

MECHANICAL WEED CONTROL BY MOWING AND ITS EFFECTS ON CORN YIELD IN NO-TILLAGE SYSTEMS

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ABSTRACT

Weeds are responsible for significant yield losses in corn cultivated under no-tillage systems. Although herbicides are the main weed control strategy, reducing their use poses an increasing challenge. This study aimed to evaluate the effectiveness of mechanical weed control through inter-row mowing in corn grown under no-tillage conditions without herbicides. The experiment was conducted during the 2022/2023 and 2023/2024 growing seasons, in a randomized block design. In the first season, four treatments were tested: no mowing, mowing at V4, mowing at V8, and two mowings (V4 and V8), with three replications. In the second season, five treatments were applied: no mowing, mowing at V4, mowing at V8, two mowings (V4 and V8), and manual weeding, with four replications. The following agronomic traits were evaluated: plant height, ear insertion height, stem diameter, number of rows per ear, number of kernels per row, number of kernels per ear, ear length and width, thousand grain weight, and grain yield. Data were subjected to analysis of variance, and means were compared using Tukey's test at a 5% significance level. Additionally, principal component analysis (PCA) was performed to assess the relationships between variables and treatments. Results showed that the implementation of two mowings promoted better crop development in both seasons, resulting in up to 132% yield increase compared to the no-mowing treatment. In

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the second season, manual weeding showed slightly superior agronomic performance. PCA confirmed that treatments with two mowings were closely associated with productivity-related variables, highlighting this practice as an effective and sustainable strategy for weed control in corn cultivation without herbicides.

KEYWORDS: Mechanical weed control; Interspecific competition; Sustainable practices.