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COTTON EXPERIMENTS, 1922

DELTA BRANCH STATION

W. E. AYRES



Dollars per Acre for Seed and Lint

Graphic Representation of the total per acre value of seed and lint of seven standard varieties—five year average, 1918-1922

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* In cooperation with Bureau Animal Industry, U. S. Department of Agriculture.

COTTON EXPERIMENTS, 1922

DELTA BRANCH STATION

W. E. AYRES

Since its establishment the Delta Station has devoted the major part of its funds and effort to the study of King Cotton. Cotton is the most profitable crop that can be grown generally in the Delta on well drained soils, but provisions should certainly be made on every plantation to produce feed at home. The lesson of 1920 should never be forgotten. No planter should ever be so thoughtless as to put all his eggs in one basket again.

Fertile soil, a full stand, thorough cultivation, good seed of a good variety, a good seed bed, and many other factors must be used if profit is to be the product, even in the Delta.

VARIETIES

Station Tests: Every year for the past 12 years the Station has tested all varieties thought to have merit for use on Delta plantations. Table I shows the total per acre value of seed and lint for 10 years of 7 standard varieties which have been and are being largely grown in the Delta. From the standpoint of money value for the past 5 years Delfos has averaged 12% better than Express, 17.7% better than Webber, 17.9% better than Lone Star, 23.1% better than Trice, 25.2% better than Wannamaker, and 39.8% better than Miller. For the past 2 years Delfos has been recognized as the most profitable cotton for average Delta conditions, but not until the fall of 1922 has seed of this cotton been available in commercial quantities. The merits and demerits of the 2 most important strains of Delfos are discussed toward the end of this publication in the discussion of Cotton Breeding. For thin warm soils Webber is an excellent cotton but on exceedingly fertile or cold-natured soils earlier varieties are desirable. Of the short cottons Trice and Wannamaker probably deserve most consideration.

TABLE I. Dollars per Acre for Seed and Lint of Standard Varieties
Data for Each Year and Average for Last Ten and Five Years

Year	Express	Delfos	Webber	Lone Star	Wannamaker Cleveland	Trice	Miller
913	122.12	105.81	110.28	106.62	129.02	104.88	117.02
914	26.29	13.50	13.54	19.58	17.43	23.27	19.57
915	87.04	92.53	73.04	90.46	78.33	75.08	82.56
916	108.37	86.02	87.59	108.97	85.17	84.95	89.48
917	291.91	264.99	281.87	256.72	267.75	204.20	218.62
918	242.52	225.75	222.96	225.59	235.63	188.46	192.93
919	270.63	279.43	227.40	227.78	218.94	255.28	169.87
920	97.75	158.87	127.11	123.23	111.78	112.11	121.81
921	160.39	194.13	168.43	144.83	117.56	125.06	113.93
922	91.71	108.54	75.52	98.42	88.56	104.25	92.96
0Yr.Av	149.87	165.10	151.03	157.87	150.70	127.82	121.85
Yr.Av	172.60	193.35	164.28	163.97	154.49	157.05	138.30

In 1922 several tests were conducted in the various parts of the Delta. Results of these tests are given in detail in tables 5, 7, and 8. Table 2 is a compilation of monetary results of all 1922 tests. It is interesting to note that in this comparison of 20 varieties and strains Delfos 6102 has yielded seed and lint worth more than that of any other variety or strain. Lone Star 65, in 5 tests, only lacked \$2.83 per acre of equalling 6102 in money value. Delfos 631, in 15 tests, lacked \$6.95 per acre of producing as well as 6102. With these 2 exceptions Delfos 6102 outranked all varieties and strains by a considerable margin. In the 20 comparisons of average results Express 350 was better than 11 strains with which it was compared and poorer than 8. Deltatype Webber in the 20 comparisons was better than 3 strains and poorer than the other 16.

TABLE II. Average per Acre Values of Varieties in 11 Tests Compared with Three Standard Varieties in Same Tests (1)

Variety	No. Tests	Average Total per A. Value	Av. Total per A. Value Other Varieties in Same Tests		
			Delfos 6102	Express 350	Deltatype Webber
Acala 5	3	99.34	130.32	100.68	101.09
Cleveland Wannamaker	2	101.26	133.08	109.00	89.37
Cleveland Piedmont	2	101.26	133.08	109.00	89.37
Cleveland 54	5	111.43	137.50	115.86	107.43
Delfos 120	4	111.03	147.51	117.28	124.07
Delfos 6102	18	137.01	Same	114.61	106.90
Delfos 631	15	127.57	134.52	118.09	104.67
Express Lightning	16	118.77	140.17	117.79	106.81
Express 350	18	114.61	137.01	Same	106.90
Express 630	4	97.26	125.29	97.93	105.08
Express 782	15	107.84	136.32	114.42	105.52
Express Walcott	2	94.86	110.88	90.24	83.35
Express 432	13	124.57	143.31	120.32	110.25
Haaga	10	100.94	128.76	112.08	92.97
Lone Star 65	5	119.14	122.97	98.84	103.46
Sunpress 61	13	119.23	143.91	120.06	113.23
Salsbury	11	122.66	141.32	115.53	105.62
Miss. Station Trice	6	114.58	133.44	111.34	105.91
Webber 49-4-6	9	104.39	130.94	117.01	96.34
Webber-Deltatype	18	106.90	137.01	114.61	Same

(1) Explanation of Table: Acala 5 was in 3 tests with an average value of \$99.34. In the same 3 tests Delfos 6102 averaged \$130.22; Express 350, \$100.68; and Deltatype, \$101.09. Delfos 631 was in 15 tests with an average of \$127.57. In the same 15 tests Delfos 6102 averaged \$134.52; Express 350, \$118.09; and Deltatype, \$104.67. It will be noted that every variety is compared with Delfos 6102, Express 350, and Deltatype Webber in all tests in which the variety occurred.

