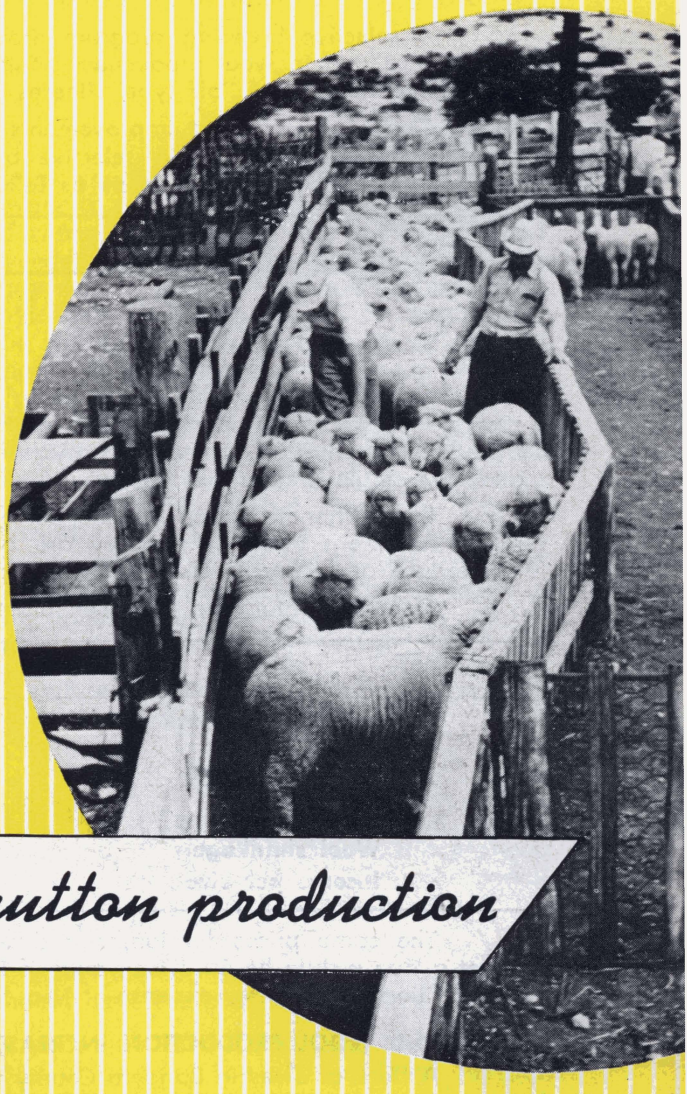
SELECTING SHEEP



for wool and mutton production

TEXAS A&M UNIVERSITY
TEXAS AGRICULTURAL EXTENSION SERVICE
E. Hutchison, Director, College Station, Texas

Results of Selection

A group of 75 ranchmen with sheep producing wool of similar quality were used to determine the value of selection. Twenty-eight of these ranchmen practiced selection while 47 did not. The practicing selection received 7.7 percent more for their wool than those who did not.

A selective breeding program provides several benefits. The sheep become more uniform in appearance and in wool production. This reduces the number of "cuts" when the lambs are delivered and in the number of "off type" fleeces in the wool clip.

One of the greatest improvements noted from the selective breeding program is the increase in percentage of lamb crop. A selective breeding program started on a flock of Columbia ewes in the fall of 1961 produced lamb crops as follows:

Year	Percent lamb crop
1961	102
1962	106
1963	112
1964	130

Although 1963-64 year was dry the 1964 lamb crop produced 113 sets of twins, 14 sets of triplets and 117 single lambs.

In addition to increasing the percentage of lamb crop, the animals become better suited to the range conditions under which they are being produced. Greater adaptability gives them the ability to produce at higher levels under the existing range conditions.

One cooperator who has been practicing selective breeding for 8 years reports the following:

	Start of program	8 years later
Lambing percent	80%	120%
Lamb weight	60 lb.	72 lb.
Fleece weight	8 lb.	12 lb.
Staple length	2-2½ inches	3½-4 inches
Wool shrinkage	70-72%	57%
Income per ewe	$10.08	$19.69

The same prices for lambs and wool were used at the beginning and 8 years later but this is not a true picture because the value of both lambs and wool increased. Production increased with no additional operating expense. Also the total number of ewes increased over the 8-year period.

LAMB AND WOOL PRODUCTION INCREASED

A flock of ewes in Bandera County was divided into three groups according to their ability to produce lamb and wool. The rams were also separated into three groups and the best ewes were mated to the best rams, next best ewes to the next rams and the poorest ewes to the poorest rams. They produced lamb and wool in the following amounts:

Groups	4 mo. spring shearing Lb.	8 mo. spring shearing Lb.	12 mo. spring[1] shearing Lb.	1st year		2nd year	
				% lamb crop	Av. wt. lambs, Lb.	% lamb crop	Av. wt. lambs, Lb.
Top	4.49	5.42	8.25	109	66	115	67
Middle	3.95	4.85	8.15	98	61	103	64
Bottom	3.75	4.67	7.31	96	58	112[2]	60

[1]Changed over from shearing twice each year to once a year.
[2]The bottom group was culled heavily the first year and given the advantage of the best pasture which should account for the high percentage lamb crop. This demonstrates that size and quality of lamb is not sacrificed by selecting for increased wool production.

