

ALFALFA SEED PRODUCTION IN RIVERSIDE COUNTY

By

Otis A. Harvey* and Wallace Sullivan**

Most of our alfalfa seed has been produced incidental to hay. In the past three or four years, however, this has been reversed on many alfalfa ranches. Seed has been the major source of income and hay production incidental. This has been due to a strong market for seed and primarily to new methods of controlling the Lygus bug. Timeliness and thoroughness in the application of D.D.T. and other insecticides has made possible greatly increased yields per acre, thereby reducing costs per pound and increasing profit.

Hemet and Palo Verde Valleys are the major seed producing areas in Riverside County and are noted for their fine quality alfalfa seed. Many growers plant the alfalfa in rows and cultivate and irrigate as a row crop. This method was adopted to insure the elimination of noxious weed seed and to conserve irrigation water.

Production - California is now the leading alfalfa seed-producing state. Preliminary estimates indicate 33,120,000 pounds for 1950, compared to an annual production of four to six million prior to 1948. Riverside County produced about three million pounds and Imperial County about eleven million pounds in 1950. Other important producing states are Kansas, Arizona, Utah, Montana, and Nebraska. United States production averaged 70 million pounds for the ten-year period 1936-45. In 1950, total production was 112 million pounds (see Table 3).

Yield per Acre - The average yield per acre for the records in Hemet with row planting averaged 515 pounds, strip check, 390 pounds; Palo Verde strip check, 309 pounds. Yield per acre varied widely - one record in Palo Verde Valley averaged 829 pounds of re-cleaned seed.

The average yield per acre for California in 1950 was 288 pounds; the highest of any state. The average for United States was only 127 pounds (see Table 3). High yield per acre is the most important factor in reducing cost per pound.

Market Prices - California farm price has varied from 22.3 to 36.7 cents per pound, being from one to four cents less than the U. S. average. (See table 3)

Varieties - In Riverside County seed of California Common Alfalfa still leads in total production. Where isolation (500 feet or more distance from common alfalfa fields) exists, seed of the certified varieties such as California Common 49, Ranger, Buffalo and Atlantic is produced. The latter three are produced for shipment to other areas of the United States and command a better price to the producer than California common.

Row Production or Solid Planting? - Alfalfa seed can be produced either in rows (36-40 inches apart) or in solid planted (border check) fields. The costs for cultural labor in row planted fields are from \$10 to \$25 per acre more than solid planting (this is due to increased cultivation costs and higher windrowing costs). However, row planted fields have several advantages such as (1) Better weed control possibilities, hence cleaner seed; (2) Better control of irrigation water. It is generally recommended that seed of certified varieties be produced in rows because nearly absolute freedom from weeds is required for certification. Furthermore, under dry-land or limited water conditions the row method is preferred. The life of the stand appears to be increased by row plantings.

*Farm Advisor, Riverside County

**Extension Economist, Farm Management, UC COOPERATIVE EXTENSION
University of California, Berkeley.

Soils - Alfalfa, a deep-rooted crop, prefers a deep sandy loam or loam soil. However, deep soils are not required for seed production. Good seed yields have been produced on shallow soils with frequent irrigation. Furthermore, good seed yields are possible on sandy soils by special attention to irrigation. Good alfalfa seed yields are possible on moderately saline soils, although here again special attention need be given to irrigation.

Establishing a Stand - The preferred planting dates are from October to mid-November or February 15 to April 1st. Earlier and later plantings are sometimes made under special conditions. Seed should be drilled one-half inch into a firm moist seed bed at the rate of 20-25 pounds per acre for solid planted fields and 1-1½ pounds in rows. It is often desirable to follow planting with a ring roller to insure a firm seed bed. The cost for establishing a stand will vary between \$35 and \$40 per acre up to the first cutting.

Irrigation - Frequency and methods of irrigation vary widely with soil types. On the deep soils of the Hemet Valley, the common practice is to apply two irrigations of 12 acre-inches each, one in the fall and one in the spring. On shallower soils irrigation may be necessary during the bloom period (providing careful control of lygus bug is given). In the Palo Verde Valley five to twelve irrigations of 4-6 acre-inches each may be necessary.