Table 3 is a compilation of the lint yield of 20 varieties and strains in all 1922 tests. The premium on staple has been small for the crop of 1922. This has made staple cotton less profitable, comparatively, than in former years and there is, at the present time, a tendency on the part of many staple producers to plant short cottons in 1923. It is necessary that the percentage of the crop planted to staples be reduced but it is doubtful if it will pay the average Delta planter to go to short cottons on Delta soils. A study of table 3 tends to discourage the growth of short cotton under average Delta conditions. Probably the hill farmer should be the first to desert staples. Table

3 shows that only one short variety has averaged more lint in the Delta than Delfos 6102 in 1922. The Delta planter should study this table carefully before buying seed of short cotton for 1923 planting.

TABLE III. Average Pounds of Lint per Acre of Varieties in All Tests Compared with Three Standard Varieties in Same Tests (1)

Variety	No. Tests	Av. No. Lbs. of Lint per Acre	Av. Lbs. of Lint per A. Other Varieties in Same Tests		
			Delfos 6102	Express 350	Deltatype Webber
Acala 5	3	364.5	419.9	318.0	313.6
Cleveland-Wannamaker	2	408.4	422.4	307.6	270.5
Cleveland-Piedmont	2	408.4	422.4	307.6	270.5
Cleveland 54	5	469.0	454.2	375.4	317.0
Delfos 120	4	364.4	485.5	374.2	314.0
Delfos 631	15	398.7	430.6	371.7	314.0
Delfos 6102	18	425.9	Same	359.3	320.7
Express 350	18	359.3	426.0	Same	320.7
Express-Lightning	16	370.4	435.5	369.9	319.1
Express 630	4	304.2	400.4	307.0	326.2
Express 782	15	344.1	417.5	354.8	318.5
Express-Walcott	2	296.8	348.9	279.6	252.9
Express 432	13	409.9	440.0	374.5	328.4
Haaga	10	297.9	383.0	345.7	277.7
Lone Star 65	5	401.6	401.0	316.6	319.9
Sunpress 61	13	335.1	445.3	377.0	339.2
Salsbury	11	404.6	426.9	358.1	317.9
Miss. Station Trice	6	434.0	438.0	358.7	314.0
Webber 49-4 and 6	9	319.5	412.3	363.7	290.0
Webber-Deltatype	18	320.7	426.0	359.3	Same

(1) Explanation of Table: Acala was in 3 tests with an average of 364.5 pounds. In the same 3 tests Delfos 6102 averaged 419.9 pounds; Express 350, 318.0 pounds; Deltatype Webber, 313.6 pounds. Delfos 631 was in 15 tests with an average of 398.7 pounds. In the same 15 tests Delfos 6102 averaged 425.9 pounds; Express 350, 359.3 pounds; and Deltatype Webber, 320.7 pounds. It will be noted that every variety is compared with Delfos 6102, Express 350, and Deltatype Webber in all the tests in which the variety occurred.

The introduction of short cotton into established staple areas is objectionable for many reasons, even if immediate per acre remuneration is as good for short cotton as for staple varieties. Short varieties become mixed, at the gin, in the field, and otherwise, with established staple strains in the community. The standard of all the cotton in the community is thus lowered. If, during any one year, considerable short cotton is shipped from any established staple area, that area loses its staple reputation in the markets. The labor disturbance caused by growing short cotton periodically is no small consideration.

Table 4 shows data for variety tests conducted at the Station in 1922. Four series of plots of each tests were planted April 21. All varieties came up to a good stand. Heavy rains, hot sun, and cool nights so reduced the stand on some varieties that results are not as reliable as is desirable for definite conclusions. Results are based on an average stand of plants after due allowance is made for advantage gained by plants adjacent to skips. Results of any first picking are misleading, since thin hulled varieties will open quicker than thick hulled ones, even if the bolls are set the same day. For this reason, publishing first picking data has been discontinued. The values and

lint produced under such heavy weevil infestation as prevailed in 1922 determine whether or not a variety is early and prolific.

In the test of standard varieties Delfos 6102 ranked 1st; Cleveland 54, 2nd; Half and Half, 3rd; Miss. Station Trice, 4th; and Delfos 631, 5th. The difference in per acre value of the products of Delfos 6102 and 631 was only \$4.83. The difference between the best and poorest varieties was \$40.12 per acre or 58.6%. The 5 high yielders averaged \$32.08 per acre or 43.8% more than the 5 low ones.

