

Deer Master: A Farmer's Perspective

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When Deer Master got under way in 1996 our property was very much typical of the average deer farm in the South Canterbury area. Whilst velvet production was good, reproductive performance was not. With mob sizes increasing every year it seemed harder and harder to get acceptable results. Added to this was my relative inexperience as a manager of deer. Deer Master was just the catalyst needed to start moving forward again.

The previous papers have given you some of the key findings of the project.

My role here today is to give you some examples of how our management practises and philosophy have changed as a result of being involved with Deer Master.

Background

We farm 240ha west of Timaru. Our climate is typically unpredictable. In 2000 we will winter the following.

| | |
|-------------------------|---------------------|
| 480 hinds | 1050 Coopworth ewes |
| 400 velveting stags | 250 Hoggets |
| 140 hybrid weaners | |
| 220 replacement weaners | |
| ----- | ----- |
| 1240 or 2280 s.u. | 1300 or 1400 s.u. |
| ----- | ----- |

At 15 stock units per hectare this is an intensive system, especially given the poor correlation of feed supply and demand with deer.

Stags and hinds are culled as two year olds and all the hybrid weaners will be killed in October regardless of weight. All red weaners are matched with their dams enabling those hinds who produce poorer velveting sons to be mated to an elk type animal.

| | 1997/98 | 1999/00 (*) |
|---------------------------------|---------|-------------|
| Reproductive performance | | |
| 15 mo hind wt | 78 kg | 89 kg |
| 15 mo hind cond score | 3.5 | 4.0 |
| 2 yo conception rate | 84% | 95% |
| 2 yo fawning % | 74% | 82% |
| Adult hind conception rate | 86% | 96% |
| Adult hind fawning % | 80% | 90.6% |
| Herd fawning % | 78% | 89% |
| Weaning Weights | | |
| Adults Hinds | 43.1kg | 48.5kg |
| 2 year old Hinds | 34.4kg | 40.0kg |
| Wap X | 53.0kg | 55.0kg |
| Death Rate | | |
| Herd death Rate | 2.7% | 1.9% |
| Stags | 3.4% | 2.5% |
| Hinds | 2.75% | 1.9% |
| Weaners | 1.5% | 1% |

Climatic conditions

These two seasons were the reverse of each other – hinds were mated in 1997 having had the benefit of the wet 1996/97 summer. They weaned these fawns after a very dry summer. The hinds in 1999 were mated in a similarly very dry period but reared their fawns over a moister summer.

Performance levels

Comparing performance levels before and after the project is not as simple as it sounds. Variations in climate, genetics and stag performance complicate the picture. However, I feel that the increases shown above can largely be attributed to better decision-making as a result of our Deer Master involvement.

Deer Master has involved a lot more than what has been discussed in previous papers. Other aspects have included:

- B1 annual Blood testing (Cu, Se, B12, Albumin, Pepsinogen)
- Selenium, B12 and Vitamin E supplementation trials
- DSP inspection of dry hinds
- Soil and herbage testing
- Teaser stag trial
- Feeding for Velvet production trial
- Parasitism investigations
- Feed budgeting Seminar
- B1 monthly field days with input from Invermay and Massey

As a participating farm we have endeavoured to be involved in as many of the research projects as possible. The knowledge we have gained as a result has been of tremendous value to us.

In an attempt to pass some of that on I would like to cover the following topics, areas where I feel we have made real progress.

- Mating management
- The supply of quality feed
- Soil fertility and trace elements
- Fawning and lactation management
- Weaner growth rates

Mating management

Hinds

Success = high and early conception rate to the best stag available

Body condition score and BCS change

Deer Master has highlighted the need to have hinds at a condition score of three or better *at weaning*, rather than increasing to this during the course of mating. This requires good feeding over lactation. First calvers and hinds rearing hybrid fawns need special treatment.

The 10kg advantage at weaning for hybrids comes at the expense of hind condition so is not for free!