Fertilizers - Fertilizers may or may not be needed for alfalfa depending on the soil types. In the Palo Verde Valley most soils respond to phosphate applications of 60-80 pounds P₂O₅ per acre per year. Hemet Valley soils are generally adequately supplied with phosphate.

Insect pests - Lygus bugs are the primary insect pest and are controlled with airplane or ground rig applications of 30 pounds of 5% DDT dust per acre or a spray of 1-1½ pounds of DDT in 7-10 gallons of water per acre or 2-3 pounds Toxaphene in 7-10 gallons of water per acre as a spray. From one to two applications

of either of the above may be needed per season. Cost of each application including materials is about \$4.50 per acre. In the Palo Verde Valley, stink bugs and red spider are often injurious in addition to lygus bugs. Consult your Farm Advisor as to control methods in these crops.

Diseases - Some Rhizoctonia is reported in the Palo Verde Valley and frequently reduces the length of life of stands in that area. No control for Rhizoctonia is available.

Pollination - Increased yields resulting from the use of bees for pollination has encouraged many growers to place 3-5 colonies of bees per acre in alfalfa seed fields. This practice is now becoming more general.

Cultivation - Cultivation is necessary in row production. Four to six cultivations per season are required at a total cost of \$8.00 per acre per year. In the border check method the old stands are renovated two ways with a spring-tooth harrow during the dormant season. Following renovation in thin stands, oats are often seeded in the fields to increase the hay yield of the first cutting.

Harvesting Hay - From two to three cuttings of hay are cut from a seed field depending on the season. Generally the hay is baled from the windrow.

Harvesting Seed Crop - The common method for harvesting seed consists of cutting, windrowing, and threshing with a pick-up combine. However, some fields are harvested standing following defoliation with 10-15 gallons of oil plus 1½ quarts of fortifier per acre.

Cost of Production - See tables 1 and 2.

Copies of this publication are available at the Agricultural Extension Service office, Room 7, Post Office Building, Riverside, California.

Table 1. Main Profit Determining Factors in Alfalfa Seed Production.

Items	Hemet Valley		Palo Verde Valley 1946-8	What are your costs
	Planted in Rows 1947-9	Strip Check 1947-9		
Number of Records	11	11	21	
Total Acres	268	271	2147	
Average Yields per Acre				
Hay - Tons	2.77	2.83	2.63	
Seed, Cleaned - Lbs.	515	390	309	
Screenings - Lbs.	27	18	66	
Straw Tons	.18	.27	.55	
Income per Acre				
Hay	72.59	78.14	70.05	
Seed, Screenings and Straw	136.89	101.48	98.15	
Pasture	.86	4.30	6.87	
TOTAL INCOME PER ACRE	210.34	183.93	175.10	
Costs per Acre				
Cultural Labor & Field Power	18.08	9.80	7.12	
Harvest " " "	35.18	33.87	32.75	
Materials	20.96	16.77	18.44	
Cash Overhead	13.11	11.22	4.38	
TOTAL CASH COSTS	87.96	71.66	62.69	
Depreciation	7.22	7.53	4.20	
Interest on Investment	22.82	22.69	12.97	
TOTAL ALL COSTS PER ACRE	118.00	101.88	79.86	
Income Above Cash Costs	122.38	112.27	112.41	
Management Income	92.34	82.05	95.24	

It should not be assumed that the averages presented here are the average for the industry, because they are a very small sample of the total acreage. They are indicative of what might be expected in costs and returns per acre.

The Hemet Valley study covered the three year period 1947-49. The records were divided into two groups: solid planting in strip checks and planted in rows 36-40 inches apart and cultivated. The Palo Verde Valley records covered the three year period 1946-48 - all solid planted.

Harvesting, hauling and cleaning costs were usually reported at contract rates. Owner and family labor is included in all costs.

