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- *Cotton Planting Seed*
- *and*
- *Related Fiber Qualities*

*May 1956*

## SUMMARY

This bulletin gives the results of a study conducted on the procurement and distribution of cotton planting seed in Texas. Cottonseed oil mills and cotton gins are the growers' principal source of planting seed in several of the major cotton growing areas. The oil mills are the wholesalers; the gins are the retailers. The quality of the cotton produced each year cannot be maintained without a dependable source of high quality planting seed. The quality of the fiber produced by each of the principal varietal types in the four areas also is included.

Data on sales of cotton planting seed were obtained from ginner and retail seed dealers in the Blackland Prairie area, the Lower Rio Grande Valley, the Upper Gulf Coast and the Rolling Plains areas. Quality data on length, fineness, strength and spinning are from the 1951, 1954 and 1955 crops.

It is estimated that 85 percent of the cottonseed planted in the Lower Rio Grande Valley in 1956 was registered and certified. This is a higher proportion of quality planting seed than in any of the other areas surveyed. Growers obtained planting seed in this area at prices below those prevailing in the other areas. The principal varieties planted are Deltapine types. Two-thirds of the planting seed came from outside Texas. Volume of seed sold was much higher (73,089 hundredweight) and prices lower than in the other areas.

More than 90 percent of the seed sold by the dealers contacted in the Upper Gulf Coast was of Deltapine types. Prices paid by growers in this area were higher than for similar types and quality of planting seed sold in the Lower Rio Grande Valley. Sales volume was much lower (10,986 hundredweight). Seed sources were similar to those of the Lower Rio Grande Valley.

Lankart, the leading variety grown in the Blackland and Rolling Plains areas, has fiber that is finer and not as strong as some of the competing types, but the bolls are storm resistant and more adapted to hand pulling and machine stripping than those of other adapted types. The prices paid by growers were higher than those prevailing in the Upper Gulf Coast and Lower Rio Grande Valley. These higher prices probably are related to lack of availability of large supplies of out-of-state seed of adapted varieties. Volume sold by 113 retailers in the two areas was 47,383 hundredweight.

Fiber produced in the Lower Rio Grande Valley in 1951 from Deltapine types was acceptable to domestic mills. Dryland fiber was shorter, finer and stronger than fiber from the irrigated land; but the dryland fiber processed into yarn equal in strength to that made from the longer, coarser and weaker irrigated fiber. This was possible because more of the shorter, finer and stronger fibers are packed into a bundle, thereby offsetting the lack of individual fiber length.

Fiber of the 1955 crop produced in the Upper Gulf Coast from Deltapine-type seed was coarser than that produced from the same type of seed in 1954. Fiber length ranged from 31/32 to 1-3/32 inches.

## CONTENTS

	Page
Summary.....	2
Introduction.....	3
Reasons for Varietal Preferences.....	4
Lower Rio Grande Valley.....	4
Source of Cotton Planting Seed.....	4
Prices Paid by Growers.....	4
Fiber Properties and Spinning Quality.....	5
Fiber Properties of Deltapine.....	5
Mill Preference, Length and Fineness.....	5
Quality of Texas-produced Deltapine Fiber.....	5
Lint-cleaned Fiber.....	6
Contributions of Quality Planting Seed.....	6
Upper Gulf Coast.....	7
Sales of Cotton Planting Seed.....	7
Source of Cotton Planting Seed.....	7
Prices Paid by Growers.....	7
Fiber Properties and Spinning Quality.....	8
Brazos River Valley.....	8
Blackland Prairie.....	8
Sales of Cotton Planting Seed, 1953.....	9
Source of Cotton Planting Seed, 1953.....	9
Prices Paid by Growers.....	9
Fiber Properties and Spinning Quality.....	9
Rolling Plains—Edwards Plateau.....	10
Sales by Variety, Type and Kind of Seed.....	10
Source of Cotton Planting Seed.....	10
Prices Paid by Growers.....	10
Fiber Properties.....	10
Acknowledgments.....	11

# COTTON PLANTING SEED AND RELATED FIBER QUALITIES

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COTTONSEED OIL MILLS AND COTTON GINS are the growers' principal source of planting seed in several of the major cotton-growing areas of Texas. The oil mills are the wholesalers; the gins are the retailers. The quality of the cotton produced each year cannot be maintained without a dependable source of high quality planting seed.

The experiment reported in this bulletin first covered only the procurement and distribution of cotton planting seed. Later the study was expanded to include the fiber properties and spinning performance of the lint produced from the principal types of cotton planting seed. Emphasis is centered on fiber fineness and tensile strength. These quality factors are becoming increasingly important in the marketing and processing of cotton. In effect, they are a refinement of and an addition to grade and staple.

Mill preference is now for medium staple fiber (31/32 through 1-3/32 inches) and for fineness from 3.8 to 5.0 micrograms per inch. Fiber tensile strength of 78,000 pounds or more per square inch also is desired. However, cottons of lower length, fineness and strength can be sold. The price must be at a level which permits sale of the fabric at a profit. The government loan for middling  $\frac{7}{8}$  inch is, in effect, the minimum price for this quality. Processing efficiency is greater on the higher quality fiber with fewer delays in spinning and weaving. Hourly wage rates are similar. A higher standard of living has brought about an increased consumption of the high quality cotton fabrics. Some of the lower quality fabrics must compete with paper products.

Shorter, finer, stronger fiber can be substituted successfully for 1-1/32 or longer staples that are somewhat weaker, but such replacement is limited to a maximum length difference of one-sixteenth of an inch. It is not always possible to obtain an adequate supply of the shorter, stronger fiber to replace the longer, weaker fiber.

A recent U. S. Department of Agriculture publication, "Better Cottons," states that variety is the most important single factor in determining fiber properties and spinning qualities of a cotton. This bulletin presents information on the fiber properties of the leading types of cotton grown in each of four areas shown in Figure 1. This

may assist Texas growers in selecting the types of cotton planting seed that will help them to produce the quality of fiber now wanted by the mills. Most of our competing areas now produce cotton of the length and fineness preferred by domestic and foreign mills. Where soil and climate permit, it would benefit Texas cotton growers to produce more fiber of the qualities now consumed in greatest volume.

