

Development of Sustainable Strategies for Managing Bacterial Diseases and Improving Tree Health in the Peach Production System

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Background

Peach is one of the most important fruit crop in the US, especially in South Carolina. But growing peach in the Southeast region is very challenging due to its warm, humid climate that favors different diseases and negatively impacts peach production.

Bacterial spot caused by *Xanthomonas arboricola* pv. *pruni* (Xap), is one of the major diseases of peach which causes millions of dollar loss every year. The presence of bacterial spot on leaves causes premature defoliation and weakens the trees while infection on fruits makes them unmarketable.

Management of this disease is solely dependent on routine spray of copper and antibiotic but they lead to the development of resistant pathogens and have harmful effects on the environment. Copper sprays also cause serious phytotoxicity on the leaves and huge defoliation. So, this study focuses on evaluating field performance of different biopesticides as potential alternative options to manage this disease more sustainably and improve tree health.

Objective

Evaluate different biopesticides for managing bacterial spot in field condition.

Methodology

Research Field Trial:

- Individual trees received five spray treatments: Bio I, Bio II (half rate of Bio I), Bio I alternated with Kocide, Bio I combined with Kocide, and Kocide (growers' standard), each with four replicates.
- Untreated trees served as the control.
- Disease and phytotoxicity ratings of five randomly selected branches and 30 fruit per tree were collected at three time points.

Data Analysis:

- Statistical analysis was conducted in MiniTab v20

Results

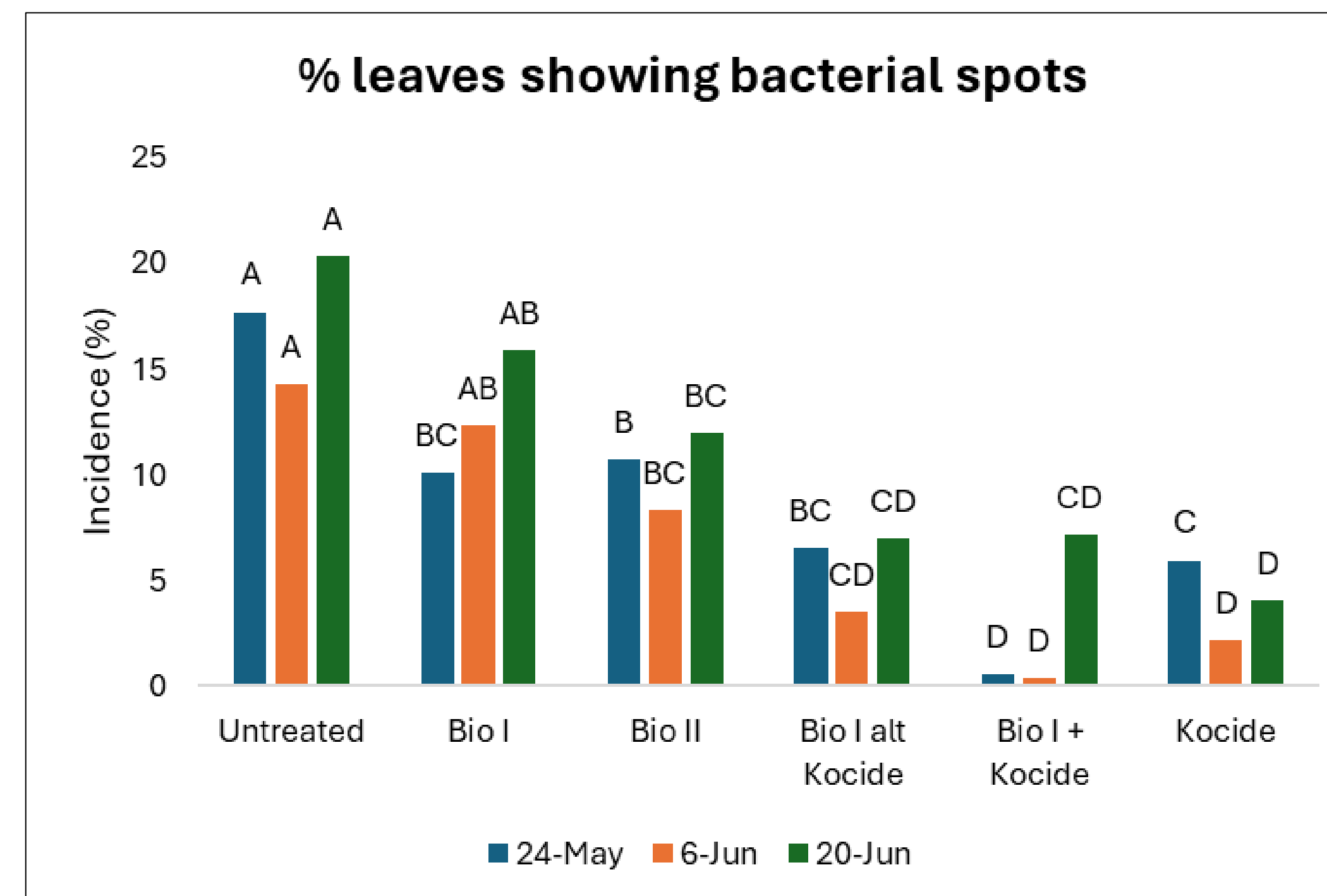


Figure 1: Percent of leaves with bacterial spot symptoms per treatment

