RED DEER IN A FARM SYSTEM

Stags

As far as reproductive performance of the breeding herd is concerned, the stag has only one function, to sire offspring. However, in order to perform this function, sire stags must be well-managed throughout the year to ensure they enter the autumn rut (mating period) in a fit and healthy condition. Sire stags tend to be the most valuable animal on the farm owing to their potential genetic contribution to the whole herd.

Annual cycle

Red deer stags undergo profound annual cycles that revolve around mating success during the rut in autumn. The most obvious changes involve the development of antlers each year, but there are many other changes that influence how stags are managed on the farm.

What is the rut?

The rut is the 3-4 week period of hyper-sexual activity in autumn (i.e. late September to late November) when stags actively and aggressively compete for access to hinds for mating. During this period they exhibit various sexual and combative behaviours, including 'roaring' and territorial defense of harems (hind groups) and rutting areas. Actively rutting stags invest huge amounts of energy into protecting their patch but do very little eating for 2-3 weeks. Consequently, they will lose up to 30% of their body weight over this period.

Warning: Farmed stags can be extremely aggressive to humans over the rutting period, even if they appear to be gentle at other times of the year. Be cautious around actively rutting stags. Fully antlered stags represent an extreme risk to people during the rut.

What happens after the rut?

Stags come out of the rut in late November in a rather emaciated condition, often sporting combat injuries. Generally they will just remove themselves from the rutting area, and it is often easiest to manage the process of stag:hind separation by simply opening gates into other areas of the farm. Post-rut stags go into a convalescence mode, becoming rather sedentary and lethargic…but don't be fooled, as they can very quickly become aggressive again over the winter period…particularly if any hinds come into oestrus (heat) after the rut. Stags regain some body condition post-rut but essentially remain quite lean over winter.

On some farms it may be necessary to give stags a post-rut anthelmintic drench and provide high quality feed for them.

As the photoperiod lengthens over late winter and spring, stags switch to a more active mode in which they dramatically increase their feed intake. During the period from about late February to early August, stags accumulate large quantities of fat in their bodies in preparation for the next rut. This period coincides with dramatic changes in testis development that control the new antler cycle.

The testis and antler cycles

Scientists have long been amazed by the profound annual changes in testicular function, and its links to the annual antler cycle, in male deer. In the case of red deer (and other deer species of northern temperate origins), the testes almost completely shut down in spring….they decrease in size, cease production of sperm and secrete only minimal quantities of the male hormone, testosterone. It is this drop in hormone production the triggers the process of antler casting in spring.

Almost immediately after casting, new antlers begin their growth cycle as velvet (non-mineralised) antler. Velvet antler exhibits a prodigious growth rate over spring and summer while the testes are in their shut-down phase. During this time stags are relatively docile and non-aggressive….and they are completely infertile.

As the photoperiod again starts deceasing after the summer solstice, this triggers a re-instigation of testes growth and sperm production. At this point, the new antlers have approached their maximal dimensions. The rising testosterone output from the testes over late summer causes mineralisation to occur inside the antlers, leading to complete hardening and stripping of outer velvet layer by late August. Testosterone also causes the stag's neck muscles to swell….the stag is once again ready for the rut.

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Mating management

For most deer farmers, the principal reason for keeping adult stags on the farm is for their use as sires, for which the most crucial time is the rut. Sire stags represent a major genetic and financial investment in the herd. There are a number of management considerations around the optimal and safe use of such high-value animals.

When should I join stags and hinds for mating?

Hinds generally start cycling (ovulating) in late September to early October, but some hinds can actually start cycling in early September. To capture the benefits of early calving it is necessary to join stags and hinds as early in September as possible. It is becoming more normal practice now on deer farms to join the sexes within the first or second week of September, although some farmers are opting for late August joining to identify very early cycling hinds.

What is the best ratio of hinds to stags?

While it is acknowledged that some sire stags have successfully mated 100-120 hinds during the rut, such high ratios carry considerable risk of pregnancy failure, especially in single-sire mating situations. Even though the rut is very intense in terms of overt stag behaviour, sire stags have limits to their libido and mating capability. Also, individual stags vary enormously in their mating ability.

- Safe adult stag:hind ratios range from 1:30 to 1:50 depending on stag age, 2 and 3 year old stags generally have lower mating capability than older stags.
- Safe yearling stag:hind ratios range from 1:8 to 1:12, highlighting their lower libido and their inexperience.
- If oestrous synchronisation procedures are used to tighten calving spread, it is very important to reduce stag:hind ratios for mating (e.g. 1:10-15) as stags have considerable difficulty serving multiple oestrous hinds in one day.

Single-sire versus multi-sire mating

- Single-sire mating, in which a single stag has sole access to a group of hinds for mating, guarantees the paternity of the offspring. However, it carries risks around stag failure. Care should be taken to observe for normal mating behaviour of single-sire stags during the rut and quickly replace any stags that show no interest in oestrous hinds. Another risk management option is the replace all single-sire stags with ‘chaser stags’ mid-late rut.
- Multi-sire mating management is often seen as a lower risk option but cannot guarantee paternity of specific stags. Care must be taken to ensure that competing sires have adequate space to develop non-overlapping rutting territories in order to minimise combat. Also, it is important not to mix antlered and non-antlered stags. The latter would be at a serious disadvantage and unlikely to effectively sire offspring.

Indications of non-performance

For both systems, it is important to frequently monitor what each stag is doing in the field, and look for signs that the stag is not performing for whatever reason. A particular indication is sitting down and failure to roar. Others continue to mount hinds but owing to fatigue, fails to complete the job. Watch for signs of exhaustion, which may include severe weight loss. Lameness (particularly in the hind legs) is another indicator of fatigue.

What are ‘chaser’ sires?

‘Chaser’ sires are replacement sires used to minimise pregnancy failure in single-sire mating situations. Generally, the primary sire is given access to the hinds for a period equivalent to 1 or 2 oestrous cycles (20-40 days), then replaced for the remainder of the rut with another stag….’the chaser’. Sometimes this simply involves rotating primary sires around the various hind mating groups.

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Removing stags after the rut?

Restricting the joining period provides some control over the spread of calving. Stag removal after a set period of mating ensures that late cycling hinds do not conceive to produce late-born calves. Such hinds are generally identified at pregnancy scanning and culled. More and more farmers are opting to remove the tail end of the calving season by removing stags early.
If left to their own devices, stags will generally opt to remove themselves from the hinds once the main mating period is over. However, it may be necessary on occasions to actively remove rutting stags (this also applies when replacing sires with chasers). This is a process requiring care and caution. Rutting stags can be quite belligerent about their eviction!

Mating yearling hinds with yearling stags

There has been much debate over the years about mating practices for yearling (R2) hinds. Low pregnancy rates have occasionally been blamed on the use of older sires over the young hinds. While there is little actual evidence for this, it has become common practice on NZ deer farms to join yearling hinds with yearling stags at ratios 1stag:8-12 hinds. Joining generally occurs quite early (mid-late September) to allow for a period of socialisation to optimise mating success. While yearling stag mating systems have not yet been shown to improve conception rates over that of adult stags, they are relatively simple to set up and manage.