Irrigation of cotton is becoming more widespread in several sections of Texas. Where available, data are included on the relative quality of irrigated and dryland cottons produced in the same area.

Data on variety, volume, type and kind of seed merchandised were obtained from 66 seed retailers in the Blackland Prairie area in 1953. Data were obtained in 1954 from 33 gins in the Lower Rio Grande Valley, 25 retailers in the Upper Gulf Coast area and 47 retailers in the Rolling Plains area. Fiber property and spinning performance data were obtained from samples gathered by project personnel in 1951 and 1955, and from U. S. Department of Agriculture data of the 1954 and 1955 crops.

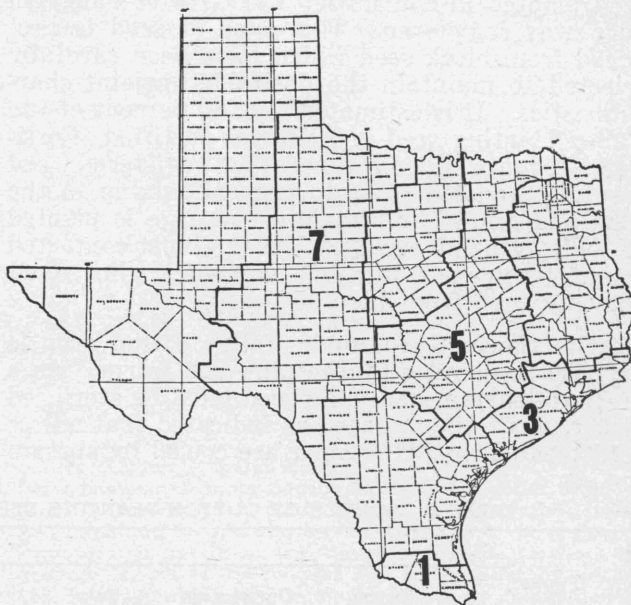


Figure 1. Production areas in which schedules of cotton planting seed sales were obtained. These areas, according to Bulletin 788, "Performance of Cotton Varieties in Texas, 1951-53," are: 1, Lower Rio Grande Valley; 3, Upper Gulf Coast; 5, Blackland Prairie and Central Texas; 7, Rolling Plains and Edwards Plateau.

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**TABLE 1. SALES OF COTTON PLANTING SEED BY 33 GINS, LOWER RIO GRANDE VALLEY, 1954<sup>1</sup>**

	Registered		Certified		Total
	Delinted	Not delinted	Delinted	Not delinted	
	Percent				
Deltapine types	18.0	3.9	68.5	9.6	100.0
Stoneville types <sup>2</sup>	10.1	.9	70.7	18.3	100.0
Other types <sup>3</sup>	71.8	4.4	19.1	4.7	100.0

<sup>1</sup>Number of cwt. of Deltapine types, 50,113; Stoneville types, 15,876; and other types, 7,100.

<sup>2</sup>Includes Delfos and Empire.

<sup>3</sup>Includes Rowden, Mebane, Lankart and Northern Star.

The wide range in climate in Texas does not justify analysis of the data on a statewide basis. Each of the four areas will be discussed separately.

### REASONS FOR VARIETAL PREFERENCES

Reasons for varietal preference are: yield, adaptation to prevailing harvesting practices, fiber properties, disease resistance, earliness of maturity, boll and plant characters, foundation seed supply and preference by farmers.

Yield in pounds of lint cotton per acre usually is given highest priority in selecting the varieties to be planted. Indirectly, yield often includes other factors such as disease resistance and earliness of maturity. Adaptation to prevailing harvesting practices now ranks first in several areas.

### LOWER RIO GRANDE VALLEY

It is reported that 25 percent of the cotton seed planted in the Lower Rio Grande Valley in 1956 was registered. This type of seed is produced from block seed which have been carefully selected to maintain the desirable varietal characteristics. It is estimated that 60 percent of the Valley planting seed in 1956 was certified. Certified seed are second generation registered seed carefully handled so as to prevent mixing in the field and gin. The remaining acreage is planted to Valley gin-run seed. A Valley ginner contacted recently reported only one customer who saved planting seed from his 1955 crop.

The Lower Rio Grande Valley cotton crop is exposed to damage by the pink boll worm. As a precautionary measure, all seed must be sterilized at the gins. Experience has indicated that unless seed treated in this manner are cooled by spread-

ing or turning soon after heating, the germination is impaired. The ginning season is short with considerable volume concentrated in a 50 to 60-day period. Growers are under pressure to harvest the crop quickly and have little opportunity to preserve the germination potential of the seed. The oil mill price for seed is usually attractive. The growers, therefore, depend on outside sources for planting seed.

Gins in this area were contacted early in 1954. The leading type of planting seed sold was Deltapine. It comprised two-thirds of the total; one-fourth was of the Stoneville types and the remainder other varieties. Data of the U. S. Department of Agriculture indicated no significant change in the distribution of varieties planted in 1955. More than two-thirds of the planting seed of the Deltapine and Stoneville types sold by the cooperating gins was certified and delinted (Table 1). Delinted seed also made up the major portion of the registered seed sold.

### Source of Cotton Planting Seed

The two dominant varieties of cotton grown in the Lower Rio Grande Valley originated in the Mississippi Valley. Analysis of the data from the 1954 sales of the 33 sample gins indicated that approximately 70 percent of the Deltapine and Stoneville-type seed came from outside the State. The remainder came from Texas seed breeders and a planting seed association. Oil mills bring in the major portion of the seed and distribute them to growers through the gins (Table 2). The trend toward this type of procurement is increasing. The oil mills buy in volume based on minimum freight rates. Seed are distributed to the gins when and in the amounts desired. A line of credit is available. This method has proved to be efficient and satisfactory.

