NebGuide

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Research-Based Information That You Can Use

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Utilizing EAZI-BREED™ CIDR® Inserts for Estrous Synchronization in Sheep

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Using intravaginal progesterone inserts (EAZI-BREED™ CIDR®) to synchronize estrous cycles in ewes is a cost-effective management strategy that allows producers to shorten lambing seasons, breed sheep out-of-season, and utilize artificial insemination and other advanced reproductive technologies to add value to their flocks.

Introduction

Since their approval by the US Food and Drug Administration in 2009, EAZI-BREED™ CIDR® (controlled internal drug release) inserts (Fig. 1) have been commonly utilized by the sheep industry to manage reproductive cyclicity. In mature ewes, they can be used to synchronize the 17-day estrous cycles (i.e., cyclicity) across the flock or to induce estrus (i.e., standing heat) out of season. Ewes of most sheep breeds are seasonal breeders that are only reproductively competent (cycling/ovulating) in the fall season, when day length is decreasing. In the spring season, when day length is increasing, ewes are typically non-cyclic, and thus do not exhibit estrus or ovulate. This limits marketing opportunities for sheep producers, as the reproductive seasonality of their animals determines when they breed and, in turn, when they lamb and when their offspring are of proper market size. However, the use of EAZI-BREED™ CIDR® inserts provides producers a method to breed sheep outside of their normal breeding season.

Figure 1. EAZI-BREED™ CIDR® for Sheep insert label.

By inducing cyclicity in pubertal females, the inserts provide the opportunity for ewes to be reproductively competent in the spring or summer months when they would normally be anestrous (i.e., non-cyclic). EAZI-BREED™ CIDR® inserts also provide producers a method for synchronizing the estrous cycles of the ewes in their flocks, thus shortening breeding and lambing seasons to allow more efficient utilization of labor and nutritional resources.

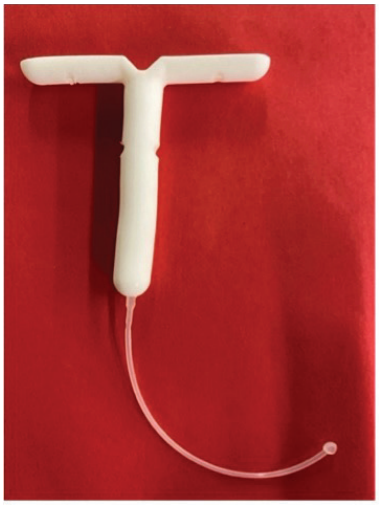

Figure 2. EAZI-BREED™ CIDR® for Sheep insert.

