

ICAT Grant 05-3
Orbital Scythe Prototype Development and Testing
O-Sage Power Equipment LLC

Abstract

The purpose of the project was to test a new type of energy-efficient mulching lawnmower by building 'near-commercial' prototypes, and comparing the operation of the prototypes, including their energy consumption characteristics, with comparably-sized commercially available products, as well as using the mowers for sufficient time under typical operating conditions to evaluate the robustness of the design and the potential commercial viability.

Three prototypes were assembled. Two were sent to the Chicago Botanic Garden for use by the lawn maintenance crews. The third was used for comparison testing with electric rotary mowers from established manufacturers. The in-use testing identified several areas that required modification, but nothing that has motivated a fundamental change in the current design approach. In general, the problems that arose were due to mechanical tolerances not being rigorously observed in the fabrication of the prototypes.

Energy consumption tests showed the new design has a significant advantage over rotary mowers, using about a third less energy than rotary electric mowers per area of grass cut. As a consequence, the prototypes were shown to be capable of cutting significantly larger lawns than established electric designs under identical conditions. The prototype design therefore represents a significant new opportunity to replace gas-powered rotary mowers – which expend several times as much energy as electric rotary mowers to cut an identical area of grass, and which produce disproportionate levels of air pollution – for yards in the range of ½-acre, which is substantially larger than the size of the average American lawn.