDL-45, but susceptible to race CDL-43. In field tests in 1997 through 1999 in three Washington locations, Golden Spike was moderately susceptible to stripe rust (Xianming Chen, personal communication).

From 1992 to 1999 in Utah tests, Golden Spike averaged 2941 kg ha^{-1} (47 site years) compared to 2867 kg ha^{-1} for 'Promontory' (Hole et al., 1995). These differences are not statistically significant ($\alpha = 0.05$). From 1996 through 1999, Golden Spike (38 site years), tested as UT944158, averaged 5040 kg ha^{-1} in the Western Regional Hard Winter Wheat Nursery compared with a nursery mean of 4777 kg ha^{-1}.

The USDA-ARS Western Wheat Quality Laboratory (WWQL) in Pullman, WA, has evaluated Golden Spike for milling and bread quality-attributes each year since 1991. Average volume weight measured by the WWQL over the previous 9 yr is 77.4 kg hL^{-1}. Golden Spike has a longer mixograph peak time (4.5 min) than Promontory (4.0 min). Loaf volume is similar to Promontory (976 and 978 mL, respectively) with similar flour yield (698 and 699 g kg^{-1}, respectively). Golden Spike has good color reaction in alkaline noodle testing with a mean ($n = 5$) 24 h L* (Minolta Chroma meter, Minolta Corp., Ramsey, NJ) of 82.0. Golden Spike appears to be of non-waxy starch composition with a mean ($n = 8$) RVA peak pasting viscosity of 181.

Golden Spike is sold as a class of Certified seed and is available from the Utah Crop Improvement Association. Seed classes will be Breeder, Foundation, Registered, and Certified. U.S. Plant Variety Protection has been applied for (PVP Certificate no. 200100033). Small amounts of seed for research purposes may be obtained by contacting the corresponding author.

D.J. Hole,* S.M. Clawson, S.A. Young, and D. Roche

References

Dewey, W.G. 1967. Registration of Cache wheat. Crop Sci. 7:683.
Dewey, W.G. 1975. Registration of 'Hansel' wheat. Crop Sci. 15:888.
Hole, D.J., W. Dewey, and R.S. Albrechtsen. 1995. Registration of Promontory wheat. Crop Sci. 35:1206
Nelson, W.L., and M. Nagamitsu. 1972. Registration of Wanser wheat. Crop Sci. 12:718.
Souza, E., J.M. Windes, D.W. Sunderman, and K. O'Brien. 1999. Registration of 'Boundary' wheat. Crop Sci. 39:296.
Sunderman, D.W., M.M. Stearns, and J.A. Hoffman. 1980. Registration of 'Arbon' wheat. Crop Sci. 20:825–826.
Sunderman, D.W., and S. Jennings. 1977. Winter wheat varieties: For dryland and irrigated areas of southern Idaho and irrigated areas of the Treasure Valley, eastern Oregon. Idaho Coop. Ext. Serv. Current Information Ser. No. 408.
Sunderman, D.W., J.A. Hoffman, and B.T. O'Connell. 1986. Registration of four winter wheat germplasm lines with resistance to dwarf bunt. Crop Sci. 26:651–652.

Dep. of Plants, Soils, and Biometeorology, Utah State Univ., Logan, UT 84322-4820. Utah Agric. Exp. Stn., Journal No. 7337. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (dhole@mendel.usu.edu).

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Registration of 'Lifter' Green Dry Pea

'Lifter' (Reg. no. CV-20, PI 628276) is a green cotyledon dry pea (*Pisum sativum* L.) developed by the USDA-ARS in cooperation with the Washington Agricultural Research Center, Pullman, WA, the Idaho Agricultural Experiment Station, Moscow, ID, and released in 2001. Lifter was released on the basis of multiple disease resistance, persistent green color of the seeds, and significant yield increases over the standard checks.

Lifter, selection PS510718, originated as an F_4 selection from the cross, PS810102/'Alaska 81'/2/PS810106/3/PS010838 made in 1993. PS810102, PS810106, and PS010838 are dry pea breeding lines selected for adaptation to the Palouse region of eastern Washington and northern Idaho. PS010838 has a semidwarf plant habit. Alaska 81 (Muehlbauer, 1987) is a cultivar developed by the USDA-ARS and Washington State University with Pea seed-borne mosaic virus (PSbMV) resistance and excellent seed quality.

Lifter was tested over 25 site-years in eastern Washington, northern Idaho, Montana, and North Dakota and outyielded 'Columbian', Alaska 81, or both in 19 site-years. In the Palouse region, Lifter was 43% higher yielding when compared with Columbian from 1997 to 1999.

Lifter has a semidwarf growth habit and has the dominant allele (*Af*) for normal leaf morphology. Vines are 80 cm long and the internodes appear in a zigzag manner. One to two basal branches are common in most environments. Leaves have two pairs of medium green leaflets. Normal, nonclasping stipules are moderately marbled. Flowering begins at the 17th node. Flowers are white and usually borne doubly on the peduncles. Pods are straight, blunt ended, and medium green with six to seven seeds. Seeds are smooth, round and dark green with dark green cotyledons and a clear testa. The dark green seed color is durable in moist conditions with intense sunlight conducive to seed bleaching, a cause of serious quality impairment in green cotyledon dry peas. Weight of 100 seeds averages 21.4 g, compared with 17.0 g for Columbian.

Lifter is resistant to race 1 of Fusarium wilt (caused by *Fusarium oxysporum* Schlecht. emend. Synd. and Hans. f. sp. *pisi*), pea enation mosaic virus, PSbMV, and powdery mildew (caused by *Erysiphe polygoni* DC). It also has a high degree of tolerance to Fusarium root rot (caused by *Fusarium solani* (Mart.) Sacc. f. sp. *pisi* Snyd. and Hans.) All four diseases are potentially devastating in the Palouse region, Montana and North Dakota.

Breeder and Foundation seed of Lifter will be maintained by the Washington State Crop Improvement Association under the supervision of the Department of Crop and Soil Sciences, College of Agriculture, Washington State University; and the USDA-ARS, Pullman, WA 99164-6434. Small samples of seed of Lifter for research purposes may be obtained from the corresponding author for at least 5 yr. Recipients of seed are asked to make appropriate recognition of the source of Lifter if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock. U.S. Plant Variety Protection will not be sought for Lifter.

K.E. McPhee* and F.J. Muehlbauer

References

Muehlbauer, F.J. 1987. Registration of 'Alaska 81' and 'Umatilla' dry pea. Crop Sci. 27:1089–1090.

USDA-ARS, 303 Johnson Hall, WSU, Pullman, WA 99164-6434. Contribution from USDA-ARS in cooperation with the College of Agriculture and Home Economics, Agric. Res. Center, Washington State Univ., Pullman, WA 99164. Scientific Paper no. 0213-37. Registration by the CSSA. Accepted 31 Jan. 2002. *Corresponding author (kmcphee@mail.wsu.edu).

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Registration of 'Franklin' Green Dry Pea

'Franklin' (Reg. no. CV-19, PI 628275) is a green cotyledon dry pea (*Pisum sativum* L.) developed by the USDA-ARS in cooperation with the Washington Agricultural Research Center, Pullman, WA, the Idaho Agricultural Experiment Station, Moscow, ID, and released in 2001. Franklin was released based on multiple disease resistance and persistent dark green seed color.

Franklin is an F_4 selection (PS510737) from the cross, RNK-2100/PS010838 made in 1993. RNK-2100 is a breeding line obtained from Syngenta, Twin Falls, ID. PS010838 is an advanced breeding line adapted to the Palouse region of eastern Washington and northern Idaho and has a semidwarf plant habit.

Franklin was tested over 13 site years in eastern Washington, northern Idaho, Montana, and North Dakota. It outyielded 'Columbian', 'Alaska 81' (Muehlbauer, 1987), or both in nine site-years. In the Palouse region, yields of Franklin were similar to Columbian in 3 yr of testing.

Franklin has a semidwarf growth habit and has the dominant allele (*Af*) for normal leaf morphology. Vines are 51 cm long with internodes that appear in a zigzag manner. One to two basal branches are produced in most environments. Leaves have two pairs of dark green leaflets with medium wax. The intense green leaf color is darker than other cultivars in production. Normal, nonclasping stipules are present with moderate marbling. Flowers are borne beginning on the 16th node. Flowers are white and borne two per peduncle. Pods are straight, blunt-ended, and dark green with six to seven seeds. Seeds are smooth, round, and dark green with a clear testa and extremely dark green cotyledons. The dark green color is persistent under conditions favorable to bleaching, a trait which is important in maintaining excellent seed color quality. Weight of 100 seeds averages 20.2 g compared with 17.0 g for Columbian. Franklin is resistant to race 1 of Fusarium wilt (caused by *Fusarium oxysporum* Schlecht. emend. Synd. and Hans. f. sp. *pisi*), pea enation mosaic virus, Pea seedborne mosaic virus (PSbMV), and powdery mildew (caused by *Erysiphe polygoni* DC). It also has a high level of tolerance to Fusarium root rot [caused by *Fusarium solani* (Mart.) Sacc. f. sp. *pisi* (Jones) Snyd. and Hans.] These diseases are potentially devastating in the Palouse region and in Montana and North Dakota.

