

>>>DEERSELECT 2006 Update

Chairman's Introduction, Collier Isaacs

DEER Select Vision and Intent

DEERSelect's vision is to provide genetic tools to assist deer breeders in the improvement of traits which are economically important to deer production.

A package of tools provided by DEERSelect will include:

- Breeding Values for individual traits.
- Genetic trends to quantify genetic progress in a herd.
- Economic indices to optimally balance selection for different production scenarios.
- Mate allocation tools to maximise genetic progress while minimising inbreeding.
- Tools to utilise information from DNA-based tests.
- Diagnostic tools which suggest opportunities to increase genetic gain.

In the short-medium term, DEERSelect will focus on Breeding Values and Economic Indices.

DEERSelect will evaluate the range of red deer (*Cervus elaphus*) which are used in deer farming in New Zealand (including Elk/Wapiti).

While within-herd evaluation will be available, DEERSelect will strongly encourage evaluation on an across-herd national basis. Where technically feasible, all deer will be evaluated on a common base and so breeding values and economic indices will be directly comparable.

DEERSelect will publish summaries of information available on recently used sires, with the purpose of 1) Assisting top tier breeders in identifying new genetics for their breeding program; and 2) Assisting commercial breeders in identifying which herds are using the sires most suited to their particular breeding goals.

Traits potentially be evaluated include:

- Growth (principally weight at 12 months and mature weight)
- Velvet production (weight-based)
- Reproductive success/failure
- Reproductive seasonality (conception date)
- Carcase traits
- Trophy score
- Disease resistance/immune competence
- Temperament

Production systems for which economic indices should be available include:

- Specialist velvet herd (majority of stags kept for velveting at 2 years).
- Dual purpose herd (some stags kept for velvet, with a significant proportion destined for venison at 12 months).
- Specialist venison herd using intensive production systems, targeting spring premiums.
- Specialist venison herd under extensive production, deer killed later in season.
- Specialist venison herd using terminal sires as much as possible.

There are now approximately 20 active herds using DEERSelect, principally for growth BVs. This doesn't include the several Landcorp herds, which have historical data loaded on the system in order to strengthen the genetic linkages between all herds. The publication of the ranking lists below for December 2006 give increasing confidence to the quality and genetic superiority of the leading stags, and support objective genetic measurements and use of EBV's as critical part of the industry productivity strategy.

• IN THIS ISSUE

- DEER Select Vision and Intent
- DEERSelect Update December 2006. (Jason Archer, AgResearch)
- Added value for velvet and hard antler genetics.
- DEER Select contacts
- Bureaux
- December Run Breeding Values released
- Top Ranked Stags on 12 Month EBV Cross Herd Evaluation

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Deer Notes

DEERSelect Update December 2006. (Jason Archer, AgResearch)

There have been significant changes in the breeding sector of the deer industry over the last few years.

Lower returns have brought an increased focus on productivity and efficiency behind the farm gate and more thought has been put into selecting animals for specific end uses (venison vs velvet vs trophy).

The use of AI in breeding has been more widely promoted and successfully used on farm with conception rates averaging 70-75% commonly.

Increasing use is being made of DNA to accurately identify parentage, and performance recording is being widely used. Alongside this, leading stud operators and AgResearch invested in the first deer genetic evaluation technologies that are now being used to more accurately identify the best animals for breeding from, based on performance records of the animals themselves and those of related animals.

DEERSelect is the deer industry's industry good programme for genetic evaluation, and following a pilot programme DEERSelect has been operating for 18 months. In this time, many of the major Red deer breeders have chosen to use the system and provide information to their clients. The emphasis initially has been on growth and its relevance to selection for venison production.

The availability of genetic comparisons made across herds has had a significant impact, as it gives both breeders and stag purchasing clients information on which to base decisions, and sharpens the focus of breeding programmes.

DEERSelect can monitor genetic progress among the participating herds. Figure 1 shows the average "genetic trend" across these herds over the past 15 years for growth to 12 months of age. Gains by any standards have been spectacular. Further development of DEERSelect will enhance the ability of breeders to produce deer which are even better than what we have today.

