Setting your breeding objectives

Breeding better deer makes sense

Deer performance in New Zealand has improved considerably since deer were first farmed in the 1970s. Much of this is due to deliberate selection of better quality breeding animals.

If deer are getting the feed they need and are in good health, their productivity is largely determined by their genetic make-up (their breeding).

Genetics drive how much venison and velvet each animal in a herd is capable of producing. They influence conception date, fertility, survivability, growth rate and meat yield. These factors in turn have a big bearing on farm profit. So breeding to improve one, some or all of these traits makes good sense.

Many genetic traits can't be measured by looking at an animal. So a growing number of farmers are selecting breeding stags based on their estimated breeding values (BVs). BVs are objective measures of the genetic traits that influence deer farm profitability.

There are some real gains to be made through improved genetics. For example, a 5 kg heavier carcass x $9/kgCW = $45/head gain.

Importantly, genetic gain in a herd is permanent and cumulative.

See the *Deer Fact*, 'Deer Select', for more about BVs.

What is a 'better' deer?

Each farmer will have their own view of what 'better' means for their farm when it comes to buying stags and selecting replacements.

Whatever you want to breed for is your 'breeding objective'. An example of a breeding objective could be "to have 95% of MA red hinds mated weaning a 57 kg fawn in the first week of March". There are several traits that will influence this:

Key points

- **It's important to have clear breeding objectives when selecting the genetics to enter your breeding herd. Base these on your priorities for improving the profitability of your herd.**
- **Use Deer Select estimated breeding values (BVs) to identify stags that have the right genetics for your farm.**
- **Eyeballing stags and judging them solely on looks can be deceiving, because size and other traits are strongly influenced by non-genetic factors, such as diet. Also, the appearance of an adult stag isn't necessarily reflected in the traits of his progeny.**
- **You can opt for a balance of BVs to produce deer with the traits you want, or you can focus on a particular trait you want to change quickly. Genetic progress is faster if you focus on one main trait.**
- **Genetic improvement can be a very profitable investment.**

growth and meat obviously, but also reproduction.

When setting breeding objectives, ask yourself how much more money you will make this year and in (say) 10 years' time if your objectives are achieved. These calculations give you an idea of how much you can afford to spend on a stag with traits for the BVs you want.

In Deer Select, BVs are listed as plus and minus figures, with zero being the average of the national herd in 1995. For most traits, the higher the plus BVs of your stags, the faster you will achieve your targets. The only exception is the conception date trait, where you look for a minus figure (days earlier conceiving than average).

Photo: Richard Hilson

Which one is right for you?
Having clear breeding objectives for your herd will give you focus when buying breeding stags. Compare stags using Deer Select BVs, to ensure your selections are sound

First decide what the stag is required for:

- To breed female replacements and venison animals, or
- To breed venison only animals (terminal sire), or
- To breed velvet herd replacements and breeding females.

Consider the challenges of your property – climate, pastures, infrastructure – and your personal preferences, and then choose a source of genetics that meets your requirements.

The three main traits in deer are growth, meat and reproduction. Some farmers choose to make steady gains in all three to achieve the type of hinds and production they want, others may focus on a single trait such as growth, improve that quickly then move onto other traits.

Some traits such as meat are about future-proofing your herd – selection on growth alone will result in larger and leaner deer over time. By incorporating meat into the goal you will get good muscling and carcass yield, which may be rewarded by venison marketers in the future.

Using BVs to improve productivity

BVs for venison

The key BVs for venison production are weaning weight (WWT), autumn weight (AWT) and weight at 12 months (W12) for young animals. Larger hinds produce bigger weaners but, if you wish to limit hind size, you will want to take into account the mature weight BV which gives an indication of mature hind size.

The key meat BVs are carcass weight (CW) and lean yield (LEANY). The meat traits are based on ultra-sound eye muscle area and CT information if available. Sometimes breeders may feature eye muscle area (EMAc) adjusted for carcass size as this is a BV farmers can visualise.

If your focus is on improving weaner weight and growth to 10-12 months, then look for higher BVs for weaning weight, autumn weight and weight at 12 months.

If your focus is improving meat yield then look at higher BVs for carcass weight and lean yield.

BVs for reproduction

The key reproduction BV is conception date and is expressed as days earlier conceiving than average. Not everyone wants to fawn earlier but no-one wants to fawn later. Some stags leave daughters that are later conceiving than average. A fertility BV was being developed when this *Deer Fact* went to press.

Hinds with the potential to conceive earlier will already be cycling at the usual stag joining date. This will give them more opportunity to get in fawn. They will also have fewer late fawns.

BVs for velvet

If your focus is velvet antler weight then the important BVs are 2-year old velvet weight (2VW) and mature velvet weight (MVW)

Velvet weight traits are highly heritable. Selection of stags on the 2VW BV is more accurate than eye appraisal. It will also result in more rapid gains in future velvet weights for age.

