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Effect of EAZI-BREED CIDR on reproductive efficiency in seasonally anestrous mated ewes (Year 3)

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Effect of EAZI-BREED CIDR on reproductive efficiency in seasonally anestrous mated ewes (Year 2)

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BACKGROUND

Improving flock reproductive efficiency and management through eliciting estrus in seasonally anestrous ewes is a high priority in intensively managed commercial sheep operations and for the industry's 2 Plus initiative. The commercial progesterone intravaginal device, EAZI-BREED CIDR (controlled internal drug release device), provides a new technology to the sheep industry for induction of estrus in ewes during seasonal anestrous.

Previous work conducted with seasonally anestrous ewes receiving exogenous progesterone treatment of 5 to 14 d resulted in synchronized estrus activity. Studies conducted to gain US approval for the EAZI-BREED CIDR demonstrated that a 5 d insertion period succeeded in synchronized estrus activity for seasonally anestrous ewes.

The sheep EAZI-BREED CIDR was developed in New Zealand during the late 1980's and is simple to apply and has proven efficacy. Implementing the sheep CIDR technology to intensive management systems has the potential to enhance overall flock management, and ease facility and labor requirements. The US sheep industry "2 Plus initiative" goals include improved flock efficiencies and to attract new sheep producers. This technology has the potential to positively impact these goals.

OBJECTIVES

To demonstrate the use of the EAZI-BREED CIDR in ewe reproductive management, and evaluate the effect of EAZI-BREED CIDR insertion period of 6 or 12 d on reproductive efficiency in seasonally anestrous ewes in the Upper Midwest.

MATERIALS AND METHODS

A study was conducted at the South Dakota State University Sheep Unit with one-hundred fifty-three Polypay or Hampshire sired ewes that were randomly allocated to CIDR treatment by age and body weight. Treatments were control (no CIDR), 6 d and 12 d with or without ram exposure during CIDR insertion period. All ewes received an intravaginal EAZI-BREED CIDR (0.3 mg progesterone) on May 4, 2011. Animals were held in separate treatment group pens until CIDR removal; control ewes were commingled with the 6 d ewes at the time of CIDR removal. Both 12 d treatment groups were joined with the control and 6 d ewes at CIDR removal. Treatment groups were exposed to fertile yearling and mature rams, Polypay and Hampshire,

according to study protocol using a ewe to ram ratio of 8:1 for 30 d. Each ram was fitted with a breeding harness to facilitate the recording of mating (estrus) activity with treatment ewes individually identified with duplicate permanent ear tags. Ewe fertility (lambing success or failure) and prolificacy were recorded at lambing in the fall of 2011.

Difference in CIDR retention and reproductive performance including estrus activity and ewe fertility and performance data resulting from treatment were separated by chi-square analysis.

RESULTS AND DISCUSSION

Data found in Table 1 represents CIDR retention, estrous activity and reproductive performance data for mature ewe response to treatment (n = 112). There were 2010 fall born ewe (n = 41) lambs distributed across treatments however none demonstrated estrus activity subsequently they were removed from further analysis and discussion. CIDR insertion period resulted in similar level of retention, estrous activity, ewe fertility and lambs born per ewe lambing. Overall the percentage of CIDR retention was 85%. There were no treatment differences for this parameter in the study but the retention rate was below our previously reported level at 91%. Ewes that failed to retain CIDR were removed from the analysis of estrous activity and reproductive performance.

Estrous activity (1st service) was different ($P < 0.01$) when comparing all treatments and for CIDR treatments only ($P = 0.05$). For the 1st service period, CIDR treatment resulted in estrous activity in 94% of the ewes compared to 50% for control ewes. Comparing within CIDR treatment groups there was an exceptional rate of response with nearly all ewes in the 6 d and 12 d CIDR groups exhibiting estrous activity however the lowest response (84.6%) was observed with the 12 d CIDR w/ram.

Also in Table 1 the observed estrous activity is also reported by service period: 1st or 2nd only, both (1st and 2nd) and neither (no marks). In the 1st service period only there was a difference ($P < 0.01$) in estrous activity. The overall response rate was 81.7% with the control ewes at 27.8%, a tendency was shown ($P < 0.07$) for CIDR treatment. In the 2nd service period the CIDR treatment groups had just 1 ewe, or 1.2%, recorded for estrous activity compared to control with 3 ewes, or 16.7% ($P = 0.02$). Estrous activity to CIDR treatment in both service periods was 12% (n = 10) with only 1 ewe observed with the 6 d treatment ($P = 0.18$). Less than 5% of the CIDR treatment ewes failed to demonstrate estrous activity in neither period during the study ($P = 0.14$). The control group had the highest proportion of neither (non-marked ewes) at 33% (n = 6). Based on data collected in this study CIDR treatment resulted in a high proportion of ewes demonstrating estrous activity in the 1st service opportunity with a relatively low number of ewes repeating an estrous cycle in the 2nd service period. The number of ewes marked in both service periods was lower than an SDSU study reported in 2011 and in studies reported by other investigators with 2nd service observations at approximately 25%.

Ewe fertility was similar ($P = 0.52$) for all treatments although the control ewes at 50% were numerically lower than for CIDR treatment at 68.3%. CIDR treatment did not affect ewe fertility ($P = 0.97$). The results with CIDR treatment are similar to a previous SDSU study with 6 d and 12 d CIDR insertion resulting in ewe fertility at 71%. Other studies using various progesterone

based protocols to induce estrus in seasonally anestrous ewes report lower or a similar level of ewe fertility. In the current study the lambing rate per lambing resulting from CIDR treatment was similar (P = 0.90), 1.55 for 6 d, 1.55 for 12 d and 1.44 for 12 d w/ram, respectively. Although no differences (P = 0.36) in lambing rate was found comparing all treatments the control group lambing rate was 200%. Mature ewe age and body weight were similar across treatments.

Table 1. CIDR retention and reproductive performance of seasonally anestrous ewes treated with the EAZI-BREED sheep CIDR for 6 d, 12 d and 12 d w/ram

	Control	6-d	12-d	12 d w/ram	CIDR Trts	Chi-sq All Trt	Chi-sq CIDR Trt
Number of ewes	18	33	32	32	97		
CIDR lost	NA	7	2	6	15 (15.5%)	NA	
Retention		26 (78.8%)	30 (93.8%)	26 (81.3)	82 (84.5%)	NA	P = 0.20
Estrous activity							
1st service	9 (50%)	26 (100%)	29 (96.7%)	22 (84.6%)	77 (93.9%)	P < 0.01	P = 0.05
1st only	5 (27.8%)	25 (96.1%)	23 (76.7%)	19 (73.1%)	67 (81.7%)	P < 0.01	P = 0.07
2nd only	3 (16.7%)	0 (0%)	0 (0%)	1 (3.9%)	1 (1.2%)	P = 0.02	P = 0.33
Both	4 (22.2%)	1 (3.9%)	6 (20.7%)	3 (11.5%)	10 (12.2%)	P = 0.23	P = 0.18
Neither	6 (33%)	0 (0%)	1 (3.3%)	3 (11.5%)	4 (4.8%)	P = 0.02	P = 0.14
Ewe fertility	9 (50%)	18 (69.2)	20 (66.7%)	18 (69.2%)	65 (68.3%)	P = 0.52	P = 0.97
Prolificacy	200%	155%	155%	144%	158%	P = 0.36	P = 0.90