

COTTON

COSTS & GENERAL HINTS ON PRODUCTION



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The costs of production in any agricultural enterprise will vary considerably from ranch to ranch. The input and cost data in this booklet are sample costs. They are intended to be used only as educational guides in assisting you to appraise and plan your own crop and livestock program.

These cost data do not represent
industry averages.

COSTS & GENERAL HINTS ON COTTON PRODUCTION

IN
KERN COUNTY

George V. Ferry,
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COTTON VARIETY:

Kern County is in a one variety district and Acala SJ-1 is the variety used for cotton production. The cotton to be grown will originate from the breeding program at the United States Cotton Field Station, Shafter, California. There are many advantages in this type of program such as, high yielding potential, uniformity of fiber properties, disease resistance, and other important factors.

SOIL REQUIREMENTS:

Cotton will do best on soils that are adapted to alfalfa, sugar beets and other deep-rooted field crops. A well drained soil is desirable in order to allow the full development of the root system to a depth of 5 or 6 feet.

SOIL CONDITIONS THAT RESTRICT COTTON GROWTH:

There are several soil conditions that will limit cotton production. Among these is soil compaction. Compaction is oftentimes caused by excessive passes of tractors and other farming equipment across the field under conditions of high moisture. This condition causes deformed roots and limits root penetration into the soil.

Another condition that affects cotton yield in Kern County is excess salinity. Excess salts inhibits plant growth. Salinity can be corrected by the proper use of soil amendments and leaching of excess salts below the root zone. Soil analysis to determine the extent of salinity is useful in order to prescribe the correct reclamation processes.

PREPARATION OF GROUND PRIOR TO PLANTING:

It is a good practice to pre-irrigate the fields in the spring before planting. The pre-irrigation should wet the soil below the final depth of rooting. This is at least 5 to 6 feet. Very seldom, if ever, does Kern County receive enough rainfall to make a pre-irrigation unnecessary.

Cotton may be planted on beds or on flat rows. The seed bed should be firm and contain ample moisture to germinate the seeds.

PLANTING DATE:

Planting dates range from March into May with the optimum planting dates from March 20 to April 15. Decreased yields are generally associated with May plantings. Soil temperature at planting time should be above 58° F. to insure rapid germination and emergence. Seed should be planted at a depth of 1.5 to 2 inches. Row widths are generally 38 to 40 inches.

PLANT POPULATION:

In general, 40,000 plants per acre is the most satisfactory stand. This would average about 3 to 4 plants per foot of row. If the grower wishes to precision plant, 12 to 15 lbs. of seed per acre are recommended. This planting should result in about 40,000 plants per acre.

It has been observed that different types of soils require different plant populations. On soil that has a tendency to produce rank cotton, about 20,000 to 30,000 plants per acre gave best results. On lighter types of soil where rank cotton is not a problem, 40,000 to 50,000 plants per acre were best. Tests have shown no apparent differences in yield between plant populations of 20,000 up to 50,000 plants per acre, or spacings of 4 to 9 inches between plants on most soils where rankness was not a problem.

IRRIGATION:

Recent work conducted at Shafter by Mr. John Stockton, of the University of California, Irrigation Department, shows cotton used approximately 24 inches of water during the growing season. The use of water in acre inches per month is as follows: April .2, May 1.0, June 2.7, July 6.4, August 7.4, and September 4.7. As the plant develops in size and leaf area, the rate of water use increases. This explains the higher water use during July and August.

The interval between summer irrigations would depend upon the water holding capacity of the various soil types. A fine textured soil, such as a clay loam, may have a 21 day interval between irrigations. A coarse textured soil, with a low water holding capacity may be irrigated as frequently as every 10 days. Longer intervals between irrigations may help to reduce rank growth where rankness is a problem. This will be a savings of water, labor and reduce boll rots.

Here are some ways to insure maximum results from water use:

- Be sure to wet the soil down to the lower levels with each irrigation. Deep soil moisture encourages full depth of plant rooting.
- Avoid excessive wilting that may damage plants. Keep a readily available supply of moisture in contact with the roots at all times, but do not over-irrigate.
- Time your irrigations carefully. If you do a good job in the early growth stages, your plants will fruit earlier. Then you can harvest a higher percentage at the first picking.