Breeder and Foundation seed of Franklin will be maintained by the Washington State Crop Improvement Association under the supervision of the Department of Crop and Soil Sciences, College of Agriculture and Home Economics, Washington State University; and the USDA-ARS, Pullman, WA 99164-6434. Small samples of seed of Franklin for research purposes may be obtained from the corresponding author for at least 5 yr. Recipients of seed are asked to make appropriate recognition of the source of Franklin if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock. U.S. Plant Variety Protection will not be sought for Franklin.

K.E. McPhee* and F.J. Muehlbauer

References

Muehlbauer, F.J. 1987. Registration of 'Alaska 81' and 'Umatilla' dry pea. Crop Sci. 27:1089–1090.

USDA-ARS, 303 Johnson Hall, WSU, Pullman, WA, 99164-6434. Contribution from USDA-ARS in cooperation with the College of Agriculture and Home Economics, Agricultural Research Center, Washington StateUniv., Pullman, WA 99164. Scientific Paper no. 0213-38. Registration by the CSSA. Accepted 4 Feb. 2002. *Corresponding author (kmcphee@mail.wsu.edu).

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Registration of 'Catchpenny' Barley

'Catchpenny' barley (*Hordeum vulgare* L.) (Reg. no. CV-298, PI 619267) is a six-rowed, feed-type winter barley developed and released in 2001 by the Maryland Agricultural Experiment Station, Department of Natural Resource Sciences and Landscape Architecture. The parentage of Catchpenny is 'Post'/4/'Jotun'/3/'Hudson'//VA 67-42-47/'Rapidan'/5/'Sussex'/'Nomini'. Catchpenny was developed by the bulk method of breeding. The last cross was made in 1988 and the seed was bulked from the F_1 through the F_5 generations. An F_5 head was sown as an F_6 head row in 1995. This F_6 head row was harvested in bulk, designated MD881007-6, subsequently tested in preliminary trials, advanced to statewide trials in the 1997-1998 crop year, and released in 2001.

Catchpenny has a green coleoptile, juvenile plants have a prostrate growth habit, leaves are glabrous, auricles are translucent, collars are closed, and anthocyanin is absent. Its nodes are green, and the flag leaf is short (avg. 5 cm) and erect at the boot stage. The spikes are compact and of medium length (avg. 6 cm) and the lemmas are awnless. Kernels are white, semiwrinkled, covered, and the rachillas have short hairs.

Catchpenny is adapted to the mid-Atlantic region of the USA. In 11 replicated performance tests conducted in Maryland from 1998 to 2000, grain yield of Catchpenny averaged 4731 kg ha^{-1}. This grain yield was similar to that of the widely grown cultivars Nomini (Starling et al., 1994), 'Callao' (Price et al., 1996) and, 'Wysor' (Starling et al., 1987), and significantly higher ($P < 0.05$) than 'Barsoy' (Finkner et al., 1968). Volume weight of Catchpenny was 591 kg m^{-3}, which was similar to that of Nomini, Barsoy, and Wysor, and lower than Callao. Heading date of Catchpenny was similar to that of Nomini and Callao, 4 d earlier than Wysor, and 2 d later than Barsoy ($P < 0.05$). Plant height was approximately 10 cm shorter than Nomini and Wysor, similar to Barsoy, and approximately 10 cm taller than Callao ($P < 0.05$). Its resistance to lodging was better than Callao and approximately equal or slightly better than Nomini, Wysor, and Barsoy ($P < 0.05$). Catchpenny is moderately resistant to powdery mildew (caused by *Erysiphe graminis* DC. f. sp. *hordei* Em. Marchal). Catchpenny is moderately susceptible to leaf rust (caused by *Puccinia hordei* G. Otth) and net blotch (caused by *Pyrenophora teres* Drechs.).

Application for cultivar protection will be made under the U.S. Plant Variety Protection Act. Breeder seed of Catchpenny will be maintained by the Maryland Agricultural Experiment Station at College Park. Small quantities of seed for research purposes are available from the corresponding author.

J.M. Costa,* A. Cooper, A. Grybauskas, R.J. Kratochvil, D.J. Sammons, and E. Shirley

Acknowledgments

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References

Finkner, V.C., C.R. Tutt, and W.R. Coffman. 1968. Registration of Barsoy barley. Crop Sci. 8:397.

Price, A.M., C.A. Griffey, T.M. Starling, W.L. Sisson, and D.E. Bran. 1996. Callao barley. Crop Sci. 36:1077.

Starling, T.M., C.A. Griffey, A.M. Price, C.W. Roane, W.L. Sisson, and D.E. Brann. 1994. Registration of Nomini barley. Crop Sci. 34:300.

Starling, T.M., C.W. Roane, and H.M. Camper Jr. 1987. Registration of Wysor barley. Crop Sci 27:1306.

J.M. Costa, A. Cooper, A. Grybauskas, R.J. Kratochvil, and E. Shirley, Dep. of Natural Resource Sciences and Landscape Architecture, Univ. of Maryland, College Park, MD 20742-4452; D. J. Sammons, Agric. Admin. Bldg., Room 26, Purdue Univ., West Lafayette, IN 47907-1168. Registration by the CSSA. Accepted 31 Jan. 2002. *Corresponding author (jc274@umail.umd.edu).

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Registration of 'Trochu' Barley

'Trochu' is a six-row, spring habit, feed barley (*Hordeum vulgare* L.) (Reg. no. CV-299, PI 614089), released in May 2000 by the Field Crop Development Centre (FCDC) of Alberta Agriculture Food and Rural Development (AAFRD), Lacombe, AB, Canada (Canadian Reg. No. 5136). Trochu was selected from the cross 'Noble'//'DL 69'/'DL 70/3/'Mari-Coho/Nackta'//TR219, completed at Lacombe in 1987. Noble is a six-row feed cultivar developed by FCDC. DL 69 (PI 383854) and DL 70 (PI 383855) are six-rowed, semidwarf cultivars introduced from India to the International Maize and Wheat Improvement Centre (CIMMYT), Mexico. Mari-Cohox-Nackta is a two row, semidwarf, and feeding line introduced from CIMMYT to Lacombe in 1981. TR 219 is a two-row line developed by the Agriculture and Agri-Food Canada Research Centre at Winnipeg, MB.

Seed from the F_1 generation was grown in the greenhouse and bulked to form the F_2 generation that was grown at El Centro, CA, in 1988. Subsequent generations were advanced using a modified bulk breeding method. Head selections were made in the F_6 generation based on desirable plant type to produce F_7 head-row lines that were grown in 1993 at Lacombe. Head selections based on plant type were made for line development. A single F_8 head row that became Trochu was selected at Lacombe and entered in yield trials from 1994 to 1998. Selection was based on grain yield, test weight, protein content, straw strength, threshability, and resistance to foliar diseases.

Trochu is smooth-awned with a green coleoptile and semierect juvenile growth habit. Leaves are green, wide, and medium-long with glabrous green sheaths and blades. The flag leaves are green, wide, medium-long, and upright. The auricle is white with a waxy sheath. Stems are medium long, with an average thickness of 2 to 5 mm. Stems generally have four nodes, a "V" shaped collar, a slightly undulated neck, and an exsertion above the base of the flag leaf blade of 3 to 10 cm. Spikes of Trochu are semidense, short, and semierect. Glume awns are smooth with purplish tips. Lemma awns are long, and smooth with purplish tips. Rachillas are long with long hairs. The shape of the basal marking looks like an incomplete horseshoe. The lateral veins of the lemma have few barbs. Kernels of Trochu are covered, medium wide, and medium long with a yellow aleurone.

