

Effects of the fungus *Epichloë occultans* on the drought resistance of different populations of ryegrass in Argentina

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INTRODUCTION

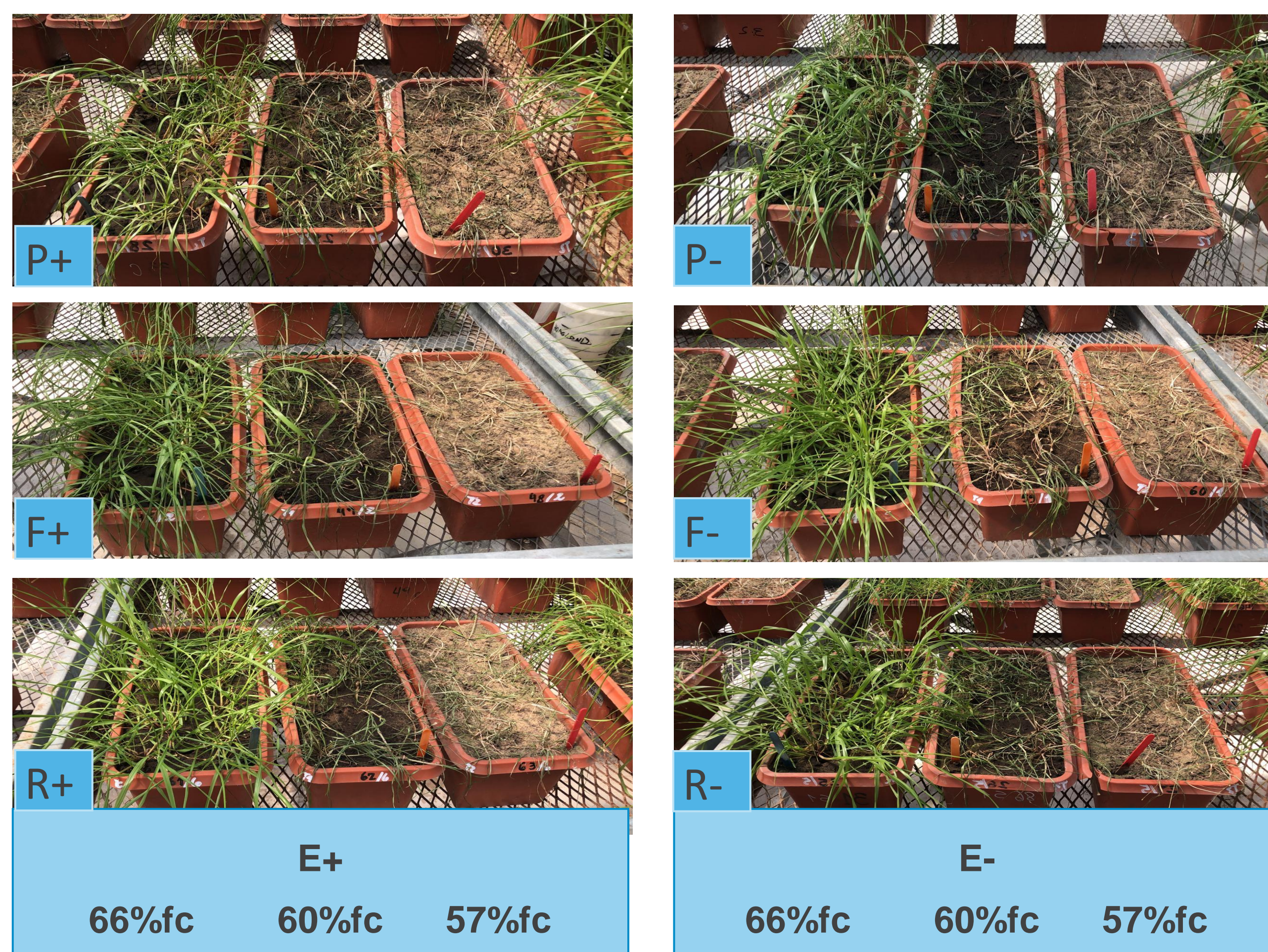
Diploid annual ryegrass is widely used as forage in Argentina. This plant is very resistant to certain conditions, such as climate, type of soil, and trampling. Importantly, the infection by the endophyte fungus *Epichloë occultans* can provide some resistance to abiotic stress in plants.

OBJECTIVE

The aim of this work was to evaluate the growth parameters, such as dry weight, plant height and number of tillers, of 3 different ryegrass Pipinas (P+), Feliciano (F+), Ribeye (R+) infected with the fungus and not infected Pipinas (P-), Feliciano (F-), Ribeye (R-). The growth rate was determined in conditions of drought to assess the effects of the infection on the abiotic stress caused by the drought in plants.

MATERIALS AND METHODS

The experiment was carried out under drought conditions in a greenhouse. The ryegrass species evaluated were Pipinas (P), Feliciano (F) and Ribeye (R) infected (+) and non-infected (-) with the fungus *Epichloë occultans*, with a total of 6 groups. The treatments were determined according to the soil moisture levels: 66% field capacity (Control), 60% field capacity (T1) and 57% field capacity (T2). The soil used for the experiments was a mix with a mass ratio of 1:1 of soil and sand. For the measurements, the TDR 300 FieldScout probe was used to measure the moisture of the soil thrice a week. The statistical design was carried out in randomized blocks, with 3 repetitions. The number of stems and the height of the plant (centimeters) were determined every 7 days, whereas the dry weight and the relative water content were determined after 3 months. The software Infostat® version 2020I was used for the statistical analysis.