Weaning date

We now wean on 1st March. This should be encouraging earlier conception though we have yet to demonstrate this. Weaning is an excellent method of bringing on wet weather, this is more helpful in early March than later in the month! More importantly it means the stag goes out in good time to settle in to his new environment.

Analysis on condition score change after weaning (Beatson *et al.* these proceedings) has shown no real gains from flushing but definite penalties for losing condition over mating. Hinds at condition score three at weaning, which subsequently lost one condition score over mating and scanned 17% dry compared with those maintaining condition at 6% dry. They were also seven days later calving. The same happened with CS 4 hinds that slipped back to CS 3.

If you were contemplating leaving fawns on mum over mating, a concerted effort would have to be made to avoid a weight loss situation. From my observations, those people that do this successfully tend to farm in higher rainfall areas with lower stocking rates.

Yearling hinds

Improving performance here has been one of the project's key aims. We have improved the conception rate but have made little progress in advancing conception date.

We are more aware now of achieving good weights pre mating for replacement hinds. Growing good replacements starts with a good weaning weight and monitoring subsequent weight gains to ensure targets are met. In our climate, young hinds have to be up to mating weight by Christmas as an insurance against a dry summer.

A point worth considering here is that research in hoggets and dairy heifers has shown that during periods of rapid growth, the presence of growth hormones can interfere with reproductive hormones. If this is the situation with young deer, then it strengthens the case for achieving target weights well before mating.

DSP analysis of the reproductive tracts of our dry hinds has shown no disease problems, simply that they are immature. Could it be that we are simply expecting too much from our young hinds?

Leaving the stag out until the end of May will get all your yearlings in calf but is not the solution we are looking for.

We have tried using melatonin treated teaser stags to advance calving with no apparent success. We have however had several yearlings calve early in October as a result of running spikers with the mob in January/February. These hinds were all by the same sire, indicating that there could be potential to select for this trait.

Stag factors

For us, the extended mating group work (high hind:stag ratio) has been a big plus. It has enabled much more rapid genetic gain and saved on the number of mating mobs and paddocks required at mating. The whole point of the exercise is to get the maximum use of the best stags, so we prefer to avoid using a back-up stag. We have tried the following options to reduce the risk of this policy;

- Last year we used wapiti bulls as back-ups so that their progeny could be identified and separated. This has worked quite well, though the resulting cross-bred progeny weren't as obvious at weaning as they are now. There could well be some with elk genes that are missed (tail length seems like the best indicator). It does give a later fawn that has more potential to grow.
- This year we CIDR'ed some hinds to cycle early in each mating group. These were then scanned in late April to check that the stag was working before deciding whether to use a backup or not.

We have successfully mated two-year-old red stags to 90 older hinds. A good stag purchase decision is magnified and so is a poor one! Common sense with a realisation of the potential costs versus benefits is important.

Supplying quality feed

So much of the Deer Master research has highlighted the need for supplying sufficient good quality feed at the right time. What then is quality feed to a deer?

- High in energy and protein
- Highly digestible
- Free of nasties (endophyte, rust, SMCO, nitrates etc)
- Palatable

For pasture this means fresh, green, vegetative, low in dead material, not too long and with a high legume/herb content This is easy to identify but not always easy to achieve

This whole issue has been confused by our perception of deer as browsers. Deer only browse in the wild because there is so little high quality feed available. We get this browsing image in our heads and transfer it to our farms- we think our deer will enjoy wandering around in long rank pastures picking out bits of clover and seed heads In reality they would much rather have a stomach full of easily harvested top quality feed and then rest in the shade

We have had to look hard at our farming operation and identify those months of the year when a supply of this quality feed is **critical**. We know we have to keep condition on hinds over lactation and that this is also the most efficient time to put weight on fawns Hence January, February and March are key months April is important so that hinds don't lose weight over mating and weaners make good post weaning gains This continues in to May when stags are needing a lift before winter as well. Space is a real problem over March and April because of the number of mating mobs and desire to give velveting stags plenty of space.

The other important period on our property is mid August to the end of September. Weaners must be pushed along once their growth clock switches on in mid August, especially if they have grown little over June and July. Velvet stags likewise are looking for excellent feeding.

