

REMOVAL OF ANTLER IN VELVET : TIME, METHOD, GRADES.

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INTRODUCTION

With the high investment costs and expectations involved in deer farming it has become essential to obtain high net returns for velvet antler. Selection and to some extent nutrition can increase returns but avoiding antler damage and removing antlers at the optimum time are all important.

Numbers of stags are increasing rapidly on farms through natural increase and each year increases in velvet production occur with the growth of stags to maturity. Against this scenario we have clear indications from velvet buyers that grading of velvet antler will become tougher. Unless new markets for processed velvet antler can be developed in the very near future there will be a production glut of lower quality velvet antler which cannot be sold on the traditional but uncertain Eastern market.

Whatever the profitability of velvet antler, its removal is necessary for safety when stags are intensively farmed. There are people who believe it more humane to remove antlers only when they have hardened and the velvet skin stripped or in tatters. These people appear to have no idea that the hardened points of a stags antlers are potentially lethal to both man and other animals. Removing antlers in velvet with an adequate degree of analgesia (painkiller) as required by law is far safer for those concerned.

The cost of involvement with the veterinary profession over velvet antler removal is of concern to some deer farmers. However, it is a sensible legal requirement that stags be velvettted under adequate analgesia and the ultimate responsibility for the proper use of tranquillisers such as Rompun lies with veterinarians by law. Debate over the control and dispensing of tranquillisers for velvettting has gone on for several years. In this paper the view is expressed that it is possible to remove velvet antlers using a suitable device for stag restraint with local anaesthetic used as the only analgesic. This method should reduce velvettting costs.

TIME OF REMOVAL

The stage at which velvet antler should be removed can be roughly indicated by time elapsed since casting of the old antler. There has been advice that adult stags should be cut at 65 days after casting. More accurately this should be expressed as "Stags are likely to be ready for antler removal between 55-70 days after casting of their old antlers".

There is variation in the time antler casting occurs in individual stags and between antler sides on a stag in relation to the differentiation of velvet antler tissue beneath the uncast coronet (Fig. 1). Some stags can knock their antler stumps off prematurely, particularly through fighting when yarded. Other stags can retain their antler stumps for some time after there has been reabsorption of bone across the interface between the pedicle and antler simply by adhesion of viscous substance. With this

variability in casting in relation to actual commencement of velvet growth, and such factors as climate, casting date only gives an indication of period rather than actual date when stags are likely to be ready for velvetting.

Casting dates for stags becomes earlier as the stags age to maturity. Rising 2 year old stags mostly cast their old antlers in late October whereas rising 5 year old stags cast in early September.

TABLE 1: Means for date of antler casting and velvet antler production (range) for a cohort of 36 red stags from 1 to 5 years of age

Age (y)	Casting date	Velvet antler (kg)	Days of growth ¹
1	-	0.29 ² (0.07-0.58)	-
2	25 Oct (5/10-9/11)	1.01 (0.68-1.53)	55 (54-58)
3	27 Sept (7/9-19/10)	1.60 (0.98-2.6)	58 (49-67)
4	14 Sept (31/8-8/10)	1.93 (1.16-2.89)	61 (47-72)
5	4 Sept (20/8-18/9)	2.17 (1.65-3.25)	60 (51-70)

¹ Days from antler casting to removal of velvet antler

² Hard antler

As antlers from stags 3 years and older become ready for velvetting they require checking three times a week to determine the optimum time for cutting. This is indicated by a very slight indentation in the top of the main beam indicating budding of the top or royal tines.

At this stage of antler development the main beam is growing in length at about 1 cm/day and the increase in weight of antlers is about 50 g/day which is the equivalent to \$5/day if the set of antlers is A grade type (at \$100). Obviously to remove the rapidly growing velvet antler at a time which will satisfy critical buyers and maximise returns with minimal downgrading requirements, and regular checking of stags and prior knowledge of what the buyer want.

From examination of hard antlers from adult red deer it can be observed that almost invariably three tines are present and they are about half way between the coronet and where the main beam divides into the top or royal tines (Fig. 2). This relationship can be used as a general rule in deciding when to remove antler or let it grow longer bearing in mind that growth rate in length is about 1 cm/day.

In a trial at Invermay using rising 5 year old stags, antlers were removed at various stages of development to determine the difference between stags in days of growth from casting, velvet weight and grading.

These stages of development were defined as Stage 1 - very slight indication of division into the top tines, Stage 2 - maximum depth of division 0.25 cm, Stage 3 - maximum depth of division 0.5 cm. Each stag had one antler removed at Stage 1 and the other side was removed alternatively from stags at Stage 2 or 3.

