AI Fast Track to Genetic Improvement

AI allows producers to use the top genetics in the breed.

by Corinne Patterson

He caught your eye from the moment you saw him. He combines the presence, the power and the performance you need to take your herd to the next level. But when the gavel dropped, you weren't even the contending bidder. Luckily, it's not the end of the road. This bull is destined for semen collection, offering you a second chance.

Artificial insemination (AI) isn't something new to the beef industry. For many breeds, including Hereford, it's been around since the 1970s. Jay Nansel, a regional sales manager and AI technician for Select Sires, says AI use is the quickest way for producers to realize rapid genetic improvement in their herds.

Nansel, who grew up on a purebred operation, took an AI class in the mid-1980s from Montana State University to learn the process. He then AI bred cows on his family's ranch for six years before joining Select Sires. Today he inseminates 3,000-4,000 heifers annually for the company and is also an AI instructor.

"I've had everything from 15-year-old girls who do very well (at AI breeding) to people in their 70s," Nansel says of participants in his class. "If they are not afraid of the animals, just about anybody can learn. There's really nothing they need to know ahead of time, other than being comfortable around the animal makes a big difference."

An AI class will prepare producers to begin using AI in their own herds. Nansel starts his class by explaining the general physiology of the cow. Once students begin learning the AI technique, they are able to see and get their hands on the reproductive tract so that they know what it feels like and looks like prior to working with the cow. Participants then inseminate 10-15 cows per day for three days to gain practical experience.

"It's good to have somebody as a standby," Nansel says, during the first time someone is inseminating. "If you just took a class and you were to go out and try to do 100 head of heifers on a synchronization program, I think there could be trouble."

However, he says a new technician who's just gone through the class will be able to heat detect and breed a smaller group of animals to develop his or her technique. AI classes range from $200-400 and are generally two to four days in length.

Getting started

While learning to AI can be fairly simple, there are many important steps to consider before implementation.

A little thought and foresight is needed to make AI a success. "You want to start thinking about it before the cows calve because a lot of strategies with artificial insemination are related to what are those animals going to do down the road," says Cliff Lamb, associate professor and beef cattle reproduction specialist at the University of Minnesota.

Lamb recommends producers first select the date when they want their calving season to begin so that their breeding date will coincide.

"We run into a lot of situations where producers decide to use artificial insemination when they do not have a lot of other factors in place that will make it a very useful tool to improve the genetics in their herds," Lamb says.

The No. 1 shortfall he notes is a lack of good working facilities to restrain the cow and to protect the AI technician.

"You have to have fairly good constraint facilities so that you can catch the cattle and you can artificially inseminate them with little stress on the cattle," he adds. Good facilities are also key in proper implementation of a synchronization protocol.

A good nutrition program and keeping cows in proper body condition are vital to giving cows the opportunity to cycle and become pregnant. Nansel says it's essential to have heifers in a body condition score of 5-6 on a 9-point scale. It's also key, he adds, to keep heifers on an even plane of increasing nutrition so that they grow correctly.

"People don't have a lot of success initially to artificial insemination because the cows are too thin and they are not cycling, or they try to breed the cattle too soon after calving," Lamb points out. "They might start AIing their cows at 30 days after calving and the cows aren't even cycling at that point."

Nansel says it's wise for producers to make mating decisions as early as possible. "Those decisions are sometimes tough to make until they see maybe the calves they had the year before," he acknowledges, but if producers delay too long they may not have the semen they want on the ranch the day they need to AI.

It's also important for producers to use an AI technician with good experience, Lamb says. Another priority, he says, is to make sure semen is purchased from a reputable semen company and collected by a Certified Semen Services (CSS) company.

Nansel works with several different breeders with a number of different management schemes. He says there really isn't a "one size fits all" synchronization program and some producers choose to heat detect.

Lamb recommends producers wait a minimum of 45 days after calving to start a synchronization program. "With

that said it doesn't hurt to start sooner than that, but the expectation should not be as high," he adds. "The nice advantage of synchronizing is that you actually kick-start your cows cycling and they become pregnant sooner in the breeding season. You can start as early as 30 days but the producers' expectations should not be to get the same pregnancy rates in those cows."

