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BUREAU OF AGRICULTURAL ECONOMICS
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THE OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE
AND
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REQUIREMENTS AND COSTS FOR PICKING, SNAPPING AND SLEDDING COTTON IN WESTERN TEXAS AND OKLAHOMA

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A Preliminary Report

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Picking by hand has always been the universal method of harvesting cotton. In parts of Texas and Oklahoma a part of the crop does not always mature and as early as 1910, the practice was to gather the cotton by PULLING or SNAPPING the immature bolls from the stalk, whereas in PICKING, the matured seed cotton was extracted from the open bolls and the hulls were left on the stalks. The lint which was extracted from the immature bolls was known as "bollie cotton". Snapping cotton, as practiced at present, represents an extension of the old method of saving bollies, whereby the practice of snapping the immature fruit from the plant gave way to the practice of actually hand stripping the plant of both open and unopen bolls.

Recently the hand stripping method has been replaced on some farms in Western Texas and Oklahoma by "sledding". The cotton sled is a great saver of time and labor and much interest in its development has been manifested in the eastern part of the Cotton Belt as well as in those parts of the Cotton Belt where it is now used in a more or less limited way.

The purpose of this report is to indicate the main reasons for the introduction of the sled, the possibilities of using it elsewhere, and the outstanding advantages and disadvantages of harvesting cotton with the sled as compared with harvesting by "picking" or "snapping".

1/ The information contained in this report was obtained by a field study carried on by the Division of Farm Management and Costs of the Bureau of Agricultural Economics and the A. & M. Colleges of Oklahoma and Texas. Information was obtained in the Hobart district of southwest Oklahoma, Chickasha district of West Central Oklahoma, and in the Stillwater district just north of the central part of the state. In Texas information was secured in the Lubbock district which is located in close proximity to the northern limits of the Cotton Belt in West Texas. Growers in these districts were interviewed by representatives of the cooperative parties. Estimates were obtained of the acreage and yield of cotton grown and the amount of cotton harvested per man or crew day, cost of harvesting and ginning, turnout of cotton and the advantages and disadvantages of the various harvesting methods.

THE COTTON SLED

The cotton sled is simply a wooden box on runners, usually with five or more finger-like attachments of steel or wood of one inch or more in width.1/ Usually the fingers or attachments are placed at a distance of about one inch apart. Some sleds, however, have a V-shaped opening and have but a single groove, which gradually narrows. The stalk passes through the groove and the bolls, stems, etc. are stripped from it. The first type of sled is suited only for harvesting cotton which is under 30 inches in height, and therefore is the principal type found in the Plains area. The single groove type is used principally for cotton with a more vigorous plant growth, instances being observed in Oklahoma where this type of sled was used successfully in harvesting cotton 40 to 50 inches in height. Sleds now in use were made by farmers or by local blacksmiths at an average cost of about $20.

Before ginning either snapped or sledded cotton it is necessary for best results to remove the hulls and other foreign matter by running the cotton through hull extractors. Gins in the districts where sleds are now used have been equipped with hull extractors for some time and the seed cotton passes directly from the hull extractor into the gin.

WHY THE SLED IS USED IN WEST TEXAS AND OKLAHOMA

In the newer cotton sections of Texas and Oklahoma, in some years it is difficult to harvest cotton by picking, since many of the bolls fail to mature either because of late spring or early fall frosts. Growers find it difficult to harvest by PICKING after frost because the stems by which the bolls are attached to the plant become so brittle that they are easily broken from the plant. Snapping permits of the use of unskilled labor to a greater extent than does picking and many hands who can make little headway in picking cotton can make fair progress in snapping.

These conditions led to hand snapping a part of the crop but as cotton production expanded, labor became relatively scarcer and more difficult to obtain. The problems of these growers were further complicated in the fall of 1926 by a rapid and severe decline in the price of cotton.