SELECTING SHEEP *for* Wool and Mutton Production

JAMES A. GRAY
Extension Animal Husbandman
Texas A&M University

INTRODUCTION

THE EWE'S FLEECE should pay for her keep, but many are kept in breeding flocks that do not fulfill this requirement. It takes just as much grass to support a low-producing ewe as a high-producing one.

Contracting a given number of lambs is often responsible for keeping poor replacements. Ranchmen will contract a certain number of lambs for future delivery. If they do not have enough wether lambs to fill the order, they frequently complete it with the largest and growthiest ewe lambs rather than cut down on the average delivery weight of the wethers. The largest, growthiest ewe lambs make up most of the best replacements. If they are sold for several years, the quality of the ewe flock will gradually reduce. It would be better to sacrifice some on the average delivery weight by making up the delivery number with the small end of the ewes and keep the bigger, better doing ewes for replacements.

MAKING SELECTION WORK

A selection program will bring about increased production in any breeding flock but, its value may not be as readily apparent in flocks where there is little variation in fleece weight. Also, progress will be slower in extremely uniform flocks.

Requirements for Success

1. There should be enough sheep in the production program each year to enable the owner to sell the inferior sheep which are culled. This should be done faithfully.
2. Selection should be carried on for at least 5 or 6 years to produce permanent benefits.
3. The person making the selections should have a goal in mind and select toward it. He should not allow minor things — such as appearance of the ears, color of eyelashes, beautiful crimp and color of the hooves — to greatly influence his selection.
4. Rams should be carefully selected by the owner to improve the ewe flock. Selection of rams should not be left to the purebred breeder. Although the purebred breeder may select rams to the best of his ability and with good intentions, he may select the wrong type unless he is familiar with the flock in which the rams will be used. Unless rams are selected as carefully as ewes, there can be little benefit from a selection program. Whenever possible, superior, production-tested rams should be used. By using tested rams you can be sure of their ability to gain, the pounds of grease and clean wool and the staple length they will produce. This removes most of the guesswork from the selection of the rams.
5. Personnel trained in selection should be called in to assist the grower.

Obstacles

1. It is difficult to round up and get all the sheep out of some pastures. Some sheep will be missed and among them there will undoubtedly be some inferior ones.
2. Few people are trained and qualified to do a good job of selection. These people should have the confidence of the grower.
3. A poor job on a first selection attempt may discourage the grower from further attempts. Trained personnel can help get the selection program underway.
4. Some growers believe their sheep to be so poor that the person called in to select will cull all of them. However, a plan can be adopted where numbers will not have to be reduced nor the overall operations of the ranch curbed.
5. The erroneous belief that good wool and good lamb production cannot be maintained in the same flock often deters owners from starting a selection program. Selections can be made to include both types of production.

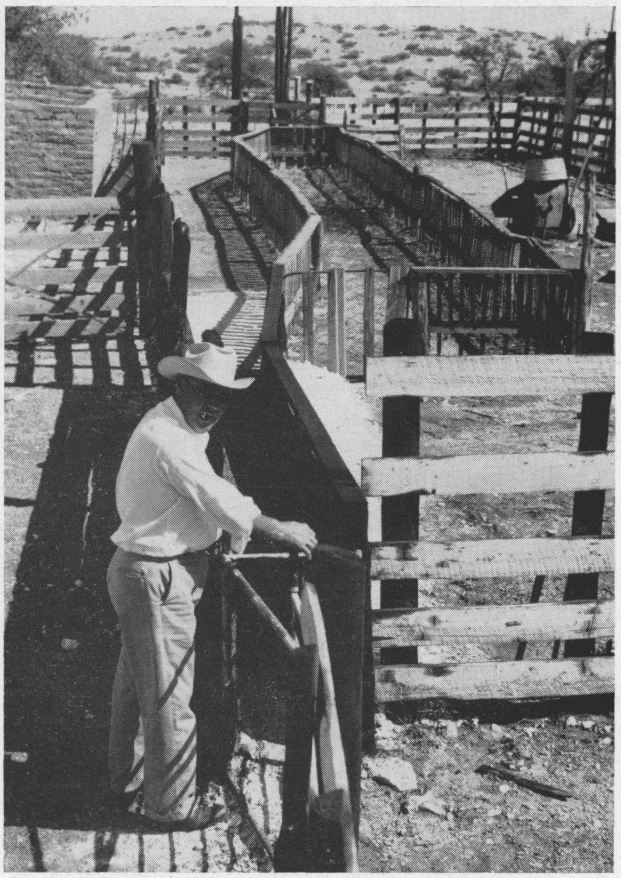
6. A *breeding* program that does not provide enough ewe lambs for replacement purposes makes it impossible to show rapid progress.