Your semen representative or a specialist at a university, Lamb says, are good resources for choosing a management scheme. For more information about beef cow synchronization protocols, visit the National Association of Animal Breeders (NAAB) Web site and download, *www.naab-css.org/education/Protocols 12-05-05.pdf.*

Insemination time

Using AI requires a few basic tools. A semen tank may cost anywhere from $250-800, Lamb says. Other products can be purchased with about $100-200. An AI gun, a thermos to thaw the semen and a thermometer to monitor the thaw temperature are necessities. Scissors to cut the straw, paper towels and sleeves are useful.

The AI procedure begins with removing semen from a semen tank where it's stored in liquid nitrogen at -320°F. From the tank the semen is put into a water bath at 95°F, Lamb says.

Handling semen correctly is vital for AI to be a success. There are a host of situations that can cause semen quality to degrade.

"It's important to remember a straw of semen needs to be protected from exposure to the air and temperatures outside of the thaw. You want to have everything prepared and ready to go when you start handling the semen," Nansel says.

The person performing the insemination should get the semen from the thaw to the cow as quickly as possible to avoid cold shocking, which can happen when a thawed straw is exposed to cold air.

"If they don't handle the semen well it doesn't matter if they heat detect well or not," Nansel points out. "It's kind of the weakest link type of a deal. If they heat detect well, and they do the semen handling, and then they AI correctly — those are the three main links to getting it done correctly."

Lamb says he usually recommends at least 30 seconds in the water bath, and then the straw must be dried completely because water is lethal to semen. Once the straw is dried, it's put into the AI gun and then it is ready to inseminate the cow.

"When the cow is restrained, you will have one of your arms in the rectum of the cow and you will palpate with that arm," Lamb describes. "You will be able to feel the cervix. And once you have the cervix in your hand you insert the AI gun into the vagina of the cow, and then you thread the AI gun, using both hands — your one hand in the rectum, the other on the AI gun — you thread the gun through the cervix of the cow into the body of the uterus. The body of the uterus is really only about the diameter of a quarter. It's fairly small. And once the tip of the AI gun is in the body of the uterus you press the plunger and deposit the semen into the body of the uterus and remove the AI gun and hopefully she becomes pregnant."

Expected results

Nansel says it's important for producers to understand results to expect from AI. "Sometimes it gets oversold the success rate they are going to have," he says. Producers using a synchronization program can expect to successfully impregnate 55-65% of their cows, he says, adding, "If they are happy with that, and we get 70% of them bred, then that's kind of gravy."

The rate that Nansel refers to is total herd pregnancy rate. A producer's goal is to achieve a live calf from each cow or heifer, so the success rate should be based on the total herd.

"There's a heat detecting rate — how many cattle will be heat detected and bred. Say if we get 80% heat detected and of those 80% we get 80% to conceive to AI, that's right at 64%, and those are some pretty good numbers."

He says that's a simple way that the industry bases its average AI conception at 65%. "If you can get 80% to come into heat and 80% of those to take, those are pretty realistic numbers and some goals that a person can kind of shoot for," Nansel says. "And if you get 65%, the next year you shoot for a little higher and tweak your program to reach those goals."

Equipment needed for artificial insemination (AI) includes plastic sleeves, AI gun, thermos, thermometer, lubricant and disposable sheaths.

An area for improvement

The American Hereford Association (AHA) staff and Board of Directors strongly support the use of AI in the breed. At the Denver meeting in January the Board approved the development of a two-tier system where breeders can either have bulls in AI use with AI certificates, or they can choose to market semen without certificates.

"The Hereford breed has less than 15% of its registrations that come from AI sires. It's hard to make much genetic change when you are not using some outside, proven bulls," says Jack Ward, AHA chief operating officer and director of breed improvement. "Even if those bulls within your herd are doing the right things, they are not being compared to anything across the breed."

Ward says the Board's move to allow semen sales without certificates should help sell more semen. However, bulls will still have to go through the same process to be certified to sell semen, including DNA parentage verification. A profile of both the sire and the dam of the bull wishing to be AI certified must be on file with the AHA.

"I think this is a pretty bold statement for the Hereford breed," Ward says. "The AHA staff and Board of Directors took the initiative and said, 'Hey, we are willing to give up the extra income that we get from AI certificates to change the direction of this breed or change the genetic trend in this breed because we really believe that AI use is important.' It was a bold statement by the staff and by the Board to support it, and I think the breeders will embrace it pretty well in the future." **HW**