

INFLUENCE OF LITHOTHAMNIUM APPLICATION ON VETIVER GRASS IN DIFFERENT SOIL TYPES

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Abstract

Vetiver grass is used throughout Asia to make handicrafts, medicines, and other products. It is widely used in several countries for its deep and abundant root system, sediment control and phytoremediation. *Lithothamnium* is derived from seaweed and contributes to soil improvement. The objective of this study was to analyze the effect of different doses of *Lithothamnium* on the growth parameters of vetiver grass in clay and sandy soil. For the experiment, twenty pots were used for each type of soil (sandy and clayey), where each pot contained a vetiver grass seedling. It was separated into 5 treatments per block: 0, 10, 20, 40, 80, g of *Lithothamnium* per pot, and the growth parameters were analyzed. Regarding height, only the clay soil showed statistical differences between treatments on days 4 and 5; The sandy soil did not show significant differences. For fresh and dry mass, only the grass grown in the sandy soil showed a significant difference. Thus, *Lithothamnium* did not show the expected effect for the grass, since it remained at the level of control in relation to the different treatments for the parameters analyzed.

Keywords: *Vetiveria zizanioides*; Clay; Sandy.

INTRODUCTION

Vetiver grass (*Vetiveria zizanioides* L. Nash) is used by part of Asia, mainly India, to make handicraft products, manufacture perfumes, medicines, and insect repellent (Gomes et al., 2020). It has been widely used in several countries because it has a deep and abundant root system, and because it is very resistant to climatic variations and tolerates contaminants (Ucker & Almeida, 2013). Vetiver grass is easy to adapt and is used in sediment control, phytoremediation, affluent treatment, and slope stabilization (Medeiros et al, 2020).

Lithothamnium is derived from seaweed with a high calcium content that contributes to the improvement of the soil (chemical, physical and biological) and the supply of magnesium which are essential nutrients for the plant, improves productivity, nutrient production and absorption and increases resistance to pests and diseases (Negreiros et al, 2023), this high content is essential for meristem growth and mandatory for cell growth and division (Evangelista et al, 2016).

This way, due to the scarcity of information about the cultivation and management of this species in different environments, more studies are needed to provide the desired effect, for divulgation and better cultivation recommendation.

So, the objective of this study was to analyze the effect of different doses of *Lithothamnium* on the growth parameters of vetiver grass in clay and sandy soil.

MATERIALS AND METHODS

The experiment was conducted on the Gragoatá Campus of Universidade Federal Fluminense (UFF), in the municipality of Niterói-RJ, latitude 22° 54' 00" S, longitude 43° 08' 00" W and altitude 8 m, in greenhouse belonging to the Farmácia Viva Phytotherapy Program. The cultivation region has an Aw climate, according to the Köppen classification, referring to a tropical climate with dry winters and rainy summers, with a mean annual temperature of 23°C and mean annual precipitation of 1,200 mm.

The experiment was carried out in randomized blocks, with two different types of soil, sandy and clay. Twenty pots were used for each type of soil and each pot (4 liters) contained a vetiver grass seedling (*Vetiveria zizanioides* L. Nash), all of which were leveled at a height of 20 cm to start the experiment, the height was checked weekly using a 5 m tape measure.

The experiment was divided into 5 treatments per block containing the doses of: 0, 10, 20, 40, 80, g of *Lithothamnium* per pot. The plants were grown in greenhouses with 70% shade and irrigation of 200 ml on alternate days.

The parameters analyzed were height in cm, fresh and dry mass in g, for each treatment. Data were collected from 02/23/2022 to 05/04/2022. Statistical analyses were carried out using the SISVAR® program.

RESULTS AND DISCUSSION

Regarding the height of the plants grown in the clay soil with application of *Lithothamnium*, there were significant differences between the treatments on days 4 and 5 when compared with their respective controls. The other days showed no significant differences (Figure 1).