### Prices Paid by Growers

The 100-pound sack was the most common unit of sales to growers; therefore, all units were converted to this measure. Growers who obtained seed from the 33 gins during the 1954 planting season paid an average of \$7.69 per sack for certified delinted Deltapine (Table 3). The ginner's margin was \$1.00. Records of one Texas breeder reveal that prices in the 1954 planting season were the lowest in recent years. Prices were at a somewhat lower level early in the 1956 planting season.

In another area in which the types grown are similar to those planted in the Valley, the price paid by growers in 1954 was \$1.85 per sack high-

**TABLE 2. SOURCE OF COTTON PLANTING SEED, 33 GINS, LOWER RIO GRANDE VALLEY, 1954<sup>1</sup>**

Types	Source							Total
	Texas	Out of state	Total	Breeder	Oil mill	Planting seed association	Other	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
Deltapine	30.9	69.1	100.0	23.4	54.3	19.6	2.7	100.0
Stoneville	27.5	72.5	100.0	15.6	83.5	—	.9	100.0

<sup>1</sup>Number of cwt. of Deltapine types, 50,113; Stoneville types, 15,876; and other types, 7,100.



TABLE 3. PURCHASE AND SALES PRICE PER HUNDREDWEIGHT BY TYPE AND KIND OF PLANTING SEED, 33 COTTON GINS, LOWER RIO GRANDE VALLEY, 1954

Types	Delinted				Not delinted			
	Price per cwt.		Amount in cwts.		Price per cwt.		Amount in cwts.	
	Purchased	Sold	Purchased	Sold	Purchased	Sold	Purchased	Sold
	Dollars	Dollars	Number	Number	Dollars	Dollars	Number	Number
Deltapine, reg.	8.08	8.89	9,035	9,035	6.35	6.45	1,972	1,972
Deltapine, cert.	6.69	7.69	34,282	34,282	6.80	7.63	4,824	4,824
Stoneville, reg.	10.42	11.56	1,595	1,595	9.10	9.73	115	115
Stoneville, cert.	6.31	6.89	11,239	11,239	7.00	8.14	2,927	2,927
Other, reg.	8.91	9.95	5,095	5,095	10.55	11.75	312	312
Other, cert.	9.03	10.13	1,358	1,358	9.27	11.22	355	335
Total			62,604	62,604			10,505	10,485

er. The types and quality were the same. The large annual volume of planting seed sales by Lower Rio Grande Valley ginnerers at a narrow margin accounts for this favorable price situation.

### Fiber Properties and Spinning Quality

In more recent years, fineness is a quality factor of increasing importance in the marketing and processing of cotton. Fineness is weight per linear inch. Fine fibers have a lower weight per inch; coarse fibers have a greater weight. Fineness information on each bale is of significance to the processor of the cotton fiber. If fibers of a wide range in fineness are mixed in the mill, processing delays usually occur. The yarn produced also is of lower quality. Fine to very fine fiber in the short and medium staple lengths may indicate immaturity and possible future processing difficulties. Few mills now attempt to process cotton without fineness data on each bale. The mixing of fiber from bales of a relatively narrow range in fineness has given mills increased operating efficiency and a more uniform product. Purchases based on fineness specifications avoid cotton not adapted to mill requirements. This method of procurement justifies the additional cost.

### Fiber Properties of Deltapine

Cotton fibers of the Deltapine types may range in fineness from 3.0 to 5.2 micrograms per inch in weight. This range is due to variations in available moisture and temperature and light intensity during the growing season. Most of the fiber produced from Deltapine varies from 3.5 to 4.6 micrograms per inch in fineness.

### Mill Preference, Length and Fineness

Mill preference is now for medium staple fiber, 1-1/32 through 1-3/32 inches, and for fineness from 3.8 to 5.0. The demand for cotton fiber of these qualities has increased materially in the past 20 years. The demand for lengths below 1 inch and above 1-3/32 inches has decreased substantially.

### Quality of Texas-produced Deltapine Fiber

With average amount and distribution of rainfall, most of the fiber produced from Deltapine types in Texas conforms to prevailing mill quality standards.

The data in Table 4 indicate that much of the fiber produced from the Deltapine types in the Lower Rio Grande Valley in 1951 was acceptable to American mills. This was the largest crop in the history of the Valley. Almost six-tenths of the irrigated samples were in the fineness range of 4.0 to 4.6. Near the same proportion of the dryland samples were in the same group. Most of the remaining irrigated samples were in the fineness group, 4.7 to 5.0. Approximately one-third of the dryland samples ranged from 3.6 to 3.9 in fineness. The latter ranged from 84,000 to 87,000 pounds per square inch in tensile strength. The irrigated samples in the fineness group higher than 4.6 had a tensile strength range of 78,000 to 83,000 pounds per square inch. More than half of these samples were in the lower segment of

TABLE 4. FINENESS, LENGTH AND TENSILE STRENGTH OF MID-SEASON COTTONS, DELTAPINE TYPES, LOWER RIO GRANDE VALLEY, 1951<sup>1</sup>

Fineness <sup>2</sup>	Average length <sup>3</sup>		Average strength <sup>4</sup>		Tests	
	Irrigated	Dry-land	Irrigated	Dry-land	Irrigated	Dry-land
Micro-grams per inch	Inches	Inches	1,000 lb. per sq. inch	1,000 lb. per sq. inch	Number	Number
3.5	1.01		82.3		2	
3.6		.98		86.9		1
3.7						
3.8	1.01	.98	88.5	84.1	1	4
3.9	1.02	1.02	82.6	86.2	1	6
4.0	1.08	1.03	81.5	84.8	2	6
4.1		1.06		85.8		5
4.2	1.07	1.05	85.6	84.6	3	4
4.3	1.05		83.9		6	
4.4	1.03	1.05	79.9	84.2	1	2
4.5	1.05	1.05	82.2	86.2	9	3
4.6	1.02	.95	83.4	87.5	12	1
4.7	1.02		80.8		11	
4.8	1.05	1.08	83.5	88.0	6	1
4.9	1.01		77.7		2	
5.0	1.07		78.8		1	
Total					57	33

<sup>1</sup>Source: Cotton Research Committee of Texas.

