

Terminal Sires: Richmond Wrightson Deer Performance Project Data

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Introduction

The use of Terminal Sires in venison production systems is widespread both in Hawkes Bay and nationally. Terminal sires in this paper refer to Wapiti or Elk type sires either as purebreds or crossbreds with red deer. Fawns sired by terminal sires and born to red deer hinds are generally heavier at weaning and have better growth rates up to 1 year of age, particularly in the autumn and spring. However, reproductive efficiency, including conception rates and weaning rates, with terminal sires have often been inferior to those achieved with red sires, both in the RWDPP (Richmond Wrightson Deer Performance Project) and in the Vet Services (Hawkes Bay) (VSHB) client base.

Pregnancy Rates – MA Hinds

Table 1 refers to mixed age (MA, >2-year-old) hind scanning results for 1999-2000 taken from the VSHB database.

Table 1 MA Hind Scanning Results from Vet Services (HB) Data Base

Year	2000	2000	1999	1999
Sire type	No.	Conception Rate	No.	Conception Rate
Terminal Sire	2384	85.24%	1902	86.0%
Red Sire	4613	90.83%	4327	92.7%

The pregnancy rate of hinds mated to red sires is on average better. Within the number of farms in each group there is also quite a variation in pregnancy rates with some good results achieved with terminal sires. However, there are some individual sires, which have very low conception rates, which markedly affect the overall herd performance. Beatson (Deermaster) and Lawrence (Proceedings of Deer Course for Veterinarians No 15 1998) report no difference in conception rate between red sires and terminal sires in the South Island. Research by Audige at Massey University suggested terminal sires achieved a better pregnancy rate. In our experience there are more disappointments with the terminal Sires than with red sires.

Table 2 MA Hind Scanning Results (district data from VSHB of RWDPP data) for the year 2000

	District	District	RWDPP	RWDPP
	No	Pregnancy Rate	No.	Pregnancy Rate
Terminal Sire	2384	85.24	1047	97.71
Red Sire	4613	90.83	1921	95.21

Table 2 compares pregnancy rates between clients of VSHB in the Hawkes Bay area and those in the RWDPP. Because of the apparent poor performance of terminal sires over a period of years in Hawkes Bay, several management factors, presented below, have been targeted based on experience within our area, communication with other veterinarians and research groups within NZ. They appear to be having some influence on results within the RWDPP.

Pregnancy Rates – Rising 2-year-old Hinds

Table 3 indicates the influence of crossbreeding Wapiti or Elk with Reds to use as breeding hinds, and the difficulties encountered in conception rates with hinds at their first mating as a rising 2-year-old (R2)

Table 3 Rising 2-year-old Hind Scanning Results (VSHB Clients, 2000 data)

	Scanned	Mean Pregnancy rate	Range
All R2 Hinds	3073	72.44%	16.7-95.7
RWDPP Hinds*	1080	82.7%	60.6-94.6
Wapiti/Hybrid Hinds	767	58.54%	16.7-81.2
Spiker Mated*+	908	86.90%	81.2-95.7

*predominantly red deer

+Yearling hinds mated in family groups with yearling stags

Hybrid yearlings have difficulty reaching puberty at 15 months of age and thus need to be at least 85% of their mature body weight to get a consistently higher conception rate at mating. In Hawkes Bay poorer feed quality during the summer months could be a factor, which does not enhance/maintain live weight gain, and thus influences onset of puberty.

With recent market demand for pregnant hinds, many clients will mate all R2 hinds and then select their replacements from those diagnosed in fawn and thus sell any surplus, hoping to capture market premiums.

Efficiency Indicators in a Breeding Herd

There are a number of ratios which can be used to analyse reproductive efficiency in a herd from conception (C), pregnancy at scanning (P), calving (Ca), weaning (W) related to the number of hinds mated (M), (Eg C/M, P/M, Ca/M, Ca/P, W/M, W/P, W/Ca) and conception date. Many of these are used in the RWDPP, and in some herds weaning weight per hind mated has also been used where herds are breeding replacements as well as fawns for venison production. Table 4 indicates weaning results from one of these herds. This is a herd where overall fawning percentage from the terminal sire groups were less than adequate and as a consequence there has been changes in the types of sires used.

