

# **Small Grain Forage for Stocker Cattle Production**

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# Small Grain Forage for Stocker Cattle Production

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## Story in Brief

Seventy-two preconditioned, crossbred steers (average BW = 400 lb) were placed on 2-acre pastures containing various small-grain forage from October 23, 2000 until March 20, 2001 at a stocking density of 600 lb beef per acre. The pastures were seeded to 1) Delta King 9027 soft red winter wheat, 2) Elbon rye, 3) Bob Oats, 4) Marshall ryegrass, 5) Delta King 9027 wheat plus Elbon rye, 6) Delta King 9027 wheat plus Marshall ryegrass, 7) Elbon rye plus Marshall ryegrass and 8) Delta King 9027 wheat plus Elbon rye plus Marshall ryegrass. These treatments were replicated three times. Pastures were covered with ice from December 21 until January 24. Steers were fed bermudagrass hay during this period. No differences occurred in average daily gain (ADG), total gain (TG) or gain per acre (G/A) from October until December 19. However, from January 25 until March 20, pastures which contained rye produced significantly ( $P < 0.05$ ) greater ADG, TG and G/A than did those which did not contain rye. Bob oats suffered severe winter kill and could not be grazed from January 25 to March 20. Regrowth of wheat and ryegrass was severely delayed compared to rye. These data suggest that rye is much more winter hardy, especially if ice covered for an extended time, than wheat, oats or ryegrass.

## Introduction

Forage of small grains has been used as pasture for cattle in Arkansas for years. However, small grains have primarily been over seeded in bermudagrass sod during late September and October. Hubbell et al. (2000) seeded soft red winter wheat, rye, oat, ryegrass and combinations of these into a prepared seed bed in September. They observed no differences in average daily gain (ADG), total gain (TG) and gain per acre (G/A) in stocker cattle which grazed pastures of wheat, oats, rye or ryegrass or mixtures of these small grains. Steer performance was excellent with ADG of 2.87 lb, TG of 321 lb and G/A of 475 lb. However, the fall and winter during 1999-2000 was extremely mild. Therefore, the objective of this study was to continue evaluating small grains as forage for stocker cattle production.

## Experimental Procedures

Twenty-four 2-acre pastures were seeded on September 10/11/2000 into a prepared seedbed as follows:

1. 120 lb/acre of Delta King 9207 soft red winter wheat
2. 120 lb/acre of Elbon rye
3. 120 lb/acre of Bob Oat
4. 40 lb/acre of Marshall ryegrass
5. 75 lb/acre of Delta King 9027 wheat plus 75 lb/acre Elbon rye
6. 90 lb/acre of Delta King 9027 wheat plus 20 lb acre Marshall ryegrass

7. 90 lb/acre of Elbon rye plus 20 lb/acre of Marshall ryegrass
8. 75 lb/acre of Delta King 9027 wheat plus 75 lb/acre Elbon rye plus 20 lb/acre of Marshall ryegrass

All pastures were fertilized at seeding according to soil analyses. Seventy-two preconditioned, commercial crossbred steers, averaging 400 lb BW, were placed on their respective pastures at a stocking density of 600 lb beef/acre (1.5 calves/acre) on October 23, 2000. Steers grazed continuously from October 23, 2000 until March 20, 2001 except when pastures were ice covered from December 21, 2000 until January 24, 2001. During this period of time, calves were fed bermudagrass hay plus 2 lb of corn per head per day. All calves were implanted with Ralgro<sup>®</sup> and were fed 2 lb of corn per head per day containing 70 mg/lb monensin. Calves were weighed using a 12-hour shrunk weight, initially and every 28 days thereafter. A commercial trace mineral vitamin salt mixture was fed free choice. The data were analyzed by ANOVA using the GLM procedure of SAS (SAS Inst. Inc., Cary, NC).

## Results and Discussion

There were no differences in ADG, TG or G/A of steers due to forage grazed from October 23, 2000 to December 21, 2000 when the ice storm occurred (Table 1). ADG ranged from 2.43 lb for ryegrass to 2.93 lb for wheat + rye + ryegrass. Total gain ranged from 141 lb to 170 lb for ryegrass and wheat, rye, ryegrass, respectively, and 211 lb to 255 lb of

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G/A for ryegrass and wheat + rye + ryegrass, respectively. Gains were limited from December 19, 2000 to January 24, 2001 when ice covered the forages and calves were fed hay, ranging from 0.54 lb to 1.11 ADG for wheat and rye + ryegrass, respectively. Daily high and low temperatures from December 21, 2000 to January 24, 2001 are given in Table 2. Pastures were ice covered from December 19, 2000 to approximately January 15, 2001 and were too muddy to graze until January 25, 2001. High temperature was 61°F on January 16, 2001, and low temperature was 6°F on December 21, 2000. Calves that grazed pastures containing rye had higher ( $P < 0.05$ ) ADG, TG and G/A than those calves which grazed other small grain forage from January 25, 2001 to March 20, 2001. The combination of consecutive cold days and three consecutive weeks of ice cover caused severe winter kill of oat forage which eliminated grazing from January 25, 2001 to March 20, 2001 and considerable winter kill of wheat forage. Delayed growth of ryegrass also occurred. However, it appeared that rye was not greatly affected by the cold temperature. Average daily gain, TG and G/A for the duration of the study favored steers which grazed pastures

containing rye ( $P < 0.05$ ). Therefore, if grain is not important, it would reduce the risk of winter kill to plant rye or rye in combination with wheat or ryegrass.