<sup>2</sup>Fiber fineness is linear density expressed in terms of micrograms per inch; 3.0 to 3.9 is fine, 4.0 to 4.9 average, 5.0 to 5.9 coarse and 6.0 and above very coarse.

<sup>3</sup>Expressed in terms of the upper-half-mean which is the average length of the longest half of the fiber by weight. This corresponds closely to staple length as determined by classers. .99-1.02 equals 1 inch, 1.03-1.05 equals 1-1/32 inches and 1.06 to 1.08 equals 1-2/32 inches.

<sup>4</sup>Fiber strength is the force in 1,000 pounds required to break the equivalent of a surface area of 1 square inch calculated from Pressley Index. 86 to 95 is strong, 76 to 85 average, 66 to 75 is fair and 65 or less is weak.

TABLE 5. LENGTH, FINENESS AND TENSILE STRENGTH OF DELTAPINE COTTONS, LOWER RIO GRANDE VALLEY, EARLY, MID-SEASON AND LATE, 1955<sup>1</sup>

Ginning period	Tests	Average length	Fineness	Average strength
		Number	Inches	Micrograms per inch
Early	4	1.04	4.6	78
Mid-season	4	1.03	4.2	79
Late	4	1.03	4.2	78

<sup>1</sup>Source: U. S. Department of Agriculture.

this tensile strength group. The finer, stronger, shorter, dryland cottons in the 3.6 to 3.9 fineness group can be processed into yarn equal in strength to that spun from the longer, coarser, weaker, irrigated cotton of the 4.7 to 5.0 fineness group. J. F. Hembree of Cotton Merchandising Research of the University of Texas has found that yarn strength is a complex of all fiber properties. The somewhat lower length of the dryland fiber is offset by the fiber being finer and stronger. This makes it possible to pack more fibers in a bundle, thereby offsetting the lack of individual fiber length. These fine cottons should not be mixed with coarse-fibered cottons when processed.

The finer fibers of the dryland samples are probably related to a retarded period of fiber development. This could have resulted from inadequate moisture and high temperatures during part of the growing season. The data show that the irrigated growths were coarser and longer than the dryland, but that the latter had higher tensile strength. Each processed into 22's yarn of similar strength and appearance. According to a recent U. S. Department of Agriculture publication, yarn strength is perhaps the most important and reliable test of yarn quality.

A large crop was again produced in 1954. Mid-season Deltapine cottons were somewhat lower in

TABLE 6. SALES OF COTTON PLANTING SEED BY 15 GINS AND 6 SEED STORES, UPPER GULF COAST, 1954<sup>1</sup>

Types	Registered		Certified		Total
	Delinted	Not delinted	Delinted	Not delinted	
	—	—	Percent	—	—
Deltapine	32.8	—	67.2	—	100.0
Stoneville	7.6	4.2	88.2	—	100.0
Other	42.6	32.1	20.1	5.2	100.0

<sup>1</sup>Number of cwt. of Deltapine types, 10,209; Stoneville types, 354; and other types, 423.

tensile strength but similar in fineness to 1951 growths of the same types. Mid-season growths of the Deltapine types produced in 1955 were finer and weaker than in 1951 but similar to 1954 cottons (Table 5).

#### Lint-cleaned Fiber

Many of the 1951 samples were processed through saw-type lint cleaners at the gin. In such instances, as fiber properties were comparable, no significant differences were evident in the quality of the yarn processed from lint-cleaned and the uncleaned fiber.

#### Contributions of Quality Planting Seed

It is reasonable to assume that good quality planting seed contribute materially to the excellent character and staple of Lower Rio Grande Valley cotton each year. Fortunately for Valley growers there is an ample supply of planting seed of the desired types readily available from outside sources. Several of the Texas breeders produce Deltapine seed in addition to their own varieties. A Texas planting seed cooperative produces an average of 1,600 tons of Deltapine types annually. Most of this is marketed in the Lower Rio Grande Valley and Upper Gulf Coast area. These sources



Figure 2. Processing and storage facilities of a cotton planting seed organization. Courtesy of Texas Planting Seed Association, Bryan, Texas.



TABLE 7. SOURCE OF COTTON PLANTING SEED, 15 GINS AND 6 SEED STORES, UPPER GULF COAST, 1954<sup>1</sup>

Type	Source						Total
	Texas	Out of state	Total	Breeder	Breeder Agent	Planting seed ass'n.	
	—	—	—	Percent	—	—	—
Deltapine	23.8	76.2	100.0	41.6	34.9	23.5	100.0

<sup>1</sup>Number of cwt. of Deltapine types, 10,209; Stoneville types, 354; and other types, 423.

are usually inadequate to supply the planting seed needs of the two areas. A large amount of Deltapine planting seed is moved into Texas each year from the Mississippi Delta. Frequently the supply available is abundant. This results in lower prices for Deltapine planting seed.

### UPPER GULF COAST

Fifteen cotton gins and 7 seed stores distributing cotton planting seed to growers were contacted early in the 1954 planting season. All were located in Wharton, Matagorda, Brazoria and Jackson counties. Most of the seed distributed were of the Deltapine types. The remainder consisted of several other types. U. S. Department of Agriculture data obtained annually from cotton ginners, seed breeders and dealers and county agents indicated a similar distribution of types. No significant change was apparent in 1955.

The Brazos River Valley in Brazos, Burleson and Robertson counties is planted almost exclusively to the Deltapine type. Data on volume of seed sold were not available. Because of the similarity in variety planted and quality of lint produced, quality data on this area are included with those of the Upper Gulf Coast.

#### Sales of Cotton Planting Seed

More than 90 percent of the seed distributed by the dealers contacted in 1954 was of the Deltapine types. All of this was delinted; one-third was registered, the remainder certified (Table 6). Some of the seed retailers take orders from growers and also keep additional seed available. Others estimate probable sales and stock seed accordingly. Sales per distributor were much lower than in the Lower Rio Grande Valley.

