

# 2001 Sheep Day Report

## ND 1709 Objective: 1

### OUT OF SEASON REPRODUCTIVE POTENTIAL OF WESTERN WHITE FACED RAMBOUILLET TYPE SHEEP UNDER NORTH DAKOTA CONDITIONS

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#### INTRODUCTION

The seasonal fertility of sheep continues to be a biological puzzle. Unlocking the puzzle offers much opportunity to the sheep industry. Many earlier studies indicate acceptable levels of success in getting sheep to conceive and lamb in non-traditional seasons, however, it usually has involved light control and or hormonal therapy. Many times there still has been some level of failure. Occasionally the level of management employed has confused the level of success of or predictability of out of season lambing schemes. The inability of sheep to consistently lamb according to chosen season severely restricts the development of a constant, dependable supply of lamb meat to consumers. If sheep were able to conceive consistently in April and subsequently lamb in mid to late September it would reduce necessity of quality facilities to maintain a breeding sheep operation under North Dakota climatic conditions . This production scheme would open opportunity to the most economically attractive markets for North Dakota producers as well. Similarly mature ewes involved in a fall lambing scheme would be available as leafy spurge grazers during typical summer months without the presence of lambs to reduce potential of predation. This would be extremely attractive insight of the level of problems associated with the presence of leafy spurge in North Dakota.

#### PROCEDURE

Starting in 1986, Rambouillet ewes were randomly mated to Rambouillet rams and evaluated in a lambing system that anticipated the ewes to lamb three times in a two year period. In the spring of 1992 the flock was closed and the ewes were being evaluated based on the anticipation of breeding in April with a July clean up mating. The ewes were exposed each time with a 51 day breeding period starting April 4 and July 15. Ram to ewe ratios were one ram to twenty ewes. This closed flock was able to maintain consistent breeding success in April of 80-90 percent of the mature ewes. Replacement ewes were selected randomly from the September born ewe lambs similar to the selection of replacement rams. Poor growth or structurally incorrect individuals were removed from the population prior to making random selections. A control set of similar background ewes mated in November for April lambing has been maintained for the duration of the trials. Replacement ewes were exposed their first time in July along with the mature ewe flock and then re-exposed the following April regardless if they had conceived in the previous July. Ewes that did not maintain a lambing sequence that included every twelve month period starting with their first anticipated lambing time were eliminated from the flock.

In the fall of 1997 one hundred May born ewe lambs of similar wool grade and structural size were selected from a commercial sheep operation in Wyoming. The purpose was to compare breeding success when subjected to the exact same breeding strategy as the one hundred ewe lambs selected from the September born closed flock ewes. Similar selections were made in the fall of 1998 and 1999 with the same intent. Rams from outside flocks were also purchased each year to service a 2x2 factorial design that included closed flock ewes mated to closed flock rams, closed flock ewes mated to purchased rams, purchased ewes mated to closed flock rams and purchased ewes mated to purchased rams. Ram to ewe ratios were maintained to be similar for all breeding groups. All ewes included in the project will be weighed and condition scored annually in the month of April. A five point condition scoring system will be employed with 1 being emaciated and 5 being obese. Routine performance measures will be recorded for the duration of the studies. A strict regimen of isolation of ewes from rams will be maintained other than during the desired mating periods to take advantage of any positive effects of the presence of the ram in enhancing the onset of estrus. Similar data will be collected for the original closed ewe flock that originated in 1986.

## RESULTS AND DISCUSSION

(Progress Report)

Table 1 indicates performance of the mature brood ewe flock that has been maintained as a closed fall lambing flock since 1986. All ewes were exposed to mate in April with clean-up mating in July-August. Table 1 indicates success of mating naturally without light control or hormonal therapy. Success would be categorized to be quite similar to traditional fall mating for spring lambing.

Table (1999) and 2000 Mature Flock Fall Lambing Performance

Birth Year of Ewes	1993	1994	1995	1996
Ewes Exposed	(55)	(56)	42	(62) 51
Ewes Lambing	(55)	(53)	38	(60) 50
Percent Bred to Fall Lamb	(100)	(95)	90	(97) 98

Table 2 indicates ewe body weights and condition scores for ewes exposed to lamb their first time in the fall . These measures would represent purchased ewes at 22 months of age and those from the closed flock being 17 months of age at breeding time in April. The data would indicate that the purchased ewes perform very similar to the ewe flock that has been selected for fall lambing.

Table 2 Yearling ewe April Body Weights and Condition Scores

	<u>Closed flock ewes</u>		<u>Purchased ewes</u>	
	1999	2000	1999	2000
Shorn Ewe Body Weights (lbs)	113.2	112.8	113.6	122.7
Ewe Body Condition Scores	2.64	2.51	2.72	2.73

Table 3 indicates reproductive performance of the four breeding schemes described in the procedure. Numbers of ewes available at time of breeding were reduced from the original one hundred closed flock ewes and one hundred purchased ewes because of predation, loss of ear tags and other natural causes. Early indications are that the purchased ewes and rams performed at a level higher than anticipated for first exposure for fall lambing. Initially there appeared to be a positive influence when using closed flock rams on purchased ewes, this effect diminished in the second year of production.

Table 3. Fall Lambing Performance of Purchased vs Closed Flocks

	<u>1999</u>		<u>2000</u>
	1997	1997	1998
<u>Ewe Birth Year</u>			
<u>Closed Ewes x Closed Rams</u>			
Ewes exposed	42	38	35
Ewes pregnant	33	30	24
Fall Breeding Percent	97	79	97
<u>Closed Ewes x Purch Rams</u>			
Ewes exposed	43	40	31
Ewes pregnant	28	32	27
Fall Breeding Percent	65	80	87
<u>Purch. Ewes x Closed Rams</u>			
Ewes exposed	43	37	34
Ewes pregnant	33	31	31
Fall Breeding Percent	72	84	91
<u>Purch. Ewes x Purch Rams</u>			
Ewes exposed	44	39	35
Ewes pregnant	23	31	33
Fall Breeding Percent	52	79	94

## Summary

This being the second year of a multiple year trial no attempt was made to analyze the data for differences. It will be especially important to evaluate year two through four and to see if the purchased

ewes breeding performance improves at similar rates as closed flock individuals as they mature in the system. They will continue to be measured as a comparison to the base closed flock.