TABLE IV. Station Variety Tests

Variety	Pounds per Acre		Per Acre Value of Seed and Lint			Length Lint Inches	Per Cent Lint	No. Bolls per Lb.
	Seed Cotton	Lint	Dollars 1922	Rank	Av. Dollars 1921-22			
First Test—Standard Varieties								
Miss. Station Trice	1171.6	351.4	104.25	4	114.65	1 1-16	30.1	86
Cleveland-Wannamaker	892.4	332.8	88.56	15	103.06	3-4	37.3	75
Cleveland-Piedmont	983.7	344.4	95.44	9	106.30	15-16	34.0	77
Cleveland 54	1069.6	381.8	105.38	2	113.10	15-16	35.7	74
Half & Half	946.0	414.3	104.87	3	106.44	5-8	43.8	72
Cook 588	739.0	274.1	75.00	19	89.87	7-8	37.1	69
Miller	964.9	320.3	92.96	10	103.44	1 1-16	33.2	58
Acala 5	767.2	273.1	78.16	17	100.13	1 1-16	35.6	72
Lone Star 79	955.5	292.3	92.18	11	117.55	1 1-16f	30.6	74
Lone Star 65	987.6	321.9	98.42	8	121.62	1 1-8	32.9	63
Salsbury	743.2	243.7	74.56	20	111.82	1 1-8	32.8	82
Webber 49-4	766.8	231.5	75.52	18	109.95	1 1-4s	30.2	78
Webber-Deltatype	678.9	207.0	68.42	22	118.42	1 1-4	30.5	80
Sunpress 61	954.2	252.8	88.60	14	130.67	1 5-16	26.5	85
Delfos 631	1020.5	320.4	103.71	5	145.01	1 1-4s	31.4	77
Delfos 698	996.6	323.8	102.49	7	137.38	1 3-16	32.5	73
Delfos 6102	1082.0	340.8	108.54	1	151.33	1 3-16	31.5	84
Express-Walcott	1058.7	320.7	102.95	6	131.87	1 3-16	30.3	67
Express 782	782.6	228.7	72.87	21	116.63	1 3-16	31.4	84
Express-Lightning	986.7	284.1	92.17	12	120.13	1 3-16	28.8	77
Express 630	836.4	249.2	80.27	16	110.38	1 3-16	29.8	82
Express 350	997.2	284.2	91.71	13	110.76	1 3-16s	28.5	86
Second Test—New and Miscellaneous Cottons								
Miss. Station Trice	1264.9	380.7	112.86	5		1 1-16	30.1	83
Trice-Burdette	977.3	295.1	87.42	19		1 1-16	30.2	79
Lone Star 65	1183.9	385.9	118.22	2		1 1-8	32.6	60
Lone Star 79	1037.9	315.5	99.63	9		1 1-8f	30.4	71
Lone Star 5-Burdette	1221.0	388.2	118.54	1		1 1-8	31.8	72
Acala 5-Nunn	884.8	312.5	89.52	17		1 1-16	35.3	69
Acala 5-Russell-Heckle	903.1	321.5	92.00	14		1 1-16	35.6	61
Acala 25-Burdette	1213.0	431.8	105.91	5		1 1-16f	35.6	61
Delfos 698	1165.4	283.4	95.57	12		1 3-16	32.9	75
Delfos 6102	1109.0	357.0	113.21	3		1 3-16	32.3	86
Delfos 120	825.4	243.4	78.57	25		1 3-16	29.5	82
Delfos 91	1026.7	326.4	103.77	8		1 3-16	31.9	72
Delfos 631	955.0	298.9	96.81	11		1 1-4s	31.3	72
Webber 49-4	810.4	237.4	77.93	26		1 1-4s	29.3	77
Haaga	762.0	226.0	74.06	28		1 1-4s	29.7	81
Express-Walcott	897.8	272.0	86.85	20		1 3-16s	30.4	64
Express 11-Walcott	926.8	281.8	89.69	16		1 3-16s	30.4	62
Express 782	755.4	237.1	74.96	27		1 3-16s	31.4	78
Express-McLendon	885.9	266.7	83.06	24		1 1-8	30.1	81
Express 79	1128.5	322.7	104.84	6		1 3-16	28.6	84
Express-Marshall	1108.2	324.7	104.14	7		1 3-16s	29.3	81
Express-Ewing	901.7	269.6	86.78	21		1 3-16	29.9	82
Express 630	892.6	265.9	84.97	22		1 3-16s	29.8	76
Express 344-1	985.8	288.8	92.64	13		1 3-16s	29.3	75

