ABSTRACT

The Kuttanad region, the rice bowl of Kerala, has specific requirements in relation to drainage and other water management practices to obtain a high level of sustained agricultural production. The introduction of the locally made propeller pump, known as *petti* and *para* revolutionized drainage pumping in the region in the early twentieth century. However, the pump is operated at low efficiencies and the operation procedures are not based on situation specific requirements. Specific water management procedures and agronomic practices are needed to obtain economic yield from the distinctly different cropping regions of Kuttanad. Group farming practices are essential for pumping, transplanting, harvesting and other agricultural operations.

The performance of the *petti* and *para* extensively used in drainage pumping in the region, was evaluated, based on extensive field and laboratory investigations. Soil and water properties, in representative agronomic regions were analysed. A test bench was specially designed and constructed to evaluate the performance of high discharge low head pumping units under controlled conditions.

Data generated from field and laboratory investigations were analysed using standard procedures. Functional

relationships of the variables influencing the performance of the pump were developed. The regression equations obtained were compared with standard rational relationships and their predictability ascertained, based on the values of correlation coefficients. Specific recommendations on suitable range in pump speed and operating head to obtain comparatively high levels of efficiency have been derived. Specific information on appropriate water management and crop production procedures are presented.