You can determine your water needs more accurately if you use these checking methods:

- Check the soil moisture with a soil tube or auger. Observe the moisture conditions of the soil at several depths in different areas of the field.
- Wilting plants in the drier portions of the field indicate that an irrigation may be needed.

SAMPLE COSTS TO PRODUCE COTTON IN KERN COUNTY - 1966

Based on man labor at \$1.40 and \$1.75 per hour;

60 H.P. Track Tractor per hour cash cost \$3.00; Depreciation \$2.40; Interest \$1.00

30 H.P. Wheel Tractor per hour cash cost \$1.05; Depreciation \$.45; Interest \$.25

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Yield - 1200 lbs. lint/acre

Operation	Hours Per Acre	Cash and Labor Cost Per Acre			Total	Your Costs
		Labor	Fuel and Repairs-Equip.	Material & Other Costs		
Cultural:						
Land Preparation: 60 H.P. track	2.0	\$3.50	\$0.00		\$9.50	
30 H.P. wheel	2.0	\$1.05	\$0.10		5.60	
Plant: 4 row - 2 men & tractor	3	.94	.30	Seed: 20 lbs. @ 10¢ \$ 2.00	3.24	
Irrigation: 1 pre & 6 crop \$1.10/hr.	12.00	18.00		3.0 acre feet @ \$10.00 30.00	48.00	
Cultivate & Fertilize	3.00	5.25	3.15	100 lbs. nitrogen @ 10¢ 10.00	18.40	
Hoe & Weed: 3 times	12.00	18.00			18.00	
Pest Control - 3 applications				Material & Application 22.00	22.00	
County taxes				12.50	12.50	
Miscellaneous overhead (office, car, operating capital, etc.)		2.50	4.00		18.50	
Total Cultural Costs	31.3	\$51.69	\$15.55	\$88.50	\$155.74	
Harvest:						
Defoliation Material & Application				\$ 5.00	\$ 5.00	
Pick and haul 3430 lbs. @ \$1.50/cwt.				51.45	51.45	
Ginning, Bagging, Ties, Ins. @ \$1.25				42.87	42.87	
Total Harvest Costs				\$ 99.32	\$ 99.32	
Total Cash and Labor Costs		\$51.69	\$15.55	\$187.82	\$255.06	
Investment						
Land	Per Acre	Annual Cost				
	\$1,000.00	Depreciation				
Irrigation facilities	200.00	\$ 15.00			\$60.00	
Tractors - 7.5 hrs.		7.27			16.00 (on 1/2 of original cost)	
Equipment	25.00	2.50			13.37	
Total		\$24.77			.75 (on 1/2 cost)	
Total Cost Per Acre				\$70.12	\$ 94.89	
Less Seed Credit of 2060 lbs. @ \$50.00/ton					51.50	
NET COST PER ACRE					\$298.45	
COST PER CWT.					\$ 24.87	

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COST OF PRODUCTION:

The cost of producing cotton is quite high. These costs will vary within the county depending upon conditions under which cotton is grown. Water costs are quite variable, the southern and eastern areas of Kern County may have power costs in excess of \$15 per acre foot.

Many growers will need to fumigate for nematode control, this cost is not included in the cost analysis work sheet in this circular.

Insect control costs may vary from year to year or between areas of the county.

A tenant operator may wish to include the value of the rent as a cost for land use.

CULTIVATION:

The primary purpose of cultivation is weed control. The cultivation should be shallow. This is because soils usually dry out as deeply as they are stirred. As soon as the plant reaches a sufficient height, the soil should be gradually worked toward them at each cultivation, in order to cover any weeds that appear in the row. A desirable row profile should be formed during cultivation to enhance the mechanical picker efficiency.

FERTILIZATION:

Extensive cotton fertilizer field trials have been conducted in Kern County during the past years. This work has shown that several factors influence the amount and type of fertilizer that should be used. Important factors to be considered are the cropping history of the land, type of soil, and the natural fertility of the soil.

