BEYOND THE FLEECE

When Breeding Doesn't Go as Planned

Understanding Fertility, Breeding Management & Reproductive Abnormalities in Alpacas

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Red Granite Ranch & Ironhide Alpacas



A note to fellow breeders

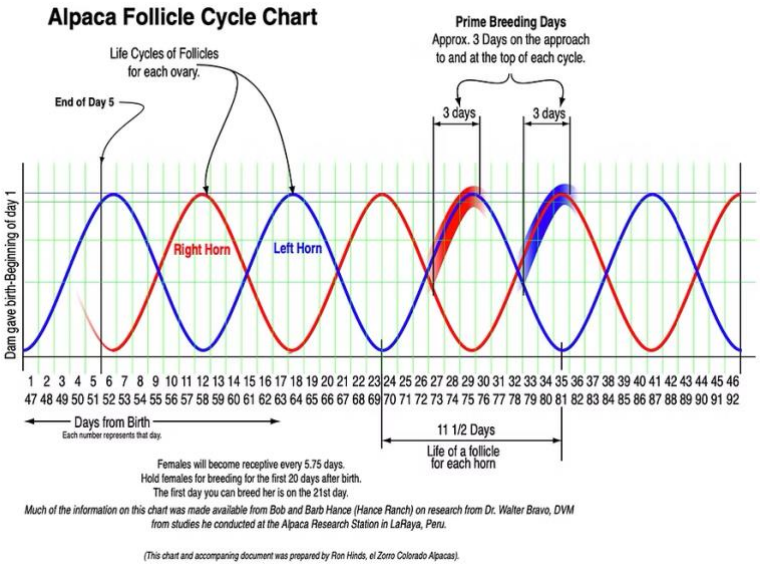
Sometimes a breeding goes exactly as planned (our favorite!). Other times, a female does not settle, a spit-off leaves us guessing, or we notice something unusual. This short guide walks through what may be happening, what to record, and when to involve your veterinarian.

Breeding alpacas can be one of the most rewarding aspects of managing a herd. From carefully selecting breeding pairs to confirming pregnancies and anticipating the arrival of new crias, each breeding season represents another opportunity to advance our programs.

Yet, even with carefully planned pairings, successful reproduction is never guaranteed. A female may accept a male repeatedly without conceiving. Another may reject breeding despite having no confirmed pregnancy. Some females conceive easily but experience early pregnancy loss, while others develop reproductive abnormalities that go unnoticed until repeated breeding attempts fail.

How many breeding's are actually necessary? What constitutes normal reproductive behavior? And at what point should a breeder investigate why a female isn't conceiving?

Understanding the answers requires looking beyond breeding dates and behavioral observations to examine the unique reproductive physiology of alpacas. Unlike many traditional livestock species, alpacas are induced ovulators. Their reproductive cycles, mating behaviors, and physiological responses differ significantly from those of cattle, sheep, and horses.



This installment of Beyond the Fleece explores three closely connected subjects: the physiology of breeding, the investigation of infertility, and the reproductive abnormalities that breeders may encounter. At the end, we share our knowledge.

Feel free to reach out with questions, we will happily answer them.

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PART ONE | Getting Breeding Right

Understanding the Reproductive Physiology of Alpacas



Female alpacas do not experience the same predictable estrous cycles observed in many other domestic livestock species. Instead, they are classified as induced ovulators, meaning ovulation is generally triggered by mating rather than occurring spontaneously at regular intervals.

Although alpacas do not have a conventional estrous cycle, their ovaries remain physiologically active. Follicles develop in overlapping waves, with one follicle typically becoming dominant during each wave. These follicles contain developing oocytes, or eggs, that may be released following an appropriate ovulatory stimulus.

