



SAINFOIN MAKING A COMEBACK IN 2006

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There is a lot of new interest this winter about sainfoin for hay or pasture. Sainfoin (*Onobrychis viciifolia* Scop.) is an ancient crop originating in Asia and first domesticated in Europe several centuries ago. It is a forage legume adapted to similar regions and uses as alfalfa, however its main advantage is its bloat-free characteristic. A significant amount of sainfoin research and variety development occurred in the Western U.S. and Canada during the 1970's, but the crop was never widely grown. Sainfoin is best adapted to well-drained, calcareous soils in the West, and under these conditions it is competitive with alfalfa in its production and longevity. Under irrigation, high rainfall or in humid areas, the longevity of sainfoin is not equivalent to alfalfa, primarily due to root and crown rot diseases.

Sainfoin is well-adapted to the hay-stockpiling system used by ranchers in Montana and the northern Great Plains. In this system, first-cut hay is harvested, and the resulting aftermath is used for fall grazing. Sainfoin at mid-bloom retains its leaves and nutrient content better than other forage legumes, and first-cut yields of sainfoin are consistently higher than those of alfalfa. Sainfoin is bloat-free due to its levels of condensed tannins, however it is highly palatable to livestock and wildlife. The current interest in sainfoin appears to be due to two factors:

1) Ranchers looking for high-quality pasture mixes to reduce haying. Since the 1970's several producers have used the bloat-free "Cooper Mix" for hay-stockpiling or direct grazing. This seed mix is based on sainfoin, with varying proportions of meadow brome grass, birdsfoot trefoil and/or orchardgrass developed by former ARS scientist C.S. Cooper.

2) Current inexpensive sources of seed that are available that are about 50% of historic prices. The major limitation to the widespread use of sainfoin is its large seed size and resulting high seeding rates and costs. Specifically, sainfoin is planted for pure stands at 30 to 35 pounds of pure live seed (PLS) per acre (23 seeds per square foot) and 40 to 45 pounds PLS on irrigated ground (30 seeds per square foot). At past prices ranging from \$2 to \$3 per pound, this required \$60 to \$135 of seed per acre for a pure stand!

Sainfoin's adaptability and production have been documented in Montana for the past 40 years, and we are encouraging producers to consider it for new hay or pasture plantings. In designed pasture mixes such as the Cooper Mix, it is more economical than ever. Below are some resources to help producers with their decisions:

Seed Source:

One seed grower in Conrad, MT is retailing a product called "Rocky Mountain Remont" for \$1.25 per pound (278-9951). This seed comes from an old certified seed field of Remont. We do not endorse this line or grower in exclusion of others – he just happens to have inexpensive

seed now. Use Remont, Eski or other varieties, and be sure the seed has a recent germination and purity test.

Growing sainfoin (our MSU Extension MontGuide):

<http://www.montana.edu/wwwpb/pubs/mt9321.pdf>

Seed inoculation:

Sainfoin requires a specific *Rhizobium* inoculant for nodulation, and it is not found naturally in many Montana soils. Buy pre-inoculated seed or inoculant to treat before planting.

<http://animalrangeextension.montana.edu/articles/forage/General/LegumeInoculationMTGuide.pdf>

Some recent performance data in MAES trials (attached tables):

Performance data in irrigated trials are shown; similar trials under dryland at Moccasin had low yields (< 0.8 tons per acre) during drought years in 1999 through 2002.

Table 1. 2000 Forage Legume Trial, Bozeman, MT (est. 4/21/2000)

Managed for ideal production under irrigation, and harvested on a 3-cut alfalfa schedule.