Nitrogen has proven to be the most important single fertilizer element needed. An ammonia source of nitrogen is preferred to nitrate nitrogen because it is not readily

leached below the root zone of the plants. Tests have shown that on fine textured soils, such as a Merced clay loam, best yields were produced with 40 to 80 pounds of actual nitrogen per acre. The medium type soils, similar to the Hesperia series; will require about 80 to 120 pounds of nitrogen; while the light soils, such as some of the San Emigdio series, will require 100 to 150 pounds of nitrogen for best results.

Phosphorus is low as a plant food in the San Emigdio soils series. These soils are located in the Wheeler Ridge-Lakeview and Maricopa areas. Some other soils near Arvin and Rosedale may also require additions of phosphorus in the fertilizer practice.

Potash generally is not recommended at this time. Most of Kern County soils are adequately supplied with potash. The Rosedale area has recently shown portions of fields that are deficient in this element. Potash deficiency symptoms generally become noticeable late in the growing season. Marginal burning of the leaf accompanied by terminal death of the plant is the common symptom.

In general, fertilizer should be applied early in the growing season. Split applications are recommended only where leaching is a problem. The fertilizer should be side-dressed and placed in a band about 6 inches to the side of the drilled row and about 6 inches below the level at which the seed was planted.

INSECTS AND NEMATODES:

Proper insecticide use is important in the successful growing of cotton. Unnecessary applications are costly, may reduce beneficial insects and cause outbreaks of other pests.

There are many insects that are injurious to cotton. Four of the most important economic pests in Kern County are: Lygus bugs, bollworms, mites and aphids. Lygus

insect feeding results in damage to squares, blooms and young bolls. Injured squares and young bolls may shed or develop into deformed bolls of lower lint quality. Mites reduce the vigor of the plants which results in lower yields. Atlantic mites cause severe defoliation of the plant. Aphids are particularly harmful in late season because of damage to the lint by the deposition of honeydew.

Root-knot nematode attacks the root system of cotton, inhibiting the development of the root system. Nematodes are most frequently found in the sandy soils of Kern County. Proper soil fumigation with a nematicide will give satisfactory control.

Further information on the effect and control of harmful insects can be obtained at the office of the University of California Agricultural Extension Service.

DISEASES:

Soil borne fungi are responsible for most of the Kern County cotton diseases. Two fungi, *Pythium ultimum* and *Rhizoctonia solani*, are responsible for damping-off of cotton seedlings and stand losses. These organisms can be controlled by proper seed treatment. PCNB in combination with a standard seed treatment gives adequate control in most instances. A more costly treatment employing in-the-row application of fungicide gives greater control where the infestation of these fungi is exceedingly high.

Verticillium wilt can cause a great deal of damage when a susceptible variety of cotton is planted. The Acala SJ-1 cotton developed at the Shafter Experiment Station offers to the growers in the San Joaquin Valley a variety with high tolerance to this disease. Rotation with nonsusceptible crops often reduces the damage of the disease.

Defoliation is recommended only when there is a
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distinct need. Some reasons for defoliation would be: increases machine picking efficiency, improves grade of lint, reduces boll rot, reduces leaf stain, and other reasons of less importance.

Some factors which contribute to good defoliation are:

- (1) Well leveled land with a gradient which insures good water penetration, and relative freedom from alkalinity.
- (2) An ample plant population per acre that is uniformly distributed over the field.
- (3) Sufficient fertility to insure good plant growth but with nitrogen, in particular, fairly well depleted by the time the crop is ready for defoliation.
- (4) A moderate, but constant, soil moisture supply throughout the growing and fruiting season.

WEED CONTROL:

Good weed control is important in successful growing of cotton. Excess grass at harvest time will result in grassy bales of cotton and reduced income.

Several herbicides can aid growers in keeping weeds under control. Careful study of the effectiveness and limitations of each should be combined with the economic advantages of herbicide usage before a decision is made. Cultural and biological methods may still be desirable for controlling weeds in most fields.

For further information on weed control can be obtained at the office of the University of California Agricultural Extension Service.