

COTTON  
SKIP-ROW  
OR  
SOLID ?



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SKIP ROW COTTON FOR 1962

"A DECISION FOR THE COTTON GROWER"

by

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Kings County Farm Advisor

With recent changes in skip-row restrictions, valley cotton growers have a chance to reap full value from skip planting.

No longer harnessed with skip spacings of at least the width of four normal rows, cotton farmers can take the advantages of plant two - skip two or plant two - skip one. In either case, each row is an outside row and enjoys the benefits of the extra sunshine, moisture and nutrients made possible by the skip.

In order to make an intelligent decision --on adopting a skip-planting method-- growers may want to consider some of the following data. To help you in making your decision a possible method is also shown which can be worked out from your individual farm records.

Since every farm and field is different, some assumptions have to be made. In general, the costs of growing skip-row will be higher than with the normal (solid) planting method.

Insect control, weed control and irrigation will be higher than regular or solid planting since additional land is involved and equipment is made primarily for solid planted fields.

One of the first questions asked by potential skip-row growers: "Can I expect sufficient yield increases to off-set the additional skip expenses"? The following data is offered as an answer. Perhaps no one can tell you with much accuracy if skip-planting will work for you. However, the following data is offered as a method to help you render your own decision.

TABLE I

SKIP-ROW DATA

(Kings & Kern Counties; Mississippi & Arizona)

	<u>Yield in</u> <u>Bales/Acre</u>	<u>% Increase</u> <u>Over Solid</u>
<u>Kings County 1956</u>		
<u>West Side, Panoche Loam</u>		
<u>Solid</u>	2.29	---
Plant 4 - Skip 4	3.45	51%
Outside Rows	3.45	102%
Inside Rows	2.29	Same

TABLE I - continued

	<u>Yield in Bales/Acre</u>	<u>% Increase Over Solid</u>
<u>Lemoore, Foster Sandy Loam 1957</u>		
	<u>2.06</u>	---
Plant 4 - Skip 4	2.56	24%
Outside Rows	3.04	48%
Inside Rows	2.08	Same

Tulare Lake, Tulare Clay Loam, 1958

(	<u>Solid</u>	<u>1.79</u>	---
One	(Plant 4 - Skip 4	2.25	26%
Pick	(Outside Rows	2.72	52%
Only	(Inside Rows	1.79	Same

Delta Experiment Station  
Stoneville, Mississippi  
Silty Loam Soil

	<u>Solid</u>	<u>1.13</u>	---
1956	Plant 4 - Skip 4	1.96	73%
	Plant 2 - Skip 2	2.57	127%
	(	<u>Solid</u>	<u>1.75</u>
1957	(Plant 4 - Skip 4	2.17	24%
Wet	(Plant 2 - Skip 2	2.52	45%
Fall	(	<u>Solid</u>	<u>1.80</u>
1958	(Plant 4 - Skip 4	2.51	40%
Rainy	(Plant 2 - Skip 2	2.87	60%
Fall			

Arizona 1956  
Phoenix

	<u>Solid</u>	<u>2.62</u>	---
	Plant 4 - Skip 4	3.07	17%

Yuma

	<u>Solid</u>	<u>4.02</u>	---
	Plant 4 - Skip 4	5.62	40%

Kern County, U.S. Cotton Field Station  
Hesperia Fine Sandy Loam Soil 1961

Plant 4 - Skip 2	-----	19% more than solid
Plant 2 - Skip 2	-----	48% more than solid
Plant 2 - Skip 2	gave <u>23% more</u> than plant 4, skip 2.	
Plant 4 - Skip 4,	outside rows gave 52% more than inside rows.	

At Shafter - Outside row compared with inside rows where one row was skipped (comparable to plant 2 - skip 1) (ave. of 6 reps.), gave 28% more on the row next to the skip than the inside or solid-planting. One other test where one-row was skipped with a total of four replicates, averaged 63% more than the solid planted cotton.

From the data the increases from skipping varies somewhat. From the Kings County tests, it can be seen that the deep West Side soils responded greatly. The Foster sandy loam didn't respond as much. If we take the data from the outside rows in the Kings County test with plant 4 - skip 4, it seems reasonable to postulate that the outside row of the four should yield the same as plant 2 - skip 2 since both rows are on the outside.

