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Agriculture and Natural Resources

Stocker Cattle and Soft Red Winter Wheat Production Systems

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Introduction

The number of farms in the United States is declining because of a lack of net income. Survival of the family farm depends on obtaining maximum net income from the land while maintaining its sustainability and protecting the environment. Production systems that integrate stocker cattle production with the production of soft red winter wheat may have merit in Arkansas. Arkansas leads the nation in the production of soft red winter wheat, producing over 45,000,000 bushels of grain annually from about one million acres.

The production of stocker cattle from grazing soft red winter wheat in Arkansas is a unique and economical renewable resource. Income is derived from both grain and the increased value that is added as weight gain to growing cattle that grazed winter wheat. Grazing soft red winter wheat in Arkansas may offer an alternative source of net income to wheat and/or cattle producers. Therefore, this fact sheet will discuss production systems involving stocker cattle and soft red winter wheat.

Wheat Pasture Management

If necessary, pastures should be treated with Roundup® three times with 1/3 gallon per treatment per acre during the summer or clean tilled to kill the existing vegetation. After killing the vegetation, till pastures to prepare a seedbed. Pastures should be fertilized each year according to soil test analyses for wheat grain production by broadcasting with ground equipment before seeding of wheat.

Seed pastures in early September with soft red winter wheat (Hickory, Jaypee, Delta King 9027, Pioneer 2580, Coker 9943 or other cultivar) at recommended seeding rate. It is not necessary to add nitrogen at the time of seed emergence. However, add nitrogen in February or as needed based on a soil test.

Cattle Management

Pre-conditioned feeder cattle weighing 400 to 500 pounds should be used to graze the wheat pasture. Vaccinate calves with a 7-way blackleg, tetanus, modified live IBR-BVD-PI3-BRSV and deworm or consult a veterinarian about vaccination protocol. Bulls should be castrated and horns tipped. Booster vaccines should be given 14 days after initial vaccinations. Growth implants should be used according to labeled instructions. Feed 2 pounds of corn containing 75 mg of ionophore per pound per steer per day plus hay as needed. Provide a mineral and vitamin supplement free choice. Graze cattle only when two to eight tillers are detected, and remove cattle when the group averages approximately 750 pounds.

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Cattle Performance Grazing Soft Red Winter Wheat (October Through February)

The ADG, total gain and gain per acre as influenced by cultivars of soft red winter wheat are given in Table 1. Steers grazing Jaypee had greater ADG, total gain and gain per acre than steers grazing Hickory. Jaypee may produce more total forage than Hickory during mild environmental temperatures.

Table 1. The effects of cultivar on average daily gain (ADG), total gain and gain per acre of steers that grazed soft red winter wheat during October through February.

Cultivars	Days	ADG	Total Gain	Gain Per Acre
			lb	
Hickory	109	2.24	247	302
Jaypee	109	2.42	264	325

Stocking Density (October Through February)

The effects of stocking density on ADG, total gain and gain per acre of steers that grazed soft red winter wheat during October through February are given in Table 2. Average daily gain was greater for steers that grazed soft red winter wheat from October through February at a stocking density of 500 pounds of beef per acre than in those steers that grazed soft red winter wheat with a stocking density of 750 pounds of beef per acre. This difference in ADG was probably due to forage availability, since more grazing pressure occurred in pastures with the higher stocking density.

Table 2. The effects of stocking density on ADG, total gain and gain per acre of steers that grazed soft red winter wheat during October through February.

Stocking Density	Days	ADG	Total Gain	Gain Per Acre
			lb	
500 lb beef/acre	109	2.49	272	272
750 lb beef/acre	109	2.18	236	355

Steers that grazed soft red winter wheat with a stocking density of 500 pounds of beef per acre had greater total gain than steers that grazed wheat pastures with a stocking density of 750 pounds of beef per acre. The higher total gain value was due to higher ADG of steers having the lower stocking density.

Steers that grazed soft red winter wheat stocked at a density of 750 pounds of beef per acre produced more gain per acre than steers at a stocking density of 500 pounds of beef per acre even though they had lower ADG (2.18 vs. 2.49 pounds). Steers stocked at a density of 750 pounds of beef per acre gained 355 pounds per acre as compared to 272 pounds of beef per acre.