Trochu was tested as H87046003 in Alberta yield trials from 1994 to 1998 and as BT 558 in the Western Cooperative Six-Row Barley Test (WCBT) of the Canadian Prairie Registration Recommending Committee for grain from 1996 to 1998. In 43 station-years of the WCBT grown in Manitoba, Saskatchewan, and Alberta, Trochu had an average yield of 7851 kg ha^{-1}, which was 112% of 'Kasota' (Helm et al., 1996), 107% of 'Tukwa' (Helm et al., 1996), and 106% of 'AC Lacombe' (Kibite, 1994). In the same tests in 42 station-years, Trochu had a mean test weight of 61.6 kg hL^{-1} compared with 61.1 kg hL^{-1} for Kasota, 61.3 kg hL^{-1} for Tukwa, and 60.6 kg hL^{-1} for AC Lacombe. The mean 1000 kernel weight of Trochu was 38.1 g compared to 40.6 g for AC Lacombe, 33.6 g for Kasota, and 33.9 g for Tukwa. Trochu had a plant height of 89.0 cm compared to 94.0 cm for AC Lacombe, 81.0 cm for Kasota, and 84.0 cm for Tukwa. Trochu is 1 d later in maturity than AC Lacombe, 4 d later than Kasota, and 2 d later than Tukwa. Trochu was superior in percentage of kernel plumpness (plumpness was measured as the percentage of seed remaining above a 2.4-mm by 19.1-mm slotted sieve). In 26 station-years, Trochu averaged 66% plump compared with 49% for AC Lacombe, 53% for Tukwa, and 36% for Kasota.

In the field, Trochu had an intermediate reaction to barley leaf scald (caused by *Rhynchosporium secalis* (Ouden.) J.J. Davis). In 11 tests where scald reaction was measured on a scale of 0 to 9 (where 0 is least affected), Trochu averaged 3.0 compared with 2.0 for AC Lacombe, 1.0 for Kasota, and 4.0 for Tukwa. Also in the field, Trochu showed intermediate reaction to net blotch (caused by *Pyrenophora teres* Drechs). It is resistant to covered smut [caused by *Ustilago hordei* (Pers.) Lagerh.] and moderate susceptible to loose smut [caused by *U. nuda* (C.N. Jensen) Rostr.].

Breeder seed of Trochu is maintained by the Field Crop Development Center of Alberta Agriculture, Food Rural Development, Lacombe, AB. Distribution Rights were granted to SeCan Association, 201-52 Antares Dr., Ottawa, ON, Canada K2E 7Z1. Application has been made for Plant Breeders' Rights.

J.H. Helm, M.J. Cortez,* P. Juskiw, D.F. Salmon, and W.M. Stewart

Acknowledgments

The technical assistance of Dave Dyson and Michael Oro is gratefully acknowledged.

References

Helm, J.H., M.J. Cortez, D.F. Salmon, P.E. Jedel, and W.M. Stewart. 1996. Tukwa barley. Crop Sci. 36:809.

Helm, J.H., M.J. Cortez, R.I. Wolfe, P.E. Jedel, D.F. Salmon, and W.M. Stewart. 1996. Kasota barley. Crop Sci. 36:1409.

Kibite, S. 1994. Registration of AC Lacombe. Crop Sci. 34:1128.

Alberta Agriculture, Field Crop Development Ctr., 5030-50 St., Lacombe, AB, Canada T4L 1W8. Registration by the CSSA. Accepted 31 Jan. 2002. *Corresponding author (manuel.cortez@gov.ab.ca).

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Registration of 'Walsh' Soybean

'Walsh' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-437, PI 615586) was developed by the North Dakota Agricultural Experiment Station, North Dakota State University (NDSU), Fargo, ND. It was released 19 Jan. 2001. Walsh has high seed yield compared to other cultivars of similar maturity.

Walsh is an F_4-derived line, originally designated ND96-8929, and has the pedigree ND88-800 × 'Council' (Helms and Halvorson, 1996); ND88-800 has the pedigree 'Maple Amber' (Bernard et al., 1995) × 'Evans' (Lambert and Kennedy, 1975). Walsh is a full-sib of Sargent soybean (Helms et al., 2002).

The cross was made in the summer of 1993 at Fargo, ND, and the F_1 plants were grown during the winter of 1993-1994

at Los Andes, Chile, S.A. The F_2 population was grown at Casselton, ND in the summer of 1994 and advanced to the F_3 by the multiple-seed procedure (Fehr, 1991). The F_3 population was advanced by the multiple-seed procedure and grown in the 1994-1995 winter nursery located at Los Andes, Chile. Walsh was derived from a single F_4 plant grown in the 1995 Casselton, ND, nursery and individually threshed in the fall of 1995. In the 1996 Casselton, ND, nursery, the $F_{4:5}$ plant-row was selected. ND96-8929 was first tested in replicated yield trials in 1997.

Walsh was evaluated in the Uniform Regional Test 0, Northern States, in 1999 and 2000 (Wilcox, 2000). Averaged across 2 yr of evaluation in the Uniform Soybean Test 0, Walsh averaged 2% higher in seed yield than 'Traill' (Helms and Nelson, 1998) and 9% less than 'Lambert' (Orf and Kennedy, 1994). Walsh matured on the same date as Traill and 6 d earlier than Lambert, and is a maturity group 0 cultivar. Lodging scores of Walsh are similar to Traill. Plant height of Walsh is the same as Traill and 13 cm less than Lambert. Seeds of Walsh are 3 mg seed^{-1} greater than Traill and 10 mg seed^{-1} greater than Lambert. Protein content of Walsh is 415 g kg^{-1}, and oil content was 203 g kg^{-1} compared to 426 g kg^{-1} protein and 193 g kg^{-1} oil content for Traill.

Walsh has purple flowers, grey pubescence, brown pods at maturity, dull yellow seed coat with yellow hila, indeterminate growth habit, and high seed coat peroxidase activity. Walsh is adapted as a full-season cultivar from 45 to 47° N lat. Walsh was evaluated in the Red River Valley of the North from 1997 to 2000 by North Dakota State University and the University of Minnesota soybean breeding programs for a total of 18 location-years. In these Red River Valley tests, Walsh averaged 8% higher in seed yield than Traill and matured 1 d later. Walsh averaged 1% less in seed yield than Lambert and matured 10 d earlier. Walsh was resistant to races 3, 4 and 25, but susceptible to races 7 and 17 of *Phytophthora sojae* M.J. Kaufmann & J.W. Gerdemann, the cause of Phytophthora root rot. Walsh is tolerant of iron deficiency chlorosis and has field ratings for this trait which are similar to Council.

Breeder seed of Walsh will be maintained by NDSU. A small sample of seed for research purposes can be obtained from the corresponding author for at least 5 yr. U.S. Plant Variety Protection for Walsh is pending (PVP Certificate no. 200100100).

T.C. Helms,* B.D. Nelson, and R.J. Goos

References

Bernard, R.L., S.K. St. Martin, J.R. Wilcox, and P.I. Morgan. 1995. Strain index for the uniform soybean tests: Northern states, 1939 to 1990. USDA Tech. Bull. No. 1846. U.S. Gov. Print Office, Washington, DC.

Fehr, W.R. 1991. Principles of cultivar development. Iowa State University Press, Ames, IA.

Helms, T.C., and M.A. Halvorson. 1996. Registration of 'Council' soybean. Crop Sci. 36:206.

Helms, T.C., and B.D. Nelson. 1998. Registration of 'Traill' soybean. Crop Sci. 38:549.

Helms, T.C., B.D. Nelson and R.J. Goos. 2002. Registration of 'Sargent' soybean. Crop Sci. 42:1380–1381.

Lambert, J.W., and B.W. Kennedy. 1975. Registration of Evans and Hodgson soybeans. Crop Sci. 15:735.

Orf, J.H., and B.W. Kennedy. 1994. Registration of 'Lambert' soybean. Crop Sci. 34:302.

Wilcox, J.R. 2000. The uniform soybean tests, northern states: 2000. USDA-ARS, West Lafayette, IN.

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Registration of 'Sargent' Soybean

'Sargent' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-438, PI 615585) was developed by the North Dakota Agricultural Experiment Station, North Dakota State University (NDSU), Fargo, ND. It was released 19 Jan. 2001. Sargent has high seed yield compared with other cultivars of similar maturity.

Sargent is an F_4-derived line, originally designated ND96-1593, and has the pedigree ND88-800 × 'Council' (Helms and Halvorson, 1996); ND88-800 has the pedigree 'Maple Amber' (Bernard et al, 1995) × 'Evans' (Lambert and Kennedy, 1975). Sargent is a full-sib of 'Walsh' soybean (Helms et al., 2002).

The cross was made in the summer of 1993 at Fargo, ND, and the F_1 plants were grown in the winter 1993-1994 nursery located at Los Andes, Chile, S.A. The F_2 population was grown at Casselton, ND in the summer of 1994 and advanced to the F_3 generation by the multiple-seed method (Fehr, 1991). The F_3 population was advanced by the multiple-seed procedure and grown in the 1994-1995 winter nursery located at Los Andes, Chile. Sargent was derived from a single F_4 plant grown in the 1995 Casselton, ND, nursery and individually threshed in the fall of 1995. In the 1996 Casselton, ND, nursery, the $F_{4:5}$ plant-row were selected. ND96-1593 was first tested in replicated yield trials in 1997.

