
PART III.

CULTURAL AND ECONOMIC DETAILS

OF

COTTON PRODUCTION.

REFERENCE LIST
OF
NAMES AND ADDRESSES OF CORRESPONDENTS.

[The numbers preceding the names of counties are used in Part III to designate the person giving any special answer.]

RED RIVER ALLUVIAL COUNTIES.

- Bowie*.—H. J. H. BREUSING, Texarkana, Ark., August 5, 1880.
Red River.—T. H. YOUNG, Clarksville, March 6, 1880.
Grayson.—(1) M. T. BRACKETT, Sherman, March 4, 1880; (2) J. P. HOPSON, Sherman, December 26, 1879.
Fannin.—(1) THOMAS LIGHTFOOT, Bonham, April 20, 1880; (2) GIDEON SMITH, Bonham, April 25, 1880; (3) JOHN L. BLAIR, Honey Grove, January 29, 1880.

OAK, HICKORY, AND PINE REGION.

- Hopkins*.—B. M. CAMP, Sulphur Springs, January 30, 1880.
Titus.—J. W. JACKSON, Mount Pleasant, January 31, 1880.
Morris.—JAMES M. BAKER, Wheatville, July 26, 1880.
Cass.—J. J. FOWLER, Linden, August 16, 1880.
Harrison.—(1) W. T. WARE, Jefferson, February 2, 1880; (2) H. V. SENTELL, Jefferson, April 10, 1880; (3) W. J. CAVEN, Marshall, March 28, 1880; (4) THOMAS STEELE, Elysian Fields, December 27, 1880.
Upshur.—J. M. GLASCO, Gilmer, March 22, 1880.
Wood.—J. H. NEWSOM, Mineola, January 31, 1880.
Van Zandt.—G. J. CLOUGH, Ben Wheeler, January 5, 1880.
Navarro.—(1) W. INGRAM, Rural Shade, March 8, 1880; (2) M. DRANE, Corsicana, April 16, 1880; (3) JAMES N. BRACEWELL, Corsicana, June 1, 1880.
Henderson.—N. P. COLEMAN, Athens, January 31, 1880.
Rusk.—(1) C. B. RICHARDSON, Henderson, January 5, 1880; (2) J. D. WOODWARD, M. D., Overton, January 28, 1880.
Panola.—H. FYKE, Carthage, February 8, 1880.
Shelby.—JOHN HOLT, Center Post-Office, January 3, 1881.
Nacogdoches.—R. P. WHITE, Nacogdoches, March 6, 1880.
Cherokee.—(1) J. T. WALKER, Etna (Smith county), September 15, 1880; (2) W. F. THOMPSON, Jacksonville, October 18, 1880.
Anderson.—(1) WILLIAM HAMLETT, sr., M. D., Beaver, January 1, 1880; (2) W. H. TUCKER, Palestine, February 2, 1880.
Freestone.—H. MANNING, Butler, February 13, 1880.
Limestone.—C. M. BELL, M. D., Tehuacana, January 16, 1880; J. Z. ADAMS, Kosse, 1880.
Houston.—C. E. DOUGLASS, Crockett, December 30, 1879.
Trinity.—(1) J. W. HAMILTON, Centralia, December 23, 1879; (2) SAMUEL T. ROBB, Trinity, December 24, 1879; (3) W. E. SHIERFIELD, Trinity, January 5, 1880.
Angelina.—E. L. ROBB, Homer, January 10, 1880.
Sabine.—C. W. HAMMOCK, Milam, 1880.
Jasper.—L. C. WHITE, Jasper, August 31, 1880.
Orange.—JOSEPH BUNN, Bunn's Bluff, 1880.
Hardin.—P. S. WATTS, Hardin, March 1, 1880.
Polk.—JOHN P. KALE, Livingston, January 1, 1880.
Madison.—P. K. GOREE, Midway, January 5, 1880.
Grimes.—(1) P. D. SAUNDERS, Gibbon's Creek, February 20, 1880; (2) A. R. KILPATRICK, M. D., Navasota, May 15, 1880; (3) C. H. EHRNGER, Navasota, February 18, 1880; (4) ROBERT D. BLACKSHEAR, Navasota, February 10, 1880.
Robertson.—H. D. PENDERGAST, Calvert, February 1, 1880.
Milam.—WILLIAM V. HEFLEY, Cameron, February 14, 1880.
Brazos.—J. W. BICKHAM, Bryan, March 16, 1880.
Burleson.—HILLARY RYAN, Caldwell, July 1, 1880.
Lee.—(1) Rev. A. J. LOUGHRIDGE, Tanglewood, May 18, 1880; (2) ROBERT H. FLANNIKEN, Tanglewood, February 4, 1880; (3) C. B. LONGLEY, Giddings, January 28, 1880.
Bastrop.—(1) JOHN FAWCETT, Smithville, January, 1880; (2) W. A. HIGSMITH, Snake Prairie, December 25, 1880.
Gonzales.—B. W. BROTHERS, Harwood Station, February 8, 1880.
Wilson.—J. W. ANDERSON, Sutherland Springs, January 24, 1880.

COAST AND SOUTHERN PRAIRIE REGION.

- Jefferson*.—W. M. CAMPBELL, Beaumont, October 26, 1880.
Chambers.—M. BYERLY, Wallisville, February 4, 1881.
Galveston.—WILLIAM J. JONES and SIDNEY SCUDDER, Galveston, January 8, 1880.
Harris.—(1) S. P. CHRISTIAN, Lynchburg, 1881; (2) ROBERT BLALOCK, Lynchburg, September 7, 1880.
San Jacinto.—GREENE B. BYRD, Cold Springs, December 24, 1879.
Waller.—P. S. CLARKE, Hempstead, February 10, 1880.
Washington.—O. H. P. GARRETT, Brenham, February 14, 1880.
Fayette.—HENRY B. RICHARDS, La Grange, January 1, 1880.
Colorado.—(1) JOHN KNIPSCHER and F. BOETTCHER, January 30, 1880; (2) W. T. McLEARY, M. D., Weimar, January 31, 1880; (3) W. H. CARLTON, Columbus, January 19, 1880.
Austin.—(1) MARTIN M. KENNY, Belleville, October 14, 1880; (2) J. H. KRAUCHER, Millheim, February 25, 1880.
Fort Bend.—(1) THOMAS B. HOWARD, Houston, June 24, 1880; (2) W. E. KENDALL, Houston, June 1, 1880.
Brazoria.—DAVID NATION, Columbia, February 24, 1880.
Lavaca.—(1) HENRY K. JUDD, Hallettsville, January 10, 1880; (2) JOHN WILLIAMS, Williamsburg, January 15, 1880.
De Witt.—A. G. STEVENS, Concrete, April 10, 1880.
Karnes.—THOMAS BUCKMAN, Helena, April 3, 1880.
Atascosa.—(1) F. W. KLEMCKE, Somerset, January 22, 1880; (2) GEORGE W. MUDD, Somerset, March 8, 1880.
Frio.—LEWIS OWINGS, Ireland Post-Office, September 23, 1880.
Aransas.—E. A. PERRINOT, Corpus Christi, 1880.
Live Oak.—G. W. JONES, Oakville, February 10, 1880.
Goliad.—REV. J. E. VERNOR, Wesatche, January 30, 1880.
Victoria.—THOMAS R. COCKE, M. D., Victoria, January 5, 1880.
Jackson.—GEORGE F. HORTON, Texana, 1880.
San Patricio.—JAMES O. GAFFNEY, San Patricio, May 26, 1880.

CENTRAL PRAIRIE REGION.

- Cooke*.—W. W. HOWETH, Gainesville, December 10, 1880.
Hunt.—WILLIAM R. HOWARD, White Rock, March 18, 1880.
Collin.—(1) A. G. GRAVES, jr., McKinney, February 15, 1880; (2) GILES G. HOUSTON, McKinney, January 21, 1880; (3) W. G. MATHEWS, Plano, February 8, 1880.
Denton.—J. W. EVANS, Pilot Point, December 30, 1879.
Wise.—J. M. HOLMES, Decatur, August 16, 1880.
Tarrant.—BENJAMIN STUART, Handley, June 1, 1880.
Hood.—G. E. WALLS, Grambury, 1880.
Dallas.—(1) W. W. ROSS, Dallas, August 13, 1880; (2) JOHN H. COLE, Dallas, 1880.
Rockwall.—WILLIAM H. PRICE, Rockwall, December 27, 1879.
Kaufman.—H. B. McCORKLE, Elmo, October 19, 1880.
Ellis.—(1) G. W. COOPER, Bristol, March 12, 1880; (2) JAMES E. SMITH, Waxahatchie, June 19, 1880; (3) GEORGE W. HAMLETT, Milford, January 28, 1880; (4) S. C. TALLEY, Chambers' Creek, 1880.
Johnson.—W. A. MENAFEE, Cleburne, January 20, 1880; J. B. ALLARD and E. E. SKIPPER, Cleburne.
Erath.—J. G. O'BRIEN, Dublin, April 20, 1880.
Somervell.—SCOTT MILAM, Glenrose, May 25, 1880.
Bosque.—T. W. ARCHIBALD, Clifton, January 28, 1880.
Hill.—(1) JOHN P. COX, Hillsboro', February 17, 1880; (2) D. D. SANDERSON, Whitney, April 30, 1880; (3) W. S. THOMAS, Irene, 1880.
Coryell.—THOMAS WILLIAMSON, Pidecock Ranch, December 24, 1879.
McLennan.—(1) J. H. EARLE and D. R. GURLEY, Waco, February 5, 1880; (2) C. A. WESTBROOK, Mastersville, January 20, 1880.
Falls.—(1) A. E. WATSON, Marlin, January 15, 1880; (2) ED. C. McCULLOUGH, Mooresville, January 15, 1880; (3) P. LEA, West Falls, February 26, 1880.
Bell.—(1) MORITZ MAEDGEN, Troy, January 29, 1880; (2) A. J. HARRIS, Belton, January 22, 1880; (3) JOHN T. DULANY, Belton, December 29, 1879.
Lampasas.—THOMAS J. DURRETT, Lampasas, April 6, 1880.
Williamson.—(1) R. E. TALBOT, Georgetown, February 10, 1880; (2) ANDREW J. NELSON, Round Rock, April 3, 1880.
Travis.—(1) J. J. WHEELER, P. O. box 285, Austin, February 4, 1880; (2) ED. H. ROGERS & SON, Austin, March 30, 1880.
Blanco.—JOHN W. SPEER, Blanco, January 29, 1880.
Comal.—RUD. WIPPRECHT, New Braunfels, January 14, 1880.
Bexar.—(1) R. B. EVANS, Selma, February 17, 1880; (2) THEO. E. S. TRIP, San Antonio, February 10, 1880.
Medina.—DR. A. WADGYMAR, San Antonio, April 29, 1880.
Guadalupe.—AUGUST EBERT, Marion, January 7, 1880.
Caldwell.—JOHN B. HOLT, Lockhart, August 12, 1880.
Kendall.—C. H. CLAUSS, Boerne, August 25, 1880.
Gillespie.—(1) THEO. B. SPLITTGERBER, Fredericksburg, February 8, 1880; (2) ADOLPH WEISS, Fredericksburg, January 31, 1880; (3) B. F. WHITE, Martinsburg, March 17, 1880.
Kerr.—W. P. COLEMAN, Kerrville, October 27, 1880.
Bandera.—JOHN CHRISTALL, Bandera City, March 1, 1880.
Uvalde.—T. W. REDMAN, Uvalde.

