

AC Reed soft white spring wheat

Sadasivaiah, R. S., Thomas, J. B. and Conner, R. L. 1993. **AC Reed soft white spring wheat**. Can. J. Plant Sci. 73: 531-534. AC Reed has a higher yield potential than Fielder combined with early maturity, resistance to prevalent races of stripe rust, and moderate resistance to powdery mildew, common root rot, shattering and sprouting. It is equal to or better than the standard check, Fielder, in overall milling and cookie-baking qualities. AC Reed is adapted to the irrigated regions of southern Alberta and Saskatchewan.

Key words: Wheat, *Triticum aestivum* L., AC Reed, cultivar description

Sadasivaiah, R. S., Thomas, J. B. et Conner, R. L. 1993. **Blé de printemps blanc tendre AC Reed**. Can. J. Plant Sci. 73: 531-534. Plus productif que Fielder, AC Reed réunit les qualités de précocité et de résistance aux races courantes de la rouille jaune striée à une résistance modérée au piétin commun, à l'égrenage prématuré et à la germination sur pied. Il est au moins aussi bon que Fielder sur le plan des aptitudes meunières générales ainsi que des aptitudes biscuitières. Le nouveau cultivar convient aux zones de culture irriguée du sud de l'Alberta et de la Saskatchewan.

Mots clés: blé, *Triticum aestivum* L., AC Reed, description de cultivar

AC Reed, a soft white spring wheat (*Triticum aestivum* L. em. Thell.), developed at the Agriculture Canada Research Station, Lethbridge, Alberta, was granted a permanent regional (Manitoba, Saskatchewan, Alberta and British Columbia) registration no. 3499 on 20 Dec. 1991 by the Variety Registration Office, Plant Products Division, Food Production and Inspection Branch, Agriculture Canada, Ottawa, ON.

Pedigree and Breeding Method

AC Reed was developed from the four-way cross: PT303/Dirkwin//Kenya321/Fieldwin. PT303 is a soft, red-kernelled CIMMYT selection, closely resembling and with the same pedigree (Inia'S'/Soty//Carazinho) as the "Sapsucker" series which included Tesopaco 76. The family from which AC Reed was selected was derived from a single F₁ plant from the final four-way cross. This bulk was identified for reselection based on its overall kernel appearance, yield, quality, and segregation for stripe rust resistance. An F₄-derived F₆ line, designated as 83351-796, was tested in preliminary and advanced yield

trials in 1986 and 1987, respectively, in southern Alberta. From 1988 to 1990, it was evaluated in Western Soft White Spring Wheat Cooperative Tests (4 and 2 locations in southern Alberta and Saskatchewan, respectively) as SWS-87. For the development of breeder seed, 226 single heads selected in F₉ generation were grown as head-rows, and 221 breeder lines derived from selected head rows were increased and bulked in 1991. Analyses of gliadin (PAGE = polyacrylamide gel electrophoresis) and glutenin (SDS-PAGE = sodium dodecyl sulfate-PAGE) electrophoregrams of single seeds showed no variability, thus confirming the uniformity of the breeder seed for these endosperm proteins. The electrophoretic patterns of gliadin and glutenin proteins of AC Reed, compared with Katepwa, are shown in Fig. 1.

Performance and Adaptation

AC Reed is a semi-dwarf awned wheat adapted to irrigated regions of southern Alberta and Saskatchewan. It yielded 6% more than Fielder and 1% less than Owens in 3 yr of Western Soft White Spring Wheat Cooperative trials (Table 1). AC Reed matured approximately 2 d earlier than the checks.