What Selection Cannot Do

1. A selection program cannot overcome the effect of poor rams.
2. It cannot overcome the effect of poor financing or poor management.
3. It cannot improve the flock if the culls are not sold or managed according to plan.
4. It will not turn a low-producing flock into a high-producing flock in 1 or 2 years. Permanent changes depend upon heredity and take time to establish.
5. It cannot overcome the effect of poor nutritional or physical condition due to a diseased condition, parasitism or overgrazing.

TYPES OF PROGRAMS

Many ranchmen say that they cannot carry on a selection program because it will run them short on number of sheep in the breeding flock.



Excellent equipment for a selection program: a working chute with a cutting gate at one end and a pen to the right of the working chute where a few questionable animals may be placed.

A selection program, however, can be flexible enough to be adapted to any ranch.

One plan is to mark a certain percentage of the ewes as culls. The culls are sold and replaced by carefully selected ewe lambs. Although this method probably will show the fastest results in greater production, it may not be possible for all ranchmen to use it.

If a ranchman feels that he cannot dispose of any ewes at the selection time, he may use an alternate plan whereby the ewes are cut into several groups according to their ability to produce wool and lamb. The number of groups may be two, three or even more if desirable. The big, smooth, open face ewes with good conformation and high-quality, long-staple fleeces compose the top group of ewes. The slightly less desirable ewes — not quite as uniform in size, conformation and fleeces — make up a second group. The smaller, more wrinkled, shorter stapled ewes are put in a third group. It is usually practical to brand these groups differently so that they can be separated easily through a cutting chute.

The bucks are then divided into groups in the same manner; the best bucks are put with the best ewes, second-best bucks with the second group of ewes, and the poorest bucks with the third group of ewes. Some ranchmen prefer to put blackface bucks with the third group of ewes and market all the lambs because blackface ewes should not be retained in the breeding flock.

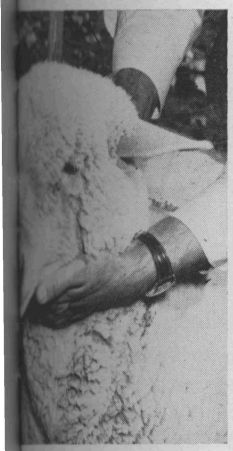
By placing the best bucks with the best ewes, the chances are increased for obtaining still higher producing ewes. The most effective use of the good-quality bucks is made in this system of mating.

If the best-quality bucks were placed with the poorest-quality ewes, the best results that could be hoped for would be to maintain the average already attained.

The largest number of replacement ewe lambs should come from the top group of ewes, with the top ewe lambs from the second group to make up the balance. No replacements should be saved from the third group of ewes.

When the ranchman is able to replace some of his flock, he can dispose of the low-grade ewes. When these are gone, he can dispose of the second-grade ewes. Finally he will work them all up to the top grade. After this has been accomplished, careful selection of ewe lambs for replacement is all that is necessary.

Dividing the flock according to quality saves time and money in gathering and handling the animals. If it becomes necessary to reduce the flock, the lower quality group can be gathered and sold.



Good Open Face
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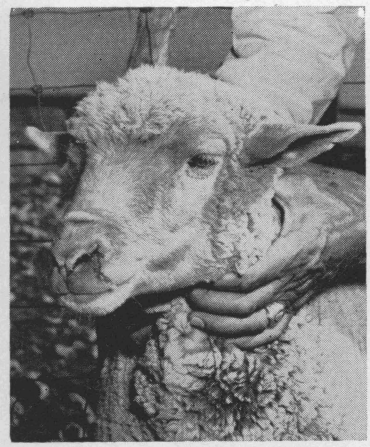
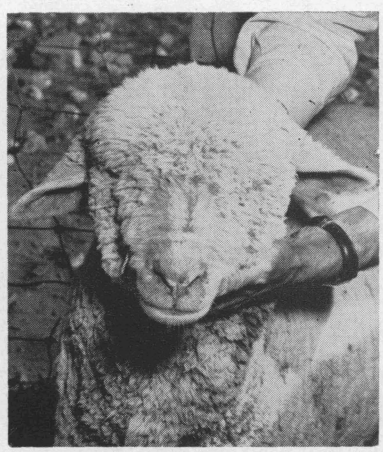
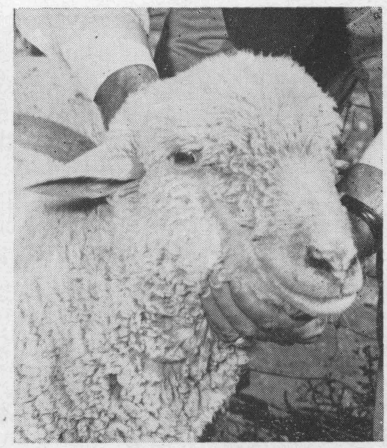


Too Much
When too much wool is taken off the face, it usually is accompanied by shorter wool elsewhere on the body.