NORTHWESTERN RED-LOAM REGION.

Clay.—WILLIAM M. POPE, Buffalo Springs, October 27, 1880.

Jack.—C. M. SNODGRASS, Jacksboro', February 25, 1880.

Palo Pinto.—J. A. McLAREN, Cokelan, March 25, 1880.

Eastland.—A. J. STUART, Eastland, February 16, 1880.

Taylor.—(1) N. N. BROWNE, Buffalo Gap, May 7, 1880; (2) J. S. PORTER, Buffalo Gap, 1880.

Comanche.—W. L. SARTWELL, Comanche, March 6, 1880.

San Saba.—J. FRAZER BROWN, San Saba, January 1, 1880.

Mason.—HENRY M. HOLMES, Mason, March 25, 1880.

Llano.—C. M. COGGIN, M. D., Bluffton, March 23, 1880.

Burnet.—A. SCHROETER, Double Horn, January 20, 1880.

Throckmorton.—CHARLES McCORMICK, Throckmorton.

ADDITIONAL CORRESPONDENTS FROM WHOM INFORMATION HAS BEEN RECEIVED.—Christ. Dietert, Kerrville; W. A. Proctor, Paint Rock; J. F. Gordon, Coleman; James W. Ward, Corpus Christi; James T. Otey, Clarendon; D. L. Switzer and W. W. Blake, Jasper; E. K. Smith, McDade; C. A. Ricks, Homer; W. D. Willis, Livingston; Victor Bracht, Rockport; William H. Caldwell, Borjas; William H. Parvin, Belle Plain; R. A. Hutchison, Archer; F. W. Voight, Nacogdoches; T. J. Chambers, Liberty; T. W. Laney, Lockhart; H. F. Best, Texarkana; G. Salmon, Decatur; J. Brockman, Fredericksburg; J. W. Hackworth, Brenham; E. D. Sim, Victoria; Rev. R. M. Loughridge and J. T. Somervell, Marlin; J. R. Self, Corsicana; F. M. Graves, Hamilton; B. F. Duren, Crockett, and others.

SUMMARY OF ANSWERS TO SCHEDULE QUESTIONS.

The following pages embrace the answers to the question schedules that were sent to each cotton county of the state. They are presented in a condensed form, to enable the reader to obtain at a glance that information which would require much time and trouble if the answers were given in detail from each county in the state. Extracts from the schedule answers are given under most of the questions in addition to the general summary, and the writer can be identified either by the given county name or by a number prefixed to that name in the list of correspondents.

TILLAGE, IMPROVEMENT, ETC.

1. Usual depth of tillage (measured on land-side of furrow)? What draft is employed in breaking up?

The usual depth is from 3 to 4 inches, sometimes less, on the sandy uplands of the oak and hickory region and in the southern and northwestern prairie regions; 5 to 8 inches on the bottom

lands of the state and in the central prairie region. The usual draft is one horse or mule on the sandy lands and two animals on the heavier lands of the state.

2. Is subsoiling practiced? If so, with what implements, and with what results?

OAK, HICKORY, AND PINE REGION: It is not practiced in twenty counties; in twelve counties it is practiced, but only "a very little" or "exceptionally", with a subsoil plow, scooter, or with diamond pointed bull-tongue plows; results are always good, and in several cases yields are reported to have increased from 30 to 50 per cent. *Brazos:* Results are good on heavy prairie soil; it is rarely practiced on sandy or timbered soil. Does no good on sandy soils. *Titus:* Very little, only on bottom lands; chiefly for corn, rarely for cotton. It is done by a scooter following a turn-plow; results are very fine for corn. *2 Anderson:* Very little, only on old and worn lands, with subsoil plows of from 16 to 20 inch standards; results are good. *Harrison, Limestone, and Lee:* Very little; yields are greater, and crops endure extremes of wet and dry weather better.

CENTRAL BLACK PRAIRIE REGION: In twenty-four counties it is not practiced; in eight it is practiced a little; by following in

the furrow of a turn-plow with a subsoil plow, bull-tongue, or another turn-plow, yields are increased from 20 to 30 per cent. *2 Fannin:* Results are good where the soil is deep enough, or where the subsoil is impervious. *1 Collin:* Very deep plowing has been practiced on a small scale with oxen without any decided results; heavy rains pack the soil together again. *2 Navarro:* Subsoiling increases yields and enables crops to endure longer droughts. *Dallas:* To a small extent; land has been plowed a second time with the same plow crossways at the same or 4 inches greater depth; land so treated in the fall will produce corn the following season in spite of the severest droughts.

SOUTHERN AND NORTHWESTERN PRAIRIE REGIONS: Only in eight counties. *Galveston:* Highly beneficial, except on sandy land. *2 Colorado:* With fine results on all lands. *Llano and Taylor:* Yields are increased one-third, and crops endure droughts better.

3. Is fall-plowing practiced? With what results?

In twenty-two counties it is practiced, though very little, because of cotton picking, but with good results. Its objects are in three counties to turn the stubble under; in four counties to improve the soil and increase the yields; in one county to prepare the ground for sowing small grain. *1 Anderson:* If it were practiced, it would facilitate the washing and gully-ing of the soil by the heavy rains. *Limestone:* Results are very satisfactory; the soil becomes more friable, vegetation is decomposed, and insects are destroyed. *Houston:* Results

are good on stiff lands. *Wilson:* The soil endures drought better in the summer following; good results. *Colorado:* It is a good way to rid the soil of weeds and trash, and should be done before vegetation dies. *Atascosa:* Results are good if the rainfall is not too great, so that the soil washes and gullies. *Live Oak:* All the farming land is broken in the fall or early winter. *Lavaea:* Results are good when it is again plowed in spring, but it can rarely be done before January; the latter is also true in *Galveston, Washington, and Fort Bend.*

4. Is fallowing practiced? Is the land tilled while lying fallow or only "turned out"? With what result in either case?

It is practiced very little throughout the state. The lands are in some of the counties, especially in the oak and hickory sandy region, only turned out. Such land is sometimes cultivated while thus resting. *Harrison:* After a year's rest an ordinary cereal crop may be obtained if the land is tilled while resting;

otherwise the crop would consist of crab-grass and other weeds. One or two years of rest increases yields from 10 to 15 per cent. *Jasper:* Land is "turned out" or pastured, and improves if not severely tramped and eaten off by stock or rooted by hogs, either of which is ruinous.

5. Is rotation of crops practiced? If so, of how many years' course, and in what order of crops? With what result?

Rotation is practiced to some extent in many of the counties, but there is no regular system or order of crops, each farmer suiting his own convenience. Cotton and corn most generally alternate on the sandy timbered lands and southern prairies for a series of years, sometimes with other crops, while in the black prairie region wheat and oats are also sometimes planted after corn or cotton. *Harrison*: On fresh land corn and cotton alternate for nine or ten years; then cotton alone is raised until the yield falls below 600 or 700 pounds of seed-cotton per acre, when the land is "turned out" or rested; sometimes oats follow cotton. *Anderson*: The usual practice consists in raising cotton from three to six years on the same soil, then corn from one to three years; pease, oats, and small patches of sweet potatoes are also raised. *Bell*: Not regularly. The best farmers follow cotton with corn or wheat, and

corn with wheat, oats, or cotton, and never raise the same kind from the same land more than two consecutive years. *Fayette*: By some in three years' courses. Oats are sown just after removing corn from the land in the fall; in the following May the oats are harvested and sweet potatoes are planted; cotton is planted on the same land in the third year. *Fort Bend*: Stiff lands are best suited to cotton, and are exclusively devoted to that crop.

RESULTS.—*Jasper*: The soil endures longer. *Titus and Wise*: Fertility is maintained without manuring. *Burleson and Grimes*: Corn yields nearly 100 per cent. and cotton 20 per cent. more. *Anderson and Hopkins*: Discourages insect pests. *Hill*: (Black prairies) cotton bolls better, and corn is more certain. *Jack*: (Northwest) cotton is our fertilizer; anything grows well after it.

6. What fertilizers or other direct means of improving the soil, are used by you, or in your region? With what results? Is green-manuring practiced? With what results?

In the timbered and sandy lands of the state fertilizers are used to a slight extent; forty-seven of the counties report the application of cotton-seed or composts to the land by a few of the farmers. The yields are variously estimated to be increased from 15 to 300 per cent. In the black prairies of the central region, and the still comparatively fresh lands of the coast and northwestern regions, fertilizers are not thought necessary, there being as yet no apparently diminished yield. Green-manuring is practiced but little. *Nacogdoches and Sabine*: The prevailing practice in this eastern region is to shift the fencing so as to include fresh land, rather than to manure the old. *Harrison*: Very little effort is made to improve the soil by any means or material, in spite of the very profitable returns that might be realized. The practice (and a bad one it is) in this region is to use the soil for corn and cotton until it ceases to produce profitably, when it is abandoned in favor of fresh soil, which in turn is put through the same course. The land "turned out" soon becomes thickly studded with pine, persimmon, sedge-grass, and briars. After lying out seven or eight years, if not too rolling, it produces fairly when again cultivated. Of late there is an apparent inclination to improve the old lands by pasturing stock. This must in a few years become a necessity, as there will soon be little available virgin soil left. *Limestone*: Little other than barn-yard manure is used, and 99 per cent. of that is allowed to waste. *Grimes*: Cotton-seed and barn-yard manure are used a little, chiefly in gardens and orchards or on sandy lands; they double the yields, and are profitable even on the richest soils. Cow-pease are raised only on small patches; they always improve the soil. *Fannin*: None of consequence, though manuring would pay well on our best Red river lands,

and better on the lighter soils. When cotton-seed is applied directly to corn in the hill, at the rate of 10 bushels to an acre, the yield of corn is increased 10 bushels per acre. Green-manuring was formerly practiced, but is not now, owing to the system of labor now prevailing. Cow-pease are most satisfactory as a feed crop and fertilizer. I have cultivated a piece of river bottom land twelve years successively in cotton without any diminution in quantity or perceptible deterioration in the quality of the product. The stalks are never allowed to be burned, but by dragging a heavy bush over the field they are ground to small fragments, which are easily plowed under. The average yield of lint-cotton on this land has been 500 pounds or more per acre; in 1879 it was 625 pounds per acre. There are other lands adjacent of the same quality, which, by a system of raking and burning of the corn and cotton stalks, etc., have been so impoverished that they do not produce a third or half as much as when fresh; and the soil has lost its mellowness, and is tilled with more difficulty. There is hardly any doubt that our deepest and best soils would last forever if stock were not allowed to tramp the ground, wet or dry, and eat what is left of the crop, and cotton-seed were all returned to the soil. Under such circumstances the soil and the yields would even improve to an astonishing degree. So far as cotton-growing is concerned, our best soils would be inexhaustible if all except the lint be returned to them. A most pernicious practice is that of turning stock into the field as soon as the cotton is picked to feed on what is left of the bolls, foliage, and even smaller branches, and then burning the remainder; in addition to which the soil is tramped and packed in all kinds of weather.

