

Progress in Developing a Fall Lambing Dorset × Finnsheep Line

J. V. Whiteman, K. A. Ringwall
and R. P. Wetteman

Story in Brief

A flock of $\frac{1}{2}$ Dorset $\frac{1}{2}$ Finnish Landrace (Finn or Finnsheep) has been assembled gradually since 1976 to serve as the basis for developing a new line of sheep that are both fertile and prolific when bred during May and June. The purpose of this line would be to furnish rams for mating to Rambouillet ewes to produce highly productive fall lambing ewes for commercial sheep production. There are currently in excess of 130 second cross (F_2) ewes that are being mated during May and June. The descendants of those matings will become the line. During the development period, procedures have been perfected relative to ram, ewe and lamb management. The current status of the project is that the base is established and procedures perfected. The next few years will produce the data that will determine the feasibility of the endeavor.

Introduction

Many Oklahoma sheep producers prefer their ewes to lamb during fall to utilize wheat pasture and market the lambs produced during the period of seasonally highest prices in the spring. Dorset × Rambouillet crossbred ewes are the most productive breed combination available but have only a moderate lambing rate when lambing during October and November. The introduction of Finnsheep breeding into the ewe flocks to increase prolificacy results in a lowered fertility (percent of ewes lambing) and no net gain in lambs born per ewe exposed.

One of the most serious restrictions that prevents sheep from supplying more meat on a continuous basis to the consumers is the seasonal nature of reproduction in most sheep breeds. The vast majority of lambs are born during the period of January through April of each year.

If a new line of sheep could be developed that were both fertile in May and June, such as the Dorset breed, and prolific, such as the Finnsheep (Finn), rams from the line mated to Rambouillet ewes should produce excellent fall lambing ewes. Further, the successful development of such a line would demonstrate that the seasonal restriction of reproduction in sheep could be corrected by selection.

This progress report summarizes our effort to develop a line of sheep based on a Dorset × Finnsheep foundation that is fertile and prolific when bred during May and June.

Materials and Methods

The crossbred foundation for the line has been assembled slowly since 1975 through the purchase of 39 ewes from two sources and the production of additional ewes annually until we have had about 100 F_1 (first cross) ewes. Over 15 different sources of breeding stock have contributed to the flock.

The management of the F₁ ewes has involved exposing each ewe during the spring (at least two times) to record her willingness to mate and her fertility if mated. Following this test period, ewes have been mated during the fall to speed the production of F₂ (second cross) ewes from which, it is anticipated, the more fertile animals will be selected to create the new line.

There are now in excess of 130 F₂ ewes, most of which are ewe lambs or yearlings. These ewes will be mated only during the spring, and those ewes and rams that are most productive will produce the next generation. Thus, natural selection under the defined conditions will determine the future direction and success of the line.

Initially the ewes were mated in one-sire pastures with rams rotated frequently. Poor breeding performance by some rams indicated that several rams should be in each pasture to increase the likelihood that any fertile ewe would be mated to a fertile ram.

All ewe lambs have been mated first during the spring breeding season. Rams have been used first as yearlings. Inability to determine which ewes or rams are most fertile has forced the use of most physically sound rams. (In order to investigate possible ways to detect which rams are more fertile, a new study has been added, and preliminary results are reported in a separate paper in the 1982 Research Reports.)

No culling of ewes that are physically sound has been done in order to build as large a base for fertility selection as possible. Some new F₁ crossbred ewe and ram lambs are being added each year, also, to broaden the base.

Early observations indicated that the Dorset x Finn crossbred animals were apparently less fertile in May and June than in April. Because it is the intent of the study to develop a line of sheep that are not seasonal in their fertility, it was decided to time the mating season when the flock was the least fertile, thereby insuring that those individuals that are most fertile during the critical time will produce the next generation. During the breeding season the rams are fitted with marking harnesses with different colors of crayons. The flock is observed for rump marks daily or every other day to monitor the mating behavior of the rams and ewes. After the lambing season, the lambing records plus the mating records are used to get the best estimates of the mating behavior of the various rams and ewes. This information plus the actual lambing performance data make it possible to identify the most fertile rams and ewes.

Results

A summary of the reproductive performance of the various groups of F₁ ewes is presented by season of breeding in Table 1. The reproductive performance is below expectations, especially from fall breeding. Our analysis of the causes leads us to believe (1) the relatively few animals involved during the early years were not given adequate care and attention because of our other, more extensive studies, (2) an outbreak of epididymitis interrupted our plans for about 2 years and (3) these sheep require a different nutritional and perhaps climatic environment than the sheep that we are familiar with.

