MINNESOTA - Best Management Production Input Approach to High Yielding Alfalfa

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A study was initiated in 2013 involving multiple universities evaluating a high input management strategy in glyphosate resistant alfalfa to maximize production. The Fergus Falls site was established in the spring of 2013 under regular field conditions as part of a larger area seeded by the cooperating producer. Treatments include insecticide, fungicide, foliar fertility, and base rate fertility comprised of nitrogen, phosphorous, potassium, and sulfur. Application timing includes all combinations of early spring (3-6" growth), 3-6" second crop regrowth, 3-6" third crop regrowth, and 3-6" fourth crop regrowth. Base fertility program is spring applied on 5x20' plots including four replications. Harvest and quality data was collected with three cuttings in 2013 establishment year and four cuttings in 2014. Glyphosate was applied with base treatments in 2013 following establishment and not deemed necessary since. The same approach is planned for 2015.

Results: There were no significant differences in yield between the eight treatments across the three harvests in 2013. Treatment 7 yield was found to be significantly higher in 2014 and treatment 6 was significantly lower than treatments 7 and 3. It should be noted that weed pressure was initially high with limited insect and disease pressure across the two seasons aside from aphids and common leaf spot prior to 6/21/14 (2nd crop) harvest. The economics of treatments and the net forage return will be calculated at the conclusion of the study and be presented with other participating locations. Partial funding of the project was provided by Monsanto.

Table 1. 2013-14 RR alfalfa input study in Otter Tail County, Fergus Falls, MN

Treatment	NPKS Rate at Planting	Pre 1st Cut at 4th Trifoliate*	Between Cut Treatment *	2013 Total Tons/Ac	2014 Total Tons/Ac
1	100%	Ins	Ins	1.83[a]	4.34[bc]
2	100%	Ins + Fol Fert	Ins + Fol Fert	1.91[a]	4.24[bc]
3	125%	Ins	Ins	1.88[a]	4.46[b]
4	125%	Ins	Ins + Fol Fert	1.82[a]	4.20[bc]
5	125%		Fol Fert	1.78[a]	4.24[bc]
6	100%	Ins	Ins + Fol Fert	1.76[a]	4.11[c]
7	100%	Ins + Fol Fert	Ins + Fol Fert + Fung	1.97[a]	4.81[a]
8	100%	Ins + Fung	Ins + Fol Fert + Fung	1.95[a]	4.29[bc]
LSD (*P*=.05)				-----	0.318

*Ins = Insecticide; Fol Fert = Foliar Fertility; Fung = Fungicide
[a,b,c] Means followed by the same letter do not significantly differ (*P*=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
CV = 6.95 (2013), 4.99 (2014); Treatment Prob(F) = 0.2562 (2013), 0.006 (2014)