

Short Staple Variety Demonstration, Graham County, 1988

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ABSTRACT

Cotton lint yields in the variety trials in Graham county were higher than the 1987 yields by close to 200 pounds per acre. Two varieties, BR 110 and NK KNX 111 (now KC 311) yielded more than DP 90 at the Thatcher site, the highest yield being 1,569 pounds of lint per acre. In Eden, DP 90 was the highest yielding variety with 1,237 pounds of lint per acre. The New Mexico acalas didn't yield as much lint per acre as the top yielding varieties, but with 1988's premium, produced substantial income per acre. In Thatcher the highest yielding acala produced \$861 per acre compared with BR 110's \$910, whereas in Eden the highest yielding acala produced \$736 per acre against DP 90's \$717.

INTRODUCTION

Two new varieties, Northrup King's KNX 111 and Desert Cotton Research and Development's BR 110, had yields rivaling the yields of DP 90 in the 1987 trials (1) and needed to be tested again in 1988. Interest in the New Mexico acalas has also grown in the Safford valley. With a fiber quality that obtains up to 16 cents per pound premium, there has been interest in determining whether any of the new New Mexico acalas could produce more dollars per acre than the current valley standards. Interest has also been kindled because the New Mexico acalas have buyers for their crop whereas the lesser quality cottons are put under government loan in the ASCS program.

MATERIALS, METHODS, AND DATA

The crops were grown with cooperating farmers according to their normal cropping procedures. The varieties were planted in two row plots to use up less acreage and the harvested seed cotton was weighed in the field using trailer scales. Duplicate samples were taken from each variety to determine lint turnout and fiber quality.

CROP HISTORY

LOCATION 1: Thatcher
COOPERATOR: Dennis Layton
SOIL TYPE: Pima clay loam
ELEVATION: 2,900 feet
PREVIOUS CROP: Cotton
PLANTING DATE: 6 April 1988
PLANTING RATE: 28 lbs/ac in 38" rows
REPLICATIONS: 4
HERBICIDE: None
FERTILIZER: 125 units of N
IRRIGATION: Pre-irrigation + 6 irrigations (4 ac ft)
INSECTICIDE: 2 applications of cygon for lygus and 2 applications of pyrethroids for pink bollworm
PIX: 1 pint applied
DEFOLIATION: Sodium chlorate, 2 applications

HARVEST: First pick: 3 November; Second pick: 2 December
 PLOT SIZE: Two row plots approximately one quarter mile long per replication.
 HEAT UNITS DURING SEASON: 3,870

RESULTS AND DISCUSSION

Table 1. Cotton Yields, Lint Turnouts, % First Pick and Plant Heights on Short Staple Cotton Varieties in the Layton Farm, Graham County, 1988.

VARIETY	LINT* YIELD	PERCENT 1ST PK	% LINT TURNOUT	PLANT** HEIGHT	PLANT POP'N
BR 110	1,569 a#	95.6 ab	38.1 a	36.9 a	36531 ab
NK KNX 111*#	1,583 a	96.4 a	36.3 bcd	36.6 a	59221 a
DP 90	1,496 a	96.2 ab	36.9 b	35.3 ab	51280 a
DP 77	1,478 a	95.7 ab	37.8 a	36.1 ab	25413 b
Delcot 344	1,262 b	95.5 b	36.4 bcd	32.8 ab	48784 a
Acala 2745	1,197 b	94.1 c	35.4 cd	35.8 ab	51280 a
1517-SR1	1,188 b	93.7 c	35.4 cd	33.0 ab	48784 a
GC 510	1,158 b	92.1 d	36.0 bcd	30.4 b	49465 a
1517-88	1,146 b	94.4 c	35.0 d	35.0 ab	54003 a
GC 260	1,126 b	92.3 d	35.6 bcd	33.1 ab	44473 a
1517-SR2	1,113 b	93.7 c	35.4 cd	32.5 ab	50599 a
GC 356	1,112 b	92.1 d	36.5 bc	30.9 ab	45834 a

* Lint yield is in pounds per acre.