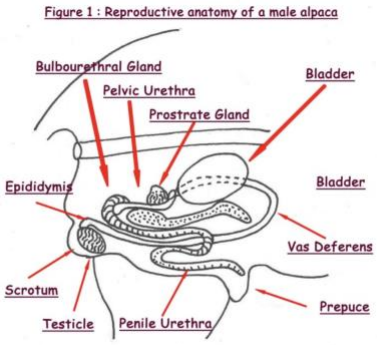
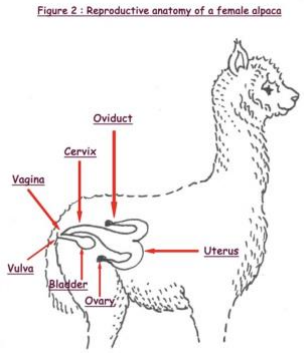
Research indicates that follicular waves in alpacas typically occur over about 12–14 days, though individual variation exists. Follicle size, maturity, and ovarian health influence whether ovulation can occur successfully. A female may be behaviorally receptive but lack a sufficiently mature follicle at breeding, which could be why she is not getting pregnant when bred.

Ovulations are generally single, i.e., only one follicle ruptures. Multiple ovulations occur in about 10% of natural matings, but twin births are extremely rare. Spontaneous ovulation occasionally occurs in alpacas, too.

Research has shown that beta-nerve growth factor (β-NGF), a component of camelid seminal plasma, helps stimulate the hormonal events that lead to ovulation. Following mating, this ovulation-inducing factor contributes to luteinizing hormone release. Ovulation generally occurs approximately 24–36 hours after mating when an appropriate follicle is present. Following ovulation, the ruptured follicle develops into the corpus luteum (CL), which produces progesterone, a hormone essential for maintaining pregnancy. If pregnancy is not established, the corpus luteum eventually regresses.

Breeding behavior alone cannot tell us everything occurring within the reproductive tract.

Male Anatomy	Female Anatomy
The male has two testicles is a non-pendulous sccrotum situated below the anus. The primary function of the scrotum is to maintain the testicles, which are the source of sperm, at a slightly lower body temperature than the rest of the body. The prepuce is the sac holding the penis. This normally points backwards during urination, but when the male is sexually aroused the prepuce points forward and the penis is extruded for mating. The tip of the penis has a slightly clockwise curvature. Males are usually, in our	The female has a small opening called the vulva situated below the anus. The vulva leads to the vagina which is the birth canal and passage for the penis during copulation. The vagina leads to the cervix which is the opening into the uterus. The uterus consists of a body and two uterine horns. During mating the male deposits sperm directly into the uterus of the female. The oviduct carries the egg from the ovary to the uterus and is also the site of fertilization of the egg by sperm. In alpacas, most pregnancies occur in the left horn. We

experience, ready to breed by 2.5 and 3.5 years old. It differs from male to male, and even different genetic lines. Eruption of fighting teeth appears to correlate with approximate time of sexual maturity.	like to first breed females when they are 20-months of age and/or about 115-130 lbs. This ensures the female has had adequate time to mature. We have had females maintain pregnancies until they are 18 years of age.
	

Figures 1 & 2 kindly provided by Australian Alpaca Association Ltd.

How Many Breedings Are Actually Necessary?

Some breeders prefer a single observed breeding. Others repeat breeding over several days, while pasture breeding may allow multiple mating events without precise documentation. Does breeding more frequently necessarily improve conception? Not necessarily.

Successful conception depends on follicular maturity, successful ovulation, viable sperm, reproductive tract health, and appropriate timing. Repeated mating cannot reliably compensate for deficiencies in these areas.

During copulation, the female typically assumes a sternal position, commonly called kushing, while the male mounts and vocalizes (orgling). Copulation may be prolonged, sometimes approaching 45 minutes. Camelid ejaculation is prolonged, but mating duration alone is not a reliable measure of reproductive success. A longer breeding does not guarantee ovulation or pregnancy, and a shorter breeding is not automatically unsuccessful.

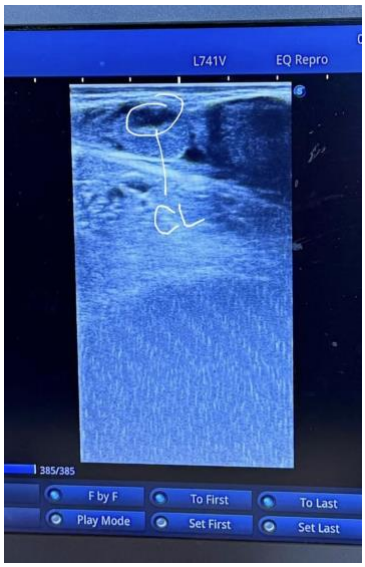
There is no universally appropriate number of matings for every female. The need for additional breeding depends on reproductive history, the quality of the initial mating, follicular status, and pregnancy confirmation. Repeated mating without a clear reason may cause unnecessary irritation or trauma and complicate the accuracy of breeding records.