BVs also allow accurate female selection. A hind's merit for velvet production is calculated from the records of all her male relatives and is also highly heritable.

There are no BVs for style as such, although these aspects are heritable. Once you have identified stags with high BVs for velvet weight, narrow your selection down by using the DINZ Velvet Grading Charts or other criteria.

When this *Deer Fact* was produced in 2018, velvet BVs were only comparable within herd, not across herds like other BVs. Deer Select BVs can still be used for selecting stags for velvet, bearing in mind that they are 'in-herd' BVs – you can't compare BVs between herds.

Economic indices

Deer Select has two economic indices (indexes) linking BVs with current economics and returns. This makes it easier to see which animal has the best $ value combination of traits overall.

The indices show the value per stag, expressed either as $ profit/hind mated or cents profit/hind mated.

The indices are:

Replacement – Early Kill: This identifies deer with high growth and carcass weight merit balanced with reproductive performance and maintenance considerations (hind mature size) of daughters.

Terminal: This identifies sires with fast growing sons and daughters that also have higher yielding carcass traits.

Many farmers use the indices to identify potential sires, before deciding which of these have the balance of component traits that are most in line with their breeding objectives.

This is because stags can achieve the same index value in different ways. For example, one stag may have better growth merit and another be stronger for meat and reproduction.

Indices are a great way to identify a range of potential sires, from which you can select the ones with the balance of traits you prefer

CASE STUDY

Focus on heavier, earlier, is paying off

Waerenga Station, Te Kuiti, has seen big lifts in venison carcass weights and reproductive performance since it began using stags with high BVs for growth rate.

Manager Edmund Ferreira says they used to buy in replacement hinds of unknown breeding each year. These were mated to unrecorded terminal sires.

"Our results were getting worse. Fawning rates in maiden and R3 hinds were poor and weaners struggled to reach good carcass weights by early December," he recalls.

Edmund Ferreira, farm manager at Waerenga Station

"So in 2012 we agreed on a strategy to improve our weaning rates and to finish the kill in early December with carcass weights of 55 kg/head or better."

The station moved to buying stags with high Deer Select BVs for 12-month liveweight (W12BVs) from Deer Improvement. They also saved the best female fawns from these matings as hind replacements.

In order to get the benefit of the greatly improved genetics, they also stepped up the quality and quantity of their feeding and deer health management.

"We fed the hinds better during lactation, including supplements if they're needed. We also now strategically feed the weaners and have a well-constructed animal health plan," Ferriera said.

In 2017, after five seasons, their average yearling stag carcass weight had increased by 5 kg. This meant Waerenga would have earned $45 more per head in year 5 assuming a $9 schedule. Over 50 offspring, the higher BV stags would have been returning an extra $2250/year each.

How to set a breeding objective

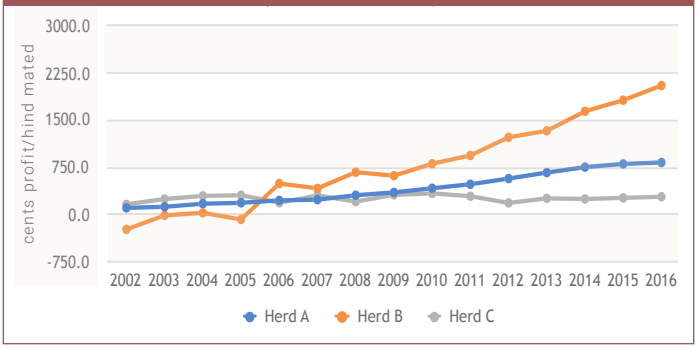
1. Calculate your baseline herd performance, averaged over (say) the last five years.
2. Decide what traits you want to improve.
3. Be realistic about what can be achieved on your farm, bearing in mind climate, topography, aspect, infrastructure and so on.
4. Market signals. Look five and ten years out to see what is likely to be making you the most money. Or hedge your bets if you don't trust your crystal ball.
5. Write your plan down. Review it annually.

How to implement your objective

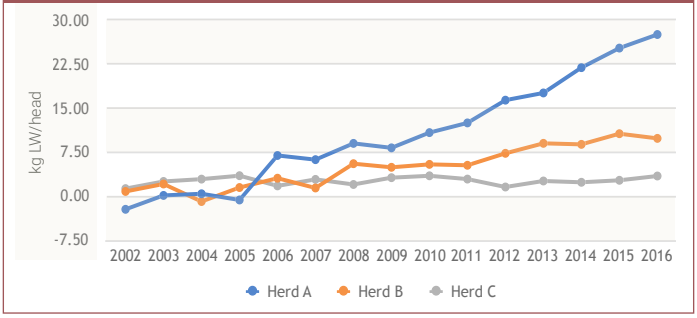
1. Get familiar with the key Deer Select BVs. See the Deer Select *Deer Fact* for more. Identify and prioritise the BVs that will help you achieve your breeding objectives.
2. Check out the current Deer Select sire summaries at www.deernz.org/deerselect. The stags listed there are the sires of young sale stags. This information gives a good starting point to source the genetics you want, whether by semen purchase (AI) or by purchase of sons of the stags.

