

HYBRIDISATION

Not just a new word for 'problem'

by Tony Pearse, Invermay Agricultural Research Centre, Otago

UPON READING sales catalogues that describe animals as 'hybrid' or 'touch of hybrid', or hearing close encounters in handling situations explained by the statement that the animals have 'got a bit of Wap in 'em' many deer farmers assume a glazed expression and react negatively.

Reaction is illustrated both by a frequent failure to sell capital breeding stock at comparable prices and by the expectation of and preparation for, a confrontation in yarding and handling. Undoubtedly the expectation of handling difficulties has some basis in fact, but is not sufficient reason to equate the term 'hybrid' with problem and leave it at that. There is an element of risk in handling any deer.

Certainly the discerning deer farmer can quantify the difference between being thrashed around the ears by an assertive Red hind when your back is turned and receiving a solid smack in the shin, or more spectacularly in the groin, from a hybrid hind on route to the weigh crate. Broken ribs as a result of a head charge from either a Red or hybrid stag, I can vouch, feel just about the same.

Problems with hybrids do arise more frequently, particularly if facilities are not conducive to the animals' comfort. Often Red handling facilities present a

confrontation situation. Wapiti or hybrids become stubborn under pressure and as time and patience are tested the final 'hands-on' drenching or whatever can get tough on both animal and handler.

There is no doubt that specialised handling crushes or races make this easier, provided that they are well-sited and simple to learn in an easy, unstressed routine. It should be emphasised that experience shows that this is required for the few rather than the many. Culling for temperament, as in Reds has often been by sale to others rather than for prudence and venison, but the exceptions have often damned the breed type as a whole, whereas the odd aggressive Red is still considered as a 'hard shot individual'.

The current difficulty in live sale of capital stock is compounded by two factors. First the end product — the heavyweight venison carcass from young animals — until recently has not been supplied with consistency and in sufficient numbers to establish markets for the larger primals or sub-primal cuts. Second, the breeding objectives within the hybrid animal are as yet not well-defined and certainly require very careful thought.

Consideration must be given to where a breeding herd is going to be in terms of size and 'blood-type' 10 years from

now. Until surplus females are slaughtered for venison as a matter of policy, these objectives are difficult to define and demand good recording and planning to avoid either a genetic maze or a herd of increasingly larger animals.

Hybridisation must therefore be seen in Red deer breeding as part of a controlled programme that gives an advantage to the production of venison, velvet and livestock for sale and is both efficient and profitable.

Peter Fennessy stated that position with precision in 1987:

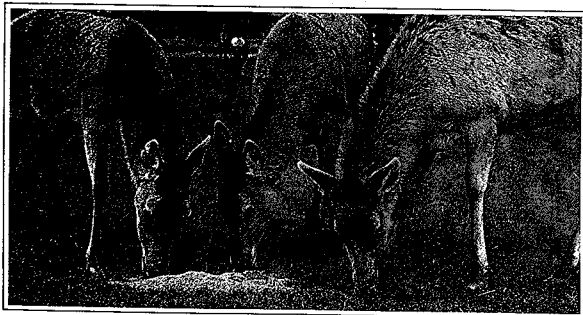
"The efficiency of any meat production system from a biological, and by implication, an economic point of view contrasts output (kg of carcass produced) with input (kg of feed eaten). The most efficient approach will involve mating a genetically large male to a genetically small female so long as there is little effect on the calving rate and the survival of the progeny."

The principle is well-established in both the research and farming contexts. Deer, particularly of the *Cervus genus*, are renowned for their diversity in size and a natural ability to hybridise successfully, producing fertile viable hybrids. In controlling such hybridisation a breeding programme requires consideration of the elements outlined in the panel which accompanies this article.

Clearly, crossing Elk terminal sires with typical New Zealand Red hinds creates the most 'efficient' form of hybrid progeny, but these are produced at the expense of easy management. For this reason, Peter Fennessy favours the progressive increase in size of Red hinds by a number of pathways to produce a hind of up to 130 kg liveweight capable of producing F1s with their associated hybrid vigour without the management constraints.

Top females can either be re-mated to pure Elk to produce a known genetic three-quarter Wapiti and selected progeny from this cross would be suitable for mating to the smaller New Zealand Red hind in a once only cross for 'Red/hybrid' venison.

New Zealand Red hinds could also be ►



Hybrid hinds with 'a bit of Wap in 'em'

There's an element of risk in handling any deer

mated to superior F1 sires to produce the one-quarter Elk with both male and females destined for venison. Under present day market conditions, per SU gross margins suggest that animals of this cross, slaughtered at 12 to 15 months are potentially the most profitable venison producers available.