Growers in these areas, had large acreages of cotton, from which they could realize but little after paying for the cost of harvesting by the usual methods. Then, too, unseasonal weather had delayed the harvesting season making it all the more necessary to resort to a rapid and low cost harvesting method or to leave the cotton in the field.

The new areas were ideal for some form of mechanical harvester. The fields are usually large and are level which permits the use of large machines. Weed control is much less of a problem than in other parts of the Cotton Belt. These conditions made it possible for one man to plant and care for 75 to 150 acres of cotton, usually without hiring labor up to the time of harvesting. It was necessary, however, to hire a considerable part of the crop harvested. Thus the cotton sled, which had been used on a few farms at various times, came into prominence for harvesting the 1926 crop.

WILL THE USE OF THE SLED BE EXTENDED?

It is recognized that only time can give a definite answer to the ques-

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1/ In some instances the box is mounted on wheels instead of on runners.

tion whether the use of the sled will be extended. The development of the snapping and sledding methods of harvesting cotton during the last 15 years, together with improvements of ginning equipment, which has made it possible to turn out a fair quality of product from snapped and sledded cotton, undoubtedly represents more real progress than has been made by the cotton industry since the invention of the cotton gin.

Most sleds of 1926 were hastily and poorly constructed and often were operated inefficiently. Even under these conditions, its use was decidedly advantageous to Western growers under the existing conditions. Much improvement may be expected in the future in the way of better and more nearly standardized models. Distinct types suited for harvesting cotton with different plant growth can well be anticipated.

If improvements in sleds are forthcoming, as now seems probable, it is likely that sledding will practically displace snapping.

Opposed to the apparent advantages found in the use of the sled, an important disadvantage in its use cannot be overlooked, where the cotton can be picked.

Local buyers usually discriminate between picked, or sledded and snapped cotton, oftentimes without reason so far as the spinning quality is concerned. The price differential in Texas and Oklahoma in 1926 is reported to have been at least 2 cents per pound of lint in favor of picked cotton. Cotton should sell on the merits of its grade and staple regardless of the method by which it was gathered.

To what extent sledding will be introduced in other parts of the country is largely a guess, at this time. Its introduction in most parts of the so-called Eastern Belt would be in the face of conditions entirely different from those prevailing where the sled is now used. Snapping and sledding delay the beginning of the cotton harvesting operations, although it is possible to harvest the crop much more rapidly when harvesting is once under way, particularly when the sled is used, than it is to harvest by picking. If the open crop is left in the field until ready for sled ding it is subjected to considerable weather damage. Any part of the crop which is not harvested until late in the season, when the leaves have fallen from the plant and the stems have become brittle, might be sledded to advantage, if proper ginning facilities are available.

In the Eastern areas the autumn rainfall is usually rather heavy; the killing frosts are later, the picking season longer and conditions generally more favorable for hand picking and less favorable for sledding than is true in parts of Texas and Oklahoma. Acreages are smaller, and labor more plentiful and cheaper than in the more Western areas. The Eastern gins are at present usually not equipped to gin snapped and sledded cotton but this difficulty can be overcome if other conditions were favorable to the profitable harvesting by the sledding method.

EXTENT OF PICKING, SNAPPING AND SLEDDING IN WEST TEXAS AND OKLAHOMA.

In 1926 it is estimated that about a million bales of cotton in Western Texas and Oklahoma were sledded. Little cotton was sledded outside of the more northern part of the West Texas cotton area and the Southwestern part of Oklahoma. Of the districts studied, the Hobart and Lubbock districts are representative of conditions where sledding and snapping are practiced rather extensively, and Chickasha and Stillwater are representative districts where cotton is usually picked or snapped. In all of the districts studied a less percentage of the crop was picked in 1926 than in 1925, and a larger percentage was snapped in 1926 than in 1925 in the Chickasha and Still-

water districts. In the Hobart and Lubbock districts a smaller proportion of the crop was snapped and a larger proportion was sledded in 1926 than in 1925. (See tableI)

LABOR REQUIREMENTS FOR HARVESTING COTTON BY DIFFERENT METHODS.