TABLE V. Cooperative Tests—Bolivar County

Variety	Lbs. per Acre		Per Acre Value		Lbs. per Acre		Per Acre Value		
	Seed Cotton	Lint	Dollars	Rank	Seed Cotton	Lint	Dollars	Rank	
H. Y. Jumper, Dahomy Typical Buckshot Soil					J. H. Pace, Buckshot Soil				
Lightning Express	1197.4	346.0	112.20	5	876.0	229.7	74.38	6	
Express 350	1282.4	356.5	116.55	4	868.5	241.4	78.94	8	
Express 432	1106.9	354.2	108.92	6	852.9	272.9	83.92	3	
Express 782	1063.8	340.4	108.09	7	810.4	259.3	82.33	4	
Express 61	1139.9	296.3	104.30	8					
fos 6102	1355.6	417.5	133.58	1	990.5	305.1	97.62	1	
fos 631	1331.1	403.3	131.48	2					
eltatype Webber	1090.3	300.9	101.54	9	821.9	226.8	76.55	9	
aga	908.1	266.0	87.34	13	851.0	249.3	81.84	5	
ebber 49-6B	1039.1	303.4	99.67	10	767.9	224.2	73.76	12	
artsville 16	972.3	278.0	91.74	11	799.6	228.6	75.43	10	
lsbury	1207.6	392.4	120.20	3	955.3	310.4	95.16	2	
ing Express	935.3	276.8	98.30	12	839.7	248.5	80.17	7	
lk					789.5	229.7	74.38	11	
O. O. Wolf, Duncan Buckshot Soil					J. W. Bishop, Shaw Buckshot Soil				
Lightning Express	822.3	237.6	77.05	7	1501.1	433.8	140.06	5	
Express 432	782.8	250.4	77.03	8	1556.9	498.2	158.17	3	
Express 782	812.8	260.0	82.67	4	1282.4	410.3	130.30	8	
lk	735.0	213.8	69.24	11					
fos 6102	938.1	288.9	92.44	1	1734.0	534.0	170.85	9	
fos 631	812.8	246.8	80.29	5	1671.6	506.5	164.12	2	
eltatype Webber	768.7	212.1	71.60	10	1052.7	290.5	197.05	12	
aga	748.4	219.2	71.98	9	1175.4	344.4	113.06	11	
ebber 49-6B	832.9	243.2	79.89	6	1181.3	344.9	113.31	10	
artsville 16	670.8	191.7	63.30	12	1311.1	375.0	123.72	9	
lsbury	894.4	290.6	89.10	2	1329.3	435.2	133.23	5	
ing Express	882.9	261.3	84.30	3	1329.8	412.2	132.93	7	
Express 350					1646.8	457.8	149.69	4	
Express 61					1381.6	359.2	126.41	9	
A. W. Wooten, Shelby Loamy Buckshot Soil					J. L. Smith, Cleveland Loamy Soil				
Lightning Express	1396.4	388.9	127.11	8	1570.5	453.9	147.14	3	
Express 350	1435.1	498.9	155.93	1	1469.2	415.9	135.44	6	
Express 432	1471.3	470.8	144.80	4	1248.1	399.4	122.81	10	
Express 782	1189.3	380.6	120.83	10	1220.2	390.5	123.97	9	
Express 61	1428.6	371.4	130.71	6	1272.5	330.8	109.81	14	
fos 6102	1366.7	520.9	134.70	3	1621.7	499.5	162.30	1	
fos 631	1275.1	371.2	122.00	9	1557.7	471.9	155.86	2	
eltatype Webber	1269.9	350.5	118.16	11	1209.9	356.3	119.55	11	
aga	1347.7	394.8	128.66	7	1305.9	382.6	125.60	8	
ebber 49-6B	1182.9	345.4	113.47	12	1490.5	435.2	143.00	4	
artsville 16	1420.1	406.1	109.64	13	1261.6	360.8	113.77	13	
lsbury	1510.6	490.9	150.50	3	1395.3	441.2	139.70	5	
ing Express	1586.1	469.5	151.43	2	1357.6	413.0	133.22	7	
lumbia					1289.9	374.1	119.31	12	
Will Dockery, Dockery, Loam Soil					S. T. Speaks, Benoit, Loam Soil				
Marshall Express	1407.9	328.0	111.80	10					
Lightning Express	2091.3	604.3	194.46	3	1358.5	392.6	128.06	6	
Express 350	1670.4	464.4	151.81	9	1443.5	401.2	131.19	5	
Express 432	1921.7	612.4	188.19	4	1351.6	432.5	133.00	4	
Express 782	1784.1	570.9	181.26	6	1018.3	325.8	103.46	9	
Express 61	1744.0	452.7	159.29	8					
fos 6102	2149.9	662.2	211.76	21	1376.2	423.8	134.60	3	
eltatype Webber	2198.4	606.8	203.77	2	1040.5	287.2	95.48	10	
artsville 16	1696.5	485.2	160.88	7	1300.2	371.9	122.69	7	
lsbury	1823.7	592.7	181.66	5	1625.9	528.4	161.97	1	
fos 631					1219.8	369.6	120.49	8	
aga					1412.9	414.0	135.89	2	
J. S. Gortner, Shelby, Loamy Buckshot					G. W. Warfield, Gunnison, Light Buckshot				
Lightning Express	708.5	204.7	66.37	8	1136.6	328.5	106.49	7	
Express 350	671.5	186.7	61.02	9	1388.4	385.9	126.20	2	
Express 432	765.7	245.0	75.44	4	1097.9	351.4	108.04	6	
Express 782	753.0	240.9	76.50	3	1280.9	409.9	130.15	1	
Express 61	804.8	209.3	73.64	7	1026.4	266.8	93.90	8	
fos 6102	784.4	241.6	139.02	1	1109.5	341.2	109.32	5	
aga	779.9	228.5	75.00	5	1205.9	353.3	115.98	3	
artsville 16	782.7	223.8	73.85	6	734.5	210.0	69.30	9	
lsbury	777.1	252.5	77.52	2					
ing Express					1212.5	358.9	115.76	4	

In the tests of new and miscellaneous cottons Lone Star 5 was 1st; Lone Star 65, 2nd; Delfos 6102, 3rd; Miss. Station Trice, 4th; and Acala 25, 5th. The highest producer was \$44.48 per acre or 60.1% better than the poorest yielder. The 5 highest yielders averaged \$113.75 per acre and the lowest 5, \$77.71. The difference was \$36.04 per acre or 46.4%. The value produced by a variety should not be considered alone. If the monetary products of two varieties differ by only a few dollars, such things as boll size and storm resistance will often make the one producing the lower value the more desirable.