TABLE 8. PURCHASE AND SALES PRICE PER HUNDREDWEIGHT, BY TYPE AND KIND OF PLANTING SEED, 15 COTTON GINS AND 6 SEED STORES, UPPER GULF COAST, 1954

Types	Delinted				Not delinted			
	Price per cwt.		Amount in cwts.		Price per cwt.		Amount in cwts.	
	Purchased	Sold	Purchased	Sold	Purchased	Sold	Purchased	Sold
	Dollars	Dollars	Number	Number	Dollars	Dollars	Number	Number
Deltapine, reg.	10.62	10.72	3,350	3,350				
Deltapine, cert.	9.30	9.56	6,859	6,859				
Stoneville, reg.	10.55	10.81	27	27	11.00	11.50	15	15
Stoneville, cert.	10.62	10.28	313	312				
Other, reg.	9.00	9.62	180	180	11.25	11.71	140	136
Other, cert.	10.48	10.72	85	85	10.00	10.50	22	22
Total			10,814	10,813			177	173

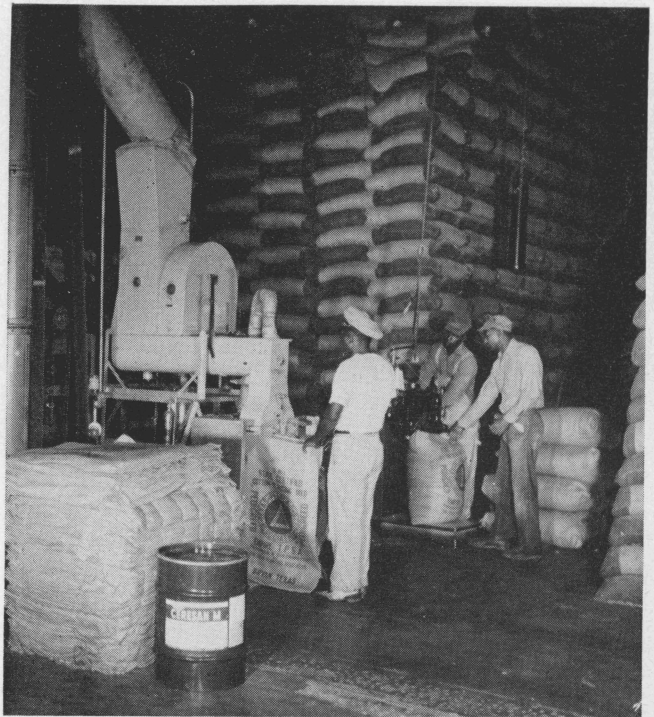


Figure 3. Sacking and storing cotton planting seed. Courtesy of Texas Planting Seed Association, Bryan, Texas.

#### Source of Cotton Planting Seed

One-fourth of the Deltapine-type seed sold by the retailers contacted was produced in Texas. The remainder was from sources in other states (Table 7). The leading type grown in this area is produced in volume in several states in the Mississippi Delta. An ample supply of out-of-state seed is usually available. Occasionally adverse growing conditions curtail the volume of planting seed produced by these out-of-state sources. Three-fourths of the seed was moved to retailers by breeders or through their agents. The remaining portion was supplied by a planting seed association (Table 7).

#### Prices Paid by Growers

Growers of the area paid distributors an average of \$9.56 per hundred pounds of delinted certified Deltapine seed in 1954. Delinted registered seed of the same type were sold for \$10.72 per 100-pound sack (Table 8). The volume sold is



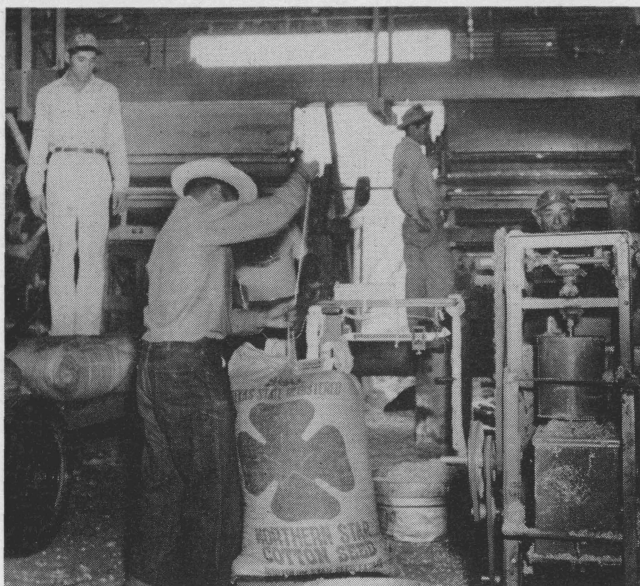


Figure 4. Cleaning and sacking cotton planting seed. Courtesy of Northern Star Seed Farms, O'Brien, Texas.

not as large as in the Lower Rio Grande Valley. This results in higher prices at the wholesale level, also greater handling charges.

#### Fiber Properties and Spinning Quality

Thirteen spinning tests were obtained from 9 locations of the Upper Gulf Coast during the middle of the 1955 ginning season. All this cotton was Deltapine. Fineness, length and tensile strength data are shown in Table 9. Slightly more than half the samples tested were in the average fineness group. Only one was in the fine group. The cotton fiber of 1955 was coarser than the fiber of the same variety produced in the area in 1954. There was no significant difference in tensile strength. Yarn appearance was similar in each of the 2 years, but 22's yarn was 5,000 to 7,000 pounds stronger in 1954.



Figure 5. Cotton planting seed coming through a delinting stand. Courtesy of Northern Star Seed Company, O'Brien, Texas.

TABLE 9. FINENESS, LENGTH AND TENSILE STRENGTH OF MID-SEASON COTTONS, DELTAPINE TYPES, UPPER GULF COAST, 1955<sup>1</sup>

Fineness	Average length		Average strength		Tests	
	Micrograms per inch	Inches	1,000 lb. per sq. inch	1,000 lb. per sq. inch	Number	Number
3.9		1.01		81.9		1
4.2		1.10		77.6		1
4.6		1.05		85.7		1
4.8		.99		82.4		2
4.9		1.03		77.9		3
5.0		1.00		84.0		1
5.1		1.04		80.8		1
5.2		1.12		78.4		1
5.3		1.04		79.5		2
Total						13

<sup>1</sup>Project field samples processed by the Textile Engineering Department, Texas Technological College, Lubbock, Texas.

