

EFFECT OF SOIL COMPACTION ON POTASSIUM UPTAKE,
GROWTH AND YIELD OF MAIZE (ZEA MAYS.L)

By

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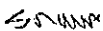
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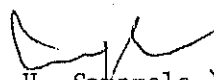
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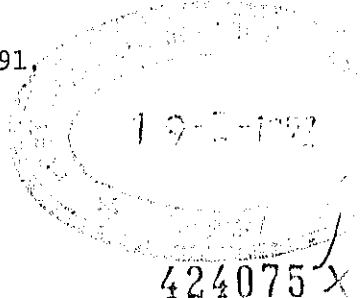
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ABSTRACT

Often soil compaction is considered undesirable for plant growth. The objective of this study was to determine the effect of soil compaction on corn plant growth, yield and potassium uptake under different soil potassium levels. Field experiments were conducted during two seasons (1986/87 and 1987/88 maha) at Maha-Illuppallama on Reddish Brown Earths soil (Rhodustalf), a well drained sandy loam soil.

Corn was grown at three compaction levels namely, No compaction (normal tillage operation, C0), Moderate compaction (compacting twice with 20kg steel block, C1) and High compaction (compacting four times with same block, C2) with three K fertilizer levels; the control (K0), 50kg K₂O/ha (K1) and 100kg K₂O/ha (K2).

The results showed that increasing levels of compaction decreased the root dry weight significantly during the two seasons. The reduction in root growth was highest (22%) between C1 and C2 levels during the maha season of 1986/87. Similarly, increasing compaction decreased K uptake, plant height and grain weight. It was also noted that mean K uptake at lowest compaction level (C0) in combination with K0 (1342mg/plant) was almost equal to the uptake value (1294 mg/plant) at the highest compaction level (C2) in combination with the highest added K at 12th week of planting during 1987/88 maha season. Increasing K levels significantly increased the K uptake and NH₄OAC extractable K content in the soil but there was no marked improvement on root growth,

plant height and grain weight. This trend was observed during both seasons.

Although the interaction effects between two factors were not significant on root growth, plant height and grain weight, it was noted that high application of K resulted in vigorous and healthy plant growth. This indicates that one of the functions of potassium in corn growth may be to counteract some of retarding factors the plant confronts in its growing environment.