TABLE VI. Prices Used in Computing Value of Lint in Preceding Tables

Length of Lint Inches	Price—Cents per Pound	Length of Lint Inches	Price—Cents per Pound
5-8	22.75	1 1-8	26.50
3-4	23.25	1 5-32	27.00
7-8	23.75	1 3-16	27.50
1 5-16	24.00	1 7-32	28.00
1 1-32	24.75	1 9-32	29.00
1 1-16	25.00	1 5-16	29.50
1 3-32	25.25	1 3-8	30.50

Bolivar County Tests: Ten cooperative tests with a few standard varieties were conducted by C. C. Smith, County Agent, and careful farmers on the important soil types of the county. Results of these tests are published in tables 5 and 6. They should be very interesting to the whole Delta but especially to planters in the immediate vicinity of the tests. Conclusions of Mr. Smith relative to varieties for general use in the county follow:

“From these tests this year, a relatively dry year, Delfos 631, Delfos 6102, Salsbury, Express 432, Express 782, and Lightning Express look like good cotton for buckshot land. For loamy buckshot lands of medium fertility, Salsbury, Express 432, Delfos 6102, and Delfos 631 seem to be good cottons. For loam lands Delfos 6102, Delfos 631, Lightning Express, Salsbury, Express 432, and Deltatype Webber seem to be good. For new grounds Delfos 6102 and Delfos 631 are outstanding cottons. Express 432, Express 350, and Salsbury seem to make good yields.

“From these tests it will be seen that Lightning Express and Express 350 are practically the same. Lightning Express is a fraction of one sixteenth longer, a little more uniform, and has a slightly better lint percentage than 350. The only places for Webber or cottons of that type seem to be thin, quick maturing loams and sandy soils or thin buckshot ridges which do not get weevils too early. The Delfos cottons are probably not adapted to real poor lands without nitrogenous fertilizers, and they are not suited to lands badly infected with cotton wilt.”

Mr. Smith's conclusions seem sound when data and observation of this and all previous years are considered. The data are published so that any interested party can do his own figuring and draw his own conclusions.

Length of lint and per cent lint used in computing values in the tests conducted by C. C. Smith follow: Lightning Express, 28.9%-1 3-16 in.; Express 350, 27.8%-1 5-32 in.; Sunpress 61, 26%-1 5-16 in.; Delfos 6102, 30.8%-1 3-16 in.; Delfos 631, 30.0%-1 7-32 in.; Deltatype Webber, 27.6%-1 1-4 in.; Haaga, 29.3%-1 7-32 in.; Webber 49-6B-29.2%-1 7-32 in.; Hartsville 16, 28.6%-1 7-32 in.; Salsbury, 32.5%-1 1-8 in.; Ewing Express, 29.6%-1 3-16 in.; Polk, 29.1%-1 3-16 inches.

Washington County Tests: Four tests were conducted by Dr. H. B. Brown, in Washington County. Results of these tests are given in table 8. These results should be worth much to planters in these immediate vicinities.

TABLE VIII. Cooperative Tests—Washington County
By Dr. H. B. Brown

Variety	Total per A. Value Dollars	Lbs. Lint per Acre	Per Cent Lint	Length of Lint Inches	Total per A. Value Dollars	Lbs. Lint per Acre	Per Cent Lint	Length of Lint Inches
				At Stoneville on Loam Soil	At Trail Lake on Buckshot Soil			
Acala 5	127.85	499	35.9	1 1-16				
Lone Star 65	144.44	503	32.0	1 1-8				
Salsbury	125.71	472	32.5	1 1-16f				
Express 432	131.98	462	32.9	1 1-8	140.9	465	31.9	1 1-8f
McLendon Express	128.70	449	32.3	1 1-8f				
Express 782	128.73	425	31.6	1 1-8f				
Walcott Express	135.33	441	29.5	1 1-8f				
Original Express	102.62	379	30.0	1 1-16				
Express 822	142.59	468	30.6	1 1-8f	135.86	422	27.3	1 3-16
Express 350	121.58	395	29.0	1 1-8f	117.95	380	27.8	1 1-8f
Lightning Express	122.62	386	29.1	1 3-16	128.18	401	28.2	1 3-16
Express 630	141.92	448	29.5	1 3-16				
Sunpress 61	144.75	394	27.0	1 1-4	136.42	373	27.3	1 1-4
Delfos 120	129.10	445	30.4	1 1-8	104.84	333	29.1	1 1-8f
Delfos 6102	169.19	562	32.7	1 1-8f	150.28	497	31.9	1 1-8f
Delfos 698	144.77	478	31.6	1 1-8f	133.45	443	32.6	1 1-8f
Delfos 631	169.39	541	31.5	1 3-16	133.93	427	31.2	1 3-16
Deltatype Webber 1	120.11	381	30.3	1 3-16	125.76	348	29.7	1 1-4
Deltatype Webber 2	136.55	435	31.0	1 3-16	134.04	362	30.3	1 1-4f
Miss. Station Trice					135.50	502	30.5	1 1-16f
Webber 49-4	128.27	404	29.2	1 3-16				
				At Dunleith on Loam Soil	At Heathman on Loam Soil			
Delfos 120	131.60	436	32.2	1 1-8f				
Delfos 6102	157.36	526	33.9	1 1-8f	113.66	403	35.3	1 1-8
Delfos 698	157.11	526	33.8	1 3-16	107.96	382	34.9	1 1-8
Delfos 631	138.14	444	32.3	1 3-16	111.46	373	34.1	1 1-8f
Sunpress 61	168.19	459	27.4	1 1-4	115.89	319	28.8	1 1-4
Deltatype Webber 1	115.27	350	30.8	1 3-16f	85.32	271	30.5	1 3-16
Deltatype Webber 2	127.40	387	30.9	1 3-16f	97.01	295	31.1	1 3-16f
Express 350	140.82	447	30.4	1 3-16	102.53	355	31.1	1 1-8f
Lightning Express	147.46	468	30.4	1 3-16	107.66	355	31.3	1 1-8f
Express 432	146.51	515	33.7	1 1-8				
Express 782	131.67	463	35.7	1 1-8				
Cleveland 54	130.08	565	36.7	7-8	87.32	385	39.7	7-8
Miss. Station Trice	110.12	484	32.1	1	84.91	358	35.2	1

