



**II Seminário
Mato-grossense
sobre Manejo
da Resistência**

Dias 23 e 24 / julho / 2019

Auditório da Famato
R. Eng. Edgar Prado Arze, SN
Centro Político Administrativo - Cuiabá - MT

**Monitoramento da suscetibilidade de
lepidópteros aos inseticidas e plantas bt**

Rafael M. Pitta - Embrapa

**“A resistência é a regra e, a ela,
não há exceções.”**



Comitê de Ação à Resistência a Inseticidas

Brasil



II Seminário Mato-grossense sobre Manejo da Resistência

Population genetic structure and demographic history of *Spodoptera frugiperda* (Lepidoptera: Noctuidae): implications for insect resistance management programs

Osmar Arias,[†] Erick Cordeiro,[†] Alberto S Corrêa,[‡] Felipe A Domingues,
Aline S Guidolin and Celso Omoto^{*} 



Nossos resultados indicam que o MRI deve ser adotado em escala local ou regional.

Abstract

BACKGROUND: *Spodoptera frugiperda* is a destructive pest that often imposes difficult management due to its high polyphagy and rapid insecticide resistance evolution. Knowledge of species diversification, population structure, and host preference can aid efforts to manage pest populations. Here, we investigated the patterns of hybridization, genetic structure, and gene flow in *S. frugiperda* populations, discussing how we can apply this knowledge to insect resistance management programs in South America.

RESULTS: The corn-strain CS-h2 of *S. frugiperda* was the most frequent haplotype in all sampled populations. *Spodoptera frugiperda* populations are experiencing demographic expansion, and the ecoregions partially explain the genetic structure and not strains. We did not find a correlation between gene flow and susceptibility levels to flubendiamide and lufenuron insecticides, but populations with high LC₅₀ sent a great number of migrants to all other locations, maintaining resistance alleles in the geographic range.

CONCLUSION: High levels of population admixture, including between corn- and rice-strains, were found in sampled populations. We showed that *S. frugiperda* immigrants will not necessarily cause an increase in LC₅₀ upon arrival in a new location but will assure the constant presence of resistance alleles in the area. Increases in LC₅₀ largely depend on the local pesticide management adopted in the areas. Our results indicate that pesticide resistance management must be adopted on a local or small regional scale.

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Supporting information may be found in the online version of this article.





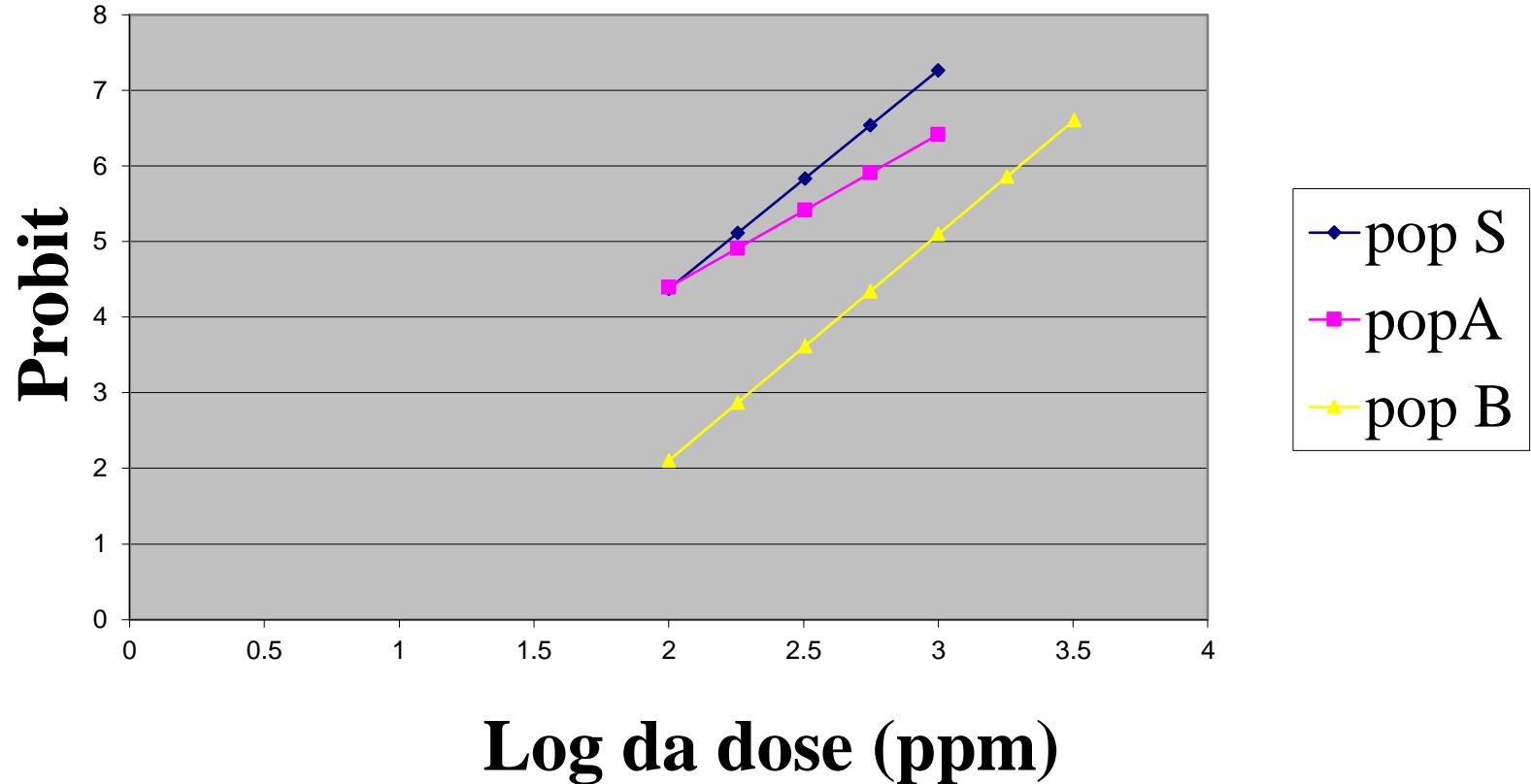
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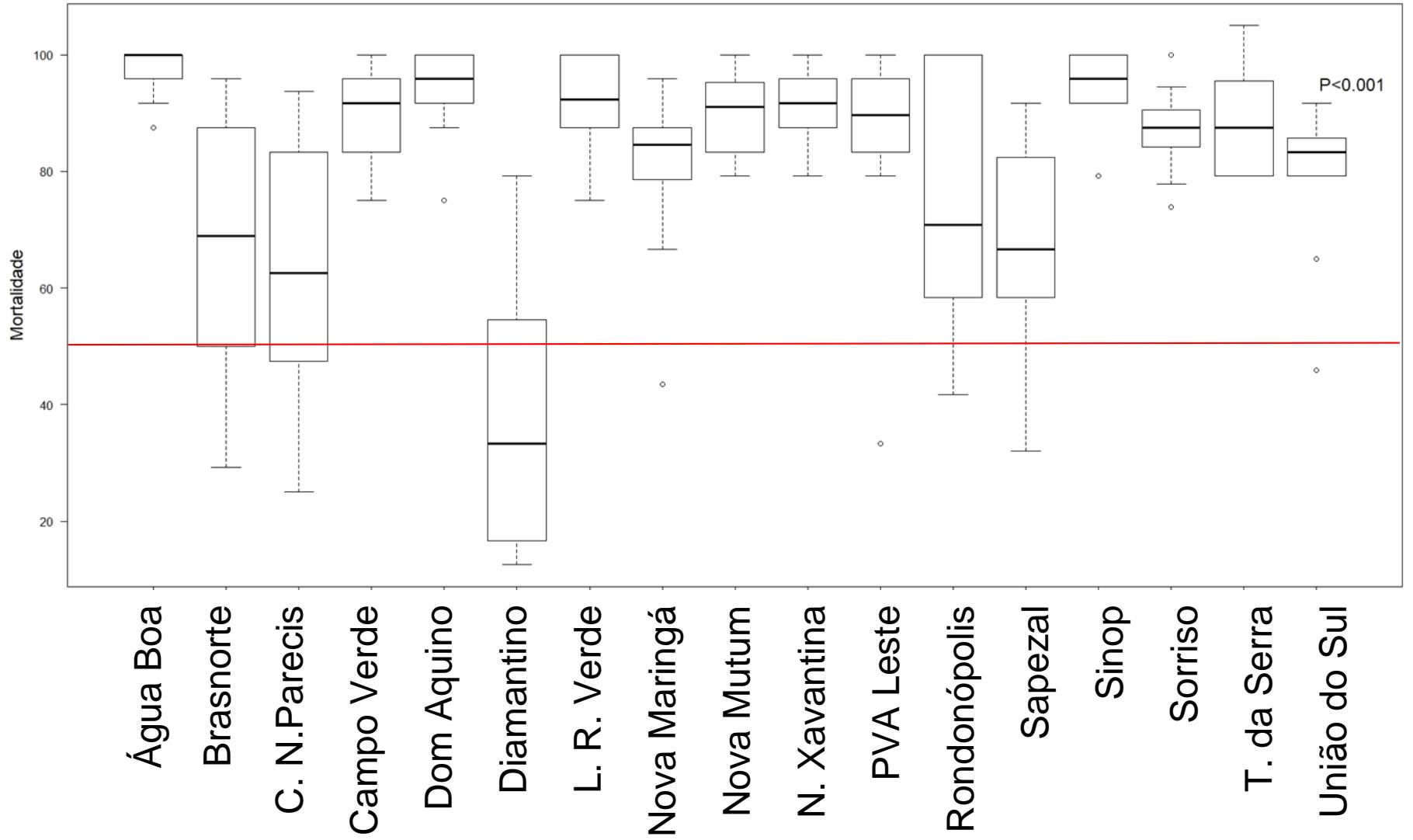


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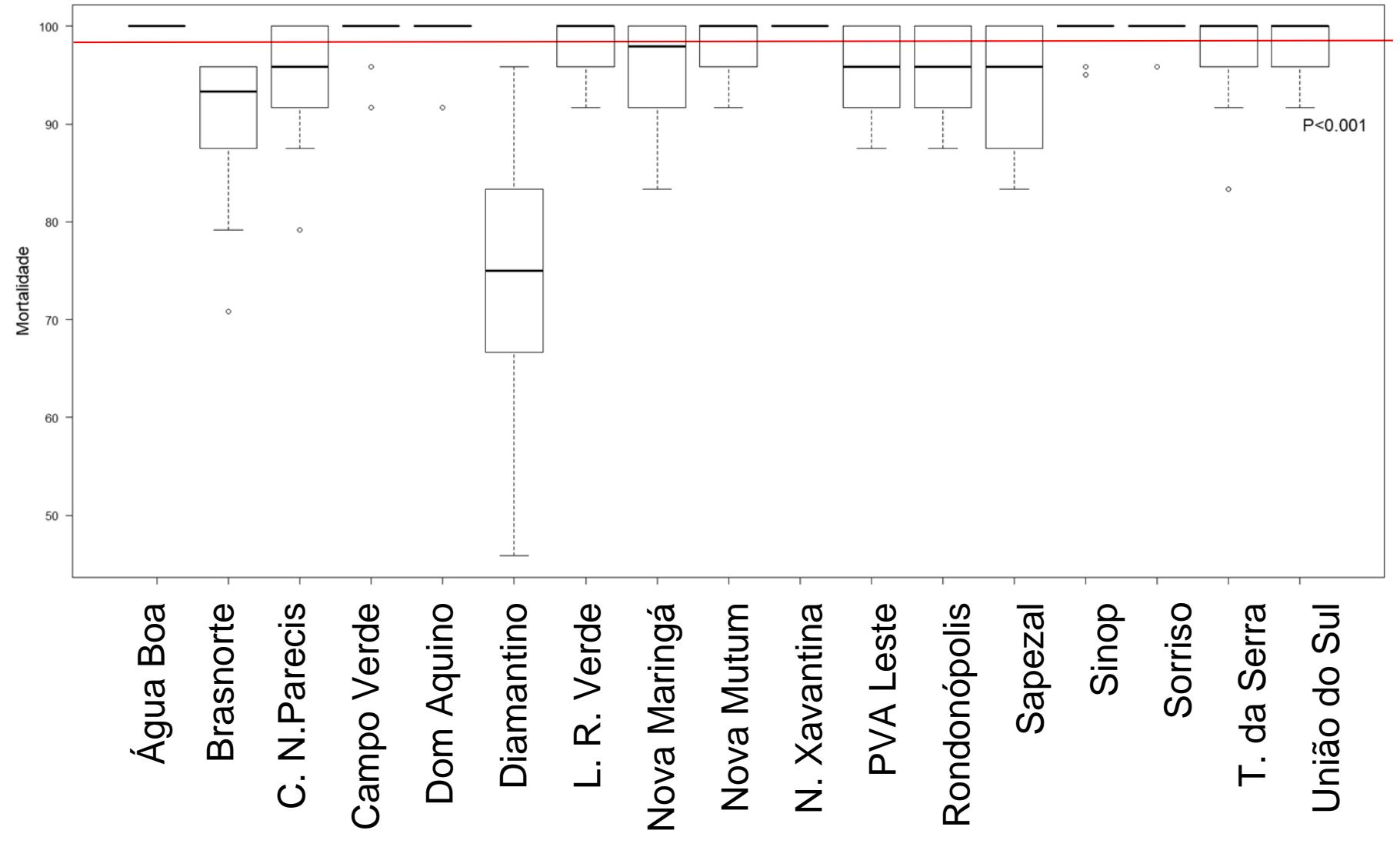
Dados estimados





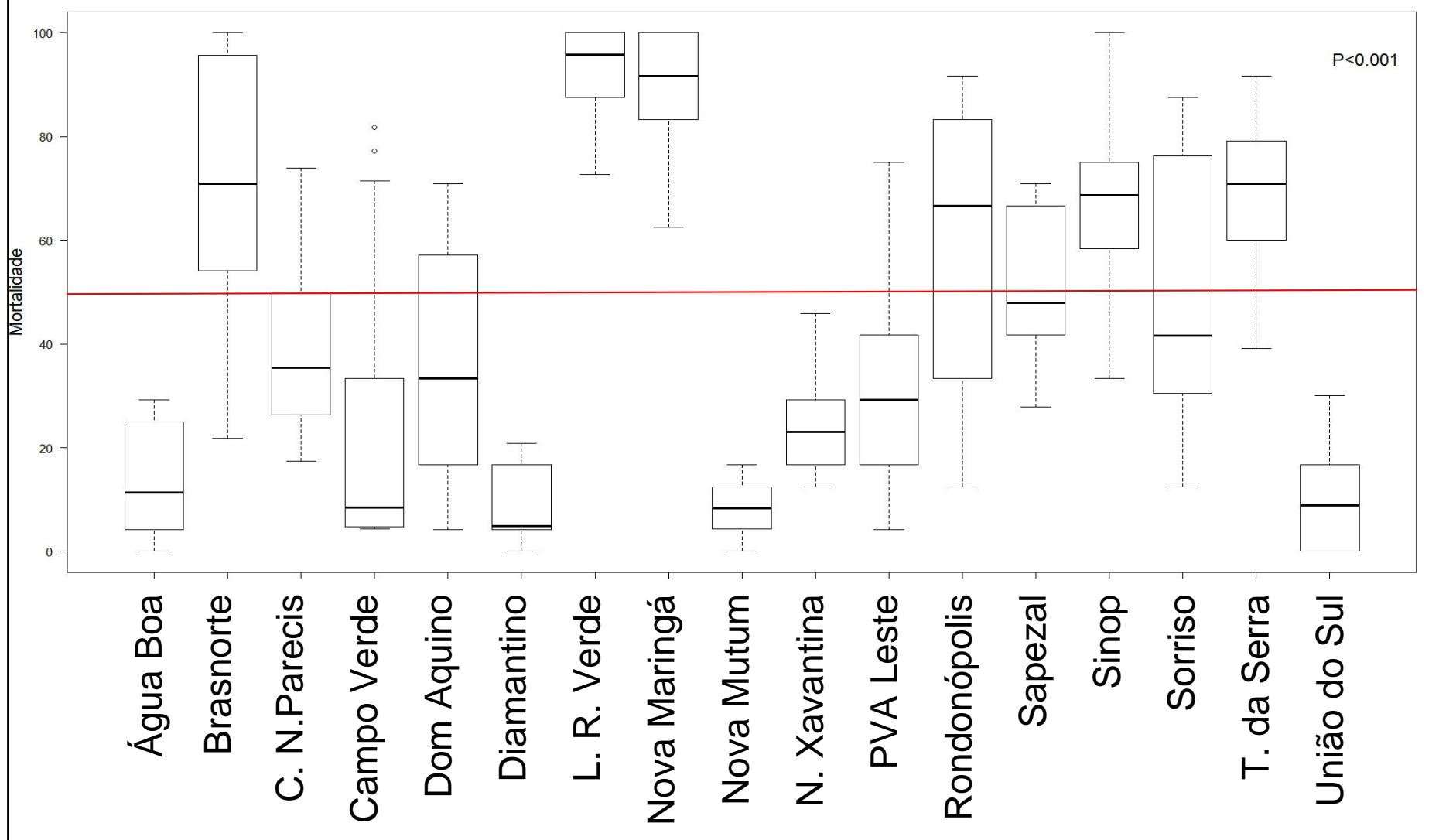
Mortalidade de lagartas de *Spodoptera frugiperda* submetidas ao contato com inseticida Flubendiamida na concentração CL_{50} . Safra 2016/17.





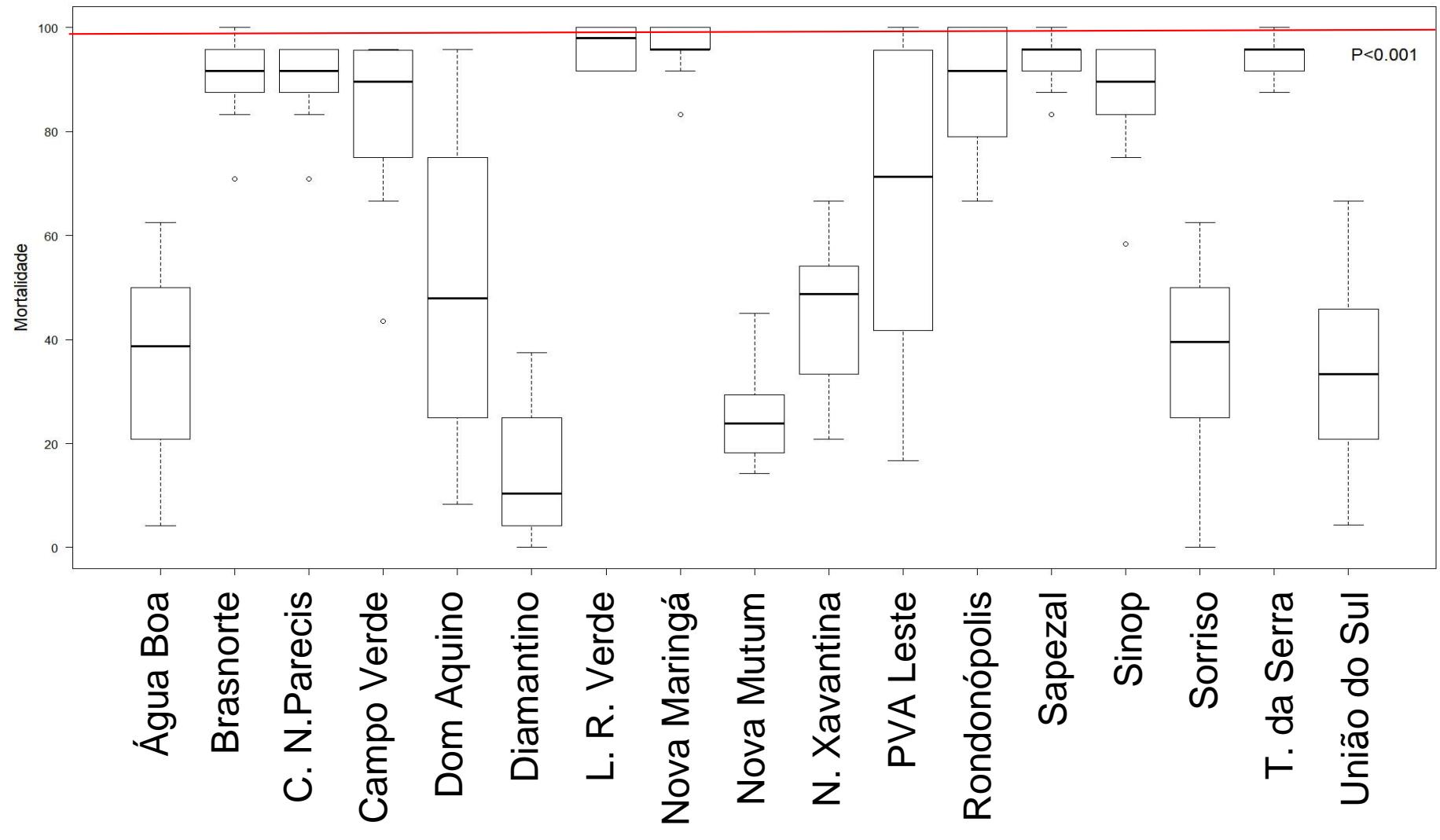
Mortalidade de lagartas de *Spodoptera frugiperda* submetidas ao contato com inseticida Flubendiamida na concentração CL₉₅. Safra 2016/17.





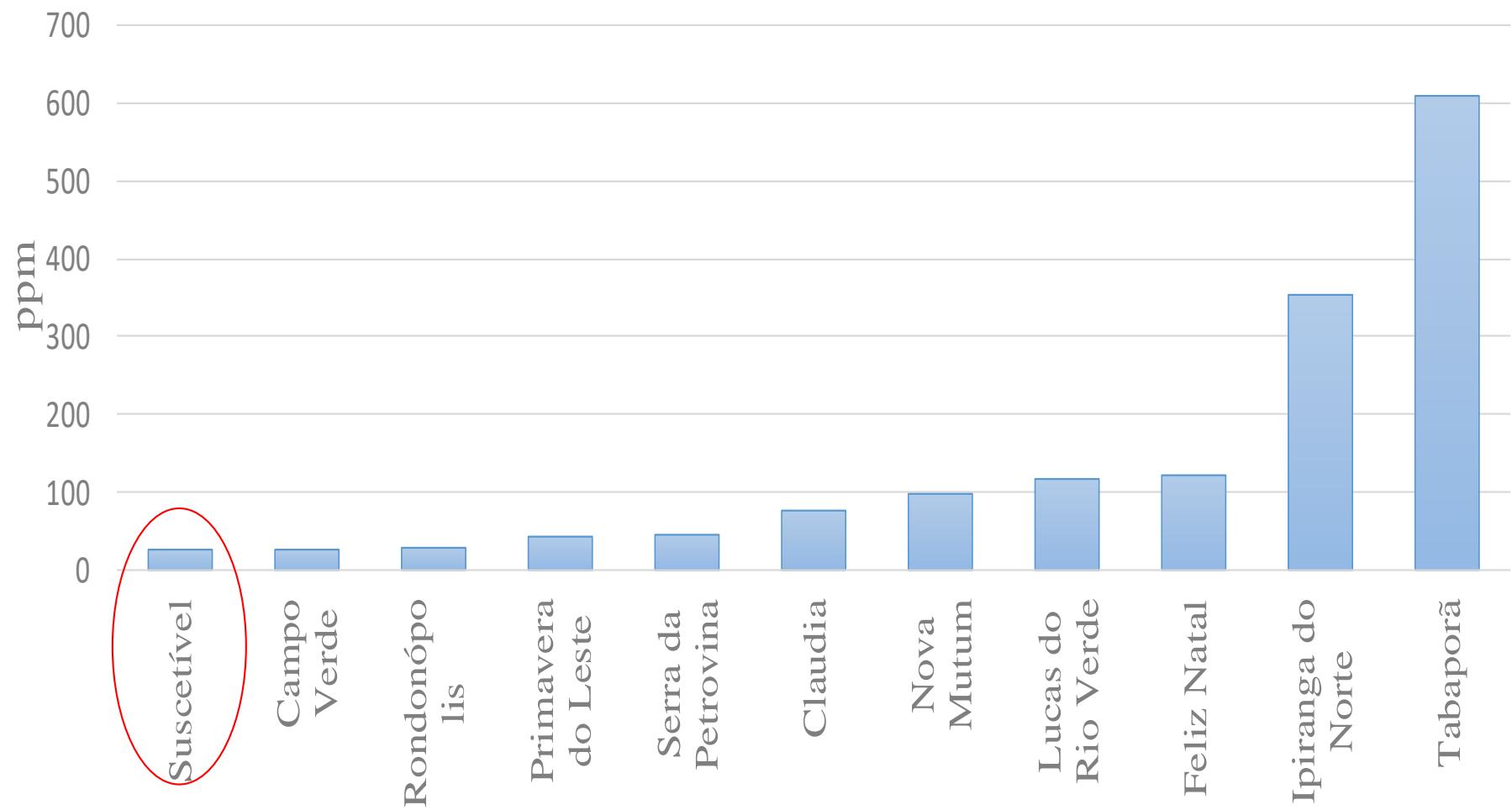
Mortalidade de lagartas de *Spodoptera frugiperda* submetidas a CL50 de Metomil Safrá 2016/17.





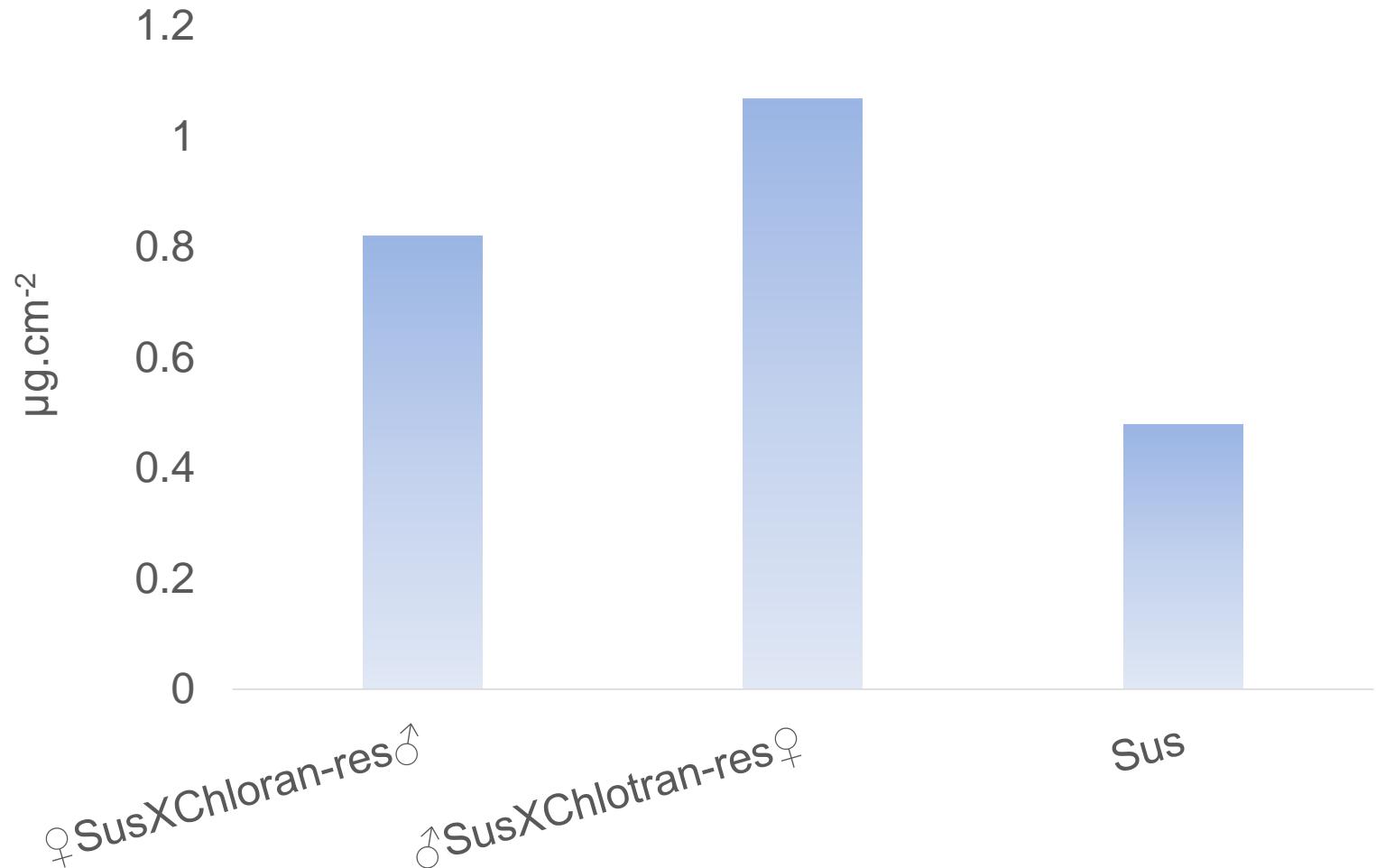
Mortalidade de lagartas de *Spodoptera frugiperda* submetidas a CL99 de Metomil Safra 2016/17.





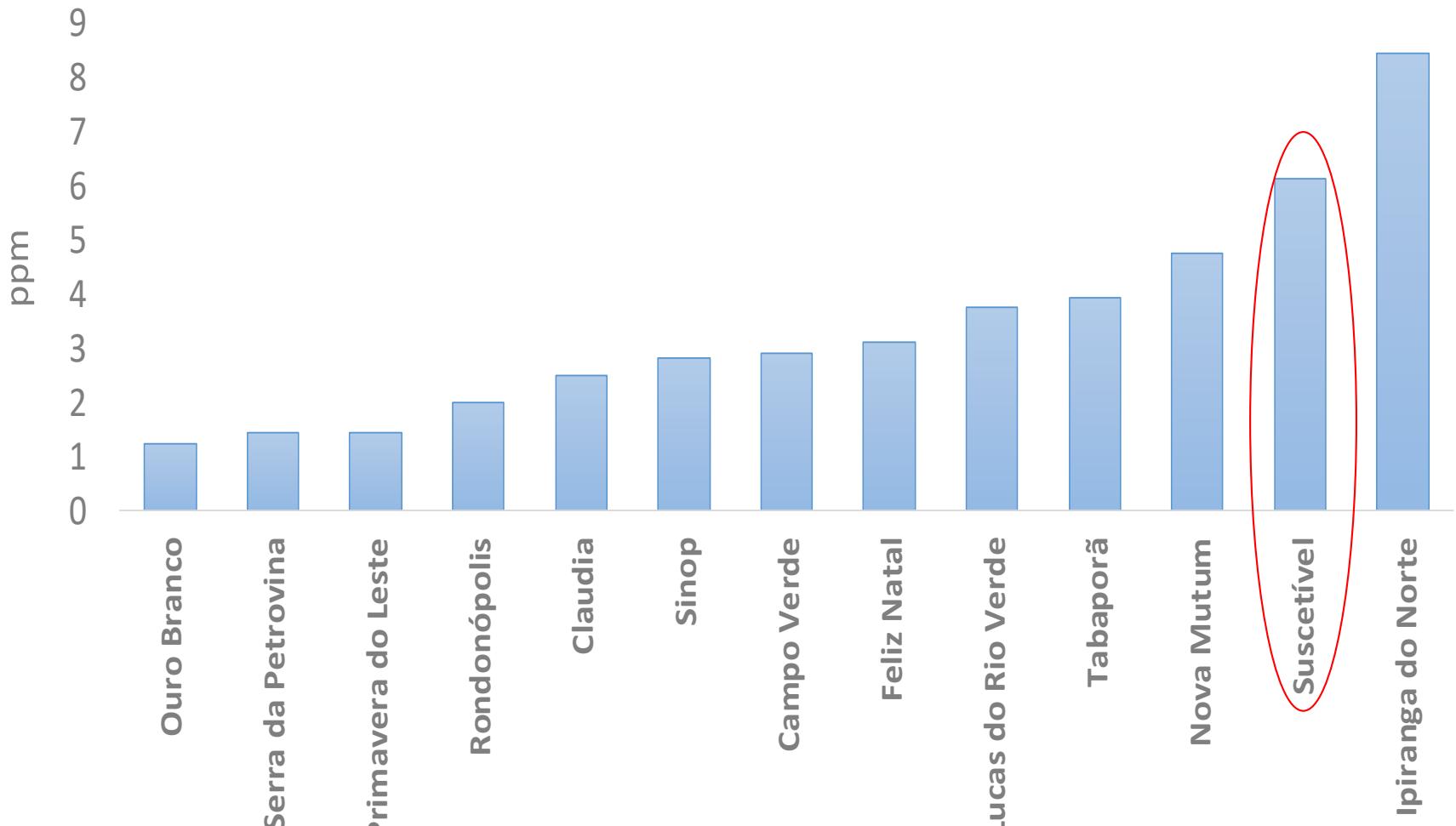
CL₅₀ de Clorantraniliprole a *Spodoptera frugiperda* em Mato Grosso na safra 2017/18.





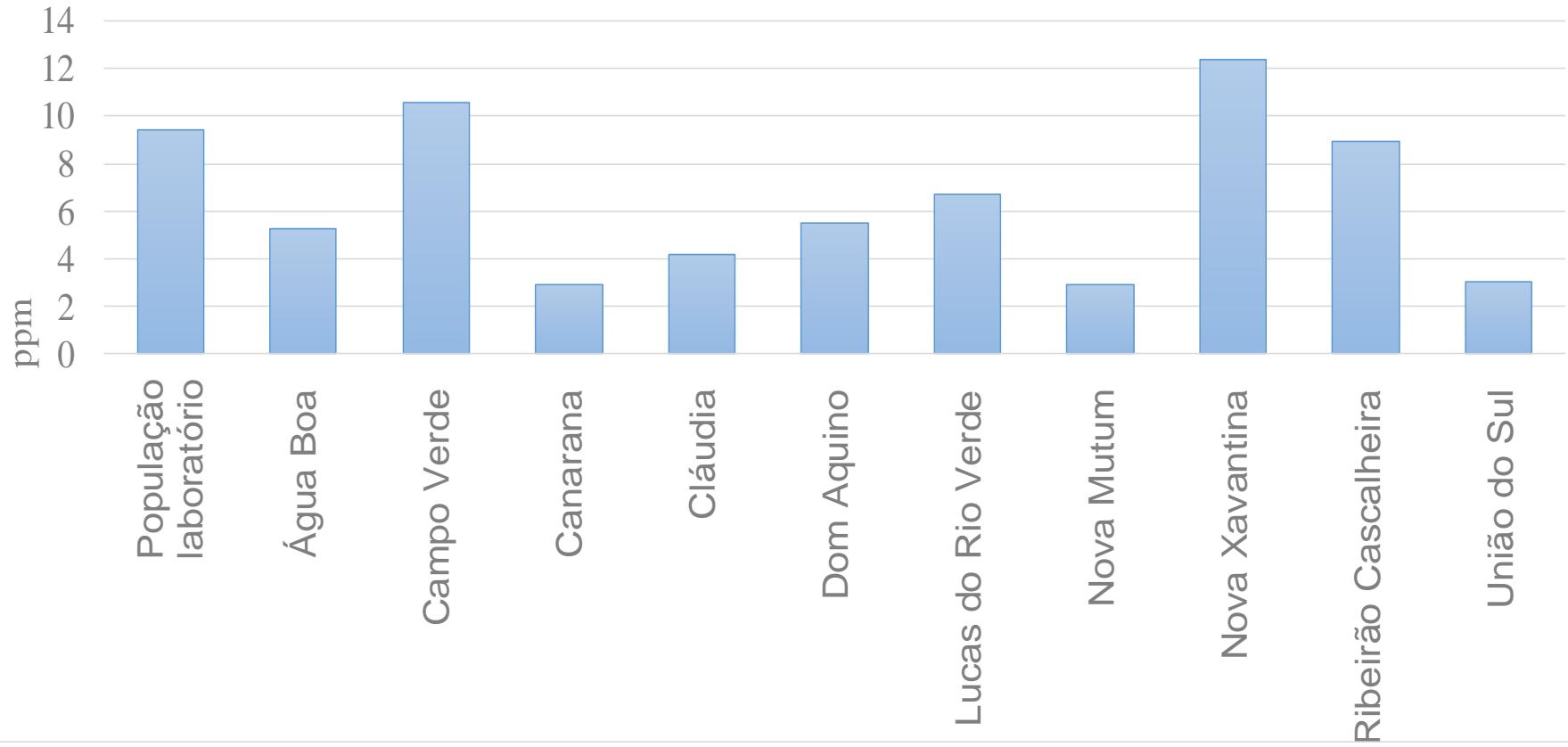
CL₅₀ de linhagens de *S. frugiperda* a Clorantraniliprole





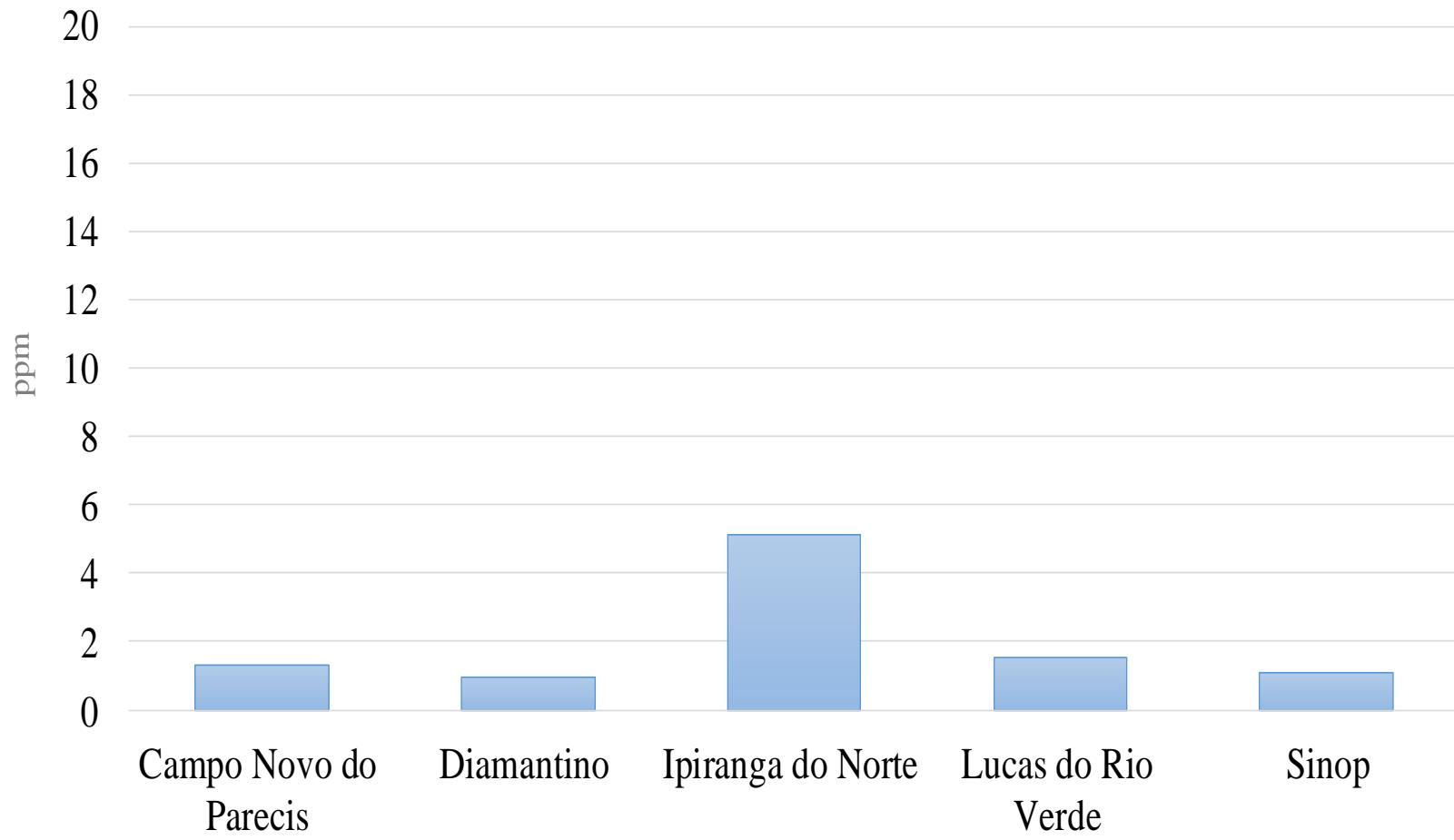
CL₅₀ de Benzoato de Emamectina a *Spodoptera frugiperda* em Mato Grosso na safra 2017/18.





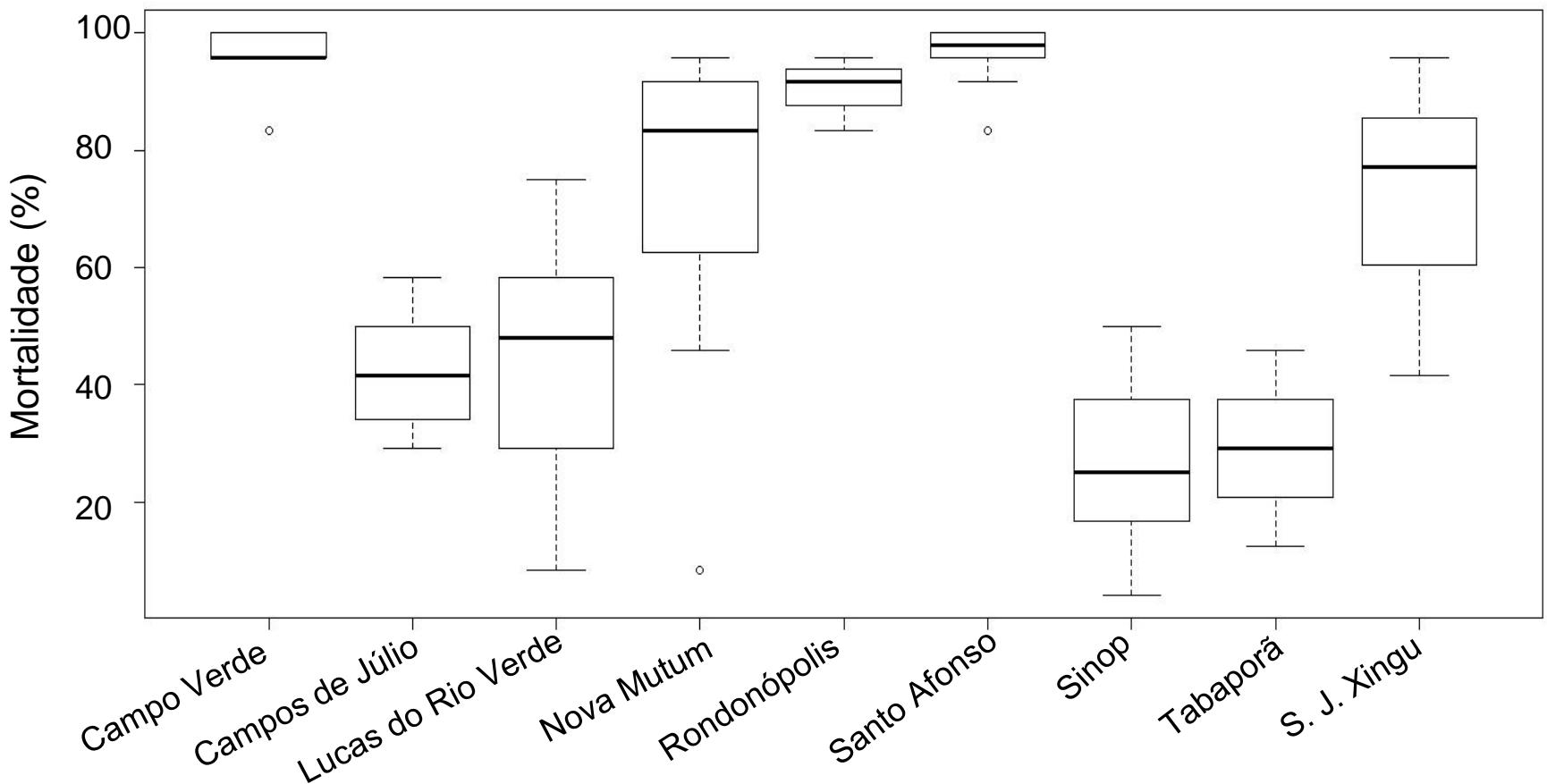
CL_{50} de *Chrysodeixis includens* a Benzoato de Emamectina em Mato Grosso na safra 2017/18.





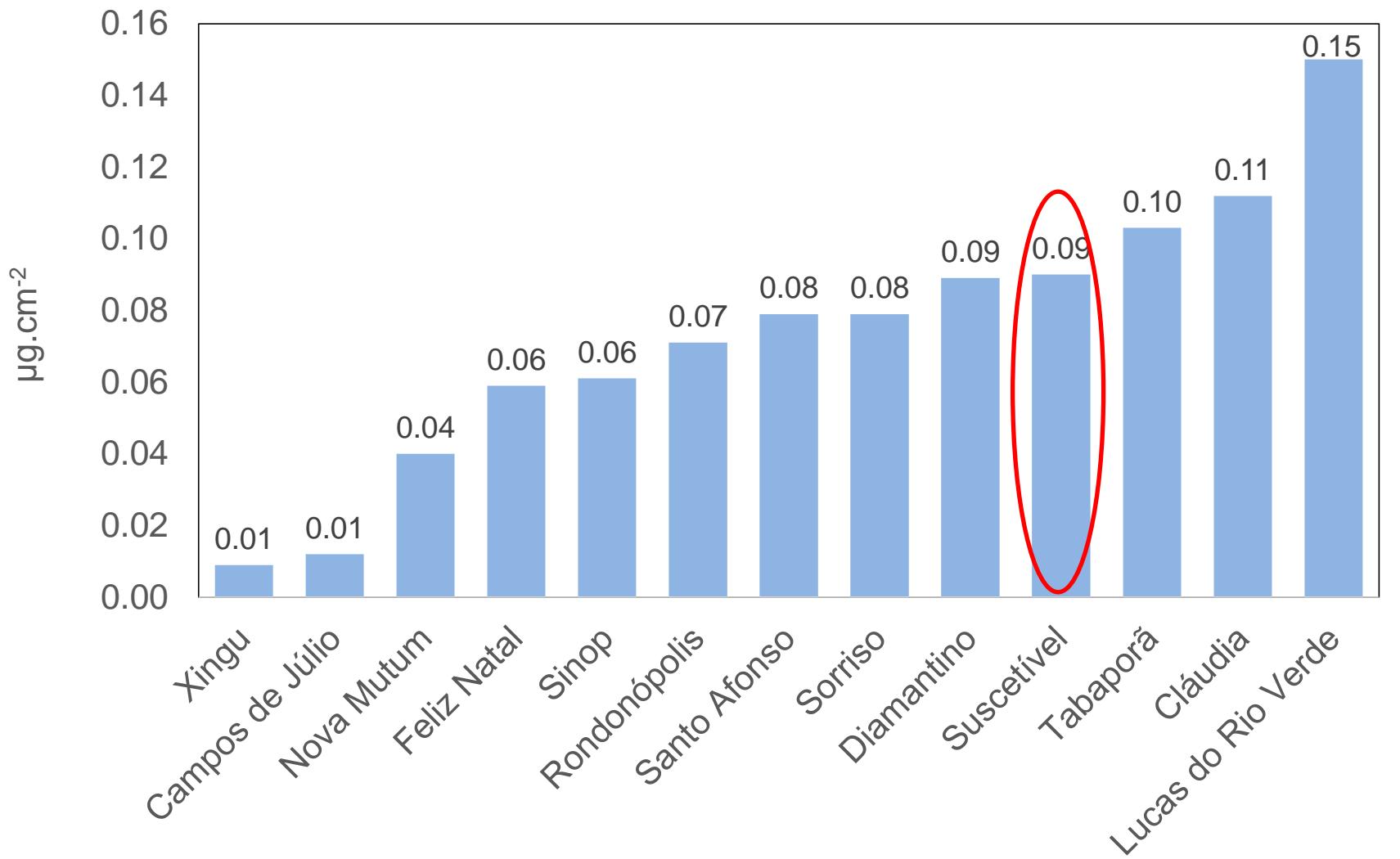
CL₅₀ de Benzoato de Emamectina a *Helicoverpa armigera* em Mato Grosso na safra 2017/18.





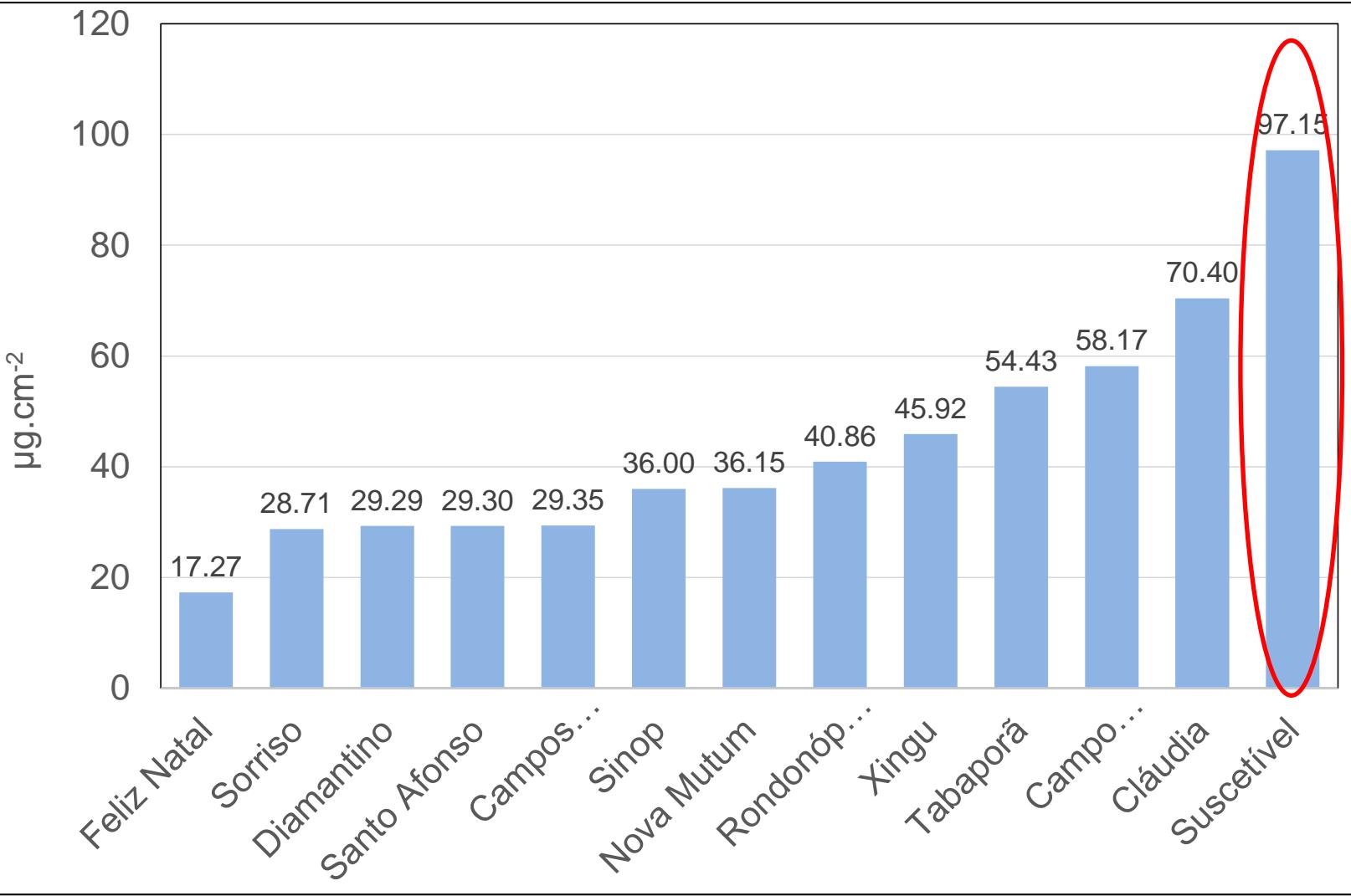
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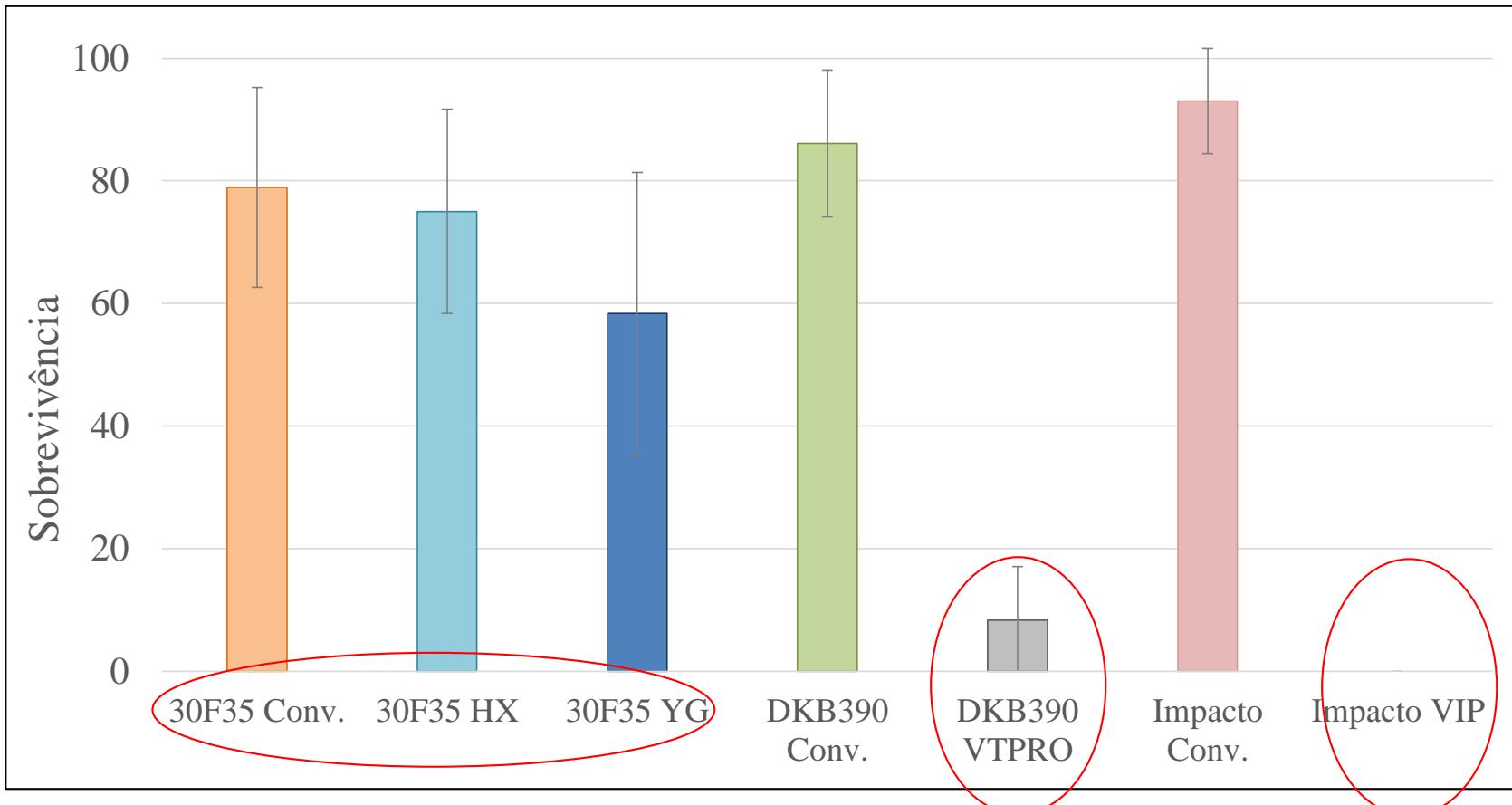
CL_{50} de Espinetoram a *Spodoptera frugiperda* em Mato Grosso na safra 2018/19





CL_{50} de Clorpirifós a *Spodoptera frugiperda* em Mato Grosso na safra 2018/19

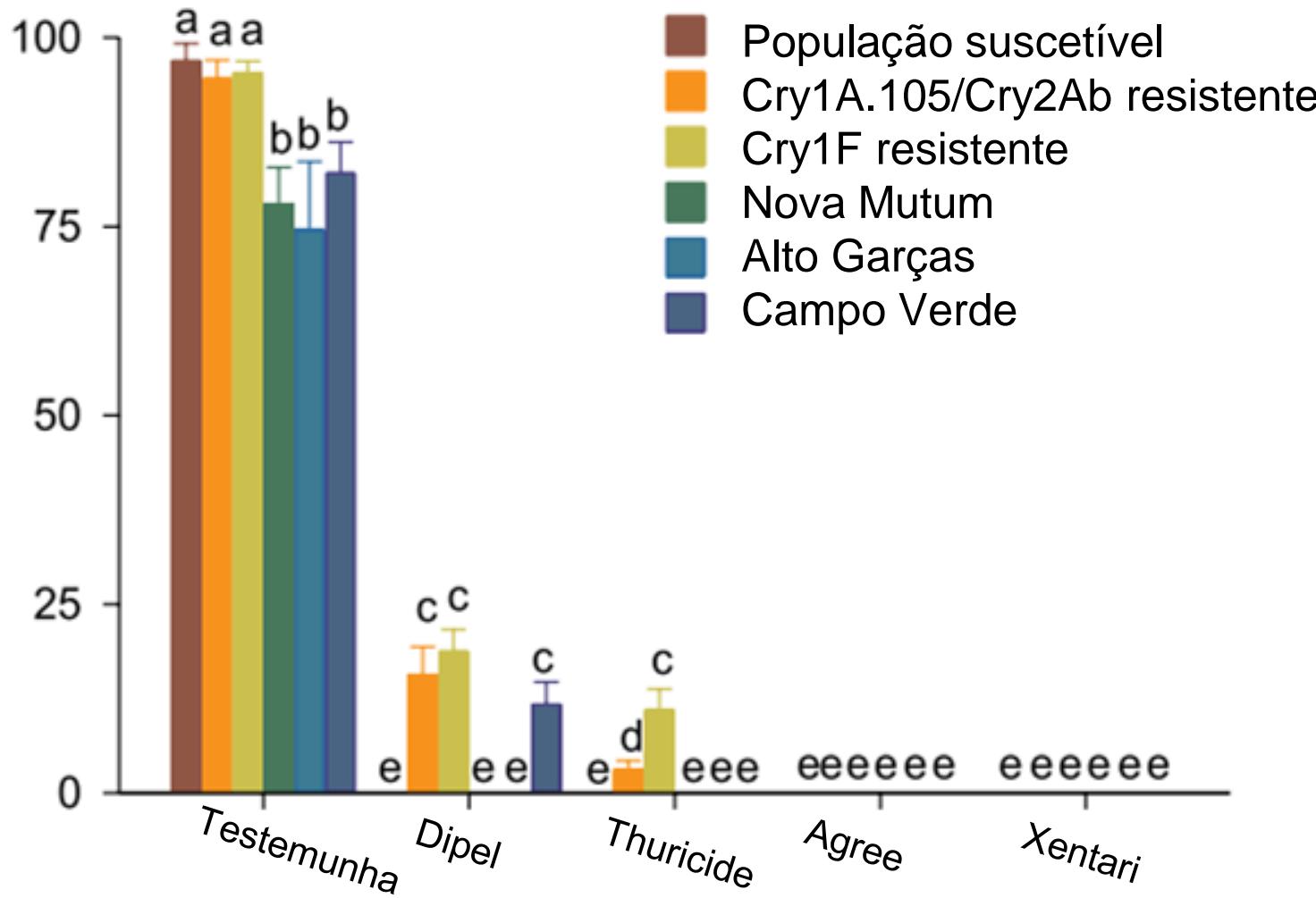




Sobrevivência de *Spodoptera frugiperda* em tecnologias Bt de milho. Safrinha 2014 – População de Sinop-MT

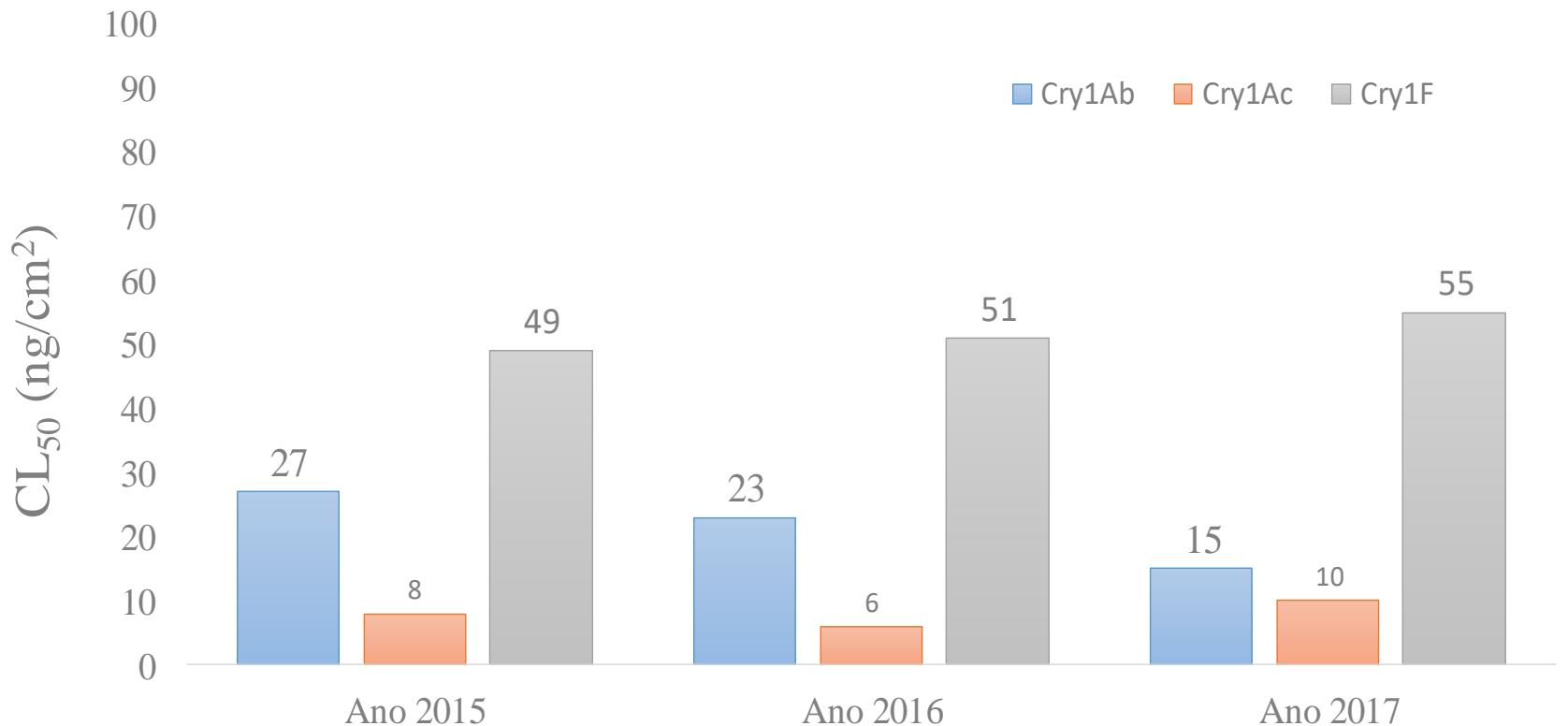
Waquil et al. (2016) **Fitness index and lethal time of fall armyworm on Bt corn.**
Pesq. agropec. bras., Brasília, v.51, n.5, p.563-570, maio 2016.





Sousa et al. (2019) Response of field populations and Cry-resistant strains of fall armyworm to Bt maize hybrids and Bt-based bioinsecticides. *Crop Protection* 120, 1–6

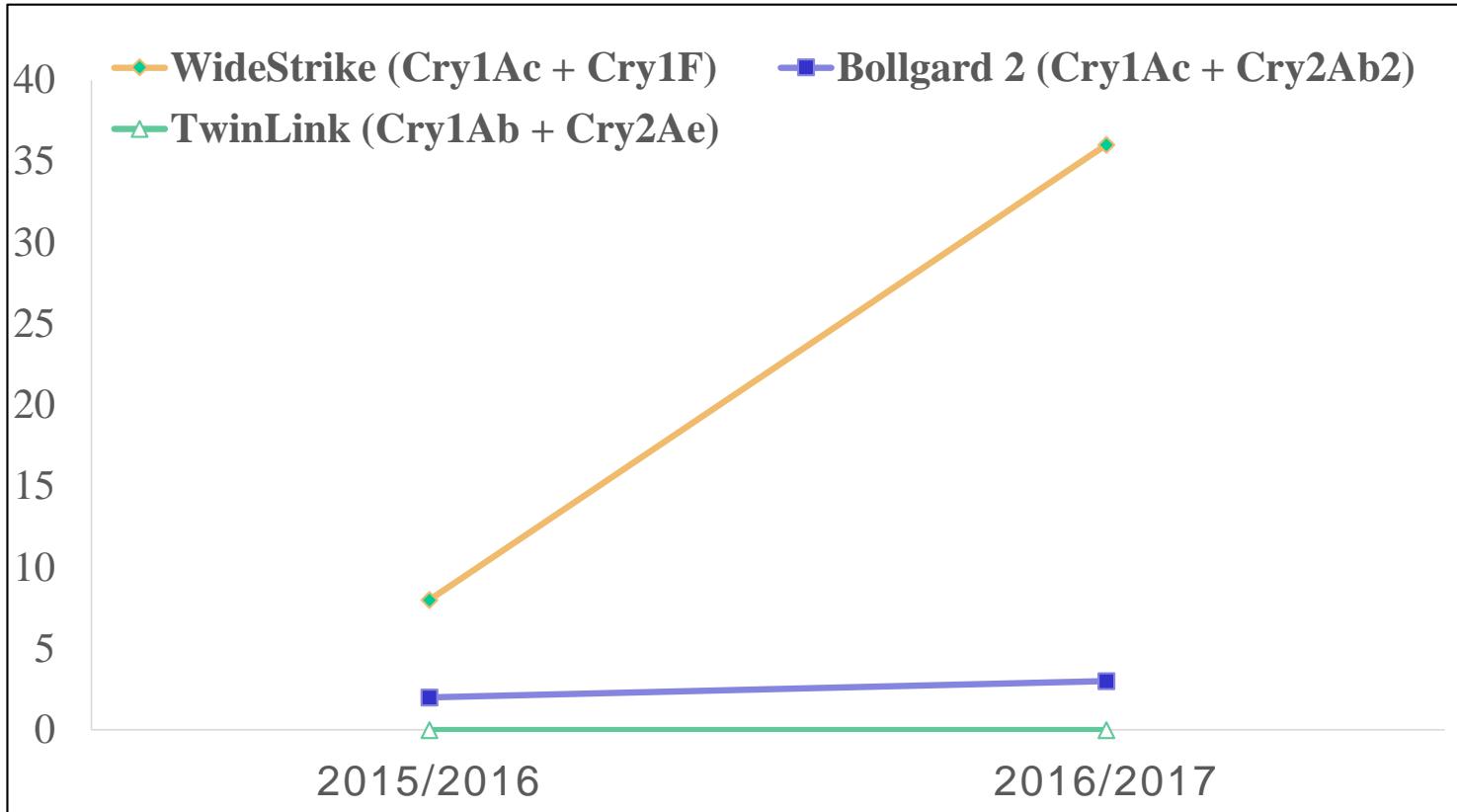




CL_{50} de proteínas Bt a *Helicoverpa armigera*. **Cry2Ab > 3.500**

Dados: Jacob C. Netto, Érica S. Martins, Rose G. Monnerat





Percentual de lagartas de *Helicoverpa armigera* que atingiram o 4º ínstare de desenvolvimento alimentando-se de folhas coletadas em cultivares de algodoeiro com expressão de diferentes proteínas inseticidas.

Dados: Jacob C. Netto



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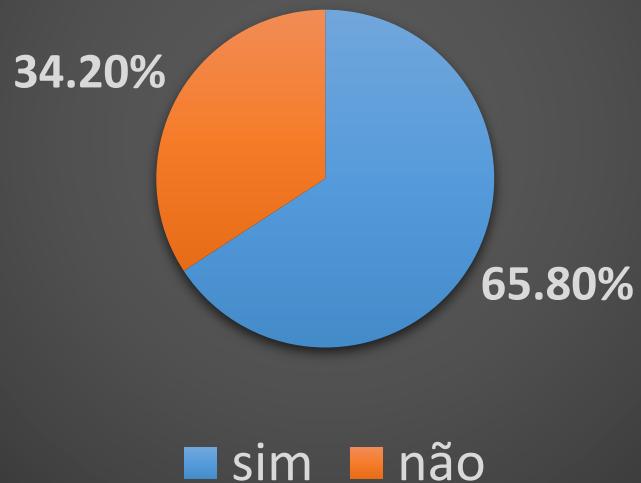
***Helicoverpa armigera*: ameaça a lavouras Bt de algodoeiro**

Jacob Crosariol Netto¹, Guilherme Gomes Rolim¹, Leonardo Scoz¹,
Erica Soares Martins¹, Rafael Major Pitta², Daniela de Lima Viana³

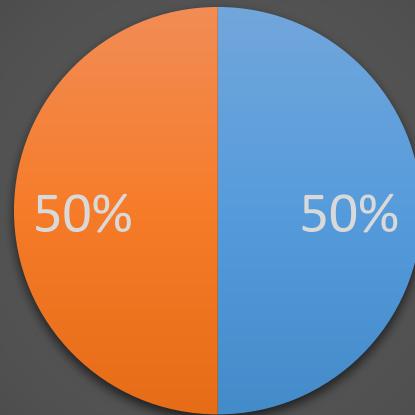


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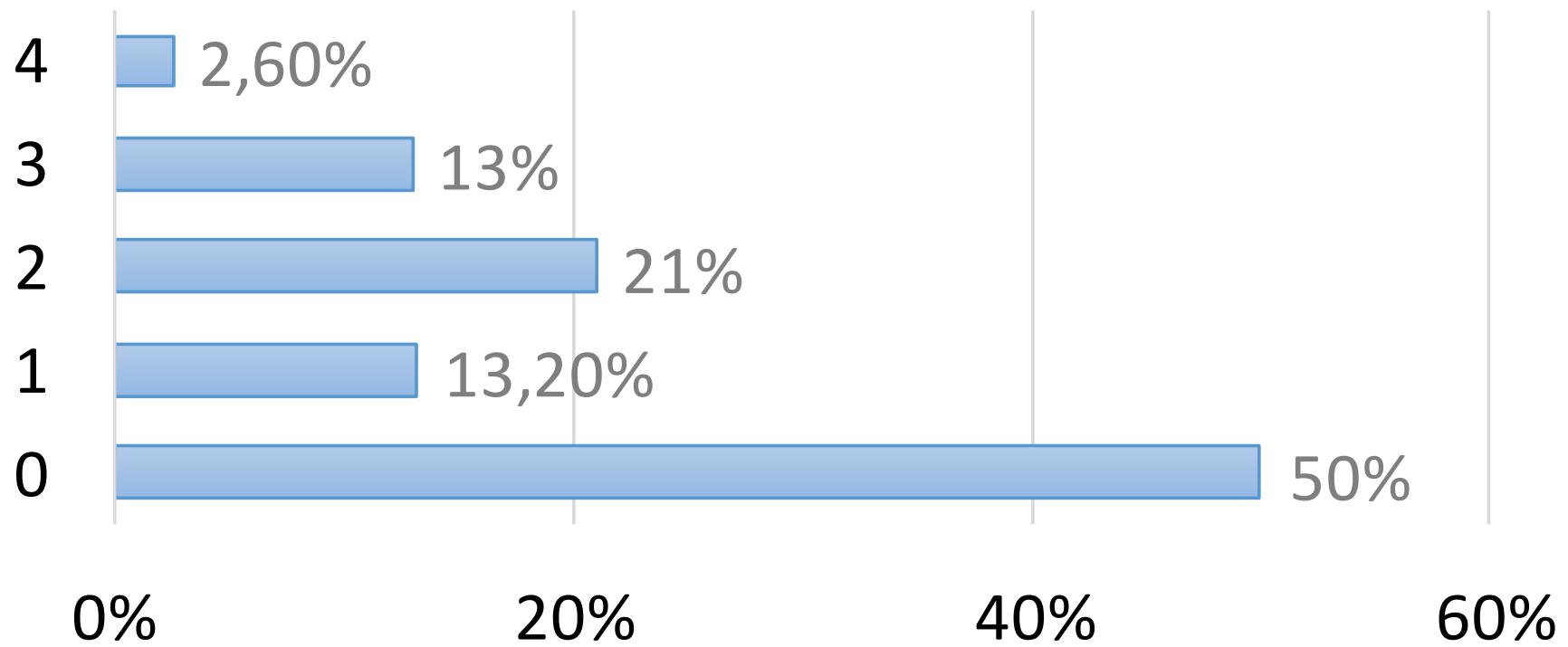
Observou presença de *Helicoverpa* spp em algodão Bt?

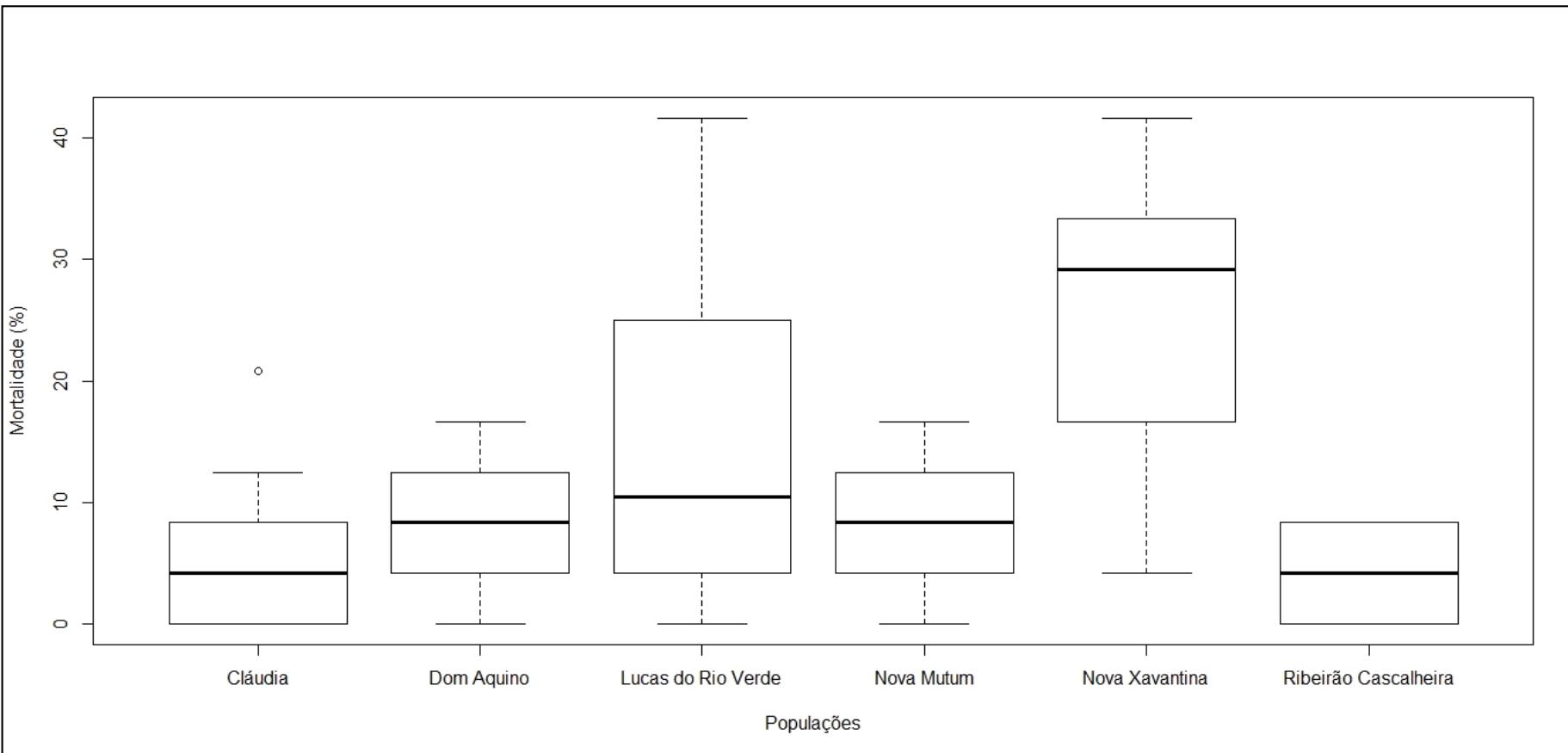


Houve necessidade de controle?



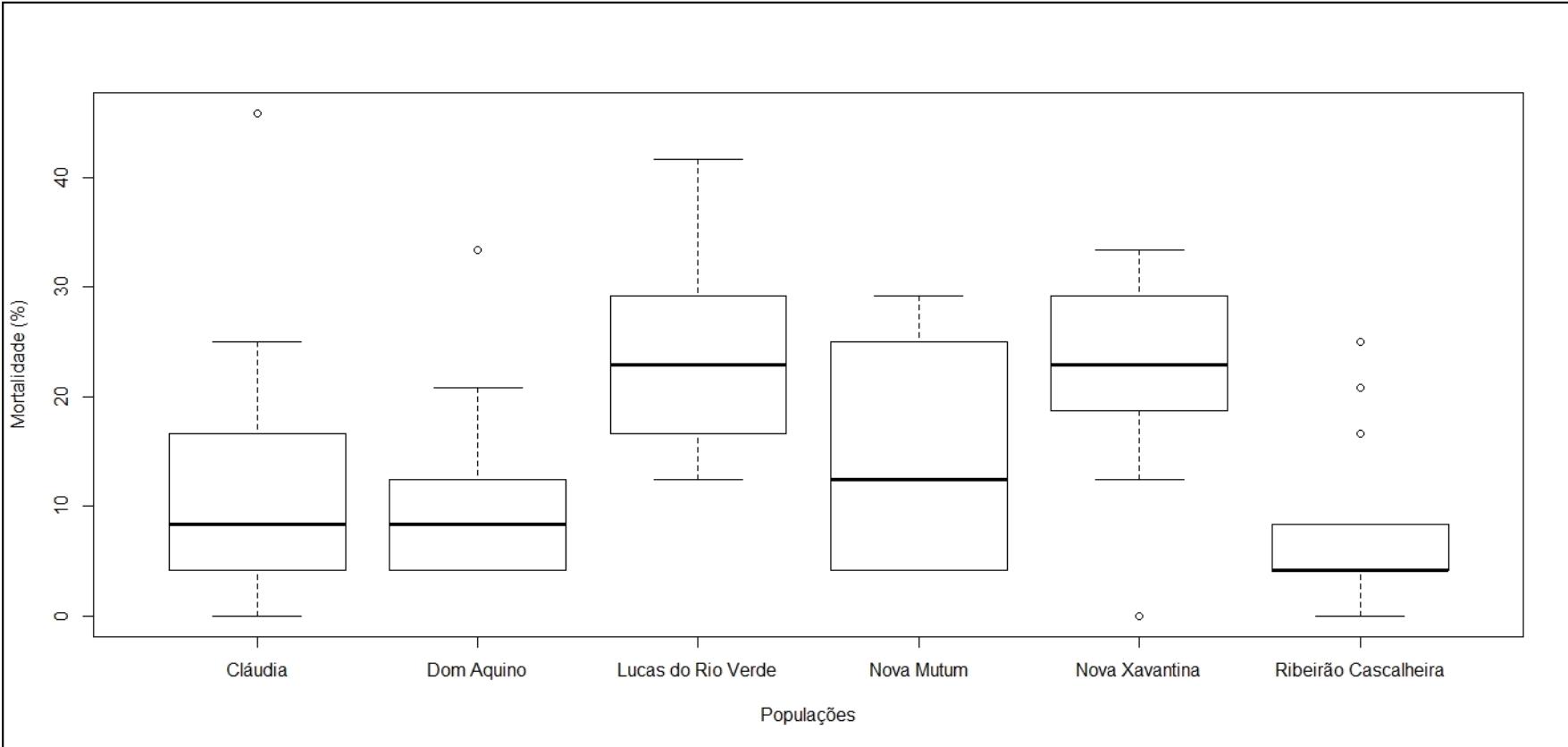
Quantas pulverizações foram necessárias para controle de *Helicoverpa* spp em algodão Bt?





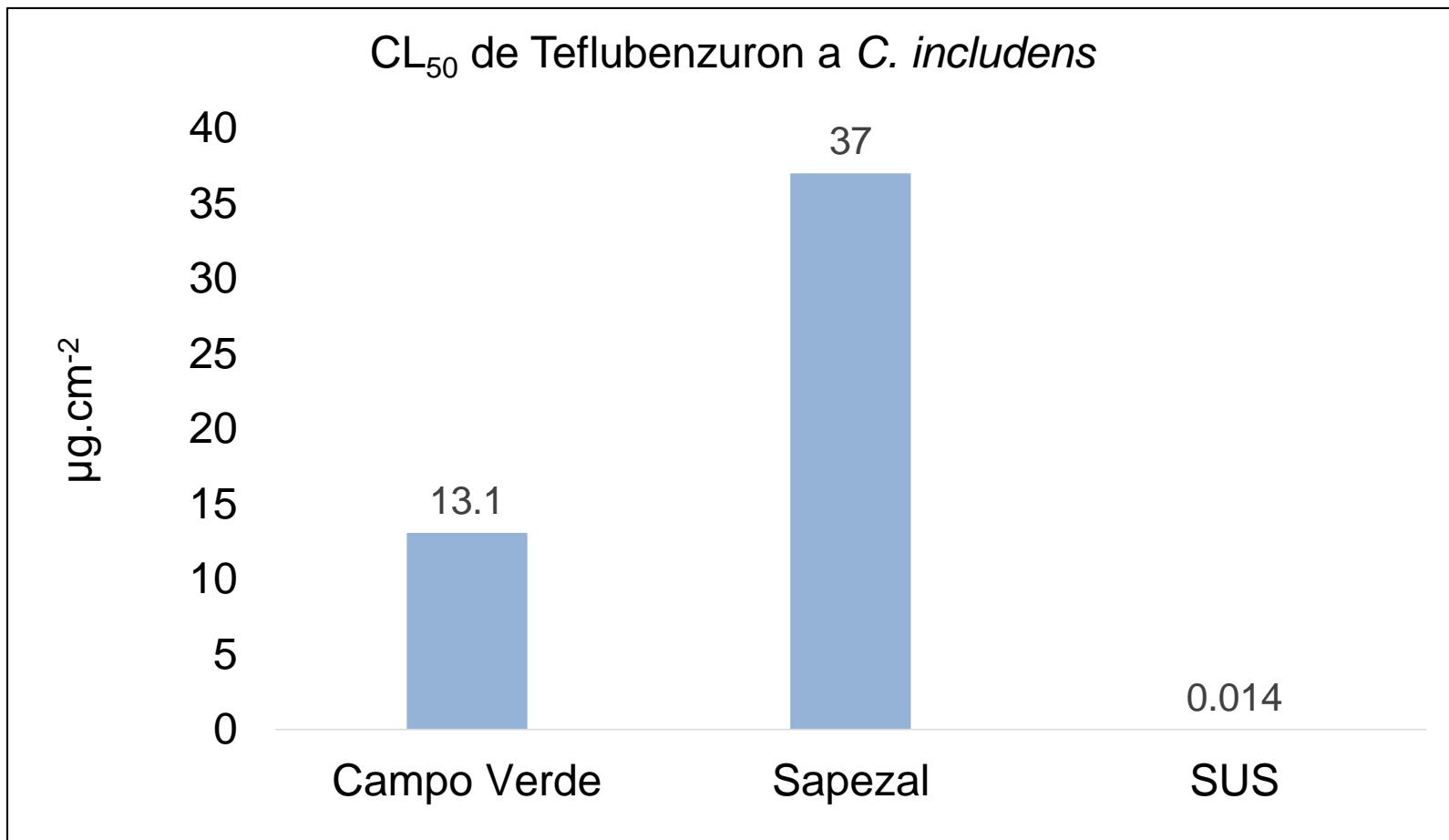
Mortalidade de lagartas de *Chrysodeixis includens* a Teflubenzurom na dose diagnóstica CL_{50} .





Mortalidade de lagartas de *Chrysodeixis includens* a Teflubenzurom na dose diagnóstica CL_{95} .





Stacke et al. (2019). Susceptibility of Brazilian Populations of *Chrysodeixis includens* (Lepidoptera: Noctuidae) to Selected Insecticides. *Journal of Economic Entomology*. doi: 10.1093/jee/toz031



Obrigado!

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Apoio



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Comitê de Ação à Resistência a Inseticidas
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Patrocínio



Realização



MINISTÉRIO DA
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E ABASTECIMENTO



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