In the districts studied, an average hand can usually snap enough seed cotton to make about 50 per cent more lint cotton than he can pick, and one man and team can sled enough cotton to make between 6 and 7 times as much lint as an average hand can snap. On the average, about 50 hours of labor is required to pick enough cotton to make a 500 pound bale of lint in the Lubbock district; about 70 hours are required in the Hobart and Chickasha districts, and about 80 hours in the Stillwater district. Labor necessary for snapping enough seed cotton for a bale of 500 pounds of lint varied from about 35 to about 55 hours in the districts studied. An average of about 5 hours of man labor was used in the Lubbock district, and 8.5 hours in the Hobart district for sledding enough cotton to make a 500 pound bale. (See Table 2) In the Lubbock district the usual sledding crew was one man and two horses. At Hobart, Oklahoma the usual crew was two men and two horses.

Table 1- Proportion of crop harvested by different methods on farms studied.

State and producing district	Farms reporting		Amount of cotton raised per farm		Amount picked		Amount snapped		Amount sledded	
	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
	Number	Number	Acres	Acres	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Oklahoma										
Chickasha	40	46	56	51	55.2	43.0	44.8	57.0	-	-
Hobart	12	35	64	68	13.5	8.6	86.5	72.1	-	19.3
Stillwater	47	49	35	37	80.0	59.5	20.0	39.1	-	1.4
Texas										
Lubbock	42	46	97	116	49.7	31.7	44.6	34.6	5.7	33.7

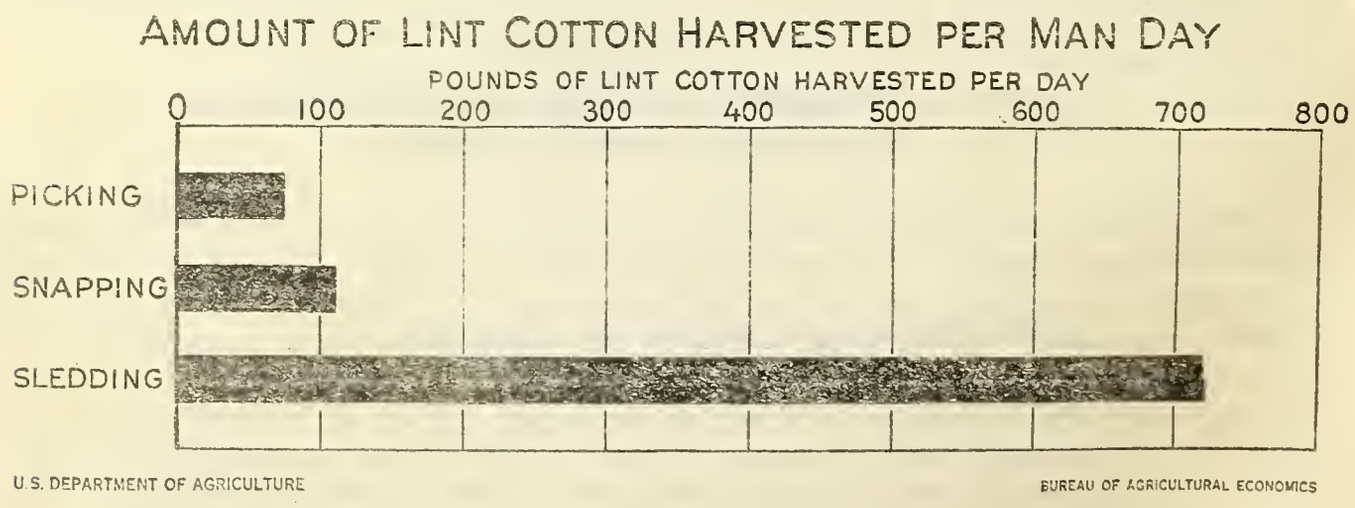

Fig. 1 - In the districts studied, it is estimated that in 1925 and 1926 a day of man labor harvested about 75 pounds of lint cotton by picking, 111 pounds by snapping, and 725 pounds by sledding.

