

## PUMP TESTING

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Irrigation pump testing has been carried on by the agricultural engineering department at New Mexico State University since 1976. The original project was a joint program between the Department of Energy and Minerals through their old Energy Research and Development Program and the Agricultural Experiment Station. About 400 pumps were tested during the 1976, 1977 and 1978 growing seasons. Results of this pilot program indicated there was much to be gained by informing farmers of the efficiencies of their pumps so that new equipment and improved efficiencies could result in fuel savings and cost reductions. In recognition of these results, the Energy Extension Service, through the New Mexico Cooperative Extension Service carried on pump testing for the 1979 and 1980 seasons. They tested almost 400 pumps, some of which were repeats of earlier tests. Energy extension funds ceased to be available for the 1981 crop season and only a few tests were conducted by the extension agricultural engineer. Prior to the 1982 season, the Interstate Stream Commission and the Four Corners Regional Commission made funds available to purchase equipment and set up a test van that would be available during the 1982 crop year. Funds also are available to employ a qualified engineer and an assistant to carry out the pump testing. This program is aimed mainly at the High Plains area where high lifts and high energy costs are causing severe problems for farmers in the highest crop production areas of the state.

The most critical areas are the High Plains from Tucumcari southward through Lea County, the Estancia Valley area and the Deming-Lordsburg pumping area. Most pumps on the Pecos and Rio Grande Rivers are involved in much shallower lifts and are not as critical for energy consumption as the above listed areas.

Pump tests during 1982 will consist of a quick overall evaluation between the energy source and the pumped water. This overall efficiency

will be used to determine whether further testing is necessary. In the case of electric drive motors only a quick test is possible and the motor is assumed to be operating at the efficiency specified in catalog ratings. For natural gas units, if the efficiency is above about 16 percent, then both pump and motor must be operating about as efficiently as can be expected and no further tests will be conducted. If the efficiency appears to be low, a torque meter will be installed between the engine and the pump and a complete engine evaluation will be carried out. This will help the farmer determine whether he needs to do engine work or pump work. Past experience would indicate that low efficiencies are generally the result of pumps rather than engines.

The program in 1982 will be conducted similarly to the previous projects with the farmer contacting the county agent who refers lists of the pumps to be tested in his county to the test crew. It is anticipated that nearly all requests in the High Plains area can be honored, but the crew does reserve the right to organize the testing in a logical community pattern. Therefore, the first request may not be the first served. In so far as possible all wells that are requested will be tested.

It should be noted that no alternate fuels are presently available to relieve the farmer's dependence on conventional energy sources. For the foreseeable future it appears that coal, agricultural wastes and solar power are not economical when compared to the conventional energy resources of natural gas and electricity. The farmer's only choice in these hard economical times is to know that he is using the energy resource as economically as possible and reducing to the extent practical his consumption of high priced energy.