

Winter Hardiness and Seed Yields of
Birdsfoot Trefoil in Roseau, Minnesota

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Birdsfoot trefoil (Lotus corniculatus L.) varieties were seeded in Roseau, MN on May 26, 1978 and on June 9, 1980. They were seeded in 1 x 4 m, 2 row plots at the rate of 2.5 kg/ha in a randomized complete block design with three replications. The 1978 seeding was rated for winter injury on May 8, 1979 and on June 5 1980. The 1980 seeding was rated for winter injury on May 19, 1981. Winter injury was rated on a scale of 1 to 5 with 1 being least injury and 5 being completely winter killed. Seed yields were harvested in August as each variety matured.

The winter of 78-79 provided excellent snow cover. There was very little injury to most birdsfoot trefoil varieties (Table 1). Winter injury in 79-80 was much more severe. 'Kentucky Ecotype', 'Missouri 20', 'Cascade', 'Viking', 'Kalo', 'Vega II', and 'Mansfield' were severely injured. Mansfield was completely winter killed in all replications. Kalo and Vega II were completely winter killed in two out of three replications and Cascade and Viking were completely killed in one replication. 'Mackinaw', 'Carroll', 'Dawn', 'Leo', NC-83 ('Norcen'), and 'Empire' demonstrated good to fair winter hardiness. Even though the 78-79 winter caused much less winter injury, the injury ratings correlated positively and significantly ($\alpha = 0.05$) with the 79-80 winter injury ratings ($r = 0.59$). Winter injury ratings in 1981 ranged from 1.0 for Leo to 5.0 for Vega II. Leo rated as the most winter hardy variety based on the 3 year average. However, Leo was not significantly different ($\alpha = 0.05$) than Carroll, Mackinaw, Norcen, and Dawn. Vega II and Mansfield rated as the least winter hardy.

In 1979 seed yields ranged from 140 kg/ha for Kalo to 400 kg/ha for Fergus. The winter injury was so severe in 1980 that only Mackinaw, Carroll, Dawn, Leo, Norcen, and Empire had enough surviving plants to justify harvesting seed yields. Seed yields in 1981 ranged from 0 kg/ha for the completely winter killed Vega II to 603 kg/ha for Leo.

Table 1. Winter injury ratings in 1979, 1980, 1981, and 3 year average.

VARIETY	WINTER INJURY†§ 1979	WINTER INJURY†§ 1980	WINTER INJURY†§ 1981	3 YEAR AVERAGE WINTER INJURY§
CARROLL	1.0 a	2.2 a	2.0 b	1.7 ab
CASCADE	2.0 b	4.7 de	3.7 de	3.5 ef
DAWN	1.7 ab	2.7 ab	3.0 cd	2.5 abcd
EMPIRE	1.7 ab	3.2 abc	3.3 cde	2.7 cde
FARGO	--	--	3.7 de	--
KALO	2.0 b	4.8 de	2.7 bc	3.2 def
FERGUS	2.0 b	3.7 bcd	2.7 bc	2.8 cde
LEO	1.0 a	2.7 ab	1.0 a	1.6 a
MACKINAW	1.3 ab	2.0 a	2.7 bc	2.0 abc
MANSFIELD	2.1 b	5.0 e	4.0 e	2.7 fg
Mo-20	1.0 a	4.0 cde	2.7 bc	2.6 bcde
NORCEN	1.2 a	3.0 abc	2.0 b	2.1 abc
VEGA II	3.5 c	4.8 de	5.0 f	4.5 g
VIKING	1.3 ab	4.7 de	3.0 cd	3.0 def

† Seeded in 1978

‡ Seeded in 1980

§ 1.0 is least injury and 5.0 is dead, means in each column followed by unlike letters differ significantly at the 0.05 level.

Table 2. Seed yields in 1979, 1980, and 1981

VARIETY	1979 SEED YIELDS [†] (kg/ha)	1980 SEED YIELDS [†] (kg/ha)	1981 [‡] SEED YIELDS [†] (kg/ha)
CARROLL	317 abc	463 ab	443 ab
CASCADE	298 abc	--	205 abc
DAWN	353 ab	373 ab	304 abc
EMPIRE	234 bcd	350 b	177 bc
FARGO	--	--	253 abc
KALO	244 bcd	--	251 abc
FERGUS	401 a	--	369 abc
LEO	346 abc	593 a	603 a
MACKINAW	218 cd	408 ab	205 abc
MANSFIELD	342 abc	--	262 abc
Mo-20	305 abc	--	219 abc
NORCEN	350 ab	388 ab	404 ab
VEGA II	140 d	--	0 c
VIKING	329 abc	--	262 abc

[†]Seeded in 1978

[‡]Seeded in 1980

Means in each column followed by unlike letters differ significantly at the 0.05 level.