

VINEYARD PNEUMATIC PRUNING MACHINES

Cost Analysis Work Sheets

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Pneumatic pruning equipment has been gradually adapted to vineyards since the introduction of pneumatic shears over 20 years ago. Until recent years their use was confined to a few progressive and large growers who built machines of their own design. These early machines were usually large, covering 10 to 16 rows, so as to spread equipment costs over more workers. These have been self-propelled or tractor-mounted to carry and power an air compressor plus an air reserve tank. Steel or aluminum booms extended over the vine rows to distribute air hoses and shears.

Observations of these early operations suggested that a savings in labor of about one-third might be achieved. In recent years a variety of commercially built standard model pruning rigs have become available, including some better suited to smaller acreages. Many growers have since become interested in the economies of this equipment in various sized vineyard farms.

The purpose of these sample cost data sheets is to assist growers in deciding if they might realize a cost savings from pneumatic pruning equipment in their own operation. Also, the pruning rates per man given here might be a guide to the best sized machine to cover a given acreage. The pruning rates and operational costs given here are results from a 1965-66 cost study involving 3 Thompson Seedless, 5 wine variety, and 1 table grape vineyard in Fresno, Tulare, Kern, and San Bernardino Counties. Generally, the manpower requirement was found to be reduced an average of 30% with pneumatic pruners and with a dollar savings of 15% from the cost of hand pruning after machine costs. Complete details are in a publication, "A Study of Pneumatic Pruning in Vineyards, 1965-66 Season," available at county farm advisors offices.

The following cost sheets are calculated to show how the size of operation or number of acres covered affects the economics of pneumatic pruning equipment using a 10-row pruner in wine varieties and a 4-row pruner in Thompson Seedless. It shows, for example, that the average Thompson Seedless grower using a 4-man machine wouldn't break even on equipment overhead costs until the machine covered somewhere between 40 and 80 acres. Thus, only a Thompson Seedless grower with near to 80 acres might realize much savings with a 4-man pruner.

The column at the far right gives an opportunity to insert figures in arriving at your own cost.

The size of machine needed to cover a certain acreage in a 50-working day season may also be calculated from the following cost sheets. Divide the maximum number of acres covered with the machine (50 working-day season potential) by the number of men on that machine. This gives the number of acres each man prunes during the season. For Thompson Seedless this would be 132 acres ÷ 4 men = 33 acres per man per season. For wine varieties, 385 acres ÷ 10 men = 38.5 acres per man per season. Thus, a 120 to 130 acre Thompson Seedless grower would consider a 4-man machine while a 260 acre grower would consider two 4-man machines or one 8-man machine.

Remember, these are only sample and average costs. Machine costs here represent near-average costs of commercial machines and shears which can range several hundred dollars per unit from this figure.

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THOMPSON SEEDLESS FOR RAISINS OR WINE, 4-MAN PRUNER

Sample Cost of Pneumatic Pruning Operation vs. Hand Pruning  
Pruning Rates Av. of 3 Fresno County Operations, 1967-68 Costs

		Total for Machine		Total for Hand	Your Cost
Total acres pruned in season	132*	80	40		
Original cost-incl. shears	\$1,900.00				
Years of life	5				
Depreciation per year	380.00				
Interest on investment at 6%	57.00				
Total deprec. & int.	\$ 437.00	\$ 437.00	\$ 437.00		
Fuel, oil & lubrication @ 11¢/hr	49.50	29.92	14.96		
Maintenance labor-sharpening shears 20 min/day @ \$1.80/hr.	30.00	18.00	9.00		
Repairs, incl. shears	90.00	75.00	60.00		
Misc. oper. costs (taxes)	10.00	10.00	10.00		
Total mach. oper. cost	179.50	132.92	93.96		
TOTAL MACHINE COST	616.50	569.92	530.96		
Total hrs. operated	450	272	136		
Total man-hrs.	1800	1088	544		
Av. wage rate incl. benefits (3 men @ \$1.60) (1 man @ \$1.80)	1.65			1.60	
Total labor costs	\$2,970.00	\$1,795.20	\$ 897.60		
TOTAL ALL COSTS	\$3,586.50	\$2,365.12	\$1,428.56		
Vines pruned/machine hr.	144			-	
Vines pruned/man hr.	36			25	
Machine hrs. to prune 1 acre	3.4			-	
Man hrs. to prune 1 acre	13.6			19.6	
<u>Cost Per Vine</u>					
Total mach. cost	.9¢	1.5¢	2.7¢		
Labor cost	4.6¢	4.6¢	4.6¢	6.4¢	
TOTAL	5.5¢	6.1¢	7.3¢	6.4¢	
<u>Cost Per Acre</u>					
Total mach. cost	\$ 4.67	7.12	13.27		
Labor cost	22.44	22.44	22.44	31.36	
TOTAL	\$ 27.11	29.56	35.71	31.36	

\*The 132 acres maximum is based on the average acreage which was covered in a 50 working-day season at 9 hours per day. Calculated at 490 vines per acre.

SPUR PRUNED, WINE VARIETIES, 10-MAN PRUNER

Sample Cost of Pneumatic Pruning Operation vs. Hand Pruning  
Pruning Rates Av. of 4 Operations, 1967-68 Costs

	Total for Machine			Total for Hand	Your Cost
Total acres pruned in season	385*	240	120		
Original cost-incl. shears	\$3,700.00				
Years of life	5				
Depreciation per year	740.00				
Interest on investment @ 6%	111.00				
Total deprec. & interest	\$ 851.00	\$ 851.00	\$ 851.00		
Fuel, oil, & lubrication @ 23¢/hr.	103.50	64.86	32.43		
Maintenance labor-sharpening shears 45 min/day @ \$1.80/hr.	67.50	42.30	21.15		
Repairs incl. shears	260.00	225.00	200.00		
Misc. operating costs (taxes)	40.00	40.00	40.00		
Total mach. oper. cost	471.00	372.16	293.58		
<b>TOTAL MACHINE COST</b>	<b>\$1,322.00</b>	<b>\$1,223.16</b>	<b>\$1,144.58</b>		
Total hrs. operated	450	282	141		
Total man hrs.	4500	2820	1410	6583	
Av. wage rate incl. benefits** (8 men @ \$1.60) (2 men @ \$1.80)	1.64			1.60	
Total labor costs	\$7,380.00	\$4,624.80	\$2,312.40		
<b>TOTAL ALL COSTS</b>	<b>\$8,702.00</b>	<b>\$5,847.96</b>	<b>\$3,456.98</b>		
<b>Vines pruned/man hr.</b>	<b>40</b>			<b>27</b>	
<b>Man hrs. to prune 1 acre</b>	<b>11.7</b>			<b>17.1</b>	
<u>Cost per vine</u>					
Total machine cost	.7¢	1.1¢	2.0¢		
Labor cost	4.1¢	4.1¢	4.1¢	5.9¢	
Total	4.8¢	5.2¢	6.1¢	5.9¢	
<u>Cost per acre</u>					
Total machine cost	\$ 3.43	\$ 5.10	\$ 9.54		
Labor cost	19.27	19.27	19.27	27.36	
Total	\$ 22.70	\$ 24.37	\$ 28.81	\$ 27.36	

\*The 385 acres maximum is based on the acreage which could be covered in a 50 working-day season at 9 hours per day. Calculated at 470 vines per acre.

\*\*Includes Workmen's Compensation, Social Security, & other benefits