** Plant height is in inches.

All values in a column followed by the same letter are not significantly different at the 5% level using the Student-Newman-Keul's test.

The Northrup King experimental KNX 111 has been renamed and is now available as KC 311. Table 1A. Lint Quality by Variety on the Layton Farm, Graham County 1988.

Table 1A. Lint Quality by Variety on the Layton Farm, Graham County 1988.

Variety	Grade*	Staple	Micronaire	Strength	Uniformity
BR 110	41	36	37	28	77.0
NK KNX 111	41	37	41	30	81.0
DP 90	41	37	41	29	81.0
DP 77	41	35/37	36/39	26	78.5
Delcot 344	41/51	38	41/45	26	80.5
Acala 2745	41/51	39	41	29/30	80.5
1517-SR1	-	-	-	-	-
GC 510	41/51	37	41/44	28/30	82.0
1517-88	41	38	38/39	29/31	79.0
GC 260	41	37/38	40	29/31	83.5
1517-SR2	41/51	37/38	41/43	28/30	83.5
GC 356	51	37/38	40	31/32	84.0

* The samples were ginned on a small gin that did not have stick or trash cleaners; as a result, the samples were trashy and the grades were lower than they should have been.

The cotton yields at the test site were higher for every variety in 1988 than in 1987, possibly due to the greater number of heat units during the growing season. The heat units between planting and first pick were 3,487 and 3,870 for 1987 and 1988, respectively. Plant heights were slightly taller and the percent first pick was considerably higher in 1988 than in 1987. BR 110 jumped from number 3 in 1987 to number 1 in 1988, partly due to the percent of lint turnout, which was higher than in the other location in Graham county and higher than seen in the trial last year. It may not be reasonable to expect that high a turnout normally.

Plant populations were fairly consistent between varieties with exception of DP 77 and BR 110; those two varieties had less plants per acre, perhaps indicating a lack of seedling vigor to cope with the cool April weather after planting. In spite of the handicap, both varieties performed well.

In evaluating the New Mexico acalas, the lint value must be considered as well at the lint yields. Premiums in the neighborhood of 16 cents were seen for the 1517's, and values of 58 cents/lb and 72 cents/lb were seen at harvest time for BR 110 and Acala 2745, respectively (2). Those values times the yields produced \$910 and \$861 for BR 110 and Acala 2745. Acala 2745 is still an experimental variety at the present time, but apparently performs well in the Graham County area.

CROP HISTORY

LOCATION 2: Eden
 COOPERATOR: Colvin Farms
 SOIL TYPE: Grabe clay loam ELEVATION: 2800 feet
 PREVIOUS CROP: Wheat and milo, 450 units of N were applied
 PLANTING: Date: 25 April 1988 Rate: 30 lbs/ac in 38" row
 REPLICATIONS: 4
 HERBICIDE: Treflan
 FERTILIZER: None
 IRRIGATION: Pre-irrigation + 4 irrigations (40 ac in)
 DEFOLIATION: Sodium chlorate + accelerate
 HARVEST: First pick: 14 October, Second pick: 16 November
 HEAT UNITS DURING SEASON: 3474

Table 2. Cotton Yields, Lint Turnouts, % First Pick and Plant Heights on Short Staple Cotton Varieties in Eden, Graham County, 1987.