Sargent was evaluated in the Uniform Regional Test 0, Northern States, in 1999 and 2000 (Wilcox, 2000). Averaged across 2 yr of Uniform Soybean Test 0, Sargent averaged 20% higher in seed yield than 'Traill' (Helms and Nelson, 1998) and 1% higher than 'Lambert' (Orf and Kennedy, 1994). Sargent matures 7 d later than Traill and the same date as Lambert and is a maturity group 0 cultivar.

Lodging scores of Sargent are similar to Lambert. Plant height of Sargent is 11 cm greater than Traill and the same as Lambert. Seeds of Sargent are 16 mg seed^{-1} greater than Traill and 17 mg seed^{-1} greater than Lambert. Protein content of Sargent is 409 g kg^{-1} and oil content was 202 g kg^{-1} compared to 412 g kg^{-1} protein and 210 g kg^{-1} oil content for Lambert.

Sargent has white flowers, grey pubescence, brown pods at maturity, dull yellow seed coat with yellow hila, indeterminate growth habit, and high seed coat peroxidase activity. Sargent is adapted as a full-season cultivar from 45 to 47° N lat. Sargent was evaluated in the Red River Valley of the North from 1997 to 2000 by North Dakota State University and the University of Minnesota soybean breeding programs for a total of 18 location-years. In these Red River Valley tests, Sargent averaged 19% higher in seed yield than Lambert and matured 1 d later. Sargent was resistant to races 3, 4 and 25, but susceptible to races 7 and 17 *Phytophthora sojae* M.J. Kaufmann & J.W. Gerdemann, the cause of Phytophthora root rot. Sargent is tolerant to iron deficiency chlorosis and has field ratings for this trait which are similar to Council.

Breeder seed of Sargent will be maintained by NDSU. A small sample of seed for research purposes can be obtained from the corresponding author for at least 5 yr. U.S. Plant Variety Protection for Sargent is pending (PVP Certificate no. 200100099).

T.C. Helms,* B.D. Nelson, and R.J. Goos

References

Bernard, R.L., S.K. St. Martin, J.R. Wilcox, and P.I. Morgan. 1995. Strain index for the uniform soybean tests: Northern states, 1939 to 1990. USDA Tech. Bull. No. 1846. U.S. Gov. Print Office, Washington, DC.

Fehr, W.R. 1991. Principles of cultivar development. Iowa State Univ. Press, Ames, IA.

Helms, T.C., and M.A. Halvorson. 1996. Registration of 'Council' soybean. Crop Sci. 36:206.

Helms, T.C., and B.D. Nelson. 1998. Registration of 'Traill' soybean. Crop Sci. :38:549.

Helms, T.C., B.D. Nelson, and R.J. Goos. 2002. Registration of 'Walsh-'soybean. Crop Sci. 42:1379–1380 (this issue).

Lambert, J.W., and B.W. Kennedy. 1975. Registration of Evans and Hodgson soybeans. Crop Sci. 15:735.

Orf, J.H., and B.W. Kennedy. 1994. Registration of 'Lambert' soybean. Crop Sci. 34:302.

Wilcox, J.R. 2000. The uniform soybean tests, northern states: 2000. USDA-ARS, West Lafayette, IN.

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REGISTRATIONS OF GERMPLASM

Registration of CO960293-2 Wheat Germplasm Resistant to *Wheat streak mosaic virus* and Russian Wheat Aphid

CO960293-2 (Reg. no. GP-728, PI 615160) winter wheat (*Triticum aestivum* L.) germplasm was developed by the Colorado Agricultural Experiment Station and jointly released by the Colorado and Kansas Agricultural Experiment Stations in January 2001. CO960293-2 was released because of its resistance to both *Wheat streak mosaic virus* (WSMV) and Russian wheat aphid [RWA; *Diuraphis noxia* (Mordvilko)]. CO960293-2 was developed from the cross PI 222668/'TAM 107'// CO850034 completed in 1991. PI 222668 is a RWA-resistant, winter wheat landrace introduction from east Azerbaijan, Iran (Souza et al., 1991). The pedigree of CO850034, an unreleased experimental line from the Colorado State University breeding program, is Novi Sad 14/Novi Sad 603//'Newton'/3/'Probrand 835'. Segregating populations of the cross from which CO960293 was derived were advanced in the field to the F_4 generation without deliberate selection by bulking successive generations. CO960293 was derived as an $F_{4:5}$ line in 1996 and tested in preliminary yield trials in 1997 and advanced yield trials in 1998. CO960293 was entered in the 1999 Regional Germplasm Observation Nursery (RGON) where it was observed to carry a high level of resistance to WSMV in field tests at Hays, KS. Twenty-five randomly chosen heads were selected from CO960293 in 1998 and grown in the field as headrows in 1999. Selection CO960293-2 (an $F_{7:9}$ line) was homogenous and homozygous for RWA resistance in standard greenhouse screening tests and WSMV resistance in field tests in 2000.

Field tests were conducted at Hays, KS, in 2000 to characterize the WSMV resistance in CO960293. Grain yield data from replicated (n = 4 observations) paired plots (e.g., WSMV-inoculated and control) indicated that WSMV resistance in CO960293 (4050 kg ha^{-1} control vs. 4178 kg ha^{-1} inoculated) is similar to that of the resistant check KS96HW10-3 (4057 kg ha^{-1} control vs. 4077 kg ha^{-1} inoculated) and greater than WSMV resistance in the susceptible checks 'Trego' (4252 kg ha^{-1} control vs. 3290 kg ha^{-1} inoculated) and 'Karl 92' (3492 kg ha^{-1} control vs. 2611 kg ha^{-1} inoculated). Greenhouse RWA resistance evaluations, based on a 1 = very resistant to 5 = very susceptible rating scale, showed that RWA resistance in CO960293-2 (rating = 2) is similar to the resistant check 'Halt' (rating = 2) and greater than the susceptible checks 'Carson' (rating = 5) and 'TAM 107' (rating = 4). Inheritance of RWA resistance in CO960293-2 is not yet known, although RWA resistance in its donor parent PI 222668 was previously determined to be conditioned by either a single dominant or a single dominant and a single recessive gene (Dong et al., 1997).

CO960293-2 is an awned, white-glumed, medium-late maturity, semidwarf winter wheat. Heading date of CO960293-2 is approximately 5 d later than TAM 107 while its plant height is equivalent to TAM 107. While replicated field performance data for CO960293-2 are not available, CO960293 was evaluated in the 1999 Colorado Lower Moisture Variety Trial (LMVT). Data from five replicated dryland locations (n = 15 observations) indicated that CO960293 is yield competitive with commercially available cultivars (TAM 107, 3843 kg ha^{-1}; 'Akron', 3957 kg ha^{-1}; CO960293, 3984 kg ha^{-1}) but has lower grain volume weight (TAM 107, 730 kg m^{-3}; Akron, 735 kg m^{-3}; CO960293, 686 kg m^{-3}).

Greenhouse and growth chamber experiments with the parents of CO960293-2 have failed to identify the original source of the WSMV resistance. Observations of symptom development following mechanical WSMV inoculation in growth chamber experiments indicate that the WSMV resistance in CO960293-2 is temperature-sensitive, similar to the *Wsm1* gene found in CItr 17884, a wheat/*Agropyron intermedium* (Host) P. Beauv. translocation line (Seifers et al., 1995). Chromosome C-banding experiments failed to identify alien chromatin in CO960293 and preliminary data from allelism tests with CO960293 and CItr 17884 indicate independent segregation of the two sources of WSMV resistance.

Small quantities of seed (3 g) for research purposes may be obtained from the corresponding author for at least 5 yr from the date of this publication. Appropriate recognition of the source should be given if this germplasm contributes to the development of improved cultivars or germplasm.

S.D. Haley,* T.J. Martin, J.S. Quick, D.L. Seifers, J.A. Stromberger, S.R. Clayshulte, B.L. Clifford, F.B. Peairs, J.B. Rudolph, J.J. Johnson, B.S. Gill, and B. Friebe

References

Dong, H., J.S. Quick, and Y. Zhang. 1997. Inheritance and allelism of Russian wheat aphid resistance in several wheat lines. Plant Breed. 116:449–453.

Seifers, D.L., T.J. Martin, T.L. Harvey, and B.S. Gill. 1995. Temperature sensitivity and efficacy of wheat streak mosaic virus resistance derived from *Agropyron intermedium*. Plant Dis. 79:1104–1106.

Souza, E., C.M. Smith, D. Schotzko, and R.S. Zemetra. 1991. Greenhouse evaluation of red winter wheats for resistance to the Russian wheat aphid. Euphytica 57:221–225.