Wool Blind
This ewe is so woolly faced that she will become wool blind before shearing time.



In-between Kind
This ewe probably will not become wool blind, but has more wool in the face than desirable.

Photos courtesy of San Angelo Standard Times.

EQUIPMENT NEEDED

Little equipment is needed to start a selection program. Adequate corrals are required to confine and crowd the sheep. A selection chute can be constructed with panels. This chute should be 3 to 4 feet wide and can be as long as desired. The longer the chute, the more sheep it will hold and the less time will be spent in refilling it.

When the selection program becomes established, it is wise to build a permanent selection chute with a narrow chute and cutting gate on one end. This arrangement makes it possible to separate the sheep as soon as they have been marked. By separating the sheep immediately, the one making the selections can see both groups of sheep and determine whether he needs to change any of his selections.

WHEN TO SELECT

The fleece is the most accurate record that can be kept. It not only tells the wool-producing ability of the sheep, but how well the animal has done through the year. The fleece is used as the basis for making selections on wool production.

Selections should not be made until 4 months or more after shearing. This gives the ewes an equal time to produce wool and makes it easy to detect differences in wool production. Because of possible age differences, ewe lambs and yearling ewes that have not been shorn previously are more difficult to judge. They may vary as much as 2 months in age, which could mean as much as ½-inch difference in staple length.

Some people prefer to select in the fall after the ewes have been shorn in the spring, while others make selections in the spring when the sheep have a 12 months' growth of wool. Good results can be obtained at either time.

Many ranchmen like to practice selection at lamb delivery time, shearing or when the sheep are gathered for drenching. Working the sheep at such times does not require additional gathering and handling of the animals. Selection in the fall at lamb delivery time is probably the most popular time.

POINTS TO CONSIDER IN SELECTION

Both the wool and mutton-producing qualities of the ewes must be considered. Experimental work shows that large, smooth, open-face, finewool sheep are the most profitable to retain in the breeding flock in Texas range production. In this type of production about ⅔ of the income is derived from the sale of lambs and about ⅓ from the sale of wool. With practice, a ranchman should become quite proficient in sheep selection by considering the following points.

Mutton-producing Qualities

Large, smooth ewes with good mutton conformation produce lambs most popular with buyers.

Open-face ewes are more apt to have lambs with open faces, and ewes with covered faces are more apt to have lambs with covered faces. Periodic shearing around the eyes, which means additional expense to the ranchman, did

not increase the production in the ewes with covered faces.

Records kept at the Ranch Experiment Station near Sonora from 1935 to 1950, show that ewes with covered faces, capable of becoming wool blind, produced 5 to 9 pounds less weaned lamb per ewe than ewes with partially covered faces. Most of this difference was due to the difference in percentage of lambs weaned.

Completely open-faced ewes produce fewer lambs than those with a small amount of wool in the faces. This indicates that it is possible to reduce production by getting sheep too open-faced or too covered.

Due to the large amount of needlegrass and Texas wintergrass (speargrass), in much of Texas the open-face characteristic has additional economic value. Ewes and lambs with open faces do not suffer the damage caused by spears and needles that occurs in wooly-faced sheep. It is necessary to shear around the eyes of wooly-faced sheep, which means additional expense to the ranchman with no increase in production.

Select ewes with wide, deep bodies; full heart girths; wide loins and well-developed legs. This type of ewe should have adequate size and a good constitution.

Length of leg does not indicate size. Just because a ewe is tall does not mean that she is a big ewe. Many times the tall ewe has a long, narrow-shallow body.

Wool-producing Qualities

Points to consider in selecting for fleece are quantity and quality.

QUANTITY

Quantity depends on length, density, completeness of covering and size of the sheep.

Length — Staple length probably is the most important single factor affecting the quantity of wool that one sheep can produce. Average fleece weights were obtained on approximately 20,000 graded fleeces from 17 different ranches in the Sonora area. Fine Staple fleeces, 2½ to 3½ inches in length, had an average grease fleece weight of 8.2 pounds; Fine French Combing, 2 to 2½ inches in length, 7.2 pounds; and Fine Clothing, 1½ to 2 inches in length, 6.3 pounds. This means that with each increase of approximately 1 inch in staple length it is reasonable to expect about 1 pound of increase in grease fleece weight. Like increases occur in the clean fleece weights.

