

DETERMINATION OF REPAIR AND OPERATING COSTS FOR AGRICULTURAL
MACHINERY USED IN COTTON PRODUCING AREAS

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Machinery management decisions are based on the best available information. This investigation, sponsored by Cotton Incorporated, was initiated a year ago to obtain more accurate, regional data on machinery costs and performance.

Repair Costs

A survey of a representative group of farmers was begun to determine repair costs, annual usage, down time and life for the major items of farm equipment. Some eighty farmers in Pima, Pinal, Maricopa and Yuma Counties were personally contacted and have agreed to furnish repair data. The cooperators have been furnished information, and record keeping procedures have been initiated on those forms having no formal records. Personal contact with the cooperating farmers will be continued on a periodic basis to assist in obtaining the desired information.

Machine Capacity

Time studies of field machine operations are being conducted to obtain data on the field efficiency, percentage of field time spent doing the primary machine function, and capacity, acres completed per hour. The cotton harvester data are summarized in Table 1. Time studies of spring field operations will continue this year.

Publication

Larson, D.L. and A.S. Gwarzo. 1975. Field capacitive performance of cotton pickers in Arizona. Paper No. 75-1506, ASAE, St. Joseph, MI.

Table 1. Average Activity Times for Two-row Cotton Pickers Operating at Different Speeds and Dumping into Trailers.

	First Picking			Second Picking	
	S>2.5	2.0<S<2.5	S<2.0	S>2.5	S<2.5
Picking time, min/ac	27.05	33.17	44.57	24.54	32.99
Turning time, min/ac	1.41	.91	2.40	1.73	1.54
Dumping time, min/ac	4.22	2.93	4.34	.50	.99
Travel time, min/ac	2.78	4.06	3.64	.78	.86
Miscellaneous time, min/ac	5.03	3.99	6.64	4.04	9.48
Effective field capacity, ac/hr	1.48	1.33	.97	1.90	1.31
Field efficiency, %	67	74	72	78	72

S = Speed, mph

MINIMUM TILLAGE COMPARISON ON SHORT STAPLE (1st Pick Only)*
Evco Farms, Art Pacheco, Mgr., Marana - 1975

J.F. Armstrong and W.W. Hinz

<u>Practice</u>	<u>Seed Cotton/Plot</u> (Pounds)	<u>Lint/Plot</u> (Pounds)	<u>Lint/Acre</u> (Pounds)
Minimum Tillage ^{1/}	884	322	966
Conventional Tillage ^{2/}	848	308	924

*Harvested - 10/28/75

Minimum Tillage Comparison on Pima S-5 (1st Pick Only)*
 Evco Farms, Art Pacheco, Mgr., Marana - 1975

<u>Practice</u>	<u>Seed Cotton/Plot</u> (Pounds)	<u>Lint/Plot</u> (Pounds)	<u>Lint/Acre</u> (Pounds)
Minimum Tillage ^{1/}	459	168	701
Conventional Tillage ^{2/}	526	193	803

*Harvested - 11/4/75

<u>Minimum Tillage Practices^{1/}</u>	<u>Conventional Tillage Practices^{2/}</u>
Shred Stalks	Shred Stalks
Chisel	Disc 2X
Landplane	Plow
Furrow Out	Landplane
	Furrow Out

Equal portions of each field tested were subjected to the two different tillage systems. Each half was then divided into four areas from which a representative sample was harvested from each area.

The primary advantage of the minimum tillage is reduced energy use and less cost per acre. Results tend to suggest that minimum tillage has less influence on yield of short staple as compared to long staple.

Minimum tillage reduced tillage costs approximately \$10 per acre.

SINGLE HARVEST REDUCTION OF COSTS AND ENERGY USE

C.R. Farr

Single harvest operations in November and December have the advantage of reducing fuel and harvesting cost over traditional double harvest. This technique increases the seasonal capacity of spindle pickers and may often increase overall fiber quality by blending the main crop with late bolls of lower fiber length and micronaire.

In this comparison double harvesting produced only 19 lbs. more lint per acre than from single harvest (Table 1) while developing the following advantages:

1. Saving 35-40% machine time
2. Saving 35-40% required labor
3. Saving 30-35% of fuel required
4. Reduced machinery wear
5. Improved cotton fiber quality

First picking with conventional double harvest produced 100% middling grades compared to 88.8% middling grades from single harvest. However, second picking produced a lower grade of 146 lbs. of lint than the Strict Low Middling Plus Grade of 111 lbs. per acre with single harvest.

Second harvest produced 73 lbs. of lint per acre with an average staple length below 1-3/32 inch, whereas single harvest produced all 1-3/32-inch cotton (Table 2).

Grades and fiber quality of two additional fields in the area are included in Table 3 to illustrate the reduced grade, staple length, and micronaire in second picking during the 1975 season.