Hand breeding allows breeders to document dates, observe behavior, and assess mating. Pasture breeding provides more opportunities for mating but may obscure precisely when and how often breeding occurred. For either approach, careful recordkeeping is essential.

Rather than routinely increasing mating attempts, consider whether an appropriate reproductive examination would provide more useful information.

The Spit-Off: What Does It Really Tell Us?

Breeders often use a female's response to a male as an informal indication of pregnancy. A female that spits, kicks, rejects the male, or attempts to escape may be assumed pregnant. That assumption can be misleading.



After ovulation, progesterone produced by the corpus luteum influences reproductive behavior. A female may reject a male even if fertilization did not occur. Discomfort, stress, previous experiences, reproductive abnormalities, and individual differences can also affect behavior. Acceptance does not conclusively establish that a female is open.

The spit-off is a behavioral observation, not a definitive pregnancy test. Ultrasonography can help a veterinarian confirm pregnancy, assess viability, and investigate abnormalities that behavioral testing cannot reveal.

For your records: Note the breeding date, male used, whether mating was observed, any repeat breeding, and the date and result of veterinary pregnancy checks. See an example of our breeding sheet at the end.

PART TWO | When something seems wrong

When a Female Won't Conceive

Repeated unsuccessful breeding should prompt a systematic investigation, rather than automatically changing herdsires or increasing mating frequency. The female is not always responsible: male fertility, mating technique, timing, and management must also be considered.

Ovarian abnormalities: Ovulatory failure or abnormal follicular activity can interfere with conception. Underdeveloped ovaries and persistent or cystic follicular structures may be associated with reproductive problems. A single large follicle on ultrasound is not sufficient to diagnose a pathological cyst; persistence, follicular dynamics, and clinical history matter. Veterinary ultrasonography helps distinguish normal from abnormal ovarian findings.

Uterine infections and inflammation: Endometritis is inflammation of the uterine lining. It may be associated with infection, contamination, trauma, or obstetrical complications. Chronic cases can have few outward signs; repeated infertility may be the principal complaint. Evaluation may include ultrasound, uterine cytology, culture, and occasionally endometrial biopsy. A positive culture alone does not establish clinically important infection.

Structural and anatomical problems: Congenital or acquired abnormalities of the ovaries, uterus, cervix, or vagina can interfere with mating, fertilization, or pregnancy. Examples include cervical injury, adhesions, and vaginal strictures. Some are not apparent on external examination. A complete veterinary reproductive examination is often more informative than repeated unsuccessful breeding.

PART THREE | Finding answers and making a plan

The Importance of Reproductive Examinations

Ultrasonography can help assess ovarian follicles, corpus luteum development, uterine fluid, pregnancy, and certain reproductive abnormalities. Findings must be interpreted alongside history and clinical signs.

Uterine cytology and culture may help evaluate suspected inflammation or infection. Culture results should not dictate treatment by themselves, because microorganisms can be detected without clinically important disease. Endometrial biopsy may be appropriate in selected persistent infertility cases to assess inflammation, fibrosis, and other changes in the uterine lining.

Male fertility must also be evaluated when indicated. A male that mounts and breeds successfully is not necessarily fertile, and previous offspring do not guarantee current fertility. If multiple females bred to one male fail to conceive, a veterinary breeding soundness examination may be useful. A male may lose sperm mobility for many reasons such as: heat stress, breeding practices, sickness, age, and more.

Why Accurate Breeding Records Matter

Useful records include the identity of both animals, breeding dates, observed behavior, mating duration, reproductive history, pregnancy examinations, and any unusual findings. A female repeatedly returning to receptivity might have failed to ovulate, failed to conceive, or experienced early loss. A female rejecting males despite negative pregnancy tests may warrant further assessment. Multiple unsuccessful pregnancies or conceptions linked to one male may suggest a male fertility problem.

