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THE USE OF OBJECTIVE PHYSICAL MEASUREMENTS AND SPECIFIC SELLING
METHODS AS A BASIS OF MARKETING WOOL THROUGH POOLS

by

Don A. Huber

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Agricultural Economics

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1962

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Don A. Huber

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INTRODUCTION

Wool has been an important product in Utah since the pioneers arrived. The Mormon pioneers had with them 358 head of sheep upon entering the Salt Lake Valley. At that time there were also 12 head of sheep near Ogden, Utah belonging to Miles Goodyear, a trading post operator. These early people were very dependent upon wool for their clothing and numerous other products.

Utah has long been one of the leading wool producing states in the nation. The following table presents a picture of how wool production in Utah ranked with other states:

Table 1. Shorn wool production and value of sales from leading states

State	Average production 1948-57 (1,000 pounds)	1959 production (1,000 pounds)	Value of wool sales 1959 (1,000 dollars)
Texas	45,921	46,726	20,559
Wyoming	19,535	21,181	9,108
California	15,599	18,332	8,066
Montana	14,857	16,209	7,294
Colorado	11,224	13,074	5,622
South Dakota	7,904	12,611	5,549
Utah	12,176	12,045	5,179
Iowa	7,232	10,971	4,498

Source: Agriculture Statistics 1960

In 1959 Utah ranked seventh among the states in pounds of shorn wool produced and value of wool sales. In that year 12,045,000 pounds were sold valued at 5,179,000 dollars. During the ten year period, 1948-57, Utah ranked fifth with an average production of 12,176,000

pounds of shorn wool per year.

Although Utah has dropped from fifth to seventh among the states in wool production it has maintained a very stable production during the last decade. For a longer period a decrease in Utah's wool production is noted. In 1930 Utah reached its peak production of wool, by producing 24,440,000 pounds of shorn wool. This was approximately double the 1959 production. Utah had its greatest annual production of wool in the late 1920's and early 1930's. Since that time shorn wool production has decreased to about one-half the peak level.

History of Pooling

Sheepmen have long been marketing their wool cooperatively. The Putman County Wool Growers Association organized in 1885 near Greencastle, Indiana was one of the earliest cooperatives.

Its members pooled their wool together from year to year to attract buyers at shearing time. A similar organization of less significance known as the Goodlettsville Lamb Club was formed in 1877 at Goodlettsville, Tennessee.

Utah sheepmen were among the first in the west to promote cooperative practices. The first cooperative wool marketing organization was formed on April 7, 1884 in the Salt Lake Valley and was called the Utah Wool Growers Association. This association was formed to promote the interests of the sheep industry and devise a satisfactory means of marketing their wool clips.

In 1887 the Wool Growers Association of Southern Utah was organized at Nephi, Utah. Its objectives were: 1) direct sale of wool to the manufacturers, 2) foster the sheep industry, 3) buy supplies such as twine and bags cooperatively, and 4) decrease transportation costs.

This organization sold its wool for 3-5 cents per pound more than non-members in the area. This increase in price was partially a result of the organization's advice to members on breeding programs and improving wool preparation in an effort to enhance the reputation of Utah wool among Eastern buyers.

In 1912 between Fountain Green and Nephi, Utah the Jericho Wool Pool was organized. This pool gained national recognition by selling its combined clips of a quarter million pounds for 71 cents per pound shortly before the market break on May 20, 1920.

This pool operated under a signed agreement each year. Only growers with flocks of all Merino blood were allowed to sign agreements. The wool graded principally Half Blood and finer with length to grade French Combing and Staple.

The Jericho Wool pool had the reputation of influencing the ideas of value not only of fine wools in Utah but elsewhere. Some wool houses were willing to take the Jericho pool's wool at a strong price but were reluctant to do so because of the influence this would have on the price of wool in other sections of the country.

The wool was sold by a committee selected to advertise the wool for sale and receive bids. When a fair bid was received, the members were called together and a majority vote taken to determine whether to accept or reject the bid.

The pool could be terminated whenever a majority vote of the wool represented so voted. On May 7, 1929 such a vote was received and the pool was disbanded. It was the opinion of some that this disbandment was due to a lack of buyers that were willing to bid on such a large volume of wool and discontentment of members from receiving the average pool price for their wool.

Throughout Utah's history wool pools have been formed, disorganized and reorganized. Most of these pools followed the practice of selling their clip on the basis of sealed bids submitted by buyers on specified dates. The objectives of these pools were to handle a larger volume of wool and educate their members in preparation of wool for market. They believed this would attract more buyers, lessen assembly costs, and result in a more influential bargaining position.

Many of these pools were discontinued because of the practice of paying for all wool at the same price rather than paying for each clip on the basis of its quality. It was generally felt that the price for the total clip was based upon the poorer quality wool. The pools were without representation at terminal markets to sell for them, so their only alternative was to sell to dealers who were not always competitive.

Objectives of the Study

The objectives of this study were:

1. To describe the organization of the wool pool and the services which it renders.
2. To study the application and use of objective physical measurements as a basis of selling wool through pools.
3. To appraise the marketing program of wool pools with respect to terms of bidding, soliciting of bids, selling arrangements, and price determination.

REVIEW OF LITERATURE

Although wool has been marketed cooperatively through pools for years, little has been written concerning it. Most of the previous writings have dealt with the technological aspects of wool marketing.

A study used for a master's thesis at the University of Wyoming covered marketing of wool through pools in that state (6). This study was of a general nature discussing the organization and methods of operation of their pools. In 1956, one pool sold its wool for 15.65 cents over the average state price by having a reputation for clean high-yielding wool and guaranteed the wool to be clean and properly prepared. All of their pools average 3.69 cents above the state average price, indicating that pooled wool clips were selling higher than individual clips.

Work done by Davis, Gabbard, and Wooten (10) in Texas indicated the value of selling wool on a quality basis. Their records showed that wool sold on a quality basis brought 25 to 50 cents more per fleece than wool sold in the original bag. They pointed out that most wool in the United States is sold on an ungraded basis and as a consequence foreign wools of similar quality, but graded and classified, brought a premium of 10 percent over U.S. Domestic wools of like quality.

Studies by E. J. Berry of Utah (7) and Gerald E. Marouisek of South Dakota (17) agreed with Davis and others (10) that quality of wool increases with size of clip. In the Texas study the 10 largest clips contained 12 percent more fine staple wool than the average.

Davis and his associates (10) established the value of selecting

flocks on staple length basis. They found that those fleeces sold on staple length basis brought 5.8 cents per grease wool pound more than those that were not.

A study was made in South Dakota (17) to determine effect of tagging upon yield and value of wool. Results were that moisture content and contamination of surrounding wool increased with time tags were left in contact with other wool.

In order to determine the most economical time for sorting tags, net returns obtained from sorting tags at time of shearing were compared to net returns derived from tagging sheep prior to shearing. The results were that sorting of tags at shearing time gave a net return of 7.25 cents per fleece while tagging prior to shearing gave a net return of .90 cents per fleece. In both cases the returns from tagging sheep were too small to create an incentive for growers to preform this operation.

Marousek (17) found that wool yields in South Dakota varied greatly between and within flocks ranging from 42.50 percent yield to 61.40 percent yield.

In the writing by Berry (7), it was stated that wool yields and grades varied widely between counties in Utah with the southern counties having the lowest yields and largest amount of finer grade wool.

A number of studies have pointed out the great variation in shrinkage of wool between breeds, within breeds and among flocks. As a result, the problem of buyers estimating shrinkage and pricing wool correctly was increased. The Production and Marketing Administration of the United States Department of Agriculture found in their study that no individual was able to consistently estimate shrinkage of domestic grease wool accurately. They found a 16 percent error in estimating shrinkage.

Core-testing of wool to estimate shrinkage has reduced this 16 percent error to 4 percent (16).

Johnston and his associates (15) found that core-sampling could be used with accuracy in determining fineness and variability of wool fibers.

Pohle (22) and Johnston (14) have made studies comparing the accuracy of results obtained from different coring methods. When analysis of variance tests were run, no significant differences were obtained between methods.

A study by Howell and Faught (13) found the core sampling method a more accurate means of determining yield and fineness than the visual appraisal method. They also pointed out that the accuracy of this system depended upon the representativeness of the sample. Their results from core-testing varied with size of tube used in sampling and area of bag from which sample was drawn.

Attitudes of wool buyers as presented by Carr and Howell (8) indicated that Boston wool buyers prefer to buy Territory wool prepared like Australian wools. The majority, however, did not want the wool skirted by the growers, but all wanted more effective tagging by growers. They also found that wool buyers preferred to buy ungraded and original bag wool, since they felt they could buy cheaper and prepare wool for manufacturing more satisfactorily than they could buy similar wool graded and skirted on the ranch.

Twenty-one wool buyers in Wyoming (6) were questioned regarding wool preparation. All stated that they preferred to buy from the ranchers with the larger clips since their wool was more uniform and changed less from year to year. Only five were favorable to buying from pools. Many disliked buying from pools because preparation of wool was often

unsatisfactory and farmers who properly prepared their wool were penalized, while those with poorly prepared clips received a premium.