Having identified what good feed is, and when we need it, the challenge has been to refine our farming system to reliably provide it

For a pasture-based system the key to providing quality feed from January to May (apart from rainfall!) is to maintain control in the spring.

Control in the spring results in higher tiller density, more clover and less seedhead and dead material Achieving this control is our perennial problem as deer farmers. We kill all our weaners soon after the grass has started to grow and the hinds can't utilise the surplus feed. We know they will need it in six weeks time so the temptation is to try carrying too much grass through into December and thus we lose control. We make things even worse by set stocking hinds at low stocking rates for eight or ten weeks.

Too often we get wary of "skinning the farm out" when making silage in November, only to regret our conservatism a couple of months later. Better to take the extra silage, get control and be prepared to feed it out again if necessary

Quality silage is a very versatile feed There does, however, seem to be a misconception that because something is wrapped in plastic or under a polythene cover then it must be good. What makes quality silage is cutting it at the correct time (early seedhead appearance) Analysis of silage samples for the stag feeding trial highlighted this to us Unless it has a high legume content we like to see it all made by November 15 This sort of product will put weight on stags after the roar and enable hinds to be weaned in good condition If for some reason we make later cut silage we keep it in a separate stack

Silage making is close to the ideal system on a deer farm but it comes at considerable cost, both in bringing it in and feeding it out again We would like to reduce our dependence on silage so are trying some of the following options :

Advancing fawning

The complete solution but something we have not achieved yet Artificial means can't bring fawning back to September where we really want it but does provide options with concentrated earlier fawning and subsequent improvements in grazing management.

Integration of other stock

Many deer farmers utilize breeding ewes or beef cows on their farms to help mop up the spring feed surplus. No other classes of stock show the leap in appetite in spring so suited to the natural grass growth pattern. A different class of stock can add the flexibility that most deer systems lack.

After 24 years of segregation (for MCF reasons) we decided eight months ago to deer fence the remainder of the farm and integrate the sheep with the deer. We have retained 1/3 of our stock units as sheep, which have effectively become second class citizens. Deer will have the first choice in times of shortage and access to the best quality feed. Managing variations in feed supply and quality should now be much easier. By retaining the sheep we can now drop our stocking rate by 1/3 over the summer/autumn period that we have identified as critical (by selling lambs at weaning and grazing ewes and hoggets off – neither of these can be done with hinds over the summer). The lambing date has been moved back by three weeks to enable better feeding of weaners and velveted stags in early spring.

A Deer Master study involving worm counts and post slaughter inspections of 2 year old hinds has confirmed that individual deer on several properties had quite high levels of parasitism (esp. ostertagia). As our farming practices intensify these problems will become worse. Sheep and deer do not share the same intestinal worms (I think), unlike cattle and deer. We expect there will be significant benefits for parasite control to both animals. These have already been very obvious in the lambs. We only have two drench families available for deer and many people rely on only one of these.

Other benefits of integrating the sheep include greater spatial separation of deer mobs (reduced erosion) and control of weed species that deer will not eat (winter cress, ragwort).

We are may be running an increased risk of Johnnes Disease and MCF - this remains to be seen.

Summer feed crops

Planting a brassica crop in spring is an effective way of transferring quality feed into the summer and reducing the spring surplus. These are some of our impressions having tried it this past year.

- To guarantee success moisture conservation is important. This means spraying paddocks out no later than mid September or even earlier if it has been a dry winter. This is prior to the spring flush and can put the squeeze on velvet stags and weaners.
- Do not use sulphur containing fertilisers at drilling – these will increase SMCO levels and probably also hinder absorption of copper. DAP contains no sulphur. A recent FITT study has found low copper levels in most brassica crops.
- Consider staggered sowing dates or planting crops of differing maturity dates so that a continuous supply of feed is available.
- Over drilling with annual or hybrid ryegrass has worked well.
- We have not done enough weighing yet to assess if the apparent feed quality is matched by actual performance.

