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

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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 6 d, 9 d, or 12 d insertion of the EAZI-BREED CIDR on seasonally anestrous ewes in the Upper Midwest.

## MATERIALS AND METHODS

A study conducted at the South Dakota State University Sheep Unit consisting of 60 mature Polypay or Hampshire sired ewes were randomly allocated to one of four treatments by age and genotype. Treatments for the study were control (no CIDR), 6 d, 9 d, and 12 d insertion periods. Ewes designated to CIDR insertion received an intravaginal EAZI-BREED CIDR (0.3 mg progesterone) on April 27, 2012. Ewes were housed in a single drylot pen with shelter during the ram exposure portion of the trial; exposure began on May 3 following CIDR withdrawal from the 6 d treatment group and remained joined with the flock for 30 days. Four fertile yearling and mature rams, Polypay and Hampshire, joined the flock providing a ewe to ram ratio of 7.5:1. The ratio is based on 30 ewes, control (n = 15) and a CIDR treatment (n = 15) group, the maximum

number expected to demonstrate estrus activity during any period of the trial. Rams were fitted with a breeding harness to facilitate the recording of mating (estrus) activity with ewes individually identified with duplicate permanent ear tags. Ewe fertility (lambing success or failure) and prolificacy were recorded at time of parturition in the fall of 2012.

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

## RESULTS AND DISCUSSION

Results reported in Table 1 include the CIDR retention, estrus activity, and prolificacy (lambs born per ewe lambing) data for ewe response to treatment. CIDR retention was 93% with no difference detected for days of CIDR insertion. In our previous CIDR studies retention levels were even lower, 85 to 91%, yet there too no differences were found due to treatment. Other investigators that have studied CIDR use in ewe reproductive management report 95% retention success. In the current study ewes (n = 3) that failed to retain the CIDR were removed from the analysis of estrus activity and reproductive performance.

Estrus activity ($1^{st}$ service) was different ($P < 0.01$) when compared across all treatments. The observed control group estrus activity was 40% compared to 95% for CIDR treatment groups over the $1^{st}$ 15 days of the trial. No difference in estrus activity was found for CIDR treatment. For the ewes that retained the CIDR during the trial (n = 42) only 2 ewes did not mark to a ram.

Other findings reported on estrus activity found in Table 1 include data analyzed by service period $1^{st}$ or $2^{nd}$ only, both ($1^{st}$ and $2^{nd}$) , or neither (no marks). CIDR treatment did affect ($P = 0.03$) the proportion of ewes that mated following CIDR withdrawal, $1^{st}$ only, and a tendency ($P = 0.06$) for ewes marked by rams in both service opportunities in this trial. Over 90% of the ewes in the 9 d group marked on the $1^{st}$ service where for the 6 d and 12 d treatment ewes approximately 50% marked on the $1^{st}$ only and at least 33% marked in both service opportunities. Despite these observations on estrus activity there were no differences ($P = 0.35$) on ewe fertility. For the ewes in CIDR treatment groups only 3 of 42 ewes, or 7.1%, failed to lamb in the fall of 2012. The observations for estrus activity of the control ewes, ram exposure without exogenous hormone treatment, are consistent with expectations from the “ram effect”. The percentage of control ewes lambing (46%) were similar to past reproductive performance with the same genotype and exposure protocol. Despite the variability in ewe prolificacy, ranging from 1.3 to 1.6 lambs born per ewe lambing, there were no difference when compared across all treatments ($P = 0.72$) or CIDR treatment ($P = 0.58$).

Table 1. CIDR retention and reproductive performance of seasonally anestrous ewes treated with the EAZI-BREED sheep CIDR for 6 d, 9 d and 12 d

| | Control | 6-d | 9-d | 12 d | CIDR Trts | Chi- sq All Trt | Chi-sq CIDR Trt |
|---|---|---|---|---|---|---|---|
| Number of Ewes | 15 | 15 | 15 | 15 | 45 | | |
| CIDR Lost | NA | 0 | 2 | 1 | 3 | | |
| Retention | | 15 (100%) | 13 (86.7%) | 14 (93.3%) | 42 (93.3%) | NA | P = 0.34 |
| Estrous Activity | n = 15 | n = 15 | n = 13 | n = 14 | n = 42 | n = 57 | |
| 1st Service | 6 (40.0)% | 14 (93.3%) | 13 (100%) | 13 (92.9%) | 40 (95.2%) | P < 0.01 | P = 0.62 |
| 1st Only | 1 (6.7%) | 9 (60.0%) | 12 (92.3%) | 6 (42.9%) | 27 (64.3 %) | P < 0.01 | P = 0.03 |
| 2nd Only | 5 (33.3%) | 0 (0%) | 0 (0%) | 1 (7.1%) | 1 (2.4%) | P < 0.01 | P = 0.36 |
| Both | 5 (33.3%) | 5 (33.3%) | 1 (7.7%) | 7 (50.0%) | 13 (31.0%) | P = 0.13 | P = 0.06 |
| Neither | 4 (26.7%) | 1 (6.7%) | 0 (0%) | 0 (0%) | 1 (2.4%) | P = 0.04 | P = 0.40 |
| Ewe Fertility | 7 (46.7%) | 14 (93.3%) | 13 (100%) | 12 (85.7%) | 39 (92.9%) | P < 0.01 | P = 0.35 |
| Prolificacy (%) | 128.6 | 128.5 | 161.5 | 141.7 | 143.1 | P = 0.72 | P = 0.58 |