Long staple finewool usually sells for 10 cents more per clean pound than short staple finewool. Longer staple wools also have a higher yield than the shorter staple wools making the proportionate grease price even greater for the longer staple wools.

Density — Density is the closeness with which the wool grows on a given area of body surface, which is much more difficult to determine than length. The following methods can be used to judge density:

1. Open the fleece and note the amount of skin area exposed. The more skin area exposed, the less density the sheep may possess.
2. Note the resistance of the fleece to opening. This method is useful in judging comparatively fine fleeces which are of average length.
3. Grasp a portion of the fleece in the hand and note whether a large or small amount of wool is included in the grasp.

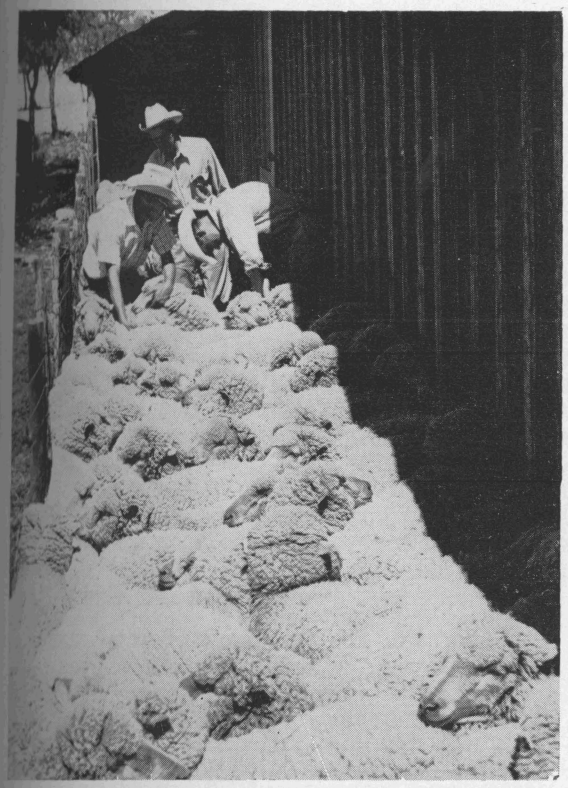
These methods will give a satisfactory field indication of density. Although there are several ways to measure density accurately, they are too technical and slow to use in a rapid selection method.

The following conditions may cause mistaken judgement of density when one of the rapid selection methods is used:

1. Differences in length—short wool always appears more dense than long wool of a similar density.

Cull and keep. Left, the culled ewe is shallow-bodied, has several skin folds, short-staple fleece and wool must be clipped from her face to prevent wool blindness. Right, the retained ewe has an open face, wide deep body, smooth skin and ½ inch more staple length of wool.

Photo courtesy of San Angelo Standard Times.



Breeding ewes being selected on the basis of characteristics such as conformation, size and wool-producing ability.

2. Excessive yolk may add to the bulk of the fleece and cause a false estimate of density.
3. The open tips of yearling fleeces make them appear less dense than fleeces from sheep that have been shorn previously.
4. A harsh, wiry fleece appears to be more dense than a softer fleece.

Completeness of Covering — The sheep should have a uniform covering of wool over the entire body, except for wool on the face and on the legs below the knees and hocks, which is of little value and adds little to the weight of the fleece. Range sheep should have a good covering on the head down to the eyes and on the legs down to the knees and hocks.

There has been a tendency for breeders to neglect the wool on the belly. During the last several years, however, breeders have paid a great deal more attention to the covering of wool on the belly, especially breeders of registered sheep. In practical selection, it is a waste of time to look for good wool on the sheep's belly if it does not have a good fleece on its back.

Rams also should be selected carefully for completeness of covering, except on the face.

Size of the Animal — The practical sheepman prefers a big sheep which, under normal conditions, produces more wool than a small one. The relative efficiency of wool production has not been worked out completely. The most efficient wool producer *possibly* is a sheep of medium size.

QUALITY

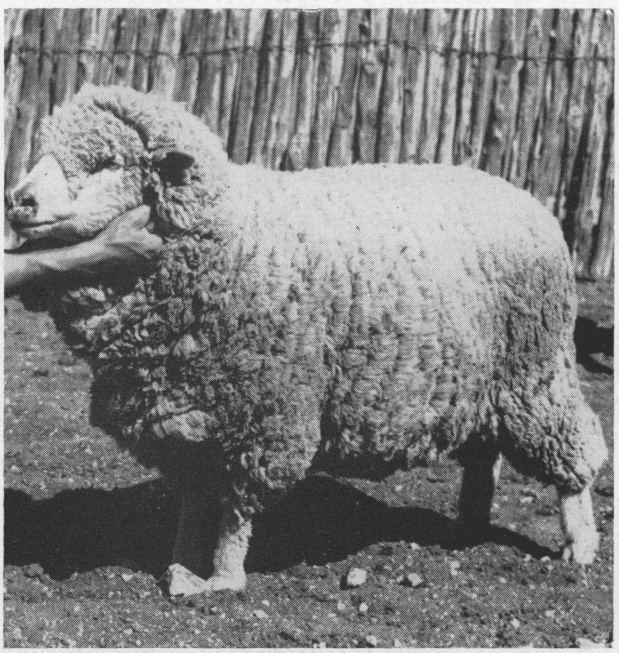
Quality is determined by fineness, length, soundness and purity.