Picture 1: Comparison between populations: with endophyte (E+) and without endophyte (E-) for both treatments 66% field capacity (Control), 60% field capacity (T1) and 57% field capacity (T2).

RESULTS

The P+ and R+ groups present a significant difference in terms of dry weight, possibly due to the protective effect provided by the fungus against stress caused by drought.

It is important to highlight that it can be observed that the different treatment conditions significantly affected the parameters evaluated, such as height growth rate, dry mass, relative water content, number of stems, as shown in figure 1.

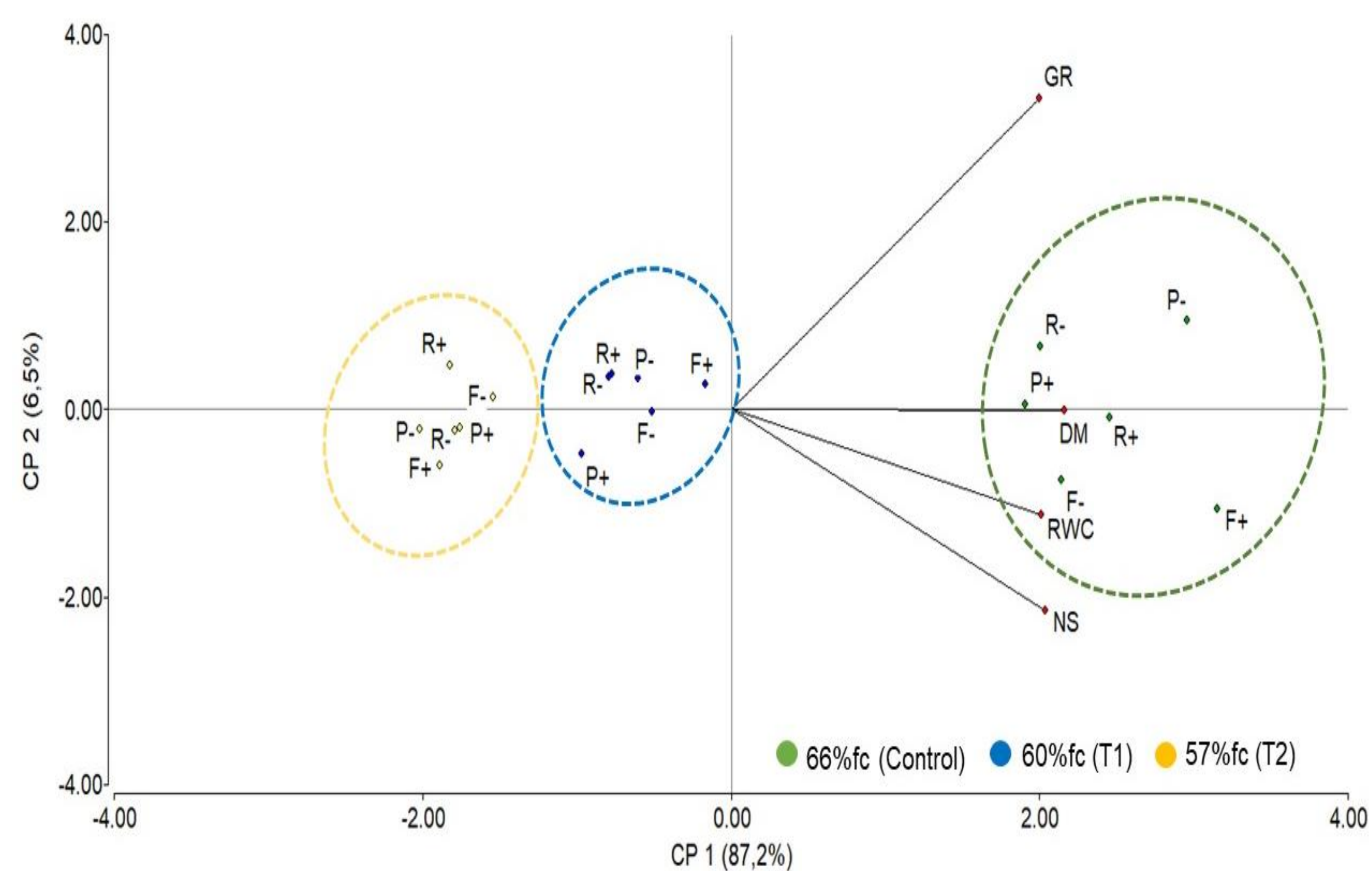


Figure 1: Analysis of the main components of height growth rate in cm (GR), Dry mass in grams (DM), Relative water content (RWC), Number of stems (NS), and field capacity values (FC) in the Pipinas (P), Feliciano (F), Ribeye (R) populations, with endophyte (+) and without endophyte (-), for the three treatments.

CONCLUSIONS

It can be observed that the *Epichloë occultans* fungus provides a protective effect against drought in the plants evaluated in this study.