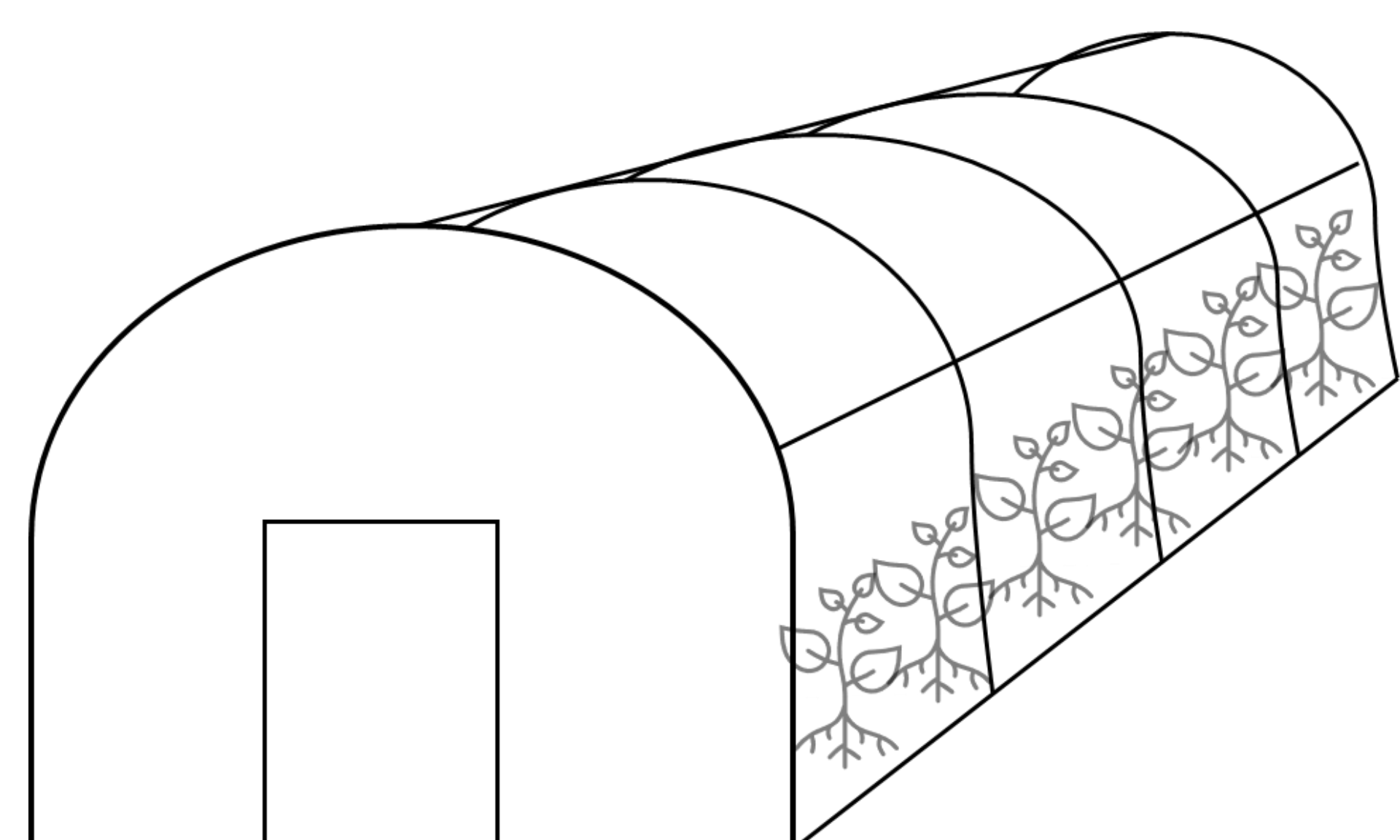


Testing an IPM program for aphids in high-tunnel winter crops

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Benefits

- Better yield quality compared to field production
- Extends the growing season
- Is more affordable than a greenhouse

Challenges

- Increased pest pressures
- Limited ability to control the environmental conditions
- High maintenance of the structure and crop within