Cattle Performance Grazing Soft Red Winter Wheat (March and April)

Weather conditions can directly affect cattle grazing winter wheat during March and April (Table 3). During Year 1, steers had greater ADG and total gain and produced more beef per acre than steers in Year 2. This was due to differences in forage quality and availability. February and the first three weeks of March in Year 2 were very dry, resulting in reduced forage growth. In addition, the temperature was warmer during February and March, resulting in earlier maturity of the wheat during Year 2 than during Year 1. There were no differences in ADG, total gain and gain per acre of steers due to cultivar of soft red winter wheat.

Table 3. The effect of year on ADG, total gain and gain per acre of steers that grazed soft red winter wheat during March and April during two years.

Year	Days	ADG	Total Gain	Gain Per Acre
			lb	
Year 1	44	3.17	139	176
Year 2	42	2.09	87	104

The effects of stocking density on ADG, total gain and gain per acre of steers that grazed soft red winter wheat during March and April are shown in Table 4. Average daily gain and total gain of steers stocked at a density of 500 pounds of beef per acre were greater than for the steers stocked at 750 pounds of beef per acre.

Table 4. The effect of stocking density on ADG, total gain and gain per acre of steers that grazed soft red winter wheat during March and April during two years.

Stocking Density	Days	ADG	Total Gain	Gain Per Acre
			lb	
500 lb beef/acre	43	2.75	119	119
750 lb beef/acre	43	2.49	107	160

Wheat Grain Yields

Higher grain yield is usually observed when wheat is grazed than when it is not grazed. When wheat is planted in early September, it tends to joint early in the spring. If freezing occurs during the early spring, grain fill is affected. Ungrazed wheat can contain a large number of blank heads. Thus, if wheat is planted in early September, grazing enhances grain yields.

There usually is no reduction in wheat grain yield when cattle are removed by first hollow stem of ungrazed wheat or little if any reduction in wheat grain yield when cattle are removed from grazing of first jointing in ungrazed wheat.

Grain yields are usually greater at lower stocking density than at higher stocking densities (Table 5). This reduction of grain yields at the higher stocking density is probably due to slower recovery of the wheat plants in the spring. Tillering also may be reduced. Wheat grazed with higher stocking densities may be overgrazed, and the spring recovery is not sufficient to produce maximum yields compared to those of wheat stocked at the lower density.

Table 5. Wheat grain yields as influenced by stocking density when wheat was ungrazed, cattle removed at first hollow stem in ungrazed wheat or at first jointing in ungrazed wheat.

	Stock Density	
Time of Grazing	**500/acre**	**750/acre**
	- - - - - - (bu/acre) - - - - - -	
Ungrazed	27.7	19.3
First hollow stem	47.0	35.0
Jointing	44.8	36.8

Economics

Average grain production costs per acre for soft red wheat cultivars are presented in Table 6. These costs include soil preparation, seeding, fertilization, seed cost, chemicals, harvesting and hauling. Total cost of production ranged between $151.17 and $147.93 per acre. The difference was the cost of seed. These production costs per acre of wheat are similar to the cost of production per acre of soft red winter wheat grown for grain by the average wheat farmer in Arkansas.

The production costs per acre, excluding forage costs, for production of stocker cattle that grazed soft red winter wheat from October through February are shown in Table 7. Costs of labor and maintenance for the production of stocker cattle were $39.63 and $53.87 for stocking densities of 500 and 750 per acre, respectively. If transportation cost of shipping cattle to the feedlot is included, an additional cost of $15.00 and $22.50 per acre for stocking densities of 500 and 750 pounds per acre, respectively, is added making the total cost of $54.63 and $76.37 per acre for stocking densities of 500 and 750 pounds of beef per acre, respectively.

Table 6. Average cost of production of soft red winter wheat for grain.

Labor and Operating Cost	
Disking	14.29
Fertilizer spreading	5.18
Grain drilling	8.11
Spraying	2.80
Rolling	4.26
Round-up	5.40
Wheat seed	15.96 to19.20
Lime	11.60
Fertilizer	22.50
Subtotal	90.10 to 93.34
Spring urea	27.17
Fertilizer spreading	2.59
Custom combining	21.32
Custom hauling	6.75
Subtotal	57.83
Total	**$147.93 to $151.17**

Table 7. Average cost for feed and maintenance of stocker cattle that grazed wheat having a stocking density of 500 and 750 lb beef per acre during October through February.