## Implications

Rye or rye in combination with wheat and/or ryegrass had little winter kill and produced good gains of stocker cattle during the severe winter. However, oat forage had nearly 100% winter kill, wheat had approximately 50% winter kill and spring growth of ryegrass was delayed considerably due to cold and ice cover. Rye appeared to have minimal winter kill. Therefore, if harvesting of grain is not important, rye should be planted or rye in combination with wheat and/or ryegrass for forage for stocker cattle.

## Literature Cited

Hubbell, D.S. et al. 2000. Arkansas Animal Science Department Report 2000. Arkansas Agri. Expt. Sta. Res. Series. 478:70.

**Table 1. Average daily gain, total gain and gain per acre of calves that grazed small grain pastures during 2000 – 2001.**

Variety	10/23 – 12/20	12/21 – 1/24	1/25 – 3/20	Overall
	ADG, lb <sup>1</sup>			
Oats	2.82	0.59	--	--
Rye + ryegrass	2.74	1.11	1.41 <sup>a</sup>	1.86 <sup>a</sup>
Rye	2.54	0.77	1.90 <sup>a</sup>	1.88 <sup>a</sup>
Ryegrass	2.43	0.88	0.54 <sup>b</sup>	1.36 <sup>b</sup>
Wheat + rye	2.74	0.50	1.71 <sup>a</sup>	1.83 <sup>a</sup>
Wheat + ryegrass	2.72	0.65	0.58 <sup>b</sup>	1.44 <sup>b</sup>
Wheat + rye + ryegrass	2.93	0.51	1.55 <sup>a</sup>	1.85 <sup>a</sup>
Wheat	2.92	0.54	0.62 <sup>b</sup>	1.51 <sup>b</sup>
SE	0.20	0.20	0.22	0.09
	Total gain/steer, lb <sup>1</sup>			
Oats	163.33	20.56	--	--
Rye + ryegrass	159.06	38.89	77.51 <sup>a</sup>	275.53 <sup>a</sup>
Rye	147.33	26.78	104.44 <sup>a</sup>	278.56 <sup>a</sup>
Ryegrass	140.67	30.67	29.78 <sup>b</sup>	201.11 <sup>b</sup>
Wheat + rye	158.78	17.33	94.00 <sup>a</sup>	270.11 <sup>a</sup>
Wheat + ryegrass	157.89	22.67	32.11 <sup>b</sup>	212.67 <sup>b</sup>
Wheat + rye + ryegrass	170.11	17.89	85.33 <sup>a</sup>	273.33 <sup>a</sup>
Wheat	169.44	19.00	34.33 <sup>b</sup>	222.78 <sup>b</sup>
SE	11.62	6.96	11.88	13.68
	Gain/acre, lb <sup>1</sup>			
Oats	245.00	30.83	--	--
Rye + ryegrass	238.33	56.67	112.33 <sup>a</sup>	407.33 <sup>a</sup>
Rye	221.00	40.17	156.67 <sup>a</sup>	417.83 <sup>a</sup>
Ryegrass	211.00	46.00	44.67 <sup>b</sup>	301.67 <sup>b</sup>
Wheat + rye	238.17	26.00	141.00 <sup>a</sup>	405.17 <sup>a</sup>
Wheat + ryegrass	236.83	34.00	48.17 <sup>b</sup>	319.00 <sup>b</sup>
Wheat + rye + ryegrass	255.17	26.83	128.00 <sup>a</sup>	410.00 <sup>a</sup>
Wheat	254.17	28.50	51.50 <sup>b</sup>	334.17 <sup>b</sup>
SE	17.37	10.32	17.88	18.84

<sup>a,b</sup>Means in a column within trait with different letters differ ( $P < 0.05$ ).

**Table 2. Daily high and low temperatures for December 19, 2000  
to January 24, 2001.**

Date	High	-°F-	Low
December			
19			
31			
10			
20	31		10
21	33		24
22	31		6
23	37		12
24	35		19
25	33		17
26	29		21
27	33		28
28	35		21
29	36		18
30	31		16
31	28		12
January			
1	27		16
2	32		7
3	27		10
4	50		24
5	55		35
6	61		27
7	53		34
8	49		33
9	43		24
10	49		19
11	42		32
12	42		33
13	43		36
14	54		40
15	53		29
16	50		29
17	43		31
18	39		33
19	39		31
20	39		19
21	44		17
22	55		23
23	52		29
24	51		33
Average	41.2		23.4