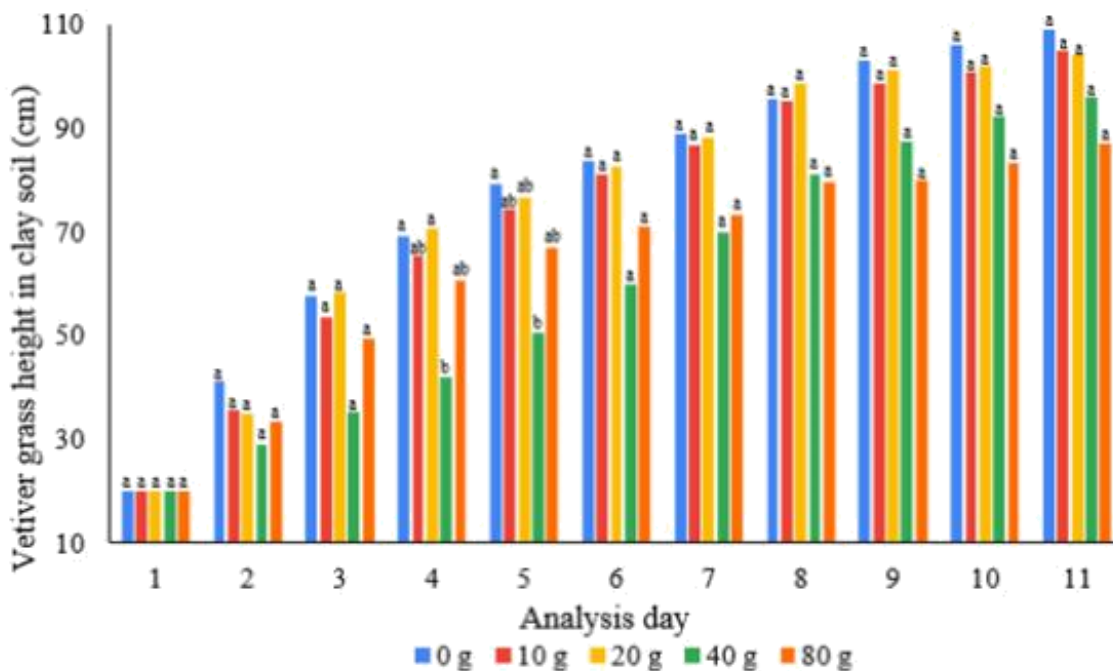


Figure 1: Height of vetiver grass grown in clay soil with different doses of *Lithothamnium*. Identical letters on the same day do not differ statistically from each other by Tukey's 5% test. Values representing the mean of n=5.

For the height of grass in sandy soil with different doses of *Lithothamnium* did not differ statistically between treatments throughout the experimental period (Figure 2). Grass height increased with increasing organic fertilizer doses (Holanda et al, 2021).