S.D. Haley, J.S. Quick, J.A. Stromberger, S.R. Clayshulte, B.L. Clifford, and J.J. Johnson, Soil and Crop Sciences Dep., Colorado State

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Registration of NC99BGTAG11 Wheat Germplasm Resistant to Powdery Mildew

Soft red winter wheat (*Triticum aestivum* L. subsp. *aestivum*) germplasm line NC99BGTAG11 (Reg. no. GP-729, PI 615588) was developed and released by the North Carolina Agricultural Research Service and the USDA-ARS in August 2000. The germplasm was released because of its potential to broaden the genetic base of resistance to powdery mildew [caused by *Blumeria graminis* (DC.) E.O. Spear f. sp. *tritici* Em. Marchal] with resistance transferred from the AAGG genome *T. timopheevii* (Zhuk.) Zhuk. subsp. *armeniacum* (Jakubz.) van Slageren. NC99BGTAG11 consistently displayed resistance to all genotypes of the fungus in field evaluations in North Carolina from 1996 to 2000.

NC99BGTAG11 is an F_7-derived line with the pedigree 'Saluda'*3/PI 427315. Saluda (PI 480474) is a soft red winter wheat developed and released by Virginia Polytechnic Institute and State University. PI 427315 is a winter growth habit accession collected 1 km northeast of Salahadin, Iraq (36°24′ N lat., 44°12′ E long., elevation 1100 m). It was deposited in the U.S. National Plant Germplasm System in August 1978 by Dr. B.L. Johnson, University of California, Riverside, who undertook collecting trips in 1972 and 1973 with the financial assistance of the National Geographic Society.

Pentaploid F_1 hybrid (genomes AABGD), BC_1F_1, and BC_2F_1 generations were produced in the 1988-1990 greenhouse crossing seasons at North Carolina State University. Field selection using the pedigree breeding method was initiated with BC_2F_2 seed in the 1991-1992 season. Selection during the 1991-1992 and subsequent seasons was primarily for mildew resistance at Feekes growth stages 8 to 10.5, but whenever possible additional selection for heading date, plant height, and straw strength was conducted with the Saluda phenotype as the benchmark. Natural powdery mildew epidemics occurred annually. NC99BGTAG11 traces to a single $BC_2F_{7:8}$ headrow harvested in 1998.

Laboratory evaluations for powdery mildew resistance by means of a detached leaf technique were conducted prior to release with 2-cm pieces of primary leaves floated on 0.5% (w/v) water agar amended with 50 mg L^{-1} benzimidazole (Leath and Heun, 1990). NC99BGTAG11 was inoculated with 31 isolates of the powdery mildew fungus with distinct differences in virulence and aggressiveness. The germplasm exhibited a very high level of resistance to all 31 isolates. The combined virulence formula for all isolates is summarized as follows (effective/ineffective genes): *Pm12*, *Pm21*, *Pm25/Pm1*, *2*, *3a*, *3b*, *3c*, *3f* (formerly Michigan Amber), *4a*, *4b*, *5*, *6*, *7*, *8*, *9*, *16*, *17*, *19*, *20*. The sources of *Pm12* and *Pm21* were *Aegilops speltoides* Tausch and *Dasypyrum villosum* (L.) P. Candargy, respectively, and thus likely to be different from the resistance transferred from the A or G genomes of *T. timopheevii* subsp. *armeniacum*. The source of *Pm25* was the A genome *T. monococcum* L. subsp. *aegilopoides* (Shi et al., 1998). Of the major genes not considered in the combined virulence formula, *Pm23* is located on the A genome, *Pm26* is located on the B genome,and *Pm22* and 24 on the D genome (McIntosh et al., 1998). *Pm27* was transferred from the cultivated *T. timopheevii* (Zhuk.) Zhuk. subsp. *timopheevii* and is located on a 6B-6G translocation (Jarve et al., 2000). We have not conducted tests to differentiate the resistance factor(s) in NC99BGTAG11 from *Pm23*, *Pm25*, or *Pm27*.

NC99BGTAG11 has similar winter survival, vernalization requirement, and heading date to the recurrent soft red winter wheat parent Saluda in North Carolina. Grain samples produced in North Carolina during 2000 were analyzed at the USDA-ARS Soft Wheat Quality Laboratory, Wooster, OH. NC99BGTAG11 had a significantly lower flour yield (71.9 versus 74.1 g kg^{-1}) than the recurrent parent Saluda, but it had significantly higher alkaline water retention capacity (58.3 versus 55.2%) and softness equivalent (65.12 versus 60.57%). The grain protein in both lines was not significantly different.

Small quantities of seed (2 g) of the germplasm line are available upon written request from the corresponding author. Appropriate recognition of source should be given if this germplasm contributes to research or development of new cultivars.

J.P. Murphy,* R.A. Navarro, and S. Leath

References

Jarve, K., H.O. Peusha, J. Tsymbalova, S. Tamm, K.M. Devos, and T.M. Enno. 2000. Chromosomal location of a *Triticum timopheevii* derived powdery mildew resistance transferred to common wheat. Genome 43:377–381.

Leath, S., and M. Heun. 1990. Identification of powdery mildew resistance genes in cultivars of soft red winter wheat. Plant Dis. 74: 747–752.

McIntosh, R.A., G.E. Hart, K.M. Devos, M.D. Gale, and W.J. Rogers. 1998. Catalogue of gene symbols for wheat. *In* Proc. 9th International Wheat Genetics Symposium, vol. 5, Saskatoon, Saskatchewan, Canada. 2–7 Aug. 1998. Univ. Extension Press, Saskatoon, SK, Canada.

Shi, A.N., S. Leath, and J.P. Murphy. 1998. A major gene for powdery mildew resistance transferred to common wheat from wild einkorn wheat. Phytopathology 88:144–147.

J.P. Murphy, and R.A. Navarro, Dep. of Crop Science; and S. Leath, USDA-ARS, Dep. Plant Pathology, North Carolina State Univ., Raleigh, NC 27695-7629. Research supported in part by the North Carolina Small Grains Growers Association, Inc. Registration by CSSA. Accepted 31 Dec. 2001. *Corresponding author (njpm@unity.ncsu.edu).

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Registration of Arkot 8606, an Early-Maturing Cotton Germplasm Line

Arkot 8606 (Reg. no. GP-740, PI 628634), a very early maturing cotton (*Gossypium hirsutum* L.) breeding line was released in 2001 by the Arkansas Agricultural Experiment Station. Arkot 8606 (tested as 8606-50) was derived from a cross of 'DES 119' (Bridge, 1986) and Miscot 7813 (Bourland, 1987), and was developed from an F_3 individual plant selection made in 1988 by means of the procedures of Bird (1982), modified to permit selection for lateral root development. Arkot 8606 was evaluated in replicated field tests at four Arkansas Agricultural Experiment Station sites in the Mississippi River Delta from 1991 through 1996, and again in 2000.

In 21 field tests from 1991 through 1996, lint yields, lint fractions, and fiber properties of Arkot 8606 were very similar to DES 119. In 12 tests where maturity was rated prior to defoliation, Arkot 8606 averaged 67% open bolls compared with 55% for DES 119. Compared with 'Stoneville 474' in four tests conducted in 2000, Arkot 8606 yielded 15% less, had a lower lint fraction (36.1 vs 40.2%), and was 19% shorter in plant height. Fiber properties of Arkot 8606 were similar to those of Stoneville 474. Over all tests, Arkot 8606 yielded

relatively better at northern Arkansas locations than at Rohwer (southeast Arkansas). Arkot 8606 is characterized as "hairy leaf", but its leaves are less pubescent than DES 119 or Stoneville 474.

During selection, Arkot 8606 was screened for resistance to races 1, 2, 7, and 18 of *Xanthomonas campestris* pv. *malvacearum* (Smith) Dye, the causal agent of bacterial blight. Resistance to these races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, Arkot 8606 has not exhibited symptoms of bacterial blight even after field inoculations with the pathogen. In the 1994 Regional Cotton Fusarium Wilt Test at Tallassee, AL, resistance of Arkot 8606 to Fusarium wilt [caused by *Fusarium oxysporum* Schlect. f. sp. *vasinfectum* (Atk.) Snyd. & Hans.] was equal to the resistant check. In the presence of intense thrips, *Frankliniella* spp., pressure in 2000, Arkot 8606 yielded more and had less relative injury than Stoneville 474.

The fiber properties and specific adaptation of Arkot 8606 are unusual in such an early maturing genotype. This combination of traits makes the line valuable as a breeding line. Small quantities of Arkot 8606 seed may be obtained for breeding purposes from the corresponding author.

Development of Arkot 8606 was supported in part by funding from Cotton Incorporated.