NITROGENOUS FERTILIZERS

The fertilizer work was begun in 1921 and results of that year published on pages 1 to 6 in Bulletin 207. The soil is typical Deer Creek Loam which had been brought to a rather high state of cultivation and fertility by the use of legumes before the tests were begun. Cotton in 1922 followed corn. The corn in 1921 had identical fertilizer treatment, plot for plot, as the cotton in 1922. These same plots are to be fertilized in the same way each year for at least five years.

Results of the work in 1921 and 1922 are given in table 9. Three plots were averaged in each case. Express 782 has been used in all plots both years. Boll weevil infestation was very heavy in 1922. All plots were poisoned with calcium arsenate one time but the loss due to weevil was very heavy and the yields low.

TABLE IX. Nitrogenous Fertilizers

Source of Nitrogen Rate per Acre Time of Applying	Pounds Seed Cotton per Acre					Per Cent Increase	
	1922			Average 1921-22		1922	Av. 1921 1922
	Actual Yield	Correct- ed Yield	In- crease	Correct- ed Yield	In- crease		
Sources of Nitrogen—15 Lbs. of Nitrogen per Acre							
Check—No Fertilizer	803.3	749.2		1104.1			
Nitrate of Soda 100 Lbs.	857.7	807.9	58.7	1269.5	165.4	78.4	15.0
Ammonium Nitrate 59 Lbs.	842.3	801.6	52.4	1248.3	144.2	7.0	13.1
Ammonium Sulphate 75 Lbs.	906.6	871.6	122.4	1305.8	201.7	16.3	18.3
Check—No Fertilizer	771.1	749.2		1104.1			
Calcium Cyanamid 100 Lbs.	768.8	771.4	22.2	1126.1	222.1	3.0	2.0
Cotton Seed Meal 250 Lbs.	866.6	899.1	149.9	1266.6	162.5	20.0	14.7
C. S. Meal 125 Lbs. N. of S. 50 Lbs.	855.5	918.7	169.5	1272.9	168.8	23.6	15.3
Check—No Fertilizer	673.3	749.2		1104.1			
Rate of Applying Nitrate of Soda							
Check—No Fertilizer	752.2	732.9		1058.4			
50 Lbs.	842.2	833.7	100.8	1147.3	88.9	13.8	8.4
100 Lbs.	896.6	901.7	168.8	1231.8	173.4	23.0	16.4
150 Lbs.	946.6	967.4	234.5	1334.7	276.3	32.0	26.1
Check—No Fertilizer	705.5	732.9		1058.4			
200 Lbs.	947.7	972.2	239.3	1347.6	289.2	32.7	27.3
250 Lbs.	994.4	1007.6	274.7	1405.3	346.9	37.5	32.8
300 Lbs.	1082.2	1083.2	350.3	1394.1	335.7	47.8	31.7
Check—No Fertilizer	741.1	732.9		1058.4			
Time of Applying Nitrate of Soda—100 Lbs. per Acre							
Check—No Fertilizer	611.1	625.1		1018.5			
At Planting Time	674.4	690.8	65.7	1132.4	113.9	10.5	11.2
First Dirting	693.3	711.1	86.0	1163.5	155.0	13.3	15.2
First Squares	733.3	753.3	128.2	1191.1	172.6	20.5	16.9
Check—No Fertilizer	607.7	625.1		1018.5			
First Blooms	688.8	694.5	69.4	1197.2	178.7	11.1	17.5
½ Planting ½ First Squares	704.4	696.5	71.4	1215.2	196.7	11.4	19.3
½ Planting ½ First Blooms	691.1	670.5	45.4	1116.7	98.2	7.2	9.6
Check—No Fertilizer	656.6	625.1		1018.5			

Corrections have been made in each test for variation in soil based on check plots as follows: From the 3 check plots in each test the unfertilized yield was computed for each fertilized plot. The actual yield of each fertilized plot was multiplied by the average yield of all checks in the test. This product was divided by the assumed or computed unfertilized yield of the plot under consideration. For full details of this method see U. S. Department Bulletin No. 33.

