

The MGA double-injection prostaglandin system offers cattlemen the opportunity to maximize estrous response and fertility during the synchronized periods. This system also provides producers the chance to inseminate more females during the first two weeks of the breeding season. The additional number of cows or heifers that can be inseminated with a second injection of prostaglandin benefits producers when they attempt to take full advantage of AI and inseminate as many females as possible over a relatively short period.

General Comments

The flexibility in matching specific synchronization methods with the particular management system involved is one of the major advantages of using MGA to control estrous cycles of cattle.

Before implementing any estrous synchronization program, remember that most failures occur when treated females fail to reach puberty or resume normal estrous cycles after calving. Estrous synchronization should not be used as a crutch for poor management. However, when administered appropriately, estrous synchronization is an effective management tool that can be used to facilitate AI, increase weight and uniformity of calves at weaning, and ultimately improve profitability of the cow-calf enterprise.

Note:

If you have any questions about the timing of the synchronization methods described here, or if you would like additional, in-depth information, please contact:

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Using MGA to Shorten the Beef Breeding Season

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Overview

Kentucky researchers have modified conventional synchronization systems for beef cows and come up with a flexible program. It provides a boost to fertility and increases the total number of females that can be inseminated during the first two weeks of the breeding season.

Background

The beef cattle industry has seen rapid gains largely due to the selection of genetically superior males and increased use of artificial insemination. Recent surveys indicate, however, that less than 5% of the beef cows in the United States are bred by artificial insemination (AI), and only half of the cattlemen that practice AI use any form of estrous synchronization to facilitate their AI programs.

The inability to predict time of estrus for individual cows or heifers in a group often makes it impractical to use AI because of the labor required for detection of estrus. Available procedures to control the estrous cycle of the cow can improve reproduction rates and speed up genetic progress. This includes synchronization of estrus in cycling females, and induction of heat accompanied with ovulation in heifers that have not yet reached puberty or among cows that have not returned to estrus after calving.

There are several advantages to a successful estrous synchronization program:

- cows or heifers are in heat at a predicted time, which allows for artificial insemination, embryo transfer, or other planned reproductive techniques;
- the time required to detect estrus is reduced, which in turn decreases labor expense associated with the breeding program;
- cycling cattle should conceive earlier during the breeding period; and
- calves will be older and weigh more at weaning time.

As an example, consider what happens during a restricted breeding season. If females are cycling when a synchronization treatment is imposed and they exhibit heat during the synchronized period, they would have three opportunities to conceive during a 45-day breeding period or four opportunities during a 63-day period. This compares with only 2 or 3 opportunities for nonsynchronized females, based on the average estrous cycle for the cow of 21 days.

Although hormonal treatment of cows and heifers to group estrous periods has been a commercial reality now for several years, producers have been slow to adopt this management practice. Perhaps this is because of past failures, which resulted when females that were placed on synchronization treatments failed to reach puberty or resume normal estrous cycles following calving.

To avoid problems when using an estrous synchronization system, females should be selected for the program when:

- adequate time has elapsed from calving to the time synchronization treatments are imposed;
- cows are in average or above average body condition (scores of 5 or higher on a scale from 1 to 9);
- minimal or preferably no calving problems are experienced; and
- replacement heifers are developed to prebreeding target weights that represent at least 65% of their projected mature weight.

There are three approaches to estrous synchronization currently available. These include prostaglandins, Syncro-Mate-B®, or a combination of a progesterone-like compound with a prostaglandin.

This publication reviews recently developed methods using MGA to control estrous cycles of cows or heifers in breeding programs involved with natural service or artificial insemination. Three methods will be outlined which use the MGA program to facilitate estrous synchronization in heifers or cows. The choice of which system to use depends largely on a producer's goals and level of management.

The MGA Program

Melengestrol acetate (MGA®) is the common denominator in each of the systems presented here. MGA is an orally active progestin. When consumed by cows or heifers on a daily basis, MGA will suppress heat and prevent ovulation.

MGA may be fed with a grain or protein carrier and either top-dressed onto other feed or batch mixed with larger quantities of feed. MGA is fed at a rate of 0.5 mg/animal/day for a 14-day period. This aspect of the treatment is critical.

When fed at the recommended level, MGA will suppress heat during the treatment period. Animals that fail to consume the required amount on a daily basis will prematurely return to estrus during the feeding period. This can be expected to reduce the synchronization response.