Some of the immediate priorities over the next 12 months include:

- Extending the system to deal with Elk and Wapiti-type deer. These deer are an important part of our industry, and DEERResearch has funded the development of the genetic software to expand the range of deer we can evaluate.
- Develop economic indices –the Breeding Worth concept. These indices rank animals for profitability under different circumstances where a different balance of traits are required. For example, the genetics for a stag being used to breed velvet stags and replacement females are quite different to what we are looking for in a terminal sire for venison production. DEERResearch has also funded development of economic indices, so that animals can be ranked for the different purposes and genetic merit is measured in dollars of profit (rather than units of weight).
- Adding beam circumference to the prediction of velvet – currently many stags are sold with heads on, and so no velvet records are available.
- A small research project has identified that beam circumference of heads cut following sale is correlated with velvet weight cut at optimal time. Inclusion of beam circumference measured on hard velvet will help predict velvet genetics (cut optimally). The prediction will not be as accurate as cutting velvet directly, and this lower accuracy will be allowed for in the calculations.
- Next steps include further evaluation of antler traits with an emphasis on the trophy industry. An evaluation of the Modified SCI of 400 young stag heads across 40 sires is proposed to assess the heritability of this trait and to develop an EBV for hard antler.
- Work continues with assessing a temperament trait, and some initial study of carcass yields and maternal genetic traits relating to seasonality.

*... 2006 activities updates
DEER Select makes solid
progress*

...DNA parentage

*... ..initial emphasis of
growth traits*

*... ..new developments
planned*

... ..elk/wapiti

*... ..Breeding Worth
economic indices*

... ..Velvet traits

... ..hard antler traits

... ..temperament

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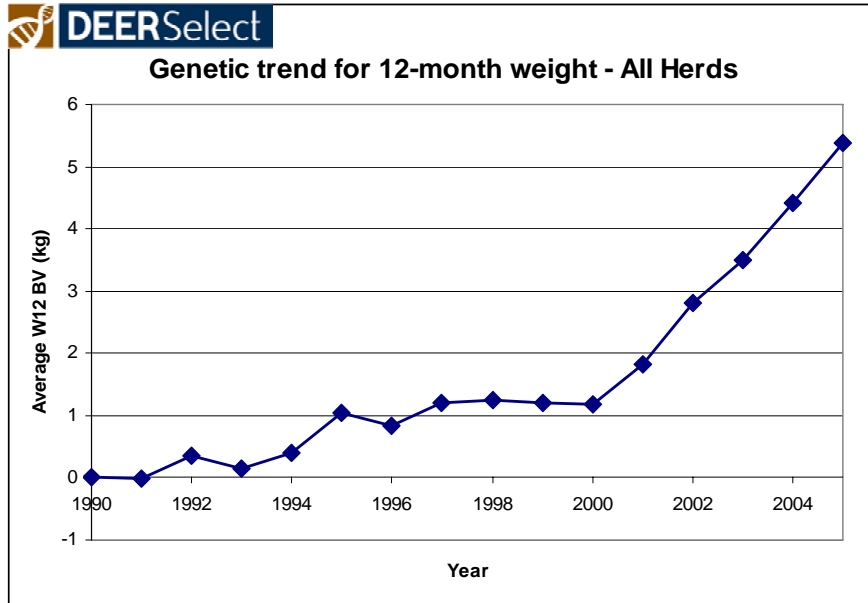


Figure 1: Genetic trends for 12-month weight across all herds show that genetic gain in the breeding herds has markedly accelerated since 2001.

Added value for velvet and hard antler genetics.

Invitation to deer breeders and those interested in hard antler and trophy genetics.

DEER Select has been operating with an initial primary focus on weight and weight gain essentially for venison production and now has two years of promotion and publication of Cross herd EBV's representing around 280 leading industry sires.

EBV's for the leading antler trait **mature velvet weight** have been available on a within herd basis since the inception of DEER Select but there is not sufficient data available to publish robust cross herd evaluations for velvet or antler traits. 4 herds have submitted a strong body of data initially, allowing traits evaluation within herd evaluation based on 2yo velvet weights and now mature velvet weight.