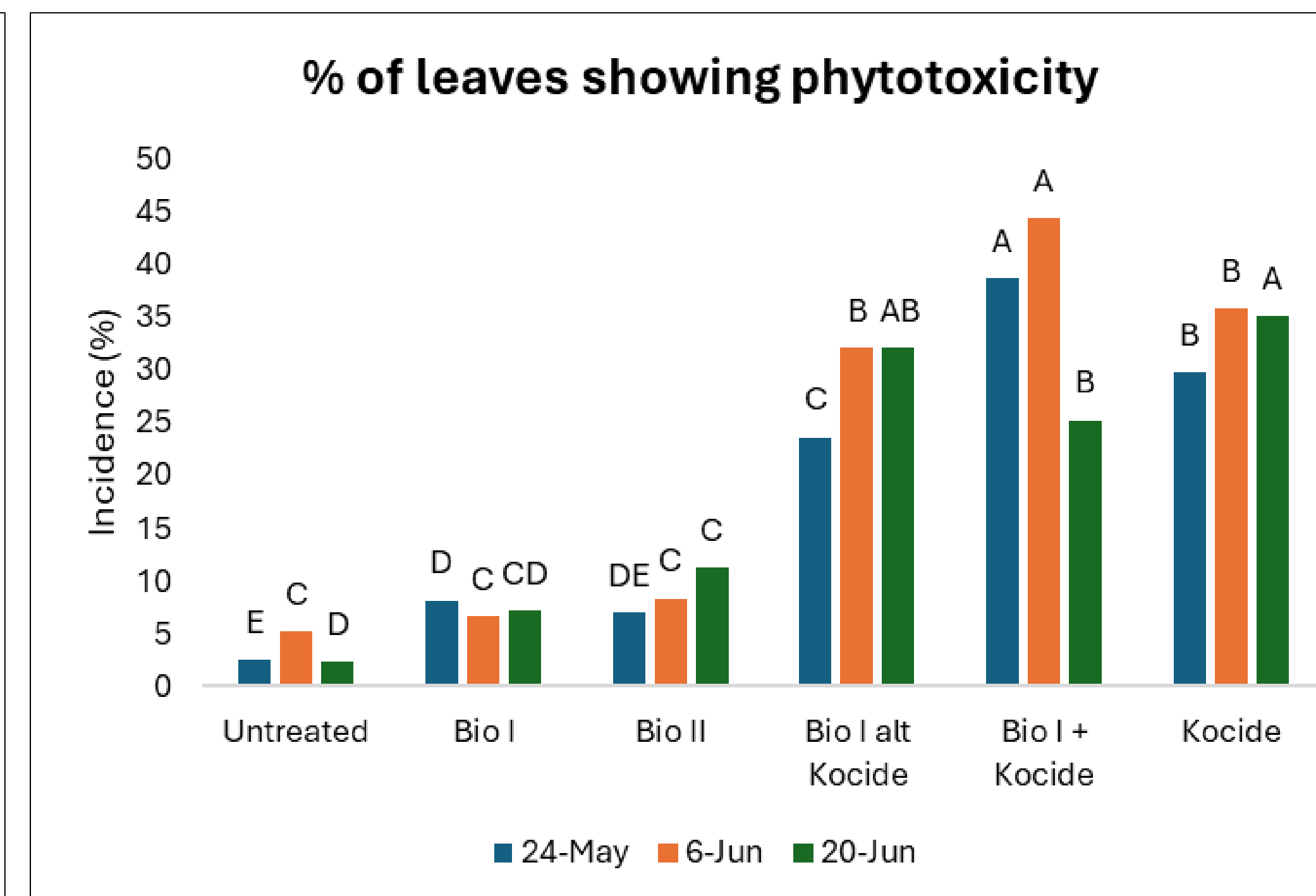


Figure 2: Percent of leaves with phytotoxicity symptoms per treatment

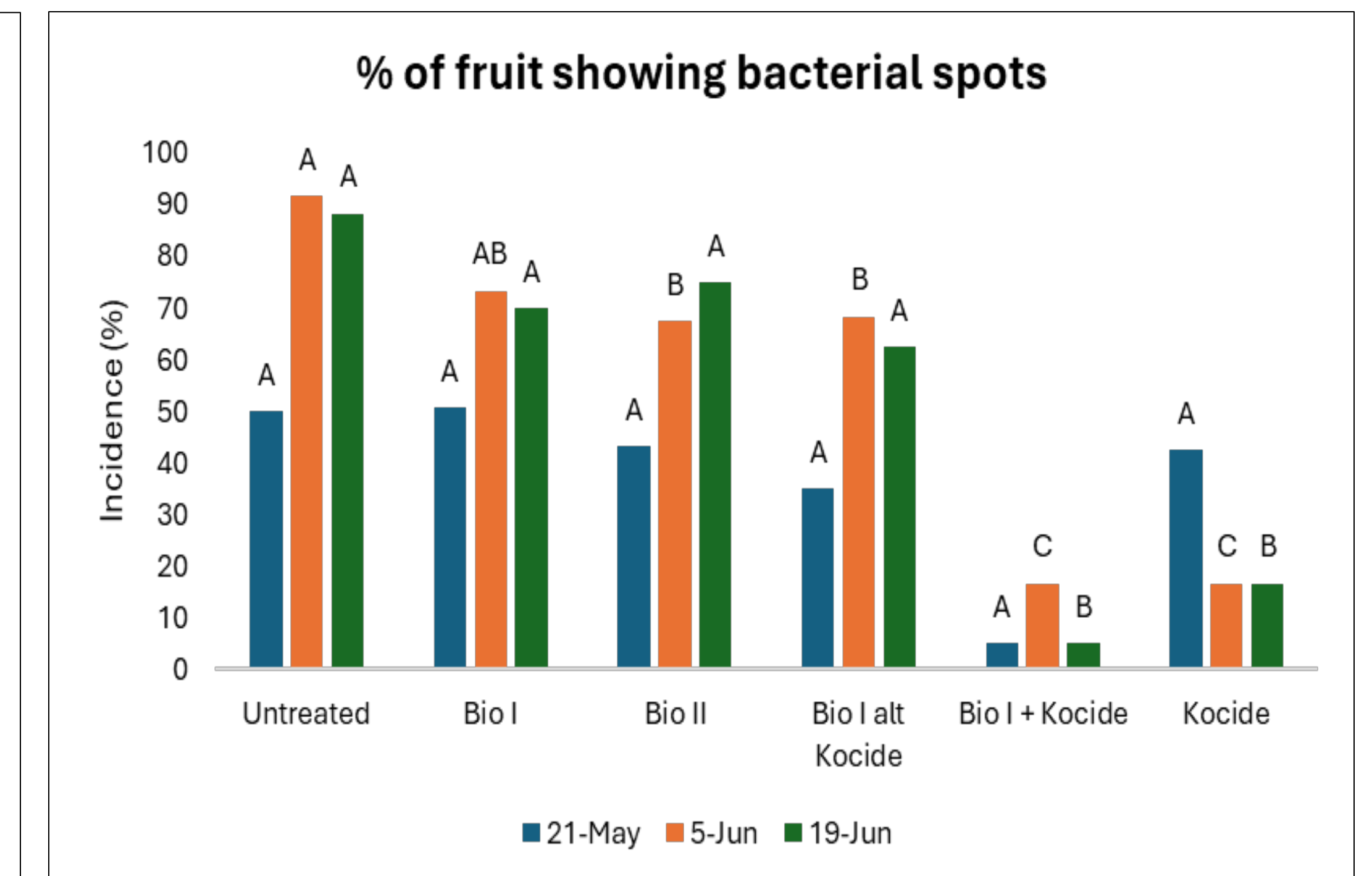


Figure 3: Percent of fruits