

AC Mustang oat

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Kibite, S., Nadja, H., Fairey, N. A., Pearen, J. R., Clayton, G., Ferguson, T. and Westerlund, D. 1995. **AC Mustang oat**. Can. J. Plant Sci. 75: 895–897. AC Mustang is a dual purpose (grain/silage) oat with high grain yield, good lodging resistance, plump kernels, high test weight, and desirable agronomic features. Its maturity rating is intermediate to Cascade and Dumont, and its forage/silage yield potential is higher than other registered cultivars with the exception of Foothill. Its hull content is higher than is desirable for milling. AC Mustang is well adapted to Alberta and the rust-free areas of western Saskatchewan.

Key words: *Avena sativa*, oat (spring), cultivar description

Kibite, S., Nadja, H., Fairey, N. A., Pearen, J. R., Clayton, G., Ferguson, T. et Westerlund, D. 1995. **Nouveau cultivar d'avoine AC Mustang**. Can. J. Plant Sci. 75: 895–897. AC Mustang est un cultivar d'avoine à deux fins grain-ensilage possédant un fort rendement en grain, une bonne résistance à la verse, un grain bien plein, un poids spécifique élevé et de bonnes qualités agronomiques. Sa cote de précocité le situe entre Cascade et Dumont et son rendement fourrager est supérieur à celui des variétés de référence incluses dans les essais, à l'exception de Foothill. Sa teneur en écale est trop élevée pour la mouture. AC Mustang convient à la région de l'Alberta ainsi qu'aux zones non exposées à la rouille de l'ouest de la Saskatchewan.

Mots clés: *Avena sativa*, avoine (printemps), description de cultivar

AC Mustang is a dual purpose (grain/silage) oat (*Avena sativa* L.) cultivar developed by Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, Alberta. It was registered (Reg. no. 4020) by the Plant Variety Registration Office, Seed Division, Food Production and Inspection Branch, Agriculture and Agri-Food Canada, on 15 December 1994. AC Mustang is recommended for Alberta and western Saskatchewan.

Pedigree and Breeding Method

AC Mustang was selected from a Cascade/Fraser cross made in 1984. The F₁ generation was grown in a greenhouse, and the F₂ through F₆ generations were grown in growth chambers using single-seed descent. Panicle-rows were grown in the F₇ generation and selected for earliness, lodging resistance, test weight and morphological uniformity. Each selected F₇ panicle-row was harvested in bulk. AC Mustang was evaluated as LAO-453-018 in a Preliminary Oat Yield Nursery at three central Alberta locations in 1987, entered into the Advanced Oat Yield Nursery at four Alberta locations in 1988, and has been evaluated in the Alberta Project Oat Test conducted at seven Alberta and two Saskatchewan locations in 1989. In 1990, AC Mustang was assigned the experimental designation OT766 and tested for 3 yr in the Western Cooperative Oat Test. This 16 site test was conducted at the University of Saskatchewan in Saskatoon, at the Alberta Wheat Pool Research sites at Olds

and Bentley, the United Grain Growers Research Farm at Neepawa, and at the Agriculture and Agri-Food Canada Research Centres located in Winnipeg, Brandon, Morden, Swift Current, Regina, Indian Head, Melfort, Scott, Lacombe, Lethbridge, Beaverlodge and Fort Vermillion. End-use quality evaluations were conducted by the Canadian Grain Commission, Grain Research Laboratory, and by the Agriculture and Agri-Food Canada Research Centres in Winnipeg and Saskatoon. Forage yield evaluations were made in replicated forage yield trials conducted at eight Alberta locations including Acme, Breton, Brooks, Lacombe, Mundare, Standard, Vegreville and Fort Vermillion in 1993.

The breeder seed of AC Mustang was developed from a balanced composite sample of approximately 150 F₁₁-derived F₁₃ panicle-row plots. Each panicle-row plot was selected for uniformity and trueness-to-type.