The 1958-1959 University of Wyoming progress report of regional project WM23 (6) covering buyer attitudes stated that the majority of wool buyers had no idea what premiums they could afford to pay for properly prepared wool. A large percent of the buyers had no idea what percent of the total volume purchased was offsorts. The other buyers ranged in their estimation of percent of offsorts from 1/2 percent to 15 percent of the total volume. All buyers were in agreement that amount of offsorts varied with time of year sheep were sheared. This report also stated that most buyers used the "Standard" or "Normal Contract" for making deductions when purchasing wool.

The buyers were asked to describe the marketing system they desired. The systems desired were: present system; concentrating of wool in warehouse and establishing an auction system; orderly marketing through the year; more competition so supply and demand determine price; selling on a core-test basis; and grower's guarantee that wool was clean.

Most wool buyers arrived at the grease wool price by multiplying the Boston clean wool price by the percentage yield of the grease wool minus the marketing charges (11). A master's thesis by Berry (7) gave the average marketing charges in Utah during 1956 as 7.12 cents per grease pound and 8.50 cents per grease pound in 1957.

Work done by Howell and Faught (13) indicated that price differences in wool clips were affected by yield, fineness, staple length, and staple crimp. However, much wool was sold on a flat rate basis without paying any attention to these factors. One of the factors that contributes to sale of wool on a flat rate basis was lack of defined and evaluated standards with adequate methods and techniques for measuring

significant differences in wool quality. They stated that no official standards existed for measurement of length, strength, uniformity, crimp of staple, and color. There was also some opposition to present fineness measurements.

It was pointed out that because of the skill and training necessary to class wool accurately, it was economically impossible to class each individuals wool separately. They felt that since a large percent of wool in this country came from small farm flocks, it would be advantageous to assemble and combine these small lots into lots of uniform quality large enough for efficient marketing.

Howell and Faught (13) stated a need for more current information on prices for determining when, where, and at what price to sell wool.

METHOD OF PROCEDURE AND SOURCE OF DATA

Information needed in studying the marketing of wool through pools in Utah was obtained by personal interview with a representative from each of the ten pools in the state. A description of each pool organization, means of financing, operating expenses, methods of operation, and services performed for members was made from this information. Type of dealer buying the wool as well as the method and market information used for determining price was also obtained. This survey provided the data needed to study the marketing programs of the pools with regard to method of soliciting bids, number of bids, and content of bids.

Physical measurements were applied to samples of wool drawn from the 1961 clips of the Box Elder, Cache, and Rich wool pools to determine the quality of wool in those pools. These three pools were selected as being representative of the pools of the state.

A list of the members and the pounds of wool each marketed in 1960 was obtained from each pool. These growers were grouped according to the number of pounds of wool in their clip. A table of random numbers was used to draw a sample of producers from each size group.

Core and hook samples were then drawn from the wool lots selected in each stratification. The sampling schedule used to designate the number of cores to be drawn was outlined by the "United States Testing Company Inc." to give an accuracy of ± 1 percent at a statistical probability of 95 percent. Under this schedule as the number of bags of wool in a clip increased, the number of cores taken from each bag and the number of bags cored decreased. Wool taken by the core sampling method

was tested for percentage yield of clean wool, fiber diameter, and foreign material. The $1\frac{1}{2}$ inch coring tube was used in obtaining the cores.

Staples of wool were drawn by the Hook method to determine staple length classification and blood grade or grades for each individual wool clip. These hooks were obtained from different depths and locations in each bag at a rate per bag that decreased as the number of bags in the clip increased. These tests were made under the direction of the Animal Husbandry Department, Utah State University.

The information from these tests was then used in comparing the price received for the tested wools with the market prices of like quality wool on the same date. Market prices for clean wool at Boston were used as a standard of comparison. The grease wool prices were adjusted for shrinkage, transportation, and other marketing costs to make them comparable with the Boston clean wool price.

PRESENTATION AND ANALYSIS OF DATA

Description of Utah Wool Pools

During the period 1956-1960 in Utah, wool pools have operated in Box Elder, Cache, Utah, Emery, Piute, Summit, Uintah, and Rich Counties. Data from records of these pools covering this period were obtained by personally interviewing an officer from each of the pools.

About 5 percent of the total volume of wool in the state in recent years was marketed through pools and both the quantity and porportion has been increasing slightly (Table 2).

Table 2. Volume of wool marketed by Utah wool pools and proportion of state total marketed through pools, 1956-1960

	Volume marketed in Utah ^a (Pounds)	Volume marketed by pools (Pounds)	Pool volume in percent of total
1956	12,741,000	510,363	4.01
1957	11,863,000	561,754	4.74
1958	11,747,000	612,533	5.21
1959	12,045,000	631,710	5.24
1960	11,910,000	662,644	5.56

^a Source: Agriculture Statistics 1956-1960

Composition of wool pools

Wool pools in Utah varied considerably in number of members (Table 3). The Uintah pool had the largest membership with 323 members in 1960. The

Piute pool with 10 members operated only one year, 1957. The Emery pool in its first year of operation in 1960 had only 11 members. Membership in all pools except Cache and Uintah has remained nearly constant during the past 5 years. The Cache and Uintah pools have increased by 40 and 47 members respectively since 1956. During the 5 year period 1956-1960, the number of woolgrowers in the state, marketing wool through pools, has increased. Much of this increase was due to an increase in the number of pools from four in 1956 to seven in 1960.

Table 3. Number of members in Utah wool pools, 1956-1960

Pools	1956	1957	1958	1959	1960	Average
	(Number)	(Number)	(Number)	(Number)	(Number)	(Number)
Box Elder				377 101	518 112	106.5
Cache	352 112	339 115	437 121	420 150	387 152	130
Central Utah			59			59
Emery					11	11
Millard				36	30	33
Piute		10				10
Rich	82	81	80	81	82	81.2
Summit	56	59	61	61	57	58.8
Uintah	276	312	309	300	323	304
Total	526	577	630	729	767	

Pounds of wool marketed per pool ranged from 16,277 pounds marketed by the Millard pool in 1960 to 225,688 pounds marketed by the Uintah pool in 1957 (Table 4).

Table 4. Number of pounds of wool marketed through Utah wool pools, 1956-1960

Pools	1956	1957	1958	1959	1960	Average year
	(Pounds)	(Pounds)	(Pounds)	(Pounds)	(Pounds)	(Pounds)
Box Elder				38,040	58,043	48,042 451
Cache	39,472	38,938	52,867	62,985	58,888	50,630 389
Central Utah			57,086			57,086 968
Emery					25,000	25,000 2273
Millard				20,047	16,277	18,162 550
Piute		18,463				18,463 1846
Rich	142,980	151,763	149,296	148,447	172,564	153,010 1884
Summit	127,981	126,902	129,262	137,395	106,302	125,568 2136
Uintah	199,930	225,688	224,022	224,796	225,570	220,000 724
Total	510,363	561,754	612,533	631,710	662,644	
	970	974	972	867	864	
	4	5	5	6	7	

Volume of wool market through the Box Elder, Cache, and Rich pools increased during the 5 year period and the volume marketed by the Millard and Summit pools decreased. The Uintah pool volume remained about constant. The total volume of wool marketed by pools increased in every year.

Wool pools in Utah varied relative to their composition as to type of producers. The Cache pool was composed mainly of small farm-flock operators while members of the Rich pool were mainly larger range type operators. When viewing the distribution for all Utah wool pools combined, nearly 80 percent of the woolgrowers marketed less than 1000 pounds of wool (Figure 1). The Cache and Rich pools size distribution

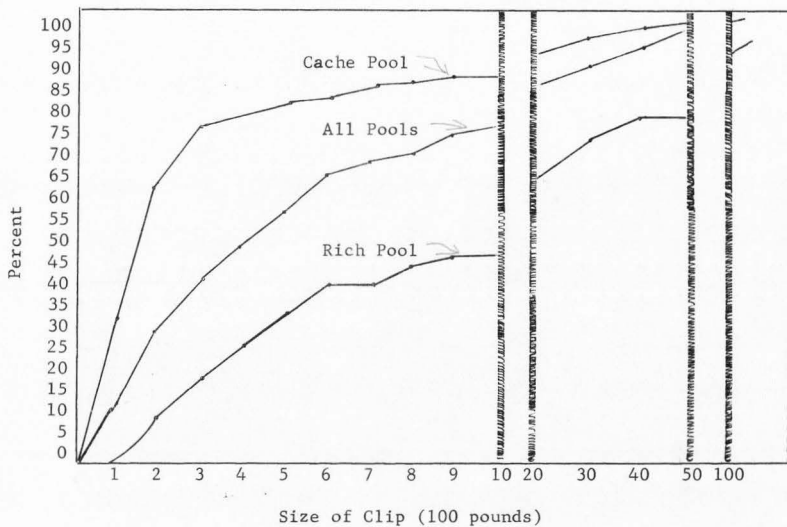


Figure 1. Cumulative distribution of wool producers by size of clip--
Cache, Rich and all pools, 1961

1960?

data were plotted in Figure 1 to represent the extreme situations. Almost 80 percent of the woolgrowers in the Cache pool marketed less than 300 pounds of wool, while in the Rich pool there were approximately 20 percent of the woolgrowers marketing less than 300 pounds. Approximately 30 percent of the woolgrowers in the Rich pool marketed a clip of 1000 to 5000 pounds and 15 percent had clips in excess of 5000 pounds.