Fineness — Texas has established a reputation for production of fine wool of excellent quality. Wool market statistics show that, over a long period of time, finewool outsells coarser grades because it takes finewool to make a soft worsted fabric.

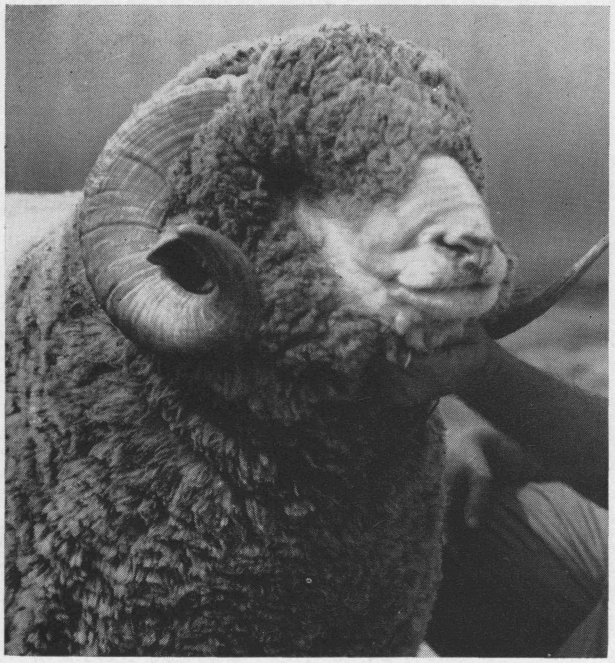
Uniformity of fineness on the individual sheep as well as in the flock should be considered by the person making selections.

Coarse hairy britches should be eliminated from the flock through selection. Hairiness has caused wool buyers to reject certain clips of wool in the last several years because it increases the amount of waste fibers in the manufacturing process. These coarse britches can be detected most easily in the fall after the sheep have been shorn in the spring.

Length — Staple length helps determine the grade. The longer the wool of a particular fineness, the higher the grade, but it is possible to obtain length in excess of grade requirements. Extra length means pounds. A 3-inch staple should be obtained for the best fine wool.



An excellent type of finewool ewe. Note the open face, freedom from wrinkles, good conformation, excellent body depth, straightness of legs and completeness of wool covering.



Excellent head. Note the wide, well-placed horns, naturally open face, masculinity and absence of wrinkles.

Soundness — Whenever a sheep has fever, it causes a weak spot to appear in the fleece. When severe enough, the sheep sheds its fleece. Sheep that shed their wool or "brush off" or pull their wool out on the brush should be eliminated.

Purity — Purity of fleece is highly important in selecting for quality. Animals with black or brown faces or black or brown spots in the fleeces should be eliminated. Wool that contains dark-colored fibers cannot be used to make white or light-colored fabrics.

SELECTION OF RAMS

Improvement cannot be expected in a flock unless the rams are superior to the ewes. As the flock reaches higher production it becomes increasingly difficult to find rams that will improve the flock.

As a result, many ram breeders are production testing rams. Such a test has been conducted at the Ranch Experiment Station near Sonora, Texas, for the past 17 years.

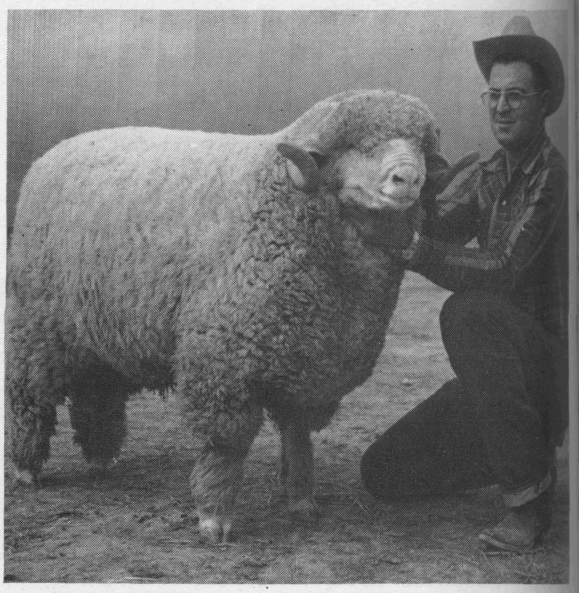
In this program ram lambs are brought to the station about the middle of September, sheared, scored and given a 10 to 14-day conditioning period. They are then started on the test. They are fed in sire groups of four rams to the pen for 148 days. In this way, records of amount of feed consumed and the amount of feed required per pound of gain are accurate. Other records kept include average daily gain, grease fleece weight, clean fleece weight, staple length, fiber diameter, conformation, belly wool, skin folds and face covering. The scores for conformation, belly wool, skin folds and face covering are made by a scoring committee while the measurements of grease fleece weight, clean fleece weight, staple length and fiber diameter are actual measurements for a known period of growth and converted to a 12-month basis.