Table 2. - Labor required for harvesting a 500-pound bale of cotton

State and producing district	Picked Cotton Man Labor		Snapped Cotton Man Labor		Sledded Cotton 1/ Man Labor	
	Usual Range	Average	Usual Range	Average	Usual Range	Average
	hours	hours	hours	hours	hours	hours
Oklahoma						
Chickasha	60 - 80	72.8	40 - 52	47.1	-	-
Hobart	60 - 80	68.2	33 - 52	43.6	5 - 16	8.5
Stillwater	75 -100	80.4	50 - 73	55.1	-	-
Texas						
Lubbock	43 - 56	48.7	26 - 44	33.7	4 - 7	5.3

1/ In the Hobart district usually 2 men and 2 horses made up a sledding crew; in the Lubbock district 1 man and 2 horses usually made a crew. The average crew was 1.6 men and 2 horses at Hobart, and 1.1 man and 2 horses at Lubbock. In addition to the man labor utilized, about 10.6 hours of horse work were expended for sledding enough cotton to make a bale of lint in the Hobart district and 9.6 hours in the Lubbock district.

SEED COTTON REQUIRED TO MAKE A BALE OF LINT.

Usually from 1500 to 1600 pounds of picked seed cotton, 2,000 to 2,200 pounds of snapped cotton and about the same amount of sledded cotton are required to turn out a 500 pound bale. In the Lubbock district the turnout of cotton appears to be relatively higher than in the other districts studied. (See table 3). This is because of the more extensive growing of varieties which have a relatively high turnout.

During some seasons greater quantities of seed cotton than those indicated above are required to turn out a 500 pound bale of lint. This was the case in the Lubbock district in 1926 when a severe sand storm in the latter part of November filled the cotton with sand and as a result the percentage of lint turned out was less than usual. When snapped or sledded, the quantity required to make a bale is influenced by the percentage of open bolls included and the quantity of foreign matter gathered. Although the sled is used after frost when the plants are fairly free from leaves, the sled gathers the hulls and stems and a considerable quantity of limbs and grass and weeds, if they are present in the rows.

Table 3 - Usual quantities of picked, snapped and sledded cotton required to make a 500 pound-bale of lint. 1/

State and producing district	Method of harvesting					
	Picked		Snapped		Sledded	
	Usual range	Average	Usual range	Average	Usual range	Average
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Oklahoma:						
Chickasha	1500-1600	1528	2000-2100	2026	-	-
Hobart	1500-1600	1548	2000-2100	2076	2100-2200	2178
Stillwater	1500-1600	1552	2000-2200	2092	-	-
Texas						
Lubbock	1300-1400	1383	1800-2200	1950	1800-2100	1960

1/ The requirements given above are farmers' estimates of the usual quantity of seed cotton required to turn out a 500 pound bale of lint cotton.

HARVESTING AND GINNING COSTS

The usual cost for picking a bale of cotton, based on an average turnout of lint and cost rates as in 1926, averages about $22 in the Oklahoma districts and about $16 in the Lubbock district. The labor cost of snapping cotton at the rate of wages paid in 1926 was from $14 to $16 per bale in the four districts studied. The cost of sledding a bale of cotton amounted to about $3.60 in the Hobart district and about $2.55 in the Lubbock district.

Owing to the lower rate of turncut of lint for snapped and sledded cotton and to the extra ginning equipment needed, ginning costs for snapped and sledded cotton averaged about $11.25 per bale in Oklahoma and $9.75 per bale in Texas compared with about $6.50 per bale in Oklahoma and $6.15 per bale in Texas for picked cotton. (See Table 4.)