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References

Bird, L.S. 1982. The MAR (Multi-Adversity Resistance) system for genetic improvement of cotton. Plant Dis. 66:172–176.

Bourland, F.M. 1987. Registration of Miscot 7813 and Miscot 7841 germplasm lines of cotton. Crop Sci. 27:367.

Bridge, R.R. 1986. Registration of 'DES 119' cotton. Crop Sci. 26:646–647.

Northeast Research and Extension Center, P.O. Box 48, Keiser, AR 72351. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (bourland@.uark.edu).

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Registration of Arkot 8710 and Arkot 8717 Cotton Germplasm Lines

Two cotton (*Gossypium hirsutum* L.) germplasm lines, designated Arkot 8710 (Reg. no. GP-741, PI 628635) and Arkot 8717 (Reg. no. GP-742, PI 628636), were developed by the Arkansas Agricultural Experiment Station and released in 2001. Arkot 8710 and Arkot 8717 possess agronomic, fiber quality, and host-plant resistance traits that make them valuable as breeding lines.

Both lines were developed from double crosses completed in 1987. Arkot 8710 originated from crossing the F_1 of 'Deltapine 50'/Miscot T8-27 (Bourland and Bridge, 1988) by the F_1 of DES 237-7 (Bridge, 1987)/Miscot 7824 (Bourland and White, 1992). Arkot 8717 originated from crossing the F_1 of 'DES 119' (Bridge, 1986)/Miscot 7803-52 (Bourland and White, 1989) by the F_1 of Miscot T8-27 (Bourland and Bridge, 1988)/8007-6, a sister line of Miscot 8006 (Bourland et al., 1993).

Arkot 8710 (tested as 8710-45-17) was derived from an F_3 individual plant selection (8710-45) made in 1990, with a second cycle of selection made from the F_8 generation in 1995. The second cycle selection was evaluated as a progeny row in 1996 and as a line in replicated tests from 1997 through 2000. Arkot 8717 (tested as 8717-17-12) was derived from an F_3 individual plant selection (8717-17) made in 1990, with a second cycle of selection made from the F_6 generation in 1993. The second cycle selection was evaluated as a progeny row in 1994 and as a line in replicated tests from 1995 through 2000. Procedures of Bird (1982), modified to permit selection for lateral root development, were used in the first cycle of selection for both lines. Second cycle selections were based on visual performance of individual plants and corresponding progeny rows.

In 10 tests from 1997 to 2000 at four Arkansas Agricultural Experiment Station sites in the Mississippi River Delta, lint yields and maturity of Arkot 8710 were equal to 'Stoneville 474'. Arkot 8710 had shorter plant height (94 vs. 111 cm), lower lint percentage (39.0 vs. 41.8%), finer micronaire reading (4.85 vs. 5.08 units), and weaker fiber strength (264 vs. 277 kN m kg^{-1}) than Stoneville 474. Leaf pubescence of Arkot 8710 is classed as "lightly hairy," being less dense and shorter than Stoneville 474.

Arkot 8717 was compared with either DES 119 or Stoneville 474 at four Arkansas Agricultural Experiment Station sites in the Mississippi River Delta from 1995 to 2000. Average lint yields of Arkot 8717 were 11% more than DES 119 in eight tests conducted in 1996 and 1997, but were 7% less than Stoneville 474 in nine tests conducted in 1995, 1999, and 2000. Compared with Stoneville 474, Arkot 8717 had lower lint fraction (38.0% vs. 41.2%), similar micronaire reading, but fibers were 5% longer and 9% stronger. Arkot 8717 is morphologically indistinguishable from Arkot 8710.

During selection, Arkot 8710 and Arkot 8717 were screened for resistance to races 1, 2, 7, and 18 of *Xanthomonas campestris* pv. *malvacearum* (Smith) Dye, the causal agent of bacterial blight. Resistance to these races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, neither line has exhibited symptoms of bacterial blight even after field inoculations with the pathogen. In the presence of intense thrips, *Frankliniella* spp., pressure in 2000, both lines yielded significantly more fiber and had less relative plant injury than Stoneville 474. With less thrips pressure, differences were not significant in 1999. Both lines had significantly lower incidence of Verticillium wilt (caused by *Verticillium dahliae* Klebahn) than Stoneville 474 at Clarkedale in 1999.

The specific adaptation, fiber properties, and host plant resistance traits of Arkot 8710 and Arkot 8717 should make them valuable as breeding lines. Small quantities of Arkot 8710 and Arkot 8717 seed may be obtained for breeding purposes from the corresponding author.

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F.M. Bourland* and N.R. Benson

References

Bird, L.S. 1982. The MAR (multi-adversity resistance) system for genetic improvement of cotton. Plant Dis. 66:172–176.

Bourland, F.M., and R.R. Bridge. 1988. Registration of Miscot T8-27 cotton germplasm. Crop Sci. 28:1035.

Bourland, F.M., C.E. Ortiz, and B.W. White. 1993. Registration of Miscot 8001, Miscot 8004, and Miscot 8006 germplasm lines of cotton. Crop Sci. 33:1106.

Bourland, F.M., and B.W. White. 1989. Registration of Miscot 7803-51 and Miscot 7803-52 germplasm lines of cotton. Crop Sci. 29: 242–243.

Bourland, F.M., and B.W. White. 1992. Registration of Miscot 7801 and Miscot 7824 germplasm lines of cotton. Crop Sci. 32:834.

Bridge, R.R. 1986. Registration of 'DES 119' cotton. Crop Sci. 26:646–647.

Bridge, R.R. 1987. Registration of DES 237-7 cotton germplasm. Crop Sci. 27:1316.

Northeast Research and Extension Center, P.O. Box 48, Keiser, AR 72351. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (bourland@uark.edu).

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Registration of Arkot 8727, a High Glanding Cotton Germplasm Line

In 2001, the Arkansas Agricultural Experiment Station released a noncommercial cotton (*Gossypium hirsutum* L.) breeding line designated as Arkot 8727 (Reg. no. GP-743, PI 628637). Arkot 8727 was derived from crossing La. HG-063 (Jones et al., 1988) with the F_1 of 'DES 119' (Bridge, 1986) and Miscot 7803-52 (Bourland and White, 1989). The cultivar H1330 was subsequently derived from the second parent (Bourland, 1996). Arkot 8727 possesses the high glanding (HG) characteristic, which is identified by the presence of gossypol glands on the calyx lobes. Calhoun (1997) indicated that a special GL_3 allele was responsible for this HG phenotype. Gossypol glands on the calyx lobes are a strong deterrent and antibiotic factor against tobacco budworm (*Heliothis virescens* F.) (Parrott et al., 1989; Hedin et al., 1992).

Arkot 8727 (tested as 8727-21-10-02) was derived from an F_3 individual plant selection made in 1989 using procedures of Bird (1982) modified to permit selection for lateral root development. Subsequently, additional individual plant selections based upon visual appearance were made in the F_5 and the F_8 generations. The resulting line was evaluated in 14 replicated field tests at four Arkansas Agricultural Experiment Station sites in the Mississippi River Delta from 1996 through 2000. Lint yields and maturity of Arkot 8727 were similar to 'Stoneville 474' at all four locations, indicating that the line possesses high yielding ability and a wide adaptive range. Fiber properties of Arkot 8727 were superior (6% longer, 7% stronger, and 6% lower in micronaire reading) to fiber properties of Stoneville 474. Average lint fraction of Arkot 8727 (38.8%) was lower than that of Stoneville 474 (41.4%). Leaves of Arkot 8727 are slightly less pubescent than those of Stoneville 474.

During selection, Arkot 8727 was screened for resistance to races 1, 2, 7, and 18 of *Xanthomonas campestris* pv. *malvacearum* (Smith) Dye, the causal agent of bacterial blight. Resistance to these races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, Arkot 8727 has not exhibited symptoms of bacterial blight, even after field inoculations with the pathogen. In the presence of intense thrips (*Frankliniella* spp.) pressure in 2000, Arkot 8727 yielded significantly more fiber and had less relative plant injury than Stoneville 474. Incidence of Verticillium wilt (caused by *Verticillium dahliae* klebahn) on Arkot 8727 was significantly less than Stoneville 474 but more than 'Sure-Grow 125' at Clarkedale in 1999.

The combination of superior fiber properties, specific adaptation, and the high glanding trait of Arkot 8727 makes the line valuable in a cotton breeding program. Small quantities of Arkot 8727 seed may be obtained for breeding purposes from the corresponding author.

Development of Arkot 8727 was supported in part by funding from Cotton Incorporated.

F.M. Bourland* and N.R. Benson

References

Bird, L.S. 1982. The MAR (Multi-Adversity Resistance) system for genetic improvement of cotton. Plant Dis. 66:172–176.