7. How is cotton-seed disposed of? If sold, on what terms, or at what price?

There are oil-mills at Dallas, Hempstead, Bryan, Galveston, Navasota, and Calvert (also at Shreveport, Louisiana), and in the neighboring counties to these places much seed is sold to the mills at from 5 to 10 cents per bushel. Along the railroads, and at the chief stations, seed is also sold to buyers, who ship

to these mills. In counties at a distance some seed is sold at much lower prices. Throughout the state the seed is otherwise either fed to cattle or allowed to rot and go to waste, except in the eastern counties, where much is returned to the soil. The seed is in some counties used as fuel for steam-engines.

8. Is cottonseed-cake used with you for feed or manure?

In the vicinity of the cotton-seed oil mills, and at points on some of the railroads, the cake is used to some extent as feed for stock, especially milch cows; as a manure it is seldom used. In other portions of the state the cake has not been introduced, and is scarcely known. *Grimes*: Sheep, cattle, horses, and mules eat it greedily when mixed with equal parts of corn-meal or bran. It is also used as manure alone for growing fruits and vegetables, for which purposes it is equal, if not superior, to guano. Cottonseed-oil mills were at first considered a great curse in this community, for they consumed the seed which should have been fed to stock and returned to the soil. The negroes especially would sell the last seed in the fall, and then depend upon owners for seed to plant in spring.

Farmers have, however, during this winter (1879-'80) arrived at a different conclusion. Trial uses of the products that remain after removing the oil from the seed have determined that for feeding stock of all kinds they are far superior to the seed itself, superior to corn and fodder; they produce more milk when fed to dairy cows than any other feed yet tried. The cotton-seed cake, meal, and hulls are also cheaper than other kinds of feed. What has heretofore been wasted will hereafter be utilized. Those who first opposed the factory are now its strongest supporters, and agree that it is very profitable to the planter to sell the seed to the oil factory and buy the resulting hulls and cake for feeding and fertilizing purposes.

PLANTING AND CULTIVATION OF COTTON.

9. What preparation is usually given to cotton land before bedding up?

Fall plowing is sometimes done on old stubble land, but the almost universal practice is simply spring plowing and bedding after

the stalks have been knocked down and sometimes burned.

10. Do you plant in ridges? How far apart?

Cotton is planted in ridges throughout the state, except in some of the western counties of the prairie regions, where the land is not thrown up in ridges. *Hood*: "On account of dry seasons the practice of ridging is being abandoned, thus dimin-

ishing the liability of the soil to become dry about the roots of the plants." The usual distances given between cotton rows are from 3 to 4 feet on uplands and from 4 to 5 feet on bottom or rich lands, where the plant has a vigorous growth.

11. What is your usual planting time?

The earliest dates are from March 1 to 15, reported from *Bastrop, Angelina, Wilson, Caldwell, San Patricio, and De Witt*; From March 15 to April 1 by twenty-four counties of the southern portion of the state; from April 1 to 15 by a large majority of

counties, and from April 15 to May 15 by seventeen counties of the central prairie region. *Kaufman*: June planting will mature in favorable seasons. *Sabine*: Cotton planted in the first week of May succeeded best in five of seven years' experience.

12. What variety of cotton do you prefer?

There are twenty-seven different names given as representing different varieties, though it is more than probable that the most of them are but supposed improvements on some of those well known in other states. Those most commonly mentioned are the Schuback or storm-proof variety, said to retain its cotton in the boll during high winds, and preferred in the open black prairie country of the central region, and mentioned by forty counties; the Dixon variety, preferred in the timbered and sandy lands, and mentioned by twenty-four counties; the Petit Gulf variety, by fifteen counties; the Cheatham and Hurlong varieties, each mentioned ten times; Meyers, four times; the Sugar-loaf, Hefley, and South American, three times each; Bagley, Peeler, Moon, and Armstrong, two times each; Matagorda Silk, Poor-man's Relief, Bohemian, and others, once each. The sea-island long staple and Kemp's long staple are also mentioned once each. *2 Harrison*: The best plan is to select the best seed from common varieties and cultivate thoroughly and judiciously. *McLennan*: The best seed, without regard to name, is obtained from the best farmers, who make selections annually from the best part of their crops. *Fort Bend*: Varieties from Tennessee and northern Georgia produce the largest yields in this (coast) region, especially the Dixon, from northern Georgia. *Brazoria*: The seed brought yearly from the extreme northern part of the state or from the Indian territory afford the largest yields and by early maturity escape the ravages of the caterpillar.

WORM-PROOF COTTON.—Mr. L. C. White, of Jasper, writes that after a number of years' trial he has succeeded in producing a hybrid variety of cotton that is entirely worm-proof. It also grows and yields well, and is an early variety, as was shown in the fact that his crop, planted on the 4th of April, had matured and been gathered by the last of August. The following experiments made to test the immunity of such cotton against the attacks of the caterpillar may be of interest: *2 Trinity*: In September the worms destroyed a field of cotton not more than 200 yards from the garden in which a worm-proof variety from Arkansas was growing. I pulled up a stalk covered with worms and set it down in the midst of the worm-proof cotton and they refused to eat it. I then put on some of the most voracious looking worms I could find in the field, but even they refused to dine upon it. The worm-proof cotton continued to fruit till frost. My opinion is that it will remain worm-proof as long as the leaves continue as bitter as they have for the past two years. What effect the climate may have on this bitter quality remains to be seen. This cotton yields finely, is easy to pick, and the lint is long and fine, and is classed as good middling. *Angelina*: The worms attacked the crops of a worm-proof variety from Arkansas, but not until other varieties had been entirely eaten up by them. The opinion among the farmers is that young worms can do nothing with it, as its leaves are very thick and rough; it has large and heavy branches from the ground up, and they bear full and large bolls.

13. How much seed is usually used per acre?

Two bushels in twelve counties, 1 or 1½ bushels in thirteen counties, and one-half bushel in *Limestone and Milam*, of the timbered and sandy region of eastern Texas. One bushel in twenty-two counties, one-half bushel in *Hood, Bosque, and Lampasas*, of the central black prairie region, and two bush-

els in six counties of the western red-loam region. In the coast counties and in a few of those of regions mentioned the number of bushels is greater. *De Witt and San Patricio*, of the coast, each report one-half bushel.

14. What implements do you use in planting?

Throughout the state any plow that is convenient for making a furrow is used for planting, the bull-tongue plow most generally, the scooter next, and the shovel and turn-plow often. In some instances the seed is covered with a sweep or cultivator; very often with a board attached to a plow-stock;

more frequently with the harrow, and sometimes with brush, block, or log. The "cotton-seed planters" vary from the rudest to the most improved; they are designated "home-made" in several reports, and as "keg planters" in several others. In most cases the kind of "planter" is not specified.

15. Are "cotton-seed planters" used in your region?

They are used more or less throughout the counties of the eastern timbered region, the central prairie region, and a few of those of the western red-loam and southern prairie regions. They seem to be home-made implements, and opinions regarding them are various, a large number (twenty-six) of the central prairie counties regarding them as time-, seed-, and labor-saving machines, planting regularly and uniformly, and making after-cultivation easy. Opinions concerning them are not

What opinion is held of their efficacy or convenience?

expressed in the majority of reports from the rest of the state. *Wood*: The land here is too stumpy and rooty for their use. *Nacogdoches*: They have been laid aside for the next generation. *Titus*: The few in use are not a success. *Burnet*: They do not plant thick enough. *Somervell*: They are more convenient, but less efficient than hands. *Falls*: Successful only on light soils. *Cooke*: Almost universally adopted.

16. How long usually before the seed comes up?

The time varies from three to ten days, with an average of about seven days, and is dependent upon depth of seed below the surface and the temperature and moisture of the soil. Early

planting requires a longer time for the plant to appear than if planted late.

17. At what stage of growth do you thin out your stand, and how far apart?

Usually throughout the state when the third or fourth leaf appears, or as soon as a stand is assured. The crop is first chopped out with hoes, leaving a number of plants in a bunch, which are afterward thinned to one or two plants for each hill. The distance apart depends on the character of the soil and consequent growth of the plant. Fourteen counties of the oak and hickory region report from 10 to 18 inches; fifteen counties from 18 to 24 inches, and a few coun-

ties as much as 36 inches. In the black prairie region twenty-two counties report from 12 to 20 inches, others a greater distance. In other regions the usual distance is from 18 to 24 inches, except in the Brazos alluvial lands and Frio county, where as much as 36 or 48 inches is given. In *San Patricio* sea-island cotton is thinned when about 18 inches high to single plants 36 inches apart.

18. Is your cotton liable to suffer from "sore-shin"?

OAK, HICKORY, AND PINE REGION: In three counties it rarely occurs; in twenty-four counties it occurs more or less, but only when the weather in the spring is wet, cool, and backward, or the nights are cold and windy, or when cotton has been planted too early. *Madison:* It appears early in the season if the crop is allowed to become weedy. In ten counties it does not occur, and is not known in some of them.

CENTRAL BLACK PRAIRIE REGION: It is rare and exceptional in eleven counties; it occurs in other eleven counties only in wet, cold, backward springs, or when cotton is planted too early. *Tarrant:* Cold weather causes "sore-shin". In four-

teen counties it does not appear, and in some of them is not known.

