

# Do the neonicotinoid seed treatments Cruiser® and Cruiser Extreme® control resistant aphids?

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## Summary

Both neonicotinoid seed treatments provided ineffective control against resistant cotton aphid. Further use of these treatments against resistant populations may exacerbate resistance.

## Introduction

Residual efficacy of neonicotinoid pre-germination seed treatments Cruiser® and Cruiser Extreme® were evaluated against susceptible and resistant cotton aphid.

## Trial design

Initially, sixty seeds of Untreated (UN), Cruiser® (CR) and Cruiser Extreme® (CE) were planted into individual pots and monitored in a growth room. At 7 days post planting when dicotyledons had emerged, one pot per treatment was transferred into an aphid proof cage with pot position randomly assigned (Fig. 1). Each plant was challenged with two adult *A. gossypii* aptera. Three replicates were performed against both resistant and susceptible strains and laid out in a complete randomised block design. Aphid numbers were recorded after one week and the pots discarded. This was repeated for seven weeks to highlight residual efficacy between treatments as plants matured.



Figure 1. Untreated and treated cotton plants in an aphid proof cage held in an insectary.

## Statistical analysis

A curvature model via a cubic spline function was fitted to the data as a generalised linear mixed model (GLMM) of treatments by age. A residual maximum likelihood (REML) method was used to estimate all parameters after logarithmic link re-parameterization and the analysis was run using ASREML (Gilmour, 2011). Predicted values and their 95% confidence intervals were calculated.

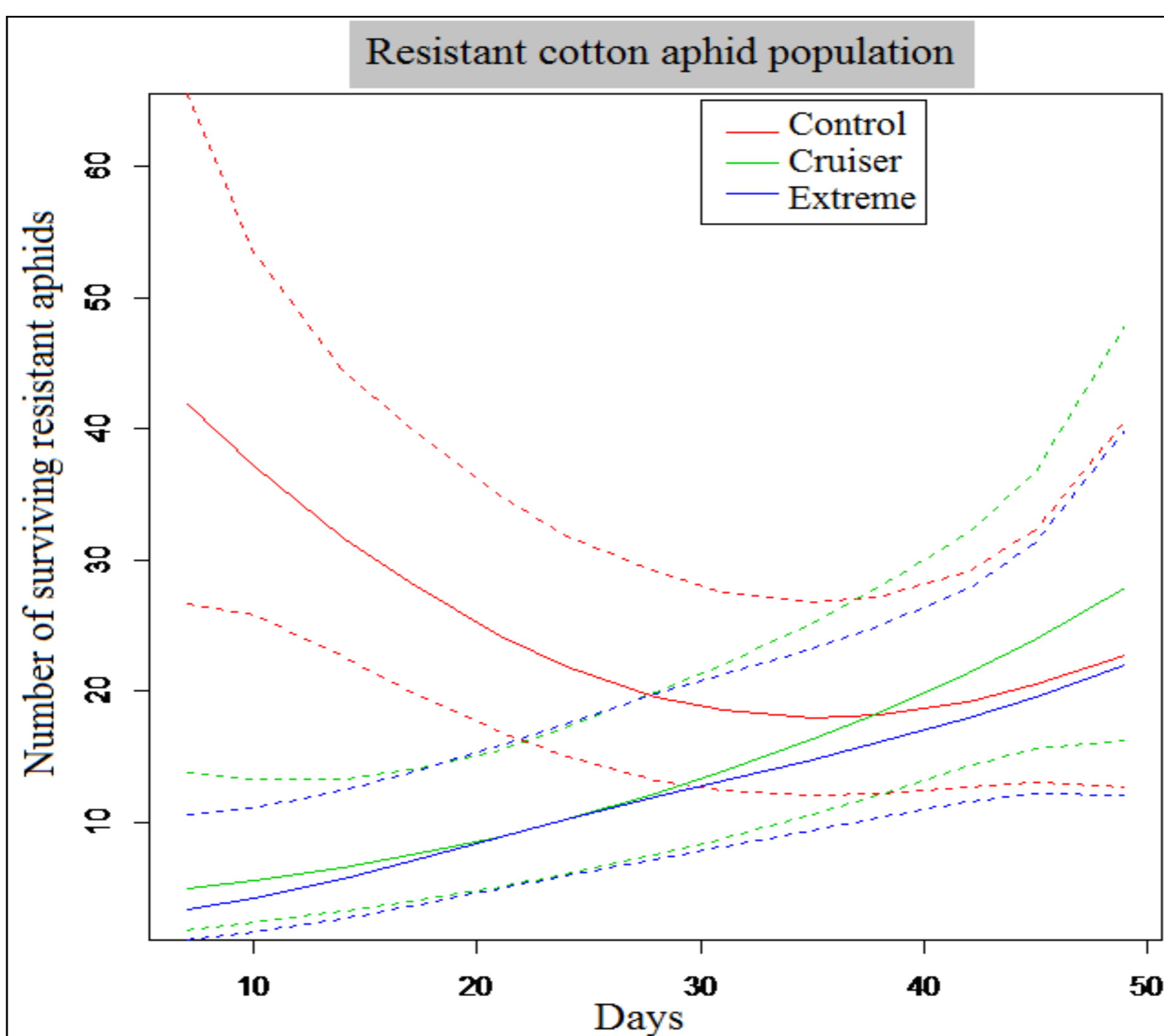


Figure 2. Predicted surviving thiamethoxam resistant aphids (solid) and 95% confidence intervals (dashed).

Effects of both treatments on the survivability of aphids were significant ( $P < 0.012$ ). After 21 days the thiamethoxam resistant strain on each thiamethoxam treatment equalled their survival rates to those of the untreated plants (Fig. 2).

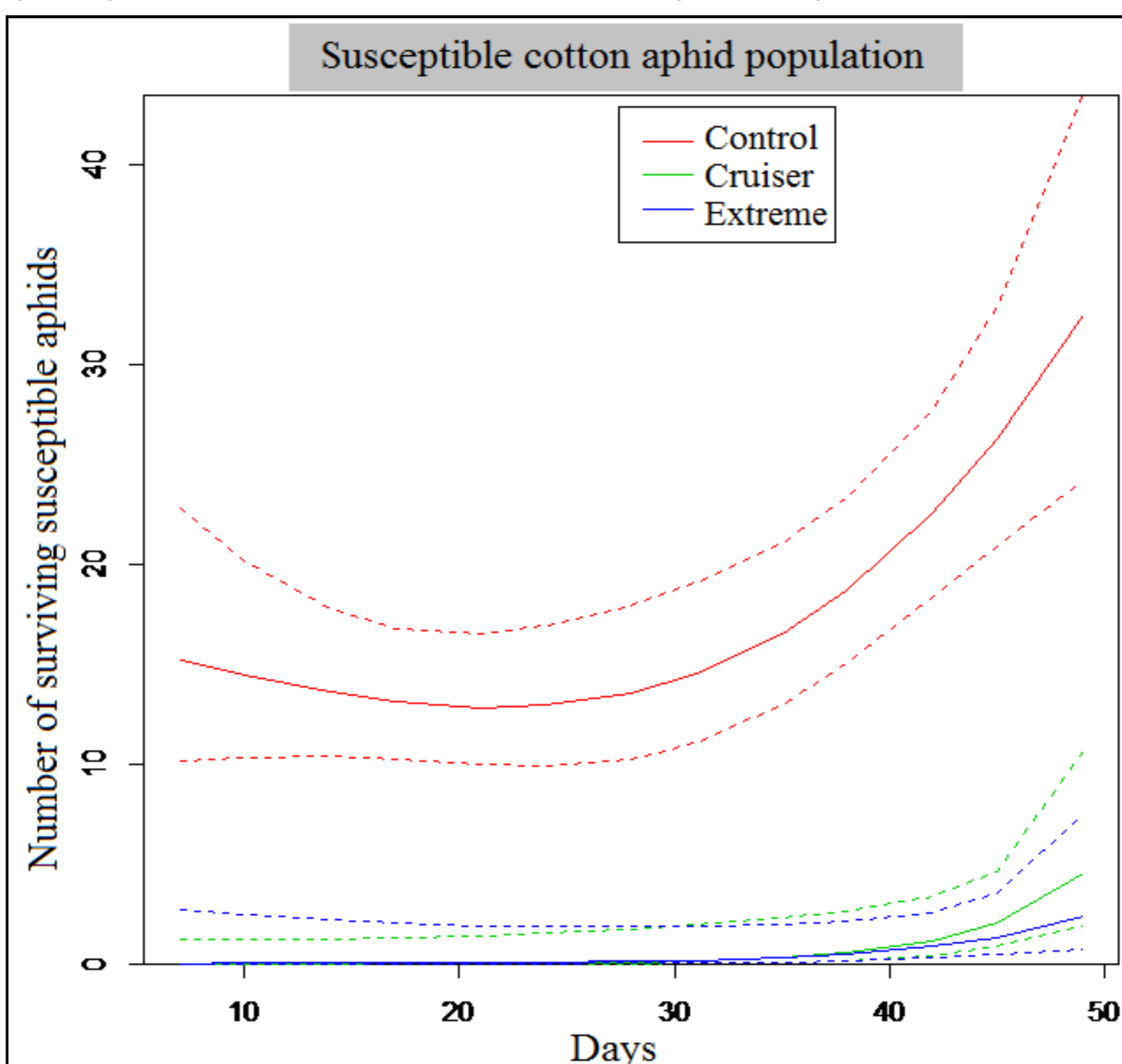


Figure 3. Predicted surviving thiamethoxam susceptible aphids (solid) and 95% confidence intervals (dashed).

Effects of both treatments on the survivability of aphids were highly significant ( $P < 0.001$ ). The susceptible strain could not survive on the treated plants (Fig. 3).

## Acknowledgements

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