

THE ROLE OF ENDOPHYTE (*ACREMONIUM LOLII*) IN *LISTRONOTUS BONARIENSIS* PEST TOLERANCE OF ITALIAN RYEGRASS (*LOLIUM MULTIFLORUM*).

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ABSTRACT

The objective of this study was to determine the behaviour of new varieties of Italian ryegrass (*Lolium multiflorum*) and their tolerance to the attack of the Argentine stem weevil (*Listronotus bonariensis*) in cultivars with and without endophyte (*Acremonium lolii*).

The variety of better behaviour was Aberoscar; although it does not have endophyte, it was not very damaged, the one which leads one to believe there are other factors besides the endophyte influencing this cultivar's resistance to the Argentine stem weevil. The effect of the endophyte was of little importance in the control of the insect pest.

KEYWORDS

Argentine stem weevil, *Listronotus bonariensis*, Italian ryegrass, *Lolium multiflorum*, endophytic fungi, *Acremonium lolii*.

INTRODUCTION

The arrival of varieties of ryegrass (*Lolium sp.*) with endophyte (*Acremonium lolii*) in the market of the south zone of Chile and the increments of cases of attack of the Argentine stem weevil (*Listronotus bonariensis*) have provoked great interest among investigators of this region studying the problem. According to that expounded by Prestidge (1991), there exists an important effect of the endophyte on the susceptibility of the Italian ryegrass (*Lolium multiflorum*) to the oviposition and feeding of the Argentine stem weevil (*Listronotus bonariensis*).

The objective of this study was to determine the behaviour of new varieties of ryegrass used in rotation (*Lolium multiflorum*) and their tolerance to the attack of the insect pest in cultivars with and without endophyte.

MATERIALS AND METHODS

The work was carried out in the Regional Center of Remehue Investigation, Central Valley of the XTM Region from Chile (40½ 35' south latitude). The climate is tempered with a mean annual rainfall of 1.290,8 mm and mean annual temperature of 11,2½ C.

The date of seeding was March 24 of 1994. There were carried out 5 treatments (varieties of ryegrass of rotation) in a randomized block design with four replicates. The varieties used were Tetrone (Holland), Abercomo and Aberoscar (Northern Ireland), Greenstone Endosafe and Greenstone Low Endosafe (New Zealand), in sowing rates of 25 kg/ha of seed. The ryegrass was cut when it had 18 to 20 centimeters of height and a residual of 4 centimeters was left. The fertilization was carried out according to analysis of soil.

RESULTS AND DISCUSSION

A summary of the results of year 1, (production of forage, damage caused by *L. bonariensis* and level of endophyte in the plants) are shown in table 1. There are significant differences in the yield of the varieties, where the highest yielding were Aberoscar, Abercomo and Tetrone, all free of endophyte. The of lowest yielding were Greenstone Endosafe (with 37,5% of endosafe) and Greenstone LE (without endosafe).

The damage produced by *L. bonariensis* was high in Tetrone and Abercomo and very small in the remainder of the varieties, although Aberoscar and Greenstone LE do not have endophyte.

One could explain this precedent according to that expounded by Goldson (1982), who said that the resistance of some species and varieties could be due to the presence of antifeedant chemicals factors. One of these could be a higher content of cellulose in the plant. Greenstone endosafe had not very significant damage, due to the presence of the endosafe, which agrees with the opposing viewpoint of Popay *et al.* (1995).

The results of year 2, (production of forage, damage caused by *L. bonariensis* and population of plants) are shown in table 2. There are significant differences in the yield of the varieties, in where the highest yielding were Aberoscar and Greenstone LE, followed by Greenstone Endosafe. The of lowest yielding were Tetrone and Abercomo, affected a great deal by damage caused by *L. bonariensis*, with 62 and 44% damaged tillers, respectively. As a result of this damage, the population of tillers of these two varieties were significantly lower.

Considering the two years of evaluation, the best variety was Aberoscar. Although it does not have endophyte, it was not very damaged the first year by *L. bonariensis* and was less affected the second year, maintaining a good density of tillers at the end of the investigation.

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Table 1

Production of forage, damage by *L. bonariensis* and endophyte levels of the year 1.

Variety	Yield t DM/ha	Damage % tillers	Endophyte Levels % tillers infected
Tetrone	12.3 a b*	67	0
Abercomo	13.6 a	60	0
Aberoscar	13.6 a	6	0
Greenstone E	11.1 b	6	37,5
Greenstone LE	11.6 b	10	0

*Means followed by the same letters are not significantly at 5% level.

Table 2

Production of forage, damage by *L. bonariensis* and plant population of the year 2.

Variety	Yield t DM/ha	Damage % tillers	Sown Grass tillers N°/m ²
Tetrone	7.6 d*	62	108
Abercomo	8.4 c	44	188
Aberoscar	10.6 a	30	835
Greenstone E	9.9 b	29	750
Greenstone LE	10.0 a b	33	723

*Means followed by the same letters are not significantly at 5% level.