

### Sativa by Falcata Alfalfa Hybrid Variety Trials

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Previous research has demonstrated that alfalfa (*Medicago sativa* L.) subsp. *sativa* by subsp. *falcata* hybrids showed heterosis. Limited work has been done examining these hybrids in a sward situation. The objective of this study was to produce sativa by falcata hybrids using Dairyland Seed Company's msSunstra male sterility system and test hybrid performance in a broad range of production environments. Two improved falcata germplasms, PI643446 and PI643447 (HFAL and IAFAL respectively) (Riday and Brummer, 2007), and three fall dormant male sterile lines (from Dairyland Seed Co.) were used. Six hybrid entries were created. Hybrids were compared to the two parental falcata entries and to three bulk male sterile by sativa hybrid entries. All seed was produced using leaf cutter bees in California under commercial seed production conditions. Check varieties included were 'Genoa', '5454', and 'Vernal.' Stands at most locations were established in 2006 in standard variety trial type plots. Test locations include: Ames, IA; Rosemont, MN; Fargo, ND; Ithaca, NY; Brookings, SD; Clinton, WI; Marshfield, WI; and Prairie du Sac, WI. Plots were harvested during 2006 and 2007. Depending on year, weather, and location stands were harvested from one to five times per year. Overall the sativa by falcata hybrids were equivalent to the sativa by sativa hybrids, with both categories out-yielding the falcata parental population.

Category	Grand Mean	Ames, IA	Brookings, SD	Clinton, WI	Fargo, ND	Ithaca, NY	Marshfield, WI	Prairie du Sac, WI	Rosemont, MN
----- Total Dry Matter Yield over One or Two Years Mg ha <sup>-1</sup> -----									
Sativa by Falcata Hybrids	14.6a	13.5a	6.5a	24.3a	16.4ab	16.4a	17.0a	8.8a	13.5ab
Sativa by Sativa Hybrids	14.6a	13.5a	6.1a	24.4a	16.9a	15.7b	17.2a	9.3a	14.2a
Falcata Populations	13.4b	11.7b	6.7a	22.9b	15.9b	15.7b	14.5b	8.3a	11.1c
'Genoa' - Check	14.2a	13.2ab	6.8a	24.1a	17.1a	15.2b	16.3a	7.7b	13.2b

Significant differences at  $p < 0.05$

We observed variation between locations; with sativa by falcata hybrids out-yielding all other categories at Ithaca, NY. Differences within categories were observed as well. Data collected until this point demonstrates that improved falcata germplasm already available may have potential in commercial plant breeding programs to develop high yielding hybrid alfalfa cultivars.

Riday, H., and E.C. Brummer. 2007. Registration of Two Improved Yellow-Flowered Alfalfa Germplasms. J. Plant Regs. 1:131-133.