Performance and Adaptation

In 3 yr of testing in the Western Cooperative Oat Test (49 location-years), AC Mustang has out-yielded Dumont and Cascade by 9.7 and 5.8%, respectively for grain yield. AC Mustang is best adapted to the Black and Grey-wooded soils of Alberta and Saskatchewan (Zone 2), and the Brown and Dark-Brown soils of Alberta (Zone 3). In Zone 2, grain yield of AC Mustang was 13.8% more than Dumont, and 7.1% more than Cascade; in Zone 3, it has yielded 10%

Table 1. Grain yield and agronomic characteristics of AC Mustang and check cultivars based on data from the Western Cooperative Oat Test, 1990–1992

Cultivar	Grain yield (t ha ⁻¹)					Days to		Height (cm)	Lodging ^y (1-9)	Test wt. (kg hL ⁻¹)	Kernel wt. (mg)	Percent		
	Zone 1 ^z	Zone 2 ^z	Zone 3 ^z	Irrigation ^z	Mean	mature	head					plump	thin	hull
Dumont	4.10	5.14	5.09	4.41	4.63	95.5	59.8	103	4.5	49.0	34.8	69.3	8.0	24.7
Cascade	4.21	5.46	5.26	4.46	4.80	92.7	60.3	111	2.8	48.4	33.7	62.3	5.5	28.7
AC Mustang	4.33	5.85	5.60	5.03	5.08	94.8	64.0	114	2.6	50.1	34.6	73.1	4.0	30.4
LSD ^x	0.38	0.59	0.45	1.44	0.30	2.9	1.7	5	0.5	1.2	0.8	6.1	1.3	1.0
Station-years	(21)	(10)	(15)	(3)	(49)	(37)	(12)	(47)	(21)	(45)	(26)	(16)	(10)	(13)

^zLocations in Zone 1 (Black Soils of Manitoba and Saskatchewan) included Glenlea, Portage, Morden, Brandon, Neepawa, Indian Head and Melfort; Locations in Zone 2 (Black and Grey Wooded Soils of Alberta) included Bentley, Lacombe, Beaverlodge and Fort Vermillion; Locations in Zone 3 (Brown Soils of Saskatchewan and Alberta) included Regina, Saskatoon, Swift Current, Scott and Acme; The irrigated test was conducted at Lethbridge.

^y1 + no lodging, 9 + completely lodged.

^xLeast significant difference ($P = 0.05$).

Table 2. Silage yield (t ha⁻¹) of AC Mustang and other cultivars based on data from a multi-location trial conducted in 1993

Variety	Acme		Breton		Brooks		Standard		Lacombe		Vegreville		Mundare		Fort Vermillion		Mean		Overall Mean	
	Cut 1 ^z	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	t ha ⁻¹	(% Cascade)
Grizzly	4.71	10.82	4.44	9.98	7.00	13.29	6.37	12.02	9.11	16.73	4.39	8.58	5.93	8.50	1.36	2.73	5.42	10.33	7.88	97.0
Foothill	5.89	12.85	5.66	11.08	8.51	15.65	7.44	12.63	10.21	17.70	5.44	8.75	7.18	9.28	1.62	3.05	6.49	11.37	8.93	110.0
Cascade	5.78	12.17	5.29	10.54	7.59	13.82	6.67	13.14	7.35	14.98	3.82	7.95	6.99	9.36	1.50	3.00	5.62	10.62	8.12	100.0
AC Mustang	5.62	12.55	4.90	10.57	7.70	14.84	7.24	12.77	9.86	16.59	5.41	9.14	6.40	9.94	1.43	2.91	6.07	11.17	8.62	106.2
LSD ^y	1.02	1.07	1.30	0.87	1.33	0.93	1.60	0.02	0.33	0.34	1.13									

^zCut 1 = at panicle emergence; Cut 2 = 2 wk after panicle emergence.

^yLeast significant difference ($P = 0.05$).

Table 3. Disease reactions of AC Mustang and check cultivars based on data from the Western Cooperative Oat Test 1990–1992

Genotype	Smut (%)			BYDV (1-9) ^z			Crown rust ^y			Stem Rust ^x		
	1990	1991	1992	1990	1991	1992	1990	1991	1992	1990	1991	1992
Dumont	0	0	0	6.5	5.2	5.2	OVR	20MS-S	TR-MS	40MR	30MR	30R-MR
Derby	—	—	35	—	—	5.4	—	—	60S	—	—	90S
Calibre	40	45	—	9.0	6.4	—	30S	70S	—	70S	80S	—
Cascade	40	55	30	6.5	6.2	5.3	50S	90S	90S	70S	80S	90S
AC Mustang	20	45	14	8.5	6.1	5.6	60S	45S	90S	70S	80S	90S

^zVirulent *R. padi* non-specific isolate Y8513 (PAV like) was used. Readings were taken at the mid-late dough stage using 1 (very resistant) to 9 (very susceptible) scale.