Sources of Nitrogen: In planning this test in the spring of 1921 all materials which bade fair to offer commercial nitrogen for fertilizer purposes were considered. Since that time Calcium Nitrate or Lime Nitrogen is being offered Delta planters in commercial quantities. This material will be compared with other standard commercial nitrogenous fertilizers in 1923.

Results in 1922 show an increase of 20% for cotton seed meal, 16.3% for ammonium sulphate, 7.8% for nitrate of soda, and an increase of 23.6% for the mixture of nitrate and cotton seed meal. Average results of 1921-22, which are more reliable, show that ammonium sulphate increased the yield 18.3%; nitrate of soda, 15%; cotton seed meal and nitrate, 15.3%; and cotton seed meal, 14.7%.

All materials were applied at such a rate as to add 15 pounds of nitrogen per acre. In considering these results the prevailing market price of the various materials must be considered.

Rates of Applying Nitrate of Soda: In 1922, 50 pounds of nitrate per acre increased the yield 13.8%; 100 pounds, 23%; 150 pounds, 32%; 200 pounds, 32.7%; 250 pounds, 37.5%; and 300 pounds, 47.8%.

Average results for 2 years show the following increases: 50 pounds per acre, 8.4% increase; 100 pounds, 16.4%; 150 pounds, 26.1%; 200 pounds, 27.3%; 250 pounds, 32.8%; and 300 pounds, 31.7%.

There seems to be no logical reason why the increases from 150 pounds and 200 pounds are so close together. Future experiments may or may not change this. The outstanding percentage increase from the heavy applications in 1922 was probably due primarily to increased earliness.

In considering the results fertility of soil must be considered. The area on which these tests were made will yield nearly a bale to the acre without fertilizer. On ordinary land the difference between the increase from 150 pounds of nitrate and 200 pounds would, in all probability, be very much greater.

Time of Applying Nitrate of Soda: Results in 1922 indicate that there is danger in waiting too late to apply nitrate. Planting time seems a little early. For the average planter it seems that applying the nitrate should begin as early after the cotton is chopped as is possible and that it should all be on by the time the plants begin to set squares. Data in the third section of table 9 are not entirely consistent but future results will probably compensate the inconsistencies. It is much safer to put nitrate on a little early than a little late. Had the soil on which these tests were made been very poor the earlier applications would, in all probability, have shown up to better advantage.

SPACING

Every year it becomes more evident that the very cheapest way of increasing yields on the average plantation is by obtaining and leaving a better stand. Much cotton is planted too early for best results. Poor seed beds are other reasons for bad stand. After a stand is obtained it is often chopped up and ruined in thinning.

Results of spacing work in 1922 and average results for 4 years are given in table X. The 1922 work was done on very rich soil with Webber cotton. Three series of plots were used. Two series were thinned to 1 stalk and two stalks per hill were left on the third series. The highest plot yield was made by the plot thinned to two stalks every 16 inches. The average yield of the 3 series shows that there was little variation in yield until the space between the hills reached 20 inches. The yield of the unthinned was nearly as high as that of the plot thinned to 24 inches.

TABLE X. Cotton Spacing, 1919 to 1922

Results 1922			Av. Results 1919, 1920, 1921, 1922		
Distance in Drill	Lbs. Seed Cotton per Acre		Distance in Drill	Lbs. Seed Cotton per Acre	
	Total Yield	Less Than Check		Average Yield	Average Increase
12 Inches	1011.1	Check	12 Inches		
Unthinned	942.2	71.1	Unthinned	1234.1	285.6
8 Inches	977.8	38.8	8 Inches	1266.1	317.6
16 Inches	985.6	33.8	16 Inches	1159.9	211.4
12 Inches	1022.2	Check	12 Inches	1228.6	280.1
20 Inches	1023.3	(1)38.1	20 Inches	1102.8	154.3
24 Inches	966.7	(1)19.9	24 Inches	1057.6	109.1
28 Inches	786.7	120.6	28 Inches	948.5	Basis
12 Inches	868.9	Check	12 Inches		

(1) More than 12 inch spacing.

Average results of 4 years' work indicate best results from 8 inch spacing. Twelve inch hills show next best results except the unthinned, which is not practical. Hills cannot be left 8 inches apart but this stand can be closely approximated by leaving from 2 to 4 stalks per hill every hoe-width. The average hoe-width will closely approximate 16 inches. There is little danger of leaving too many plants. Too much stand is many times safer than too little. BE SURE TO LEAVE A STAND.

DATE OF THINNING

There have been some publications broadcasted which recommend letting cotton get 8 to 12 inches high before it is thinned. There seem to be no published data, however, on which to base such recommendations.

A test was conducted in 1922 with 5 series of plots of Webber cotton. One plot in each series was thinned when the plants had 3 to 4 leaves, and the other when the plants were 8 to 12 inches high and had begun to set squares. The plots which were thinned early averaged 736 pounds of seed cotton per acre and the late thinned plots averaged 556 pounds. The difference was 180 pounds or 32.4%. At the first picking the difference in favor of early thinning was 89%. Data on 8 tests in Mississippi and Arkansas show that thinning when the plants are small—the common practice—produced 21.5% more cotton than thinning when the plants were 8 to 12 inches tall. Thin as soon as danger of frost and dying is over.

