

Fast-tracking genetic progress in deer with AI

Erin Hutchinson

Looking to bring the science into deer breeding, Deer Improvement (DI) started out with a press release and nothing else.

Although as an offshoot of dairy genetics company LIC, DI was not exactly starting from scratch.

"We'd never collected or processed a straw of deer semen, we'd never trained a technician or done any deer AI [artificial insemination], but we could see that the capabilities that we had in dairy were directly applicable," said Peter Gatley, director of DI, at a field day held at Tikokino in late October.

DI is focusing on genetics for venison production rather than antler growth, and the DEERSelect genetic evaluation system provides an industry-based platform for the company to make use of.

"Why did we come into the business and focus specifically on venison production? We could see that heritability of the trait was there - there was genetic diversity.

"We knew that we could take our standard AI procedure - which is easy and straight forward - and apply it directly to deer; it's no longer the old laparoscopic surgical AI.

"We knew that there was a good value proposition there for farmers, because they could do AI on a small proportion of hinds and leverage that across the whole mob - including the ones being extensively farmed out on the hills."

LIC geneticist Jake Chardon compared a breeding programme to a cookbook.

"These are the directions to the possibilities you have for a breeding programme, and if you follow them you'll be successful.

"Of course, there are some cooks that don't follow them and are still successful, but those are sometimes the breeders that have beautiful philosophies and by accident they're very successful as well.

"Genetic progress is determined by selection intensity, accuracy, genetic variation in the population and generation interval.

"Selection intensity really means

that if you select a few animals out of a large population, you can put a lot more selection pressure on a certain trait.

"If your possibilities are to select from a thousand animals, you make a lot more progress than when you select from a hundred animals," Chardon said.

Genetic variation is also important. If all animals are alike, there is no superior animal and no way to breed a better animal.

"The bigger the differences that you see within a group of animals, the more possibilities there are for genetic progress."

One of the goals for DI's breeding programme is to generate 100kg weaners before winter, but the company recognises that breeding for animals with good growth rates could be a double-edged sword.

"We'll not necessarily select the biggest animal, but we'll look at yield as well," explained Chardon.

"We feel that if you select for the biggest animal without looking at the yields, you'll be selecting for a Wapiti-style animal; you'll be selecting for an animal with increased mature weight.

"But if you still kill them at 100kg you start killing more and more immature animals, and immature animals will have, percentage-wise, less meat to the rest of the carcass, so less efficiency."

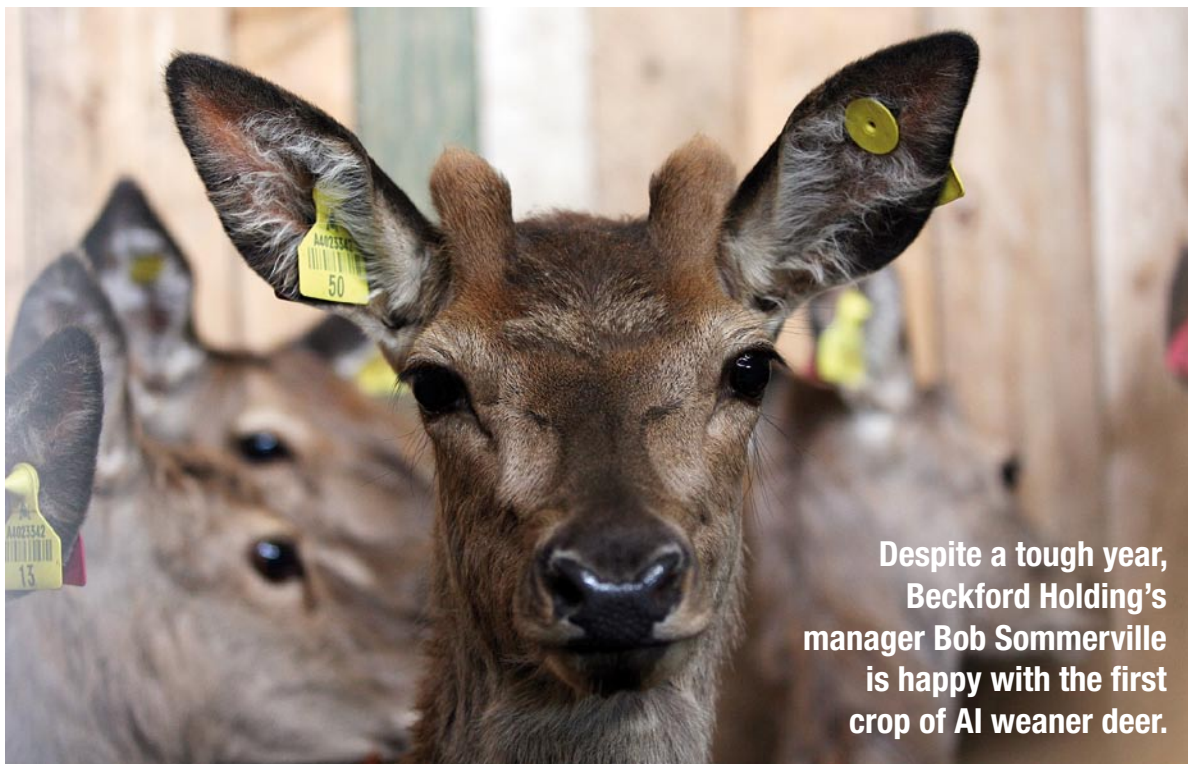
Currently DEERSelect focuses on breeding values (BVs) related to weight and weightgain, with more traits to be added as sufficient data becomes available.

