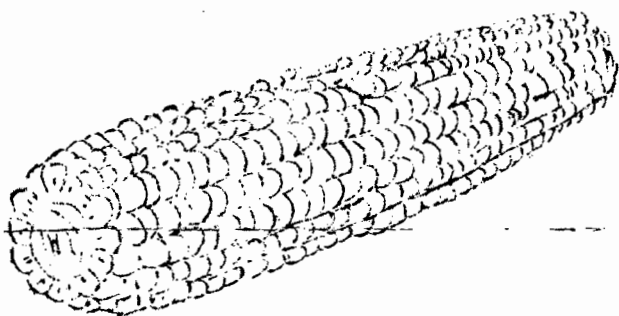


CO-SI-54-2

1954

FIELD CORN
PRODUCTION STUDIES
DESERT AREAS
OF
RIVERSIDE COUNTY



Agricultural Extension Service
University of California
Room 7, P.O. Building
Riverside, California

FIELD CORN PRODUCTION STUDIES
PALO VERDE VALLEY, 1954

by Win Lawson, Farm Advisor

Field corn shows promise in the desert valleys. In observation tests last fall in both the Coachella and Palo Verde Valleys, and in full scale replicated tests this spring, as well as approximately 900 to 1000 acres of field plantings, it has been shown that field corn can be grown with reasonable success. If future work, along with growers experiences, confirms that corn is well adapted to this area it will definitely be an asset to the agriculture of the valleys.

First:

As a spring crop corn can take the place of former cotton acreage left bare by allotments.

Second:

Corn fits in well as a summer crop to go in at a time when there is a minimum number of field crops that can be planted.

Third:

With the livestock program on the increase in the Palo Verde Valley, corn will make an excellent feed both as grain and as ensilage. Also with California importing a large percentage of grain corn from the Midwest, it seems likely that corn ~~will be in demand here in California.~~

In order to determine the possibilities of field corn as a crop for the Palo Verde Valley and to bring to growers as much information as possible on this crop the Agricultural Extension Service has conducted field trials both last fall and this spring.

Following is a summary of the trials conducted this spring, a summary of the yields of the observation tests last fall, as well as general observations and conclusions.

FIELD CORN VARIETY TEST - SPRING 1954 - Cooperator, Cliff Sharp, Allied Farms, Blythe

PROCEDURE

Ten varieties were tested in a trial replicated 4 times and randomized. Each treatment was 4 rows 150 feet long, rows 40 inches wide.

SOIL TYPE

Medium loam.

HISTORY OF GROUND

1953-cotton; 1952-cotton; 1951-brush.

TIME OF PLANTING

February 24 (Soil temperature 58 degrees)

METHOD OF PLANTING

Planted with I.H. cotton planter with corn plate #1795A. Cogs were changed on the chains as necessary to give a 5-7 inch spacing within the row, planted 2 inches deep into pre-irrigated beds after harrowing down.

CULTURAL PRACTICES

Due to drying winds, corn had to be irrigated on March 2. Ground temperatures remained down between 52 degrees and 54 degrees from March 3 until March 17. On March 16 the ground was broken up over the drill row with a rotary hoe.

CULTIVATIONS

March 29, April 15, April 22.

FERTILIZATION

Two hundred pounds 16-20 broadcast prior to listing, 200 pounds ammonium nitrate side dressed April 1st 8 inches from both sides. Two hundred pounds ammonium nitrate side dressed April 20th. Total, 40 pounds P_2O_5 and 164 pounds actual nitrogen.

IRRIGATION

March 20th, rained .65 inches. April 3, April 25, May 7, May 14, May 21, May 28, June 4, June 10, June 16, June 22, June 26. Total, eleven irrigations.

INSECT CONTROL

About May 15 corn earworm moderately heavy. Treated May 19, three pounds toxaphene spray per acre, flown on. Treated again approximately May 30. Benefit from treating doubtful.

HARVESTING PROCEDURE

Picked July 22. Fifty feet of two center rows of each variety in each replication were picked by hand.