Top females (selected for growth rate and leanness) of this quarter-Elk cross could assume the role of 'Megared' hinds and be re-mated to Elk to produce animals similar in size to New Zealand Wapiti, but not as variable in performance or type.

Alternatively, provided strict culling criteria for type, F1 x F1 types can be

interbred and intensively selected. The F2 or stabilised crossbred could be selected to produce the 'Megared' animal, or those with dominant Elk traits selected to produce an animal equivalent in size to the existing NZ Wapiti. Either will provide a new starting point for more defined breeding programmes.

However, selecting for size alone may become an economic inefficiency. Animals with larger mature size have higher maintenance costs either in feeding or in adjusted stocking rates. Animals which have a greater adult size and show impressive daily weight gains may not grow relatively faster. In

extreme cases these may take an extra year to become sexually mature and require a relatively longer productive life to equate their efficiency. Larger animals will certainly require different handling techniques.

Knowing the costs and risks of hybridisation and with advantages calculated from an efficiency viewpoint it is both feasible and profitable to introduce a clearly defined terminal sire breeding plan into any base Red herd for venison production. That in itself creates a challenge and reward; the problem often remains that there is a lack of forward planning both in objectives and in deer farming techniques. □

Controlled hybridisation SOME CONSIDERATIONS

Dam

New Zealand Red hind (95 to 110 kg)

Selected and performance-recorded for temperament, calving ability, mothering ability. Bred for type; carrying genes for leanness, high growth rate and superior velvet production.

Or:

'Megared' (125 to 140 kg)

Base New Zealand Red x Red European bloodlines, or large NZ Red x NZ Red, selected for ultimate size and the above traits.

The advantages when compared with Wapiti dams are:

- Easily handled in paddock and yards.
- Annually fertile and sexually mature as a well-grown yearling.
- Cost-effective in relation to supplementary feeding in either winter or drought during lactation.
- Smallest practical size for efficient cross breeding.

Effective use of land as stocking rate is not compromised by the size of the animal.

- Farm feed costs are minimised at the cost of more intensive management of stock.
- Readily available as base stock.

But:

- Hinds must be managed to shed surplus fat in winter and have intake restricted in late pregnancy to avoid fawning difficulties. On intensive farms an element of 'fitness' must be maintained.
- Hinds should be mature and experienced fawners and well-grown for type.

Sire

Sire options include:

- Canadian Wapiti (380 to 450 kg)
- Canadian Wapiti x NZ Wapiti (360 to 400 kg)
- NZ Wapiti (300 to 350 kg)
- F1 (Canadian Wapiti x NZ Red) (280 to 320 kg)
- NZ Wapiti x Red (220 to 280 kg)
- East European Red (280 to 320 kg)

These bulls and stags will be highly selected for economic traits, such as velvet production, growth rates, temperament, leanness, from an elite known genetic base.

The sire chosen will be the largest feasible for the hinds it has to service.

- It will allow the skilled management required for Wapiti animals to be confined to a few males. The risks of metabolic stress known to affect these types (ryegrass staggers, copper deficiency, etc) may be easier to manage.
- It will probably be expensive.

The progeny

The hybrid progeny will show these good features:

- Fertility.
- Predictable weaning weight, growth rate and slaughter weight.
- Their genetic make up for growth can be identified in setting up a breeding programme (based on known blood type) and a production system established for market requirements rather than absolute age.
- They will be lean and grow fast. Both male and female will be suitable for venison production.
- The possibility of hybrid vigour exists especially if the parents are as far apart as genetically possible without compromising the viability of the cross (especially calving performance). Put simply, this means that offspring produce more (either velvet or venison) or grow faster than is expected from the average of the parents' performance for that character. (Moore TDF November '87 F1 growth rates).
- Artificial insemination and blood typing techniques now under development will play major roles in breeding programmes and can be quantified.

But there is a down side — hybrid progeny also present some challenging management tasks:

- Behaviourally, hybrids can be unpredictable and difficult to handle in yards, although paddock temperament is generally quiet.
- Mating enthusiasm or libido in Wapiti or Wapiti crosses seems lower, especially under multi-sire or intensive mating management.
- Fast growing hybrid calves put heavy lactational demands on their mothers and may create feeding problems in late summer in drought risk areas. At worst some hinds may be slow to cycle next season or fail to conceive.
- Hybrids, particularly those with Elk genes, may be more susceptible to the debilitating diseases of Wapiti under farmed conditions (ryegrass staggers, copper deficiency nutritional scours).
- Longer gestation for the Wapiti/Red deer cross can further complicate late spring management and increase birth death loss from dystocia.
- Market requirements for heavy fast-growing carcasses are as yet not clearly defined.