Other rams are fed in large groups and the same type of records kept.

From these records it can be seen that good improvement has been made in average daily gain. Good improvement has been made in both grease and clean fleece weights. The greatest improvement has been made in staple length which is probably one of the most highly heritable characteristics of sheep. Practically no change has occurred in the face covering of the rams on test and only slight improvement in the number of skin folds.

Several of the larger commercial ranchmen raise their own rams and have developed a system of range production testing that is practical for their own situations.

The ram lambs are weaned when the largest percentage reach about 75 pounds in weight. They are then identified, weighed and run together under pasture conditions until September when they are again weighed and sheared. They are then run under pasture conditions until the following spring when they are again weighed and sheared. At this time fleece weights and staple lengths also are taken. This gives the ranchman three body weights to use and the fleece weight and staple length



A good finewool ram. Note the large size, open face, good body conformation, smoothness and good covering of wool.

TABLE 1. AVERAGE VALUES FOR RAMBOUILLET RAMS ON THE 11-YEAR TEST

	Daily gain lb.	Grease wool lb.	Clean wool lb.	Staple length in.	Face covering score	Skin fold count
1948-49	.37	13.8	6.6	3.36	2.7	33.8
1949-50	.45	16.7	7.8	3.57	2.8	38.9
1950-51	.49	18.0	8.1	3.34	2.7	44.8
1951-52	.46	17.7	8.2	3.47	3.3	25.1
1952-53	.48	18.4	8.6	3.56	3.0	40.7
1953-54	.51	19.5	9.3	3.80	2.9	31.3
1954-55	.49	17.8	8.7	4.07	2.8	32.2
1955-56	.48	19.9	9.2	3.87	2.7	26.6
1956-57	.50	18.8	9.1	4.02	2.8	25.7
1957-58	.60	19.2	9.3	4.20	2.6	36.4
1958-59	.49	15.4	8.0	4.16	3.0	26.3
1959-60	.51	16.0	9.2	4.41	3.0	23.2
1960-61	.50	17.1	9.0	4.21	2.8	23.6
1961-62	.53	18.4	9.5	4.21	2.8	29.3
1962-63	.55	17.4	9.0	4.12	2.6	1.8*
1963-64	.56	18.3	9.4	4.56	2.7	2.0
1964-65	.51	18.1	8.9	4.53	2.7	2.0

*Method of scoring skin folds changed from counting to scoring system.

for a known period of growth. From this information the ranchman can pick his fastest-gaining, best wool-producing rams. Most ranchmen test about twice as many rams as they intend to keep and dispose of the ones they do not want.

DEVELOP A REPUTATION
FLOCK OF SHEEP BY:

1. Balance livestock numbers with land, facilities, available feed and labor.
2. Follow carefully planned grazing and range improvement programs.
3. Practice selective breeding for greater production and increased quality.
4. Follow sound flock management practices.
5. Make best use of supplemental feeds.
6. Control internal parasites through controlled and rotation grazing, proper stocking rates, supplemental feeding and systematic treatment.
7. Practice proper preparation of wool for market.
8. Market on a quality basis.

RECORDS TO MEASURE PROGRESS

Some records should be kept to determine the progress being made. It is helpful to know the percentage of lamb crop, the weaning weights of the lambs and the average fleece weights of the ewes. Registered breeders may want to keep a more complete record or even an individual record on each ewe.

Records of individual fleece weights on the rams will help the ranchman eliminate the light shearers from his flock.