NORTHWESTERN REGION: In *Palo Pinto* slightly; in *Taylor* slightly, owing to cold winds; and in *San Saba*, but not in the other counties.

SOUTHERN PRAIRIE REGION: Very little or rarely in six counties; in five counties only in cold, wet, late springs, or if cotton is planted too early. It does not appear in four counties. *Austin* and *Fayette:* Yes; if hoed carelessly or if too young. *Colorado* and *Lavaca:* In cold, late springs, or when damaged by careless and early hoeing.

19. What after-cultivation do you give, and with what implements?

The usual method is first to "bar off" or run a plow close to the plant, throwing the dirt from it. Then the crop is thinned out with hoes, and the dirt is thrown back to the plant. The method after this differs greatly; the majority of farmers give a surface cultivation with sweeps or shovel-plows to keep down the grass, while others plow out the middles with a turning-plow first, and then simply use sweeps. A number of hoeings are given to the plants through the season till "laid by". The following extracts from reports are given: *Harri-son:* A plowing every ten to twelve days until about July 15, when the crop is laid by; first stir the soil and throw a little to the row with the scooter or small shovel-plow, then clean out the row with hoes; plow again with sweep or shovel, or, if the weather be wet or the field grassy, the turn-plow is used; two or three hoeings are given. *Titus:* Three days after thinning side up with a small sweep, next plow out with a long shovel, after which the solid sweep, or (what is better) a short scooter, with heel-sweep attached, is used. *Cherokee:* First throw soil immediately about the plants, then keep down the grass and weeds until the crop shades the ground; sweeps are used, and quite successfully, where the ground was broken before planting. *Trinity:* Dirt is thrown to the row with a solid sweep or bull-tongue plow, and the ground is then kept free from weeds the best way possible. The turn-plow and scraper are also used. *Upshur* and *Free-stone:* Bar off or throw the dirt from the row, thin to a stand, sweep near the rows, break out the middles, and sweep again. *Grimes:* Bar off, thin to a stand, throw dirt to the row with plows and hoes until the crop is laid by; sweeps and double-shovel cultivators are used; plowing is shallow. *Burleson:*

Some bar off with the turning-plow and then use sweeps; others use sweeps altogether. *Milam:* Usually plow first with the cultivator, then deep in the middles with shovel or bull-tongue plows; repeat until the bolls open. The practice varies with seasons. *Collin:* Sulky cultivators, double shovels, sweeps, and hoes are used; the turn-plow is used on flat lands, where the ridges should be kept higher. The chief thing is to keep the grass down. *Bell:* Double shovels, sweeps, and sulky cultivators are used; in ordinary seasons the crop is plowed once in two weeks to keep weeds down; oftener in wet, and less frequently in dry seasons; the less cultivated the better. *Gillespie:* When rows are not ridged the soil is thrown from them toward the middles with a scraper or double shovel; the stand is then thinned, weeds are then kept down with double shovel, sweep, or cultivator, and hoe until the bolls appear. *Erath:* Bar off, thin to a stand, hoe once, and plow about twice, using turn-plows, sweeps, bull-tongues, or scooters. *Travis:* Three plowings and two hoeings after thinning to a stand, using sweeps, double shovels; progressive farmers use cultivators with four shovels, which run astride the row. *Harris:* Bar off with bull-tongue plow, hoe out, and return the soil to the row with sweeps; the shovel-plow is sometimes used. *Fort Bend:* Four to six workings are given; first with the hoe and turn-plow, afterward with the sweep (and hoe if necessary); cultivators are used to a limited extent, but they cause the plants to run too much to weed. *Colorado:* The bull-tongue, shovel, harrow, sweep, cultivator, and (if weeds become large) the turn-plow are used, but chiefly the sweep; sometimes a final hoeing is given.

20. What is the height usually attained by your cotton before blooming? When do you usually see the first blooms?

The usual height on the timbered uplands and prairies is from 10 to 18 inches, and on the bottom lands from 18 to 24 or 30 inches. The earliest dates in which the first blooms are seen are about the last of April, in *Bastrop* and *Victoria*; early in May in nine counties of the coast region; about the middle of May in two counties of the coast, and in *Brazos*, *Lee*, and *Robertson*, and

other extreme southern counties of the timbered region; the last of May or early in June in the central counties of the state, and about the last of June or early in July in the northern counties.. 2 *Trinity:* About one month from the time of planting.

21. When do the bolls first open?

The earliest date is from May 15 to June 1, in *Victoria* county; June 15 in *Lee* and *Bastrop*, of the oak and hickory region; late in June in *Grimes*, of the same region, and in four counties of the coast region; early in July in other southern counties of the state; usually the last of July in the central, east, and

west counties, and from August 1 to 15 in the northern counties. In the northwestern red-loam region the dates are July in *Clay* and *San Saba*, September in *Llano* and *Taylor*, and August in the other counties. 1 *Bexar:* Bolls open about forty days after blooming.

22. When do you begin your first picking? How many pickings do you usually make?

About July 10 in *De Witt*, July 15 in *Lavaca* and *Brazoria*, and later in July in a large number of the southern counties. From August 1 to 10 in *Bell* and *Gillespie* of the central prairie region, *Clay* and *Jack* of the northwestern region, and the other southern counties of the coast and timbered regions. The middle of August in the central or interior counties of the state, and

about September 1 in the northern counties of the eastern timbered region, and in the greater number of those of the central black prairie region, and also in the northwestern region. The latest dates are October 1 in *Llano* and *Taylor*. Three pickings are usually given in most of the counties, the work continuing until the crop is gathered.

23. Do you ordinarily pick all your cotton?

The crop is usually all gathered, excepting such as is lost by storms or by falling to the ground, or that which, opening late, is too much scattered to justify picking. *Polk*: About one-fourth is

left in the field. *Wilson*: 100 pounds of seed-cotton per acre are usually left. *Grayson* and *Fort Bend*: One-tenth is wasted or left in the field.

24. At what date does picking usually close?

In the greater number of counties from December 1 to 30. In November in *Navarro*, *Anderson*, *Wilson*, *Lee*, *Brazos*, *Gillespie*, *Medina*, *Palo Pinto*, *San Saba*, *Jack*, and seven counties of the

coast region. In October in *Chambers* and *Austin*. In *Bowie*, February 1.

25. At what time do you expect the first "black frost"?

OAK, HICKORY, AND PINE REGION: Throughout the region usually from the 1st to the 15th of November. The following counties report frosts in October, from the 15th to the 30th: *Bowie*, *Titus*, *Harrison*, *Wood*, *Henderson*, *Rusk*, *Nacogdoches*, *Cherokee*, *Anderson*, *Madison*, *Burleson*, and 3 *Lee*. (1 and 2 *Lee* report that black frost is not known in that county.)

NORTHWESTERN REGION: In November in *Clay*, *Comanche*, and *San Saba*, December in *Llano* and *Mason*, and October in *Jack* and *Palo Pinto* counties.

SOUTHERN PRAIRIE REGION: November in fifteen counties; December in *Chambers*, *Live Oak*, *Colorado*, and *Jefferson*. In *Fort Bend* "the average time for the appearance of 'black frost' for the past forty years has been November 15".

CENTRAL BLACK PRAIRIE REGION: From November 15 to 30 in all of the counties of the region except the following, which report its appearance during the last of October: *Cooke*, *Fannin*, *Tarrant*, *Dallas*, 2 *Navarro*, 2 *Falls*, and 3 *Gillespie*.

26. Do you pen your seed-cotton in the field or gin as picking progresses?

The majority of farmers throughout the state either pen their cotton in the fields (some piling it on the ground) or place it securely under shelter until the picking season is nearly over, or until good prices induce them to gin it for market. Others gin as picking progresses (or when enough for a bale), especially in the central prairie region, where in the counties of *Hunt*, *Collin*, *Dallas*, *Erath*, *Falls*, *Williamson*, and *Bell* the

practice is very general; also in *Colorado*, *Austin*, and *Karnes*, of the coast region, and *Hopkins* and *Sabine*, of the eastern counties. *Harrison* and *Titus*: Some pile it on the ground; a bad practice, as it gets moist, heats, and turns yellow. *Waller*: Penned in the field and hauled to gin at the end of each week. *Victoria*: Field pens are a thing of the past.

GINNING AND BALING.

27. What gin do you use? How many saws? What motive power—steam, horses, or mules?

Pratt's gins, with from 40 to 100 saws, is reported in forty-four counties; Gullett's, with from 45 to 180 saws, in thirty-one; Brown's, with from 40 to 80 saws, in nineteen; Winship's, with from 45 to 80 saws, in seven; the Chatham, with from 50 to 60 saws, in five; the Eagle, with from 40 to 60; the Carver, with from 45 to 60, and the Etna, with from 50 to 60 saws, each in three; the Hulsey and Hall gins, with from 45 to 80 saws, each in two; the Billup, Massey, Excelsior, Kingsland, Ferguson, Schadwick, Phoenix, Tarver, Centennial, Rose, and Logan gins, with from 50 to 80 saws, in one

county each. The use of steam-power is reported in 81 counties; horse or mule in 58; water-power in 10. More lint separated in a given time by steam, but a better quality of the staple is produced where horse-power is used. *Jack*, *Colorado*, *Jasper*, *Lavaca*, *Lee*, and *Gillespie*: On account of safety and cheaper insurance horse- or mule-power is preferable. 2 *Anderson*: One-fourth of the gins are run by steam-power, the balance by mules, horses, or oxen. *Kaufman*: Previous to May, 1880, there had not been a gin in *Erio* county; likewise in *San Saba*, previous to September of the same year.

28. How much clean lint do you make in a day's run of 10 hours?

Pratt's gin of 80 saws, with steam-power, will make from 5,000 to 7,500 pounds (*Colorado*); 5,000 pounds (*Falls*); 4,000 pounds (*Red River*, *Hill*, and *Falls*). With mule-power, from 850 to 1,350 pounds (*Taylor*); 75 saws, with steam-power, 3,500 pounds (*Atascosa*); 70 saws, with steam-power, 4,000 pounds (*Henderson*); 65 saws, with steam-power, 2,000 pounds (*Karnes*); 60 saws, with steam-power, 5,000 pounds (*Grimes*); 4,500 pounds (*Harrison*); 3,750 pounds (*Jefferson*); 3,000 pounds (*Bevar*); 2,500 pounds (*Fayette*); 2,000 pounds (*Williamson*); 50 saws, with steam- or mule-power, 1,500 pounds (*Harrison*, *Panola*, *Shelby*, *Harris*, and *Nacogdoches*); 40 saws, with horse-power, 800 pounds (*Hardin*).