Table 4 Weaning Results, one example farm (MH) – 2000 data

	1 st Calvers	Mixed Age	Terminal Sire
Calving %	82%	90%	76%
Weaning Wt (kg)	40.1	52.6	57.7
Wng.Wt/Hind Mated (kg)	32.9	47.3	43.9

Management recommendations for using Terminal Sires

The following are some of the guidelines we have used within the RWDPP to try and improve reproductive performance when terminal sires are used.

- Age of Sire - The number of apparent sire breakdowns tends to be higher in younger sires, particularly 2-year-old. Thus we recommend that terminal sires be at least 3-years old before use with larger numbers of hinds.
- Adequate condition of stag – The nutritional requirements of terminal sires is often underestimated and it is important that terminal sires used have good condition scores prior to the commencement of mating.

- Transportation before mating – Transportation of stags immediately prior to their intended use as a sire is a common factor associated with poor stag performance. The stags need to be well adjusted from a nutritional, environmental and behavioural viewpoint before mating occurs.
- Proximity to Red Stags – Terminal sires are often dominated and intimidated by red stags either in the same or adjacent paddocks. Terminal sires should be well away from Red Stags when with their mating mobs. Red stags include sire stags and velvet stags.
- Introduction of stags to mating mob - Ensure stags are introduced early to their mating mobs to acclimatise socially with their mob and the environment.
- Single Sire mating - is considered preferable. However, if multi-sire mating with terminal sires is required, try and use stags of similar age that have socialised with their cohort sires.
- Social structure of hind mob – If groups of hinds are being mixed together for mating purposes, it should be done well before mating is predicted to start. Different mobs or age groups of hinds sometimes isolate themselves within a mating mob.
- Backup stags – Backup stags must be used when terminal sires are used, to decrease the risk of poor conception rates in any mating mobs.
- Hind group identification – From a farm management perspective it is really essential to identify the hinds in each mating group and the sires that they are mated with. In our experience this is not a task that farmers readily accept!! But it is so important when establishing facts related to sire performance at hind scanning.

Profitability of Terminal Sire

Within the RWDPP the profitability of each component of the production systems is analyzed in the continual quest to optimize/maximize returns for farmers.

Table 5 shows a gross margin analysis of data taken from the RWDPP comparing the use of red sires and terminal sires based on differing pregnancy rates, weight of fawns weaned and market value of fawns. This table does not account for any differences there may be in values of red or terminal sires.

Table 5. Gross margins Breeding hinds vs Wap/Elk

Production	Red sire	Wap/Elk sire
Fawning %	90%	80%
Weaning	50 kg	55.0kg
Sale price (nett)	\$4.36/kg	4.96/kg
Sale price (nett)	\$218/hind	\$273/hind
Gross income	\$156/hind	\$188/hind
	\$82/su	\$98/su
Expenditure	\$12/hind	\$12/hind
Gross margin (before interest)	\$144/hind	\$175/hind
	\$76/su	\$91/su
Interest on Stock Capital (10%)	\$56/hind	\$55/hind
Gross margin (after interest)	\$88/hind	\$120/hind
	\$47/su	\$63/su
Feed eaten	1048/hind	1073/hind
Gross margin	\$0.08/kgDM	\$0.11/kgDM

Table 6 is a sensitivity analysis based on advantage to Red sire in terms of fawning percentage and varying weight advantage of Terminal sire fawns. The analysis gives the dollar advantage (disadvantage) per hind with the variables given.

Table 6 Sensitivity Analysis - \$/hind margin Hybrid over Red Sire

Weaning wt advantage to wapiti sire	Fawning % advantage to Red Sire				
	0%	5%	10%	15%	20%
10.0kg	74	63	52	41	30
7.5kg	64	53	42	31	21
5.0kg	54	43	\$32	22	11
2.5kg	44	33	23	12	1
0.0kg	34	24	13	2	(9)

There are clearly some significant impacts on profitability to be had if the fawning percentage can be improved using terminal sires.

A sensitivity analysis of weaner sale value of progeny from terminal and red deer sires is presented in Table 7. This analysis shows that if a progeny is 10 kg heavier at weaning, and if the differential in price is \$1/kg live weight for progeny of terminal sires, the increased margin per hind is \$70.