with bacterial spot symptoms per treatment

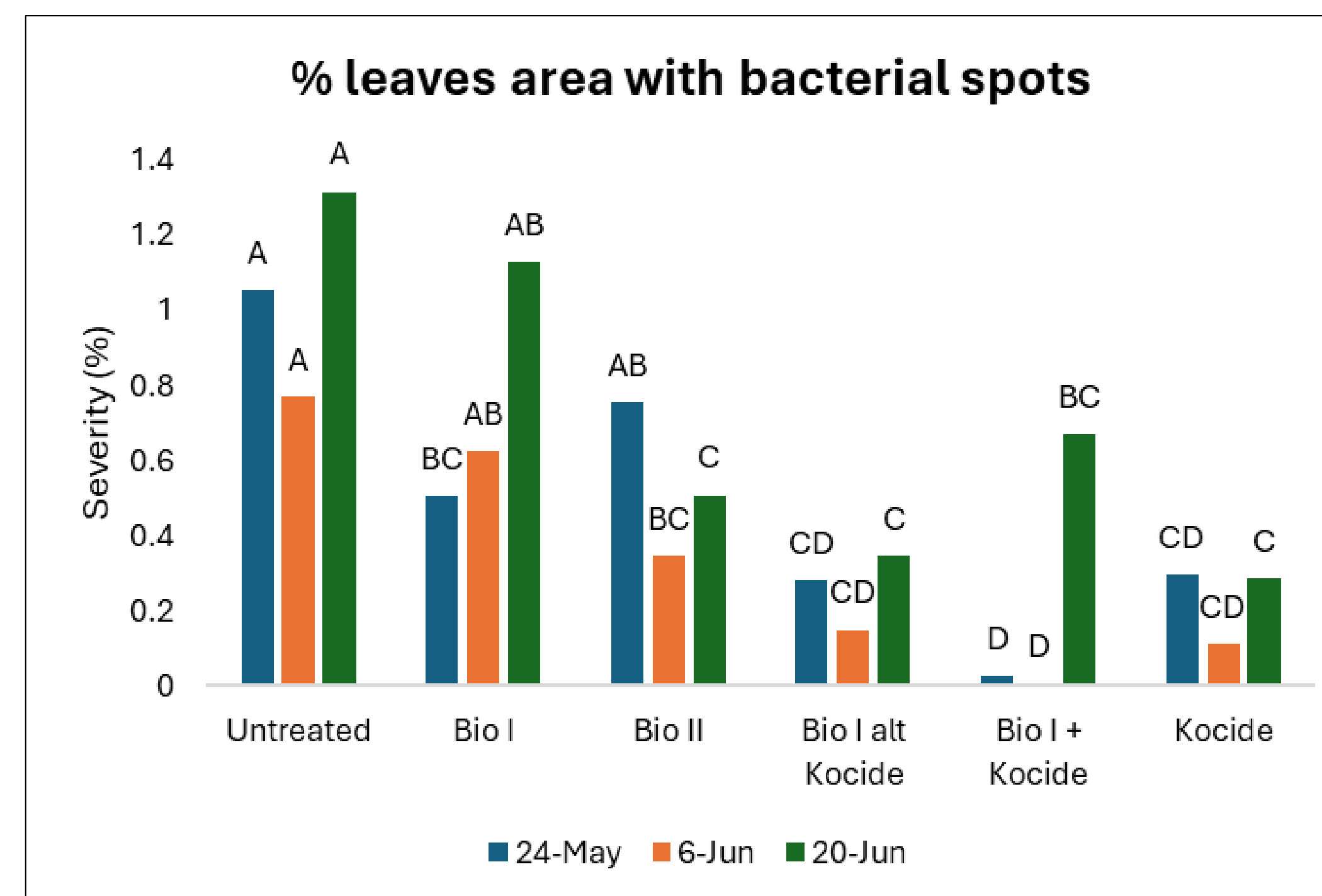


Figure 4: Mean percent area of leaves containing bacterial spot symptoms for each treatment