VARIETY	LINT* YIELD	PERCENT 1ST PK	% LINT TURNOUT	PLANT** HEIGHT
DP 90	1,237 a#	93.0	37.2	37.5 abc
BR 110	1,182 ab	89.8 h	36.1 ab	39.4 a
STV 506	1,175 ab	95.7 bc	37.5 a	32.9 c
DP 20	1,165 #*	97.1	34.4	27.0
DES 119	1,124 abc	96.1 b	37.1 a	34.3 bc
DP 77	1,069 bcd	89.5 h	37.3 a	39.6 a
NK KNX 111##	1,065 bcd	93.0 f	37.0 a	40.5 a
Delcot 344	1,041 bcd	95.4 bcd	36.3 ab	35.8 abc
1517-SR2	1,023 bcd	92.9 f	35.7 ab	38.8 ab
1517-SR1	1,014 bcd	95.4 bcd	35.2 ab	35.9 abc
GC 260	987 cd	94.6 d	35.6 ab	37.1 abc
Acala 2745	986 cd	95.2 cd	35.4 ab	37.1 abc
1517-77BR	983 cd	94.9 cd	33.3 c	38.5 ab
1517-88	959 cd	95.0 cd	35.6 ab	36.4 abc
GC 356	909 cd	92.0 g	36.3 ab	37.9 ab
GC 510	895 d	93.9 e	36.1 ab	37.1 abc

* Lint yields are in pounds per acre.

** Plant heights are in inches.

All values in a column followed by the same letter are not significantly different at the 5% level using the Student-Newman-Keul's test.

#* DP 20 was not included within the replicated test, but was planted alongside the test.

Northrup King's experimental KNX 111 has been renamed and is now available as KC 311.

Table 2A. Lint Quality by Variety on the Colvin Farm, Graham County, 1988.

Variety	Grade*	Staple	Micronaire	Strength	Uniformity
DP 90	31/41	35/36	40/43	26/30	82
BR 110	41	37	41	27	78
STV 506	41/42	36/37	42/43	26/27	81
DP 20	-	-	-	-	-
DES 119	41	35/36	42/44	27	83
DP 77	31	37	39	25	80
KNX 111	41	36	43	30	76
Delcot 344	31/41	36/37	43/45	27/28	81.5
1517-SR2	41/51	37	43	28/30	83.5
1517-SR1	31/41	38/39	37/40	29/31	84.5
GC 260	31	37	45	28	84
Acala 2745	41	37	43/44	28/29	81
1517-77BR	41	38	43	32	82.5
1517-88	41	37/38	40/42/43	28/29/31	81.5
GC 356	41	36/37/38	41/42/43	29/30/31	84
GC 510	37	37/38	43	27/28	84

* The samples were ginned in a gin without a stick and trash cleaner; the extra trash in the lint lowered the grades in most samples.

As was seen in Thatcher, the yields in 1988 surpassed those in 1987, with actually less heat units from planting to first pick in 1988 than in 1987. Heat units recorded at the experiment station in 1987 were 3,637 vs 3,474 in 1988. The shorter season varieties, such as Stoneville 506 and DES 119 and the acalas increased more than the long seasoned varieties. Plants were taller perhaps due to a better season, perhaps due to better soil. Delta Pine 90 produced the most lint per acre both last year and this year, with BR 110 coming in second, but the interesting part was that the next three varieties were shorter seasoned varieties. Delta Pine 20 looked particularly impressive, coming in with the most lint at the first picking and having the highest percent first pick. In a shorter season situation, these varieties would be advantageous.

Again, comparing the values of the 1517 acala against DP 90, the yield of 1517-SR2 at 72 cents/lb produces \$736 and the yield of DP 90 at 58 cents/lb produces only \$717. In this case the 1517 acala showed an economical advantage. Caution must be exercised in using the yield data for the new New Mexico varieties since this is the first time many of them have been tested in this area. Another year or two of testing will give a better idea of their yield potential. The market is also flexible and premiums vary from year to year. Table 3 is given so one can select a yield and a premium and find on the table the value of the crop, 53 cents per pound is used for the base value on this chart.

Table 3. Values of Cotton with Various Premium Levels and Various Yields, 53 Cents per Pound is used for The Base Value.