Following are some suggested forms for commercial and registered flocks:

COMMERCIAL FLOCK RECORD

DATE _____

Description	Number of head	Total pounds of wool	Average fleece weight	Average percent lamb crop weaned	Average weaning weight of lambs	Average weight of lambs sold	Remarks
Top ewes							
Middle ewes							
Bottom ewes							
Replacement yearlings							
Bucks							

INDIVIDUAL RECORD FOR RAMS

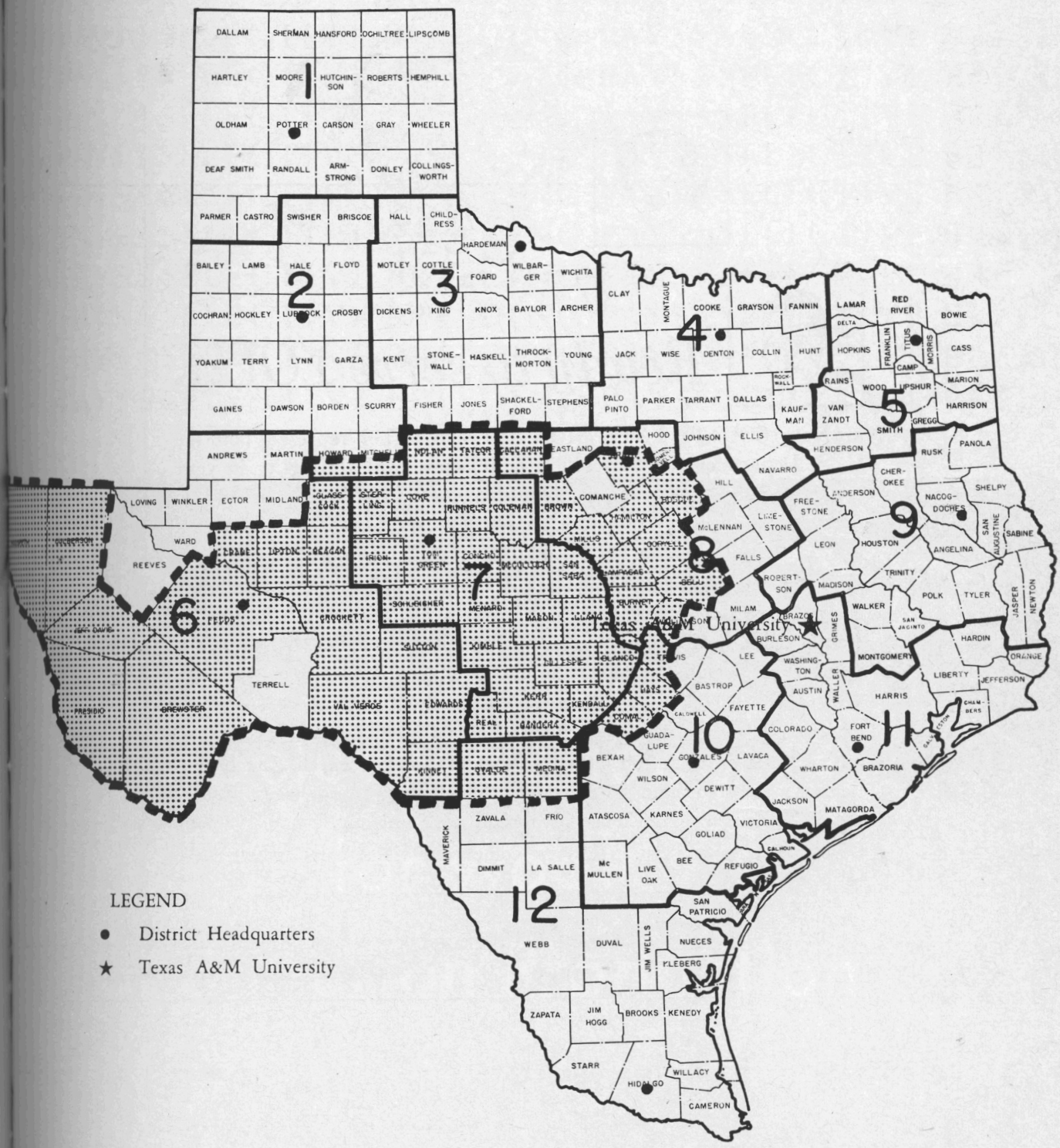
DATE _____

Number	Length of staple	Weight of fleece	Shorn body weight	Remarks

INDIVIDUAL RECORD FOR REGISTERED SHEEP

DATE _____

Number	Length of staple	Weight of fleece	Shorn body weight	Weaning lambs weight of	Remarks



The area enclosed by a broken line represents the area of heaviest sheep production in Texas. The shaded counties represent those where county agricultural agents have been trained and aggressive sheep selection programs are in progress. Terrell County does not have a county agricultural agent and Mason and Llano counties are principally areas for wintering lambs. There are very few breeding sheep flocks in these two counties.

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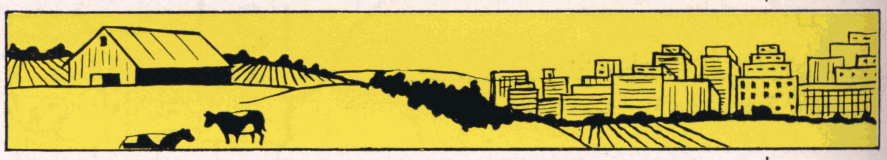

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