

(4) Pumping efficiency was reported in these two sources and was calculated at 42 percent and 64 percent for Dinuba and Arvin. These figures are in keeping with observations made since that time, with considerably more efficiency on the larger pumps. The lower pump efficiency was used for the small farm in Arvin, in keeping with this observation.

(5) It was assumed that all pumping was done by electricity, since but few pumps are driven by gas or butane. On the basis of flow and pump efficiencies, the kilowatt-hours required per acre-foot of water were calculated on the basis of the following standard formula:

$$\text{Kw.-hr.} = \frac{43,560 \times 62.4 \times 746 \times \text{head}}{33,000 \times 60 \times 1,000 \times \text{efficiency}} = 1.024 \frac{\text{head}}{\text{efficiency}}$$

This resulted in a kilowatt-hour requirement of 132 for Dinuba and 291 for the large Arvin farm and 444 for the small Arvin farm (higher because of assumed lower efficiency). The total kilowatt-hours for each of these sizes, based upon water requirements are: Dinuba 18,860; Arvin, 422,241 on the larger unit, and 73,704 on the smaller.

(6) The size of motor was calculated on the basis of the above data according to the following standard formula:

$$\text{H. P.} = \frac{\text{G. P. M.} \times 62.4 \times \text{total head in feet}}{450 \times 550 \times \text{efficiency in percent}}$$

On the basis of this calculation, a 10-horsepower motor was required in Dinuba; three 75-horsepower motors on the large Arvin unit and one 45-horsepower motor on the smaller unit.

(7) The demand and energy charges for power were developed on the basis of rates used by the Pacific Gas & Electric Co., which serves these areas. It has three agricultural power rates, known respectively as schedule P-3-S, schedule P-12-S, and schedule P-13-S. The first two schedules embody demand charges which are based upon the connected horsepower load and energy charges which are based upon the number of kilowatt-hours consumed. The third schedule has only a charge for energy, but in using this schedule the operator must guarantee a minimum charge per horsepower of connected load. Schedule P-12-S can only be used where the connected horsepower load amounts to 200 horsepower or more. Power bills were calculated on the basis of all applicable schedules and the lowest cost used, in keeping with actual procedure. It developed that schedule P-13-S resulted in the lowest total power bill for each unit.

The cost of pumps and motors was developed from information collected in the field observations made in the San Joaquin Valley in the winter of 1944, when records on size of motors and original cost were obtained. On the basis of these observations, costs were assigned. These costs are below present costs of such motors but in line with the cost of motors of these sizes over the past 20 years. The following costs resulted from these calculations: \$800 for the pump and motors on the Dinuba farm, \$2,500 each for the three pumps and motors on the large Arvin farm, and \$1,700 for the pump and motor on the small Arvin farm.

(8) Records from the report for Kern County referred to in the foregoing indicate that the average depth of the well in the Arvin community is approximately 500 feet. This depth was used for all wells in that area. Comparable records were not immediately available for Dinuba. However, on the basis of the total pumping head