

Out of Season Breeding Alternatives for Sheep

Delma Kennedy, OMAFRA Sheep Specialist – Genetics, Reproduction and Performance Programs

Introduction

Out-of-season breeding is becoming more popular as producers move to accelerated lambing programs to supply product to the marketplace on a year round basis.

Controlled reproduction will synchronize the ewe so that lambing occurs in a restricted timeframe. It will also give an out-of-season heat so that ewe can be bred in the spring for accelerated lambing programs and for the production of lamb for the Christmas and winter markets.

Ewes cycle in days of decreasing day length. When in season, sheep cycle approximately every 17 days (range 15-19 days). Some breeds are more seasonal than others. There is a large variation in the onset and duration of the season. Prolific breeds and breeds that originated closer to the equator tend to be less seasonal.

Out-of-Season Breeding

Breed and selection

There is a large variation between breeds in the length of breeding season. The season for each breed tends to vary around the shortest day. Breeds with longer breeding seasons will be more likely to breed out of season. If the season for a breed is about 100 days long the season will tend to start 50 days before the shortest day and end 50 days after the longest day. If the season is 70 days long, it will tend to start 35 days before the shortest day and end 35 days after the shortest day.

Genetic selection is a slow but permanent method of achieving breeding out of season. The trait has a low heritability (10 per cent). This means it is difficult and time consuming to develop a flock of animals with the genetic ability to breed (naturally) year round. In order to create a selection program that works, it is necessary to define what out of season means on your farm.

Some questions to consider:

- Is this a ewe that will breed in April, May, June or July?
- Does the ewe have to lamb out of season every time she is exposed to be considered an out-of-season breeder?
- Is the ewe expected to breed out of season as a ewe lamb?
- How many daughters must a ram produce to be considered proven as an out-of-season breeder?

The other problem that makes selection for this trait very slow is that the trait is not expressed until the selected animal has lambs of its own.

Light Control

Modifying day length can induce sheep to ovulate out of season. The change of day length from long days to short days initiates estrus. As a result, it is necessary to create a situation with light control where long

days are followed by short days before the out-of-season breeding starts. This can be done gradually or abruptly.

There are breed differences in response to light control but most breeds will respond to a light control program.

- Expose breeds that have a shorter natural season to extended and decreased light for a longer time period.
- Expose ewes to long days for 8-12 weeks and then to short days for 8-12 weeks before breeding. If the out-of-season breeding period is in June, near the longest days of the year, best results are obtained by using 12 weeks.
- Expose rams, as well as ewes, to the lighting program. Exposing rams to short days increases testicular growth, mating activity and semen quality.

Management factors

There are several management factors to observe in managing the light control system.

- The difference in illumination between short and long days should be six to eight hours. Flashes of light will upset the ewe's perception of the period of darkness.
- A minimum of 100 luxes of light is needed for daylight and less than 10 luxes of light can be present for the period of darkness.
- The time of the start of breeding after the short days begin depends on the breed of ewe and the time of the year. This will usually be a minimum of eight weeks after the short days begin.
- End the short day period as soon as the rams are removed from the ewe.

If all protocols are rigidly observed, conception rates of over 80 per cent can be achieved if there is a minimum of 70 days between lambing and breeding. Ewes under this system will exhibit more than one estrus cycle similar to ewes breeding in season.

If a light control system is undertaken it is important to do everything possible to ensure success because ewes that don't breed out of season (to the light control) will come into estrus the following fall 8-12 weeks later than usual.

To determine the dates when to expose ewes to long days, work backwards from the desired breeding date. The following example helps with the required calculations.

Example:

Desired Date Breeding Begins - May 15

Short Day Period (8 weeks long) Begins - March 15

Long Day Period (12 weeks long) Begins - December 15

Hormone Control

There are two options for hormone control: controlled internal drug release devices (CIDRs) or melengesterol acetate (MGA).

CIDRs

- Insert naturally occurring progesterone impregnated CIDRs into the vagina for 12-14 days.
- Upon removal, treat the ewes with Pregnant Mare Serum Gonadotrophin (PMSG).
- Introduce the ram to the ewes 24 hours after CIDR is removed, when most ewes should be in heat. All ewes should be in heat after 48 hours.
- The fallout rate of the CIDR varies between farms and seasons.
- There is a risk of vaginal infection or injury if the operator is not gentle and proper sanitation of equipment is not observed.
- CIDRs are not recommended for ewe lambs, primarily due to the risk of injury.
- Using CIDRs is the best method of synchronization for artificial insemination (AI) because the time of ovulation can be more accurately predicted than when using MGA.
- CIDRs and PMSG must be obtained from your veterinarian.

The results that producers see with this method can range from 8 per cent to 85 per cent. Typical results are 50 per cent to 60 per cent of the ewes treated having lambs out of season. CIDRs generally produce only one synchronized estrus out of season.

MGA

Melengesterol acetate is a feed additive. It is commonly used in feedlot heifer rations to prevent estrus. It is not licensed for use in sheep and therefore a veterinary prescription is required.

- Feed MGA at a rate of 0.125 mg, twice a day for 12-16 days.
- The MGA can be formulated into a ewe supplement or into a complete ration.
- The two feedings should be as close to 12 hours apart as possible. It is important to keep the hormone levels in the blood consistent.
- Similar to the CIDRs give PMSG as part of the hormone treatment.
- Administer PMSG five to 10 hours after the last feeding of MGA.
- For good results, strictly follow the timing of the MGA feeding and administration of PMSG.
- The ewes will come into heat two to two-and-a-half days after the last feeding of MGA.
- Introduce the ram after 48 hours.

Similar to CIDRs, there is a wide variation in the results of using MGA, with reports of 10 per cent to 85 per cent, with average results of 50 per cent to 60 per cent.

Management Factors Affecting the Success of Out-of-Season Breeding

Treatment of Ewes

The management and care of the ewes has a large impact on the success of out-of-season breeding.

- Ewes must be in good body condition, preferably gaining body weight at the time of mating. Feed the ewes a flushing ration prior to and during breeding.
- The start and duration of flushing depends on the body condition of the ewes. Flush thin ewes starting two weeks prior to the hormone treatment. Flush ewes in good condition starting when the hormone treatment begins. Continue flushing for two to four weeks after mating depending on body condition. Flush ewes until they are body condition score 3-3.5.
- Minimize, or avoid stress and handling during treatment, mating and for one month after mating.

- If possible, mate ewe lambs separately from mature ewes. The rams will preferentially mate mature ewes and ewe lambs tend to come into estrus later than mature ewes following hormone treatment

Treatment of Rams

It is also important to ensure good care and management of the rams. Poor nutrition can decrease testicular size and sperm reserves at a time when the size and reserves are already smaller.

- Production of spermatozoa takes seven to eight weeks. Begin supplementary feeding eight weeks prior to mating to increase sperm reserves.
- There are seasonal variations for rams in semen production, quality and libido. Elevated body temperatures in rams from hot weather can cause temporary infertility.
- Shear rams two months prior to breeding and ensure that all wool is removed from the scrotum.
- Ensure that adequate ram power is available for out-of-season breeding. Rams are not able to breed as many ewes out of season. It is recommended that a maximum of five ewes to each ram be used out of season, particularly when hormone treatments are used and the ewes are synchronized. Hormone treatments can be staggered to optimize ram power.

Conclusion

Regardless of the out-of-season breeding method used, it is important to ensure that ewes and rams are managed to optimize success. The breed of the flock will affect the animals' natural season and the ability to respond to controlled reproduction methods. Light control, CIDRs and MGA are all successful alternatives to enhance an out-of-season breeding program.