Further research and developments now include a further focus on antlers that will appeal to breeders in trophy and hard antler production.

a) predicted velvet weight from hard velvet/antler measurements

It has been recognised that many breeders and clients have a greater interest in hard antler evaluation, and that many of the leading 2 year old sons in the industry are presented for sale in outgrown velvet or hard antler. The opportunity to assess velvet weight by either measuring beams and length at the optimal velvet weight and developing a prediction EBV then is often lost, or considered practically risky in terms of growing a fully developed 2 yo head.

.....adding value to velvet traits

..... predicted velvet weight from hard velvet measurements

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A trial established last year across a small number of key breeders measured a number of parameters on hard velvet cut at the stripping stage and related that back to the other antlers specifications cut at the optimal velvet stage.

- The key finding was that a beam circumference measured in hard velvet taken at the point of stripping has proven to be a reliable consistent measurement that can be used as a solid predictor of assumed velvet weight after conversion from the developed formula based on this work.
- Hard velvet upper beam circumference can also be accurately be converted to velvet upper circumference
- Accuracy is around 60% which is sufficient in genetic terms to allow this information to be useful, where none existed before.

Use of this measurement could provide:

- More accurate velvet EBV's on animals not velvetted
- BV's for velvet available prior to sale
- genetic evaluation to account for the selected recording of velvet weight for animals not cut for sale
- BV's on upper beam circumference itself, as an economically relevant trait in its own right, as well as being a predictor of velvet weight.

b) Modified SCI scores as a new trait.

The industry recognises the value of hard antler and the potential for trophy animals as a key part of the industry dynamics. Its also recognised that the modified SCI score is a key measurement in selection and breeding programmes, it is objectively used in hard antler competitions and in advertising and promotion and can be verified to a standard by experienced measurers.

DEER Select proposes this year to develop the background needed to provide heritability estimates for SCI and hard antler scores and produce an EBV for this trait. While the assumption from individual experience is that this trait is strongly heritable it is not yet quantified.

A measurement trial covering 400 young heads of known age linked to at least known sires with scores is proposed to develop this EBV for the 2007/08 season.

DEERSelect believes this offers some further strong incentive for breeders and purchasers of antler genetics to step up for inclusion in the DEER select evaluation services to cover growth, liveweight, velvet weight and hard antler characteristics.

Further work covers the evolution of EBV's alone to indices of economic worth and a \$ value that breeders and buyers will be able to use assess their own genetic goals with in that context.

DEER Select invites breeders with an interest in velvet antler and in trophy antler genetics to contact DEER Select and add their records on velvet and antler growth to allow the same cross herd evaluations programme to be applied. Existing records, plus this new capacity to reference hard velvet beam measurements and calculate an estimated velvet weight EBV are critical to increase the number of herds on the recording base. The industry has advised us for a long time that when antler traits are available the genetic evaluation programme will be uptaken by the rest of the industry breeders to support the 4 leading herds that have already supplied extensive data.

That focus is now and will allow cross herd evaluation later in 2007 if sufficient uptake is committed.

*.... modified SCI score
traits being developed.*

*.... participation from
antler breeders invited*

*... More velvet antler
records and breeder
participation required to
provide crossherd EBV's
for antler traits*

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December Run Breeding Values released.

See website www.deerresearch.org.nz for full lists and details
The Breeding Values lists released to the website this month include a basic sort function allowing internet access and more flexibility for both breeders and their clients to more easily assess rankings on the major traits, 12-month weight and mature weight.

Sire summaries

These sire summaries represent the top 30 English and European stags, and the top 20 English stags based on EBVs for weight at 12 months. Stags on the list have a minimum of 5 progeny recorded, have a minimum accuracy for 12-month weight breeding value of 75%, and have progeny born in the last 2 years. The traits presented here are 12-month weight and mature weight.