RESULTS

In order to compare yields accurately it was necessary to take moisture percentages of each variety and calculate yields to a standard moisture percentage. Twelve per cent moisture was used as a standard. Each picking was weighed and the yields given here are averages of three replications. (A poor stand was obtained in replication 4 and it was discarded). Yields were calculated by using the standard of 70 pounds per bushel of corn on the cob.

TABLE I

VARIETY	BU/A	YIELD* LBS. GRAIN/A	MOISTURE PERCENT- AGE AT HARVEST	HEIGHT OF PLANT IN INCHES	WORM DAMAGE	SMUT	MATURITY RANGE
FUNKS G-29	125.2	7011	20	108	Slight	None	Medium Early
BIG JIM	105.5	5908	26	116	Slight	Moder- ate	Medium
PFISTER 403	105.4	5902	21	96	Moder- ate	Moder- ate	Medium
PFISTER 383	102.5	5740	23	108	Heavy	Heavy	Medium
PIONEER 352	85.5	4788	17	114	Heavy	Heavy	Early
CARLSON	82.9	4642	22	108	Moder- ate	Heavy	Medium
FERRY MORSE GRAIN	74.9	4194	18	84	Moder- ate	Light	Early
PIONEER 302	70.6	3954	31	114	Slight	None- Light	Medium
TEXAS 30	68.4	3830	41	116	Slight	None- Light	Late
TEXAS 28	60.6	3393	42	118	Slight	Light	Late

* Calculated to a moisture content of 12%.

TIME OF PLANTING TRIAL, Cooperator, Cliff Sharp, Allied Farms, Blythe

TREATMENTS

Plantings February 10, February 24, March 17, April 1.

PROCEDURE

Test replicated, randomized, 4 rows per treatment, rows 600 feet long.

VARIETY

Texas 30

METHOD OF PLANTING

Cultural practices and harvesting procedure are the same as noted in the variety test.

TABLE II

TREATMENT	YIELDS *	
	BU/A	LBS. GRAIN/A
February 10	79.9	4474
February 24	68.6	3841
March 17	50.5	2828
April 1	Not harvested, ears not pollinated	

* Average 4 replications, calculated to 12% moisture. Significant difference between February 10 and February 24 plantings and between February 24 and March 17 plantings.

FERTILIZER RATE TEST, Cooperator, Cliff Sharp, Allied Farms, Blythe

PROCEDURE

Trial was replicated 4 times and randomized, rows 150 feet long, 4 rows per treatment, 40 inches rows. Irrigation, insect control, method of planting, cultural practices, and harvesting procedure are the same as noted in the variety test.

VARIETY: Texas 30

DATE OF PLANTING: February 24

FERTILIZER: Ammonium nitrate
and treble superphosphate

DATE OF APPLICATION:
March 26

METHOD OF APPLICATION:
Side dress 2" deep 8" to
side of row

TABLE III

TREATMENT	YIELD* BU/A	YIELD* LBS. GRAIN/A
0 N, 0 P ₂ O ₅	10.6	593
80 N, 0 P ₂ O ₅	35.9	2010
160 N, 0 P ₂ O ₅	65.7	3679
160 N, 150 P ₂ O ₅	67.6	3785

* Yields calculated to 12% moisture. Significant difference in 0 N and 80 N. Significant difference in 80 N and 160 N. Difference due to P₂O₅ not significant.

SPACING TRIAL, Cooperator, Cliff Sharp, Allied Farms, Blythe

PROCEDURE

Plants thinned by hand hoeing on April 16. Corn about 18 inches high, replicated three times and randomized. Two rows per treatment, all other factors same as noted in variety trials.

VARIETY: Texas 30

DATE OF PLANTING: February 24

TABLE IV

TREATMENT	YIELD* BU/A	YIELD* LBS. GRAIN/A
Check - unthinned (6 inch spacing)	68.2	3819
12 inch spacing	71.8	4020
18 inch spacing	71.0	3976

* Yields calculated to 12% moisture. Statistical analysis shows no significant difference in any of the treatments.