   The summaries are updated every two months and include all sires recorded on Deer Select with 10 or more progeny born within the previous three years.
3. Consider using one of the two economic indices on Deer Select to do an initial ranking of animals on profit per hind mated. Look then at the BVs of these stags for the traits that will be help you achieving your breeding objectives.
4. Ask the breeder of the stags with traits you are interested in for their Genetic Trend Graphs for these traits. These should show an upward trend over time; except for conception date, which should trend downward.
5. As the graphs (below) for three herds show, not all stud herds will be making genetic progress. Nor will they necessarily be making progress in the traits that are important to you.

Replacement – Early Kill Index



W12eBV



If you breed your own replacements, you'll want the best of both worlds: Stags with good growth rates for venison, and good breeding females of suitable mature size. That means you'll probably be looking for stags with a high Replacement – Early Kill index. That's Herd A or B (blue and orange) in the top graph.

If you are looking for terminal sires you'll probably be looking for a stag that will give you high growth rates in the first 12 months. That means you will probably be looking for a stag with a high W12eBV – that's Herd A (blue) in the lower graph – or one that has a good terminal index value.

If your objective is improved velvet production, you'll be looking at BVs and Genetic Trend Graphs for velvet weight

6. Not all breeders put all BVs in their sale catalogue. Nor are all BVs recorded by Deer Select published in the sire summaries. If there is a trait you are interested in ask the breeder if they are recording it. If they are, ask to see the BVs for these traits.
7. Structure, conformation and temperament are important additional traits to consider when making your final decision.
8. Don't compromise your investment in better genetics. Provide hinds and their progeny with adequate nutrition and monitor their health. Bear in mind that animals with higher growth rate BVs need more feed than those with low BVs.
9. Half the genetic package carried by the fawns you produce comes their mum. See the *Deer Fact*, 'Stag and hind replacements to boost your bottom line'.

In early July 2018, Ferriera said the average LW for his weaner stags was 79 kg, nearly 4 kg ahead of the year before.

"I am expecting a further 2 kg increase in carcass weights this year. We have achieved the objectives we set in 2012 and reaching a 60 kg average by 2020 is now our new goal," he said.

"We bought the stags with the BVs we needed, we fed and looked after the herd and we're getting results.

The benefits for Waerenga of improved genetics, better feeding and a greater focus on animal health include a dramatic improvement in weaning percentages. In 2014 the weaning percentage for MA hinds was 85%; for first fawners, 78%. In 2017/18 they were 95% and 92% respectively (hinds mated versus fawns weaned).

Numbers and weights of yearling stags processed

Season	Av BV of stags purchased	Number yearlings killed	Average carcass weight (kg)	$/head @ $9/kg schedule
2012	15.6	315	51.2	$461
2014	19.5	340	50.8	$457
2016	30.1	299	53.9	$485
2017	32.1	347	55.7	$501
2018	34+	365	57.5*	$518
New objective 2020	36+	390	60	$540

*projected

CASE STUDY

More meat for the same weight

Wilkins Farming Company, Northern Southland, run two breeding herds. As part of their focus on carcass weight and value, they are using CT scans to identify sires that produce more high-value venison relative to their weight.

Mike Wilkins (pictured) says their breeding objective in this case is a better meat yield off the same weight carcass.

"Selected stags are scanned and then their sires are identified, to find which sires produce the best meat to bone ratio," he said.

Future BVs

Work was underway in 2018 to include a Breeding Value in Deer Select for parasite resistance. This is based on an animal's response to the CARLA saliva test which indicates a deer's ability to mount an immune response to a parasite larvae challenge. The CARLA response is heritable and variable.

A fertility BV based on mating and pregnancy scanning information was also being developed.

For the latest information on Deer Select BVs: www.deernz.org/deerselect

Monitor your progress

One way to monitor your own herd performance as new genetics are introduced is via the DINZ Benchmark system. See the Deer Hub, Production Target section at www.deernz.org/benchmarks

Track growth rates of young stock against examples of good performance on the Venison Growth Curve calculator. See the Tools section of the Deer Hub on www.deernz.org/deer-growth-curves

More >>

Deer Fact: Deer Select

Deer Fact: Stag and hind replacements that will boost your bottom line

DINZ *Deer Hub*: www.deernz.org/deerselect

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P2P

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