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INFLUENCE OF APPLICATION OF DIFFERENT PROPORTIONS OF ROOT TINNING AND CUTS ON THE UPPER AREA ON CITRONELA GROWTH

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Introduction

The value of medicinal, aromatic or flavoring plants is determined by the chemical compounds they make and which are called active ingredients and may be contained in the leaf, flower, root or bark, depending on the plant species (Corrêa & Scheffer, 2013), and the biosynthesis of these chemical compounds may vary due to numerous factors, ranging from changes in crop management to environmental factors such as light, temperature, soil state and photoperiod, can directly interfere with growth and development, as well as yield (Peixoto et al, 2011; Pavarini et al, 2012; Nobre et al, 2013). Productivity is even reported as being widely affected according to weather conditions in the trial year (Plūduma-Pauniņa et al, 2019).

In addition, other situations may interfere with the production of this crop, as it is necessary to make cuts to remove the leaves, for later extraction of the active ingredients throughout the cultivation and to verify how the cutting of the shoot along with cuts in the system. root can influence biomass production is of prime importance as the raw material may be affected, depending on the factor, it can provide a better crop yield such as for example a better root development (Kaczorowska–Dolowy et al, 2019).

Thus, the species known as citronella grass, whose scientific name is *Cymbopogon nardus* L., is a plant of great interest as a raw material to produce natural products, due essential oils (OE) in its leaves.

Therefore, the objective of the present study was to analyze the biomass partition of citronella plants submitted to different levels of shoot and root cuts.

Materials and Methods

The plants (*Cymbopogon nardus* (L.) Rendle) were conducted for five months until the beginning of the treatments. For this, the experiment was conducted in a completely randomized design, with five different proportions of root thinning (zero cut, 25, 50, 75, 100%) after 145 days of seedling planting and distinct cuttings in the aerial part (leaves). Being the first cut of all leaves performed on the same day as the root cut. Thus, for leaf cutting were four treatments: blunt; a cut at 145 DAP (days after planting) along with the root cut; a cut at 228 DAP; and cuts at 145 and 228 DAP (two cuts). The roots were cut into the container with water and kept immersed in this water for 24 hours to avoid cavitation in the vascular system. After 24 hours the plants were replanted in 8 liter pots containing the same soil.

To obtain the data of dry matter accumulation and photoassimilate partition, successive collections were performed, starting on the day of seedling planting, totaling four collections and in each collection the dry mass of the plant organs (leaf, stem and roots) was determined.

Statistical analysis - ANOVA was with split plots (Treatment a: five different proportions of root cuts and treatment b: four different types of leaf cuts) with five replications.

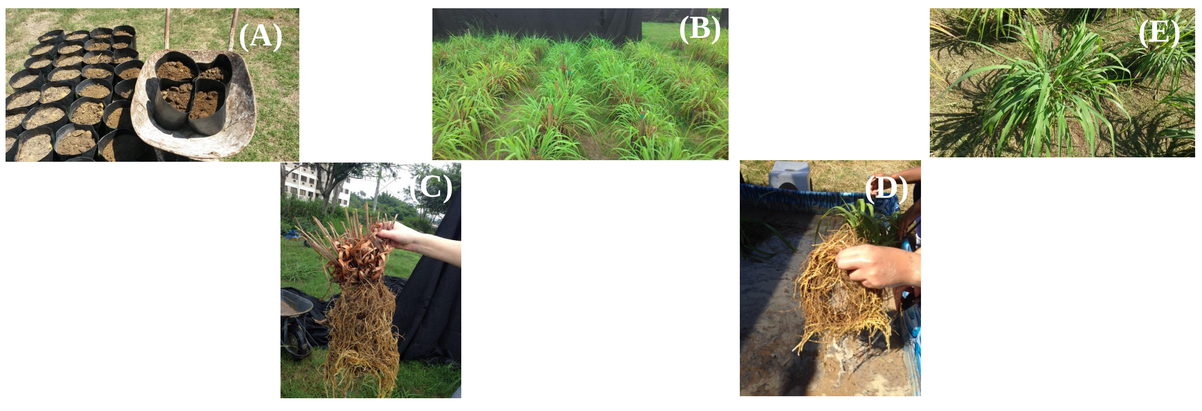

Figure 1. Study steps (A e B) cultivation; (C e D) cuts leaves and roots; (E) plants at the end of the study.

