

## AEC Hillcrest awned slender wheatgrass

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Darroch, B. A. and Acharya, S. N. 1996. AEC Hillcrest awned slender wheatgrass. *Can. J. Plant Sci.* 76: 345–347. AEC Hillcrest awned slender wheatgrass [*Elymus trachycaulus* subsp. *subsecundus* (Link) Gould] is a reclamation variety developed for use in reclaiming and revegetating disturbed sites in the mountains and foothills of Alberta. It is the first variety of awned slender wheatgrass available in Canada.

**Key words:** Awned wheatgrass, slender wheatgrass, *Elymus trachycaulus*, cultivar description, reclamation

Darroch, B. A. et Acharya, S. N. 1996. Agropyre élané à barbe AEC Hillcrest. *Can. J. Plant Sci.* 76: 345–347. Le cultivar d'agropyre élané AEC Hillcrest [*Elymus trachycaulus* ssp. *subsecundus* (Link) Gould] est une variété sélectionnée pour la restauration et pour le reverdissement des sols perturbés dans les montagnes et les avant-monts de l'Alberta. C'est la première variété de cette graminée à être mise au commerce au Canada.

**Mots clés:** Agropyre barbu, agropyre élané, *Elymus trachycaulus*, description de cultivar, restauration

AEC Hillcrest (AG-299) awned slender wheatgrass [*Elymus trachycaulus* subsp. *subsecundus* (Link) Gould] was released by the Alberta Environmental Centre in 1994 for use in reclaiming and revegetating disturbed sites in the mountains and foothills of Alberta. It is the first variety of awned slender wheatgrass released in Canada and provides

another native grass species for reclamation seed mixes. AEC Hillcrest is well adapted to elevations up to 1800 m and, although it grows well, it may not produce mature seed above this elevation. AEC Hillcrest awned slender wheatgrass is self-pollinated and a short-lived (4–5 yr) perennial when grown at lower elevations in the prairies, like other

**Table 1. Performance of AEC Hillcrest, AEC Highlander, and Revenue slender wheatgrass in small plot trials seeded in 1990 at Columbia Icefields (elevation 1860 m, Jasper National Park, Alberta) and Mountain Park (elevation 1800 m, south of Hinton, Alberta)**

Location	Year harvested	Variety	Percent cover (%)	Seed yield (mg m <sup>-1</sup> )	Plant height (cm)
Columbia Icefields	1993	AEC Hillcrest	10.8	— <sup>z</sup>	— <sup>z</sup>
		AEC Highlander	23.3	—	—
		Revenue	32.5	—	—
		SE <sup>y</sup>	4.7	—	—
Columbia Icefields	1994	AEC Hillcrest	15.8	—	—
		AEC Highlander	45.0	—	—
		Revenue	44.2	—	—
		SE	7.6	—	—
Mountain Park	1993	AEC Hillcrest	49.2	7.2	37.0
		AEC Highlander	39.2	3.3	37.0
		Revenue	50.8	0.0	21.0
		SE	4.1	5.7	3.7
Mountain Park	1994	AEC Hillcrest	87.5	112.3	53.0
		AEC Highlander	82.5	18.7	39.0
		Revenue	89.2	124.8	37.7
		SE	5.4	36.0	4.0
Mean		AEC Hillcrest	40.8	59.8	45.0
		AEC Highlander	47.5	11.0	38.0
		Revenue	54.2	62.4	29.4

<sup>z</sup>No or few flowering heads produced.

<sup>y</sup>Standard error based on 35 degrees of freedom.

**Table 2.** Performance of AEC Hillcrest, AEC Highlander, and Revenue slender wheatgrass in small plot trials at Vegreville (elevation 640 m) and Beaverlodge (elevation 730 m), Alberta

