

Table 1. Reproductive performance of F₁ ewes.

	Ewes exposed	Percent mated	Percent lambled	Lambs per ewe lambing	Average birth wt
Spring 1976	10	90.0	40.0	1.75	5.23
Spring 1977	35	88.6	17.1	2.00	5.86
Spring 1978	58	72.4	25.9	2.13	5.70
Fall 1978	31	90.3	35.5*	2.27	6.97
Spring 1979	72	93.1	44.4	1.75	5.36

*Not a true estimate of fall breeding potential; several rams were found to be infected with Brucellosis Ovis (epididymitis) following the breeding season. These rams were relatively infertile or sterile.

individual variation also shows up in the rams, where only four rams, out of the total of 18 rams exposed to ewes, have sired almost all the fall born F₂ lambs.

This variation creates a situation where all F₂ fall born lambs were produced by ewes and rams that were fertile during the spring. Through selection, an attempt will be made to develop a superior reproductive line of sheep to use for fall lambing programs from this group of Finn x Dorset sheep.

The Value of Scoring Mating Behavior as Indicated by Chalk Marks During Different Breeding Seasons

Joe V. Whiteman and John Fields

Story in Brief

An effort has been under way since 1976 to determine if scoring the contact between rams and ewes at each estrus would improve the value of the mating records. Rump marks indicating 1-2 mounts were scored L (light), 3-5 marks M (medium) and 6 or more marks H (heavy). The records from five breeding periods involving about 250 ewes and eight rams each period were included in these preliminary summaries.

These summaries attempted to determine if the mating intensity scores (L, M & H) tended to be different during different periods of the year when breeding efficiency is different. During May and June more of the first contacts (estrusses) between rams and

ewes were scored L and fewer ewes became pregnant at first contact than during breeding periods in September-October or January-February. There were generally few contacts scored as H by the definition used in this study. Conception rate was higher from matings scored M than from those scored L at the first detected estrus of all breeding seasons. When considering only the ram-ewe contact that resulted in conception, two to six times as many contacts were scored M as L. An attempt to relate the number of multiple births to the intensity of the mating at which the ewe conceived gave no conclusive results. The data will be used in a much more intensive analysis to determine the value of the score.

Introduction

Observation of a breeding flock during the mating period leads to the quick conclusion that there is great variation among the rams and the ewes in how they behave. There are also large differences in the effectiveness of the mating process under different conditions. Spring mating is much less effective than fall mating. Research at Ft. Reno (SLAFRS) has shown that Hampshire x Suffolk yearling crossbred rams are more effective during the spring breeding season than straightbred Hampshire or Suffolk rams.

Some males appear to make more mounts and probably more matings than others. Further, ewes appear to be more receptive during certain seasons and certain ewes are more receptive than others during the same season. A better understanding of some of these relationships and behavior patterns might make it possible for stockmen to make more meaningful observations of their flocks during the breeding season.

The purpose of this study was to determine the value of using a measure of mating intensity in addition to regular mating records to record the mating behavior of a flock of mixed ewes bred during three distinctly different periods of the year.

Materials and Methods

During the period beginning in January 1976 and continuing through October 1978, a flock of about 250 ewes of mixed Dorset, Finnsheep and Rambouillet breeding were involved in an accelerated lambing program. They were mated for about 45 days on an 8-month interval basis. Mating seasons were during September-October, January-February and May-June.

The ewes were divided into eight equal groups on the basis of breeding, age and the number of lambs raised during the immediate past season. Each season two Suffolk, two Hampshire and four SXH or HXS crossbred yearling rams were assigned at random to the eight breeding pastures containing the ewes. The rams were fitted with "Sire-sine" marking harnesses so that matings could be recorded each morning of the breeding season.

In an effort to score mating intensity the shepherd recorded L if there were 1-2 marks indicating 1-2 mounts, M for 3-5 marks and H for 6 or more marks. This was to indicate the estimated number of times the ewe was mounted during the estrus period.

The data for the period involve the records from the January-February 1976, September-October 1976, May-June 1977, January-February 1978 and September-October 1978 mating seasons. Since the breeding seasons were 45 days long, an ewe would not be expected to exhibit more than three estrusses and would only exhibit one if she conceived at her first estrus. Actually, most ewes exhibited no more than two estrusses.

Summarization of the data involved investigating what happened during the first contact between each ram and ewe, i.e., was it classed as L, M, or H and did the ewe conceive. Also of interest was what happened at the estrus at which the ewe conceived.

Results

The data collected and summarized came from a flock of about 250 ewes or their survivors that were bred five times from the winter of 1976 to the fall of 1978. The rams were usually different each time and were between 1 and 2 years of age. Table 1 presents the summary regarding the first estrus contact between the ewes and rams for the three breeding seasons.

