

forage dry matter yield of Arthur in the establishment year was higher ($P < 0.05$) than 'Summit' crested wheatgrass [*Agropyron desertorum* (Fisch. ex Link) Schultes] and 'Chief' intermediate wheatgrass [*Thinopyrum intermedium* (Host) Barkw. & D.R. Dewey]. In 1979, the dry matter yield of Arthur was lower ($P < 0.05$) than Summit and greater ($P < 0.05$) than Chief for the first harvest and greater ($P < 0.05$) than both cultivars for the second harvest. Second-harvest yields for Arthur were also greater ($P < 0.05$) than Summit and Chief in 1980 and 1981. In six regional trials, the mean dry matter yields of Arthur in the establishment year and the first production year were higher ($P < 0.05$) than 'Prairieland' Altai wildrye [*Leymus angustus* (Trin.) Pilger] and giant wildrye [*Leymus cinereus* (Scribn. & Merr.) A. Löve]. The mean seed yield of Arthur in these trials was 517 kg ha⁻¹, compared with 216 kg ha⁻¹ for Prairieland Altai wildrye. In a replicated, cafeteria-style grazing test over 2 yr, cattle (*Bos taurus*) were observed to eat the leaves from Arthur, then eat the leaves of Altai wildrye and giant wildrye before returning to eat the culms and heads of Arthur. This preliminary study indicated that Arthur Dahurian wildrye is palatable to cattle.

Arthur is adapted to the Brown and Dark Brown Chernozem soil zones of western Canada, where it can be used as a short rotation pasture or hay crop or in mixtures with long-lived species that are slow to establish. Arthur is similar to the Dahurian wildrye cultivar James in most respects; however, Arthur heads 2 d earlier than James.

Breeder seed will be produced by Agriculture Canada at the Research Station, Swift Current, SK, and the Seed Increase Unit, Experimental Farm, Indian Head, SK. The multiplication and distribution of foundation and certified seed will be handled by SeCan Association, 200-57 Auriga Dr., Nepean, ON K2E 8B2, Canada.

T. LAWRENCE, P. G. JEFFERSON, C. D. RATZLAFF,
AND G. A. KIELLY* (3)

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3. T. Lawrence (retired), P.G. Jefferson, C.D. Ratzlaff, and G.A. Kielly, Res. Stn., Agric. Canada, P.O. Box 1030, Swift Current, SK S9H 3X2, Canada. Registration by CSSA. Accepted 31 May 1994. *Corresponding author.

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Registration of 'James' Dahurian Wildrye

'James' Dahurian wildrye (*Elymus dahuricus* Turcz. ex Griseb.) (Reg. no. CV-169, PI 576438) was released by the Agriculture Canada Research Station, Swift Current, SK, on 3 Mar. 1989. James is the second of two cultivars of Dahurian wildrye registered for sale in Canada. Dahurian wildrye is a self-pollinated, hexaploid ($2n=6x=42$) (2), short-lived perennial, caespitose grass native to Siberia, Mongolia, and China. Stands of Dahurian wildrye persist 2 to 3 yr in southwestern Saskatchewan. This short-lived perennial with high seedling vigor is well adapted for seeding in mixtures with long-lived grass species with low seedling vigor for improving the early productivity of dryland pastures. James is characterized as having excellent establishment-year vigor, forage dry matter yield, and seed yield (1). James was tested under the experimental designation Sc D27620.

Breeding lines were selected on the basis of maturity and head type from a space-plant nursery that had been established from a single accession (Sc 1732) introduced from China and obtained from Dr. J.W. Morrison, Research Branch, Agriculture Canada, Ottawa, ON. The pure line breeding method was used in the development of James, and the resulting 23 F₄ lines were included in performance trials.

In performance trials established at Swift Current in 1978, forage dry matter yield of James in the establishment year was higher ($P < 0.05$) than 'Summit' crested wheatgrass [*Agropyron desertorum* (Fisch. ex Link) Schultes] and 'Chief' intermediate wheatgrass [*Thinopyrum intermedium* (Host) Barkw. & D.R. Dewey]. In 1979, the dry matter yield of James was lower ($P < 0.05$) than Summit and greater ($P < 0.05$) than Chief for the first harvest and greater ($P < 0.05$) than both cultivars for the second harvest. Second-harvest yields for James were also greater ($P < 0.05$) than Summit and Chief in 1980 and 1981. In six regional trials, the mean dry matter yields of James in the establishment year and the first production year were higher ($P < 0.05$) than 'Prairieland' Altai wildrye [*Leymus angustus* (Trin.) Pilger] and giant wildrye [*Leymus cinereus* (Scribn. & Merr.) A. Löve]. The mean seed yield of James in these trials was 677 kg ha⁻¹, compared with 216 kg ha⁻¹ for Prairieland Altai wildrye. In a replicated, cafeteria-style grazing test over 2 yr, cattle (*Bos taurus*) were observed to eat the leaves from James, then eat the leaves of Altai wildrye and giant wildrye before returning to eat the culms and heads of James. This preliminary study indicated that James Dahurian wildrye is palatable to cattle.