^yField ratings based on reaction to an artificially inoculated mixture of virulent crown rust races (no. OR192); OVR + over reaction; MS + moderately susceptible; MR = moderately resistant; R + resistant, S = susceptible; TR = trace.

^xField ratings based on reaction to an artificially inoculated mixture of virulent races of stem rust (no. NA26); R = resistant; MR = moderately resistant; S = susceptible.

more than Dumont, and 6.5% more than Cascade (Table 1).

AC Mustang is equal to Cascade and significantly better than Dumont in lodging resistance. It also has higher test weight, higher percentage of plump kernels, and a lower percentage of thin kernels than Cascade and Dumont (Table 1). AC Mustang has demonstrated a higher silage/forage yield potential than Grizzly and Cascade, but lower than Foothill (Table 2). It has high hull content, and will not likely be chosen in preference to other cultivars as a milling oat (Table 1).

AC Mustang is adapted to Alberta and western Saskatchewan. It is not recommended for Manitoba and the rust-prone area of eastern Saskatchewan.

Other Characteristics

SEEDLING CHARACTERISTICS

Coleoptile color. Green.

Hypocotyl. Medium long, no apparent pigmentation.

Juvenile growth habit. Erect.

Seedling leaves. Medium green to dark green in color; lower leaf sheath and lower leaf blades are glabrous (smooth).

ADULT PLANT CHARACTERISTICS

Growth habit. Spring.

Tillering capacity. Intermediate.

Leaves. Dark green; medium long; medium wide; glossy; smooth (glabrous) leaf margins.

Flag leaf. Dark green; glossy; medium wide; medium long; slightly drooping; a ligule is present at the base of the flag leaf.

Upper culm node. Glabrous.

Upper culm internode. Glabrous.

Maturity. Medium late; similar to Calibre; about 2 d later than Cascade; about 1 day earlier than Dumont.

Plant height. Tall; about 3 cm taller than Cascade; about 10 cm taller than Dumont.

Lodging resistance. Very good; similar to Cascade; significantly better than Calibre and Dumont.

PANICLE CHARACTERISTICS

Attitude. Equilateral.

Size. Medium wide; medium long.

Shape. Ovate.

Density. Intermediate.

Panicle branches. **Semi-erect**; medium long; about 5 whorls of branches per panicle; the lower whorl of branches are attached to a false node; very few, short hairs are present on lower panicle nodes.

Rachis. Straight; glabrous.

Rachilla. Medium long; narrow; glabrous.

Rachilla grooves. Shallow.

SPIKELET CHARACTERISTICS

Attitude. Nodding.

Number of florets. 3 or 4.

Spikelet separation. By fracture.

Floret separation. By hectofracture.

Glumes (empty). Broadly lanceolate; pointed; boat shaped; glabrous; medium wide; medium long.

Number of kernels per spikelet. 2 except in some of the terminal spikelets in which 3 kernels may be formed.

KERNEL CHARACTERISTICS

Size. Medium long; medium wide.

Color. White.

Shape. Plump.

Basal hairs. Very few or absent.

Lemma. Glabrous; glossy; medium-long, pointed tip.

Lemma color. White at maturity.

Lemma awns. Very infrequent; when present, the lemma awns may be straight or twisted at the base.

Palea. About the same length as the lemma.

Fluorescence. Light blue under UV light.

Caryopsis. Pubescent; long brush hairs; large and pointed scutellum.

DISEASE REACTION

AC Mustang is similar to Cascade in its reaction to diseases. It is resistant to Victoria blight [caused by *Bipolaris victoricae* (F. Meehan & Murphy) Shoemaker]; moderately resistant to smut [caused by *Ustilago avenae* (Pers.) Rostr., and *U. kolleri* Wille.], moderately susceptible to barley yellow dwarf virus (BYDV), and is susceptible to the oat crown (caused by *Puccinia coronata* Cda. f. sp. *avenae* Eriks.) and the oat stem rust (caused by *P. graminis* Pers. f. sp. *avenae* Eriks & E. Henn.) (Table 3).

Maintenance and Distribution of Pedigreed Seed Stocks

The breeder seed of AC Mustang will be maintained by Agriculture and Agri-Food Canada, Experimental Farm, Indian Head, Saskatchewan. Multiplication and distribution of other classes of pedigreed seed will be handled by Alberta Wheat Pool, Seed Business Unit, 4715 — 65 Street, Camrose, Alberta, Canada T4V 3M5.