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Soil compaction under different sugarcane management systems*

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- The fundamental role of soil preparation operations is to create ideal conditions for root growth.
- Changes that occur in the structure of the soil are recognized in soil bulk density, mechanical resistance to penetration, total porosity, soil storage and water availability values.
- Compaction, soil de-structuration and the reduction of organic matter content are considered the main factors inducing soil degradation.
- For the sugarcane production system, soil preparation is one of the most important management phases because the operations performed during the installation of the crop will influence sugarcane yield over several years (ratoons).
- Intense machinery traffic occurring during crop renewal added to successive mechanical operations during crop development intensify even more the compaction of the soil, even of deep layers. Knowing that sugarcane roots can reach depths of 5 m it becomes important to monitor soil compaction.

OBJECTIVE

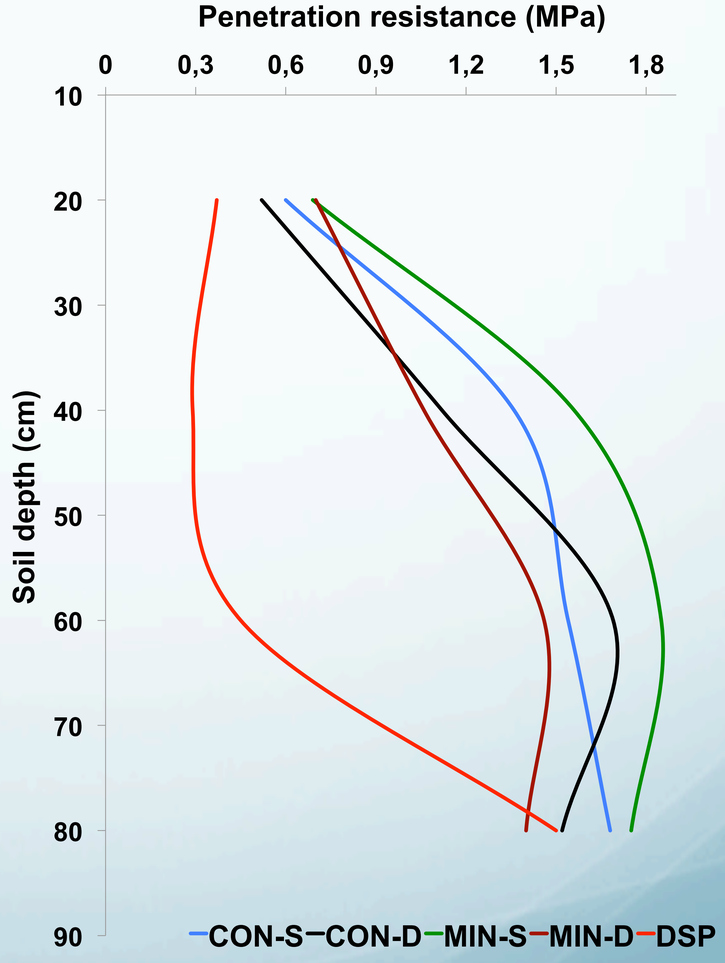
Evaluating soil compaction under different soil preparation systems and crop spacing for sugarcane.

TREATMENTS

- Conventional (CON) and Minimum (MIN) tillage were combined with two spacing: Simple (S) of 1.5 m and Double (D) alternating 1.5 and 0.9 m, resulting treatments CON-S, CON-D, MIN-S and MIN-D, added to a deep soil preparation with double spacing (DSP), with a total of five treatments of Soil penetration.
- Measurements were taken within cane lines to be sure to be in the region where most of the roots develop, at depths of 0-20, 20-40, 40-60, 60-80 cm.

RESULTS

- At the soil surface (0-20 cm) and the deepest layer (60-80 cm) no differences in penetration were found among treatments (Figure).
- At the 20-40 cm layer, treatment PPF (0.29 MPa) presented lower penetration resistance in relation to CON-S and MIN-S (1.36 and 1.56 MPa, respectively).
- For the 40-60 cm layer the DSP (0.45 MPa) treatment showed efficiency, once penetration resistance values were lower in relation to all other treatments.
- The lower values of penetration for PPF are due to the sub-soiling operation made with an implement called *DRENO*, in depth at the cane line, once the equipment breaks compacted layers in depth.



CONCLUSION

- Penetration resistance indexes were very promising for the deep soil preparation system (DSP), where other assessments also proved their efficiency in comparison with other treatments.

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