

AC Remington winter rye

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McLeod, J. G., Gan, Y. T. and Payne, J. F. 2000. **AC Remington winter rye**. *Can. J. Plant Sci.* **80**: 605–607. AC Remington, 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. AC Remington is a semidwarf with 20 to 25% shorter straw and improved lodging resistance compared with tall cultivars. AC Remington has good winter survival and is well adapted to the Canadian Prairies. AC Remington has improved grain yield, test weight, kernel weight and Hagberg Falling Number compared with those of the semidwarf cultivar AC Rifle. Plant height, heading, maturity and ergot infection of AC Remington are similar to those of AC Rifle.

Key words: Cultivar description, semidwarf, rye (winter), Hagberg Falling Number, *Secale cereale* L.

McLeod, J. G., Gan, Y. T. et Payne, J. F. 2000. **Seigle d'automne AC Remington**. *Can. J. Plant Sci.* **80**: 605–607. AC Remington est un cultivar de seigle d'automne (*Secale cereale* L.) sélectionné au Centre de recherches agricoles pour la prairie semi-aride (Ministère de l'Agriculture et de l'Agroalimentaire du Canada) à Swift Current en Saskatchewan. C'est un cultivar demi-nain possédant une paille de 20 à 25 % plus courte et une meilleure résistance à la verse que les cultivars à chaume long. Sa bonne survie à l'hiver en fait une intéressante variété pour les prairies canadiennes. Par comparaison avec le cultivar demi-nain AC Rifle, AC Remington a un rendement grainier, un poids spécifique du grain, un poids de 1 000 grains et un indice de Hagberg améliorés. La hauteur de la plante, la précocité d'épiaison et de maturité, de même que les cotes d'infection par l'ergot du seigle sont les mêmes que chez AC Rifle.

Mots clés: Description de cultivar, demi-nain, seigle (d'automne), temps de chute de Hagberg, *Secale cereale*

AC Remington 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. 4846 was issued for AC Remington on 31 December 1998 by the Canadian Food Inspection Agency.

Pedigree and Breeding Method

AC Remington derives from the progeny of a composite cross made in 1985 at Swift Current. The parents were semidwarf selections from 8093 A (Puma/Polish dwarf), the progenitor of AC Rifle (McLeod and Payne 1996), 8093 F (Cougar/Bulgarian dwarf), 8093 G (Puma/Bulgarian dwarf) and 8093 H (Bulgarian dwarf) crossed in reciprocal with Musketeer (McLeod et al. 1981) and Prima (McLeod et al. 1985) in April 1985 to form the population designated 8591. Polish dwarf and Bulgarian dwarf sources were introduced from the Institute of plant Breeding and Acclimatization, Radzikow, Poland, through the University of Manitoba. Puma (Shebeski et al. 1973) has superior winter hardiness and Cougar has reduced plant height and large plump kernels. AC Remington was developed using sib-mating, ear-to-row and recurrent mass selection techniques from 1986 to 1992. Tall plants were rogued from the population in each

generation prior to flowering. In September 1985, reciprocal F_1 seed was bulked, planted in the growth room and intercrossed to form eight F_2 populations. In the fall of 1986, the F_2 generation was seeded in the field in isolation at a low seed rate in order to distinguish individual plants. In 1987, plants were selected on the basis of the phenotypic characteristics reduced plant height for lodging resistance, resistance to diseases such as root rot and leaf spots, erect spikes for resistance to shattering and large and uniform seeds. Rows with a high frequency of tall plants were discarded. Plants within the most uniform semidwarf rows were selected and sib-mated (in pairs) by placing a spike from each plant in a glassine crossing bag. The reciprocal cross seed from sib-matings within rows was held in storage. Remnant seed from single rows was used to establish replicated yield tests. Superior genotypes were selected based on the results of these replicated yield tests in 1988, and the seed from sib-matings, which was held in storage, was used to establish a single row isolation nursery in the fall of 1988 and harvested en masse in 1989 to reconstitute the cycle 1 population (C_1). The process of sib mating and progeny testing with remnant seed was continued for a second cycle to produce the C_2 . In 1993, the isolation progeny rows were harvested en masse to form the reconstituted C_2 population and then seeded into a large increase plot. The increase plot was har-

Table 1. Mean grain yield, test weight, kernel weight, plant height and Hagberg falling number of AC Remington compared with Kodiak, Musketeer, Prima and AC Rifle checks based on data from Cooperative Fall Rye Tests (1995–1997)