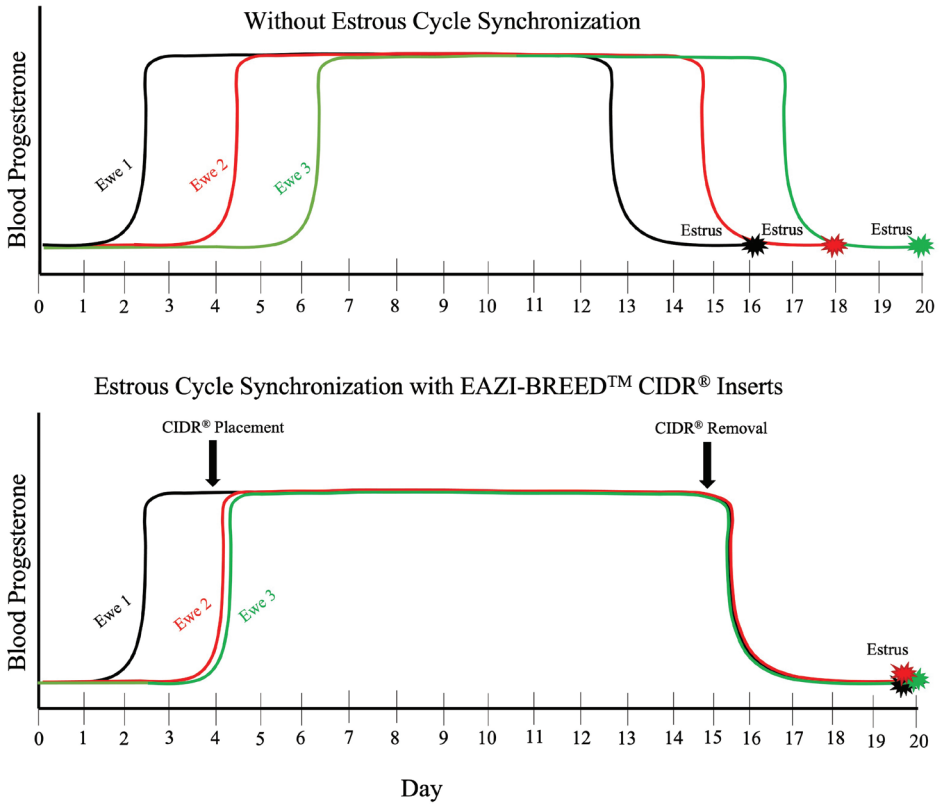

Figure 3. Illustration of estrous cycle synchronization with EAZI-BREED™ CIDR® inserts.

The Science Behind CIDR® Insert Technology

EAZI-BREED™ CIDR® inserts are simple to use and have been shown by the manufacturer and independent researchers to be effective in inducing estrus in ewes that have reached sexual maturity, which typically occurs at 10 to 12 months of age in most breeds. The inserts can be used alone or in combination with other estrous synchronization products (e.g., prostaglandins or gonadotropins). These T-shaped intravaginal nylon inserts are lined with silicone and secrete progesterone, which is absorbed into the bloodstream at a specific steady rate (Fig. 2). Progesterone is a naturally occurring steroid hormone produced primarily by the ovaries in mammalian females. It is responsible for maintaining pregnancy but also suppresses other hormones that promote standing heat and ovulation. Blood progesterone begins to rise immediately after EAZI-BREED™ CIDR® inserts are placed, and it reaches the intended concentration within about an hour. This rise in circulating progesterone mimics the natural conditions of the luteal (i.e., non-estrus) phase of the estrous cycle and functions to prevent the ewe from exhibiting estrus, ovulating, or mating. When inserts are removed 5 to 12 days later, the rapid decline in progesterone permits standing heat and ovulation by removing the suppression of estrus-related hormones. Because of this, removing EAZI-BREED™ CIDR® inserts from all ewes within the flock at the same time will cause them to ovulate, exhibit estrus, and be receptive to breeding at approximately the same time, as illustrated in Fig. 3. This greatly condenses the window for lambing and thus creates a more uniform lamb crop.

Additional Advantages of Utilizing CIDR® Devices

Out-of-Season Breeding

The ability to achieve out-of-season breeding offers a variety of advantages, from maintaining a more consistent lamb supply throughout the year to diversifying management opportunities for sheep operations. Sheep producers may find value in using out-of-season breeding to produce fall-born lamb crops, which allows lambs to be born during milder weather conditions. This is particularly beneficial for producers in Nebraska and throughout the Midwest, as it also coincides with peak cool-season forage availability. Additionally, fall-born lambs can be marketed near the end of the year when prices are often higher due to the lower supply and the increased holiday-season demand. Using EAZI-BREED™ CIDR® inserts to induce cyclicity for out-of-season breeding is a common and cost-effective use of the technology.

Protocol: To induce cyclicity for out-of-season breeding, EAZI-BREED™ CIDR® inserts are placed intravagi-