The only data that might be comparable to plant 2 - skip 1 is the incidental findings taken at Shafter. Considerable variation exists between these two tests. The tests were not specifically designed to check on skip planting. They were irrigation and fertilization tests where Dr. John Stocton removed several single rows and made them into borders. When he was harvesting, he noted the differences in yield between those rows next to a border and harvested several of them so he could determine the increases due to skips. The meagerness of such data doesn't make it very valid but does indicate that sufficient increase might be obtained from plant 2 - skip 1 to warrant its use.

#### Costs:

Perhaps the next thing that a grower would want to estimate would be the additional costs of skip planting. Estimates may vary from place to place but by using one's own records, a base can be established which is a starting point for a grower to determine skip system costs.

Table II is a cost analysis sheet prepared for Kings County. It doesn't show a true picture for every field but gives a general picture for most of the county. The columns on the right-hand side of the sheet are for your convenience in figuring your costs under solid planting.

COST ANALYSIS WORK SHEET - TABLE II

SAMPLE COSTS TO PRODUCE 1000# COTTON PER ACRE - KINGS COUNTY 1962

Man labor @ \$1.35 and \$1.05 per hour, including Social Security and Compensation Insurance; 40 H.P. tractor per hour cash cost \$1.25; depreciation 70¢ per hour; interest 25¢ per hour.

O. D. McCutcheon, Kings County Farm Advisor

	Sample Costs		My Costs	
	Per Acre	Per Cwt. L.	Per Acre	Per Cwt. L.
<u>Pre-Harvest Cash Costs:</u>				
Land preparation - man & tractor 4 hours	\$ 10.40			
Plant (4-row planter) 2 men & tractor .3 hr.	1.19			
Seed: 20 pounds @ 10¢	2.00			
Irrigate: 1 pre and 6 crop, 12 man hours	16.20			
*Water: Power to pump 3 acre feet @ \$5.00	15.00			
Cultivate: 6 times, man & tractor 3 hours	7.80			
Fertilizer: 80# of Nitrogen @ 9¢	7.20			
Fertilizer Application: contract	2.25			
Hand Weeding: 3 times, 12 man hours @ \$1.05	12.60			
Insecticides: Mites @ \$8, Lygus @ \$3, Bollworms @ \$3	14.00			
Insecticide Application: 1 ground @ \$1.50, 2 air @ \$2.75	7.00			
Micellaneous labor, equipment & materials	4.00			
County Taxes	6.00			
Office, car, operating capital, etc.	7.50			
Repairs (except tractor): Irrig. system, equip.	3.00			
<b>TOTAL PRE-HARVEST CASH COSTS</b>	<b>\$116.14</b>	<b>\$11.61</b>		
<u>Harvesting Costs:</u>				
Defoliate: 2 gals. material @ 85¢; air application @ \$2.75	\$ 4.45	\$ .45		
Picking: Machine (contract) 2444 lbs. seed cotton @ \$1.25/CWT. & 501 lbs. @ \$1.50/CWT. including hauling	38.07	3.81		
Ginning, bagging, ties, insurance, storage & sampling @ \$1.18/CWT. seed cotton	34.75	3.48		
<b>TOTAL HARVESTING COSTS</b>	<b>\$ 77.27</b>	<b>\$ 7.73</b>		
<b>TOTAL CASH COSTS</b>	<b>\$193.41</b>	<b>\$19.34</b>		
<u>Depreciation:</u>				
Irrigation System: (original cost \$110) 16 yr. life	\$ 6.88			
Tractor: 8 hours @ 70¢	5.60			
Equipment, except tractor: (original cost \$25) 10 yr. life	2.50			
<b>TOTAL DEPRECIATION</b>	<b>\$ 14.98</b>	<b>\$ 1.50</b>		
<b>TOTAL CASH &amp; DEPRECIATION COSTS</b>	<b>\$208.39</b>	<b>\$20.84</b>		
<u>Interest on Investment @ 6%:</u>				
Land at \$600	\$ 36.00			
Irrigation system on 1/2 cost (\$55)	3.30			
Tractor: 8 hours @ 25¢	2.00			
Equipment on 1/2 cost (\$12.50)	.75			
<b>TOTAL INTEREST</b>	<b>\$ 42.05</b>	<b>\$ 4.21</b>		
<b>TOTAL COST OF PRODUCTION</b>	<b>\$250.44</b>	<b>\$25.04</b>		
Less Seed Credit for 1501 lbs. seed @ \$57/T	\$ 42.79	\$ 4.28		
<b>NET COST OF PRODUCTION LINT COTTON</b>	<b>\$207.65</b>	<b>\$20.77</b>		