Gullett's gin of three stands, of 60 saws each, or 180 saws, with steam-power, will make 8,500 pounds (*Falls*); 80 saws, with steam, 5,000 pounds (*Navarro*); 4,000 pounds (*Lampasas*); 3,500 pounds (*Collin*); 70 saws, with steam, 4,500 pounds (*Travis*); 4,000 pounds (*Navarro*); 60 saws, with steam, from 6,000 to 7,000 pounds (*Hunt*); 4,500 pounds (*Comanche*); 2,500

pounds (*Chambers* and *Grayson*); 60 saws, with horse-power, from 2,000 to 2,500 pounds (*Hunt*); 50 saws, steam, 3,000 pounds (*McLennan*); with mule-power, 2,500 pounds (*San Saba*); 40 saws, with horse-power, 1,000 pounds (*Jasper*).

Carver gin of 90 saws, with steam-power, will produce 500 pounds every half hour, or 10,000 pounds in a day's run (*Grimes*).

The Brown gin, 80 saws, with steam, 5,000 pounds (*San Jacinto*); 2,500 pounds (*Eastland*); 60 saws, with steam, 2,500 pounds (*Angelina*); with mule-power, 2,000 pounds (*Clay*); 50 saws, with mule-power, 2,000 pounds (*Fannin*).

The Winship gin, 80 saws, with steam, 2,500 pounds (*Eastland*); 60 saws, with steam, 3,500 pounds (*Hamilton*); 3,000 pounds (*Fannin*); 50 saws, with mule-power, 2,500 pounds (*Cherokee*).

The Chatham gin, 80 saws, with steam, 4,000 pounds (*Hill*); 50 saws, with steam, 5,000 pounds (*Trinity*).

The Hulsey and Logan gin, 50 saws, with mule-power, 1,200 pounds (*Morris*). The Tarver gin, 60 saws, with steam, 3,500 pounds (*Harris*). The Etna gin, 50 saws, with mule-power, 1,775

pounds (*Cherokee*). The Centennial gin, 50 saws, with mule-power, 1,500 pounds (*Harrison*). The Rose gin, 60 saws, with steam, 4,500 pounds (*Harrison*). The Eagle gin, 60 saws, with steam, 3,000 pounds (*Fannin*); with mule-power, 2,000 pounds (*Anderson*). The Billup gin, 50 saws, with horse-power, 1,500

29. How much seed-cotton on an average is required for a 475-pound bale of lint?

In sixteen counties, 1,425 pounds; in three counties, 1,485 pounds; in twenty-three counties, as much as 1,545 pounds; in twenty-five counties, 1,665 pounds; in five counties, 1,725 pounds; in six counties, 1,780 pounds; in five counties, 1,900

30. What press do you use for baling? What press is generally used in your region? What is its capacity per day?

Brooks' press is reported in thirty-one counties; Reynolds' in fourteen; old-fashioned wooden and compass presses each in six; iron screw press, Williams' and Farmers and Planters', each in four; the Southern Standard and Gray's, each in two; Winship's and the Grasshopper presses, each in three; the Colburn, Wilson, Smith, McGowan, Eclipse, Schadwick's, Self-return screw, Albertson segment screw, Simmond's, and Caruthers' and Crenshaw's, each in one. Brooks' press, with 6 men and 2 mules, will pack 30 bales in 10 hours (*Wood*); with 3 men and 1 horse, 15 bales (*San Saba*); with steam-power, 12 bales (*De Witt*); with 3 men and 2 horses, from 9 to 15 bales (*Madison*); with 2 men and 2 horses, from 10 to 12 bales (*Bell*); with 2 men and 1 horse, 10 bales (*Somervell*, *Grimes*,

31. Do you use rope or iron ties for baling? If the latter, what fastening do you prefer? What kind of bagging is used?

The use of iron ties is universal throughout the state. The preference for the arrow or buckle fastening is reported in forty-five counties; no preference from eight counties. The Beard hook is preferred in *Navarro*, *Brazoria*, and *Williamson*; both arrow and Beard in *Falls*; Davis hook in *Coryell*; alligator fastening in *Sabine*; either the buckle or Beard hook in *Brazos*; Schadwick's fastening in *Llano*. The use of double

32. What weight do you aim to give your bales? Have transportation companies imposed any conditions in this respect?

All the counties excepting twelve report 500 pounds. Railroad freight charges are almost universally by the bale, regardless of weight. Forty counties report that merchants deduct \$1 per bale for all bales weighing less than 400 pounds. In *Tarrant* the deduction is \$2; in *Rusk*, from \$1 50 to \$2 50; in *Brazos* and *Robertson*, one-half cent per pound. Bales are discounted if less than 450 pounds in *Titus* and *Sabine*; in *Johnson*, \$2 50 per bale. In *Lavaca*, if less than 360 pounds; in *Van Zandt*, if less than 350 pounds; in *Colorado* and *Grayson*, \$1 per bale if less than 300 pounds. *Bell*: If a bale weighs between 400

pounds (*Anderson*). Hulse gin, 60 saws, with mule-power, 2,500 pounds (*Fannin*). Schadwick's gin, 60 saws, with mule-power, 3,600 pounds (*Llano*); 85 pounds lint for 10 saws for 10 hours is good work (*Grimes*).

pounds; in *Llano*, *Lavaca*, and *Fayette*, 2,000 pounds, and in *Trinity*, 2,130 pounds. The greatest number of high estimates are from counties outside of the sandy timbered region of the eastern part of the state.

Johnson, and others). Reynolds' press, with steam-power, will pack 20 bales (*Ellis*); from 10 to 12 bales (*Titus*); from 8 to 10 bales (*Atascosa*); with from 4 to 5 men and 1 mule, from 15 to 20 bales (*Harrison*); with horse-power, 10 bales (*Ellis*). The wooden press, with 4 men and 1 horse, will pack 16 bales (*Collin*); from 10 to 12 bales (*Robertson*); with 8 men and 2 horses, 12 bales (*Brazoria*); with 2 men and 1 horse, 10 bales (*Somervell* and *Victoria*). The iron-screw press with steam-power will pack from 15 to 20 bales (*Upshur*); with 4 men and 1 horse, 16 bales (*Collin*); with 3 men and 1 mule, from 8 to 10 bales (*Fayette*). The "Self-return screw press" will pack 20 bales while others pack 10 bales (*Navarro*). The capacity of other presses run by horse-power is given at 10 or 12 bales.

anchor bagging is reported by forty-two counties; jute, 2 pounds per yard, by twenty-two; "India", by nineteen; Texas mills, 1½ pounds per yard, by six; Kentucky, by eight; manila, by four; hemp, by three; greenleaf, gunny, and bark each, by two; and Saint Louis, Indiana, Dundee, grass, Eureka, and elephant bagging are reported each by one county.

and 450 pounds it is discounted by merchants one-quarter per cent. of market value, and if between 350 and 400 pounds one-half per cent. *Houston* and *Karnes*: When cotton is lost carriers pay for actual weight. *Jasper*: Bales are required to be entirely covered. *Collin*: Freight charges are extra on bales exceeding 500 pounds in weight, but no deduction is made on bales weighing less. *Navarro*: For short distances the charges are per bale; for long distances, per 100 pounds. *San Saba* and *Eastland*: Farmers have no intercourse with transportation companies.

DISEASES, INSECT ENEMIES, ETC.

33. By what accidents of weather, diseases, or insect pests is your cotton crop most liable to be injured (caterpillar, boll-worm, shedding, rot of boll, rust, blight)? At what dates do these several pests or diseases usually make their appearance, and to what cause is the trouble attributed by your farmers?

OAK, HICKORY, AND PINE REGION: The caterpillar and boll-worm are of common occurrence in the following counties: *Bowie*, *Hopkins*, *Henderson*, *Harrison*, *Rusk*, *Panola*, *Nacogdoches*, *Cass*, *Cherokee*, *Anderson*, *Houston*, *Trinity*, *Hardin*, *Madison*, *Grimes*, *Brazos*, *Lee*, and *Gonzales*, occasionally in *Red River* and *Navarro*, and rarely in *Milam*. The time of appearance varies from June to October. The caterpillar is common in *Titus*, but comes too late to do much damage; is more dreaded than anything else in *Angelina* and *Sabine*. Hot days and cold nights about May 15 favor the growth of mildew to feed the caterpillar in *Jasper*. Does little harm in *San Jacinto* and *Robertson*. It occurs to some extent in *Morris*, *Wood*, and *Wilson*. The boll-worm appears generally in *Titus*, and is the worst enemy of all; it often destroys one-third of the crop,

being present from the dropping of cotton-blooms to maturity of the crop. Also, in *Morris*, *Van Zandt*, *Wood*, and *Freestone*; occasionally in *Angelina* and *Sabine*. Aphides are of common occurrence in *Morris*, *Upshur*, *Henderson*, *Nacogdoches*, and *Brazos*; "attributable to cold wet springs." Shedding is common in all of the counties of this region except *Wood*, *Van Zandt*, *Rusk*, *Shelby*, *Houston*, *Jasper*, *Hardin*, *Madison*, *San Jacinto*, and *Milam*, and is generally caused by extreme conditions of the weather, wet or dry. Rust and rot of bolls occur commonly in *Bowie*, *Titus*, *Cass*, *Harrison*, *Upshur*, *Panola*, *Angelina*, *Anderson*, *Trinity*, *Polk*, *Madison* (when too much shaded by foliage), *Grimes*, *Brazos*, *Lee*, *Nacogdoches*, *Sabine*, *Robertson*; generally attributable to wet autumn. Rust is found in *Hopkins*, *Preestone*, *Bastrop*, and *Red River*. Blight is of

general occurrence in *Red River, Hopkins, Titus, Cass, Brazos, Lee, Trinity, and Bastrop*; occasionally in *Cherokee and Anderson* in July, and is confined to special spots, where the plants invariably die; the cause must lie in the soil. Drought causes trouble in *Hopkins, Wood, Rusk, Freestone, Limestone, Grimes, Robertson, and Wilson*; "undoubtedly attributable to uniform south or southeast winds without changes of temperature either way." Excessive rains damage the cotton crop more than anything else (*Red River*).