Years pools have been in operation

The Summit pool with operations dating back to about the year 1920, was the oldest pool in the state which was presently operating. The Emery pool was the newest having been started in 1960. Five pools have started operations since 1956 and two pools have discontinued operations. Four pools operated continuously during the years of this study. These four pools were also the oldest pools in years of operation.

Organizational structure of Utah wool pools

Wool pools were organized for a specialized purpose. Their main, and almost sole function was to market wool for members at shearing time and provide services incident thereto.

Marketing operations in most pools were performed by a pool committee consisting of a chairman, vice chairman, secretary, and directors. Services performed by these pool committees were provided, for the most part, without remuneration except for a small fee paid to the member keeping the records. Most pool committees worked closely with the county agricultural agent and in many cases the agent was an officer of the committee.

Two of the nine pools were incorporated.

Means of financing

Eight of the nine pools obtained operating funds by direct charges levied on the members. Two pools made a direct charge of 1 dollar per member. One levied a charge of 1 dollar per member plus 1/2 cent per head of sheep. Three pools charged on the basis of volume of wool sold. These charges ranged from one-eighth of a cent per pound to 2.52 cents per pound. The one pool not making any charges was in its first year of operation and had encountered no expenses.

Operating Practices of Utah Wool Pools

Operating agreements

Wool pools attempted to guarantee volume of operation by placing members under written contract to deliver their wool to the pool. These contracts were varied in requirements. One contract required members who failed to sell wool through the pool to pay a penalty amounting to 10 percent of sales from diverted wool. Another pool charged 15 percent of gross value, while a third pool charged 50 cents per fleece for breaking contract with the pool. Four pools had a marketing contract without definite penalties specified. Two of the pools were operating under oral agreements. During the period of study few contracts were broken and there was little or no evidence that penalties had been inflicted on members for breaking contract with the pool.

Restrictions on membership

Wool varied greatly in quality among flocks, among breeds, and within breeds. Quality is also influenced by the conditions under which the wool is produced. Therefore, it is often necessary to place restrictions upon the quality of wool being pooled. Three pools in Utah

restricted the quality of wool that they would accept. The Emery pool had a rule that wool containing burrs would not be accepted. The Summit pool restricted wool that contained burrs, dirt and hay leaves. The restriction made by the third pool was that wool improperly prepared would be refused.

No pool made restrictions as to the size of clip that would be accepted.

Two pools made restrictions as to type of operation. The Box Elder pool restricted their pool to farm flocks while the Rich pool would not accept wool from sheep that had been on the desert.

Information provided buyers

The officer interviewed was asked what kind of information was provided potential buyers. Five of the seven officers from the pools that were operating in 1960, indicated that they provided wool buyers with information about the quality of their wool in order to help them more accurately appraise the wool and to encourage more buyers to submit bids.

Two pools provided buyers with measures of quality of their wool, number of black-face fleeces in the pool, and the date that wool could be delivered. Other items of information indicated number of fleeces in pool, where delivery would be made, terms of contract desired, date bids would be accepted, that past sales records were open for buyers inspection, a report of last year's grade out, quantity of wool available for sale, and the number of sheep containing Columbia breeding.

Display of wool for buyers

It is a general practice among buyers to inspect ungraded grease wool before buying so that the wool may be more accurately bought on its merits.

There were only three pools that displayed wool for buyers in 1960. All of the other pools were willing to display their wool but were not asked by buyers to do so. Two of the pools that displayed wool consigned to the Utah Wool Marketing Association and were paid on a graded basis. The one pool that sold to an independent buyer had almost all of its wool inspected by the buyer at time of shearing. Fifty percent of the wool in another pool was inspected by opening the end of the bags. In the third pool, the buyer made his inspection by feeling along the bags for lumps and cutting the seams to inspect the wool of those bags having lumps.

Only one pool had access to a warehouse for displaying its wool.

Sources of market information

Six pools used available market information to aid them in arriving at reservation prices.

One source of information used by five of the pools was reports of local wool sales. Three pools based their expectations upon a report from the State Extension Marketing Specialist. Reports of other pool sales were used by one pool. Data reported from the Boston wool market, government marketing reports, newspaper wool futures, and magazines were all listed as sources of market information.

Coordination of sale with other pools

Only one pool tried to coordinate its sale with another pool's sale. This was done one year, and without much success.

Services provided by pools to members

Since the operations of wool pools were specialized, they usually provided only those services incident to the preparation and marketing

of wool. Wool bags and fleece strings were provided at cost by six of the nine pools. Three pools offered their members help in a breeding program.

Transportation from assembly area to market was provided by two pools. Providing market reports, sacking twine, and shearing help were services offered by some pools to members. One pool retied bags at assembly point as a means of improving appearance of the pool.

Preshearing instructions given by pools to members

Individual wool clips sold through wool pools were, generally, rather poorly prepared. This poor preparation was due, partly, to the fact that most wool clips were small and added little to total farm income. As a result, there was little incentive to improve preparation. When asked what they did to improve wool preparation, officers from seven of the pools said they gave preshearing instructions to members. Few felt that these instructions were followed very closely.

A list of usual preshearing instructions follows: Four pools instructed members to tag sheep and bag the tags separately; Three pools suggested bagging crutchings separately; Two pools sent a bulletin on wool preparation to members in 1960; Instructions to crutch sheep, bag burry wool separately, how to tie fleeces, to shear in a clean area, keep wool clean, and to bag fine buck wool separately appeared twice in the list of instructions offered by pools; Fourteen other instructions including keeping wool clean, how to bag certain types of wool, and tying of fleeces were given by pools to help improve wool preparation. It was not possible to measure the results derived from following or not following instructions.

Comparison of number of bids received by pools

Two primary objectives of pooling wool are to bring together a large enough volume of wool to be attractive to prospective buyers and to increase the competition among buyers and thereby increasing price. A third objective is to reduce handling, transportation, and other marketing costs.

Data in this study were not sufficient to measure the effect number of bids had upon price. Therefore, bidding practices that took place are merely described. In 1960, five pools received bids on their wool. This was the highest number of pools to receive bids in one year. The least number of pools to receive bids in a single year was two. During the two years the Millard pool was operated, it declined the bids and consigned its wool to the coop. The other pools that marketed through the coop consigned their wool each year without receiving any bids. The most bids received by a single pool in one year was five. The least number of bids received by a single pool in one year was one (Table 5).

Table 5. Number of bids received by Utah pools selling on bids, 1956-1960

Pools	1956	1957	1958	1959	1960
	(Number of bids received)				
Box Elder				1	5
Millard				4	3
Summit	1	3	3	2	2
Rich	2	3	3	4	1
Emery					2
Piute		1			

The highest percent of the pools that received bids, sold their wool after receiving three bids. Twenty-five percent of the sales in various years were made after receiving only one bid.

Most of the bidding was done by two or three buyers.

Sealed bids on a single pool ranged from 0 to 5.63 cents per pound between the low and the high bid. This would indicate that some buyers lacked knowledge of the quality of wool within the pool or did not bid the price as close as they could. Therefore, those pools selling after receiving only one bid were, possibly, not receiving the highest price for their wool.

Types of dealers buying pooled wool

Pooled wool in Utah was sold to five types of dealers during the years 1956 through 1960 (Table 6).

The coop was the only dealer handling wool from pools every year. In every year except 1960, the coop handled the largest volume of wool. For the five years studied approximately 50 percent of the total volume of wool marketed by pools was marketed through the coop. Independent dealers bought pooled wool in four of the years and in the five years bought 22 percent of pooled wool. Commission dealers bought wool three of the years, top makers in two and each type bought about 15 percent of the pooled wool. There were eight different dealers that bought wool from Utah pools during the years of 1956 through 1960.

Methods used in determining price

Sealed bids, private treaty, and consignment to the coop were the three methods used by pools in determining price. Consignment through the coop was the most used method with price for about half of the wool

Table 6. Number of pools and pounds of wool sold or consigned to various types of dealers, 1956-1960

Year	Type of dealer <i>bundles</i>				
	Coop	Independent	Top maker	Commission	Hide & fur
(Number of pools sold or consigned)					
1956	2	1		1	
1957	2	1		1	1
1958	3		2		
1959	3	1	1	1	
1960	3	4			
(Number of pounds sold or consigned)					
1956	239,402	127,981		142,980	
1957	264,626	126,902		151,763	18,463
1958	333,975		278,558		
1959	307,828	38,040	137,395	148,447	
1960	300,735	361,909			
5 year total	1,446,566	654,832	415,953	443,190	18,463
Percent of total	48.6	22.0	14.0	14.9	0.6

sold through pools being determined by this method (Table 7). Sealed bids and private treaties were equally used by pools in selling their wool.