Nematode treatment under pre-harvest costs would add \$15 per acre. \*Water costs vary considerably. The figure used is low in some areas and too high in others.

Cost Per CWT. Lint Cotton At Varying Yields

Yield - lbs. per acre	500	750	1000	1250	1500
Net Cost per CWT. lint	\$38.52	\$26.68	\$20.77	\$17.22	\$14.84

The costs are estimated for a slightly above average yield in Kings County. Your costs will vary from those presented here. The two columns on the right on the Cost Analysis Work Sheet are provided for your use.

Planting 2 - skip 2 provides for maximum use of sun and air. In deciding what system to use in 1962, both the plant 2 - skip 2 and the plant 2 - skip 1 should be scrutinized. Table III is offered for your consideration. Some of the increases in costs are based on assumptions others are evident. Since plant 2

- skip 2 uses twice as much land, some operational costs would be doubled while others would be up only about 1/4 to 3/4 depending on the experiences of the individual estimator. Table III contains a column on the right side which can be used for you in making your own estimates.

TABLE III

Comparison of Estimated Growing Costs of Solid Planting vs. A Skip Row System Known as Plant 2 - Skip 2

Items of Cost	Costs Per Acre		Increased Cost Due to Skips	My Costs	
	Solid	Plant 2 Skip 2		Solid	Plant 2 Skip 2
Land Preparation; planting; cultivation; county taxes; defoliation; interest on land; irrigation system; tractor & equipment; depreciation on tractor and irrigation equipment	\$ 34.37	\$168.74	Double		
Seed Fertilizer	9.20	9.20	Same		
Irrigation labor; hand weeding; miscellaneous labor; equipment & material; office, car, operating capital; repairs (except tractor); irrigation system & equipment; depreciation on equipment	45.80	57.25	Up 1/4		
Fertilizer Application	2.25	3.38	Up 1/2		
Water	15.00	25.00	Up 2/3		
Insecticides; insecticide application	21.00	36.75	Up 3/4		
<b>TOTAL PRE-HARVEST &amp; INTEREST COST</b>	<b>\$177.62</b>	<b>\$300.32</b>	Up <u>69%</u>		

This comparison shows that the difference between costs of growing an acre (solid planting) and an allotted acre under the plant 2 - skip 2 is up \$122.70. This is an increase of skip over solid of 69%.

A second system that many growers are considering is plant 2 - skip 1. Under this system the land used is increased by

1/2. This means that increased costs due to skipping would not be as high as with plant 2 - skip 2. Table IV is offered. Here, as in Table III, certain assumptions have been made in order to derive a figure for increased costs. Extra columns are provided for you to make your own estimates.

TABLE IV

Estimated Growing Costs of Solid  
vs.  
The Skip Row System - Plant 2 - Skip 1

Items of Cost	Costs Per Acre		Increased Cost Due to Skips	My Costs	
	Solid	Plant 2 Skip 1		Solid	Plant 2 Skip 1
Planting	\$ 1.19	\$ 2.38	Double		
Seed and Fertilizer	9.20	9.20	Same		
Irrigation labor; miscellaneous labor and equipment; repairs (except tractor); irrigation system; equipment; office, car, operating capital; depreciation on equipment	33.20	37.35	Up 1/8		
Hand Weeding	12.60	15.75	Up 1/4		
Land preparation; water; cultivation; fertilizer application; insecticides; insecticide application; county taxes; defoliation; interest on land; irrigation system; tractor and equipment cost; depreciation on tractor and irrigation system	121.43	182.15	Up 1/2		
<b>TOTAL PRE-HARVEST AND INTEREST COSTS</b>	<b>\$177.62</b>	<b>\$246.83</b>	<b>Up 39%</b>		

The comparison shows an estimated increase of \$69.21 in costs when the plant 2 - skip 1 system is used. This is 39% more than solid or normal planting.

