Evaluation of performance of selected tillage tines regarding quality of work

Al-Neama, Amer Khalid Ahmed, author

Abstrak

This book examines and evaluates the performance of four standard chisel plough tines: heavy duty, double heart, double heart with wings and duck foot, which were connected with a rigid shank. Experiments were conducted in a soil bin filled with sandy loamy soil, and the experimental factors included varying operation conditions (speed and depth) and their dependency upon a draft force and their components (horizontal and vertical force), specific force (force per unit area), specific power (power per unit area), soil loosening percentage (above and below the original soil surface) and soil profile parameters (e.g. furrow height, furrow width, ridge height, area of ridge and furrow etc.). The evaluation involved developing regression equations based on Glancey and Upadhyaya’s model by adding new terms related to the tine geometric parameters or by adding a dummy term variable. These two techniques made up the general study parameters and had the same trend effect on operation conditions to compare between tines. Lab results such as force components and the width of furrow were verified in a field test. Furthermore, a model to predict the draft force by using principles of soil mechanics and soil profile evaluation was designed.