Bourland, F.M. 1996. Registration of 'H1330' cotton. Crop Sci. 36:813.

Bourland, F.M., and B.W. White. 1989. Registration of Miscot 7803-51 and Miscot 7803-52 germplasm lines of cotton. Crop Sci. 29: 242–243.

Bridge, R.R. 1986. Registration of 'DES 119' cotton. Crop Sci. 26: 646–647.

Calhoun, D.S. 1997. Inheritance of high glanding, an insect resistant trait in cotton. Crop Sci. 37:1181–1186.

Hedin, P.A., W.L. Parrott, and J.N. Jenkins. 1992. Relationship of glands, cotton square terpenoid aldehydes, and other allelochemicals to larval growth of *Heliothis virescens* (Lepidoptera: Noctuidae). J. Econ. Entomol. 85:359–364.

Jones, J.E., J.I. Dickson, E. Burris, D.F. Clower, W.D. Caldwell, J.G. Marshall, and S.J. Stringer. 1988. Registration of three insect resistant cotton germplasm lines. Crop Sci. 28:200.

Parrott, W.L., J.N. Jenkins, J.E. Mulrooney, J.C. McCarty, and R.L. Shepherd. 1989. Relationship between gossypol gland density on cotton squares and resistance to tobacco budworm larvae. J. Econ. Entomol. 82:589–592.

Northeast Research and Extension Center, P.O. Box 48, Keiser, AR 72351. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (bourland@.uark.edu).

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Registration of Arkot 8918 and Arkot 9103 Cotton Germplasm Lines

Two cotton (*Gossypium hirsutum* L.) germplasm lines, designated Arkot 8918 (Reg. no. GP-744, PI 628638) and Arkot 9103 (Reg. no. GP-745, PI 628639), were developed by the Arkansas Agricultural Experiment Station and released in 2001. The lines possess agronomic, fiber quality, and host-plant resistance traits that make them valuable as breeding lines.

Both lines were derived from crosses with one common parent, 'H1330' (Bourland, 1996). The second parent of Arkot 8918 was Mo F86-28, an advanced strain derived from the cross of 'Delcot 311' (Sappenfield, 1980) by Auburn 623 RNR (Shepherd, 1974), then backcrossed to Delcot 311. The second parent of Arkot 9103 was 8517-18, an advanced strain from the cross of DES 237-7 (Bridge, 1987) and Miscot 7824 (Bourland and White, 1992).

Arkot 8918 (tested as 8918-01-08) was derived from an F_3 individual plant selection (8918-01) made in 1991, with a second cycle of selection made from the F_7 generation in 1995. The second cycle selection was evaluated as a progeny row in 1996 and as a line in replicated tests from 1997 through 2000. Arkot 9103 (tested as 9103-38-01) was derived from an F_3 individual plant selection (9103-38) made in 1993, with a second cycle of selection made from the F_6 generation in 1996. The second cycle selection was evaluated as a progeny row in 1997 and as a line in replicated tests from 1998 through 2000. Procedures of Bird (1982), modified to permit selection for lateral root development, were used in the first cycle of selection for both lines. Second cycle selections were based on visual performance of individual plants and their corresponding progeny rows.

Agronomic traits of the lines were evaluated in 10 tests conducted from 1997-2000 at four Arkansas Agricultural Experiment Station sites in the Mississippi River Delta. Lint yields of Arkot 8918 and Arkot 9103 were, respectively, 9% less than and equal to 'Stoneville 474'. Yields of both lines were relatively higher at north Arkansas locations (Keiser and Clarkedale) than at central (Marianna) and south (Rohwer) locations. However, maturity of the lines was similar to Stoneville 474. Fiber properties of both lines were superior (3% longer with 1.2% higher uniformity index, 10% stronger) than those of Stoneville 474. Micronaire readings of Arkot 8918 and Arkot 9103 were 8% lower than and equal to Stoneville 474, respectively. Lint fractions of the two lines averaged 36.9%, compared with 40.9% for Stoneville 474. The lines are morphologically similar, but somewhat shorter than Stoneville 474. Leaves of Arkot 9103 are less pubescent than those of Stoneville 474.

During selection, Arkot 8918 and Arkot 9103 were screened for resistance to races 1, 2, 7, and 18 of *Xanthomonas camp-*

estris pv. *malvacearum* (Smith) Dye, the causal agent of bacterial blight. Resistance to these races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, Arkot 8918 and Arkot 9103 have not exhibited symptoms of bacterial blight in testing even after field inoculations with the pathogen. In the presence of intense thrips (*Frankliniella* spp.) pressure in 2000, both lines yielded significantly more fiber and had less relative plant injury than Stoneville 474. With less thrips pressure, differences were not significant in 1999.

The superior fiber properties and specific adaptation of Arkot 8918 and Arkot 9103 should make them valuable as breeding lines. Small quantities of Arkot 8918 and Arkot 9103 seed may be obtained for breeding purposes from the corresponding author.

Development of these lines was supported in part by funding from Cotton Incorporated.

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References

Bird, L.S. 1982. The MAR (Multi-Adversity Resistance) system for genetic improvement of cotton. Plant Dis. 66:172–176.
Bourland, F.M. 1996. Registration of 'H1330' cotton. Crop Sci. 36:813.
Bourland, F.M., and B.W. White. 1992. Registration of Miscot 7801 and Miscot 7824 germplasm lines of cotton. Crop Sci. 32:834.
Bridge, R.R. 1987. Registration of DES 237-7 cotton germplasm. Crop Sci. 27:1316.
Sappenfield, W.P. 1980. Registration of Delcot 311 cotton. Crop Sci. 20:669.
Shepherd, R.L. 1974. Registration of Auburn 623 RNR cotton germplasm. Crop Sci. 14:911.

Northeast Research and Extension Center, P.O. Box 48, Keiser, AR 72351. Registration by CSSA. Accepted 31 Jan. 2002. *Corresponding author (bourland@uark.edu).

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Registration of GC-86L-98 Cowpea Germplasm Resistant to *Cucumber mosaic virus* and Blackeye cowpea mosaic virus

Cowpea [*Vigna unguiculata* (L.) Walp.] germplasm line GC-86L-98 (Reg. no. GP-225, PI 612607) was developed by the USDA, ARS, Plant Genetic Resources Conservation Unit, Griffin, GA, and released in August 2001. This line has value as a parent because of its resistance to *Cucumber mosaic virus* (CMV) and its high resistance to Blackeye cowpea mosaic virus (BlCMV). Infection of cowpea by these two viruses causes cowpea stunt, the most serious disease of cowpea in the USA. Resistance to CMV had not previously been reported (Gillaspie, 2001).

GC-86L-98 was selected from PI 441918 which was first observed to be a possible resistant line in a germplasm regeneration plot in a 1998 field planting. PI 441918 is a large-seeded cowpea originating in Brazil and having a 105-d maturity. PI 441918 is a mix of tan and white seeds of the same size and shape. The seeds in the seed lot of PI 441918 grown in 1998 were separated by color and tested in the greenhouse. Mechanically-inoculated plants from PI 441918 with white seeds had lower amounts of CMV as judged by enzyme-linked immunosorbent assay (ELISA) than did plants of a susceptible control 'Coronet' or PI 441918 with tan seeds. In field tests in 1999 and 2000 in which plants of Coronet were inoculated with CMV and BlCMV and used as spreader rows, plants arising from white-seeded PI 441918 had a significantly lower number of plants infected with CMV than did Coronet. Tan-seeded PI 441918 plants also had lower numbers of plants infected with CMV than did Coronet. Neither of the PI 441918 selections were infected with BlCMV in these tests (Gillaspie, 2001).

GC-86L-98 (PI 441918-white seed) is a high seed producer and the line produces only white seeds. GC-86L-98 produces a round, solid color, smooth seed with a 100-seed weight of 24.8 g. The pods are 24 cm long and borne above the foliage. Plants are semiprostrate with a height of 15 cm.

A sample of 50 seeds of GC-86L-98 will be available for breeding and research purposes by writing to the corresponding author.

A.G. Gillaspie, Jr.*

References

Gillaspie, A.G., Jr. 2001. Resistance to *Cucumber mosaic virus* in cowpea and implications for control of cowpea stunt disease. Plant Dis. 85:1004–1005.

USDA, ARS, Plant Genetic Resources Conservation Unit, 1109 Experiment St., Griffin, GA 30223. Registration by CSSA. Accepted 31 Jan 2002. *Corresponding author (s9gg@ars-grin.gov).

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Registration of AR91017 Winter Rapeseed Germplasm

AR91017 (Reg. no. GP-8, PI 619618) winter rapeseed [*Brassica napus* L. subsp. *oleifera* (Metzg.) Sinsk. f. *biennis*] was developed as a canola-quality germplasm line by the Arkansas Agricultural Experiment Station and released in 2001. This line was released for its yield potential and broad adaptation in the southeastern and midwestern USA.