Fiber length was in the qualities in greatest demand. This area usually produces a high quality cotton that is acceptable to domestic mills.

#### Brazos River Valley

Seventeen spinning test samples were obtained in the Brazos River Valley during the 1955 season; all were Deltapine types. Seven of the tests were from irrigated land; 10 were produced on dryland. Fineness, length and tensile strength of the samples tested are shown in Table 10. Eight of the 10 dryland tests were 3.7 or higher in fineness. All the samples of irrigated tests were 4.0 or higher. Tensile strength of the dryland tests averaged significantly higher (5,000 pounds per square inch). The strength of 22's yarn processed from the dryland cotton also was significantly higher. The finer, stronger, shorter dryland fiber produced the strongest yarn.

#### BLACKLAND PRAIRIE

Retail seed dealers were contacted in Collin, Dallas, Lamar and Limestone counties during June 1953. Fifty-eight gins, 4 feed and seed

TABLE 10. FINENESS, LENGTH AND TENSILE STRENGTH OF IRRIGATED AND DRYLAND COTTONS, DELTAPINE TYPES, BRAZOS VALLEY, 1955<sup>1</sup>

Fineness	Average length		Average strength		Tests	
	Irrigated	Dryland	Irrigated	Dryland	Irrigated	Dryland
Micrograms per inch	Inches	Inches	1,000 lb. per sq. inch	1,000 lb. per sq. inch	Number	Number
3.2		.94		90.2		1
3.6		.95		78.7		1
3.7		.91		84.9		2
3.8		.97		78.8		1
4.0	1.07	.94	75.0	85.2	1	1
4.1	1.04		74.9		1	
4.2		1.08		77.3		1
4.3		.97		81.7		1
4.4	1.04	1.02	78.8	84.0	1	1
4.6	.99		78.0		1	
4.7		1.04		86.5		1
4.8	1.01		76.0		1	
4.9	.98		80.5		1	
5.0	1.04		80.9		1	
Total					7	10

<sup>1</sup>Project samples processed by the Textile Engineering Department, Texas Technological College, Lubbock, Texas.

TABLE 11. SALES OF COTTON PLANTING SEED BY 66 RETAILERS, BLACKLAND PRAIRIE, 1953

Types	Registered		Certified		Second year & mixed		Total
	Delinted	Not delinted	Delinted	Not delinted	Delinted	Not delinted	
Percent							
Rowden <sup>1</sup>	—	6.9	2.3	42.6	1.2	47.0	100.0
Mebane	—	9.3	1.9	55.6	—	33.2	100.0
Northern Star	—	11.8	5.7	58.3	—	24.2	100.0
Deltapine	6.7	17.2	20.1	26.5	—	29.5	100.0
Other	.9	4.1	13.5	42.9	—	38.6	100.0

<sup>1</sup>Number of cwt. of Rowden, 17,336; Mebane, 11,189; Northern Star, 1,969; Deltapine, 2,446; others, 4,206.

stores and 4 seed salesmen made data available. Forty-seven percent of the seed sold was of the Rowden types and 30 percent of the Mebane types (including Mebane, Qualla, Lockett 140 and Western Prolific). Several types made up the remaining portion.

Surveys by the U. S. Department of Agriculture indicated that in 1955 one-third of the cotton seed planted in this area was Lankart, 29 percent of the Mebane types and 20 percent Rowden. The Lankart boll is storm resistant. This is a special boll type in which the locks are held closely in bolls which open only partially and remain intact before and during the machine stripping or hand pulling operation. These desirable properties of storm-resistant cottons are not characteristic of the normal or "open boll" cottons. The locks of the open boll cottons tend to string out and fall during the stripping operation.

**Sales of Cotton Planting Seed, 1953**

Non-delinted seed is the principal kind sold in the Blackland area. Ninety-six percent of the Rowden seed distributed in 1953 was not delinted. Ninety-eight percent of the Mebane types also was non-delinted (Table 11). Certified, second year and gin-run seed made up most of the total volume sold.

**Source of Cotton Planting Seed, 1953**

Eight-tenths of the Rowden seed sold was produced in Texas. Most of the remainder was from Arkansas. Nearly all of the Mebane types were produced in Texas (Table 12).

Seed of the certified and registered grade were distributed to retail outlets by the breeders; 38 percent of the Rowden and 50 percent of the Mebane types moved in this manner. Gins were the source of 52 percent of the Rowden and 31 percent of the Mebane. The production of planting seed by growers who plant registered or certified seed is a common practice in this area. The seed cot-

ton produced is handled carefully when ginned to prevent mixing of the seed with that of cotton ginned previously. This second generation seed is known as "second year." Cotton gins often stock and sell this type of planting seed.

**Prices Paid by Growers**

The breeder and largest distributor of cotton planting seed in this area recently stated that the price of his seed had not been changed during the past 5 years. Another large distributor in the area has had one change in price in a like period. This was for seed to be planted in 1956.

The prices quoted in Table 13 are those received by the cooperating retailers in the 1953 planting season. They are similar to the prices quoted for the past 5 years by the two distributors mentioned. The prices paid for cotton planting seed by growers in this area are higher than those paid by growers in the Upper Gulf Coast and Lower Rio Grande Valley. This applies to adapted varieties of similar type and kind of seed. The greatest difference is in the prices paid for delinted seed. This kind of seed when used in the South Texas area usually is mechanically delinted. Much of that sold in the Blackland area is acid delinted. Such seed usually are packed in 50-pound bags. The lower prices paid by Upper Gulf and Lower Rio Grande Valley growers are probably related to the availability of large supplies of out-of-state seed of adapted varieties.

**Fiber Properties and Spinning Quality**

Lankart is now the leading variety grown in the Blackland area. The fiber is finer and not as strong as that of Rowden (Tables 14 and 15). However, the bolls produced by Lankart are storm resistant and more adapted to hand pulling and machine stripping than the bolls of other adapted types. One-third of the area is now planted to Lankart seed. This will probably increase as stripper harvesting is more widely adapted.

