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Visual Evaluation of Soil Structure in *Brachiaria decumbens* cv. Basilisk Swards

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Introduction

- Soil structure is a complex soil property, partly related to inherent characteristics of particle size and clay mineralogy and partly to anthropogenic influences related to land use and management (Ball et al., 2007).
- Soil structure can be described in terms of (Ball et al., 2007):
  - ✓ (i) structural form; the heterogeneous arrangement of pores and solids at any given time;
  - ✓ (ii) structural stability, the ability of soil to retain its structural form after exposure to stress; and
  - ✓ (iii) structural resilience: the ability of soil to recover its structural form through natural processes.
- Visual Evaluation of Soil Structure (VESS) method (Ball et al., 2007; Guimarães et al., 2011) analyze in field the aspects of soil structure and rooting. A distinctive feature of VESS is the ability to distinguish layers in the topsoil of differing structure.
- This works aimed to evaluate the soil structure applying VESS method in an area with *Brachiaria decumbens* cv. Basilisk swards under different levels of soil base saturation (V%) and grazing intensities.

Material and Methods

- The experiment was carried out at FZEA-USP, Pirassununga, SP, Brazil.
- *Brachiaria decumbens* cv. Basilisk was seeded in November 2012, and it was maintained under free growth until October 2014, then rotational stocking was employed based on the criterion of 95% of light interception.
- Treatments comprised of combinations between three levels of soil base saturation (V% 35, 50 and 65) and two grazing intensities (40% and 60% of pre-grazing height) and were distributed in a randomized complete block design in a 3x2 factorial arrangement.
- At each plot the VESS method was performed and each layer of soil identified was classified into one of five categories (Figure 1).
- VESS was evaluated every 2 cm from 0 to 20 cm depth in triplicate (Figure 2).

Figure 2. Analyzing the visual soil structure according to the VESS chart.

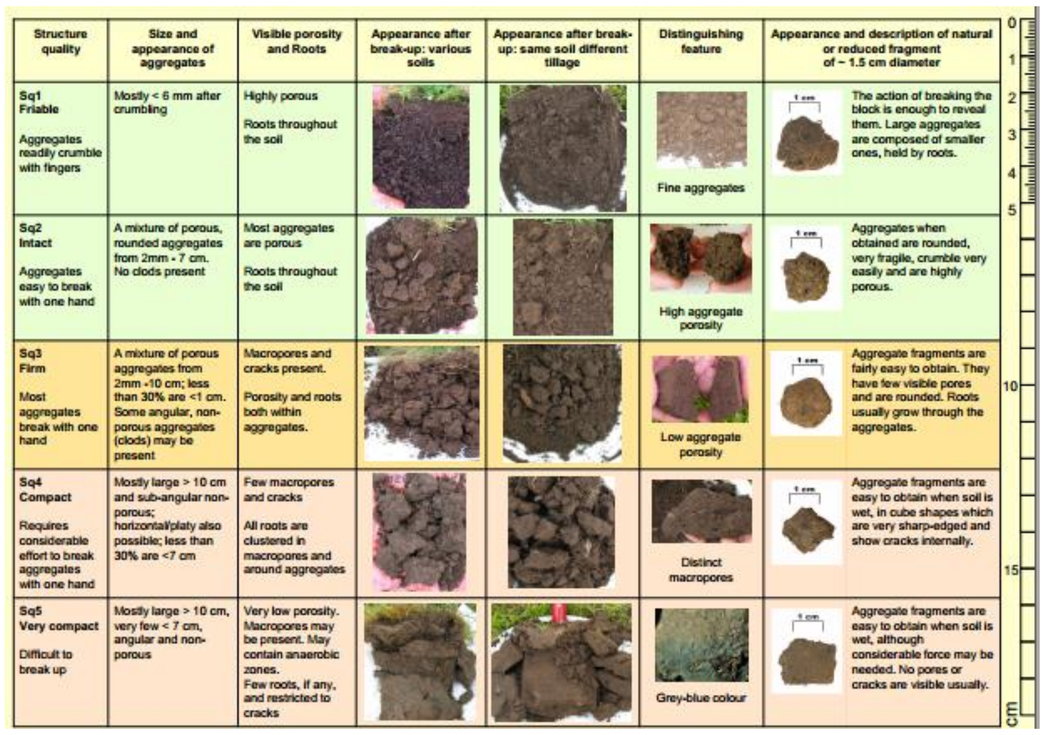

Figure 1. Description and illustration of soil structure and distinguishing features in each of the five categories of quality (Guimarães et al., 2011).

Results and Discussion

- VESS results showed effect between of soil base saturation (V%) and grazing intensity (GI) ($P < 0.0001$).

Table 1. VESS soil quality (Sq) score for area of *Brachiaria decumbens* cv. Basilisk swards.

GI \ V%	35	50	60
40%	1.40 aA	1.20 bB	1.10 aB
60%	1.00 bB	1.43 aA	1.07 aB
S.E.M	0.0649	0.0649	0.0649

V% - soil base saturation; GI - grazing intensity; S.E.M. - standard error of the mean; capital letters compare grazing intensity and small letters compare soil base saturation.

- For all combinations, VESS Sq score were lesser than 2, indicating good structural quality of the soil and no changes needed in current management.

Conclusion

- More intensity of grazing with lower base saturation promote higher values of VESS, indicating a possible injury in soil structure. However, a higher base saturation helps to keep Sq score close to 1, regardless grazing intensity.

References

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