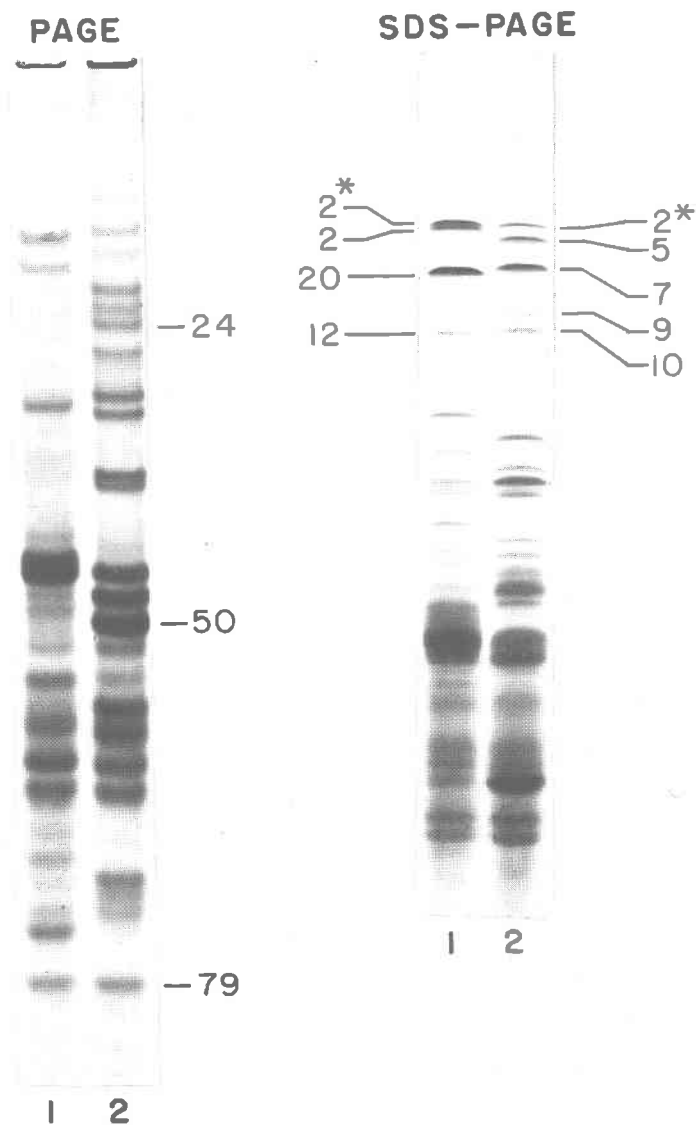


Fig. 1. Polyacrylamide gel electrophoresis (PAGE) and sodium dodecyl sulfate-PAGE (SDS-PAGE) patterns of AC Reed (1) and Katepwa (2). PAGE patterns show the three reference bands used in computer analysis of the pattern, and the SDS-PAGE patterns show the high molecular weight (HMW) glutenin subunits.

Its lodging resistance is similar to that of Fielder, and better than Owens. AC Reed has better shattering and sprouting resistance than Fielder (Table 2).

Other Characteristics

SPIKES. Oblong to tapering, mid-dense, mid-long, erect to semi-nodding.

GLUMES. Glabrous, shoulders elevated, midsize, midlong, midwide, ovate; glume beaks narrow and acute.

KERNEL. Soft texture, creamy white, mid-size, midlong, midwide, ovate; germ size small to midsize, ovate; crease midwide to wide, mid-deep; cheeks rounded to angular; brush hairs small to midsize, midlong.

MATURITY. Approximately 2 d earlier than Fielder and Owens (Table 2). **SPROUTING.** Moderately resistant, better than Fielder and Owens (Table 2).

STRAW. Better lodging resistance than Owens, and 4 cm shorter than Fielder (Table 2). **DISEASE REACTION.** Resistant to prevalent races of stripe rust (caused by *Puccinia striiformis* West.); moderately resistant to powdery mildew (caused by *Erysiphe graminis* DC. ex Merat. f. sp. *tritici* Em. Marchal) and common root rot [caused by

SHATTERING. Moderately resistant, similar to Owens, better than Fielder (Table 2).

Table 1. Grain yield for AC Reed and check cultivars in the Soft White Spring Wheat Cooperative Tests (1988–1990)

Entry	Yield (t ha ⁻¹)				
	1988	1989	1990	Mean	% Fielder
AC Reed	5.15	6.78	6.10	6.01	106
Fielder	5.06	6.45	5.55	5.69	100
Owens	5.18	6.98	6.07	6.08	107
SE	0.15	0.18	0.25	0.11	
No. station-years	5	6	5	16	

Tests with a coefficient of variation exceeding 15% were not included; tests were grown at Lethbridge, Iron Springs, Vauxhall and Bow Island, Alberta, and at Saskatoon and Outlook, Saskatchewan.

Table 2. Agronomic performance of AC Reed and check cultivars in the Soft White Spring Wheat Cooperative Tests (1988–1990)

Entry	Maturity (d)	Height (cm)	Lodging (1–9) ^z	Shattering (1–9) ^y	1000-kernel wt. (g)	Sprouting (0–4) ^x
AC Reed	107.0	73.9	2.3	2.0	36.0	2.0
Fielder	108.7	78.0	2.5	3.8	36.7	3.5
Owens	109.2	74.7	3.2	2.0	33.3	3.7
SE	0.3	0.5	0.7	0.4	0.5	0.3
No. station-years	13	15	6	5	18	3

^z 1 = no lodging, 9 = completely lodged.