Table 7. Sensitivity analysis \$/hind margin for sale of weaners from hybrid sires compared with red sires

Weaning wt advantage to terminal sire	\$/kg advantage for progeny of terminal sires				
	\$0.20	\$0.40	\$0.60	\$0.80	\$1.00
10.0kg	35	44	52	61	70
7.5kg	25	34	42	51	60
5.0kg	15	24	\$32	41	50
2.5kg	5	14	23	32	40
0.0kg	(5)	4	13	22	30

Growth Rates From Weaning

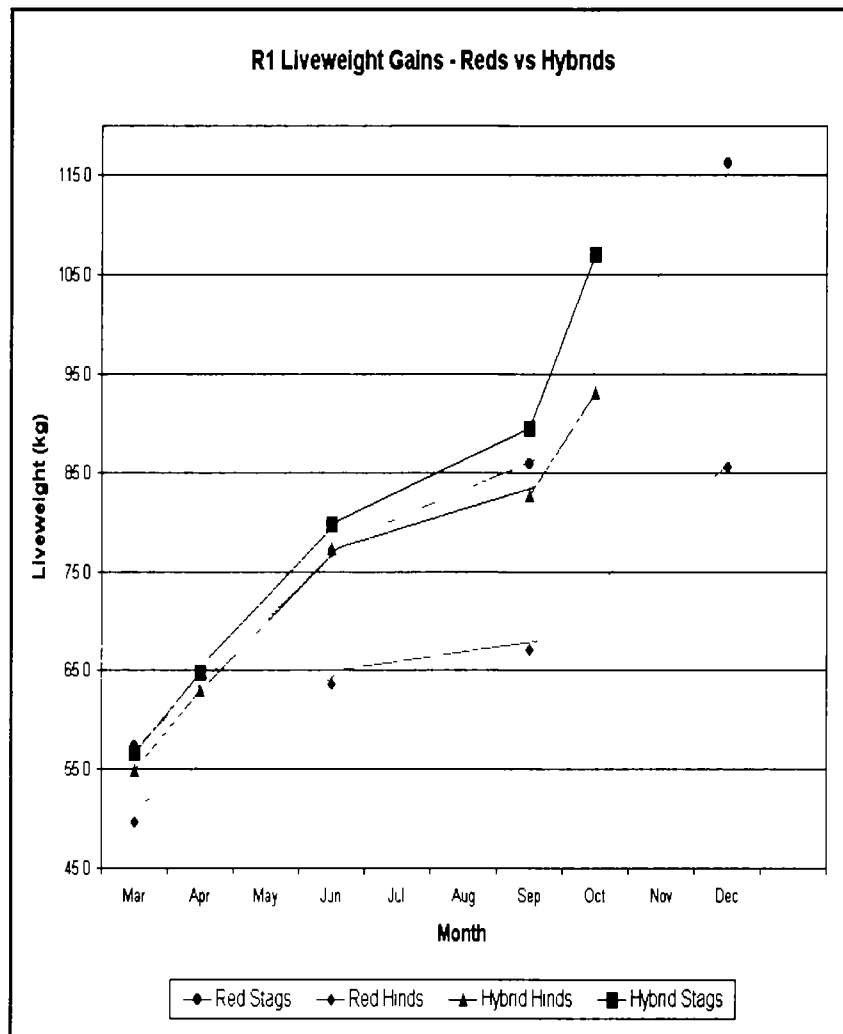
Table 8 indicates comparative growth rates of both hinds and stags from either red sires or terminal sires from one property where they were grazed together.

The hybrid stags reached their slaughter live weight earlier than the red stags and thus the last weight is in October.

Table 8 Mean rising 1-year-old Weights (KG) and Growth Rates (g/d)- 2000 data

Month	Red Stags N=29	Red Hinds N=43	Hybrid Stag N=24	Hybrid Hind N=21
Mar	57.3	49.7	56.7	54.9
Apr			64.8 (219)	63.0 (217)
May				
Jun	77.0 (179)	63.6 (135)	79.7 (213)	77.2 (212)
Jul				
Aug				
Sep	85.9 (116)	67.1 (42)	89.5 (131)	82.7 (72)
Oct			107.1 (464)	93.1 (313)
Nov				
Dec	116.2 (337)	85.6 (201)		

Graph 1 is the same data



With this herd the terminal sire fawns had a later median fawning date by about 7 days. The hybrid stags had a significant advantage in growth rate particularly in the spring.

Table 9. Weaner weights (kg) and Growth Rates () (g/d) comparing Yugoslavian-origin X red sires and Wapiti – 2000 data

Month	3/8 Yugo X Red n=11	1/2 Yugo X Red n=18	3/8 Elk X Red n=24
Mar	54.1	59.2	56.7
Jun	76.3 (201)	77.5 (166)	79.7 (213)
Sep	84.3 (106)	86.8 (123)	89.5 (131)
Nov	-	-	107.1 (464)
Dec	114.4 (334)	117 (340)	-

Graph 2.