AR91017 was derived from a single plant selection in the F_5 generation from the cross 'CX W03'/'Falcon'. The cross was made by personnel of Jacob Hartz Seed Co. (a unit of Monsanto Company, St. Louis, MO) and was among the segregating families donated to the University of Arkansas. The single plant selection was advanced, open-pollinated in the vicinity of sister lines for a year at Kibler, AR, in a non-replicated yield trial. The F_6 line was tested in replicated yield trials from 1996 to 2000 as AR91017-44E-5. AR91017 outyielded AR91004 (Bacon and Kelly, 2000), 2566 vs. 2223 kg ha^{-1}, respectively, in Arkansas breeding trials representing 8 location years from 1996 to 2000.

AR91017 was also tested in the 1999 and 2000 National Winter Canola Variety Trials coordinated by Kansas State University (Table 1). The 1999 trial reported data from 18 locations (Rife, 2000); the 2000 trial reported data from 24 locations (Rife, 2001). The yield data in Table 1 represents the combined yield of locations within a region for both years. 'Jetton' and 'Ceres' have consistently been among the highest yielding winter canola genotypes and 'Wichita' (Rife et al., 2001) and 'Plainsman' (Rife et al., 2000) are recently released cultivars with similar adaptation. AR91017 produced grain yield similar to those cultivars (Table 1).

Agronomic data from the National Winter Canola Variety Trials indicate that AR91017 is similar in maturity, approximately 3 cm taller, has a lower test weight (564 vs. 584 kg m^{-3}), slightly higher oil content (399 g kg^{-1} vs. 383 g kg^{-1}), and slightly higher winter survival (90.4 vs. 85.1%) relative to Wichita (Rife et al., 2001). The seeds are black and weigh 3.8 g per 1000. The most threatening disease of canola in the Southeast U.S. is probably blackleg [caused by *Leptosphaeria maculans* (Desmaz.)]. This disease has caused severe losses in production in Georgia and the Southeast as well as in other canola producing regions such as Australia. AR91017 has good blackleg resistance with a rating in the 2000 National Winter Canola Variety Trials of 10% which is similar (LSD0.10 = 10%) to Wichita (12%) and Jetton (17%).

Analyses performed by the Central Analytical Laboratory at the Poultry Science Center, University of Arkansas indi-

Table 1. Seed yields in the National Winter Canola Variety Trial in 1999 and 2000.

	South†	Midwest‡	Great Plains§	Grand mean¶
	kg ha^{-1}			
Jetton	2209	2132	1565	1969
Wichita	2070	2235	1308	1871
AR91017	1987	2032	1430	1816
AR91004	1881	1886	1303	1690
Ceres	1861	1765	1869	1665
Plainsman	1568	1610	1189	1456

† 1999 locations = Fayetteville, AR; Griffin, GA; Calhoun, GA; Holly Springs, MS; Prairie, MS.
2000 locations = Kibler, AR; Fayetteville, AR; Holly Springs, MS; Prairie, MS; Griffin, GA; Calhoun, GA; Normal, AL.

‡ 1999 locations = Belleville, IL; Columbia City, IN; East Lansing, MI; Columbia, MO; Novelty, MO; Portageville, MO; Orange, VA; Petersburg, VA; Suffolk, VA.
2000 locations = Belleville, IL; Columbia City, IN; Columbia, MO; Novelty, MO; Orange, VA; Petersburg, VA; Suffolk, VA.

§ 1999 locations = Colby, KS; Hutchinson, KS; Bushland, TX; Munday, TX.
2000 locations = Colby, KS; Garden City, KS; Hutchinson, KS; Manhattan, KS; Parsons, KS; Lincoln, NE; Sidney, NE; Lubbock, TX; Munday, TX; Moses Lake, WA.

¶ Grand mean = average of three regional means.

cated that seed of AR91017 had an oil quality of less than 10 g kg^{-1} erucic acid allowing it to be classified as canola. The fatty acid profile of AR91017 was similar to seed of Ceres. Tests in our laboratory show that the meal of AR91017 has a low glucosinolate content (Tes-tape score of ≤0.5 units, on a scale of 0–5) (Smith and Donald, 1988).

This germplasm should be useful for breeding winter canola-quality rapeseed cultivars adapted to the central and southern USA. Breeder seed of AR91017 will be maintained and distributed by the Arkansas Agricultural Experiment Station. Small quantities of seed will be available upon written request to the corresponding author. Programs receiving seed will be asked to make appropriate recognition of the source of the germplasm if used in development of parental lines, cultivars, or hybrids.

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References

Bacon, R.K., and J.T. Kelly. 2000. Registration of AR91004 winter rapeseed germplasm. Crop Sci. 40:1206–1207.

Rife, C. 2000. 1999 National Winter Canola Variety Trial. Department Report. Kansas St. Univ. Agric. Exp. Stn. and Coop. Ext. Ser. p. 58.

Rife, C. 2001. 2000 National Winter Canola Variety Trial. Department Report. Kansas St. Univ. Agric. Exp. Stn. and Coop. Ext. Ser. p. 58.

Rife, C.L., D.L. Auld, W.D. Stegmeier, H.D. Sunderman, W.F. Heer, D.D. Baltensperger, L.A. Nelson, D.L. Johnson, D. Bordovsky, and H.C. Minor. 2000. Registration of 'Plainsman' Rapeseed. Crop Sci. 40:292–293.

Rife, C.L., D.L. Auld, H.D. Sunderman, W.F. Heer, D.D. Baltensperger, L.A. Nelson, D.L. Johnson, D. Bordovsky, and H.C. Minor. 2001. Registration of 'Wichita' Rapeseed. Crop Sci. 41:263–264.

Smith, D.B., and C.N. Donald. 1988. The measurement of glucosinolates in oilseed rape by glucose reaction. Plant Varieties Seed 1:121–130.

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REGISTRATIONS OF GENETIC STOCKS

Registration of Alfalfa Genetic Stocks Segregating for Mutable Alleles of the Anthocyanin Locus C2

Alfalfa (*Medicago sativa* L.) genetic stocks segregating for WI Mutable 2 (Reg. no. GS-1, PI 619433) and WI Mutable 3 (Reg. no. GS-2, PI 619434) were released by the Wisconsin Agricultural Experiment Station on 26 June 2001. The mutable alleles behave like transposable elements and are useful for basic genetic studies. They express reversion during development from the recessive white flower condition to the dominant purple state. This reversion produces streaks and sectors of purple anthocyanin pigment in flower petals and seeds that are otherwise white. Reversion early in development results in large sectors whereas later reversion results in small sectors. Timing and frequency of reversion are under genetic control at the locus. The genetic designations of the stocks are c2-m2 and c2-m3, respectively (Bingham and Clement, 1989). Gene c2-m2 has been studied extensively (Bingham and Clement, 1989; Talbert and Bingham, 1989) and c2-m3 is known to behave like c2-m2 (Bingham and Clement, 1989). Both genes are allelic to c2-m1 (PI605704) (Bingham and Clement, 1989), allelic to c2-m4 which reverts only in tissue culture (Groose and Bingham, 1986), and allelic to c2-m5 and c2-m6 which have not been studied extensively (Bingham and Clement, 1989).

Seed of both genetic stocks was produced in cage isolation at Prosser, WA. Both stocks are segregating and contain about 75% white flowered plants, 20% expressing the respective mutable with streaks and sectors of purple pigment in otherwise white flower petals. The remaining ~5% are purple and could be due to reversion to purple during gametogenesis, or due to contamination. Both lines have 'Vernal' (Graber, 1956) and 'Saranac' (Murphy and Lowe, 1966) in their pedigrees and their fertility and adaptation are similar to those cultivars. Five grams of seed of each will be sent upon request until the Wisconsin supply is depleted. Send requests to E.T. Bingham, Agronomy Department, 1575 Linden Drive, University of Wisconsin, Madison, WI 53706.

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References

Bingham, E.T., and W.M. Clement, Jr. 1989. Alfalfa transposable elements and variegation. Developmental Genetics 10:552–560.

Graber, L.F. 1956. Registration of 'Vernal' alfalfa. Agron. J. 48:587.

Groose, R.W. and E.T. Bingham. 1986. An unstable anthocyanin mutation recovered from tissue culture of alfalfa. Plant Cell Reports 5:104–107.

Murphy, R.P., and C.C. Lowe. 1966. Registration of 'Saranac' alfalfa. Crop Sci. 6:611.

Talbert, L.E., and E.T. Bingham. 1989. Genetic characterization of a mutable allele in alfalfa. J. Heredity 80:407–410.

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