James is adapted to the Brown and Dark Brown Chernozem soil zones of western Canada, where it can be used as a short rotation pasture or hay crop or in mixtures with long-lived species that are slow to establish. James is similar to the Dahurian wildrye cultivar Arthur in most respects; however, James heads 2 d later than Arthur.

Breeder seed will be produced by Agriculture Canada at the Research Station, Swift Current, SK, and the Seed Increase Unit, Experimental Farm, Indian Head, SK. The multiplication and distribution of foundation and certified seed will be handled by SeCan Association, 200-57 Auriga Dr., Nepean, ON K2E 8B2, Canada.

T. LAWRENCE, P. G. JEFFERSON, C. D. RATZLAFF,
AND G. A. KIELLY* (3)

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3. T. Lawrence (retired), P.G. Jefferson, C.D. Ratzlaff, and G.A. Kielly, Res. Stn., Agric. Canada, P.O. Box 1030, Swift Current, SK S9H 3X2, Canada. Registration by CSSA. Accepted 31 May 1994. *Corresponding author.

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Registration of 'M-204' Rice

'M-204' rice (*Oryza sativa* L.) (Reg. no. CV-97, PI 559472) was developed by the California Cooperative Rice Research Foundation, Inc. (CCRFF), at the Rice Experiment Station (RES), Biggs, CA, and was released jointly by CCRFF, the California Agricultural Experiment Station, and the USDA-ARS in 1992. M-204 is a photoperiod-insensitive, early-maturing, glabrous, semidwarf medium-grain cultivar. Physi-

cochemical tests conducted by the USDA-ARS Cooperative Regional Rice Quality Laboratory, Beaumont, TX, indicate the apparent amylose content and alkali spreading score of M-204 are typical of U.S. medium-grain cultivars (1). Taste panelists and marketing agencies rated the cooking and processing qualities of M-204 comparable to 'M-201' (2) and 'M-202' (3), which are the principal medium-grain cultivars marketed as 'Calrose'-type eating rice. The primary reasons for releasing M-204 are improved lodging resistance over M-202, greater resistance to cool temperature-induced floret sterility than M-201, higher yield stability than M-201 and M-202, and improved whole grain and total milling yield over both M-202 and M-201.

M-204 was developed from the cross R8747, made in the summer of 1982 at the RES. Its pedigree is M-201/M7/3/M7//ESD7-3/Kokuhorose'. The female parent, M-201/M7, was an early-maturing line from the 1981-1982 F₅ Hawaii winter nursery. M7//ESD7-3/Kokuhorose and ESD7-3/Kokuhorose were early-generation (F₃) selections with superior translucency and kernel shape characters. M-201 is an early-maturing, semidwarf medium-grain cultivar currently grown in California. M7 is a late-maturing, semidwarf medium-grain cultivar (4). ESD7-3 is a very early-maturing medium-grain sister line of 'M-101' (5) that headed 3 d later than M-101. Kokuhorose is a late-maturing, tall, premium quality medium-grain cultivar. M-204 was developed by the pedigree and modified bulk breeding methods. It was entered in the California Statewide Yield Tests (CSYT) in 1989 with the experimental designation 88-Y-317.

M-204 was evaluated in 20 replicated yield tests conducted cooperatively with the University of California Cooperative Extension from 1988 through 1991. Mean comparisons of agronomic, kernel, and starch characters of M-202, M-204, and M-201 in Table 1 were developed from CSYT; disease nurseries; special laboratory, location, and greenhouse evaluations; and starch chemical tests.

M-204 has good seedling vigor, similar to M-201 but less than M-202. It heads 1 d earlier than M-201 and 3 d later

than M-202. Field maturity as indicated by harvest moisture is very close to M-202. M-204 is similar to current California rice cultivars in tolerance to recommended rice herbicides. Panicles of M-204 normally are exerted completely from the leaf sheaths. M-204 height is similar to M-201 but shorter than M-202. Its lodging resistance is better than M-202 but slightly less than M-201. M-204 has good resistance to floret sterility caused by cool night temperatures (10 to 14 d before heading), similar to M-202, and is an improvement over M-201. M-204 has glabrous leaves and hulls except for a few hairs on the leaf margins and lemma keel. M-204 is sparsely awned. No plant parts of M-204 showed anthocyanin pigmentation.