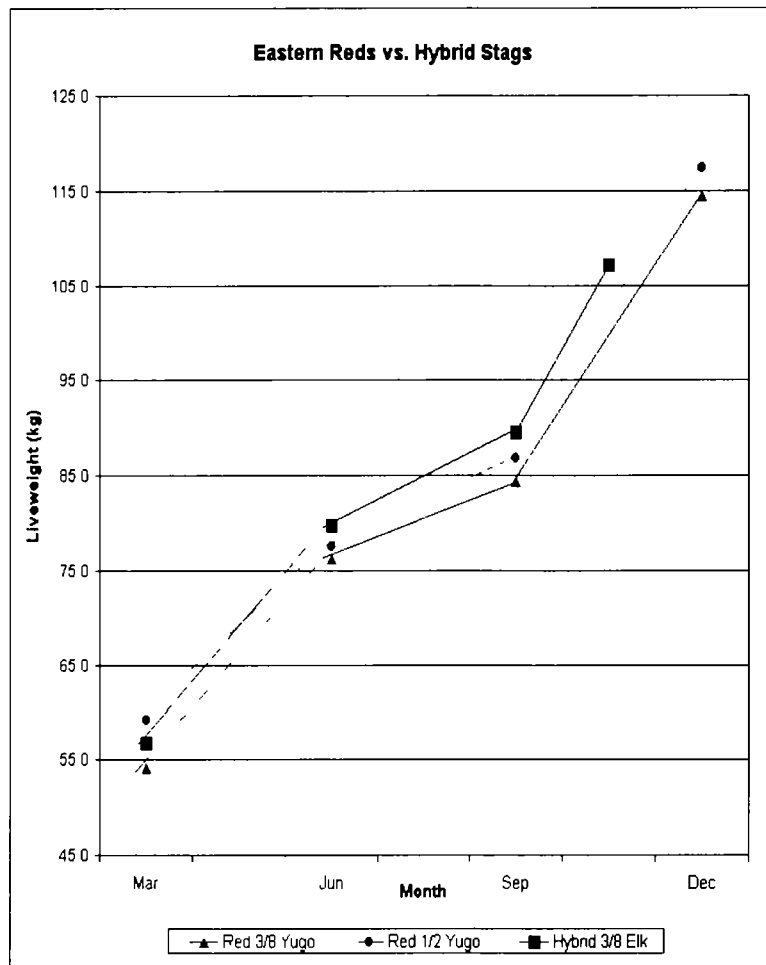


Table 8 and Graph 2 compares similar data on the same property but using 'Eastern Type' stags and Wapiti type terminal sires.

The Eastern sires had an advantage in terms of pregnancy rate, conception date and peri-parturient survival and were not discounted significantly in live weight gains.

As a consequence, this farmer is focussing more on using Eastern sires as a terminal sire in comparison to a Wapiti Cross sire

Table 10 Gross Margin Finishing Stags

	Red	Hybrid
Stock Units/hd	1.29	1.23
BuyL Wt kgs (March)	50	55
Buy\$/kg L wt	\$4.70	\$5.20
Carcass Wt kgs	56.5	58.5
Venison Value Net	\$8.00	\$9.00
Deaths %	2.0%	2.0%
Months Farmed	9	8
Buy/opening value	(\$235)	(\$286)
Sell/closing Value	\$452	\$527
<i>Costs</i>		
Animal Health	(\$5.00)	(\$5.00)

	Red	Hybrid
Freight In	(\$7 00)	(\$7.00)
Deaths	(\$4 40)	(\$5.72)
Profit \$/hd(Before interest)	\$200 30	\$222 78
Winter Feed Demand kgDM/hd/d	2 10	2 33
Feed Eaten kgDM/hd	711	675
Return\$/kg/DM	\$0 26	\$0 30

Table 10 is a Gross Margin analysis for finishing with red stags or hybrid stags with the stated variables. The Comparative profitability of hybrid fawns in a venison finishing production system is obvious, but capturing all elements of performance remains the challenge

Conclusions

The use of terminal sires in our deer farming systems provides some challenges to achieve better reproductive performance with their use

Quite clearly, if these challenges can be overcome there are some significant advantages to profitability.