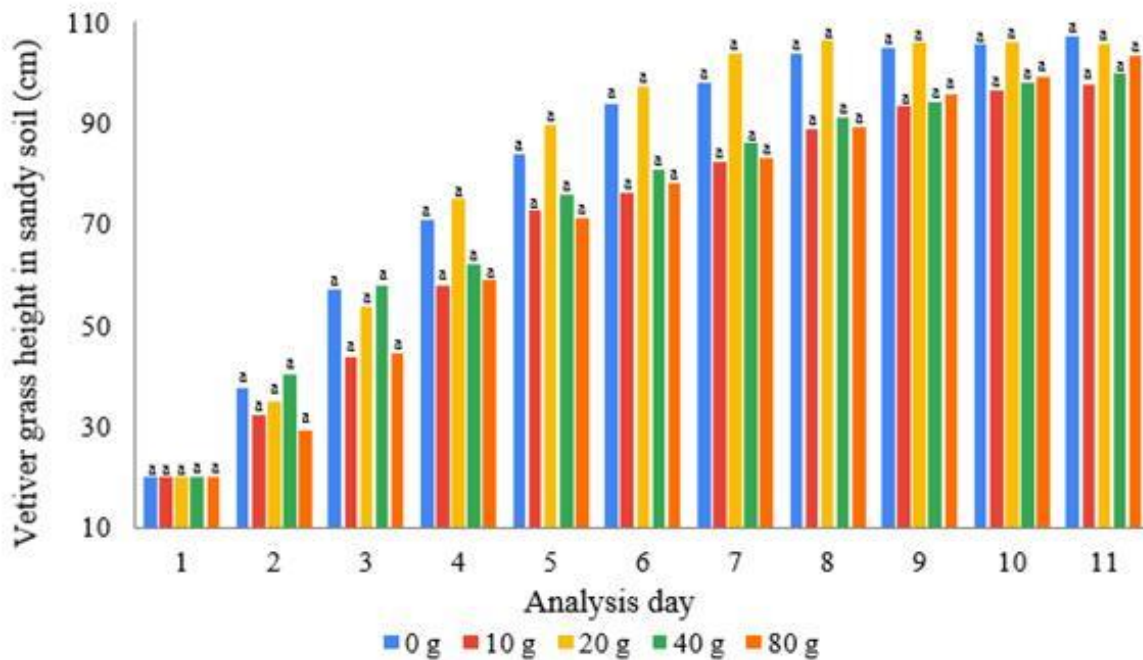


Figure 2: Height of vetiver grass in sandy soil with different doses of *Lithothamnium*. Identical letters on the same day do not differ statistically from each other by Tukey's 5% test. Values representing the mean of n=5.

Regarding the fresh and dry mass data, there were significant differences between the treatments only for the sandy soil, where only the controls did not differ from each other (Figure 3). The doses of 40 and 80 g for dry mass of grass plants in sandy soil showed statistical differences, while the other doses remained at the level of their control (Figure 3B).

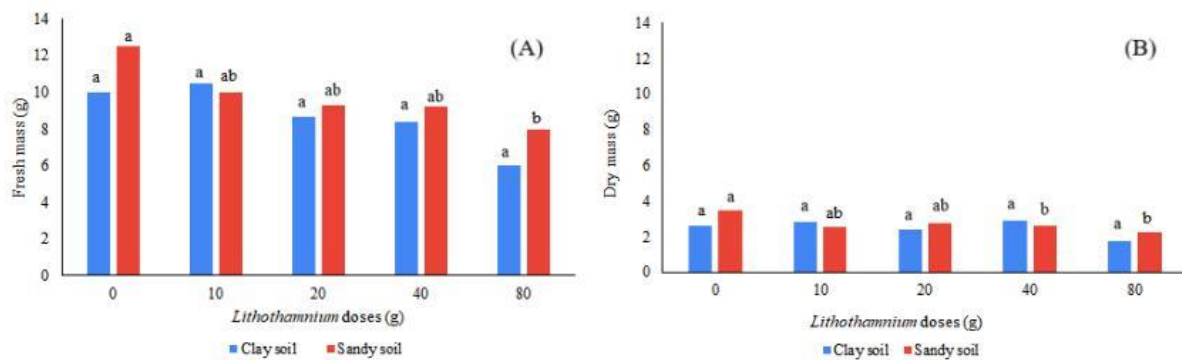


Figure 3: Fresh mass (A); Dry mass (B) of vetiver grass with different doses of *Lithothamnium* in different soil types. Identical letters on the same day do not differ statistically from each other by Tukey's 5% test. Values representing the mean of n=5.

CONSIDERATIONS

Regarding height, only the clay soil showed statistical differences between treatments on days 4 and 5. The fresh and dry mass of vetiver grass in the clay soil showed no significant differences, while the sandy soil showed statistical differences for the treatments with doses of 40 and 80 g, but only for dry mass.

O lithothamnium did not show the expected effect for the grass, since it remained at the level of control in relation to the different treatments for the parameters analyzed.

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PRESENTATION: <https://www.youtube.com/watch?v=A-0Ob8qOzaI>