To make a realistic estimate of net return consideration should be given to possible profits from alternate crops such as corn, milo, alfalfa, etc., that could be grown were the additional land used by the skips devoted to an alternate crop and the cotton grown in a solid block. For the plant 2 - skip 2, the extra land used is 100% more (doubled) than the quantity used with solid planting. With the plant 2 - skip 1

50% more land is used. This means that with the latter method (plant 2 - skip 1) 1/4 of the total land used by the plant 2 - skip 2 could be devoted to a crop other than cotton. Table V on the next page shows estimated costs of producing four crops commonly used as alternates in our rotation system. The figures used are estimates based on cost analysis sheets available at the Farm Advisor's Office. The value of the crop is based on the average price received by farmers in 1961 and reported in the 1961 Summary of the California Crop and Livestock Reporting Service.

TABLE V

Comparison of returns from some possible alternate crops at various yield levels. Yield values based on state averages received by farmers in 1961.

		Production Cost Per Ton	Aver. Value Received in 1961/Ton	Net Profit or Loss	
				Per Ton	Per Acre
Alfalfa Hay	8 tons/acre	\$23.81	\$21.00	\$ - 2.81	\$ -22.48
	9 tons/acre	21.17	21.00	- 0.17	- 1.53
	10 tons/acre	19.05	21.00	+ 1.95	+19.50
Corn for Grain	2 tons/acre	\$58.42	\$49.60	\$ - 8.82	\$ -17.64
	2½ tons/acre	47.44	49.60	+ 2.16	+ 5.40
	3 tons/acre	40.11	49.60	+ 9.49	+28.47
Grain Sorghum (milo)	2 tons/acre	\$56.47	\$41.78	\$ -14.69	\$ -29.38
	2½ tons/acre	45.88	41.78	- 4.10	-10.25
	3 tons/acre	38.81	41.78	+ 2.97	+ 8.91
Barley	2 tons/acre	\$45.80	\$45.40	\$ - 0.40	\$ - 0.80
	2½ tons/acre	37.44	45.40	+ 7.96	+19.90
	3 tons/acre	31.86	45.40	+13.54	+40.62

From Table V it can be observed that most of our alternate crops offer the grower little unless yields are high. Most of these crops with average or better yields have been near the "break-even" level. Prices on such crops could rise or fall as the season progresses.

In Table VI, a comparison between solid planting and several yield levels of the two skip systems is shown. The growing cost figures in Part A include an estimated net profit from an alternate crop of \$20.00 per acre under plant 2 - skip 2 and \$10.00 under plant 2 - skip 1. These figures are added so that a grower can make a more realistic estimate. Only \$10.00 is used in plant 2 - skip 1 to compensate for the fact that only 50% more land could be planted to an alter-

nate crop while in plant 2 - skip 2, 100% more land would be used. The cost figures are taken from Tables III and IV for each of the two skip systems. Part B of Table VI is the same as Part A except that the alternate crop figure is removed.

The costs of growing an acre of cotton remain the same whether your yields are one bale or five bales. The only additional costs that one has in producing higher yields is in harvest and ginning. The net lint value in Table VI is found by taking the value of lint at \$160 per bale (32¢ per pound) and subtracting the remaining picking charge that exists after the value of the seed was subtracted from the over-all picking and ginning charge.



Example: A man receives a 2-bale yield (1000 lbs. lint). It sells for 32¢ per pound or \$160 per bale. He picks 83% of his cotton first pick for \$1.25 cwt. and 17% second pick at \$1.50 per cwt. Seed is worth \$57 per ton or \$2.85 per cwt.

Ginning cost \$1.18 per cwt. of seed cotton. How much are his remaining picking costs after his seed credits have been applied to the harvest and ginning cost? Seed is calculated as a lint turn-out of 34% or lint x 1.5.