CENTRAL BLACK PRAIRIE REGION: The caterpillar appears extensively in *Grayson, Burnet, Hunt, Tarrant, Dallas, Rockwall, Bosque, Navarro, Coryell, Travis, Medina, Guadalupe, Caldwell, Gillespie, and Kerr*; to some extent in *Collin, Somervell, and Lampasas*; rarely in *Falls, Blanco, and Denton*. In *Fannin* and *Wise* it is always too late to do any damage. Time of appearance varies from early in the summer to late in the fall. The boll-worm occurs generally in 28 counties of the region. The worms are, in most cases, attributed to too much rain and cool nights. Aphides are common in *Tarrant and Dallas*, and occasional in *Fannin*. The army-worm is found in *Bexar* county, being attributed to a moth called the candle-fly; and in *Kendall*, where it is considered as more destructive to cotton crops than anything else. Shedding is of common occurrence in all of the counties of this region, excepting *Hamilton, Burnet, Comal, and Guadalupe*; it is owing to extreme states of the weather, wet or dry. Rot of bolls and rust are of general occurrence in *Fannin, Denton, Dallas, and Kaufman*; occur to some extent in *Hunt and Collin*, and are never heard of in *Bexar*. Rot of bolls occurs in *Tarrant, Coryell, and Blanco*; rarely in *Travis*. Rust appears quite commonly in *Wise*. Blight is a source of injury to the cotton crops in *Fannin, Wise, Hamilton, Bell, and Bosque*; to some extent in *Hunt, Collin, Hill, and Williamson*; rarely in *Travis*, and never heard of in *Bexar*. Droughts occur in *Bosque, Navarro, Falls, Bell, Williamson, and Bexar*. All these troubles are attributed entirely to the weather in most of the counties.

"On the high and extensive prairies, where cotton grows and matures to perfection, it is blown out by the constant south winds almost as fast as it opens. To save it by immediate picking is impracticable where there is much to pick" (*Fannin*).

"Shedding is attributed to a partial arrest of the supply of plant-food, and the consequent insufficiency to maintain the large number of bolls; hence their death" (*Erath*).

"When the young plants are about five or six days old they are often destroyed, when the nights are warm and damp, by night-ants, beetles, and cut-worms. The only way to compensate for this trouble is to plant an abundance of seed, and thus make liberal allowance for these pests. Sometimes on

34. What efforts have been made to obviate it, and with what success?

The majority of counties report no efforts to obviate the diseases and pests. The moths of the caterpillar and boll-worm are in *Titus, Trinity, Fayette, and McLennan* sometimes decoyed at night by lights placed in basins of water and oil, and thus caught. Shedding and boll rot are obviated in *Titus, Grimes, Lee, Angelina, and Jack*, and a few other counties by deep plowing. *Titus*: To avoid rust, underdraining; and to avoid blight, harrowing is done soon after the rains, in order to break the crust and allow air to reach the roots. *Grimes*: If corn and pease are planted a year or two, the diseases are less damaging to the succeeding cotton crop. *Ellis*: Early planting and deep plowing are practiced to obviate the effects of drought; the other pests so rarely appear that the farmer is wholly unprepared for them. *Bell*: Nothing is done, for the reason that the cause of the blight is not known here. On the blighted or "dead spots" potatoes rot, and the Osage orange (*bois d'arc*) dies before the third year, but cereals remain unaffected. *Kendall*: The caterpillar is sought after by a gray linnet and several other small birds; insectivorous birds, however, are scarce in this region. I believe that the common European sparrow would do good service against pestiferous insects, and would also recommend that flocks of tur-

the finest looking plants, loaded with foliage, blooms and bolls are observed to die on spots of ground scattered over as much as 10 varas, apparently not from any fault of the soil, for the trouble occurs in spots. The root seems first to be affected; it is found covered with mold" (*Kendall*).

NORTHWESTERN REGION: The caterpillar never causes any serious trouble in *Comanche*; they are rarely found in *Eastland*. The boll-worm is of common occurrence in *Jack, Palo Pinto, and Llano*; occasionally in *Taylor*. The grasshopper is troublesome in *San Saba and Palo Pinto*. Shedding damages the crop in *Jack, Eastland, Taylor, Comanche, and Llano*. Rust is a source of trouble in *Llano*, due to a lack of sunshine, and appears soon after heavy rains. Excessive rains also do damage. Blight appears to some extent, in spots, in *Taylor*. Drought occurs in *Jack, Eastland, and Taylor*. The web-worm is sometimes injurious on black bottom lands in *Comanche* when cotton is coming up, and is attributable to cool nights.

SOUTHERN PRAIRIE REGION: The caterpillar and boll-worm are of common occurrence in *Chambers, Galveston, Fayette, Colorado, Austin, Washington, Jefferson, Harris, Waller, Fort Bend* ("if not checked, destroys the crops from August 15 to 25"), in *Brazoria, Lavaca, De Witt, Karnes, Atascosa, San Patricio, Frio, Live Oak*; is the chief pest in *Goliad* county, appearing any time in June to late in August. If it comes early a half crop or more will mature after it disappears. In *Victoria* "the later it comes the less the damage it does; if in August an average crop will still mature; it is the chief pest". The time of its appearance, and also that of the boll-worm, varies from about June to October, attributable to wet weather in the majority of cases. The boll-worm is common in *Chambers, Galveston, Fayette, Colorado, Austin, and Washington*; does not do much damage in *Fort Bend*; is occasionally found in *Goliad*, but rarely in *Lavaca*. The web-worm is found in *Galveston and De Witt*. The army-worm is a source of injury to the cotton crop in *Lavaca and De Witt*. Aphides are found in *Colorado and Washington*, owing to cold, wet springs. Shedding is of common occurrence in *Galveston, Harris, Waller, Fayette, Colorado, Austin, Fort Bend, Brazoria, Lavaca* (after drought), *De Witt, Atascosa, Goliad* (after drought), *Victoria, and Washington*; to some extent in *Karnes*. Rot of bolls occurs quite commonly in *Chambers, Galveston, Fayette, Colorado, Fort Bend, Lavaca, Goliad, Victoria, and Washington*. The cause is generally attributed to wet weather. Rust damages the cotton crops in *Jefferson* (due to plowing when wet), *Chambers, Galveston* (on some soils), and *Colorado* (in wet weather of April and May). Blight is found in spots in *Austin*; it does very little damage in *Fort Bend*. Frosts occasion trouble in *Colorado, Austin, and Goliad*.

keys, especially hens with their broods, be kept in the cotton fields when pests are liable to appear. There are also many varieties of wasps, ants, and lizards, that prey eagerly upon the cotton-worms in this region. *Comanche*: Plowing immediately after the plants come up successfully prevents damage by cut-worms. *San Saba*: Generally nothing is done. Winter plowing would turn up, expose to frost, and thus favor the destruction of insect eggs. *Austin*: The "dying out in spots" is to some extent remedied by green manuring. *Brazoria*: Early planting, with seed from northern counties, and early and rapid cultivation have been successfully practiced. *Fannin*: Some or most of these pests and hinderances may be obviated by planting corn and cotton together on the same land; for example, let every third row be corn; then of every three acres planted one produces corn and two produce cotton. The yield of the acre of corn under such circumstances is much greater than in the case of corn planted exclusively. The yield of cotton is also improved in quantity and quality. The corn should be planted as early as possible; then by the time the cotton is up it is protected by the corn against the cool, spring winds. The rows should be made east and west, because the damaging winds are north and

south. Such protection is considerable through May, and even in June, up to which time cotton, so planted, has a more vigorous appearance than that planted the usual way. From about June 15 until the foliage is stripped from the cornstalks (which should be done by July 15) there is a perceptible hesitation in the growth of the cotton foliage. The plants are then observed to be leaning away from the corn, and to be crowding toward the center of the cotton strip. This ceases, and the cotton again spreads when the cornstalks are stripped. While the growth of the foliage is retarded the bearing is not affected, and the quality of the lint is probably improved. Cotton so planted is not injured by aphides, even if they do

35. Is rust or blight prevalent chiefly on heavy or ill-drained soils? Do they prevail chiefly in wet or dry, cool or hot seasons?

They prevail chiefly on ill-drained soils, both sandy and heavy; on nearly all flat and bottom lands and the uplands black waxy and hog-wallow prairies of the central region, and on the flat prairies of the coast region; on some of the red and black lands of the eastern part of the state, and sometimes on sandy uplands, and apparently without regard to seasons, though the majority of counties report cool and wet seasons, and others dry and hot, wet and hot, and cool and dry seasons. On this point, however, the answers vary greatly even in the same agricultural region and as regards the same character of land. The following replies are given. *Colorado*: It occurs chiefly in wet springs when days are warm and nights are cool, and is most common on poor, cold, wet, sandy soil, especially that which has produced cotton successfully. Where corn has grown one season it is not so bad. 1 *Cherokee*: They are perhaps a little more common on the heavy red and the light mahogany soils; seasons, tenacity of soil, or drainage seem to make no difference. *Henderson, Hill, Fayette*, and 1 *Travis*: Rust and blight cause no trouble; but there are spots of from 1 to 100 plants where cotton dies; peach-trees also die, and potatoes rot. These spots are on any kind of soil, but more commonly on the dark colored kind. 2 *Travis*: Rust and blight do no serious damage here; they appear in dry, hot seasons, and are most com-

36. Is Paris green used as a remedy against the caterpillar? If so, how, and with what effect?

It is not used in a majority of counties, the caterpillar usually appearing too late to do much damage. Laborers are very much afraid of the effects of the poison, both on themselves and on the work-stock; the plants also are often killed or injured by it. It is applied either in solution, by means of water-pots, or in the dry state, mixed with flour or resin. A fresh application is necessary after rains and to any new leaves that may appear, and its use in a great majority of cases has not proved successful. *Harrison*: Where 15 acres per hand are cultivated in cotton its use is considered impracticable. Even if applied in any form to the extent of one-fourth pound per acre, it will cause the leaves to shrivel. *San Jacinto*: "Three-fourths" of a pound to 40 gallons of water, applied with a fountain pump or other improved sprinkler, a sure exterminator, if the weather is dry. *Grimes*: Yes; it is sprinkled on in solution or sifted on the plants in the form of powder, mixed with flour; it is generally, but not always, effectual, and often checks the growth of the plant. Arsenic

appear, nor by the caterpillar, boll-worm, etc. It is well known that the boll-worm never commences near corn, or near any shade, but that these summer and fall pests always begin in the interior of a cotton field, and will exhaust this part before going to the exterior, to which, even then, only the grown worms will venture. For this reason many plant corn and cotton in alternate parallel strips, always with good results. On the prairies already mentioned is to be observed the great advantage of the standing rows of cornstalks, which here prevent the constant south winds from tangling and blowing out the cotton as fast as the bolls open.