The mating intensity refers to whether the mating marks at each ewe's first contact were classed as light (1-2), medium (3-5) or heavy (6 or more). In the first column opposite May-June the 45.0 indicates that 45 percent of the ewes in the mating pastures during that breeding season were indicated to have been mounted only one or two times at their first heat. Thirty-two percent had 3-5 mounts and only about 4 percent had 6 or more marks. The last three columns give the percent of the ewes that conceived to that first estrus contact. For instance, about 48 percent of the ewes with an M for their first contact conceived at that estrus.

Summarizing Table 1, only 81.2 percent (45.0 + 32.0 + 4.2) of the ewes mated to the May-June matings in 1977. Conception rate was fair to the M matings (48.2 percent). (There were so few H matings that little confidence should be placed in the conception rates to H matings). During the May-June breeding season more first ram-ewe contacts were classed L. During the September-October and January-February breeding seasons, the first ram-ewe contact was more often classed M (51.6 to 71.8 percent) and conception rates were higher. Further, conception rates to first estrus contacts were higher during January-February mating than during the other seasons. (Conception rates from September-October 1978 matings were influenced by epididymitis in the rams and therefore not included).

The general mating behavior of these ewes during May-June 1977 was much poorer than with the same ewes during the same season in 1974 and 1975. Apparently lambing during February, as most of the ewes did in 1977, interfered with the resumption of normal cycling in May, thus accounting in part, at least, for the poor performance shown in Table 1. The 8-month interval between breeding seasons in these data had considerable influence on the mating performance only during the May-June season.

The relationship of mating intensity to ultimate conception is shown in Table 2. This summary considers the mating at which each ewe conceived each season, and

Table 1. Mating intensity at first estrus and conception rate for those matings during May-June, September-October and January-February.

Mating season	Mating intensity			Conception rate		
	L	M	H	L	M	H
	%	%	%	%	%	%
May-June '77	45.0	32.0	4.2	12.8	48.2	61.2
Sept.-Oct. '76	18.5	71.8	2.9	31.5	54.0	75.0
'78 ¹	21.2	61.5	14.9			
Jan.-Feb. '76	26.0	61.8	7.1	71.2	83.8	49.4
'78	33.6	51.6	0.0	48.6	76.6	0.0

¹The conception rate was affected during this season by epididymitis in the rams and is therefore deleted.

tabulates whether the mating was recorded (a few were not) and the intensity if recorded. During May-June 1977, for instance, 8.5 percent of the ewes conceived at a mating that was not detected; 5.8 percent at matings classed L; 19.9 percent at matings classed M; 3.9 percent at matings classed H; and the remainder of the ewes did not conceive. The first four columns show similar results in that in all seasons the largest group of ewes that conceive apparently are mounted 3-5 times.

The last four columns indicate the percent of ewes of each mating intensity class that produced more than one lamb. (There appears to be little or no pattern to the values in the last four columns). The higher rate of multiple births from September-October and January-February matings than from May-June matings is also apparent and would be expected.

Discussion

During the examination of these data it was apparent that tremendous variation exists from ram to ram in individual behavior. Each season's data as presented is the average performance of eight rams. Four of these were purebred Hampshire or Suffolks and four were crossbreds. The data were examined for differences caused by kind of sire, and no strong conclusions could be drawn. The performance of purebred and crossbred rams were quite similar during the September-October and January-February seasons. During the May-June breeding season there was a higher conception rate to the crossbred rams resulting in more ewes lambing to such rams which was in general agreement with previous results under spring breeding conditions.

This study is concerned with trying to determine if knowing the relative number of mounts made by rams during the breeding season will add worthwhile information to breeding records. It is well to remember that each mating intensity record results from the action of both the ewe and the ram. Differences between rams in behavior can be determined within a season because each ram is with a group of ewes. When a ram makes excessive light matings he might be suspect. Differences between seasons, as between spring and fall breeding seasons, may be due to both ewes and rams.

More study of these and similar data may permit better prediction of the effectiveness of individual rams under observation. The summaries made so far, however, only serve to aid in the understanding of why breeding is more effective in some seasons than others.

Table 2. Mating intensity at conception and associated lambing rate during May-June, September-October and January-February.

Mating season	Fertile to				Percent multiples from			
	O	L	M	H	O	L	M	H
May-June '77	8.5	5.8	19.9	3.9	41.7	24.7	53.2	38.8
Sept.-Oct. '76	7.5	9.5	63.0	4.0	67.1	83.9	74.8	85.7
Jan.-Feb. '76	9.5	19.0	60.1	4.8	62.8	37.9	54.1	76.6
'78 ¹	23.1	17.5	46.0		70.1	77.5	70.4	

¹No matings were classed as H.