Good records help veterinarians choose the most appropriate diagnostic tests, too. The more complete the history, the more informed the investigation.

Recognizing When to Seek Veterinary Assistance

Occasional failure to conceive can occur even when both animals are reproductively normal. Repeated failures, unusual discharge, unexplained pregnancy loss, or abnormal reproductive behavior should not be ignored.

Systemic illness, significant bleeding, painful abnormalities, and concerning postpartum findings warrant prompt veterinary attention. Early investigation may identify problems before additional unsuccessful breeding attempts occur.

Do not administer reproductive hormones, antibiotics, or intrauterine treatments without veterinary diagnosis and direction. Camelid physiology differs from that of other livestock species, and certain reproductive medications may threaten an established pregnancy.

The takeaway: look beyond the breeding date

Successful breeding is not determined solely by the number of matings, the duration of copulation, or whether a female rejects a male afterward.

A mature follicle must be present. Ovulation must occur. Fertilization must take place. The reproductive tract must support the developing embryo, and pregnancy must be established and maintained. Disruption at any stage can prevent a successful outcome.

Repeated breeding may not correct an ovarian abnormality. Changing herdsires may not resolve uterine inflammation. Behavioral observations cannot replace confirmation of pregnancy.

The goal should never be to breed more simply because a female has failed to conceive. It should be to understand why conception has not occurred and make informed decisions from there. Responsible breeding involves more than producing the next generation. It also requires protecting the reproductive health and long-term well-being of the animals responsible for creating it.

What We Do at Red Granite Ranch

At Red Granite Ranch, reproductive management begins well before the first breeding of the season. We strive to ultrasound all of our breeding females, with a particular emphasis on maiden females and outside females brought to our ranch for breeding. These examinations allow us to assess reproductive soundness, evaluate ovarian activity, identify developing follicles, and detect potential abnormalities before breeding.

We are fortunate to work closely with an exceptional reproductive specialist, Dr. Richard Wheeler, DVM, who has been an integral part of our program since the ranch's establishment in 2006. Dr. Wheeler has extensive experience in camelid & canine reproduction and is capable of identifying pregnancies as early as 13 days post-breeding, evaluating follicular development, assessing reproductive soundness, and much more. His expertise has played an instrumental role in our reproductive success, and much of the knowledge and management practices we utilize today have developed through our years of working alongside him. With Cadence also studying to be a veterinary technician (and then hopefully a veterinarian), we also take advantage of his teaching abilities with her, for us.

Our breeding decisions are based on a combination of female receptivity, reproductive history (if available), and ultrasound findings when available.

We have done both pasture and hand breeding; however, we have had greater success with hand breeding and therefore, we only do hand breeding now. We also will only allow males to breed for a maximum of 30-40 minutes, and usually only once a day, and only 3 -4 times per week maximum. This is to ensure the health of the male and maintain his reproductive soundness; his health is more important to us than getting multiple breedings in one day. Additionally, the longer a male is in with the female, the longer he has the potential to irritate the vaginal walls and the uterus itself.

When evaluating follicles through ultrasound, we generally aim to breed females with a dominant follicle measuring 8 - 10 mm, with Dr. Wheeler recommending approximately 10mm as an ideal target for improving the likelihood of successful ovulation and conception. If a female is found to have an 8 mm follicle, we may breed her initially and, if she remains receptive, breed her again on her third day, when the follicle may have developed closer to 10 mm. Follicular growth is averaged to grow 1.5 mm per day, and their lifespan is roughly 11 1.5 days. Ultrasound is the most reliable way to confirm development of follicles.