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Top Ranked Stags on 12 Month EBV Cross Herd Evaluation

Top 30 Eastern

Birth Herd	Current Tag	W12BV	W12Ac c%	Current Flock Prefix
Black Forest Park	KABUL	+21.4	98%	Black Forest Park
Stanfield Eastern	MOSSIMO	+20.0	91%	Deer Improvement
Stanfield Eastern	MAXIMILIAN	+19.8	98%	Stanfield Eastern
Black Forest Park	KURGAN	+19.7	92%	Black Forest Park
Canterbury Imp Red Deer	COSSAR	+19.4	85%	Deer Improvement
Stanfield Eastern	MAXIMILIAN II	+18.6	88%	Stanfield Eastern
Black Forest Park	SUPER NOVA	+18.2	89%	Black Forest Park
Black Forest Park	LEO	+16.8	80%	Black Forest Park
Peel Forest Estate	ADMIRAL	+16.1	93%	Deer Improvement
Black Forest Park	VIRGO	+15.7	82%	Black Forest Park
Black Forest Park	HERCULES	+15.5	81%	Black Forest Park
Black Forest Park	ROMEO	+15.4	98%	Black Forest Park
Stanfield Eastern	COLOSSUS	+15.4	91%	Deer Improvement
Black Forest Park	PICES	+15.3	81%	Black Forest Park
Black Forest Park	SAMURAI	+15.3	97%	Black Forest Park
Black Forest Park	PICES	+15.2	81%	Black Forest Park
Black Forest Park	ALPHA	+15.1	90%	Deer Improvement
Black Forest Park	SHIRAZ	+15.1	93%	Black Forest Park
Canterbury Imp Red Deer	CRUSADER	+15.0	95%	Deer Improvement
Doncaster Deer Partnership	CARL	+14.8	97%	Deer Improvement
Stanfield Eastern	92/002	+14.2	96%	Canterbury Imp Red Deer
Black Forest Park	REGAL	+14.1	90%	Deer Improvement
Black Forest Park	MAJOR	+13.8	87%	Deer Improvement
Peel Forest Estate	3500	+13.7	81%	Peel Forest Estate
Landcorp Stuart	425/02	+13.6	83%	Landcorp Stuart
Black Forest Park	TAURUS	+13.5	78%	Black Forest Park
Doncaster Deer Partnership	FAVOURITE	+13.5	92%	Deer Improvement
Landcorp Stuart	127/97	+13.5	97%	Landcorp Stuart
Black Forest Park	LUGAR	+13.4	89%	Black Forest Park
Black Forest Park	TERKA	+13.4	95%	Black Forest Park
Doncaster Deer Partnership	CALIBUR	+13.2	87%	Deer Improvement

Deer Notes

Top 20 English Deer

Birth Herd	Current Tag	W12BV	W12Ac c%	Current Flock Prefix
Pelorus Deer	TOBY	+9.9	95%	Peel Forest Estate
Raroa Red Deer	99353	+9.9	84%	Sarnia Park
Stanfield English	68/95	+9.9	89%	Pelorus Deer
Stanfield English	HENRY JAMES	+9.7	91%	Foveran Deer Stud
Stanfield English	MERLIN	+9.5	95%	Stanfield English
Stanfield English	ARAGORN	+9.0	92%	Stanfield English
Stanfield English	HOTSPUR	+6.0	95%	Stanfield Pelorus
Stanfield English	99/082 HENRY JAMES	+6.0	76%	Foveran Deer Stud
Canterbury Imp Red Deer	96053	+5.8	94%	Canterbury Imp Red Deer
Stanfield English	ANDREW 11	+5.1	96%	Stanfield English
Pelorus Deer	18	+3.9	89%	Foveran Deer Stud
Windermere Red Deer Farm	295/90	+3.8	85%	Windermere Red Deer Farm
Beaufort Lodge	RYAN	+3.3	95%	Peel Forest Estate
Pelorus Deer	MAC	+3.0	90%	Peel Forest Estate
Warnham Park	CHARLES RUPERT	+2.8	97%	Stanfield Sarnia
Stanfield English	022056BP	+2.6	84%	Peel Forest Estate
Rata Hill	SULTAN	+1.9	94%	Rata Hill
Stanfield English	WILLIAM JOHN	+1.6	94%	Foveran Deer Stud
Love Red Deer Stud	NO 5	+0.7	88%	Peel Forest Estate
Tower Farms	PACQUIN	+0.5	77%	Tower Farms