Optimum Utilization and Selection of Mowers for Highway Rights-of-Way

ALLEN L. COX, Louisiana State University;
DARRYL C. RESTER, AMCO International; and
MANSEL M. MAYEUX, Louisiana State University

ABRIDGMENT

• A STUDY of roadside mowing operations was conducted in Louisiana to determine the optimum size and combination of mowers for roadside mowing. The literature indicated that very little research had been done on the subject. However, there was general agreement among highway maintenance personnel on which type of mower was best for each roadside condition, indicating that a variety of mowers of different sizes and widths were required for roadside mowing.

Study of optimization procedures used in industry indicated that linear programming methods could be applied to the problem of utilizing and selecting roadside mowing. The Brittany Maintenance Unit, located in the Louisiana Department of Highways' District 61, was selected as a parish model. The roadsides in the parish model were surveyed to determine the area, physical dimensions and the number and types of obstructions within each control section. The roadsides were classified for mowing. Time and motion studies were conducted to determine the workday length and field capacities of the mowers as they operated on the different classes of roadsides. This information was used to determine the mowing costs per acre.

A programmed mowing cycle was set up by using field test data in conjunction with linear programming methods to assign the mowers to the different classes. The entire parish was mowed as programmed and the solution was found to be feasible. The actual overall equipment time required to mow 1,290 acres varied from the predicted equipment time by approximately 1 hr. However, the predicted time of individual units on individual assignments varied considerably more.

Seven classes of right-of-way adequately described the parish road network. Four types of mowers were tested in the parish model. The assignment procedure can be adapted to any number of right-of-way classes and any number of mowers. The procedure maximizes production of an existing combination of mowers while minimizing the cost of completing a mowing cycle. It can also be adapted to aid in selecting optimum replacement mowers. Recommendations were made for implementing the procedure on a state- or district-wide basis.

Paper sponsored by Committee on Maintenance Equipment and presented at the 45th Annual Meeting.