ENSILAGE AND GRAIN VARIETY TRIAL: Cooperator, Ben Olson, Blythe

PROCEDURE

Replicated 4 times, randomized, 100 feet of row cut for silage by hand. Weighed immediately after cutting. All varieties cut at same stage of maturity (80% dent). The four varieties tested were, Pioneer 302, Pioneer 352, Pfister 383, and Texas 30. Pioneer 352 and Pfister 383 were cut June 19. Pioneer 302 and Texas 30 were cut June 24th. On July 22 100' of the same rows were picked by hand and grain yields computed.

PLANTING DATE

February 26

SOIL TYPE

Holtville Loam

IRRIGATION

A total of 15 irrigations were given

FERTILIZATION

Three hundred pounds 16-20 before pre-irrigation, two one hundred pounds application of urea and one 75 pounds application of ammonium nitrate. Total - 60 pounds P₂O₅, 173 pounds N.

TABLE V

VARIETY	TONS ENSILAGE	GRAIN YIELD*		MOISTURE PERCENTAGE AT GRAIN HARVEST
		BU/A	LBS/A	
Texas 30	27.8	120.9	6770	21.1
Pioneer 302	26.1	130.8	7324	19.9
Pioneer 352	25.5	151.7	8495	11.06
Pfister 383	22.3	133.4	7470	9.83

* Average of 4 replications calculated to 12% moisture.

VARIETY OBSERVATION PLOT: Cooperator, Cliff Sharp, Allied Farms, Blythe

PROCEDURE ¹

DATE PLANTED: February 24

Four rows of 7 varieties not included in replicated trial were observed. The following table gives the yields as determined from 100 feet of row in each variety.

TABLE VI

Based on one unreplicated plot

VARIETY	YIELD PER ACRE*		PER CENT MOISTURE	WORM DAMAGE	SMUT
	BU/A	LB. GRAIN			
Vinton V-11	106	5936	21	Moderate	Slight
Pioneer 300	98	5488	30	Heavy	Heavy
Vinton V-35	91.0	5096	31	Moderate	Heavy
Watson 124	83	4648	41	Moderate	Heavy
N.K. #30	74	4144	41	Slight	Slight
Texas 15	71	3976	49	Slight	None
Pioneer 505	68.3	3824	30	Slight	Slight

* Calculated to 12% moisture 1. All other procedures same as variety trial.

Planted July 21,

FALL 1953
INDIO TEST RESULTS

Harvested December 17th

VARIETY	BUSHEL ACRE	POUNDS GRAIN ACRE	% TASSEL* % SILK		RELATIVE MOISTURE		REMARKS
			SEPT. 11	SEPT. 11	AT HARVEST		
Northrup King #30	55	3080	40%	0	Dry		
Aggeler & Musser 2577	51	2856	90%	0	Dry		
DeKalb 2231	51	2856	0	0	Medium Dry		
Carlson C25MF Aggeler & Musser 3493*	47	2632	60%	0	Dry		Short Stalk
Pioneer 302*	45	2520	10%	0	Medium Wet		
Pioneer 302*	45	2520	75%	0	Dry		
Pfister 347* Aggeler & Musser 8530-1	41	2296	75%	0	Dry		
Aggeler & Musser 9577	40	2240	99%	50%	Very Dry		
DeKalb 1002*	38	2128	99%	50%	Dry		
DeKalb 2456*	37	2072	50%	0	Dry		
Pioneer 300*	37	2072	25%	0	Dry		Short Stalk
Pioneer Ex 5171	36	2016	25%	0	Dry		
Pioneer 352*	36	2016	85%	0	Dry		
Pioneer 352*	35	1960	40%	0	Dry		
DeKalb 459	34	1904	60%	0	Dry		Short Stalk
Pioneer 301 B	34	1904	10%	0	Medium Dry		
Pfister 38319F*	34	1904	30%	0	Dry		
K 3A2861	32	1792	60%	0	Dry		
C 12 MF	32	1792	95%	0	Dry		Short Stalk
Pfister 34719F*	31	1736	30%	0	Dry		
K 3A NK	28	1568	90%	0	Dry		
Pioneer 354	28	1568	75%	0	Dry		
Pfister 48419F	28	1568	0	0	Medium Dry		
C 22 MF	26	1456	75%	0	Dry		
Pioneer X9781	26	1456	50%	0	Dry		
Vinton V-35	18	1008	60%	0	Dry		
Pioneer 388	13	728	90%	50%	Very Dry		Very Short Stalk

*Average of 2 replications. Temperatures for a week prior to Sept. 11th ranged from 100 to 112 degrees. Temperature on Sept. 11th was 105 degrees.

Planted July 24th

FALL 1953
BLYTHE TEST RESULTS

Harvested December 16th

VARIETY	BUSHEL ACRE	POUNDS GRAIN ACRE	% TASSEL* SEPT. 11	% SILK SEPT. 11	RELATIVE MOISTURE AT HARVEST	REMARKS
Pfister 38319F	88.6	4962	90%	5%	Dry	Thin Husk Loose Husk
3493 Aggeler & Musser, Mexican June	76	4256	0	0	Wet	
Pioneer 345	70.3	3937	75%	0	Dry	Tight Husk
Pfister 48419F	70.3	3936	10%	0	Medium Wet	Thin Husk Loose Husk
Aggeler & Musser 2577	66	3696	90%	5%	Dry	
Northrup King #30	63.2	3539	0	0	Medium Wet	
Pioneer 352	51	2856	95%	5%	Dry	Tight Husk
DeKalb 1002	41.5	2324	0	0	Medium Wet	
Vinton V-35	34.2	1885	35%	0	Dry	Short Stalk
Pioneer 302	34.2	1885	5%	0	Medium Dry	
Northrup King K 3 A			NOT HARVESTED, POOR STAND			
Pioneer 300			NOT HARVESTED, POOR STAND			
Pioneer 344			NOT HARVESTED, POOR STAND			

* Temperature during this period about 105 degrees

FALL 1953
COACHELLA VALLEY FEED YARDS OBSERVATION TEST, INDIO

Planted August 8th

VARIETY	YIELD*	
	BUSHEL/A	LBS. GRAIN/A
Pioneer 302	101	5656
Mexican June	87	4822
King Krost	58	3284
A & M Y Strain	58	3284
A & M E Strain	49	2744
Hickory King	40	2240

*Based on 1 unreplicated plot. Plot size 3/4 to 1 acre.
Yields given are on the basis of 10% moisture.

CONCLUSIONS AND OBSERVATIONS

1. Some of the trials, such as the Olson test, show that with good soil and proper management, it is possible to obtain high yields. Possibly some of the factors that go to make these top yields are not completely known and a grower probably can not expect to obtain these yields every time. But it does show the possibilities and lends encouragement to the idea that field corn may take its place as one of the crops for the desert valleys.
2. Corn is a heavy user of nitrogen. Unless following a legume, it may take from 160 - 220 pounds of actual nitrogen to produce maximum yields.
3. Irrigation of field corn, especially from silking until the corn is in the hard dent, is critical. Holding off water on corn in late stage of development during hot weather can result in drastic reduction in yield.
4. Corn earworm may cause some damage during the later part of the spring season but it probably does not pay to try to control them. Fall corn will present greater problems with earworm and fall army worm damage. More work needs to be done to determine economical methods of control.
5. Corn will not do well on light, sandy soils even with heavy fertilization.
6. Cost of production will be about \$100 per acre with adequate fertilization.
7. Data on yields of various varieties is not complete enough to recommend one variety to the exclusion of others. The grower can see from the accompanying tables the performance of the various varieties. ~~It is to be noted that no one~~ variety is consistently high in all tests in all areas. However, there are several promising varieties and with proper management field corn can well become a major field crop in the desert valleys.