Each pool followed the practice of determining price by the same method year after year.

Table 7. Number of pools selling wool by various methods, 1956-1960

Method of selling	1956	1957	1958	1959	1960	Total
	(Number of pools)					
Sealed bids	1	1	1	2	2	7
Private treaty	1	2	1	1	2	7
Coop consignment	2	2	3	3	3	13

Marketing Charges

Marketing charges have a great impact upon the net price received for wool. These charges are figured as the cost of getting the wool from the farm and selling it on the Boston market since the Boston market has historically been the deficit market point because of the importance of wool manufacturing in New England.

Marketing charges are figured differently depending on whether wool is sold on a graded or ungraded basis. When wool is sold on a graded basis the wool grower has a direct charge made to him. When the wool is sold on an ungraded basis the grower indirectly pays the charge by receiving a lower price. Wool sold on a graded basis generally has the following market charges made against it: commission and handling, grading, storage, and transportation. These charges were subject to change from year to year (Table 8).

These marketing charges were the marketing charges used in computing the market values used in a later section. Storage costs were not included because their importance is a direct function of time.

Marketing charge rates changed with the volume of wool marketed (Table 9).

Table 8. Minimum charges made by the Utah Wool Marketing Association for performing certain functions, 1956-1960^a

Items	Years				
	1956	1957	1958	1959	1960
	(Cents per pound)				
Handling	2.25	2.25	2.25	2.00	1.70
Grading	1.50	1.50	1.50	1.50	1.50
Transporting	3.35	3.70	3.00	2.52	2.54

^a Higher rates are scheduled according to volume of wool marketed.

Table 9. Rates for performing specific marketing functions according to volume of wool, Utah Wool Marketing Association, 1960

Function	Volume	Charge
Handling	Over 5000 pounds	1.70 cents per pound
	Under 5000 pounds	2.70 cents per pound
Grading	Over 2000 pounds	1.50 cents per pound
	Under 2000 pounds	2.52 cents per pound
Transporting	Over 40,000 pounds	\$2.45 per hundred pounds
	Over 30,000 pounds	\$2.68 per hundred pounds
	Over 24,000 pounds	\$3.99 per hundred pounds

In computing marketing charges, the lowest rates were used since pooling combines small clips into larger lots making the lower marketing rates applicable. Individual wool growers obtain the advantage of this lower rate charge. To illustrate let us use a weight of 1200 pounds as the volume of wool being marketed by one individual woolgrower. This volume would be charged \$47.88 for transportation from Utah to Boston. By pooling the clip with others in a lot large enough to come under the \$2.45 per hundred rate, it would cost \$29.40 to move this same volume of

wool to Boston, creating a savings of \$18.48. This would be equal to receiving 1.54 cents a pound more for the wool.

Handling charges, with commission included, and grading charges can likewise be reduced by pooling if the total clip is treated as a single slip, however, if handling and grading were performed on an individual producer basis, no savings could be obtained in these two areas. If handling was charged on the total pool volume, a 1 cent per pound saving could be obtained. Grading charges could be reduced 1.02 cents per pound. In total, a 3.56 cent per pound reduction in marketing costs would be obtained by growers with small volumes of wool by pooling in lots large enough to come under the lower rates.

Marketing charges cannot always be made on the total pool volume rate since those pools selling through the coop have their clips graded on an individual basis. In doing so, they are charged a rate corresponding to the volume of wool which they marketed.

Wool buyers buying pooled wool should be able to pass on to the pool the savings in marketing costs brought about by the larger volume of wool in the form of a higher price per pound of wool.

Results of Marketing Through Pools

If wool pools are to be successful and continue their operations, they must be able to obtain a higher price than the individual producer could obtain, or else make a substantial saving in marketing costs. Pools not able to meet one or both of these requirements are, generally, discontinued.

Comparison of pool prices and state average
prices considering time of sale

Prices received by each of the pools during the 1956 to 1960 marketing years were compared with the average price received for wool by producers in the state of Utah during the same month the pools were sold (Figure 2). Those pools selling through a coop are represented by a straight line through the period June through November since the majority of their wool was sold during those months and it was impossible to pin date of sale to a definite month.

In 1956, the price of wool was rising and the wool sold by the Cache and Uintah pools was sold late in the season receiving the advantage of the rising price trend. The two pools selling early received a price close to the average state price at time of sale.

The Rich and Summit pools were the only pools in 1957 that received a higher price than the state average wool price during the month their wool was sold. These two pools sold early in the year while prices were rising. The Cache and Uintah pools received prices of 15.56 and 10.85 cents per grease pound respectively below the state average price. These low prices may be explained by the fact that much of their wool was sold late in the season with some carried over into 1958. The continual drop in prices and the added cost of storage were partially responsible for these low prices.

In 1958, there was one pool that received a higher price than the average state price.

In 1959, the price received by pools ranged from .55 to 4.64 cents a pound above the average state price.

All pools received a price in 1960 from .50 to 3.47 cents a grease pound above the state average price for the period sold.

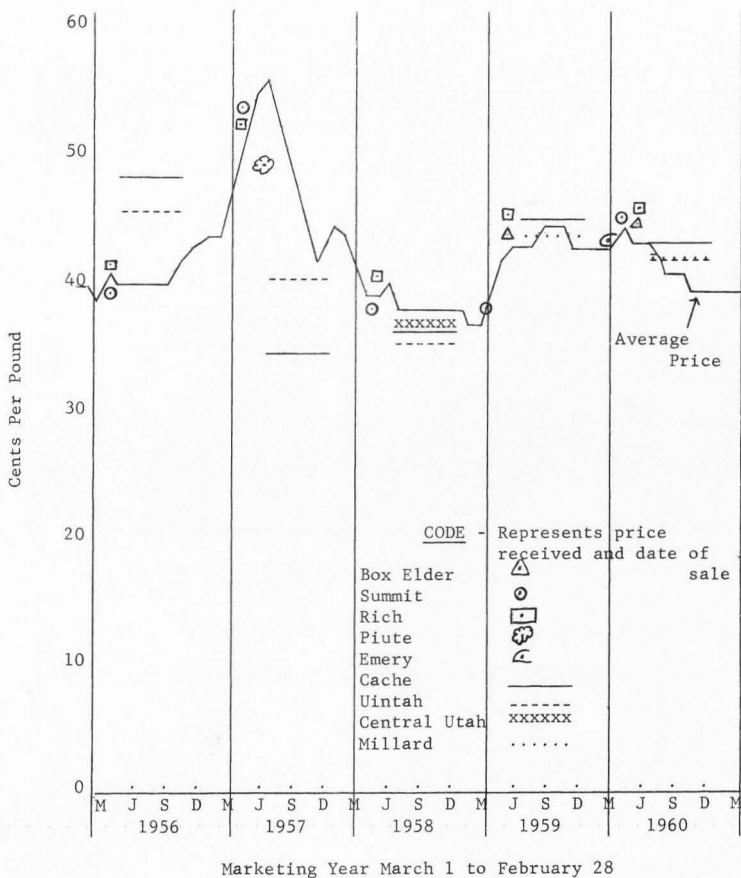


Figure 2. Comparison of average price received by Utah wool producers with price received by various pools at time of sale, 1956-1960

When prices received by each pool for the years 1956-1960 were averaged, five of the nine pools received .29 to 2.37 cents a grease pound above the state average (Table 10).

Table 10. Price differentials between price received by pools and the state average price at time of sale, Utah wool pools, 1956-1960

Pools	1956	1957	1958	1959	1960	Average
	(Price differential, cents per pound)					
Box Elder				+1.74	+1.20	+1.47
Cache	+7.30	-15.56	-2.86	+2.16	+2.28	-1.13
Central Utah			-2.28			-2.28
Emery					+ .50	+ .50
Millard				- .21	+ .80	+ .29
Piute		- 7.38				-7.38
Rich	+ .90	+ 1.33	+1.51	+4.64	+3.47	+2.37
Summit	- .99	+ 2.41	-1.46	+ .55	+1.37	+ .38
Uintah	+4.68	-10.85	-3.31		+ .78	-2.18

Over the five years covered in this study, the Rich County pool has consistently received the highest price compared with the state average, while the Box Elder pool received the next highest price averaging 1.47 cents a pound above the state average price. The highest price received by any pool was 52.407 cents per grease pound in 1957 near the peak of the price cycle. The lowest price received was 35.02 cents a grease pound by the Uintah Basin pool in 1958. This comparison was made without regard to quality of wool in each pool.

Quality of Wool in Selected Utah Wool Pools
as Based on Physical Measurements

The modified hair-like fiber produced by sheep known as wool has many characteristics which makes it desirable for a multitude of finished consumer and industrial products. In order to produce given final products, wool of certain characteristics is required.