1000# lint at 32¢	=	Gross Return	=	\$320.00
2945# seed cotton @ \$1.18/cwt.	=	Ginning	=	\$34.75
83% of 2945 = 2444# x \$1.25	=	1st pick harvest charge	=	30.55
17% of 2945 = 501# x \$1.50	=	2nd pick harvest charge	=	7.52
Total Charge for Harvest & Ginning			=	\$72.82
Seed credits = 1001 x 1.5 = 1501# seed				
x \$2.85 cwt.			=	\$42.78
Remaining harvest cost after seed credits are subtracted			=	\$30.04
Net value of lint (after harvest and ginning costs and seed credits)				<u>30.04</u>
				\$289.96

TABLE VI

Comparison of returns from solid-planted cotton with two types of skip planting with an alternate crop estimate (Part A) of \$20.00 per acre for plant 2 - skip 2 and 1/2 less or \$10.00 for plant 2 - skip 1. Lint values at 32¢ per pound. Part B same as A, except alternate crop charges are removed.

Item	Plant 2 - Skip 2					Plant 2 - Skip 1				
	Solid 2	Increase Above Solid Planting at (2 Bales Yield)				15%	20%	25%	30%	40%
		30%	40%	50%	75%					
Yield in bales/acre	2	2.6	2.8	3.0	3.5	2.3	2.4	2.5	2.6	2.8
Net value of lint (after harvest and ginning costs & seed credits)	\$289.45	\$377.00	\$405.98	\$434.96	\$507.47	\$333.59	\$348.02	\$362.56	\$377.00	\$405.98
<b>PART A</b>										
Less growing costs (including \$20 charge for alt. crop on <u>plant 2 - skip 2</u> and \$10 charge of <u>plant 2 - skip 1</u> )	177.62	320.32	320.32	320.32	320.32	256.83	256.83	256.83	256.83	256.83
<b>NET RETURN PER ALLOTTED ACRE</b>	<u>\$111.83</u>	\$ 56.68	\$ 85.66	\$114.64	\$187.15	\$ 76.76	\$ 91.19	\$105.73	\$120.17	\$149.15
Advantage or disadvantage for skip over solid		-55.15	-26.17	+ 2.81	75.32	-35.07	-20.64	- 6.10	+ 8.34	37.32
% of value increase or decrease due to skip		- 49%	- 23%	+ 02%	+ 67%	- 31%	- 18%	- 05%	+ 07%	33%
		← Loss →	← Loss →	← Profit →	← Profit →	← Loss →	← Loss →	← Profit →	← Profit →	← Profit →
<b>PART B</b>										
Less growing costs (not including alternate crop charge) (subtract from net value after harvest and etc. - line 2 above)		\$300.32	\$300.32	\$300.32	\$300.32	\$246.83	\$246.83	\$246.83	\$246.83	\$246.83
Net return per allotted acre	<u>\$111.83</u>	\$ 76.68	\$105.66	\$134.64	\$207.15	\$ 86.76	\$101.19	\$115.73	\$130.17	\$159.15
Advantage or disadvantage for skip over solid		-35.15	- 6.17	+22.81	95.32	-25.07	-10.64	+ 3.90	18.34	47.32
% of value increase or decrease due to skip		- 31%	- 05%	+ 20%	+ 86%	- 22%	- 10%	+ 03%	16%	+ 42%
		← Loss →	← Loss →	← Profit →	← Profit →	← Loss →	← Loss →	← Profit →	← Profit →	← Profit →

If we look carefully in Part A of Table VI where the \$20.00 and \$10.00 net figure for an alternate crop is used, we find that between 40 and 50% increase with plant 2 - skip 2 would start making us additional profit due to skipping. With the plant 2 - skip 1 system, we would have to increase yield more than 25% to compensate for the extra costs due to skip planting and to make more profit than was made with the solid system.

In Part B where the \$20.00 and \$10.00 alternate crop figure is removed, we would be making more profit than with solid when our yield increase (plant 2 - skip 2) was only slightly more than 40%. With plant 2 - skip 1, we could be making an additional profit when our yield increase was about 21% more than solid.

It should be realized that the figures offered are primarily a guide. In making a decision as to skip planting, it would be wise to prepare a similar table (Table VI) with your own cost figures. After it is prepared, you could then consider your ability to cope with cultural and management decisions and decide if your yield increases are likely to be high enough to go above the extra costs due to skipping.