The above table shows the average yield, cost and income per acre for the records in the enterprise studies as indicated above. Estimate your costs and income in the blank column, assuming conditions as they would be on your own land. See Table 2 for further break-down of costs.

Table 2. An Analysis of Alfalfa Seed Production Costs and Income
Average for 3 Years 1947-48-49 11 Records - 271 Acres - Hemet - Strip Check.

Total Cost per Acre				Total Cost Seed Crop Per Acre	Total Cost Hay Crop Per Acre
Items	Labor and Field Power	Materials	Total		
Preharvest					
Renovate, etc.	2.29		2.29	Dusting 3.00	Cut, Rake, etc. 3.81
Fertilize	-		-	Cut, Rake, etc. 2.12	Bale 12.15
Irrigate	4.05	9.68	13.73	Thresh, comb. 10.45	Stack & Haul 2.62
Dusting	1.21	1.79	3.00	Clean and Haul 2.83	Irrigate 75% 10.30
Reseed	.65	3.78	4.43	Bale and Stack Straw 1.41	Fertilize 50% -
Miscellaneous	1.60	--	1.60	Fertilize 50% -	Other Preharvest 50% 4.16
Total	9.80	15.25	25.05	Irrigate 25% 3.43	Cash Overhead 50% 5.61
Harvesting				Other preharvest 50% 4.16	Depreciation 50% 3.77
Seed Crop				Cash Overhead 5.61	Int. on Investment 11.35
Cut, Rake, etc.	2.12		2.12	Depreciation 3.76	Total All Costs 53.77
Thresh, comb.	9.57	.88	10.45	Interest on Investment 11.34	Less Income
Clean & Haul	2.83		2.83	Total all Costs 48.11	from Pasture 4.30
Bale & Stack Straw	1.41		1.41	Less income from	Net Cost of Hay 49.47
Total	15.93	.88	16.81	straw & screening 4.48	Cost per ton (2.83T) 17.48
Hay Crop				Net cost of seed 43.63	
Cut, Rake, etc.	3.81		3.81	Net cost of seed	Income per Acre
Bale	11.51	.64	12.15	per B.W.T. 390# 11.19	Hay 78.14
Stack & Haul	2.62		2.62	Income per Acre	Pasture 4.30
Total	17.94	.64	18.58	Seed 97.01	82.44
Total all Harvest	35.95	1.52	35.39	Screening & Straw 4.48	Management Income
Cash Overhead			11.22	101.49	Per Acre 28.67
Total Cash Costs			71.66		
Depreciation			7.53		
Interest on Investment			22.69		
Total All Costs	45.75	16.87	101.88	Management Income	
Total Income			183.93	Per Acre 53.38	
Income over Cash Costs			110.10		
Management Income			22.05		

UC COOPERATIVE EXTENSION

An estimated break down of costs and income from the seed crop and hay crop are shown in the last two sections.

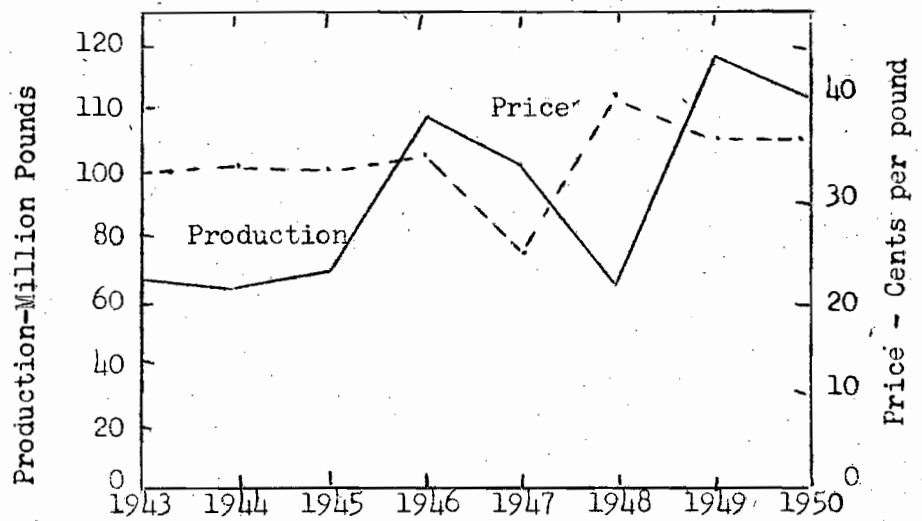
Table 3.

