

# Novel approach to find the optimal parameters of a tractor disc plough used for land preparation

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## Abstract

This study presents a new approach to find the optimal operating parameters of a tractor disc plough, to minimize the fuel used for the land preparation of sugarcane fields. The new approach is composed of three steps: (1) construct the regression model; (2) use modified differential evolution (MDE) to find the optimal parameters; and (3) verify the optimal parameters by performing a real experiment. The use of MDE obtained optimal parameters giving 12.37% and 16.96% lower fuel use than for the traditional method, when using the response optimizer and particle swarm optimization, respectively.

## Author keywords

differential evolution; disc plough; energy; Land preparation; response surface method