Animals should be observed for signs of behavioral estrus each day of the feeding period. This may be done as animals approach the feeding area and prior to feed distribution. This practice will ensure that all females receive adequate intake.

Cows or heifers will exhibit estrus beginning 48 hours after MGA withdrawal, and this may continue for 6 to 7 days. Females that exhibit heat during this period should not be inseminated or exposed for natural service. This is generally recommended because of the reduced fertility females experience at the first heat after MGA withdrawal.

Method 1

The simplest of the methods involves using bulls to breed synchronized groups of females. This practice is especially useful in helping producers make a transition from natural service to AI. In this process, cows or heifers receive the normal 14-day feeding period of MGA. Fertile bulls are then exposed to treated groups of females as early as 15 to 18 days after MGA withdrawal.

(See Figure 1.)

No more than 15 to 20 synchronized females should be exposed to a single bull. Producers using this system must be sure to consider age and breeding condition of the bull and results of breeding soundness examinations.

Figure 1—Using MGA to synchronize estrus in natural service breeding programs.

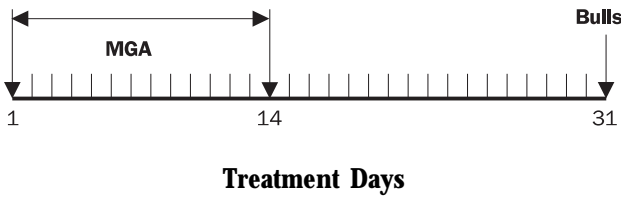
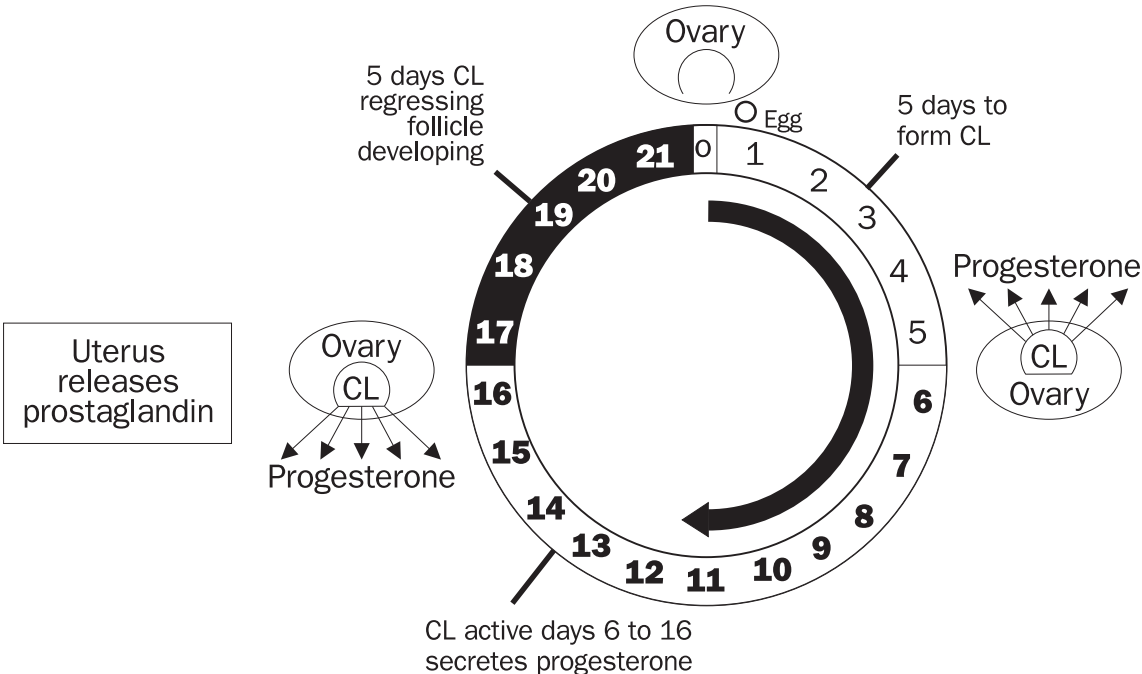


Figure 2—Physiology of the estrous cycle.