Nevertheless, the data suggest that 70 to 80 percent of these ewes mate during the spring, but only 40 to 50 percent lamb. Blood tests taken on the ewes that mate during May and June indicate that about 20 percent of the ewes that mate probably do not produce eggs (ovulate). The records further suggest that perhaps as high as 30 or 40 percent of the ewes that do ovulate do not become pregnant or do not maintain their pregnancy to term. Further research is planned to more accurately estimate the nature and extent of these losses.

Table 1. Historical record of reproductive performance (spring and fall breeding) of the F₁ Dorset x Finn ewes

Breeding season	Ewes exposed	Percent mated	Percent lambred	Lambs/ewe lambing	Birth wt
Spr 1976	10	90.0	40.0	1.75	5.23
Spr 1977	35	88.6	17.1	2.00	5.86
Spr 1978	58	72.4	25.9	2.13	5.70
Fall 1978	31	90.3	35.5 ^a	2.27	6.97
Spr 1979	72	93.1	44.4	1.75	5.36
Fall 1979	53	88.0	81.0	2.33	6.66
Spr 1980	32	78.0	50.0 ^b	1.63	6.22
Fall 1980	51	98.0	86.3	2.45	7.11
Spr 1981	46	82.6	43.5 ^b	1.75	5.83

^aRams infected with epididymitis.

^bAll ewes were ewe lambs or yearlings.

The early results from the F₂ (second generation) ewes is presented in Table 2. The majority of these ewes are ewe lambs or yearlings. These ewes are mated only during May and June. These ewes and rams are expected to be highly variable in fertility and prolificacy (lambing rate). When we have completed study of this generation of ewes and rams over several years of performance, we can more accurately evaluate the likelihood of success with the effort. It is expected that a few of the ewes and rams in this generation will obtain both the out-of-season breeding ability of the Dorset ancestry and the high prolificacy of the Finnsheep ancestry. If identifiable, these animals should be the basis of the new line.

It is believed that at least part of the relatively poor performance shown in Table 2 can be corrected by improved feeding of the ewes prior to breeding and prior to lambing.

Table 2. The reproductive performance of the F₂ and F₃ (second and third generation) ewes of Dorset x Finn breeding

Breeding season	Ewes exposed	Percent mated	Percent lambred	Lambs/ewe lambing	Birth wt
Spr 1979	20	95.0	50.0	1.50	4.47
Spr 1980					
Ewes ¹	17	64.0	29.4	1.80	5.24
Ewe lambs	19	73.7	31.6	1.67	4.52
Spr 1981					
Ewes ¹	81	81.5	38.3	1.68	5.48
Ewe lambs	17	94.1	52.9	1.78	4.54

¹Yearling and older ewes.

Observations

The establishment of this flock under the desired conditions was a challenging experience for all personnel concerned. Through experience the following observations seem warranted:

- The Dorset x Finn sheep are apparently reasonably fertile about April 1 but become less fertile from then until sometime in June at which time there is little

sexual activity. For this reason the breeding season is in May and June so that those breeding animals that are most fertile at that time are the ones that produce the next generation.

- These sheep are not good foragers. When grazed with ewes that are one-half or more Rambouillet, they do not maintain themselves nearly as well as do the ewes that are part Rambouillet. At least a portion of the poor productivity of the ewes may have resulted from their lack of adequate nutrition at breeding.
- The newborn lambs are smaller than expected, and they do not grow well as compared to usual commercial lambs with which the personnel are more familiar. Small lambs during the fall can result from the effect of summer heat on the pregnant ewes. This does not explain the frequent smaller-than-expected spring-born lambs, however. Also, when ewes produce litters of 4 to 6 lambs, the lambs are usually quite small and difficult if not impossible to raise.

These observations might lead one to conclude that with all these problems, why be concerned with sheep of this kind? Past research has demonstrated that ewes that are $\frac{1}{4}$ Finn $\frac{1}{4}$ Dorset and $\frac{1}{2}$ Rambouillet are excellent commercial ewes except that they do not lamb well during October and November. Therefore, the rewards to be obtained with success in the endeavor will make the effort worthwhile and it is the purpose of research to try to learn what can be done.