The difference in days of growth from casting between Stage 1 and Stage 2 antlers was about 7 days producing an additional 0.18 kg per side of velvet antler. Stage 3 was reached about 3 days after Stage 2. In the development of the antler it appeared that lines of division appeared slowly as growth of the main beam proceeded rapidly. However once the lines of division

were evident to a medial depth of over 0.25 cm growth of division became rapid.

Incidental to this experiment it was observed that after hanging the cut velvet antler upside down for several hours the division at the top of the beam largely disappeared. After the velvet antler had been dried no real difference in the shrunken tops of the beams was discernable.

The frozen velvet was graded independently by 3 companies. The result of the grading gave highest returns for antler cut at Stage 2 with an extra \$6/kg which combined with extra weight of velvet antler produced gave a return of \$48 (23%) more for a set of antlers cut at Stage 2 instead of Stage 1. Removing antlers at Stage 3 reduced returns slightly from Stage 2 removal (Table 2).

TABLE 2: Returns in \$/kg and \$/head for stags with antlers removed at different stages of development

Grading Source	Removal Stage		
	1	2	3
X (\$/kg)	96	105	105
Y (\$/kg)	101	107	104
Z (\$/kg)	91	94	86
Mean \$/kg	96	102	98
Wt Velvet (kg)	2.20	2.54	2.58
Return \$/stag	211	259	253

Calculated on velvet prices: AA = \$125/kg
 A1 = \$105/kg
 A = \$100/kg
 A2 = \$90/kg
 B = \$70/kg

Regrowth of antler on the sides cut early at Stage 1 was more common than on sides cut at the later stages. Of sides cut at Stage 1, 73% grew substantial regrowth compared to 60% of sides cut at Stage 2 and 39% at Stage 3.

The time to remove antler in velvet from rising 2 year old stags is more complicated and involves a decision on whether or not to cut for T grade velvet for the Taiwanese market. The criteria for T grade velvet are length 20-25 cm, thick beam, with only slight indication of division into the tree tine. This stage is reached at about 40-50 days of growth after casting of old antler and weight of velvet antler at this stage is about 50-55% of what it would be if cut later at a similar stage as from older stags. When assessing the best stage to remove velvet antler after tree tine development it should be remembered that the main beam may not swell and divide into top tines in many 2 year old stags.

Prices offered for T grade velvet have been highly variable and farmers should thoroughly discuss grade prices with the velvet antler buyers before deciding at what stage to remove antlers. Removing antlers early for T grade has the disadvantage that more regrowth needs to be removed later in the season. An advantage may be that the velvet is removed

earlier in the season and can be sold before prices may drop with market uncertainties later in the velvetting season.

For velvet antler from fallow bucks the top prices have been paid for antler removed when the trez tine is just starting to develop. Weights of antlers at this stage is about 0.5 kg per buck and depending on grade price returns have to be considered in terms of removal costs as well as later removal of regrowth.

METHOD OF REMOVAL

The best methods of removal have one result in common - a minimal amount of damaged velvet antler in the freezer. Minimising the amount of antler damage is not simply a matter of how it is removed. A broader view of velvetting is required.

Stags should be familiarised with being yarded well before velvetting is required. A common mistake is to think stags can be yarded for the first time at velvetting without undue velvet damage. Animals are more difficult to yard and handle during hot or unsettled weather conditions and velvetting during these periods should be avoided. When large numbers of stags are required to be velvetted they are best drafted into small groups of about 30 by casting period. This results in groups of stags becoming ready for velvetting at about the same time and it minimises the number of times stags need to be yarded before velvetting and thus the opportunity for them to damage their velvet antlers. Having smaller groups of stags relative to the size of the yards greatly reduces

the amount of velvet antler damage which can occur when stags become overcrowded in the yards and start boxing each other with their forefeet.

Actual method of antler removal depends to some extent on the skill of the operator to avoid antler damage. Suitable crushes or devices have been developed for the restraint of stags but they do depend largely on being suitably positioned in the yard design. Most important is the facility to hand draft a stag into the crush and a method to restrain the head quickly and securely to avoid the antlers hitting any object.

Crushes have several advantages besides reducing labour costs of velvetting and removal of antler regrowth. Stags can be velvetted humanely using only local anaesthetic as a nerve block to the antlers. This reduces the costs associated with having to use Rompun or Fentaz and local anaesthetic is potentially far less dangerous to humans in cases of self injection than these tranquillisers. Administration of local anaesthetic is easily taught and learnt and it would be hoped more freely dispensed than Rompun by veterinarians to farmers.

If markets for processed velvet are developed in the West then drug residues will undoubtedly be of concern to the importers. In this regard the use of only local anaesthetic avoids Rompun or Fentaz residues in the antler. Another advantage is that the need to use a tourniquet is greatly reduced in animals which are not tranquillised and the tourniquet can generally be removed after velvetting just before the stag is let out of the crush.