mon on black land which is underlaid by chalk rock. *Fannin*: They are not peculiar to any kind of soil. Rust prevails in either extreme of wet or dry seasons, is most common on heavy soils, and is always stopped by change of season. Blight is caused by an alkali or brackish ingredient in the soil. It occurs in spots, which will not produce any root crops, but will produce any cereal or other crop the essential part of which is above ground, except cotton. Cotton suddenly wilts down at any stage of growth; on examination the roots appear as if they had been limed. *Dallas, Bexar*, and other counties: They occur in spots of a few square yards to an acre on the flat and stiff hog-wallow and all low valley lands. *Bell*: In spots alike on all lands and in all seasons. *Jasper*: In low wet places at bases of hills. *Wise*: Where the sandy and waxy soils join. *Titus*: On bottoms and moist depressions of the uplands. *Houston*: On stiff post oak and prairie soils. *Victoria*: On low flats of black land. *Austin*: On sandy uplands and ill-drained bottoms, especially when drought is followed by heavy rains. *Fort Bend*: On stiff brown soils. *Navarro*: On sandy mesquite lands (low and flat) when too wet in spring and suddenly dries out. *Madison, Panola, Red River*, and *Trinity*: On light gray sandy soils. *Bowie*: On hickory land.

is also used in the same way. *Wilson*: The aqueous solution is sprinkled on the plant; it kills the worm, but checks the plant's growth, though the latter will soon grow off rapidly again if not too badly poisoned. Arsenic and other poisons are also used. *Travis*: Paris green and arsenic in solution are sprinkled upon the plants; they effectually destroy the worm. Negroes are afraid of the poison, and will not pick cotton where it has been used. 1 *Colorado*: Yes; by sprinkling its solution, or sifting the powder and powdered resin on the plants while wet with dew. The effect is good, but the material is too costly, and the application too troublesome. Arsenic is better; it is applied while the worms are young at the rate of 1 pound in 200 gallons of solution to 6 acres. *Lavaca*: Yes; by sprinkling it upon the plants at the worm's first appearance and repeating if necessary; in wet weather it is very difficult to kill it. Arsenic is also used, but Paris green alone is preferred; both are certain death to the worm.

LABOR, AND SYSTEM OF FARMING.

37. What is the average size of farms or plantations in your region? Is the prevalent practice "mixed farming" or "planting"?

Farms vary greatly in size in every county, and each answer gives usually a minimum and maximum. The largest farms are 3,000 acres in *Harrison*; 1,500 acres in *Falls and Hill*; 1,000 in *Waller, Robertson, Bastrop, Grimes, Fort Bend, San Jacinto*, and *Travis*; 500 in *Cass, Henderson, Clay, Jack, Lampasas, Collins, De Witt, Red River, Fannin, Brazos, Bosque, Austin*, and *Colorado*; 300 to 400 in twelve counties; 100 to 250 in other counties. Averages are from 25 to 30 acres in *Frio, Live Oak*, and *Wilson*; 40 acres in *Shelby, Angelina, Hood, Gillespie, Kerr*, 818

Harris, and *San Patricio*; 50 acres in *Wood, Jasper, Gonzales, Somervell, Comanche, Chambers*, and *Victoria*; 75 acres in *Houston, Morris, Upshur, Van Zandt*, and *Limestone*; 100 acres in ten counties; 150 acres in *Fayette, Rockwall, Burleson, Dallas*, and *Caldwell*, and 200 acres in *Titus* and *Rusk*; 250 in *Brazoria*, and 300 in *Cherokee*. "Mixed farming" is the prevalent practice throughout the state, with the exception of a few counties, in which "planting" is also done.

38. Are supplies raised at home or imported, and if the latter, where from? Is the tendency toward the raising of home supplies increasing or decreasing?

Corn is usually produced in sufficient quantities for home consumption, as is also wheat in many of the central prairie counties. Other supplies are in part imported from Saint Louis, Kansas City, and other western cities, and in part from New Orleans.

39. Who are your laborers chiefly?

OAK, HICKORY, AND PINE REGION: Whites chiefly in nine counties, viz: *Van Zandt, Wood, Sabine, Limestone, Henderson, Angelina, Navarro, Wilson, and Lee*. Negroes chiefly in *Red River, Harrison, Rusk, Freestone, Houston, Bastrop, Grimes, Madison, Burleson, and Jasper*. In all other counties of the region the proportion is about equal. In *Polk* "the negroes occupy different parts of the county from the whites". Germans are reported in *Wilson* and *Lee*, Mexicans in *Wilson*.

CENTRAL BLACK PRAIRIE REGION: White laborers predominate in all of the counties of this region except in *McLennan, Fannin, Collin, Falls, Rockwall, Dallas, Travis, Williamson, and Caldwell*,

40. How are wages paid; by the year, month, or day, and at what rates? When payable?

Daily wages are payable weekly or at the close of each day's service. In other cases wages are payable monthly in thirty counties; monthly or yearly, according to terms, in eight counties; on demand at any time after being earned in twenty-five counties; at end of time of service, or when the work is done, in twelve counties; and in twenty counties a part is paid during the year (in cash or supplies), and full payment is made at the close of the season or when crops are sold. Wages are from \$8 to \$12 per month in twenty-eight counties; from \$8 to \$15 in nineteen counties; from \$10 to \$16 in *Henderson, Burnet, and*

The tendency toward the raising of home supplies is decreasing in *Denton, Jackson, and Harris*; unvarying in *Panola, Freestone, Jefferson, Waller, and Nacogdoches*; and is increasing in the other counties.

where the proportion of whites and negroes is about equal. Germans are reported in *Medina, Bell, Lee, Bexar, Gillespie, Blanco, Comal, Washington, Dallas, Travis, Victoria, Mexicans in Bexar and Caldwell*.

SOUTHERN PRAIRIE REGION: Whites predominate only in *Kerr, Live Oak, and Goliad*. In five other counties whites and negroes are in about equal proportions, while in all others the negroes predominate. Polish laborers are reported in *Karnes and Grimes*, Germans in *Harris, Colorado, Fayette, and Washington*.

NORTHWESTERN REGION: Whites predominate in all of the counties.

Waller; from \$12 50 to \$15 in eight counties; from \$12 50 to \$20 in *Erath*; from \$10 to \$20 and board in *Wood*; \$15 with or \$20 without board in *Hopkins*; \$15 in *Live Oak, Denton, Comanche, Jefferson, Hunt, and San Saba*; from \$15 to \$16 in *Dallas*; from \$15 to \$20 in *McLennan and Goliad*; \$16 in *Limestone*; \$18 in *Gonzales*, and \$20 in *Bandera*. Daily rates are usually from 50 to 75 cents throughout the state; from 50 cents to \$1 per day in *Lee, Rusk, Comal, Gillespie, and Collin*; and \$1 in *San Jacinto, Jefferson, and Bandera*.

41. Are cotton farms worked on shares? Are any supplies furnished by owners?

The share system prevails very generally throughout the state, except in *Jasper and Karnes*, where but few farms are thus worked. Supplies, consisting of implements, teams, and their feed, are often furnished by the owners, who receive in return one-half of all the crops. When the renter furnishes his own supplies, the owner of the land receives one-fourth of the

cotton and one-third of the grain and other products. Buildings and improvements are included with the farm; gins and presses only when they belong to the farm. Should the laborer receive his board in addition to farm and implements, he receives one-third of the crop.

42. Does your system give satisfaction? How does it affect the quality of the staple? Does the soil deteriorate or improve under it?

The share system gives very general satisfaction in 67 counties of the 80 reporting, and in the others not so great, because of the unreliability of the laborer. In 32 counties the share systems are reported as not affecting the quality of the staple. In 10 counties the quality is improved. In 4 counties it deteriorates. In 3 counties it deteriorates under the one-half share system. In 6 counties the staple suffers from bad and careless handling. The staple is better handled when the laborer owns one-half. In 39 counties the soil is reported as

deteriorating under the share system if restorative means are not resorted to. In *Red River* the soil deteriorates very little. In *Robertson* the soil is affected alike by all systems. In 18 counties the soil maintains its fertility. In 24 counties it improves if well managed. *Colorado*: The share systems are satisfactory to married tenants, but not entirely to owners nor to unmarried tenants. Picking is badly done by negroes; Germans and Bohemians gather their cotton with care and thus produce a staple of superior quality.

43. Which system (wage or share) is the better for the laborer? Why?

The following is a summary of answers in favor of each system:

SHARE SYSTEM.—It pays the laborer more fully for all labor bestowed; he makes more, is apt to stay with the crop and save it all, and habits of industry are encouraged; he can raise most of his provisions; in good seasons he can double what wages he would have received; he enjoys greater liberty, has a home, occupation, and support for himself and family; he has money in the bank and live-stock about his farm; he would spend his wages as fast as received; he risks nothing but his labor, and his share is net gain; he can employ additional help, and increase his income proportionally; he can

make use of his family in cotton-picking time, and in keeping cows, poultry, and a garden.

WAGE SYSTEM.—Because the laborer is better satisfied, and makes more in the end; because he consumes his share in supplies; shares with cotton at so low a price do not pay him; he cannot go in debt; he mortgages his prospective share of the crop, and he takes no risk in a poor crop, because the negro is usually negligent, improvident, and has a lack of judgment which disqualifies him for success under the share system. He is not easily defrauded out of his share; he lives extravagantly under the share system; wages are certain; crops sometimes fail.

44. What is the condition of the laborer?

Generally good throughout the state, except in *Angelina, Hardin, Milam, Grimes, Denton, Lampasas, Llano, Chambers, Goliad, Atascosa, Brazoria, Frio, San Patricio, and De Witt*. In *Robertson* and *Upshur* they are jolly and happy, and in some instances in better condition than their employers. *Grimes*:

The negro as a rule is shabby, lazy, careless, indolent, and therefore thriftless and poor. *Fannin*: Well provided, healthy, and vigorous, and are improving. *Dallas*: Thrifty and of average intelligence. *Travis*: Good, but immediately dependent on their daily earnings. *Bexar*: Whites do well, and

soon acquire homes; Mexicans provide nothing for the immediate future; negroes sometimes do a little better. *Lavaca*: The thrifty have acquired homes of their own. *Fort Bend*: Laborers have horses, mules, wagons, cattle, hogs, etc. They are now better satisfied, and more cheerful and industrious than formerly. Many of the negroes are buying small tracts of land (in some cases from their former masters, whom they have never left), and are making comfortable homes. *Harrison*: Their condition (negroes) is good, bad, and indifferent. The good class are in a thriving condition. They own live-stock of all kinds, and many have small farms; they are also disposed to make use of opportunities for intellectual and moral im-

provement. The second and third classes are composed chiefly of those just arriving at maturity. Their aspirations go little beyond a sufficiency of tobacco, rum, and (costly) brass jewelry. Some of them will labor all the year and spend their shares before they are entirely gathered. Some strive to appear genteel, but care not for to-morrow. There is prevalent among them a rather exaggerated idea of freedom. *Collin*: The whites are generally content and prosperous; the negroes are improvident, not caring for the future if they have two weeks' rations on hand. Their condition is poor, but that is their own fault.