Results and Discussion

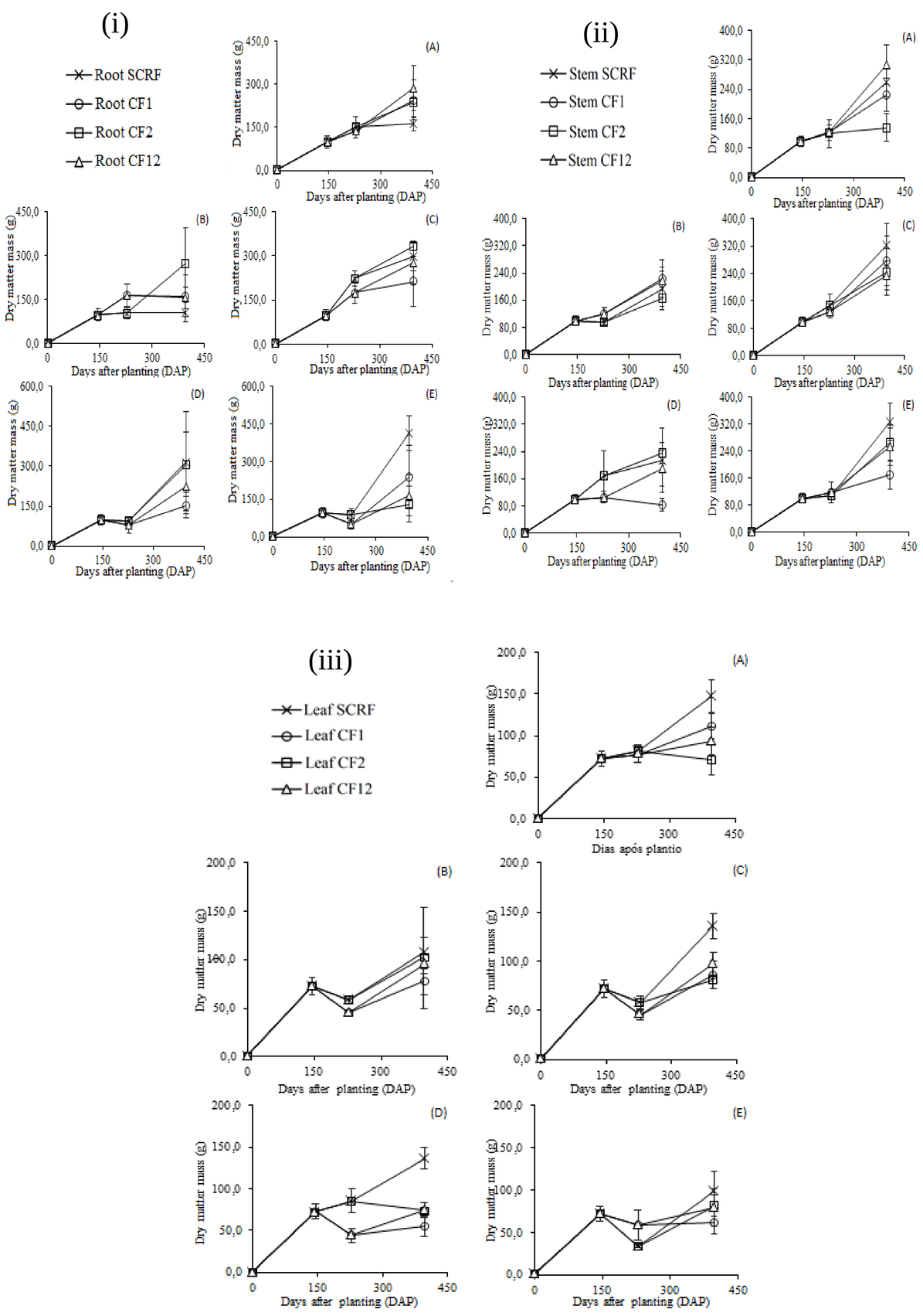

Figure 2. Evolution of citronella plant matter accumulation in (i) root, (ii) stem, (iii) leaf, in leaf cut treatments: (A) blunt root; (B) 25% root cut; (C) 50% root cut; (D) 75% root cut; (E) 100% root cut. (SCRF: no leaf cutting; CF1: leaf cutting at 145 DAP; CF2: leaf cutting at 228 DAP; CF12: leaf cutting at 145 and 228 DAP). Bar indicates Standard Deviation.

Conclusions

Citronella plants containing root pruning show compensatory growth in relation to root thinning, and the increase of root biomass gradually depends on the increase of thinning level, the same not being verified for stem and leaf biomass, which varied according to the levels of shoot cuts.

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