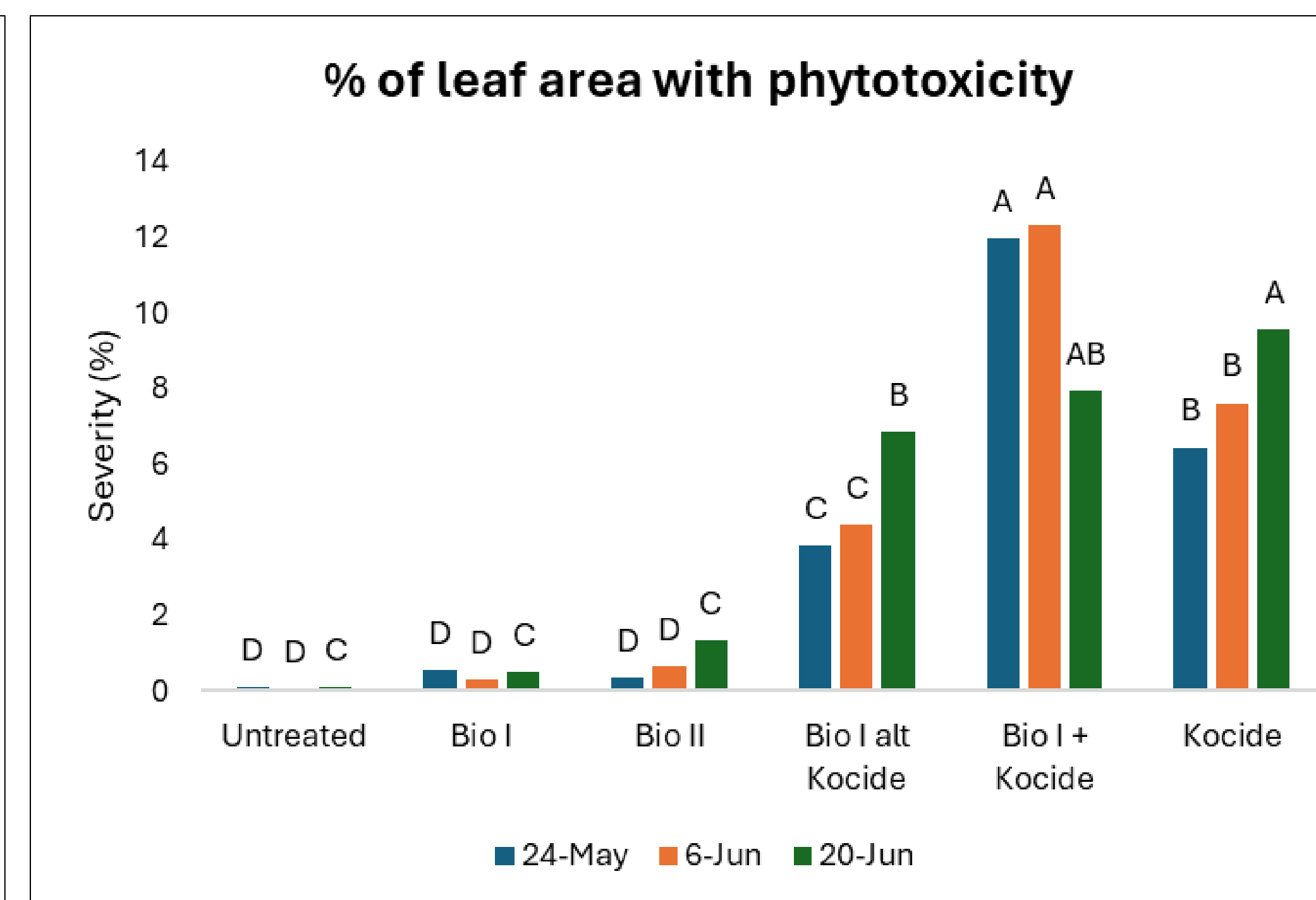


Figure 5: Mean percent area of leaves containing phytotoxicity symptoms for each treatment