	Stocking Density	
Expenses	**500/acre**	**750/acre**
	- - - - - - $/acre) - - - - - -	
Electric fence	5.00	5.00
Corn	15.75	23.66
Hay	4.48	6.72
Labor	3.20	3.20
Water	3.02	3.02
Minerals and Ionophore	4.90	7.35
Vet and medical	3.28	4.92
Subtotal	39.63	53.87
Hauling to feedlot	15.00	22.50
Total	$54.63	$76.37

Economic analysis of stocker cattle production when soft red winter wheat was grazed from October through February is shown in Table 8. Income over the cost of forage and non-forage expenses per acre for stocker cattle ranged from $69.03 to $103.30, depending on cultivar of wheat and the stocking density of cattle. Average income over expenses per acre was $87.83 and $86.10 for Hickory and Jaypee, respectively. Average income above expenses for cattle having a stocking density of 500 and 750 pounds per acre was $70.60 and $103.23, respectively. Income over expenses per head averaged $70.52 and $68.90 for Hickory and Jaypee, respectively, whereas it was $70.60 and $68.82 for stocking densities of 500 and 750 pounds per acre. Cost per pound of gain averaged $0.50 and $0.49 for Hickory and Jaypee, respectively, and $0.52 and $0.47 for stocking densities of 500 and 750 pounds of beef per acre.

Returns over expenses of wheat grain production are shown in Table 9. Since there were no significant differences in wheat grain yield due to time the cattle were removed from the wheat and wheat yields were essentially state average (45 bushels per acre), 45 bushels per acre of wheat grain with a selling price of $3.50 per acre were used in this economic scenario. Income over expenses per acre when all expenses were charged to grain was $6.33 for Hickory and $9.57 for Jaypee. If one received $4.00 per bushel for wheat grain, income over expenses would have been $28.83 and $32.07 for Hickory and Jaypee, respectively. If average wheat grain yields were increased to 55 pounds per acre, income over expenses would have been $41.33 and $44.56 for Hickory and Jaypee, respectively. If average wheat grain yield were

Table 8. Economic analysis of cattle production while grazing soft red winter wheat during October through February, based on $75/cwt selling price of cattle.

	Hickory		Jaypee	
Stocking Density	**500 lb/acre**	**750 lb/acre**	**500 lb/acre**	**750 lb/acre**
Economic Parameters				
Total gain, lb/acre	308.00	378.50	299.50	374.00
Return, $/acre	231.00	283.88	224.63	280.50
Total non-forage cost, $/acre	54.63	76.37	54.63	76.37
Return, $/acre	176.37	207.51	170.00	204.13
Forage cost, $/acre	104.21	104.21	100.97	100.97
Income over expenses, $/acre	72.16	103.30	69.03	103.16
Income over expenses, $/head	72.16	68.87	69.03	68.77
Cost per lb gain, $/pound	0.52	0.48	0.52	0.47

Table 9. Economic analysis of soft red winter wheat that was grazed by stocker cattle from October through February and harvested for grain based on $3.50/bu selling price of wheat grain and assuming all production costs were for grain.

	Hickory		Jaypee	
Stocking Density	**500 lb/acre**	**750 lb/acre**	**500 lb/acre**	**750 lb/acre**
Economic Parameters				
Wheat grain yield, bu/acre	45	45	45	45
Cost of production, $/acre	151.17	151.17	147.93	147.93
Income, $/acre	157.50	157.50	157.50	157.50
Income over expenses $/acre	6.33	6.33	9.57	9.57

increased to 55 bushels per acre, income over expenses would have been $41.33 and $44.57 for Hickory and Jaypee, respectively, when selling price was $3.50 per bushel and $68.83 and $72.07 when the selling price of wheat was $4.00 per bushel. Therefore, there is a good potential of making money from stocker cattle when wheat grown for grain is grazed.

Conclusions

Soft red winter wheat produces forage of exceptionally high quality for stocker cattle when planted on a prepared seed bed in early September and grazed from October through April. Average daily gains of stocker cattle are approximately 2.5 pounds while grazing soft red winter wheat during this period. Grazing of wheat does not reduce grain yields if cattle are removed by first jointing of ungrazed wheat.

More net profit occurred when wheat was grazed from October until March 1 and then wheat grain harvested in June ($134.20 per acre) when compared to grazing from October through April ($30.80 per acre). Wheat farmers in Arkansas should consider planting wheat in early September, grazing it with stocker cattle and then harvesting wheat grain. Depending on the relative buying and selling price of the stocker calves, the income from the cattle will more than pay for the production of wheat grain. Therefore, net profit per acre may be increased.

With over one million stocker cattle available in Arkansas and surrounding states, Arkansas agricultural income could be increased by approximately $25 million from stocker cattle production. Utilization of soft red winter wheat by stocker cattle has great potential in Arkansas and surrounding states.

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