Following breeding, we follow a consistent monitoring schedule:

- 3 Days post-breeding: Perform an initial behavior test (BT) to observe the female's response to the male.
- 7 Days post-breeding: Perform another BT if the female was not receptive (NR) on her 3rd day.
- 14 Days post-breeding: Perform another BT if the female was NR on her 7th day.
    - *By a females 14 day, we will add them to our ultrasound list if their behavior is consistent.*
- 21 Days post-breeding: Perform another BT if the female was NR on her 14th day.
    - *By a females 21 day, we will add them to our ultrasound list.*
- ~30 days post-breeding: Perform an ultrasound to confirm pregnancy and evaluate reproductive status.
- Every 14 days following initial pregnancy confirmation: Continue BT until a second ultrasound is performed.
- ~60 days post-breeding: Perform second ultrasound to confirm pregnancy.
- ~90 days post-breeding: Perform third ultrasound to confirm pregnancy.

Once the pregnancy has been reconfirmed and fetal viability is established, we mark the females as "DONE" on our breeding records. At this point, the routine BT and ultrasounds are discontinued unless a concern arises and warrants further evaluation. Occasionally, we will perform a third ultrasound, usually only with females from outside farms here for breeding's.

If a female has bred more than three times and still is receptive, then we schedule an ultrasound and vet evaluation. We do not like breeding a female more than three times continuously without knowing why she is still receptive. She could be a submissive breeder, maybe a male change is needed, or something is wrong internally.

- *Ex) Female breeds 5/2, again on 5/5, and again on 5/8, or Female breeds on 5/2, then again on 5/9.*

When females are consistently not receptive and have never bred, we usually suspect they have a retained corpus luteum (CL) and will have them ultrasounded. If our suspicions are confirmed, then we will administer one of the following to the females under the OK from D. Wheeler:

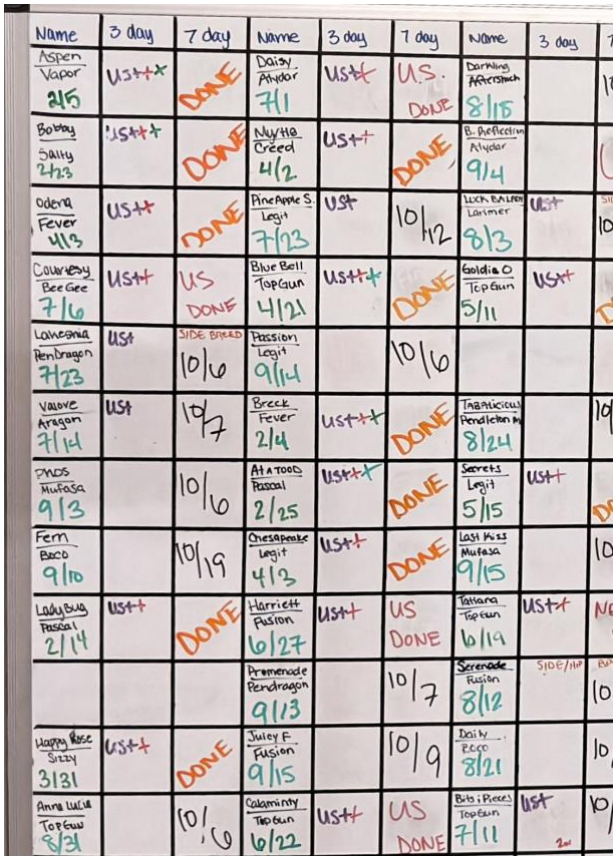
- **Luteinizing Hormone (Lutalyse):** Completes the process of follicle development in the ovary, cleans out old CLs, and gets females back on schedule. It is a quick, natural form of prostaglandin that is primarily used in cattle. We only use this on in-house females, unless pre-approval is obtained from the outside female's owner due to it being primarily cattle-tested. We have had great success using this. You can start behavior testing the female 7 days after giving the injection.
- **Estrumate:** Estrumate is similar to Lutalyse; however, it stays active in the bloodstream for a longer period, therefore taking longer to work. It is a synthetic drug. More approved for alpacas; used for outside breeding and sometimes in-house breeding. You can start behavior testing the female 7 days after giving the injection; we find they are more receptive around 1.5 - 2 weeks after the injection.