TOPPING COTTON

The question of topping is often raised. In 1922 16 plots of loam soil were set aside for a topping test. Express 782 was used. Four plots were topped 50 days after planting; 4, 60 days after planting; 4, 70 days after planting; and 4 were not topped. The untopped plots averaged 955 pounds of seed cotton per acre; those topped 50 days after planting 851.6 pounds; those topped 60 days after planting, 960.8 pounds; and those topped 10 days later 887.5 pounds. Topping reduced the yield in both 1921 and 1922.

COTTON BREEDING

Scientific cotton breeding was begun at the Delta Station by E. C. Ewing, plant breeder at the Main Station, more than 10 years ago. When he resigned in 1915 to become plant breeder and experimentalist for the Delta Pine Land Co., Scott, Miss., his successor, Dr. H. B. Brown, continued the work until the writer took it up in the spring of 1920. Both straight selection and crossing, followed by selection, have been used with good results.

From a rather small beginning the work has grown until 1921 when 530 selections made in 1920 were tested, to say nothing of the extensive testing of promising strains brought forward from previous years. Fourteen hundred fifty single row plots were devoted to testing Delta-Station-selected cottons in 1921 in addition to the field and variety tests. The work in 1922 was practically as extensive as in 1921. Many promising strains were isolated.

The first Delta-Station-bred cottons to become commercially important were selected in the fall of 1911. Delfos 120 is still rather widely grown but Express 122 was soon replaced by Express 350, a 1913 selection, which is probably the most widely grown cotton in the Delta. Below are given the descriptions of the Station-bred strains which are now commercially important or bid fair to become so.

Express 350: Dwarf, pyramidal type (almost King type), very early and prolific, fruit limbs medium to long, foliage sparse, very few base limbs, and vegetative branches; bolls small, 80 making a pound of seed cotton, medium to pointed, opening rather wide, permitting the locks to dangle rather badly—due to short peduncles or boll stems, the upright habit of the bolls, and the tendency of the burs to curl—and the cotton to blue and gray considerably due to so much surface being exposed; the lint is good quality, 1 1-8 to 1 3-16 inches under average conditions, and 1 1-4 inches under very favorable conditions. The lint per cent has averaged 29.2 in 23 tests. Express 350 has been and is a good cotton for general use. It is considerably wilt resistant and is probably the best staple variety, now commercially available, for lands showing much wilt infection. For extremely thin lands it is not quite vigorous enough and should be replaced by Express 432 or 782 or by the Webbers. Lightning Express is a descendant of 350 and is very similar to it.

Express 432: Very vigorous and rangy for Express, early and prolific, fruit limbs very long, foliage sparse and very open, very few basal and vegetative branches; bolls small, 82 making a pound, slightly less pointed than those of 350, opening wide but retaining the locks much better than 350; lint, 1 1-8 inches under average conditions, and good quality; 32% lint in 13 tests.

Express 432 is a good cotton for general planting, usually producing higher money values than 350.

Because of its vigor it is well adapted to thin lands and to buckshot soil which produces small plants.

Express 782: Vigorous plant, resembling its parent, Express 432, but slightly later than 432, fruit limbs slightly shorter, and a somewhat denser grower; bolls medium, 75 making a pound, more pointed and larger than Express 432 or 350 bolls, and retaining the locks well; lint is 1 3-16 inches under average conditions and very silky; 31.6% lint in 8 tests. Express 782 has practically the same adaptation as 432 but has longer lint and lint which is finer and silkier.

Sunpress 61: A cross between Sunflower and Express. The plant is very similar to that of Express 350 except that it is a little more vigorous and leafy. The bolls are small, 79 making a pound, with the same tendency to produce low grades as has Express 350. The lint is of excellent quality, being very fine and silky and is 1 5-16 to 1 3-8 inches when grown under average conditions. The percentage of lint is low, averaging 26.4% in 11 tests. For those who want an early, prolific, extra long cotton, Sunpress has much merit.

Delfos 6102: Very dwarf, widely pyramidal, very early and prolific, leaves very small, foliage very sparse, fruit limbs very long for the size of the plant, very few basal and vegetative branches; bolls small—81 to the pound of seed cotton—opening very wide, standing very erect, burs curl very badly, and the locks dangle and weather very badly; lint, 1 3-16 inches and of good quality under average conditions; lint percentage 31.8 in 13 tests. Due to its earliness, prolificacy, open type, and dwarfness Delfos 6102 is especially adapted to new or other rich land. This does not mean, however, that it is not good for general planting. It has made good on all types of soil. Except on wilt infected soil and probably on extremely thin unfertilized soils there is probably not a higher lint producer in existence and certainly there is no better producer in the staple class. With all of its good qualities it weathers as badly as, or a little worse than, Express 350 and has small bolls.

Delfos 631: Plant type very similar to Delfos 6102 except that it is a little more vigorous grower, and has larger leaves, shorter fruit limbs, and some more vegetative branches. The bolls are larger than those of 6102, 69 making a pound of seed cotton. The peduncles or boll stems are longer, the burs curl very little, and it is much more storm resistant than 6102. The lint is good quality and is 1 3-16 to 1 1-4 in. long when grown under average conditions. In 14 tests the lint percentage has averaged 31.1. The adaptation of Delfos 631 is the same as that of 6102 except that it is better for poor land and not so good on extremely rich soil where the rotting of the bolls, due to dense shade, is an important factor. It is not quite so prolific as 6102 but if the difference in grades and picking had been considered it would have ranked as high in value in the average of all tests where the two strains have been compared—about 25 tests in all.