M-204 average yields were 4 and 6% greater than yields of M-201 and M-202, respectively. Hulled kernels of M-204 have light brown pericarp and white, nonwaxy, nonaromatic endosperm. M-204 seed size, shape, and weight are similar to M-202 and M-201. Kernel size of brown and white rice samples of M-204 are more uniform than M-202 and M-201. Milling samples were sequentially harvested as the moisture content of M-202, M-204, and M-201 decreased from 250 to 170 g kg⁻¹ in 1989, 1990, and 1991. These tests indicated that M-204 produced higher and more stable total and whole kernel milled rice yields than M-202 and M-201. The apparent amylose content of M-204 is slightly higher than either M-202 or M-201.

M-204 is not significantly different from M-202 and M-201 in reaction to stem rot (caused by *Sclerotium oryzae* Cattaneo) and aggregate sheath spot [caused by *Rhizoctonia oryzae-sativae* (Sawada) Mordue]. The stem rot ratings utilized a scale 0 to 10 (6) and aggregate sheath spot was scored according to the number of dead leaves on the uppermost four nodes. Reaction to diseases not prevalent in California is unknown.

M-204 is recommended for all production areas where M-201 is currently grown, but is not recommended for the coldest rice production areas. Slightly less seedling vigor and a later maturity may limit M-204 yield potential in cooler areas adjacent and north of the Sacramento-San Joaquin Delta.

M-204 was approved for certification by the California Crop Improvement Association in 1991 and 1992. Variant and offtype plants (0.0034%) during these 2 yr were found and rogued from the foundation seed fields. The variants included plants that appeared like M-204, except that they were either earlier and/or slightly taller (2-4 cm). These variants seem to be the result of residual variation not detected in two previously grown M-204 head rows in 1989 and 1990. Elongated upper internode and tetraploid natural mutants like M-204 were also rogued. Offtypes rogued included plants that seemed to be M-204 outcrosses to medium- and/or long-grain varieties. The grain shapes included medium- and long-grain types with straw colored and red awns, pink apiculus, pubescent medium grains of M-204 height, and glabrous medium grains with awns. Long awned and awnless pubescent short grains like S-101 were also rogued.

Classes of seed will be breeder, foundation, registered, and certified produced in California. Foundation seed can be used to produce foundation seed when necessary. Headrow seed will be produced in foundation fields as necessary to maintain cultivar purity. Application is being made for protection of M-204 under the U.S. Plant Variety Protection Act with the Title V option of the Federal Seed Act. Breeder and foundation seed will be maintained by the CRRF, Rice Experiment Station, P.O. Box 306, Biggs, CA 95917.

Table 1. Mean comparisons of M-202, M-204, and M-201 rice for various agronomic, kernel, and starch characters.

Character	Units	Cultivar		
		M-202	M-204	M-201
Yield trials				
Seedling vigor	score†	4.3	4.0	3.9
Days to 50% heading	d	93	96	97
Plant height	cm	96	92	93
Harvest moisture	mg g ⁻¹	187	189	199
Lodging	%	39	17	12
Yield (120 g kg ⁻¹ moisture)	Mg ha ⁻¹	10.220	10.840	10.460
Yield (120 g kg ⁻¹ moisture)	lb acre ⁻¹	9125	9682	9335
Other agronomic tests				
Cool temp. sterility	%	26	23	48
<i>S. oryzae</i> †	score†	5.6	5.3	5.0
<i>R. oryzae-sativae</i> ‡	score†	2.5	2.3	2.2
Total milled rice	mg g ⁻¹	680	696	674
Whole grain milled rice	mg g ⁻¹	599	630	617
Brown rice kernel				
Length (L)	mm	6.15	6.20	6.10
Width (W)	mm	2.90	2.85	2.80
L/W ratio	-	2.12	2.18	2.18
Weight	mg	23.1	23.6	22.5
White rice				
Apparent amylose	g kg ⁻¹	177	193	172
Alkali (17 g L ⁻¹ KOH)	score	7.0	7.0	7.0

† Scores: seedling vigor, 1-5 (5 = best); sclerotium infection, 0-10 (0 = best); rhizoctonia infection, 0-4 (0 = best).

‡ Stem rot caused by *Sclerotium oryzae* Cattaneo.

§ Leaf and sheath spot caused by *Rhizoctonia oryzae-sativae* (Sawada) Mordue.

C. W. JOHNSON,* S. T. TSENG, K. S. MCKENZIE, J. J. OSTER, J. E. HILL, AND D. M. BRANDON (7)

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Registration of 'Maxcy' Soybean

'Maxcy' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-326, PI 568236) was developed by the South Carolina Agricultural Experiment Station and cooperatively released by the Georgia, North Carolina, and South Carolina Agricultural Experiment Stations in August 1992 because of its high seed yield and multiple nematode resistance.