	Forage Yield, tons DM/A						
	2000 2-cut Total	2001 3-cut Total	2002 3-cut Total	C1 6/3/2003	C2 8/11/2003	2003 2-cut Total	2000-2003 Total
exp. RDY sainfoin	4.22	8.77	5.62	2.17	2.19	4.36	22.96
Shoshone sainfoin	4.17	8.24	4.86	2.09	2.34	4.43	21.70
Remont sainfoin	3.24	7.88	4.70	2.06	2.27	4.32	20.15
Nova sainfoin	4.15	7.38	4.11	1.66	2.69	4.35	19.99
Eski sainfoin	3.22	7.82	4.87	1.84	1.86	3.70	19.61
Shaw alfalfa	2.82	6.60	5.45	1.68	2.57	4.25	19.11
Forager alfalfa	2.98	6.50	5.55	1.81	2.24	4.05	19.08
Ladak 65 alfalfa	3.02	6.48	5.04	1.93	2.33	4.26	18.80
Empire birdsfoot trefoil	2.29	4.27	3.47	0.64	2.59	3.23	13.24
exp. L2 Syn-1 birdsfoot trefoil	2.37	3.93	3.48	0.76	2.28	3.04	12.82
Tretana birdsfoot trefoil	2.39	3.70	3.64	0.70	2.19	2.89	12.62
Viking birdsfoot trefoil	2.08	4.06	3.70	0.68	2.04	2.73	12.57
Leo birdsfoot trefoil	2.24	3.87	2.67	0.76	1.72	2.48	11.26
Lutana cicer milkvetch	0.98	3.07	2.63	1.33	1.77	3.10	9.78
Windsor cicer milkvetch	0.75	3.07	2.50	1.23	1.60	2.83	9.15
Monarch cicer milkvetch	0.43	2.44	2.52	1.29	1.59	2.88	8.28

Values in **bold** within a column are not statistically different from the highest yield ($P = 0.05$).

Mean	2.58	5.50	4.05	1.42	2.14	3.56	15.70
lsd (0.05)	0.37	0.56	0.63	0.22	0.56	0.66	1.64
CV%	10.1	7.0	10.8	11.0	18.1	12.9	7.3

Species Means

<i>Sainfoin mean</i>	<i>3.80</i>	<i>8.02</i>	<i>4.83</i>	<i>1.97</i>	<i>2.27</i>	<i>4.23</i>	<i>20.88</i>
<i>Alfalfa mean</i>	<i>2.94</i>	<i>6.53</i>	<i>5.35</i>	<i>1.81</i>	<i>2.38</i>	<i>4.19</i>	<i>19.00</i>
<i>Birdsfoot trefoil mean</i>	<i>2.27</i>	<i>3.96</i>	<i>3.39</i>	<i>0.71</i>	<i>2.16</i>	<i>2.87</i>	<i>12.50</i>
<i>Cicer milkvetch mean</i>	<i>0.72</i>	<i>2.86</i>	<i>2.55</i>	<i>1.28</i>	<i>1.66</i>	<i>2.94</i>	<i>9.07</i>

Table 2. 1999 Forage Legume Trial at Kalispell, MT (est. 4/99).

Managed for ideal production under irrigation, and harvested on a 3-cut alfalfa schedule.

	Forage Yield, tons DM/A				
	C1	C2	C3	2002	1999-2002
	6/27/2002	8/1/2002	10/2/2002	3-cut Total	Total
exp. RDWY sainfoin	5.00	2.00	0.50	7.49	25.81
exp. 97-1 sainfoin	4.78	1.82	0.41	7.01	23.30
Remont sainfoin	5.06	1.92	0.44	7.42	23.24
Alfalfa (3 lb)/sainfoin (16 lb)	4.31	2.33	0.74	7.37	22.98
Shoshone sainfoin	4.93	1.57	0.20	6.69	22.56
AC Grazeland alfalfa	4.11	1.95	0.84	6.90	20.74
Alfalfa (3 lb)/sainfoin (8 lb)	3.64	2.12	0.65	6.41	20.19
Ladak 65 alfalfa	4.04	1.63	0.72	6.39	20.11
Windsor cicer milkvetch	5.34	1.11	0.33	6.78	16.93
Monarch cicer milkvetch	4.87	1.07	0.18	6.12	15.76
Lutana cicer milkvetch	4.96	1.02	0.22	6.19	15.72
exp. L2 Syn-1 birdsfoot trefoil	2.51	1.19	0.09	3.78	12.11
Eski sainfoin	2.69	1.00	0.10	3.79	10.99
Tretana birdsfoot trefoil	1.88	0.79	0.09	2.75	9.05
Mean	4.15	1.54	0.39	6.08	18.54
lsd (0.05)	1.04	0.24	0.12	1.15	2.65
CV%	17.6	10.8	20.5	13.2	10.0

Values in **bold** within a column are not statistically different from the highest yield ($P = 0.05$).*Species Means*

<i>Sainfoin mean</i>	4.49	1.66	0.33	6.48	21.18
<i>Alfalfa mean</i>	4.07	1.79	0.78	6.64	20.43
<i>Cicer milkvetch mean</i>	5.05	1.07	0.25	6.36	16.14
<i>Birdsfoot trefoil mean</i>	2.19	0.99	0.09	3.27	10.58