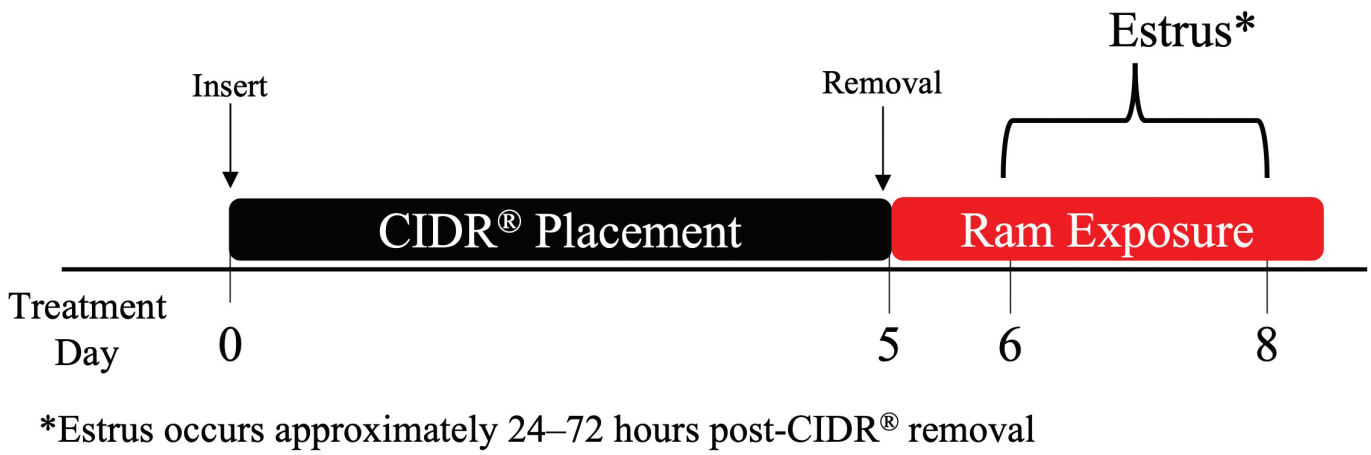

Figure 4. Timeline for using EAZI-BREED™ CIDR® inserts to induce estrus out-of-season.

nal for 5 days, per the manufacturer. Inserts are removed at the end of this period, and ewes are then placed with rams within 24 hours at a recommended 18:1 ewe-to-ram ratio for breeding. Estrus will typically be exhibited 24 to 72 hours after insert removal (Fig. 4). No increases in effectiveness have been documented to justify placing EAZI-BREED™ CIDR® inserts for longer than 5 days when inducing cyclicity for out-of-season breeding. Additionally, these inserts are designed for one-time use. Reusing them can reduce their effectiveness and spread sexually transmitted diseases. Progesterone is an active hormone in all mammalian species including humans, and thus EAZI-BREED™ CIDR® inserts must be handled using appropriate care (see the product label in Fig. 1 for more information).

Estrus Synchronization for Artificial Insemination and Embryo Transfer

A popular use for EAZI-BREED™ CIDR® inserts in sheep is for the synchronization of estrous cycles to improve the effectiveness of fixed-time artificial insemination or embryo transfer. These advanced reproductive technologies (ART) require precise timing of ovulation and estrus, and have low success rates without estrous synchronization, whether ewes are in-season or not. ART provide better opportunities for genetic improvement and lamb crop uniformity, and the first step in their utilization is reliable estrous cycle synchronization.

Protocol: EAZI-BREED™ CIDR® insert protocols for estrous cycle synchronization are more diverse than for inducing estrus out of season, and they may require additional products such as prostaglandin (e.g., Lutalyse®) or gonadotropin (e.g., P.G. 600®) to increase their effectiveness. As of 2022, these additional products are not labeled for use in sheep, and thus they require veterinary approval to be used in ewes. Nevertheless, several combinations of these products with EAZI-BREED™ CIDR® inserts have been shown to be effective for synchronizing estrous cycles in ewes. Below are two common protocols (Fig. 5A and 5B). Depending on the protocol, estrus is typically exhibited 24 to 48 hours after insert removal.

