

Title Economic evaluation of selective mechanical harvesting for asparagus
Authors T. Cembali, R.J. Folwell, R.G. Huffaker, J.J. McCluskey, P.R. Wandschneider
Citation ISHS Acta Horticulturae 776:33-44. 2008.
Keywords asparagus; harvest; bioeconomic model; mathematical model; simulation

Abstract

Asparagus (*Asparagus officinalis* L.) is currently harvested by hand. Resulting from increasing labor costs, mechanical harvesting is being evaluated again. A bioeconomic simulation model was used to calculate the profit that could be generated by a mechanical harvester with a full recovery rate equivalent to the quantity and grade as hand harvesting. Alternative harvesting intervals are possible with a machine rather than the classic 24-hour necessary with hand labor. Different harvesting intervals and costs were simulated to determine the optimal harvesting interval. The bioeconomic simulation model results indicated that the average break-even recovery rate for the period 1989-2004 for asparagus in the State of Washington was 70.15 percent for the 24 hours harvesting interval in order for the mechanical harvester to be economically acceptable in place of hand harvesting. 28, 32, and 36 hour harvesting intervals produced break-even recovery rates that were not statistically different from the 24 hours interval. By increasing the manual harvesting costs from US\$0.51/kg to US\$0.60/kg the recovery rate needed by the mechanical harvester to break-even with manual harvesting decreased from 70.15 percent to 61.30 percent. In addition, if the per unit cost of manual harvesting increases, the longer harvesting intervals become not significantly different from the 24-hour interval. At the US\$0.60/kg for manual harvesting, the 24, 28, 32, 36, and 40 hours harvesting intervals were not statistical different in term of profits.