Cultivar	Grain yield (t ha ⁻¹)	Test weight (kg hL ⁻¹)	Kernel weight (mg)	Plant height (cm)	Hagberg falling number (s)
Kodiak	3.84	67.9	32.4	114	168
Musketeer	4.12	71.4	32.4	113	154
Prima	4.38	71.4	32.4	113	179
AC Rifle	4.07	69.8	28.4	85	169
AC Remington	4.39	70.5	29.8	88	188
LSD _{0.05}	0.25	0.4	0.8	5	13
No. of tests ^z	35	34	34	33	34

^zTest sites were at Rosebank, MB, Swift Current, Indian Head and Melfort, SK, Lethbridge and Lacombe, AB, and Brookings, SD, from 1995 to 1998, inclusive; at Saskatoon (University of Saskatchewan), SK, and Dalroy, AB, in 1995 and 1996; at Watrous, SK, and Beaverlodge, AB, in 1996 and 1997; at Carstairs, AB, in 1996 and 1997; at Saskatoon (Agriculture and Agri-Food Canada), SK, and Kentville, NS, in 1995; at Winnipeg, MB, in 1996 and at Irricana, AB, in 1997.

Table 2. Mean heading, maturity, survival, lodging and percent ergot of AC Remington compared with Kodiak, Musketeer, Prima and AC Rifle checks, based on data from the Cooperative Fall Rye Tests (1995–1997)

Cultivar	Heading (d)	Maturity (d)	Survival (%)	Lodging (1–9) ^z	Ergot (%)
Kodiak	160	222	72	3.7	0.74
Musketeer	158	221	81	3.1	1.15
Prima	159	221	80	3.6	0.60
AC Rifle	160	220	89	2.0	0.57
AC Remington	160	221	91	2.1	0.66
LSD _{0.05}	1	3	15	0.9	0.19
No. of tests	30	6	15	10	19

^z1 = no lodging; 9 = completely lodged.

vested en masse in 1994 and formed the basis of AC Remington. AC Remington was tested in the Western Cooperative Fall Rye Test as RT172 during the 1994–1995 to 1996–1997 seasons, inclusive. A frequency of 2–3% of tall plants persists in the population and increases in frequency if not removed in each generation.

Performance and Adaptation:

AC Remington is a semidwarf cultivar, adapted to the soils and climate of the Canadian Prairies and it represents improvements in several agronomic characteristics over the semidwarf cultivar AC Rifle. In 35 performance trials of the Western Co-operative Fall Rye Test (1995–1997, inclusive), AC Remington yielded significantly more grain ($P < 0.05$) than the semidwarf check AC Rifle and was equal to the best check cultivar, Prima (Table 1). The test weight of AC Remington was significantly greater ($P < 0.05$) than that of AC Rifle and Kodiak, and significantly less than that of Musketeer and Prima. Kernel weight was significantly greater than that of AC Rifle ($P < 0.05$) and significantly less than that of the conventional height check cultivars Musketeer, Prima and Kodiak. AC Remington headed significantly later (2 d) than Musketeer and was equal to AC Rifle, Kodiak and Prima (Table 2). AC Remington matured within the range of the checks. Winter survival was significantly greater ($P < 0.05$) than that of Kodiak and not signif-

icantly different from AC Rifle, Musketeer and Prima, the most cold-tolerant cultivars.

Plant height of AC Remington (88 cm) was significantly less ($P < 0.05$) than that of the conventional height cultivars and similar to that of AC Rifle (Table 1). Lodging resistance of AC Remington was significantly better than that of all the conventional check cultivars and equal to that of AC Rifle (Table 2).

The Hagberg falling number of AC Remington was significantly greater ($P < 0.05$) than that of AC Rifle, Kodiak and Musketeer and was equal to that of Prima and thus AC Remington is one of the most suitable of Canadian cultivars available for bread-making purposes.

Other Characteristics

AC Remington has a low frequency of tall plants, similar to that of AC Rifle. The frequency of tall plants will increase if they are not removed in each generation. This is a typical characteristic of all semidwarf, open-pollinated cultivars.

Disease Reaction: Percentage ergot infection [caused by *Claviceps purpurea* (Fr.) Tul.] of AC Remington was within the range of the check cultivars (Table 2). Shattering was visually rated equal to AC Rifle and less than Prima, Musketeer and Kodiak.

Spikes: Awned, erect, lax, medium length, elliptical and glaucous; chaff is white; Glumes are lanceolate.

Kernels: Medium in size, mid-long and narrow; brush hairs are short; cheeks are rounded; germs are slightly raised, mid-sized and oval; crease is narrow and mid-deep; colour is light blue; phenol reaction is black.

End use suitability: AC Remington is eligible for the grades of the Canada Western Rye class.

Maintenance and Distribution of Pedigreed Seed

The breeder seed of AC Remington was produced at Swift Current during the 1997–1998 season. It derives from the increase, which was harvested en masse in 1994 and formed the seed lot for the co-operative testing of AC Remington.

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

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