Maxcy was derived from an F₄ plant selection composited in the F₅ from the cross 'D76-9665' × 'Johnston' made at Clemson, SC, in 1981 (2). Parentage of D76-9665 (7) is 'Forrest' × 'Centennial' (3,4). The F₁ plants were grown at Isabela, Puerto Rico, during the winter of 1981 and the F₂ to F₄ generations were advanced by modified single-seed descent (pod-bulk method) in South Carolina and Puerto Rico during 1982 and 1983. Evaluation of agronomic traits, nematode resistance and seed yield were conducted in South Carolina from 1985 to 1987. Maxcy, previously identified as SC84-679, was evaluated in the Uniform Soybean Tests, Southern Region, Preliminary Group VIII in 1988 and in Uniform Group VIII from 1989 to 1991 (6).

Maxcy is a Maturity Group VIII cultivar that matures the same day as 'Kirby' (1) and ≈ 1 d later than 'Coker 6738' (5) and is generally adapted from 28 to 35° N lat. It has determinate growth habit, purple flowers, tawny pubescence, and tan pod walls at maturity. Mature plants of Maxcy average 5 cm shorter than Kirby. Maxcy is similar in lodging to Kirby. Seed size averages 13.8 g 100 seed⁻¹, 9% larger than Kirby. Seeds are yellow with black hila, which may vary in intensity from light to dark. Seed protein and oil average 404 and 208 g kg⁻¹ (dry wt. basis), respectively. Maxcy has averaged 21 and 5% higher in seed yield than Kirby (6) and Coker 6738, respectively.

Maxcy is resistant to the soybean cyst nematode Race 3 (*Heterodera glycines* Ichinohe) and moderately resistant to the southern root-knot nematode [*Meloidogyne incognita* (Kofoid & White) Chitwood], with gall ratings slightly higher than for Kirby (5,6). Maxcy has produced good seed yields in South Carolina fields infested with Columbia lance nematode (*Hoplostaimus columbus* Sher). It is also resistant to the foliar diseases bacterial pustule [caused by *Xanthomonas campestris* pv. *glycines* (Nakano) Dye], powdery mildew (caused by *Microspora diffusa* Cooke & Peck) and races of frogeye leaf spot (caused by *Cercospora soiiina* K. Hara) prevalent in the southern USA. Maxcy is susceptible to stem canker [caused by *Diaporthe phaseolorum* (Cooke & Ellis) Sacc. f. sp. *meridionalis* Morgan-Jones] (6).

Breeder seed of Maxcy was released to the South Carolina

Foundation Seed Association in 1992. Application has been made for U.S. Plant Variety Protection, Title V option, permitting only Foundation and Certified classes beyond breeder seed. The South Carolina Agricultural Experiment Station will be responsible for the maintenance of breeder seed. A small quantity of seed for research purposes is available for at least 5 yr from the corresponding author.

E. R. SHIPE,* J. D. MUELLER, S. A. LEWIS,
AND P. F. WILLIAMS, JR. (8)

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Registration of 'Sandusky' Soybean

'Sandusky' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-327, PI 576145) was developed by the Ohio Agricultural Research and Development Center, The Ohio State University (OARDC-OSU). It was released 1 Aug. 1993 because of its high yield and resistance to lodging in comparison with cultivars of similar maturity.

Sandusky is an F₄-derived line, originally designated HS88-4908, from the cross 'Conrad' × 'Hayes' (2,4). The cross was made in the summer of 1985 at Columbus, OH. The F₂-derived line HS87-5028, from which Sandusky was selected, was tested in Ohio from 1987 to 1989. The F₄-derived line HS88-4908 was tested in multiple Ohio locations from 1989 to 1993. It was evaluated in the Uniform Soybean Tests, Northern States, Preliminary Test IIA in 1990 and Uniform Test III in 1991.

Sandusky has purple flowers, gray pubescence, tan pods, and dull yellow seedcoats with buff hila. It is a Maturity Group II (relative maturity 2.9), indeterminate cultivar and is generally adapted as a full-season cultivar from 41 to 43° N lat. In Ohio tests, Sandusky was similar to 'Chapman' (3) in maturity, lodging resistance, and plant height, but had 3% greater seed yield. Protein and oil content of the seed of Sandusky was similar to that of 'Kenwood' (1). In the 1991 Uniform Test III, Sandusky yielded 2% more than 'Burlison' (5) and matured 1 d earlier (6).

Sandusky has the *Rps1-k* gene for resistance to phytophthora rot (caused by *Phytophthora sojae* M.J. Kaufmann & J.W. Gerdemann). It is susceptible to brown stem rot [caused by