^y 1 = no shattering, 9 = completely shattered.

^x Data based on rain simulator assessment with four replicates and five heads per replicate; 0 = no sprouting, 4 = whole head sprouted.

Table 3. Disease reactions of AC Reed and check cultivars in the Soft White Spring Wheat Cooperative Tests (1988–1990)

Entry	Stripe rust (1–6) ^z	Leaf rust (1–6) ^z	Stem rust (%)	Powdery mildew (1–6) ^z	Black point (%)	Ergot no. kg ⁻¹	Bunt (%)	Loose smut (%)	Root rot (%)
AC Reed ^y	1.5	2.4	60.0 MS ^x	2.8	18.9 S	0.2	50.9 S	84.0 HS	17.6 MR
Fielder	5.0	2.2	70.0 MS	2.9	21.6 S	0.4	42.9 S	75.0 HS	27.1 MR
Owens	2.0	2.3	60.0 MS	3.1	23.0 S	0.9	34.2 S	65.5 S	16.7 MR
SE	0.6	0.2	5.8	0.1	1.8	0.2	5.0	0.6	3.7
No. station-years	2	8	2	12	18	18	6	2	3

^z Scale of 1–6 rated under field conditions with natural infection; 1 = resistant, 6 = highly susceptible. No stripe rust was observed in the field in 1988 and 1989. In 1990, it was observed in Bow Island and Iron Springs.

^y Approximately 2% of seedlings inoculated under controlled environmental conditions showed a low level of stripe rust infection.

^x MS = moderately susceptible; S = susceptible; HS = highly susceptible; MR = moderately resistant.

Cochliobolus sativus (Ito & Kurib.) Drechs. ex. Dast.]; similar to Fielder in its reaction to leaf rust (caused by *Puccinia recondita* Rob. ex. Desm. f. sp. *tritici*), stem rust (caused by *P. graminis* Pers. f. sp. *tritici* Eriks. & Henn.), black point [caused by *Alternaria alternata* (Fr.) Keissler] and common bunt [caused by *Tilletia laevis* Kuhn (syn. *T. levis*, *T. foetida* (Wallr.) Liro) and *T. tritici* (Bjerk.) Wint. (syn. *T. caries* (DC) Tul.)]; highly susceptible to loose smut [caused by *Ustilago tritici* (Pers.) Rostr.] (Table 3).

QUALITY. AC Reed is equal in quality to the standard check, Fielder (Williams and Cordeiro 1991).

GRADE ELIGIBILITY. AC Reed is eligible for all grades of Canadian western Soft White Spring Wheat.

Maintenance and Distribution of Pedigreed Seed

Breeder seed derived from a bulk of 221 breeder lines will be maintained by Agriculture Canada Experimental Farm, Indian Head, SK, Canada S0G 2K0. The multiplication and distribution of pedigreed seed are handled by SeCan Association, 200-57 Auriga Dr., Nepean, ON, Canada K2E 8B2.

The valuable technical assistance provided by S. M. Perkovic, D. C. Pearson, B. K. Postman, and A. D. Kuzyk during the development of this cultivar is gratefully acknowledged. We thank D. E. Harder, J. Kolmer, P. L. Thomas (Agriculture Canada, Winnipeg), D. A. Gaudet (Agriculture Canada, Lethbridge) for data on disease reactions, and P. C. Williams (Canadian Grain Commission Research Laboratory, Winnipeg) for the evaluation of end-use quality. Our thanks are also due to Dr. W. Bushuk, Department of Food Science, University of Manitoba, Winnipeg for preparations of PAGE and SDS-PAGE patterns of AC Reed. Development of AC Reed was funded in part by Alberta's Farming for the Future Program.

Williams, P. C. and Cordeiro, H. 1991. Report on the 1990 Western Canadian Soft White Spring Wheat Cooperative Trials. Minutes of the Wheat Rye and Triticale Subcommittee of the Prairie Registration Recommending Committee for Grain. p. 219.

R. S. Sadasivaiah, J. B. Thomas, and R. L. Conner

Research Station, Research Branch, Agriculture Canada, P. O. Box 3000, Main, Lethbridge, Alberta, Canada T1J 4B1. Contribution no. 3879231. Received 1 June 1992, accepted 3 November 1993.