CULTIVAR DESCRIPTION

AC Rifle winter rye

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McLeod, J. G. and Payne, J. F. 1996. **AC Rifle winter rye**. Can. J. Plant Sci. **76**: 143–144. AC Rifle, a cultivar of winter rye (*Secale cereale* L.), was developed at the Semiarid Prairie Agricultural Research Centre, Research Branch, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan. It is the first semi-dwarf cultivar registered for production in the Prairie Provinces of Western Canada. AC Rifle represents a 30% reduction in plant height compared to conventional height cultivars. Grain yield potential and winter hardiness of AC Rifle is equal to the check cultivars It has improved lodging resistance over all other adapted cultivars of winter rye.

Key words: Cultivar description, semi-dwarf, rye (winter), *Secale cereale* L.

McLeod, J. G. et Payne, J. F. 1996. **Seigle d'automne AC Rifle.** Can. J. Plant Sci. **76**: 143–144. AC Rifle est un cultivar de seigle d'automne (*Secale cereale* L.), sélectionné au Centre fédéral de recherches agricoles de la prairie semi-aride à Swift Current, Saskatchewan. C'est le premier cultivar demi-nain homologué pour la culture dans les provinces des Prairies de l'Ouest canadien. AC Rifle a une paille de 30% plus courte que les cultivars de type ordinaire. Son rendement grainier et sa rusticité hivernale sont comparables à ceux des cultivars témoins et sa résistance à la verse est supérieure à celle de tous les cultivars de seigle d'automne recommandés dans cette région.

Mots clés: Description de cultivar, demi-nain, seigle d'automne, *Secale cereale* L.

AC Rifle winter rye (*Secale cereale* L.) was developed at the Semiarid Prairie Agricultural Research Centre, Research Branch, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan as part of the Canadian Rye Breeding Program. Registration no. 3989 was issued for AC Rifle on 5 October 1994 by the Plant Health and Plant Products Directorate, Food Production and Inspection Branch of Agriculture and Agri-Food Canada.

Pedigree and Breeding Methods

AC Rifle derives from a cross made in 1980 at Swift Current, between Puma (Shebeski et al. 1973) and a semi-dwarf introduction, 2D 1125, from the Institute of Plant Breeding and Acclimatization, Radzokow, Poland. It was developed using ear-to-row and mass selection techniques.

The F_1 generation was grown in 1981. Individual semi-dwarf F_2 plants were selected in 1982 and grown in a single row nursery in 1983. Individual semi-dwarf plants were selected from the most uniform rows and grown in isolation while the remnant seed was harvested from these rows and used to establish replicated field trials in 1984. The isolation plot was rogued of tall plants and certain rows were eliminated on the basis of frequency of tall plants. Selection continued for five successive generations until 1988 when the seed from the isolation plot was harvested, bulked and entered into the Fall Rye Cooperative Test as RT152. Each year the increase plot of RT152 was rogued of tall plants prior to flowering and the harvested seed used as test seed for the Fall Rye Cooperative Test. After 2 yr of cooperative testing tall plants were still persisting in the population. Pair matings were made between plants of semi-dwarf stature from RT152 in 1990 and seeded as single rows. In 1991 matings were made between plants of the most uniform rows and grown at Indian Head for seed increase. This seed was used for Fall Rye Cooperative Test Seed in 1992. It was observed that three of the lines were more uniform than the rest in 1992 and 1993. Seed from the three most uniform lines was used for thr Fall Rye Cooperative Test in 1993. The breeder seed increase derives from 1992 remnant seed of the three most uniform lines. Frequency of tall plants is 2–3%.

Performance and Adaptation

AC Rifle is the first semi-dwarf rye adapted to the soils of the Canadian Prairies. It has shorter and stronger straw than the best check cultivars.

In 47 performance trials AC Rifle outyielded Kodiak and Musketeer but yielded less than Prima (Table 1). The test weight of AC Rifle was significantly less than Prima and Musketeer and greater than Kodiak ($P < 0.05$). Kernel weight was about 10% less than that of the checks. Both time to heading and maturity were within the range of the checks (Table 2). Winter survival percentage was equal to Prima, the most cold tolerant cultivar.

Plant height averaged 82 cm, about 70% of the checks mean (Table 1). The reduction in height resulted in an increase in lodging resistance over the check cultivars

Table 1. Mean grain yield, test weight, kernel weight, plant height and Hagberg falling number of RT152 compared with Kodiak, Musketeer and Prima checks, based on data from the Fall Rye Cooperative Tests (1989–1993)

Cultivar	Grain yield (t ha^{-1})	Test weight (kg hL^{-1})	Kernel weight (mg)	Plant height (cm)	Hagberg falling number (S)
Kodiak	3.71	68.7	32.3	121	190
Musketeer	3.64	72.0	32.7	118	178
Prima	4.18	72.0	31.7	117	197
RT152	4.01	71.2	29.3	82	193
$LSD_{.05}$	0.23	0.4	0.9	4	14
No. of tests	47	46	46	36	35

Table 2. Mean heading, maturity, survival, lodging, ergot infection and snow mold reaction of RT152 compared with Kodiak, Musketeer and Prima checks, based on data from the Fall Rye Cooperative Tests (1989-1993)

Cultivar	Heading (d)	Maturity (d)	Survival (%)	Lodging (1-9)[z]	Snow Mold reaction[y]	Ergot (%)
Kodiak	159	215	80	3.5	VS	0.14
Musketeer	156	215	84	3.2	VS	0.24
Prima	157	213	98	3.8	VS	0.14
RT152	159	214	95	1.0	S	0.17
$LSD_{.05}$	1	4	14	1.0	–	0.12
No. of tests	13	5	12	7	1	20

[z]1 = no lodging; 9 = completely lodged.
[y]S, susceptible; VS, very susceptible.

(Table 2).

Reaction to snow mold (caused by *Sclerotinia borealis* Bub. & Vleug.) was only determined on one test where AC Rifle displayed a susceptible reaction (Table 2). Determinations of percentage ergot infection [caused by *Claviceps purpurea* (Fr.) Tul.] revealed AC Rifle to be within the range of the checks.

Shattering resistance was visually rated superior to all of the check cultivars.

KERNELS: Medium in size, mid-long and narrow; brush hairs short; cheeks rounded; germ mid-size and oval; crease narrow and mid-deep; colour light blue. The phenol reaction is black.

SPIKES: Awned, erect, lax, medium length, elliptical, glaucous; chaff white; glumes lanceolate.

Maintenance and Distribution

AC Rifle has been released to Proven Seed-United Grain Growers, TD Centre, 201 Portage Avenue, Winnipeg, Manitoba, Canada R3C 3A7, for multiplication and distribution. Breeder seed originating from the uniform breeder lines will be maintained by the Seed Increase Unit of the Research Farm, Agriculture and Agri-Food Canada, Indian Head, Saskatchewan, Canada S0G 2K0.

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Shebeski, L. H., McGinnis, R. C., Evans, L. E. and Zuzens, D. 1973. Puma, a new cultivar of winter rye. Can. J. Plant Sci. **53**: 67.