U.S. and California Acreages, Production (thresher-run), Average Yields, and Farm Price of Alfalfa Seed, 10-year averages 1936-1945, annually 1946-1950

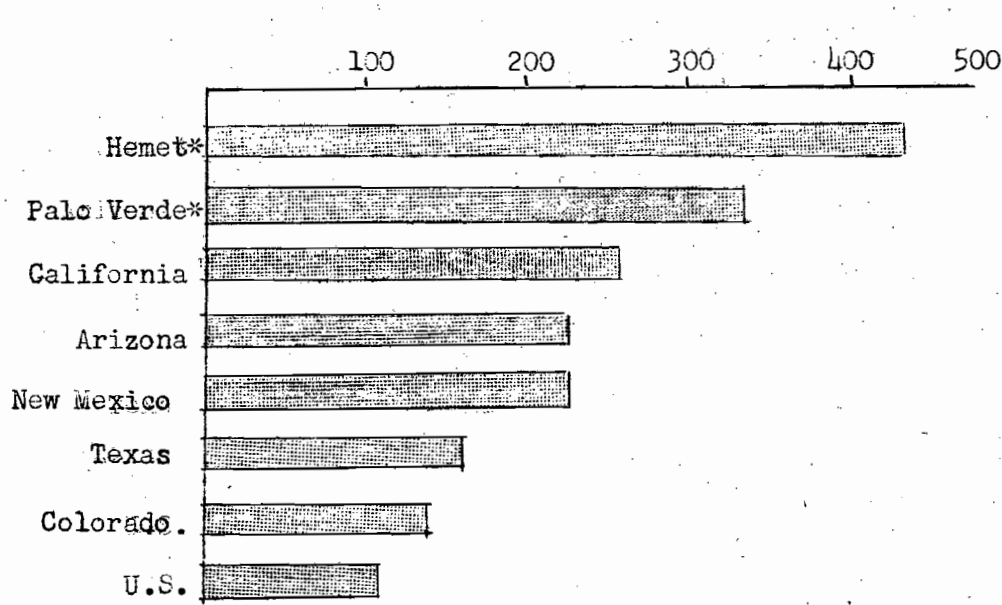
	California	Four States*	U.S.
	<u>Acreage</u>		
10-yr. av. 1936-1945	19,260	78,680	801,080
1946	27,000	112,000	1,174,200
1947	33,000	130,000	995,700
1948	18,000	71,000	635,400
1949	55,000	201,500	1,005,500
1950	115,000	135,000	884,100
	<u>Production (thresher-run)- 1000 lbs.</u>		
10-yr. av. 1936-1945	3,593	13,441	70,742
1946	6,000	18,480	109,344
1947	8,340	25,680	102,000
1948	4,740	13,908	62,700
1949	15,180	31,740	119,804
1950	33,120	51,360	112,722
	<u>Average yield per acre - pounds</u>		
10-yr. av. 1936-1945	189	171	89
1946	222	165	93
1947	252	198	103
1948	264	196	97
1949	276	235	120
1950	288	255	127
	<u>Average farm price - ¢ per lb.</u>		
10-yr. av. 1936-1945	22.3	21.9	24.2
1946	36.7	36.1	36.7
1947	22.5	20.3	25.3
1948	29.3	31.0	41.6
1949	31.3	29.5	37.8
1950	33.7	29.8	37.3

*California, Arizona, New Mexico, Colorado

U.S. Production and Farm Price of Alfalfa Seed



Average yields per acre in pounds



*Average of records in cost study