Wool used in the Worsted Industry is a longer staple wool that is combed into tops and woven under tension, while the wool used in the Woolen Industry is shorter staple, being too short to comb and weave under tension. The Carpet Wool Industry uses a long staple wool with extremely coarse fibers for its products.

Wool used in these various industries comes from specific types of sheep since the type of wool varies considerably with the breed of sheep. Some breeds are grown primarily for production of wool; some primarily for meat, while still others are grown because of their proficiency in producing the two products jointly.

Much progress has been made through selection and breeding to improve the quantity and quality of wool produced on sheep of a given type. In spite of this, and for reasons too numerous to list, wool is found in a market situation with a wide variety of physical characteristics. As shorn from sheep, wool has additional variables which influences its value, such as weight loss in getting it from grease to clean basis, color, and prevalence of foreign material such as dirt, leaves, chaff and burrs.

In a competitive market the general level of prices for wool of given characteristics is determined by supply of such wool and the demand derived from the end products produced from it. For example, the

relative prices of fine short fibered wool and course long fibered wool is determined at any given time, by supply of and demand for the two types of wool.

The value of a given clip of wool above or below the general price level is presumably related to its physical qualities.

One objective of this study was to measure these physical qualities of wool and determine their relationship to prices paid for wool.

The physical characteristics measured were percent yield of clean wool, fiber diameter or fineness, staple length, color of wool, prevalence of vegetable matter and colored fibers. Measurements were applied to wool samples taken from randomly selected clips in the Box Elder, Cache, and Rich County Wool Pools. Wool samples were obtained by the Core¹ and Hook² methods.

Yield of clean wool

Yield is concerned with the percent of clean wool which is obtained from grease wool. Measurements were made by dividing the core-samples from each clip into three equal volumes. One lot went into a pool composite to be tested by the Department of Animal Husbandry, Utah State University. Another composite sample was tested by the United States Testing Company at Denver, Colorado. These two composites were made on a pool basis with all clips in the pool included. A third lot of wool

¹Core samples were obtained by cutting a designated number of $1\frac{1}{4}$ inch cores from specified location in a bag of wool to obtain a representative sample. This sample was used for measuring yield, fineness, color, and prevalence of vegetable matter and colored fibers.

²Hook samples were obtained with a hook 36 inches long that was projected into the bag of wool to secure a staple of wool which could be measured for length and graded visually. Hooks were taken from different locations in each bag.

from each clip was kept separate and tested to indicate the percent yield of the wool being pooled by each individual wool grower. The clip yields were then averaged to derive the mean percentage yield for the pool (Table 11).

Table 11. Comparison of yields as derived from two composites and mean of individual samples with variation in yield among clips, Box Elder, Cache, and Rich pools, 1961

Pool	Percentage yield			Variation among clips	
	Logan composite (Percent)	Denver composite (Percent)	Mean of individual (Percent)	Standard deviation (Percent)	Coefficient of variation (Percent)
Box Elder	45.94	46.00	45.96	3.97	8.64
Cache	45.41	46.66	47.62	5.79	12.16
Rich	42.08	43.03	44.43	6.10	13.97

The differences in percentage yield calculated from the three different samples for each pool were not significant when tested by the Analysis of Variance F Test at the one percent level of significance.

The percentage yields of the Box Elder and Cache pools were similar at about 46 percent, and the Rich pool yield was about three percentage points lower. Assuming a market price for clean wool of 1 dollar per pound, the wool from the Rich pool would be worth about 3 cents a pound less than wool from the other two pools on the basis of yield alone.

Variation in yield among clips. Standard deviation and coefficient of variation were used to measure the dispersion of individual clip yields. The Box Elder pool had the least variation in yield among clips of the three pools with a coefficient of variation of 8.64 percent. The Rich pool had the greatest with a coefficient of 13.97 percent (Table 11).

The higher the coefficient of variation the greater the inequity between individual clips if all are paid for at the average price received for the total pool.

Wide variation among clips makes it more difficult for wool buyers to accurately appraise the value of the pool.

Fineness of wool fibers

Two systems have been used to determine grade of wool on the basis of fiber fineness. The American Blood grades when first developed referred to the amount of Merino blood in the sheep producing the wool. The more Merino blood the finer the wool. Now it refers only to the fineness of the wool.

The Bradford or Count system is based upon the number of hanks of yarn which can be spun from a pound of wool. Centuries ago the term, "a hank of wool," was established to denote a 560 yard length of worsted yarn. Wool designated as 56's denotes that 56 hanks can be spun from a pound of wool. Fiber diameter measurements are sometimes used in determining grade.

The relationship between the two systems presently being used by the trade to designate fineness of wool with the range in fiber diameter are shown in Table 12.

Grades of wool based on fineness in the three pools were determined by three different methods. Under one method a representative sample of wool fibers were measured under a microscope.¹

¹Microscope measurements were obtained by projecting a cross section of fibers that had been mounted on a slide through a microscope on to a calibrated ruler.

Table 12. Comparison of systems of determining fineness of wool with proposed fiber diameter specifications for each grade

Blood system grades ^a	Equivalent grades in count system	Diameter ^b of fibers in each grade (microns)
Fine	80's	17.7-----19.1
	70's	19.2-----20.5
	64's	20.6-----22.0
1/2 Blood	62's	22.1-----23.4
	60's	23.5-----24.9
3/8 Blood	58's	25.0-----26.4
	56's	26.5-----27.8
1/4 Blood	50's	29.4-----30.9
	48's	31.0-----32.6
Low 1/4 Blood	46's	32.7-----34.3
Common and Braid	44's	34.4-----37.0
	40's	37.1-----38.9
	36's	39.0-----41.2

^a Source: Keetch, R. R., Two Methods of Determining Fineness of Wools, Utah State Agricultural College Extension Service, Fact Sheet No. 2.

^b Diameters are proposed specifications for grade or fineness of wool, A S T M Designation: D419-58.

The Micronaire¹ test was another method used to measure average diameter of wool fibers in the samples. These two methods were used as a check on one another rather than to compare results of the two methods. A third method of measuring fineness was determined by visual observation of hook samples taken from individual wool clips. Each clip was classified by the Blood system of grading. Differences in the average fiber diameter among the three pools were small but both the Microscope and

¹Micronaire measurements were made by blowing air through wool that had been corded and measuring the pressure.

This test was made under the direction of Alexander Johnston, Wool Specialist at the University of Wyoming.

Micronaire methods of determining fineness were in agreement that the Rich pool marketed the finest wool (Table 13). Wool from this pool graded high 56's or low 58's depending on the method of measurement used. Regardless of the method used, the wool would classify as Three-Eighths Blood. Wools from the Box Elder and Cache pools were similar in fineness. The wool from both pools graded either low 56's or high 54's depending on the method used for testing fineness. By the Blood system, wool in these two pools would grade Three-Eighths Blood or Quarter Blood since the wool in these two pools was near the limit separating the two grades.

Table 13. Fiber diameter and grade of wool as determined by the Micronaire and Microscope tests with variation in fineness among fibers, Box Elder, Cache, and Rich, 1961

Fineness and grade		Pools		
		Box Elder	Cache	Rich
Micronaire Test	Average fiber diameter (microns)	27.5	28.35	26.8
	Count system grade	56's	54's	56's
Microscope Test	Average fiber diameter (microns)	28.54	27.16	25.21
	Count system grade	54's	56's	58's
Dispersion of Microscope Measurements	Standard deviation (microns)	8.21	6.23	6.13
	Coefficient of variation (percent)	28.77	22.93	24.29

Analysis of Variance F. test at the 1 percent level of significance found no significant difference in fineness between the two methods used.

The wool in the Rich pool was finer than the Cache or Box Elder pools by about one spinning count grade but less than one Blood grade.

In general the smaller the fiber diameter of wool, the greater the shrink from grease to clean basis. The wool in the Rich pool was consistent with this relationship.

Variation in fineness. Wool fineness as measured by mean fiber diameter is of limited value unless accompanied by some measure of dispersion. Approximately 600 wool fibers that had been selected from each pool composite were measured to determine average fiber diameter by the Microscope method. These wool fibers varied greatly in diameter in all three pools (Table 13). The Box Elder pool had a coefficient of variation of 28.77 percent. The other two pools had coefficients four to six percentage points lower. The variation in fineness within the pools was verified by visually classifying each clip according to its Blood grade or grades (Table 14).

The greatest percentage of the individual wool clips in each pool were graded as three-eighths or Three-Eighths to Quarter Blood. The Rich pool had a relatively large percent of clips in both the Fine to Three-Eighths Blood and Half to Three-Eighths Blood classes.

The distribution of clips by blood grades confirms both the level of fineness of the composite pool samples and the differences among the pools. It also emphasizes the wide variation in fineness among the clips comprising the pool.