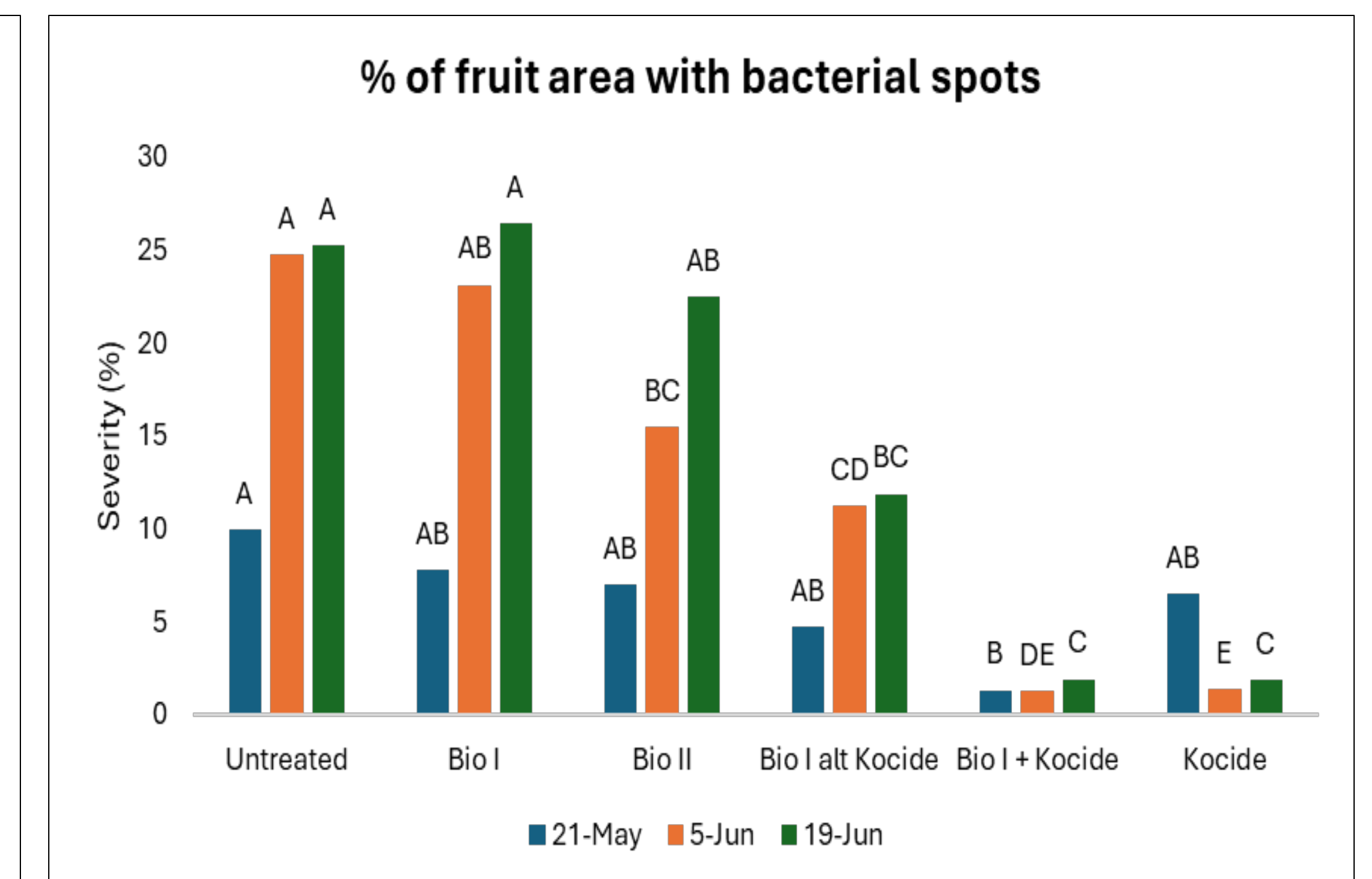


Figure 6: Mean percent area of fruits containing bacterial spot symptoms for each treatment

Conclusions

- All treatments delayed the bacterial spot symptom development
- Kocide and mixture of Bio I + Kocide significantly suppressed disease development on both leaves and fruit.
- All Kocide treatments caused significant phytotoxicity on leaves
- Half rate Bio I had similar effect as full rate for managing bacterial spot.

Acknowledgements

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