Method 2

A more sophisticated means of estrous cycle control using MGA involves the combination of MGA with a prostaglandin. Prostaglandins are luteolytic compounds normally secreted by the uterus of the cow. Prostaglandins are capable of inducing luteal regression, but cannot inhibit ovulation. When prostaglandins are administered in the presence of a functional corpus luteum they initiate premature regression of the corpus luteum and a return to estrus by the cow. (Figure 2 is a physiological depiction of these hormonal changes.)

In this system prostaglandins should be administered 17 days after MGA withdrawal. This treatment places all animals in the late luteal stage of the estrous cycle at the time of injection, which should shorten the synchronized period and maximize conception rate. (See Figure 3.)

Three available prostaglandin products for synchronization of estrus in cattle could be used after the MGA treatment: Lutalyse®, Bovilene®, or Estrumate®. Label approved dosages differ with each of these products; carefully read and follow directions for proper administration prior to their use.

Figure 3—The MGA + prostaglandin estrous synchronization system for use in AI programs.

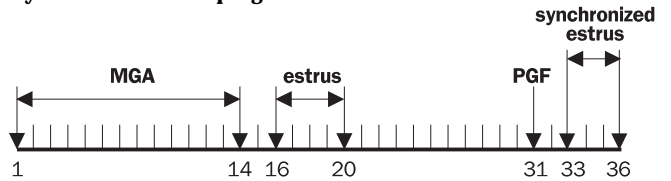
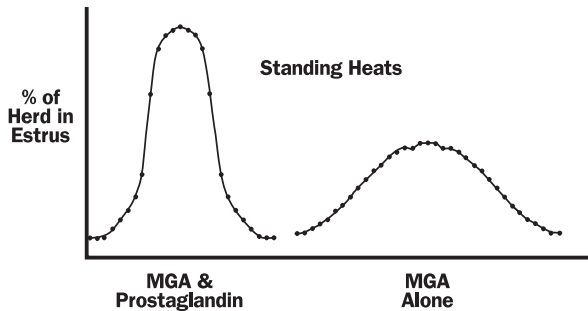


Figure 4 illustrates differences in the distribution of estrus comparing the MGA + prostaglandin system to an MGA-only system. The MGA + prostaglandin system is best suited for use in AI programs because it concentrates heat activity and reduces the labor expenses associated with the breeding program. Furthermore, it decreases the amount of time required for heat detection. Under natural mating conditions, however, there may be an advantage in distributing estrus over several additional days for bulls that are involved in these programs.

Figure 4—Distribution of estrus comparing the MGA + prostaglandin system for AI with an MGA-only system for use with natural service.



Method 3

A very high proportion of cycling females placed on the MGA + prostaglandin treatment will exhibit estrus during the synchronized period. But in some cases, up to 20% of the females that should respond to the prostaglandin injection fail to do so. Therefore, a third system involving a second injection of prostaglandin may be used.

A second injection of prostaglandin can be administered 11 days after the first injection to cows or heifers that fail to respond during the first synchronized period. Cows that have already been inseminated should not, however, be re-injected. (See Figure 5.)

Figure 5—The MGA double-injection prostaglandin system for use in AI programs.



The MGA double-injection prostaglandin treatment is useful in maximizing estrous response and improving fertility during both synchronized periods. In fact, recent University of Kentucky studies indicate that synchronized conception and pregnancy rates are higher among cows that receive MGA prior to prostaglandin.

Cows in the UK study were assigned to an MGA double-injection prostaglandin system or a prostaglandin-only system. A higher proportion of cows that receive MGA will exhibit estrus after the first injection of prostaglandin compared with cows that are treated only with prostaglandin.

This is logical, since cows that receive MGA should be grouped into the late luteal stage of the estrous cycle at the time prostaglandin is administered. By re-injecting cows that fail to respond to the first injection, we increase the total number of cows that can be inseminated. Cows that receive MGA prior to prostaglandin, however, experience a significant improvement in conception rate at first service and overall pregnancy rate. We define conception rate as the proportion of cows that conceive of those we inseminate based on detection of estrus, and pregnancy rate as the proportion of cows that become pregnant of the total number we synchronize.

This calendar presents the daily sequence of events to follow when using MGA for estrous cycle control, assuming the breeding season starts May 20.

APRIL MGA 20	MGA 21	MGA 22	MGA 23	MGA 24	MGA 25	MGA 26
MGA 27	MGA 28	MGA 29	MGA 30	MAY MGA 1	MGA 2	MGA 3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	Method 1 Method 2 Method 3 20	21	22	23	24
25	26	27	28	29	30	Method 3 31