Another use of your cost tables would be to estimate your gross and your expenses at various yield levels and compare them with the solid or non-skip system.

Example: Assume a man has a 50 acre allotment and he has 100 acres of crop land (enough to plant 2 - skip 2). Assume he could plant an alternate crop and net \$20 per acre. Also assume that his yield with plant 2 - skip 2 is 50% more than solid and 25% more than solid with plant 2 - skip 1. What would his net be with solid planting? With plant 2 - skip 2 and with plant 2 - skip 1? He expects his cotton to sell for 32¢ per pound or \$160 per bale. Assume his costs for either method are the same as determined in Tables II, III, IV and VI. His lint turn-out is 34% and his seed is estimated on the basis of lint x 1.5, valued at \$2.85 per cwt.

From Table III the cost of growing 2 bales solid =		\$177.62
The harvest and ginning charge was as follows:		
2945# seed cotton ginning @ \$1.18/cwt.	=	\$34.75
83% at 1st pick @ \$1.25/cwt.	=	30.55
17% at 2nd pick @ \$1.50/cwt.	=	7.52
TOTAL GINNING & HARVESTING		\$72.82
Seed credit 1001 x 1.5 = 1501 x \$2.85/cwt.	-	42.78
Remaining cost of harvesting after ginning & seed credit		\$30.04
TOTAL COST OF GROWING, GINNING AND HARVESTING		<u>30.04</u>
<u>2 BALES SOLID</u>		\$207.66

Bales of cotton from 50 acres = 50 x 2 = 100		
Value of cotton 100 x \$160 =		\$16,000
Net value from alternate crop on 50 acres = 50 x \$20		1,000
GROSS FROM RANCH		\$17,000
Cost of growing cotton \$207.66 x 50 acres =		10,383
SOLID PLANTING - NET PROFIT FOR RANCH		<u>\$ 6,617</u>

If we grow plant 2 - skip 2 and get 50% more per allotted acre, our yield would be 3.0 bales per allotted acre.

3.0 x 50 = 150 bales		
150 bales x \$160 =		\$24,000 gross
Expense (From Table III) =	\$300.32	
Plus remaining cost of harvesting after ginning & seed credit	<u>45.04</u>	
Cost of growing, ginning and harvesting per allotted acre	\$345.36	
Costs for Ranch \$345.36 x 50 =		17,268
NET RETURN FOR RANCH --- <u>PLANT 2 - SKIP 2</u>		<u>\$ 6,732</u>

If we used plant 2 - skip 1 and get a 25% increase, we would have 2.5 bales per allotted acre and we would have 25 acres for alternate crops.

Gross Return = 125 x \$160 =		\$20,000.00
Return from 25 acres alternate crop (25 x \$20) =		500.00
TOTAL GROSS RETURN		<u>\$20,500.00</u>
Expenses of growing an acre (Table IV) =	\$246.83	
Remaining harvest cost after ginning and seed credits	<u>37.44</u>	
Costs of growing, ginning and harvesting per allotted acre	\$284.27	
Costs for ranch \$284.27 x 50 acres =		<u>\$14,214.00</u>
NET FOR RANCH ( <u>PLANT 2 - SKIP 1</u> )		<u>\$ 6,286.00</u>

From the figures shown, an increase of \$115 in favor of plant 2 - skip 2 as compared to solid is shown for the ranch.

From the data available in Table I, it can be assumed that most of our soils should give an increase over solid of 50% or greater.

There isn't much data on plant 2 -skip 1, and it doesn't seem likely that the increase in yield could be expected to be as great as with plant 2 - skip 2. Because the skip space is smaller, in late season there will be less sun and air to mature the fruit than with the wider skip method. However, costs are less and yield increases do not need to be as great to add additional profit.

Perhaps, the grower that will get the most out of a skip system will be the man who pays close attention to the managerial problems and solves them on time. This means that his crop is planted on time into a good seed-bed; properly nourished and weeded and irrigated so as to stimulate the plant to produce a maximum of fruit and not too much foliage.

Growers who have been burdened with an alternate crop which caused them to neglect their cotton, might find that if they devoted full time to one crop such as cotton, they could increase their profits. Under such conditions, a skip system might yield high and give maximum profits.

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