With the use of local anaesthetic it is important to wait 2-5 minutes for the local anaesthetic to work. Because the main innervation to the antler goes up the outside, the antler should be removed by sawing from the outer side in. If the local anaesthetic has not worked adequately this can be easily detected at the first saw cut, by the animals response and more local anaesthetic given.

GRADING

Grading tends to be the prerogative of the buyer and variations in grading do occur between buyers. Antler in velvet is generally graded on weight, length, beam thickness, stage of development and shape and down-grading for damage. Some buyers are more concerned about the degree of pointing in the brow and bez tines.

Besides grading of sides or sets of velvet antler, it is important to recognise that Eastern buyers differentiate between grade value of regions within the velvet antler. These regions are the trez tine and above, the beam below, and the basal beam region with the brow and bez tine. (Fig. 3).

More attention should be paid to the top region of a stags velvet antler production when selecting breeding stags rather than solely relying on yield weights. The circumference of the antler beam below the trez is probably the best measurement to use because length of the main beam and trez are quite variable due to removal time. It is a good idea to obtain a photographic record of individual stags velvet before it is sold. The

photograph of the velvet antlers should be made at a standard distance between camera and velvet with a ruler alongside to allow relative comparisons when examining the prints. Without records and stag's antler production it is difficult to make wise decisions in the selection of stags for breeding, velvetting, sale or slaughter.

The rapid expansion of numbers of farmed stags through natural increase is going to have a major impact on grading and velvet antler returns to farmers unless markets can absorb this increase in production.

The amounts of velvet antler exported from New Zealand in 1982 and 1983 are shown in Table 3. While these figures may not accurately reflect the actual amount of velvet antler removed in these seasons they do indicate the level of production allowing that some velvet antler came from wild deer. Dried velvet is about 35% its wet weight. Thus it can be calculated that exports in 1982 and 1983 were the equivalent of 24 and 34 tonnes of wet velvet.

TABLE 3: Exports of velvet antler from New Zealand

Export year	Velvet Antler (kg)	
	Frozen	Dried
1982	7,229	5,874
1983	4,899	10,207

Source: N.Z. Dept. of Statistics

From the Department of Statistics figures for the number of red deer hinds on farms at June 1982 estimates of increases in velvet antler production from red deer through natural increase and ageing of stags are shown - Table 4.

TABLE 4: Projected velvet antler production of farmed red deer through natural increase and ageing of stags

Year ending January	Age (y)	Stags ('000)				Total velvet (tonnes)
		1	2 ^A	3 ^B	4 ^{C+}	
1984		25	15	-	-	15
1985		30	22	11	-	38
1986		38	27	17	11	74
1987		48	34	20	28	120
1988		61	43	25	48	176
1989		77	55	32	73	249
1990		97	69	41	105	340

Assuming

A 10% stags slaughtered at 15 months x 1.0 kg/head

B 25% stags slaughtered at 26 months x 1.5 kg/head

C mature stags x 2.0 kg/head

The increase in numbers of stags was calculated using a weaning percentage of 85 with equal sex ratio of calves and allowing 7½% mortality rate for adult hinds.

The table shows that through natural increase and ageing of stags there is a potential additional increase to production this season of 38 tonnes of velvet antler compared with the figure of 34 tonnes exported in the 1983 year. In the 1985 season this potential almost doubles to 74 tonnes. In 5 years time the 1989 season could potentially produce 10 times the amount of antler in velvet exported in 1983.

It is urgent that the industry research and develop markets for this pattern of production increases.

Fig 1. Various stages of velvet antler tissue development at which casting occurs.

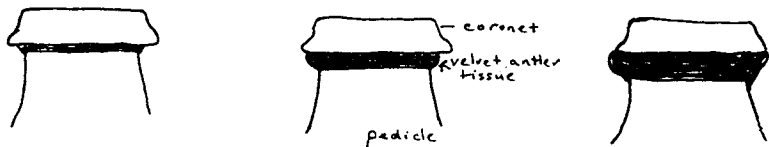


Fig 2. hard antler

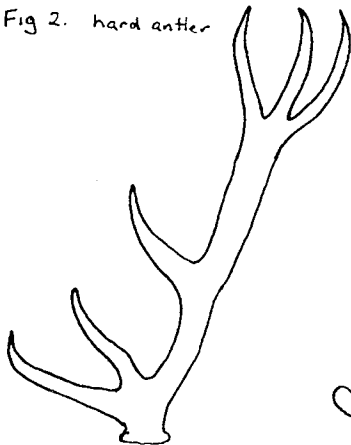


Fig 3. grade value of regions of velvet antler.