Table 4 - Cost of harvesting and ginning a bale of picked, snapped and sledded cotton 1/

State and producing district	Harvesting cost			Ginning cost			Total		
	Picked cotton	Snapped cotton	Sledded cotton	Picked cotton	Snapped cotton	Sledded cotton	Picked cotton	Snapped cotton	Sledded cotton
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Oklahoma:									
Chickasha	22.00	14.58	-	6.48	11.02		28.48	25.60	-
Hobart	21.67	16.19	3.61	6.54	11.24	11.70	28.21	27.43	15.31
Stillwater	22.50	15.69	-	6.56	11.31	-	29.06	27.00	-
Texas:									
Lubbock	16.18	14.04	2.55	6.15	9.80	9.84	22.33	23.84	12.39

1/ Based on costs as in 1926 and average turnout of cotton.

In 1926 Oklahoma gins charged 30 cents per 100 pounds of seed cotton for ginning picked cotton, and 45 cents for ginning snapped and sledded cotton, and in addition charged $1.90 per bale for bagging and ties. In Texas, ginning costs varied considerably declining with the decline in the price of cotton. A charge of 30 cents per 100 pounds for picked, and 40 cents for snapped and sledded cotton, together with a charge of $2.00 per bale for bagging and ties was representative at the beginning of the season.

The average cost for picking 100 pounds of seed cotton was $1.17 in the Lubbock district, $1.45 in the Stillwater district, $1.40 in the Hobart district and $1.44 in the Chickasha district. The cost of snapping 100 pounds of seed cotton was $.72 in the Lubbock and Chickasha districts and $.75 and $.78 in the Stillwater and Hobart districts, respectively. Most of the Labor utilized for sledding dotton was furnished by the farmer and the members of his family. Labor for sledding was charged at $3 per man day and horse work at $1.00 per day in all districts, in figuring the cost of harvesting cotton. The fact that the regular farm labor could harvest the crop on most farms by sledding was an important consideration with the prevailing low cotton prices of 1926, since the harvesting operation did not require an actual outlay of cash. On the other hand, the bulk of the picking and snapping of cotton was done by hired labor in the Chickasha, Hobart and Lubbock districts.

In the stillwater district much of the snapped and picked cotton was gathered by the regular farm labor. All ginning costs were cash expenses as the cotton was custom ginned. The average cash expenses for harvesting and ginning picked cotton varied in the four districts from about $14 to $25 per bale. The cash cost of harvesting and ginning snapped cotton was somewhat higher than for picked cotton. In the Hobart and Lubbock districts no cash expense was reported for harvesting sledded cotton. The cost of ginning averaged $11.70 and $9.84 per bale, respectively . (Table 5)

Table 5 - Average cash expenses to growers for harvesting and ginning a bale of picked, snapped and sledded cotton. 1/

State and producing district	Cash expenses for harvesting			Cash ginning costs			Total cash outlay for harvesting and ginning		
	Picked cotton	Snapped cotton	Sledded cotton	Picked cotton	Snapped cotton	Sledded cotton	Picked cotton	Snapped cotton	Sledded cotton
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Oklahoma:									
Chickasha	14.59	11.97	-	6.48	11.02	-	21.07	22.99	-
Hobart	18.27	13.62	-	6.54	11.24	11.70	24.81	24.86	11.70
Stillwater	7.18	6.28	-	6.56	11.31	-	13.74	17.59	-
Texas:									
Lubbock	10.64	9.04	-	6.15	9.80	9.84	16.79	18.84	9.84

1/ Of the picked cotton, about 66 per cent at Chickasha, 84 per cent at Hobart, 32 per cent at Stillwater and about 63 per cent at Lubbock was harvested by hired labor. Of the snapped cotton about 77 per cent at Chickasha, about 84 per cent at Hobart, about 39 per cent at Stillwater and about 64 per cent at Lubbock, was harvested by contract labor. When cotton was harvested with a sled, growers were able to gather the crop without hiring labor.