COOPERATORS

Seed was supplied for the tests
by the following seed companies

Company	Represented by
Aggles and Musser 622 Mateo Street Los Angeles, Calif.	
Carlson Hybrid Corn Company Audubon, Iowa	
Germain Seed Company (Funk Seed Corn)	Sam Decker 747 Terminal Street Los Angeles, California
DeKalb Agricultural Association DeKalb, Illinois	Harry Kinder C. M. Volkman & Company 55 Union Street San Francisco, California
Northrup King Company P.O. Box 6036 Capitol Station Phoenix, Arizona	David McFadden 5608 Sheila Street Los Angeles, California
Pfister Associated Growers, Inc. Monroe, Iowa	John Stretcher Taylor-Walcott 768 Brannan Street San Francisco, California
Pioneer Hybrid Corn Company Johnston, Iowa	Jonathan Garst 6024 Margarido Drive Oakland, California
Blythe Feed & Seed Texas 30 and Ferry-Morse Grain	Jim Lurman Blythe, California
Ferris-Watson Seed Company	Minter Womack Box 276 Garland, Texas
Vinton Hybrid Corn Company Vinton, Iowa	

RESULTS
HYBRID FIELD CORN VARIETY TEST SPRING PLANTING 1954
Bowlin Ranch 48th and Jackson, Indio

by Otis A. Harvey, Farm Adviser

Ten varieties of hybrid field corn were planted February 24, 1954, in rows forty inches apart. Each variety was planted in four different locations of four rows each in random order. Harvesting for results was done by hand from two rows fifty feet long for each variety at each of the four locations. The results for each variety were averaged, the per acre yield calculated and adjusted to 12 per cent moisture.

A summary of the results are reported in Table I below.

TABLE I

YIELDS IN POUNDS PER ACRE (Adjusted to 12% moisture)

VARIETY	BUSHEL PER ACRE (Ear corn lbs divided by 70)	POUNDS GRAIN PER ACRE (56 X Bushels)	POUNDS EAR CORN (Cob & Kernels)
Pioneer 302	88.2	4939	6178
Pfister 383	85.1	4766	5959
Pfister 403	79.7	4463	5577
Funk G-29	75.2	4211	5263
Texas 28	75.1	4206	5258
Carlson C-25	74.6	4178	5225
Texas 30	71.4	3998	5000
Ferry Morse Grain	71.0	3976	4971
Big Jim	66.7	3735	4669
Pioneer 352	66.4	3718	4647

PLANTED: February 24, 1954

SOIL TEMPERATURE: 60°, 10:00 A.M.

SOIL TYPE: Indio loam - pre-irrigated

PREVIOUS CROPS: Heavily fertilizer
vegetables and cotton

ROW SPACING: 40", 6" average spacing in row

FERTILIZER: 140 per acre of nitrogen from ammonium gas drilled

DATE HARVESTED: July 15, 1954

CONCLUSIONS

YIELDS

The results of this test show that nearly ninety bushels of corn (five thousand pounds of grain) were produced on a medium textured soil from a late February planting in the Coachella Valley.

VARIETIES

In this test, Pioneer 302 yielded highest (88.2 bushels) with Pfister 383 following closely (85.11 bushels).

It should be pointed out, however, that although this test was replicated four times, one years testing of any group of varieties is certainly not conclusive. Experience in corn test plots elsewhere in the county and in the state show that anyone variety may do poorly one year even though a top yielder normally. Therefore this test does not determine precisely which variety will give the best average yield over a period of years.

It is also probable that any one of the top four or five varieties could, under good conditions, yield over a hundred bushels in the desert.

GENERAL CONCLUSIONS

The data from this test indicate that reasonably high yields of corn are possible in the Coachella Valley. It is also possible that with more experience particularly with irrigation technique, yields of over one hundred bushels of hybrid field corn can be secured. In fact, a similar test conducted in the Palo Verde Valley (by Win Lawson, Farm Advisor) gave yields of over one-hundred bushels per acre.

300 c/
7/54