

## Hybrids between meadow and smooth brome grass: a new forage crop for Canada

B.E. Coulman and Y.S.N. Fernandez

*Agriculture and Agri-Food Canada, Saskatoon Research Centre, 107 Science Place, Saskatoon, SK S7N 0X2 Canada, Email: coulmanb@agr.gc.ca*

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**Introduction** Smooth brome grass (*Bromus inermis* Leyss.) has been an important hay grass in the agricultural regions of western Canada for approximately 50 years. Meadow brome grass (*B. riparius* Rehm.) has become the most important pasture species in this region over the last 15 years. It is possible to produce hybrids between these species, which could lead to the development of a type of brome grass which would be useful for both hay and pasture purposes.

**Materials and methods** In 1976 and 1977, three hybrid brome grass populations were created by the late R.P. Knowles by crossing plants of meadow brome grass (cv Fleet and Paddock) and smooth brome grass (cv Signal). By bringing the two species into flower at the same time under a controlled environment and enclosing panicles of the two species in a crossing bag, approximately 20% of the florets of the meadow brome parent developed viable seed. The hybrid plants grown had variable floret fertility, with a mean slightly lower than the parents. Two lines were developed, S9197 and S9073, which were selected over several cycles over a 15 year period for increased vigor, improved floret fertility, improved seed type (no awns or pubescence), reduced creeping habit and fast regrowth. In 1981-82, hybrid plants were backcrossed to smooth brome grass (a reduced creeping line) and seed harvested from the smooth brome parent. This led to the development of S9183 which was selected for uniform plant type, floret fertility and vigour. A line designated S9356, which had increased height, large seed size and reduced creeping habit, was selected out of S9183. These four hybrid lines were extensively evaluated in western Canadian trials from 1995-2002.

**Results and Discussion** In an analysis of the morphology of hybrid plants relative to those of the parental species (Fernandez and Coulman, 2000), the hybrids were found to be intermediate (leaf to stem ratio) or did not differ (tiller height). In other characteristics, hybrid plants more closely resembled meadow brome (leaf area index, leaf pubescence) or smooth brome (tiller density, panicle density, hay dry matter yield and leaf disease incidence). S9356 and S9183 were more "smooth-brome" like in appearance than S9197 and S9073 with wider leaves and fewer basal leaves.

In forage nutritive value, the hybrid populations had consistently lower NDF and ADF than the parental species at a vegetative stage of growth. This suggests that the hybrid has potential as a high quality forage grass for grazing or hay prior to, or at, heading. At anthesis, the hybrids had lower concentrations of crude protein than either of the parental species.

In grazing experiments conducted in two eco-zones of western Canada, beef steers gained more per unit area on S9197 hybrid brome, than on either smooth or meadow brome grass. In simulated grazing studies which measure regrowth after clipping, the hybrids produced more dry matter than smooth brome grass and a similar amount to meadow brome grass.

Hay yield trials including one or more of the hybrid lines were conducted at from six to ten locations in western Canada. The hybrid lines produced more dry matter than meadow brome in all eco-zones. The mean hybrid yields were from 2-6% less than smooth brome grass, but in the drier eco-zones, the yields of the hybrid were similar to, or higher than, smooth brome grass. In the sub-humid climate of eastern Canada, hay yields of the hybrid lines were inferior to both smooth and meadow brome grass.

S9197 hybrid brome grass was released to the Canadian seed industry in 2000 under the name of 'AC Knowles', with certified seed available for planting in spring, 2004. S9356 was released as 'AC Success' in 2003.

**Conclusions** Hybrid brome grass is a new dual purpose (hay and pasture) type of grass available to producers in Canada, with two cultivars having been recently released. Hybrid brome produces hay yield similar to smooth brome grass, with regrowth similar to meadow brome. Grazing experiments have shown higher beef gain ha<sup>-1</sup> for hybrid brome grass than for either of the parental species.

### Reference

Yasas F.S.N. & B.E. Coulman (2000). Characterization of meadow X smooth brome grass hybrid populations using morphological characteristics. *Canadian Journal of Plant Science*, 80, 551-557.