45. What proportion of negro laborers own land, or the houses in which they live?

One-half in *Victoria* and *San Saba*; one-fourth in *Madison* and *Lavaca*; one-fifth in *Van Zandt*; one-sixth in *Sabine* and *Fort*

Bend; one-tenth in fourteen counties; one-twentieth in fourteen counties, and a very small proportion in all other counties.

46. What is the market value per acre of the land in your region? What rent is paid?

OAK, HICKORY, AND PINE UPLANDS: Prices, from \$1 to \$5 for unimproved land, and from \$10 to \$20 for improved. Rents, from \$3 to \$5 per acre.

NORTHWESTERN REGION: Prices are from 50 cents to \$3 for unimproved, and from \$8 to \$10 for improved; sometimes higher. Rents are from \$1 to \$3; for grazing purposes in *Mason*, 2½ cents.

CENTRAL PRAIRIE REGION: Prices average about \$5 for unimproved (less than that in a few counties), and from \$10 to \$25 for improved land, and even higher near railroads and towns. Rents are from \$3 to \$5, and seldom higher.

SOUTHERN PRAIRIE REGION: From \$1 to \$3 for unimproved (\$5 for some land in *Colorado*), and from \$5 to \$25 for improved lands. Rents, from \$2 to \$5 per acre; in *Victoria*, \$8 for well-fenced land.

47. How many acres or bales per hand is your customary estimate?

OAK, HICKORY, AND PINE REGION: On the sandy pine lands of the southeast, about 3 bales or 10 acres; on the better class of uplands in the rest of the region, from 4 to 6 bales, or from 10 to 15 acres in cotton alone, or 8 acres in cotton and 15 in corn. On bottom lands, from 8 to 10 bales. *Grimes*: The white laborer cultivates from 15 to 20 acres—two-thirds of it in cotton; the negro cultivates 12 acres, one-half of which is in cotton. *Harrison*: One man and a mule can cultivate 30 acres. CENTRAL PRAIRIE REGION: Usually from 6 to 10 acres or from 4 to 6 bales, or from 15 to 20 acres in cotton and other crops, or 5 bales of cotton and 150 bushels of corn. *Grayson* and *Comal*: One

hand can cultivate 10 acres of cotton, but can pick only 5 or 6 acres or bales.

NORTHWESTERN REGION: From 4 to 5 bales or 12 acres of cotton. *Taylor*: With help to thin out, a good hand can easily cultivate 20 acres. *Jack*: Ten acres of cotton, 10 of corn, and 5 of wheat.

SOUTHERN PRAIRIE REGION: Usually from 3 to 5 bales. *Fort Bend*: The negro can cultivate about 4 acres and gather 2½ bales of cotton. *Fayette* and *Lavaca*: Five or 6 bales, or 10 acres of cotton and 10 of corn.

48. To what extent does the system of credits or advances upon the growing cotton crop prevail in your region?

It is not prevalent in *Burnet*, *Gillespie*, *Clay*, *Palo Pinto*, *Eastland*, *Frio*, and *Live Oak* counties; to a very small extent in *Hopkins*, *Van Zandt*, *Cooke*, *Dallas*, *Grayson*, *Denton*, *Johnson*, *Tarrant*, *Hill*, *Lavaca*, *Karnes*, *Goliad*, *Victoria*, *Rockwall*, *Titus*, *Wilson*, *Comal*, *Harris*, *De Witt*, *Hardin*, *Chambers*, *Jefferson*, *Guadalupe*, *Blanco*, *Bezar*, and *Atascosa*. In other cotton counties of the state it prevails very largely, usually to one-half or three-fourths, and sometimes to the full value of a crop. In a few of the counties it is declining. As a rule, the land-owner is made responsible for any supplies that merchants may advance to tenants or share-laborers. *Robertson*: Local or Galveston merchants advance supplies to about \$30 per bale at 8 per cent. interest. *Grimes*: About four-fifths of the farmers ob-

tain advances of goods; planter pledges to merchant, the merchant makes advances as far as he feels safe, and at the close of the season generally takes all the crop. Mortgages are sometimes given before the crop is planted, and very few can raise a crop without assistance. Merchants sell goods at cash rates, but charge 1 per cent. per month on all credits. *Colorado*: Besides obtaining supplies from merchants, the tenant also obtains on credit milk cows, corn, meat, etc., from the farm-owner. The merchant always makes money, while the land-owner suffers loss when, from fault of season or tenant, the crop partially or entirely fails. It sometimes takes three years to pay for what was spent in eight months.

49. At what stage of its production is the cotton crop usually covered by insurance?

Not at all in fifty-five counties; only when baled or stored preparatory to shipment in the majority of other counties. About planting time in *Shelby*; when the bolls have begun to open in *Morris*, *Jack*, *Hunt*, and *Kaufman*. When in the gin-house

in *Rusk*, *Robertson*, *Grimes*, *Limestone*, *Navarro*, *McLennan*, *Galveston*, *Titus*, *Collin*, *Ellis*, *Taylor*, *Harris*, *Waller*, *Colorado*, *Brazoria*, and some other counties.

50. What are the merchants' commissions and charges for storing, handling, shipping, insurance, etc., to which your crop is subject? What is the total amount of these charges against the farmer per pound or bale?

Commissions are almost universally 2½ per cent. on gross sales. Storage, from 25 to 50 cents per bale for the first month, and 25 cents per month after that. Handling, 25 cents; shipping, 25 cents; insurance, from one-fourth to one-half per cent. of its market value, or from 6 to 25 cents per bale per month. Weighing, from 7 to 15 cents per bale; inspection, from 10 to 15 cents, and drayage from 5 to 25 cents per bale. The total amount of these charges, including freight, vary from \$3 to \$6 in eighteen counties, and as high as \$7 50 in *Falls*, *Collin*,

Gonzales, *Polk*, *Jasper*, and *Hopkins*, and from \$8 to \$8 75 in *Tarrant* and *Blanco*. Without freight the charges per bale vary from 12 cents in *Brazoria* to 50 cents in *Washington* and *Travis*, \$1 25 in *Bosque*, \$1 50 in *Bell* and *Upshur*, \$1 75 in *Navarro* and *Harris*, \$2 50 in *Hill*, and \$3 50 in *Angelina*. Cotton is usually sold to local buyers at railroad stations at from 1 to 2 cents below Galveston and New York quotations, and the farmers avoid the above charges, except that for weighing.

51. What is your estimate per pound of the cost of production in your region, exclusive of such charges, and with fair soil and management?

The lowest estimates are 3½ cents per pound in *Madison, Coryell, Brazoria*; from 4 to 5 cents in *Wilson, Wood, Red River, Trinity, Burnet, Erath, Dallas, Gillespie, Fannin, Hill, Travis, Jack, Eastland, Live Oak, and Jefferson*; 6 cents in *Milam, Robertson, Morris, Gonzales, Anacerson, Harrison, Lee, Somervell, Bexar, Ellis, Denton, Cooke, Grayson, Galveston, Harris, Fort Bend, and Austin*. From 7 to 8 cents in all other counties except *Houston, Cherokee, Grimes, Williamson, Blanco, McLennan, Lavaca, Fort Bend, and 2 Austin*, where the estimate is from 9 to 10 cents per pound.

Sabine: After cotton is ready to pick it costs \$18 50 per 500-pound bale to deliver it at the shipping point ready for sale. For example:

To picking 15½ cwt. of seed-cotton at 50 cents per cwt.	\$7 75
To nine days' board of hand while picking.....	2 25
To hauling to gin	1 50
To ginning	3 00
To baling and ties.....	2 00
To hauling to the river	2 00
	<hr/>
	18 50
	<hr/>

The cost of delivering is of course greater where the production is more remote from shipping points.

Cost of each item of labor and material expended in the cultivation of an acre of cotton.

Items.	COUNTY.			
	Navarro.	Bell.	Gillespie.	Brazoria.
Rent.....	\$3 00	\$4 50	\$3 00	\$5 00
Fencing, repairs, and interest on	1 00		7 00	50
Knocking stalks.....		50	1 00	30
Pulling and burning stalks.....			1 00	10
Listing			1 50	40
Bedding with hoes.....			1 75	
Breaking up.....	1 00	1 50	6 00	
Harrowing		15	1 25	
Splitting middles.....			35	40
Laying off.....		25	75	10
Bedding up.....		1 50	1 50	
Splitting middles.....			35	80
Knocking off beds.....	15		1 00	
Planting, opening.....	15	25	40	
dropping	05	15	25	12
covering.....	15	25	40	10
Replanting	05		25	05
Seed	05	05	25	50
Thinning	1 00	75	50	30
Number of plowings.....	1 50	3 00	1 00	60
Number of hoeings.....	25	1 00	2 00	50
Wear and tear of implements.....	50			
Total	8 85	13 85	31 50	9 77
<i>Other expenses.</i>				
Picking, per hundred-weight	75	50 to 75	75	60
Hauling to gin.....	2 50	1 25	1 00	
Ginning, per hundred-weight	25	25	1 20	80

NOTES ON THE ABOVE TABLE.

Bell county: The original cost of fencing, repairs, etc., depends on number of acres in inclosure. Knocking down stalks is not usually done. Harrowing is not general. Hauling to gin costs about 12½ cents per 100 pounds. The usual toll for ginning is one-twelfth of the cotton. It is impossible to indicate

with certainty the cost of raising and gathering an acre of cotton. It is much more some years than others. It depends greatly on the seasons; the better the seasons the greater the cost and the greater the profit.

COST OF PICKING 100 POUNDS OF SEED-COTTON.—*Bowie*: 75 cents early in the fall, and from \$1 to \$1 25 later in the season. *Fannin*: From 75 to \$1. *Wise*: 75 cents and board and \$1

without board. *Washington*: 80 cents. *Gillespie and Victoria*: 75 cents. *Caldwell*: 70 cents. *Liberty*: From 50 cents to \$1. *Nacogdoches*: From 50 to 75 cents.

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