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**RELATIONS BETWEEN TILLAGE SYSTEMS AND CULTURES IN SUCCESSION
ON THE MECHANICAL RESISTANCE TO PENETRATION
ON THE PRODUCTIVITY OF SWEET CORN AT THE END
OF TEN YEARS, IN THE BRAZILIAN NORTHEAST.**



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INTRODUCTION

One of the main causes of land degradation is the compaction, result of the increased density and penetration resistance. Soil compaction occurs very often in environments that use machinery and tools or in areas where the animal trampling is intense, and is one of the most serious factors restricting the development of plants. The No-tillage system contributes to the maintenance of agricultural sustainability in tropical regions, in order to keep or to recover the soil quality, working together with green manure and other soil management practices. The edaphological conditions of the TABLELANDS IN THE NORTHEASTERN REGION OF BRAZIL during TENTH YEAR OF EVALUATION IN LONG-TERM PLOTS was studied.

MATERIALS AND METHODS

The experimental split-plot with three randomized replications (12 treatments: 3 Tillage systems (CC - conventional tillage, CM - minimum tillage, PD - No-tillage) X 4 green manure species rotations: peanut /amendoim (*Arachis hypogaea* L.) and beans / feijão (*Phaseolus vulgaris* L.), until o ninth year of experiment conduction, after change to feijão sunflower (*Helianthus annuus*) and milhet (*Penisetum americanum*), e since the start, guandu / pigeonpea / guandu (*Cajanus cajan* L.) and sunnhemp / crotalaria (*Crotalaria juncea* L.), rotated with sweet corn (*Zea mays* L.).
Evaluate - In determining the penetration resistance was used an electronic penetrometer, model FALKER SoloTrack PLG 5200, making the readings to a depth of 40 cm in 12 treatments (three tillage systems associated with four cover crops in succession)



TABLE. Productivity of spikes of the sweet corn when submitted cultures in succession and many tillage systems.

Culturas	Productivity of spikes (Kg/ha.)		
	TC	MT	NT
Pigeonpea ("guandu")	6.373,4 aA	8.287,0 aA	9.830,2 aA
Millet ("milheto")	3.935,2 aC	6.589,5 aB	9.830,2 aA
Sunnhemp ("crotalaria")	5.863,6 aA	9.722,1 aA	10.000,0 aA
Sunflower ("girassol")	5.370,4 aB	7.145,0 aB	12.762,3 aA
Average	5.335,6 b	8.005,4 a	10.536,2 a
	VC(%)	31,6	

NT – No tillage, MT – Minimum tillage and TC – convencional tillage - Lowercase letters in the column, the capital letters in line, and different letters differ statistically by Tukey test at 5% probability

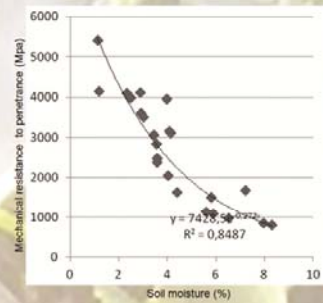


FIGURE. Correlation between soil moisture (%) and Mechanical penetrometer resistance - MRP (Mpa)

RESULTS



FIGURE. Electronic penetrometer FALKER SoloTrack PLG 5200

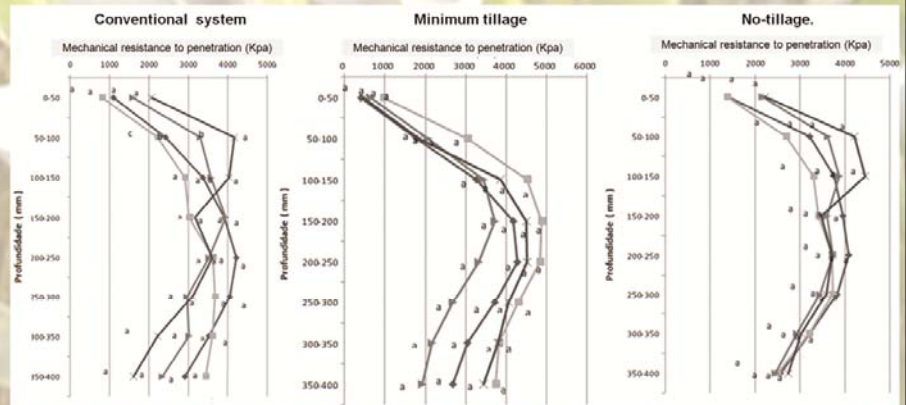


Figure – Mechanical penetration resistance (kPa) throughout the soil profile for different cultures of succession under different cropping systems
Conventional system, Minimum Tillage and No-tillage. Same letter do not differ statistically by Tukey test at 5% probability.

— Guandu - pigeonpea
— Crotalaria - sunnhemp
— Milheto - millet
— Girassol - sunflower

CONCLUSIONS

- 1) The no-tillage system provides the best yield of sweet corn combined with lower values of mechanical resistance to penetration along the profile.
- 2) The use of green manure contributed to alleviating the pressure on the penetration of the soil, especially in tillage, and consequent increase in productivity of sweet corn.
- 3) Conservation tillage systems proved to be a viable alternative to reducing the values of RMP and maintenance of an agroecosystem in relation to productivity of sweet corn, because the productive efficiency achieved in these systems was higher than that obtained under conventional tillage for sweet corn.

SUPPORT:

