



UNIVERSIDAD
DE LA REPÚBLICA
URUGUAY



Facultad de Veterinaria
Universidad de la República
Uruguay

Effect of supplementation with multifloral pollen on the strength and honey production of honey beecolonies located in " Eucalyptus grandis " monocultures

Agustín Pérez-Graña^{1*}, Pablo Juri², Valentina Rodríguez-Batista², Ciro Invernizzi², Enrique Nogueira²

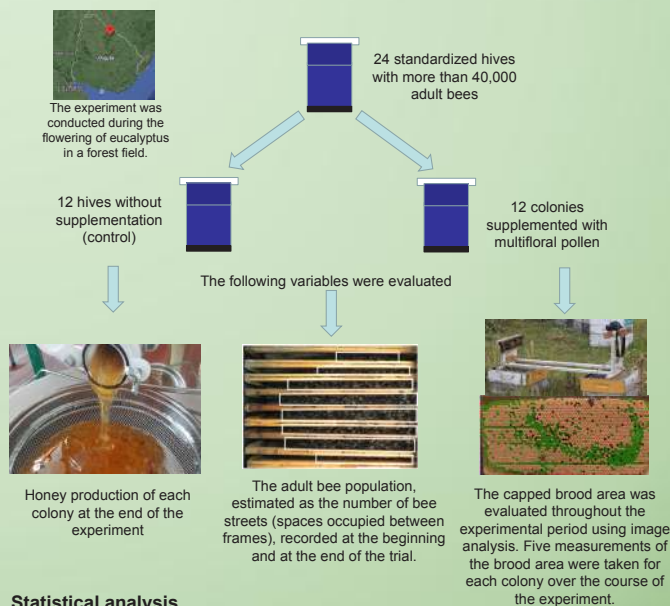
1-Facultad de Agronomía, Universidad de la República, Uruguay 2-Facultad de Veterinaria, Universidad de la República, Uruguay

*aperez@fagro.edu.uy

INTRODUCTION

In Uruguay, forest development has created an opportunity for beekeeping in *Eucalyptus grandis* plantations. Flowering begins in late summer and extends until mid-autumn. However, since these plantations cover large areas of a single crop whose pollen is deficient in certain essential amino acids, colonies tend to weaken towards the end of the season, compromising their ability to survive the winter. In this context, the aim of this study was to assess whether supplementation with multifloral pollen could help improve colony strength and productivity.

METHODOLOGY

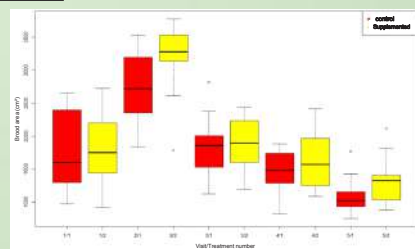


Statistical analysis

The Mann-Whitney test was used to compare the adult bee population between groups, while ANOVA was employed to assess differences in capped brood area and honey production. All analyses were performed in R version 4.3.2 (R Core Team, 2023), using the packages stats (for ANOVA and Mann-Whitney test), and ggplot2 (Wickham, 2016) for data visualization

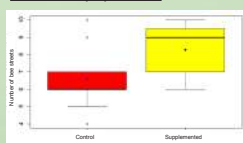
RESULTS

Brood area



No significant differences were detected between groups in capped brood area during the study; however, significant differences were observed among evaluation dates.

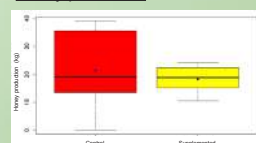
Adult bee population



The blue dot indicates the mean

At the end of the trial, the adult bee population was significantly higher in the Supplemented group compared with the Control (Mann-Whitney, $p = 0.04$).

Honey production



The blue dot indicates the mean

Regarding honey production, although no significant differences were found between treatments, the Supplemented group showed lower variability (18.3 ± 4.9 kg) compared with the Control (22.0 ± 13.8 kg).

CONCLUSION

Multifloral pollen supplementation enhances adult bee survival by improving the nutritional balance in response to the essential amino acid deficiency of *E. grandis* pollen. The larger adult bee population observed at the end of the trial reflects a direct benefit to colony vitality, and this effect may be further amplified in the following weeks, given that nutritional stress can have long-term consequences.

Although honey production did not differ significantly between groups, the lower variability recorded in supplemented colonies represents a practical advantage for beekeeping management, as it results in more homogeneous colonies in terms of productivity.

Overall, multifloral pollen supplementation helps maintain stronger colonies at the end of the *E. grandis* flowering period, which is a key factor for improving overwintering success.

APIMONDIA
SCANDINAVIA 2025
23-27 SEPTEMBER
COPENHAGEN



Effect of supplementation with multifloral pollen on the strength and honey production of honey bee colonies located in " *Eucalyptus grandis* " monocultures

Agustín Pérez Graña¹, Pablo Juri², Valentina Rodríguez Batista², Ciro Invernizzi², Enrique Nogueira²

¹Facultad de Agronomía, Universidad de la República, Uruguay

²Facultad de Veterinaria, Universidad de la República, Uruguay

In Uruguay, forest development has created an opportunity for beekeeping in " *Eucalyptus grandis* " plantations. Flowering begins in late summer and extends until mid-autumn. Since these plantations consist of large areas of a single crop whose pollen is deficient in some essential amino acids, colonies become weak by the end of the season, compromising their ability to overwinter. This study evaluated the effect of supplementing colonies located in a forested area with multifloral pollen by measuring colony development and honey production. A total of 24 standardized colonies were used and divided into two groups (Control and Supplement). The adult bee population was recorded at the beginning and end of the trial, the area of capped brood was measured throughout the trial using image analysis, and the weight of honey produced per hive was recorded. At the end of the trial, the adult bee population was significantly higher in the Supplement group compared to the Control group (Mann-Whitney test, $p = 0.040$). ANOVA analysis of the capped brood area and honey production showed no significant differences between the groups. The trial began with similar adult bee and brood populations, and no differences in brood area were observed throughout the study. Therefore, the difference in the number of adult bees at the end suggests a higher survival rate in the supplemented colonies. This effect could continue to amplify in the weeks following the removal of hives from the forest, as nutritional stress has been reported to have long-term effects. Although honey production did not show significant differences, the supplemented group was more uniform (18.3 ± 4.9 kg) compared to the control group (22.0 ± 13.8 kg). Thus, we consider that supplementation with multifloral pollen facilitates colony management by promoting more homogeneous colonies in terms of productivity and allowing colonies to maintain a larger adult bee population at the end of " *E. grandis* " flowering, which supports better overwintering.