Table 14. Distribution of wool clips according to Blood grade classification, Box Elder, Cache, and Rich pools, 1961

Grades	Pools		
	Box Elder (Percent)	Cache (Percent)	Rich (Percent)
Fine	0	0	0
Fine - Half	11.76	0	6.90
Fine - Three-Eighths	5.88	10.53	20.69
Half	5.88	0	0
Half - Three-Eighths	11.76	5.26	20.69
Half - Quarter	0	15.79	3.45
Three-Eighths	52.94	21.05	24.14
Three-Eighths - Quarter	11.76	47.37	24.14
Quarter	0	0	0

Staple length

The term "staple" in the wool trade refers to a group of wool fibers comprising a lock, or else to the length classification which is referred to as combing wools. A staple length classification referring to the length of the fibers was developed by wool manufactures. The three classes which they established were Combing, French Combing, and Clothing. In the combing process the long wool fibers are set parallel to one another, while the short fibers are removed. These long fibered wools are made into tops for worsted yarn manufacturing. The wools which are long enough to be combed by this process are known as Combing or Staple Wools. In 1845, the French or Continental comb was developed for combing cotton. This machine would comb much shorter fibers than the Noble or Holden combs used in combing wool. This made it possible to comb shorter

wool fibers for making worsted yarn. Therefore, those wools which were too short for Noble Combing could be combed with the French Comb and become known as French Combing. Those wools which were too short for either type of combing and those short and broken fibers removed in the combing process, known as noil, are made into a woolen yarn for woolen manufacturing. These short wools are known as Clothing wools.

Wools are classified on the basis of fineness and length of wool staple. Under this system, staple length increases as fiber diameter increases for each length class (Table 15).

Table 15. Suggested staple lengths for grades of grease wool^a

Length ^b class	Suggested lengths by grades					
	Fine	1/2 Blood	3/8 Blood	1/4 Blood	Low 1/4	Common
	80's	62's	58's	54's	Blood	& Braid
	70's	60's	60's	50's	48's	44's
	64's				46's	40's 36's
	(Inches)	(Inches)	(Inches)	(Inches)	(Inches)	(Inches)
Staple	2.5	3.0	3.5	4.0	4.5	5.0
Good French Combing	2.0	2.5	3.0	3.5		
Average French	1.5	2.0	2.0	2.5		
Short French	1.0	1.5				
Clothing & Stubby	Under 1.0	Under 1.5	Under 2.0	Under 2.5	Under 4.5	Under 5.0

Source: U.S.D.A., A.M.S., M.E.R.D. Technical Bulletins, No. 1247, July 1961.

^a Length designations are based on unstretched staple length and represent minimum length for bulk of staples in sample.

^b Minimum lengths are shown.

These length classes are only suggested since no official classes have been established. The French combing has been sub-divided into sub-classes.

About 50 staples of wool were measured from each individual clip to determine its staple length. The average staple length of each wool clip was averaged to obtain the mean staple length for the pool.

Wool from the Cache pool averaged the longest while the wool from the Rich pool averaged the shortest (Table 16).

Table 16. Average staple lengths and variation among clips, Box Elder, Cache, and Rich pools, 1961

Pools	Clips	Average staple length (Inches)	Variation among clips	
			Standard deviation (Inches)	Coefficient of variation (Percent)
Box Elder	19	3.20	.36	11.3
Cache	21	3.58	.35	9.8
Rich	29	2.92	.17	5.9

This variation in fiber length among pools was consistent with fineness since normally the finer the wool the shorter the staple. Wool from the Rich Pool was of sufficient length to be classed as Average French Combing while the wool from the Box Elder and Cache pools was classified as Good French Combing. However, the difference in average staple lengths between the pools was not as great as the length classification would indicate since the Rich pools wool averaged just under the lower limit of Good French Combing, while the wool in the Box Elder pool was just above the limit.

Variation among clips. Standard Deviation and Coefficient of Variation were used to express the variation found in average staple length among wool clips in each pool. The coefficient of variation in

the Rich pool was 5.9 percent, lowest of the three pools (Table 16). The Box Elder pool had the largest variation in staple length with a coefficient twice as large as that of the Rich pool.

Other physical factors

Individual wool samples collected by the core-sampling method were rated subjectively on color, burrs, chaff and amount of colored fibers in the sample. Color of wool was classified as "bright," "semi-bright," or "dark." Each wool clip was rated as having a "heavy," "medium," or "light" amount of burrs and chaff in the sample. Individual samples of wool were rated on quantity of colored fibers as "large amount," "small amount," or "none."

These physical factors affect the value of wool but are hard to accurately discount in price. Color is related to shrinkage in that the darker wools contain larger proportions of dirt, grease, and other foreign materials. Some wool dealers discount as much as 3-6 cents per grease pound on color. Most "Standard Contracts" discount burrs and chaff 2-5 cents a grease pound. Fleeces containing black fibers are also discriminated against.

The highest percent of wool clips in the Box Elder and Cache pools were rated as "bright" in color while the largest percent in the Rich pool were rated "semi-bright" (Table 17). The Box Elder pool was the only pool with clips classified as "dark." Burrs were a problem in both the Cache and Box Elder pools. Cache was the only pool with clips rated as "heavy" in burrs. Wool from the Rich pool contained no burrs.

Chaff was found in the wool from all three pools; however, the Cache wool contained the greatest amount. The majority of samples in the Box Elder and Rich pools were rated as "light" in chaff.

Table 17. Distribution of wool clips by certain visual classifications, Box Elder, Cache, and Rich pools, 1961

Classification		Box Elder	Cache	Rich
(Percent of clips)				
Color	Bright	68.42	61.91	37.93
	Semi-bright	26.32	38.09	62.07
	Dark	5.26	0	0
Burs	Heavy	0	9.53	0
	Medium	21.05	33.33	0
	Light	78.95	57.14	100
Chaff	Heavy	0	4.76	0
	Medium	10.53	52.38	37.93
	Light	89.47	42.85	62.07
Colored Fibers	Large amount	5.26	9.52	0
	Small amount	31.57	14.29	17.24
	None	63.16	76.15	82.76

The majority of the clips in all three pools contained no black fibers. Five and nine percent respectively of the Box Elder and Cache clips were classified "large amount" on the basis of colored fibers. This was because more of the clips in these two pools were from coarser-wooled black-face sheep.

Value of Wool Clips as Determined by Physical Measurements

Results of physical measurements were used to calculate the market value of the wool in each pool. This was done by multiplying the percentage yield by the Clean Boston price¹ for wool of like quality on the date of sale. Marketing charges were deducted from this calculated price.

¹Source of Boston quotation was U.S.D.A., A.M.S., publication, Weekly review of Boston wool Market.

This calculated price was compared with the price received by the pool. This calculated price is not a precise value, since it is based on average quality of the clips. Previously stated measurements indicated that these quality measurements were on the border between two grades. In calculating market value, no discounts were made for burrs, chaff and colored fibers. Value was based on the three factors of yield, fineness, and staple length.

Box Elder pool comparison

The calculated value of wool in the Box Elder pool was based on grease wool yielding 46 percent and grading Three-Eighths Blood Average French Combing. This grade was selected as a compromise between Three-Eighths Blood Good French Combing and Quarter Blood Average French Combing grades represented by this pool.

The calculated value of the wool from this pool on date of sale was 41.41 cents per grease pound. The wool from this pool in 1961 sold for 41.21 cents per grease pound.

For purposes of comparing prices received and calculated value for wool in past years, it was assumed that the quality was the same as in 1961. On this basis, the Box Elder pool received a higher price than the calculated value in 1959 and 1960, but slightly lower price in 1961 (Table 18).

There was considerable variation in the calculated value of individual clips in the pool. Using the pool value of 41.41 cents per grease pound as the basis of comparison, individual wool clips ranged from 9.07 cents per pound above the pool value to 5.69 cents below. The spread was nearly 15 cents per grease pound between the clips with the highest and lowest calculated value (Figure 3).

Table 18. Comparison of price received by Box Elder wool pool with calculated value on date of sale, 1959-1961

Items	1959	1960		
		(Cents per pound)		
Price received	44.74	45.20	41.21	43.72
Calculated value	41.13	41.41	41.41	41.32
Difference	+3.61	+3.79	-.20	+2.40

Cache pool comparison

Based on the calculated value of wool grading Three-Eighths Blood Good French Combing and yielding 46 percent on June 2, 1961, the wool from the Cache pool was valued at 43.71 cents per grease pound. This wool was graded and consigned through the coop at an average price at 45.90 cents per greased pound. Payments were made to each individual on his clip grade out. Prices paid for the 21 individual clips were compared to their calculated values to determine any correlation. Statistical test of correlation resulted in a correlation coefficient of $r = +.3085$.

The week ending June 2, represents the week the wool was shipped to the coop and this date was used for comparison for comparability with the other pools.

Calculated value of wool from this pool in past years assumed that quality of wool was the same as in 1961. This pool has sold its wool through the coop every year and the precise date of sale was not available. The Boston Market quotation for the six month period, June through November, was used in calculating value for this pool.