TABLE 12. SOURCE OF COTTON PLANTING SEED, 66 RETAILERS, BLACKLAND AREA, 1953

Types	Source							Total
	Texas	Out of state	Total	Breeder	Gin	Oil mill	Other	
Percent								
Rowden <sup>1</sup>	80.4	19.6	100.0	38.1	51.9	9.1	.9	100.0
Mebane	99.9	.1	100.0	50.5	31.6	16.1	1.8	100.0

<sup>1</sup>Number of cwt. of Rowden, 17,336; Mebane, 11,189.



Fiber from machine stripped Lankhart compared favorably in spinning quality with hand pulled fiber of the same variety. The machine harvested and hand harvested cottons had similar fiber properties.

## ROLLING PLAINS—EDWARDS PLATEAU

Three feed and seed stores and 44 cotton gins in the Rolling Plains area were contacted in February and March 1954. The information obtained applied to the 1953 planting season. Half of the seed distributed by the cooperating retailers was of the Lankart variety, 11 percent was of the Mebane types and 6 percent was Northern Star. The remaining one-third consisted of several types.

### Sales by Variety, Type and Kind of Seed

Cotton planting seed sold by the cooperating retail gins and seed stores were predominantly non-delinted. Eight-tenths of the Lankart variety and nine-tenths of the Mebane types were of this kind. Half of the other types of seed sold was delinted (Table 16). Many of the sales of delinted seed were in 50-pound bags. The price was relatively more per pound when sold in these small containers.

Registered seed dominated sale of the Lankart variety seed with more than half of this variety sold being non-delinted (registered). The sales of Mebane-type seed had 64 percent in the certified grade.

The planting of second-year seed by growers is a common practice in this area. Many growers produce this type of seed. It is from second generation registered or certified seed cotton handled carefully to prevent mixing when ginned. Favorable weather during the ginning season encourages the saving of this type of planting seed.

### Source of Cotton Planting Seed

Nearly all of the cotton planting seed of the three leading types sold by the agencies contacted in the Rolling Plains area came from Texas sources (Table 17). Commercial seed breeders are the principal source of registered and certified seed. Gins and oil mills distribute most of the second-year seed.

TABLE 13. PURCHASE AND SALES PRICE PER HUNDRED-WEIGHT BY TYPE AND KIND OF PLANTING SEED, ROWDEN, NORTHERN STAR AND MEBANE VARIETIES, BLACKLAND PRAIRIE, 1953

Types	Delinted		Not delinted	
	Price per cwt.		Price per cwt.	
	Purchased	Sold	Purchased	Sold
	Dollars			
Rowden, cert.	16.71	16.95	10.62	10.77
Northern Star, cert.	19.41	19.80	9.75	10.02
Northern Star, 2nd yr.	—	—	4.77	5.07
Mebane, reg.	16.32	16.32	10.27	11.25
Mebane <sup>1</sup> , cert.	—	—	9.72	10.14

<sup>1</sup>Includes Mebane, Qualla, Lockett 140 and Western Prolific.

TABLE 14. LENGTH, FINENESS AND TENSILE STRENGTH, DRYLAND COTTONS, LANKART VARIETY, BLACKLAND PRAIRIE, 1955

Item	Tests	Average length	Average fineness	Average tensile strength
		Inches	Micrograms per inch	1,000 lb. per sq. inch
Project samples	7	.93	4.7	78
USDA tests	7	.92	4.7	77

### Prices Paid by Growers

Non-delinted registered Lankart planting seed were sold to growers in 1953 at \$9.14 per hundred pounds (Table 18). This was below cost. This area has suffered from drouth since 1950. Ginners have been unable to sell all the seed purchased and have reduced prices in order to move the seed. One of the principal sources of planting seed for the Lower Rio Grande Valley delivered delinted registered planting seed to gins in 1953 for \$9.45 per 100-pound sack. The price paid by Rolling Plains growers in 1953 compared favorably.

### Fiber Properties

The Rolling Plains produced 530,000 bales of cotton in 1951. Production in 1952 and 1953 was less than half that of 1951. Ginnings in 1954 were 391,000 bales.

Strength and fineness of the principal varieties grown in 1951 are shown in Table 19. Mid-season samples of the 1955 crop processed by the U. S. Department of Agriculture indicate that fiber of the Lankart variety is similar in fineness to 1951 growths but more than 5,000 pounds lower in tensile strength.

Fiber from the Northern Star and Deltapine types grown in 1955 was similar in fineness to 1951 growths of these varieties. Tensile strength for Northern Star in 1955 was lower but not significantly so. Tensile strength of Deltapine was significantly lower in 1955 (Table 19). This illustrates the effects of variations in moisture, temperature and light intensity as they affect fiber quality.

TABLE 15. LENGTH, FINENESS AND TENSILE STRENGTH, ROWDEN VARIETY, BLACKLAND PRAIRIE COTTONS, 1955

Ginning period	Tests	Average length	Average fineness	Average tensile strength
		Inches	Micrograms per inch	1,000 lb. per sq. inch
	Number			
Early <sup>1</sup>	1	.96	5.2	90
Early <sup>2</sup>	1	.91	5.5	84
Mid-season	1	.92	5.3	81
Late	1	.93	5.5	82

<sup>1</sup>Project sample from Williamson county.

<sup>2</sup>U. S. Department of Agriculture data, Navarro county.



TABLE 16. SALES OF COTTON PLANTING SEED BY 44 GINS AND 3 SEED STORES, ROLLING PLAINS, 1953<sup>1</sup>

Types	Registered		Certified		Second year & mixed		Total
	Delinted	Not delinted	Delinted	Not delinted	Delinted	Not delinted	
	Percent						
Lankart	18.9	55.5	2.2	6.0	.7	16.7	100.0
Northern Star	27.1	19.1	4.7	23.9	—	25.2	100.0
Mebane <sup>2</sup>	1.3	22.4	3.4	60.8	6.7	5.4	100.0
Other	35.2	10.7	15.0	21.1	1.7	16.3	100.0

<sup>1</sup>Number of cwt. of Lankart, 5,992; Northern Star, 635; Mebane, 1,167; others, 2,434.

