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ECONOMIC ASSESSMENT OF STOCKERS GRAZING RYE-RYEGRASS PASTURES AT THREE STOCKING RATES AND THREE LEVELS OF SUPPLEMENT

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Background. Winter pasture costs for stockers have increased in direct proportion to energy-related costs associated with fertilizer and fuel. On non-irrigated small grain plus ryegrass pastures planted on low-to-medium fertility soils, pasture costs may range from $100 to $225/ac depending upon fertilizer N input. As price of cattle increase, it generally becomes more profitable to increase stocking rate to enhance gain per unit land area. With moderate to high-priced cattle, and low to moderate feed costs, use of supplementation to substitute for high-value forage offers management options to increase stocking rates. Objectives of this evaluation were to assess costs and returns per animal and per acre from rye + ryegrass pastures grazed at three stocking rates with stockers receiving three levels of a corn-based supplement. Performance traits were reported in a companion 2006 Field Day Report (Rouquette et al).

Research Findings. Performance, costs, and returns from the stocking rate (SR) x supplementation (SUP) experiment showed the advantages and disadvantages of treatments (Table 1). Using input-sales information for this 2004-2005 period, costs per pound of gain ranged from $0.31 to $0.38/lb on both low (1.5 hd/ac) and medium (2.1 hd/ac) SR regardless of SUP level. On the high SR (3.0 hd/ac), costs per pound of gain were similar at $0.45 and $0.48/lb, respectively, from .4% and .8% BW daily SUP. On the non-SUP, high SR pasture, cost/lb gain was highest at $0.63/lb. When ADG was only 1.12 lbs/da, returns per acre ranged from a loss of $53/ac on high SR, non-SUP pastures, to $252/ac on medium SR plus .8% BW SUP (Table 1). Although a SR of 1.5 hd/ac was a relatively low-risk pasture management option, return/ac was more than doubled to $196/ac by using .4% BW SUP. Additional increases in returns of this magnitude were obtained only by increasing SR to 2.1 hd/ac and using SUP of .4% BW ($219/ac) or .8% BW ($252/ac).

Application. Differential returns per acre among SR and SUP levels allow for economic assessments among treatments (Table 2). For example, on the low SR, non-SUP pasture, an extra $75/ac was realized by increasing SR from 1.5 to 2.1 hd/ac. However, a loss of $132/ac resulted by doubling SR from 1.5 to 3.0 hd/ac on non-SUP pastures. Compared to non-SUP and SR of 3.0 hd/ac, all other treatments resulted in additional income that ranged from $139/ac to $305/ac. Economic returns were increased and often optimized at moderate SR, however, these SR are both site-specific and management-controlled. Increasing SUP to levels that dramatically substitute for forage intake can be economically rewarding with low to modest-priced supplement and moderate to high-priced cattle. Supplement effectiveness and economic returns are dependent upon purchase-selling prices of cattle, supplement costs, supplement:extra gain ratios, delivery method, weight, and body condition of cattle at termination of grazing.

Table 1. Performance, costs, and returns from stockers grazing rye-ryegrass at three stocking rates and three levels of supplemental corn ration. (SUP)

SR (hd/ac)	**1.5**	**2.1**	**3.0**	**1.5**	**2.1**	**3.1**	**1.5**	**2.2**	**3.0**
SUP (% BW)	**0**	**0**	**0**	**0.4**	**0.4**	**0.4**	**0.8**	**0.8**	**0.8**
Days on Pasture	148	148	148	148	148	148	148	148	148
Avg. Daily Gain (lbs/d)	**2.80**	**2.21**	**1.12**	**3.13**	**2.85**	**1.93**	**3.24**	**3.11**	**2.10**
Total Wt. Gain (lbs)	6635	5595	2663	6945	6760	4576	7235	5523	5253
Avg. Initial Wt. (lbs)	577	565	574	566	587	589	584	582	579
Avg. Daily SUP (lb/hd)	0.00	0.00	0.00	2.82	2.80	2.70	5.90	5.94	5.40
Avg. Daily Hay (lb/hd)	1.71	3.87	4.81	1.71	2.76	4.39	1.82	2.85	3.72
Total Revenue ($)	14018	14849	12471	14510	15143	15143	15069	11764	14939
Revenue per Hd ($)	876	873	779	967	946	866	1005	980	879
Revenue per Ac ($)	1314	1834	2384	1451	1988	2685	1507	2157	2636
Value of Gain ($/lb)	0.44	0.58	0.52	0.62	0.57	0.55	0.61	0.60	0.59
Oper. Expen.[1] ($)	13169	13593	12747	12548	13472	13411	13366	10388	14355
Cost per Hd ($)	823	800	797	837	842	838	891	866	844
Cost per Ac ($)	1235	1679	2437	1255	1768	2598	1337	1904	2533
Cost/lb Gain ($/lb)	**0.31**	**0.36**	**0.63**	**0.33**	**0.33**	**0.45**	**0.38**	**0.35**	**0.48**
Net Revenue	849	1255	-276	1962	1671	446	1703	1376	584
Return to Oper. (%)	**6.45**	**9.23**	**-2.17**	**15.64**	**12.41**	**3.33**	**12.74**	**13.25**	**4.07**
Return per Hd ($)	53	74	-17	131	104	28	114	115	34
Return per Ac ($)	**80**	**155**	**-53**	**196**	**219**	**86**	**170**	**252**	**103**
Break-even Wt. (lb/hd)	868	818	757	889	895	846	947	920	852
Break-even Price ($/lb)	0.83	0.89	1.08	0.81	0.84	0.96	0.84	0.83	0.95

[1] Operating expenses include all pasture, supplement, hay, and animal costs.

Table 2. Differential returns per acre among stocking rate (SR) x supplement treatments (SUP).

TRT (SUP-SR)	**0-1.5**	**0-2.1**	**0-3.0**	**.4-1.5**	**.4-2.1**	**.4-3.1**	**.8-1.5**	**.8-2.2**	**.8-3.0**
					$/Ac				
0-1.5	0.00								
0-2.1	75[1]	0.00							
0-3.0	-132	-208	0.00						
.4-1.5	117	41	249	0.00					
.4-2.1	140	64	272	23	0.00				
.4-3.1	7	-69	139	-110	-133	0.00			
.8-1.5	91	15	223	-26	-49	84	0.00		
.8-2.2	173	97	305[2]	56	33	166	82	0.00	
.8-3.0	23	-52	156	-93	-116	17	-67	-149	0.00

[1] If 0-2.1 is compared with 0-1.5, an additional $75/ac was obtained due to stocking rate increase of 1.5 to 2.1 hd/ac.
[2] A total of $305/ac was obtained by decreasing stocking rate from 3.0 to 2.2 hd/ac and supplementing with .8% BW.