1. In-Season Estrous Cycle Synchronization (Fall Breeding)

   5 to 12-day intravaginal EAZI-BREED™ CIDR® insert placement

   Prostaglandin (Lutalyse®)* administration 24 to 48 hours prior to insert removal

2. Out-of-Season Estrous Cycle Synchronization (Spring or Summer Breeding)

   5 to 12-day intravaginal EAZI-BREED™ CIDR® insert placement

   Chorionic gonadotropin (P.G.600®)* administration 24 hours before insert removal

   **Veterinary Approval Needed: Dosage and administration route will be specified by the veterinarian and will depend on the specific product used. See additional resources for more information on dosage and administration.*

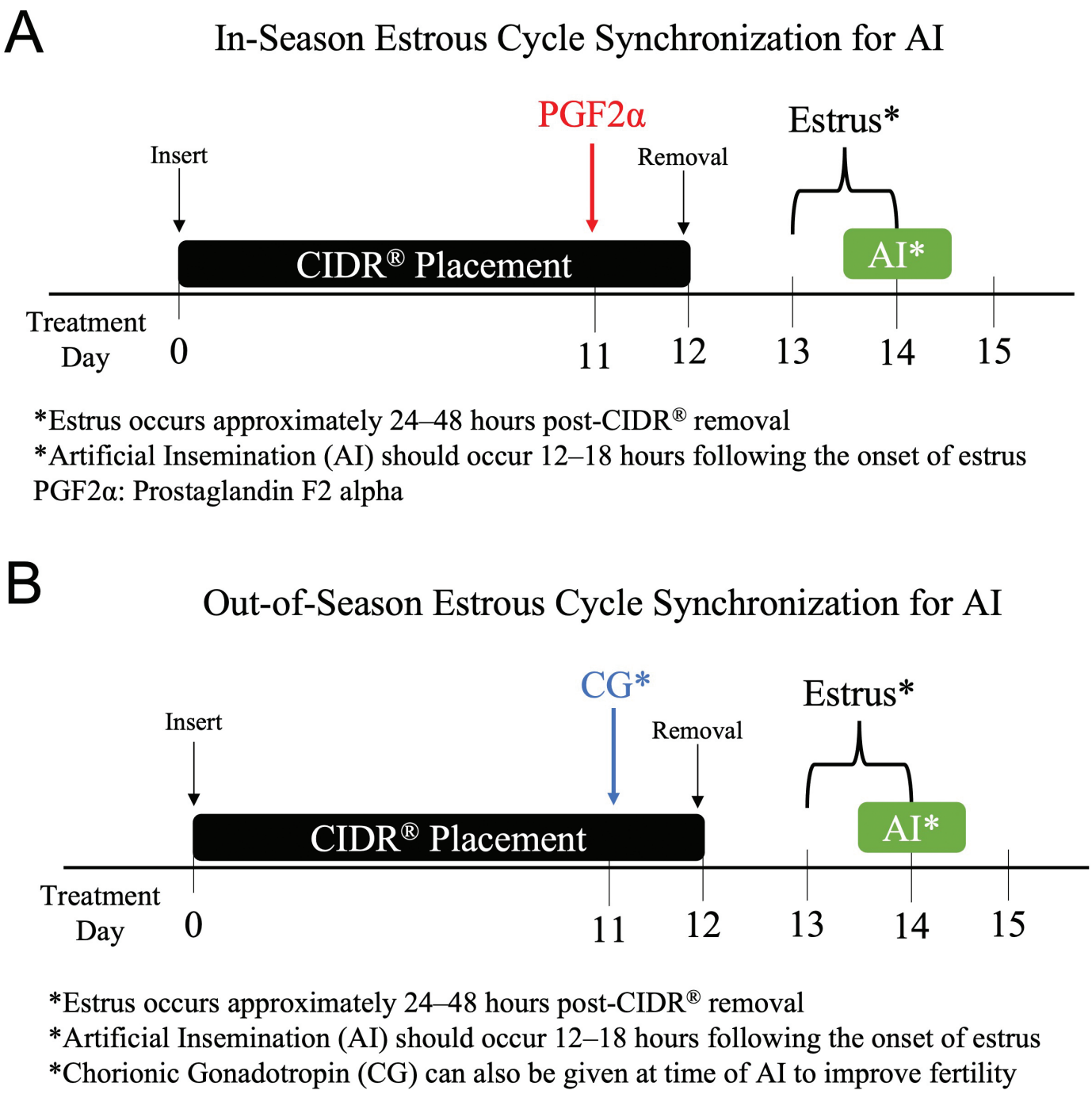

Figure 5. Timeline for using EAZI-BREED™ CIDR® inserts to synchronize estrous cycles.