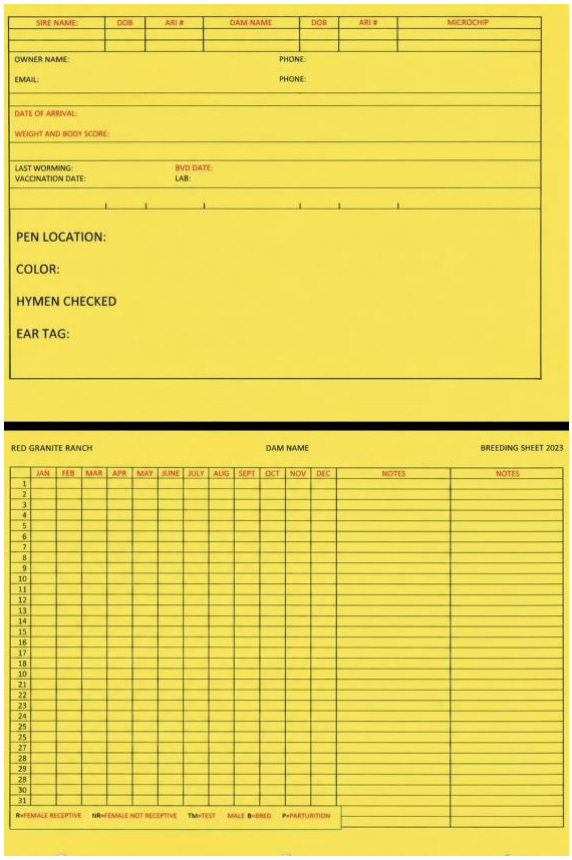
When a female tends to lose their pregnancy at or around 30 – 60 days, then we will put them on Regumate for about 60 days, sometimes longer if advised by our vet.

- **Regumate:** A synthetic progestin used to hold pregnancy in females that are prone to difficulty holding pregnancies between 30-60 days. Given orally, daily, with a slow weaning-off period after about 60 days.

Record keeping is extremely important, and we take great pride in ours. Detailed breeding records will allow you to go back and see if a different stud was used and when, and if a certain female has had breeding issues in the past. This will ultimately help you be more prepared the second, third, or even tenth go around.

Our breeding board features three columns. One for the female and male along with their breed date (we will also put the number of confirmed ultrasounds here), one for their 3 days, and another for their 7 day. Alongside our breeding board, we also have our breeding binder featuring detailed breeding pages for each female that breeding season. This allows us to have two places of information. At the end of the season, we will enter all of the breeding sheets into our herd database (HerdEASE), which usually allows us to catch things we didn't catch before. See below for an example of each.





Following parturition, female alpacas can become receptive to breeding again as early as 21 days postpartum. The first three weeks after birth are a vital recovery period. During this time, the dam is healing, uterine involution is occurring, and follicular activity is resuming. This window should be used to ensure:

- Optimal body condition
- Balanced nutrition

- Minimal environmental and social stress

In our experience, we will only continue to breed females if their weight is good, she is still producing good milk, and their crias are healthy and of a good weight with no abnormalities of difficulties during birth. Their overall health is much more important than creating our next champion. Saying that they “like to be pregnant” is not an excuse to breed a thin female either.

Breeding at or shortly after 21 days postpartum often aligns well with renewed follicular activity and can improve the likelihood of establishing a healthy pregnancy. While some operations utilize ultrasound to precisely monitor follicle size and ovarian activity, many breeders successfully rely on behavioral observations and "teaser" males to assess readiness. We utilize both approaches in our own breeding program, as mentioned above.

In the end our goal is to make informed breeding decisions rather than relying solely on behavioral observations or repeatedly breeding females without understanding reproductive status. While behavior testing can provide useful information, it is not a definitive pregnancy diagnosis. Females may reject a male for many reasons.

By combining ultrasound examinations, behavioral observations, detailed breeding records, and veterinary guidance, we are better equipped to recognize potential reproductive problems early, avoid unnecessary breeding, and manage our females with greater confidence.

We are always open to helping fellow breeders; just reach out. Our next “Beyond the Fleece” article will touch base with birthing and pregnancy in the females.

References & Further Reading

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Educational disclaimer: This article provides general information and is not a substitute for veterinary diagnosis or treatment. Consult a veterinarian experienced in camelid reproduction for individual cases. This includes medical treatment and things that have worked for us.