Special purpose species

There are a number of plant species that combine very high seasonal production with excellent quality. Hybrid type ryegrasses will produce considerably more than perennials over autumn, winter and spring. Chicory, red clover and lucerne will all perform over the period that hybrid ryegrass won't. We are interested in using all these plants more widely, in conjunction with summer and winter Brassica crops. We have bought a half share in a direct drill and see this as a means of more economically adopting this sort of system. We have already seen the benefits in terms of soil conservation and labour savings. Success requires time (ideally two months between first spray and drill), additional nitrogen and monitoring of insect pests.

Ryegrass with the AR 1 endophyte is one we hold high hopes for when it becomes available. Plantain may be worth a look as well.

Mechanical and chemical topping

Chemical topping must have potential in areas with reliable summer rainfall. We intend to try it this coming spring on an area destined for direct drilling into Italian ryegrass in the autumn. It should help with the control of annual grasses as well as improving the clover content. Mechanical topping seems to be necessary at times but we hate to see feed going to waste!

Fawning and lactation management

Although the fawn loss project (Beatson *et al.* this proceedings) has not definitively proven the benefit of fawn proof fences we can still see major advantages in having fawn proof paddocks. It keeps fawns where they belong i.e. not in silage paddocks and lane ways. Pel's new 16 line netting is a big help. The identification of paddock variables such as presence of trees and proximity to disturbances are helping us to select which paddocks are most suitable for fawning. We will continue to fawn proof these paddocks.

Shade was a paddock variable associated with higher fawning %. We have several woodlots adjacent to deer paddocks that we intend to fence to give hinds access at fawning. We have yet to identify which tree species will be the most resistant to deer damage. We consider shelter a must on a deer farm and it has to be beneficial to newborn fawns.

Scanning has enabled late calving hinds to be separated. This helps to lower the stocking rate in fawning paddocks and enables earlier shifting of mobs on to better feed post fawning. Unfortunately the system of aging will never be perfectly accurate for prediction of calving data (see Wilson *et al.* this proceedings) so some leeway is required.

The recent advent of cervical AI could have **major** benefits in managing hinds and feed quality over fawning. Scanning can identify the first cycle conceptions from the later ones. Hinds could then be spread over a large area for a short time to fawn, then mobbed up to maintain feed quality. Having to set stock for long periods over fawning is a real impediment to good pasture management. We look forward to trying this technology.

Two seasons of severe drought during Deer Master have forced all the farmers involved to look at hind management over lactation. David Stevens from Invermay provided valuable advice and highlighted the protein requirements of milking hinds and weaned fawns. A silage and barley ration with no grass cannot meet the optimum requirements for lactation and growth. We have subsequently grown a paddock of lupins that were harvested for seed last month (yield of 1 ½ t per acre). At close to 40% protein they will be invaluable in the next drought.

A final thought on our expectations on weaning percentages – if you set stocked 100 single bearing ewes or cows and left them to it, how many lambs or calves would you get, and how many dead animals? Maybe deer are not so bad after all?

Fertiliser and trace element use

As a sponsor of the project Ravensdown has assisted farmers with a number of soil and herbage tests and follow up advice. A trial on one paddock involving a capital application of superphosphate has convinced me of the need to increase our P levels above the current average Olsen P of 15. This year the farm will receive 500kg/ha of superphosphate rather than the usual 180kg/ha. Higher P levels mean longer growing seasons.

We have used up to ten tonnes of urea per annum in recent years. At current prices it provides cheap feed. We are concerned with its effect on clover content so are now restricting its use to those paddocks with little clover, short term pastures and paddocks to be direct drilled.

The bi-annual blood testing over three years has given a good indication of the trace element status in our animals. Veterinary input has led to a good understanding of the required levels and various interactions involved. We don't lose sleep worrying about trace elements now.

Copper levels have given the most concern. We hope to avoid problems by keeping the pH below 6.2 (high pH = lower copper), avoiding the use of molybdenum (except on lucerne paddocks) and by ensuring animals are well fed (they can't get a full quota of copper from half a ration.). We also applied 6kg/ha of copper sulphate with the autumn fertiliser. The blood test data will provide a good benchmark to measure progress against.