Yield (lb/ac)	Premium (cents/pound)									
	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.2	
800	424	440	464	480	504	520	544	560	584	
900	477	495	522	540	567	585	612	630	657	DOLLAR
1000	530	550	580	600	630	650	680	700	730	VALUE
1100	583	605	638	660	693	715	748	770	803	OF
1200	636	660	696	720	756	780	816	840	876	LINT
1300	689	715	754	780	819	845	884	910	949	PER AC
1400	742	770	812	840	882	910	952	980	1022	
1500	795	825	870	900	945	975	1020	1050	1095	
1600	848	880	928	960	1008	1040	1088	1120	1168	

1. Clark, Lee J. and Ronald E. Cluff. 1988. Short Staple Variety Demonstration, Graham County, 1987. Cotton Report. Univ. of Arizona, College of Agriculture, Series P-72; 131-4.

2. Personal communication with SWIG Cotton, El Paso, TX.

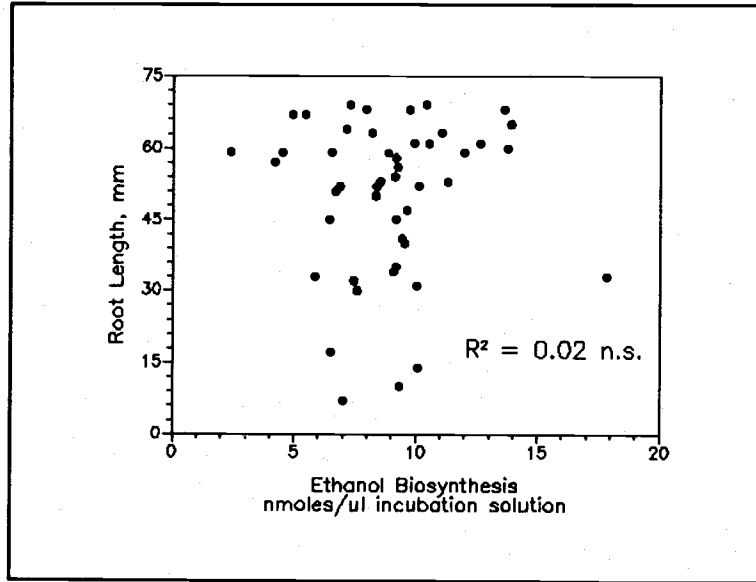


Figure 1. Relationship between cool test results and ethanol biosynthesis of imbibed cotton seeds incubated in N₂ gas for 2 hours.

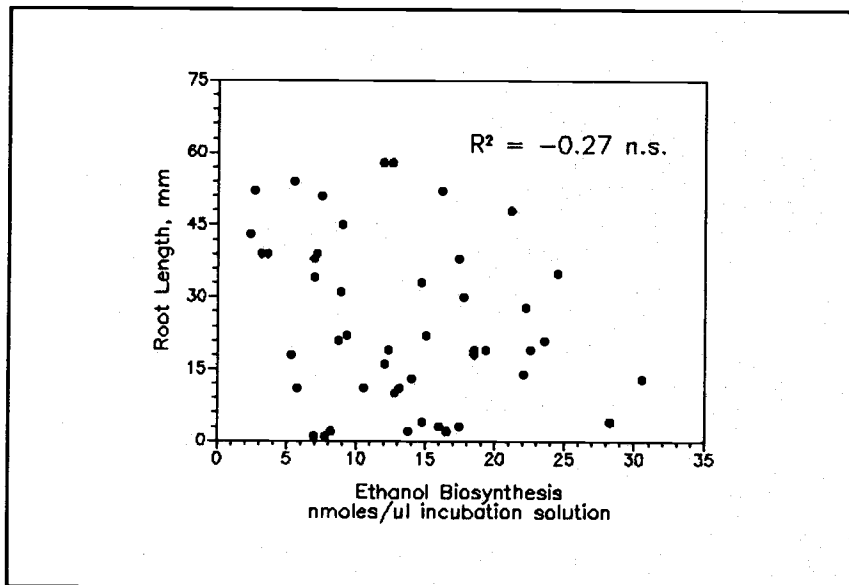


Figure 2. Relationship between cool test results and ethanol biosynthesis of imbibed cotton seeds incubated in N₂ gas and PEG for 2 hours.