Location	Year		Variety	Seed yield (kg ha <sup>-1</sup> )	Time to maturity (d <sup>2</sup> )	Plant height (cm)
	Seeded	Harvested				
Vegreville	1990	1991	AEC Hillcrest	787	101	95.3
			AEC Highlander	1299	91	94.0
			Revenue	906	106	97.8
			SE <sup>2</sup>	100	0.6	4.0
Vegreville	1990	1992	AEC Hillcrest	419	108	77.1
			AEC Highlander	902	100	81.0
			Revenue	777	111	81.2
			SE	91	1.7	3.1
Vegreville	1991	1992	AEC Hillcrest	747	106	72.8
			AEC Highlander	1321	100	75.2
			Revenue	1242	112	90.5
			SE	118	0.5	2.3
Vegreville	1991	1993	AEC Hillcrest	873	111	100.9
			AEC Highlander	1538	99	96.4
			Revenue	1328	127	122.4
			SE	102	0.0	3.3
Beaverlodge	1990	1991	AEC Hillcrest	919	120	102.1
			AEC Highlander	1415	96	96.8
			Revenue	1102	108	97.8
			SE	75	0.7	3.0
Beaverlodge	1990	1992	AEC Hillcrest	207	113	74.1
			AEC Highlander	398	97	72.8
			Revenue	513	113	90.0
			SE	51	0.0	1.7
Beaverlodge	1991	1992	AEC Hillcrest	340	113	63.4
			AEC Highlander	630	98	66.6
			Revenue	705	113	94.0
			SE	65	0.1	2.2
Beaverlodge	1991	1993	AEC Hillcrest	462	117	80.1
			AEC Highlander	765	104	81.3
			Revenue	564	117	90.0
			SE	41	0.0	4.9
Mean			AEC Hillcrest	594	111	83.2
			AEC Highlander	1034	98	83.0
			Revenue	892	113	95.5

<sup>2</sup>Days from 15 April to maturity.<sup>3</sup>Standard error based on 35 degrees of freedom.

slender wheatgrass varieties (Crowle 1970; Rogler 1973; Darroch and Acharya 1995). At higher elevations, AEC Hillcrest is long-lived and survives for 10 or more years.

AEC Hillcrest was derived from a single plant collected in 1985 from a site (elevation 1800 m) near Hillcrest, Alberta, in the Crowsnest Pass region of southwestern Alberta. It was part of a slender wheatgrass collection from 100 sites in the eastern slopes of the Rocky Mountains. The seed from this plant has been multiplied and tested through successive generations. AEC Hillcrest has been primarily evaluated for seed production at prairie sites, and for growth and vigour at mountain locations. Breeder seed was first bulked in 1989 (in the third generation from collected plants).

Spikes of AEC Hillcrest have long awns with lemma awns 10–30 mm long and glume awns 3–7 mm long whereas

lemmas of AEC Highlander and other slender wheatgrass varieties are awn-tipped (Darroch and Acharya 1995). Culms of AEC Hillcrest plants appear generally bluish-green due to bluish-green leaf sheaths. AEC Hillcrest has a stronger blue colour than AEC Highlander slender wheatgrass. Leaf sheaths are glabrous on upper leaves but pubescent on lower leaves.

### Performance

AEC Hillcrest is a different subspecies of slender wheatgrass to both AEC Highlander and Revenue (*E. trachycaulus* ssp. *trachycaulus*); therefore, it is difficult to make direct comparisons among these varieties. In mountain trials, all three varieties provided similar plant cover (Table 1). However, limited data were available on seed yields because

it takes 3 yr or more of growth before slender wheatgrass begins to produce seed heads at high elevations. At Mountain Park in 1993, AEC Hillcrest produced some seed ( $7.2 \text{ mg m}^{-1}$ ) while Revenue did not produce any ripe seed. In 1994, both AEC Hillcrest and Revenue had similar seed yields although most seed from Revenue was immature. Plant height was greatest for AEC Hillcrest, followed by Revenue and AEC Highlander. AEC Hillcrest matured approximately 2 wk earlier than Revenue, and this is especially important in the short growing seasons at higher elevations. Plants of AEC Hillcrest were often harvested by late August at the mountain locations whereas Revenue plants often did not ripen within the growing season. At low-elevation prairie sites, seed yields of AEC Hillcrest were lower than those of AEC Highlander and Revenue (Table 2) although these differences were not always significant. AEC Hillcrest had a mean seed yield of  $594 \text{ kg ha}^{-1}$  (8 station-years) compared with  $1034 \text{ kg ha}^{-1}$  for AEC Highlander and  $892 \text{ kg ha}^{-1}$  for Revenue. On average, AEC Hillcrest matured 2 d earlier than Revenue and 13 d later than AEC Highlander. In addition, no head smut (*Ustilago bullata* Berk) was observed on AEC Hillcrest while it was observed on plants of Revenue.

### Seed Distribution

Breeder seed of AEC Hillcrest will be maintained by the Alberta Environmental Centre, Vegreville, Alberta. The multiplication and distribution of Foundation and Certified seed will be handled by Peace Valley Seeds, Box 100, Rycroft, Alberta, Canada T0H 3A0.

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