Weaner growth rates

With reducing velvet prices we have been finishing more weaners for the spring market. Deer Master has highlighted to us the areas to focus on to meet October killing dates. Hybrid weaners certainly do have growth potential over winter as Table 1 shows.

Table 1. Growth rates last winter for a mixed sex mob of 46 hybrid weaners (fed grass and quality silage)

| Month/s | Females | Males |
|---------------------|---------|-------|
| June | 180 | 216 |
| July | 60 | 190 |
| August – 22 October | 180 | 295 |
| Avg LW 22 October | 92kg | 113kg |
| % mob under 90kg LW | 25% | 0.5% |

This table shows that growth rates of over 200g/day during winter are possible for the male progeny. It also raises the question as to whether or not the females should be run separately and how much slower they are to get going in the spring.

For animals with winter growth potential our philosophy is the following – if you have to spend “X” dollars to simply maintain them over winter why not spend “X plus a little more” to actually grow them over this period. In this way you get some return on the cost of wintering. It depends on the how much the “plus a little more” really is. Feed tables are of use in determining this. For example, I have compared the cost of growing a 70kg weaner stag at 0 vs 200gms/day for June and July (Table 2). I have assumed the extra feed is supplied as barley (\$220/t) and that the venison price is \$7/kg.

Table 2. Calculation of cost of additional winter feeding

| Growth rate | MJ ME /day | Extra MJ/day | Extra Barley/day | Additional cost For 2 months |
|-------------|------------|--------------|------------------|------------------------------|
| 0 | 20 | | 0 | |
| 200 | 28 | 8 | 0.8kg | 48kg = \$12.00 |

The net return is

$$6.5 \text{ kg of carcass weight } \$7 = \$45.5 - \$12 = \$33.50 / \text{head}$$

Growth rates from weaning to mid May have averaged 290g/day for the mob of 140 hybrid weaners this year. To achieve these growth rates we use a “take half, leave half policy” i.e. about a **50% utilisation of feed** at a given grazing. We are prepared to shut mating mobs up on a silage diet to provide the space to achieve this.

The situation is different with red weaners that do not have such high winter growth potential, or with replacements where early spring liveweights are not so clearly rewarded financially. Here maintenance over June and July is more acceptable. We need to concentrate on excellent feeding prior

to winter and then getting them going again in mid August. A number of farmers in the Deer Master group have now switched their focus from providing winter feed for their weaners to providing it in summer/autumn Judson and Nicol (these proceedings) have pointed out that the quality of feed offered to these animals from January to May is so often the exact opposite to what is needed to achieve growth potential over this time

Ultimately the easiest way to meet target weights for weaners is to have them born earlier

It has been noted that two weeks earlier birth is equivalent to 5kg LW for a red fawn. More for a hybrid On this basis we have CIDR'ed all the hinds being mated to wapiti bulls this autumn. We used 6 Bulls split into three mobs to mate a total of 145 hinds. If successful, 70% of the hinds should fawn around November 15 Deer Master has calculated the mean birth date for adult hinds on our property as November 30 - that means half of the hinds would normally fawn in December. The economics stack up pretty well in my eyes

The Future

The challenge is still there to make significant advances in calving date by natural means. There must also be potential to identify individual animals with high growth rates. A lamb can grow at 300- 400 grams per day any day of the year – why is it that an animal with twice the mature body size can only manage this sort of growth rate for a couple of months of its life? Are deer not the efficient converters of grass to meat that we have been led to believe they are? We need to more reliably identify the top animals and then utilise the breeding technologies available to enable their widespread use. There will be greater demand for fewer superior animals.

Conclusion

Our involvement with Deer Master has been a tremendously positive experience. The knowledge we have gained has already given significant improvements in productivity.

The advances we make in the next few years will outstrip those already made as we learn how to more effectively apply what we have learnt.

The challenge now is to pass on our knowledge and enthusiasm to the wider industry

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