EAZI-BREED™ CIDR® Application

Items Needed

- EAZI-BREED™ CIDR® Inserts for Sheep (1 per ewe, 0.3 g progesterone) ~$7/each
- EAZI-BREED™ CIDR® Insert Applicator (1 per technician) ~$11/each
- OB Lubricant (1 gallon)
- Latex gloves

1. The EAZI-BREED™ CIDR® insert (Fig. 6A) is placed tail-first into the applicator (gray) by folding the wings of the t-shaped region of the insert, as illustrated in Fig. 6B and 6C.

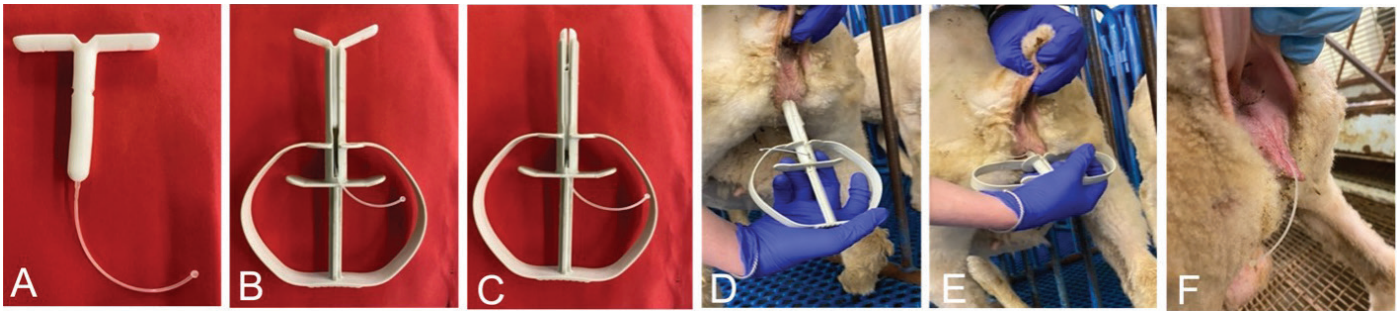

Figure 6. Step-by-step instructions for EAZI-BREED™ CIDR® insert application.

2. OB lubricant is applied liberally to the applicator prior to insertion. To place the EAZI-BREED™ CIDR® insert, the applicator is angled upward at a 45° angle and gently inserted into the vaginal opening (Fig. 6D).

3. The handle of the applicator is then firmly squeezed to eject the insert into the vaginal cavity (Fig. 6E), leaving only 1 to 2 inches of the EAZI-BREED™ CIDR® insert's tail exteriorized (Fig. 6F). Leaving too much tail exposed increases the chances of the insert dislodging. Leaving too little tail exposed can make retrieval difficult.

4. To remove, gently pull downward on the exposed tail of the EAZI-BREED™ CIDR® insert at a 45° angle.

5. Applicators should be cleaned and disinfected with a disinfectant solution (chlorohexidine, Nolvasan, etc.) before each use to prevent the potential spread of infection. EAZI-BREED™ CIDR® inserts themselves should not be reused. Inserts should be stored at room temperature (i.e., 68° to 77° F) prior to use, and should be discarded after their expiration date.

Additional Resources

Estrus Synchronization in the Sheep and Goat. 2021. Veterinary Clinics of North America: Food Animal Practice. https://www.sciencedirect.com/science/article/pii/S0749072020300797

Hormonal Control of Estrus in Goats and Sheep. 2021. Merck Veterinary Manual. https://www.merckvetmanual.com/management-and-nutrition/hormonal-control-of-estrus/hormonal-control-of-estrus-in-goats-and-sheep

Optimal dose of PG600 when given to progestogen-synchronized ewes during anestrus as affected by day of the year and temperature. 2019. Translation Animal Science. https://academic.oup.com/tas/article/3/1/433/5086070

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