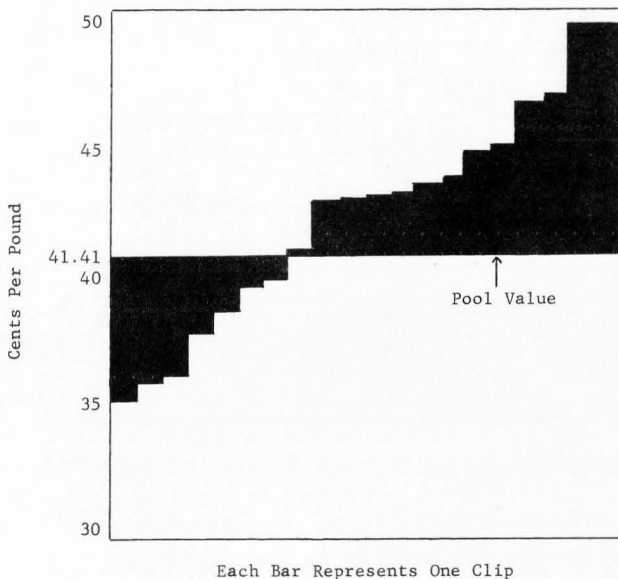


Figure 3. Distribution of 19 sample wool clips by calculated values compared with pool value, Box Elder pool, 1961^a

^a Individual calculated values figured on individual clip grades and yields as shown in Appendix, Table 21.

In every year except 1957, the price the pool received was very close to calculated value (Table 19).

Table 19. Comparison of price received by Cache wool pool with calculated value on date of sale, 1956-1960

Items	1956	1957	1958	1959	1960	1961	
	(Cents per pound)						
Calculated value ^a	46.44	52.95	37.18	46.14	43.85	43.71	45.04
Price received	47.63	35.11	36.47	46.16	43.78	45.90	42.51
Difference	+1.19	-17.84	-.71	+ .02	-.07	+2.19	-2.53

^a Market value was six month average (June - November).

In 1957 pool price was 17.84 cents a grease pound below calculated value. A major part of this difference may be attributed to the fact that prices were falling in 1957 and much of the wool was sold when prices were near the low point in the price cycle. Higher storage costs were also encountered since wool was stored longer than normally.

In 1961 difference between calculated value and price received was attributed to wool being sold later in the season after prices had risen.

Calculated value of individual clips in this pool varied from a high of 56.60 cents per grease pound to a low of 33.47 cents. This amounted to a difference of 23.13 cents per grease pound between the value of the poorest clip and the top value clip (Figure 4).

Rich pool comparison

Based on the market quotation of wool grading, Three-Eighths Blood Average French Combing and yielding 43 percent clean wool, the calculated value of wool from this pool on the farm at time of sale in 1961 was

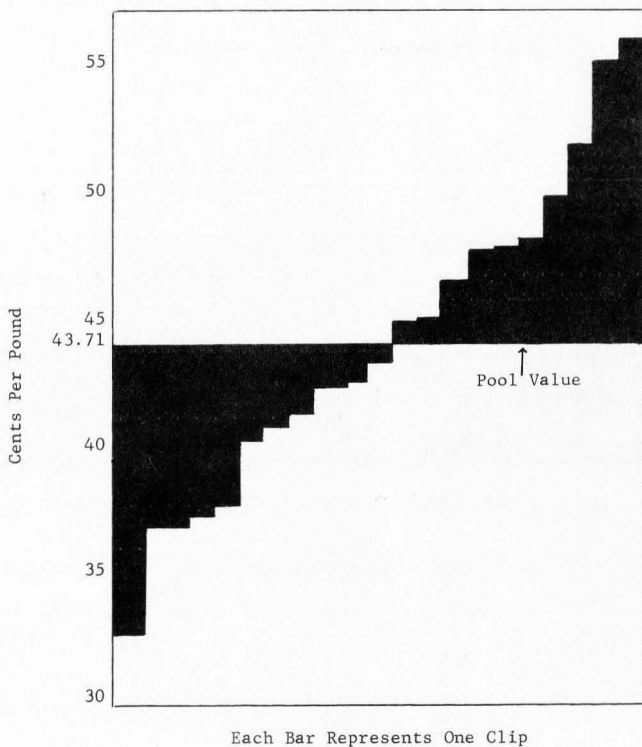


Figure 4. Distribution of 21 sample wool clips by calculated values compared with pool value, Cache pool, 1961^a

^a Individual calculated values figured on individual clip grades and yields as shown in Appendix, Table 22.

38.34 cents per grease pound. The price actually paid by the buyer was 38.99 cents per grease pound. This wool was graded and payment made to each individual on his clip grade out. Price paid for 29 individual clips was compared to the calculated value of these clips to determine if there was any correlation. Statistical test of Correlation resulted in a correlation coefficient of $r = +.249$.

When market prices for past years were computed as based upon the quality of the 1961 clip, it was found that price received by the pool exceeded calculated market price in each year from 1956 to 1961 (Table 20).

Table 20. Comparison of price received by Rich wool pool with calculated value on date of sale, 1956-1960

Items	1956	1957	1958	1959	1960	1961	
							(Cents per pound)
Price received	41.95	51.38	40.56	47.69	47.52	38.99	44.68
Calculated value	39.34	49.53	31.95	38.06	38.34	38.34	39.26
Difference	+2.61	+1.85	+8.61	+9.63	+9.18	+ .65	5.42

In three of those years, price received was 8-10 cents above the calculated value of the pool.

The calculated value of individual clips in the Rich pool varied from a low of 30.60 cents per grease pound to a high of 56.97 or a range of 26.37 cents per grease pound (Figure 5).

In this comparison an attempt was made to compare the prices received to calculated price for each pool to previous years. No attempt was made to compare calculated prices of the three pools since the effect of burrs, chaff, color, and colored fibers were not computed in the calculated prices.

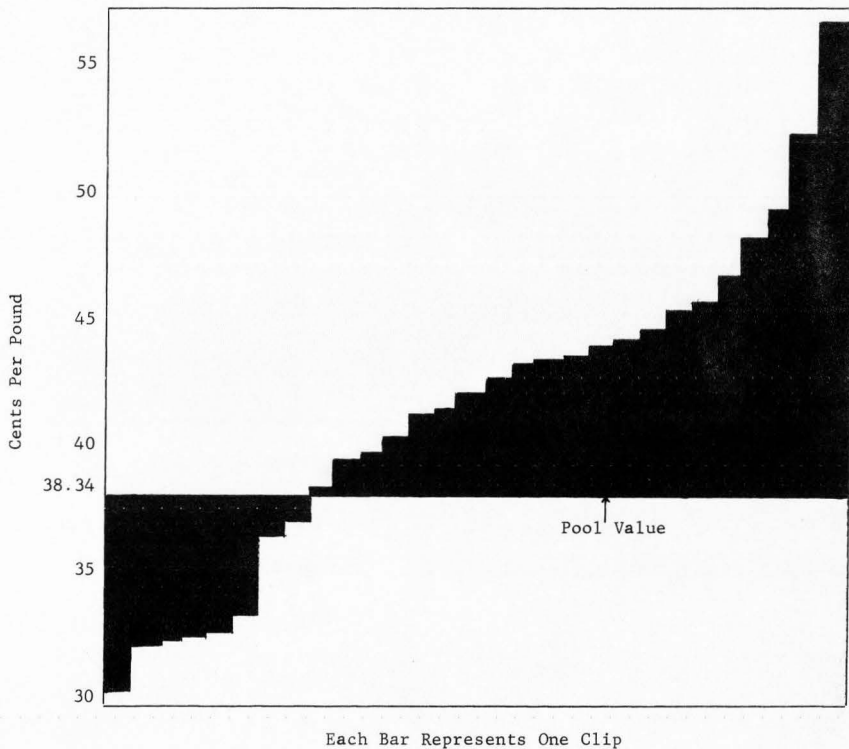


Figure 5. Distribution of 29 sample wool clips by calculated values compared with pool value, Rich pool, 1961^a

^a Individual calculated values figured on individual clip grades and yields as shown in Appendix, Table 23.

SUMMARY

1. Nine pools were operating between 1956-1960 and marketed about 5 percent of Utah's wool. These pools varied in membership from 10 to 323, and in volume from 16,277 to 225,688 pounds. Approximately 80 percent of the clips marketed by these pools were under 1000 pounds; however, distribution by size varied among the pools.

2. The primary function of a wool pool is to market wool from producer to first handler at or soon after shearing time. Because of limited functions and seasonal operation, most pools were operated by a committee which served without remuneration.

3. Operational practices used by pools consisted of: using operating agreements to insure patronage of members; restricting membership; providing buyers with information about their wool; displaying wool for buyers inspection; using market information to arrive at reservation prices; providing limited services to members; and giving preshearing instructions to improve wool preparation.

4. Two or three pools rather consistently consigned their wool to Utah Wool Marketing Association without considering other outlets. Other pools sold direct to various types of buyers by sealed bid or private treaty. These sales were made in various years after receiving from one to five bids.

5. For most years since 1956, prices received for wool sold through pools has been similar to the state average grease price. The differential from the state average varied from 7 cents above in 1956, to 15 cents below in 1957, for the Cache County pool. Rapidly rising prices

in 1956 and falling prices in 1957, and the impossibility of obtaining precise date of sale were largely responsible for this wide variation.

