

FROST PROTECTION IN CITRUS ORCHARDS - TULARE COUNTY - 1971

Sample Costs for Wind Machines and Heaters

Table 1 - WIND MACHINE

	<u>10 acres</u>	<u>Per acre</u>
<u>Investment:</u>		
Total cost installed (including pad)	\$5,825	\$582
<u>Overhead:</u>		
Taxes, etc. at 1% of original cost	\$ 58	\$ 6
Depreciation - based on 15 years life	388	39
Interest at 7% on 1/2 of original cost (\$2,912)	204	20
Total overhead	\$ 650	\$ 65

Annual/Costs for 10 acres at 3 Levels of Use

	Low ^{1/}	Medium ^{2/}	High ^{3/}
<u>Operating Cost:</u>			
Labor: patrol, start, stop & minor maintenance at \$5 per machine per night + \$2 mileage	\$ 42	\$ 84	\$168
Gas, oil and operating @ \$2.50 per hour	125	250	500
Annual tune-up and repairs	45	45	60
Total operating cost	\$212	\$379	\$728
Total Wind Machine overhead	650	650	650
Total wind machine cost - 10 acres	\$862	\$1,029	\$1,378
" " " " per acre	86	103	138

Table 2 - HEATERS TO SUPPLEMENT WIND MACHINE AT 20 PER ACRE

	<u>10 acres</u>	<u>Per acre</u>
<u>Investment:</u>		
Heaters: assembled & placed in orchard @ \$10 each	\$2,000	\$200
Storage tank: 8,000 gals. for 10 acres	960	96
Hauling tank & rig: approx. 300 gal. cap.	250	25
Torches, 2 @ \$9; thermometers & shelters, 3 @ \$10	48	5
Initial filling of heaters @ 2¢ per gal.	36	4
Total investment in heaters & equipment	\$3,294	\$330
<u>Overhead:</u>		
Taxes, etc. at 1% of original cost	\$ 33	\$ 3
Depreciation - based on 15 years life	218	22
Interest at 7% on 1/2 of original cost (\$1,647)	115	12
Total overhead	\$ 366	\$ 37

Table 2 Continued - over

^{1/} Low use: Wind machine, 6 nights - 50 hours run; no heaters fired.

^{2/} Medium use: Wind machine, 12 nights - 100 hrs. run; some heaters fired 1/2 time of machine operation but burning only the equivalent of 30 hours for all heaters.

^{3/} High use: Wind machine, 24 nights - 200 hours run; heaters fired for an equivalent of 100 hrs. for all heaters.

Table 2 - Continued

Annual Heater Costs for 10 Acres at 3 Levels of Use

	Low ^{1/}	Medium ^{2/}	High ^{3/}
<u>Operating cost:</u>			
Firing and standby: 1 man per 20 A. @ \$4 per hr. none		\$100	\$200
Refilling at 2¢ per gal.	"	72	240
Oil: 0.6 gal. per hr. per heater - total gals.	"	(3,600)	(12,000)
Cost at 13¢ per gal.		\$468	\$1,560
 Total heater operating cost	"	\$640	\$2,000
 Total heater overhead	\$366	\$366	\$ 366
 Total heater cost - 10 acres	\$366	\$1,006	\$2,366
" " " per acre	37	101	237

Table 3 - WIND MACHINE AND HEATER COMBINED

	10 acres	Per acre
<u>Total investment: Wind machine and heaters</u>	\$9,119	\$912
<u>Overhead:</u>		
Taxes, etc.	\$ 91	\$ 9
Depreciation	606	61
Interest	319	32
 Total overhead - Wind machine & heaters	\$1,016	\$102

Annual Combined Wind Machine and Heater Costs for 10 Acres at 3 Levels of Use

	Low ^{1/}	Medium ^{2/}	High ^{3/}
Total operating cost	\$212	\$1,019	\$2,728
Total overhead	1,016	1,016	1,016
 Total cost wind machine & heaters - 10 acres	\$1,228	\$2,035	\$3,744
" " " " " per acre	123	204	374

Tulare County citrus districts frequently experience temperatures near the danger point for freezing of fruit. A temperature of 27° is considered the threshold for freezing of oranges. Long term records at Lindsay show the following:

10 winters in 37 years had less than 10 hours below 27. (Mildest, less than 1 hour)
13 " " 37 " " 10 to 50 hours below 27.
8 " " 37 " " 50 to 100 hours below 27.
6 " " 37 " " over 100 hours below 27. (Most severe, 305 hours)

John E. Pehrson, Farm Advisor
Tulare County

Robert C. Rock
Extension Economist

Burt B. Burlingame
Extension Economist
2/8/71 500 c
ec

UC Cooperative Extension