Chardon suggests that over the next few years BVs for carcassweight, temperament and disease resistance should become available.

LIC business analyst Garth Anderson outlined some of the benefits of getting weaners to a killable weight before winter.

He said if the weaners could be killed before winter there would be reduced competition for next year's crop of animals, meaning they in turn should have a higher growth rate.

Hind numbers could be lifted, again potentially lifting overall productivity.



Despite a tough year, Beckford Holding's manager Bob Sommerville is happy with the first crop of AI weaner deer.

"If you can get your animals gone before the first winter you're really starting to get into a management system that's more like a lamb system; you can produce a lamb and kill it before winter - and that's highly profitable," Anderson said.

"You're not having to feed them over winter when, theoretically, your grass is most expensive. A number of guys - especially in the South Island - feed a lot of supplementary feed, grain and other bits and pieces, in the winter; if they can get them killed before winter, there's none of that cost."

"We knew that we could take our standard AI procedure - which is easy and straight forward - and apply it directly to deer."

Anderson suggested how an AI programme could be implemented on a commercial farm, starting with selecting a nucleus made up of the best hinds in the herd.

"You can ask the question, well, which are my best hinds? And our starting point is whichever ones you think are your best hinds."

This could take into consideration factors like growth rates, conformation, fawn rearing success, and just plain old personal preference.

The nucleus herd should be made up of 10-20% of the total hinds on the property, depending on how quickly the operation wants to progress.

The next stage is to synchronise the hinds with CIDRs.

A CIDR is a device containing

the naturally occurring hormone progesterone, which the device releases over a period of 12 days. Removal of the CIDR triggers oestrous with AI carried out a couple of days later.

The success rate of AI in deer is much higher than in dairy, with DI averaging around a 74% pregnancy rate in the past season.

To maximise potential rate of genetic gain, Anderson recommends keeping the majority of the hinds produced by AI, using them as replacements for the nucleus herd.

The best of the male AI offspring should then be monitored as a contemporary group, with the best being used over the rest of the herd in subsequent years.

The field day was held at Makarora farm, part of a wider farming operation known as Beckford Holdings.

Manager Bob Sommerville said they had been using AI for the past two matings, and the first crop of AI weaners were on display.

Makarora itself is a finishing unit for the deer, located at Tikokino in Hawke's Bay. The deer breeding unit (North Block) is nearby, but is closer to the Ruahine Ranges and has a cooler climate.

North Block is home to 780 breeding hinds.

Mating occurs around March 10, with the rising two-year-old hinds mated at Makarora. The in-fawn hinds are then trucked up to the breeding block with the balance finished and killed.

On the breeding block, hinds are mobbed by peer group - so each mob relates to a birth year.

It's an all grass system with "shuffle" grazing rather than rotation. First-fawners and cast-for-age

hinds are weaned pre-roar to give them time to put on condition.

The balance of the hinds is weaned after the roar.

All weaners go to Makarora, and once they've settled down they are split into male and female lines, then top and bottom groups, and set-stocked - there aren't enough paddocks to rotate all the mobs.

Beckford Holdings supply First Light Venison, with Sommerville pleased with the way it fits into their finishing system.

"We do have problems up here, being colder country, getting deer into that spring kill ... we're killing deer on a fixed contract price right throughout the year, when it suits us.

"The prices are competitive, we're very happy with it, and it just suits our programme; we can kill the deer when we get them to weight, and it just takes the pressure off the whole system."

After a short learning curve, Sommerville is happy with the way AI has gone on Beckford Holdings.

One of Sommerville's reasons for using AI was the lack of high quality, DEERSelect-rated stags in the North Island. Using DI means they can still access top ranking stags.

In the first year Sommerville selected 60 of "the biggest and best" hinds from the wider herd to form the AI nucleus.


There were a few management hiccups as they travelled up the learning curve, but still managed 67% pregnancy rate to the AI.

This year they lifted the numbers in the nucleus herd to 73, selecting from the rising two-year-olds those that had weaned the best fawns to boost the numbers.

The pregnancy rate also lifted to 86% from the AI.

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