6. Average physical characteristics of wool for the three pools measured were similar. Yield was 46 percent in two pools and 43 in the third. Fineness measurements indicated the wool from all three pools to be about Three-Eighths Blood with sufficient length to classify French Combing. All three pools had a large amount of variation within the pool. Such characteristics as percentage yield, fiber diameter, staple length, and prevalence of foreign material varied considerably among the clips in each of the pools.

7. The price received by each pool was compared with the calculated value, based on Boston clean price, adjusted for marketing costs and quality measurements. The Box Elder pool received a price above the calculated value in two of three years compared. The Cache pool received a price above its calculated value in two and below in three of the five years compared. The Rich pool received a price above the calculated value in every year, and in three of the six years compared, the premium was 8 to 10 cents per grease pound.

8. Calculated value of individual clips indicated a large amount of variation within each of the three pools. The range from high to low calculated value of individual clips in the Box Elder, Cache, and Rich pools was 14.76, 23.13, and 26.37 cents per grease pound respectively.

CONCLUSIONS

Utah wool pools differed in organizational structure and services rendered, but each had as their primary function, marketing of wool from producer to first handler at or soon after shearing time.

Over the years, these pools have returned a price to members slightly above the state average price at time of sale. This has been partially accomplished by increasing the bargaining position of the small producer through combining small clips into lots large enough to be attractive and by letting a better informed agency bargain for him. Larger volumes of wool have made possible lower transportation rates. It is concluded that terms of bidding, selling arrangements, and methods of price determination also contributed to this slightly higher price. The effect attributable to each factor could not be singled out; therefore, additional study is suggested to determine the effect of each factor on price.

Pools have provided small producers with a convenient market outlet for their wool. They have also increased the variation in quality of wool being sold as one lot, and the problem of paying each member the value of his clip. Payments made on the average quality of the pool has discounted the high quality clips and paid a premium for the poor quality, thus destroying incentive to improve wool quality.

Pooling benefits wool buyers by decreasing their expenses through buying a large volume of wool at one time. This large highly variable volume of wool increases the problem of the buyer in pricing the wool on its merits; and may also be too large for some small wool buyers. Still

other buyers who deal in specific types of wool may be uninterested in wool with such variation.

There is a real challenge for pools to develop a system of pooling which retains their advantages while minimizing the problems which they create. One possible system would be to use objective physical measurements to determine the quality and variation in quality of wool within the pool. Pools could use this information to combine clips into lots of near equal quality and make payment to contributing members at a uniform price. This would aid buyers in pricing the wool near its merited value and give small wool buyers a chance to compete. This separation on basis of quality would give specialized buyers an opportunity to buy only those types of wool which they desired.

Further study is recommended to determine alternative systems of distributing returns from pooled wool.

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A P P E N D I X

Table 21. Quality of sample clips in the Box Elder wool pool based on objective physical measurements, 1961

Producer number	Percentage yield at 12% moisture	Average fiber length (inches)	Color of wool	Vegetable Burrs	matter Chaff	Amount of colored fibers	American wool grades
1	45.98	2.7	Bright	Light	Light	None	Half
2	48.64		Semi-bri	Light	Light	Small	--
3	45.74	4.29	Bright	Light	Light	Small	3/8
4	42.93	2.98	Bright	Med.	Light	None	3/8
5	45.12	3.41	Bright	Med.	Light	None	3/8
6	45.62	3.26	Bright	Light	Med.	None	Fine, 3/8 Half
7	42.85	3.51	Bright	Light	Light	Large	3/8, 1/4
8	40.45	3.20	Semi-bri	Med.	Med.	Small	3/8
9	40.94	3.23	Bright	Med.	Light	None	3/8
10	44.14	2.88	Semi-bri	Light	Light	None	3/8
11	43.90	3.05	Bright	Light	Light	Small	1/2, 3/8
12	52.27	3.03	Bright	Light	Light	None	3/8
13	48.84	3.2	Semi-bri	Light	Light	None	3/8
14	54.85	3.14	Bright	Light	Light	None	3/8, 1/4
15	39.40	2.7	Dark	Light	Light	None	Fine, Half
16	48.30	3.4	Semi-bri	Light	Light	Small	3/8
17	48.44		Bright	Light	Light	None	--
18	49.37	3.21	Bright	Light	Light	Small	Half, 3/8
19	45.51	3.14	Bright	Light	Light	None	Fine, 1/2

Table 22. Quality of sample clips in the Cache wool pool based on objective physical measurements, 1961

Producer number	Percentage yield at 12% moisture	Average fiber length (inches)	Color of wool	Vegetable matter		Amount of colored fibers	American wool grades
				Burrs	Chaff		
1	42.45	3.11	Bright	Med.	Med.	None	3/8, 1/4
2	43.59	4.25	Semi-bri	Med.	Med.	None	3/8, 1/4
3	56.86	3.3	Bright	Light	Light	Large	
4	46.87	3.7	Bright	Light	Med.	Small	3/7, 1/4
5	51.69	3.63	Semi-bri	Light	Med.	None	3/8, 1/4
6	39.71	3.58	Semi-bri	Light	Light	None	3/8
7	60.82	3.37	Bright	Light	Light	None	3/8, 1/4
8	49.34	4.44	Bright	Light	Light	None	1/2, 3/8, 1/4
9	50.51	3.2	Bright	Light	Light	None	
10	45.33	3.49	Bright	Med.	Med.	None	3/8
11	44.59	3.96	Semi-bri	Med.	Heavy	None	3/8
12	47.80	3.17	Semi-bri	Heavy	Med.	None	3/8, 1/4
13	51.81	3.21	Semi-bri	Med.	Med.	Small	3/8
14	45.02	3.49	Bright	Med.	Light	None	3/8, 1/4
15	41.69	3.34	Semi-bri	Light	Light	None	3/8, 1/4
16	38.25	3.68	Semi-bri	Heavy	Med.	None	1/2, 3/8
17	57.15	3.65	Bright	Light	Light	None	1/2, 3/8
18	49.76	3.4	Bright	Light	Med.	Large	Fine, 1/2, 3/8
19	42.19	3.47	Bright	Light	Med.	None	3/8
20	46.92	3.73	Bright	Light	Light	Small	3/8, 1/4
21	42.70	3.97	Bright	Med.	Med.	None	Fine, 1/2, 3/8

Table 23. Quality of sample clips in the Rich wool pool based on objective physical measurements, 1961

Producer number	Percentage yield at 12% moisture	Average fiber length (inches)	Color of wool	Vegetable matter		Amount of colored fibers	American wool grades
				Burrs	Chaff		
1	44.10	2.90	Bright	Light	Med.	None	Fine, 1/2, 3/8
2	44.37	2.95	Bright	Light	Light	None	3/8
3	48.69	3.03	Bright	Light	Med.	None	3/8, 1/4
4	35.84	2.92	Semi-bri	Light	Light	None	1/2, 3/8
5	38.08	3.02	Semi-bri	Light	Med.	None	Fine, 1/2, 3/8
6	36.56	2.58	Semi-bri	Light	Light	None	Fine, 1/2
7	51.70	3.04	Semi-bri	Light	Med.	None	Fine, 1/2, 3/8
8	37.26	2.92	Bright	Light	Light	None	3/8
9	41.09	3.01	Semi-bri	Light	Light	None	1/2, Fine
10	39.71	2.98	Semi-bri	Light	Med.	None	3/8, 1/2
11	51.48	2.72	Bright	Light	Light	Small	Fine, 3/8 Half
12	43.86	2.68	Bright	Light	Light	None	Fine, 3/8 Half
13	37.55	3.17	Semi-bri	Light	Med.	None	3/8, 1/4
14	45.94	2.65	Semi-bri	Light	Med.	Small	Fine, 3/8 Half
15	48.48	2.74	Bright	Light	Light	None	1/4, 3/8
16	37.78	3.00	Semi-bri	Light	Light	None	1/2, 3/8
17	35.45	2.75	Semi-bri	Light	Med.	None	3/8
18	44.28	3.04	Bright	Light	Med.	None	1/2, 3/8, 1/4
19	48.13	3.1	Semi-bri	Light	Med.	None	3/8
20	47.43	2.7	Bright	Light	Light	None	3/8
21	50.25	2.99	Bright	Light	Light	Small	3/8, 1/4
22	41.17	2.97	Semi-bri	Light	Light	None	1/2, 3/8
23	47.64	2.62	Semi-bri	Light	Light	None	1/2, 3/8
24	61.18	3.15	Semi-bri	Light	Med.	Small	3/8, 1/4
25	49.35	3.11	Bright	Light	Light	Small	3/8
26	51.92	3.06	Semi-bri	Light	Light	None	3/8, 1/4
27	48.88	2.83	Semi-bri	Light	Light	None	1/2, 3/8
28	37.68	3.12	Semi-bri	Light	Light	None	3/8
29	42.71	2.83	Semi-bri	Light	Light	None	3/8, 1/4