<sup>2</sup>Mebane includes Mebane, Qualla, Lockett 140, Western Prolific and Marv-L-S Cluster.

TABLE 17. SOURCE OF COTTON PLANTING SEED, 44 GINS AND 3 SEED STORES, ROLLING PLAINS, 1953<sup>1</sup>

Types	Source							Total
	Texas	Out of state	Total	Breeder & agents	Gin	Oil mill	Other	
	Percent							
Lankart	100.0	—	100.0	58.9	23.4	—	17.7	100.0
Mebane	98.5	1.5	100.0	74.5	17.7	—	7.8	100.0
Northern Star	100.0	—	100.0	31.9	43.2	24.9	—	100.0

<sup>1</sup>Number of cwt. of Lankart, 5,992; Mebane, 1,167; and Northern Star, 635.

TABLE 18. PURCHASE AND SALES PRICE PER HUNDREDWEIGHT BY TYPE AND KIND OF PLANTING SEED, LANKART AND MEBALE VARIETIES, ROLLING PLAINS, 1953

Types	Delinted				Not delinted			
	Price per cwt.		Amount in cwts.		Price per cwt.		Amount in cwts.	
	Purchased	Sold	Purchased	Sold	Purchased	Sold	Purchased	Sold
	Dollars	Dollars	Number	Number	Dollars	Dollars	Number	Number
Lankart, reg.	16.98	18.57	1,306	1,135	9.32	9.14	5,942	3,327
Lankart, cert.	19.03	19.16	140	130	10.04	10.14	387	360
Lankart 2nd yr.	7.00	10.00	40	40	4.50	4.50	1,000	1,000
Mebane <sup>1</sup> , reg.	10.50	12.00	50	15	9.97	10.17	263	261
Mebane, cert.	11.25	12.00	40	40	9.52	11.21	928	710
Mebane 2nd yr.	8.00	10.00	78	78	5.00	5.10	63	63
Total			1,654	1,438			8,583	5,721

<sup>1</sup>Mebane includes Qualla, Lockett 140, Western Prolific and Marv-L-S Cluster.

TABLE 19. LENGTH, FINENESS AND TENSILE STRENGTH OF DRYLAND COTTONS, EARLY AND MID-SEASON, ROLLING PLAINS, 1951 AND 1955

Types	Tests		Average length		Average fineness		Average tensile strength	
	1951	1955	1951 <sup>1</sup>	1955 <sup>2</sup>	1951 <sup>1</sup>	1955 <sup>2</sup>	1951 <sup>1</sup>	1955 <sup>2</sup>
	Number	Number	Inches	Inches	Micrograms per inch	Micrograms per inch	1,000 lbs. per sq. inch	1,000 lbs. per sq. inch
Lankart	7	2	.94	.94	4.6	4.4	84	78
Northern Star	10	2	.94	.94	4.5	4.3	85	83
Deltapine	7	2	1.00	1.00	4.6	4.4	84	80

<sup>1</sup>Data by Cotton Research Committee of Texas.

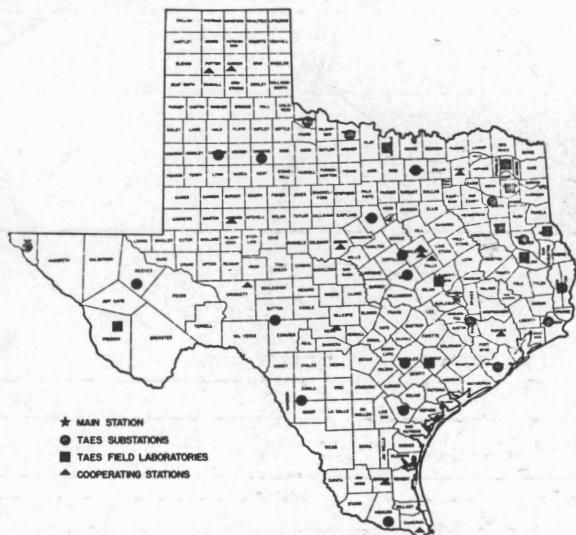
<sup>2</sup>Data from U. S. Department of Agriculture.

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Location of field research units in Texas maintained by the Texas Agricultural Experiment Station and cooperating agencies

## State-wide Research



The Texas Agricultural Experiment Station is the public agricultural research agency of the State of Texas, and is one of nine parts of the Texas A&M College System

**I**N THE MAIN STATION, with headquarters at College Station, are 16 subject-matter departments, 2 service departments, 3 regulatory services and the administrative staff. Located out in the major agricultural areas of Texas are 21 substations and 9 field laboratories. In addition, there are 14 cooperating stations owned by other agencies, including the Texas Forest Service, the Game and Fish Commission of Texas, Texas Prison System, the U. S. Department of Agriculture, University of Texas, Texas Technological College and the King Ranch. Some experiments are conducted on farms and ranches and in rural homes.

**R**ESearch BY THE TEXAS STATION is organized by programs and projects. A program of research represents a coordinated effort to solve the many problems relating to a common objective or situation. A research project represents the procedures for attacking a specific problem within a program.

**T**HE TEXAS STATION is conducting about 350 active research projects, grouped in 25 programs which include all phases of agriculture in Texas. Among these are: conservation and improvement of soils; conservation and use of water in agriculture; grasses and legumes for pastures, ranges, hay, conservation and improvement of soils; grain crops; cotton and other fiber crops; vegetable crops; citrus and other subtropical fruits, fruits and nuts; oil seed crops—other than cotton; ornamental plants—including turf; brush and weeds; insects; plant diseases; beef cattle; dairy cattle; sheep and goats; swine; chickens and turkeys; animal diseases and parasites; fish and game on farms and ranches; farm and ranch engineering; farm and ranch business; marketing agricultural products; rural home economics; and rural agricultural economics. Two additional programs are maintenance and upkeep, and central services.

**R**ESearch RESULTS are carried to Texas farm and ranch owners and homemakers by specialists and county agents of the Texas Agricultural Extension Service.