Green peach aphid
(*Myzus persicae*)



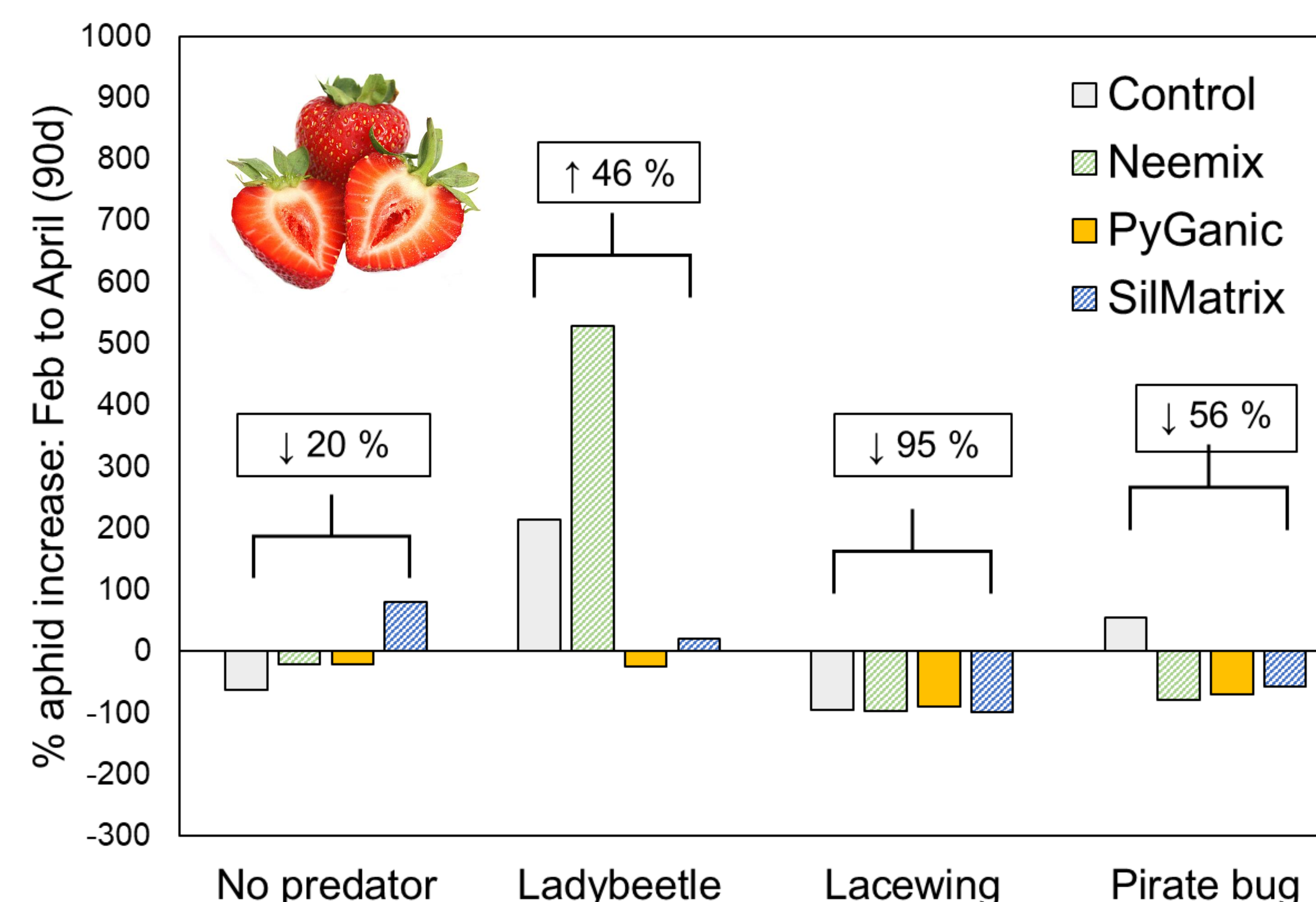
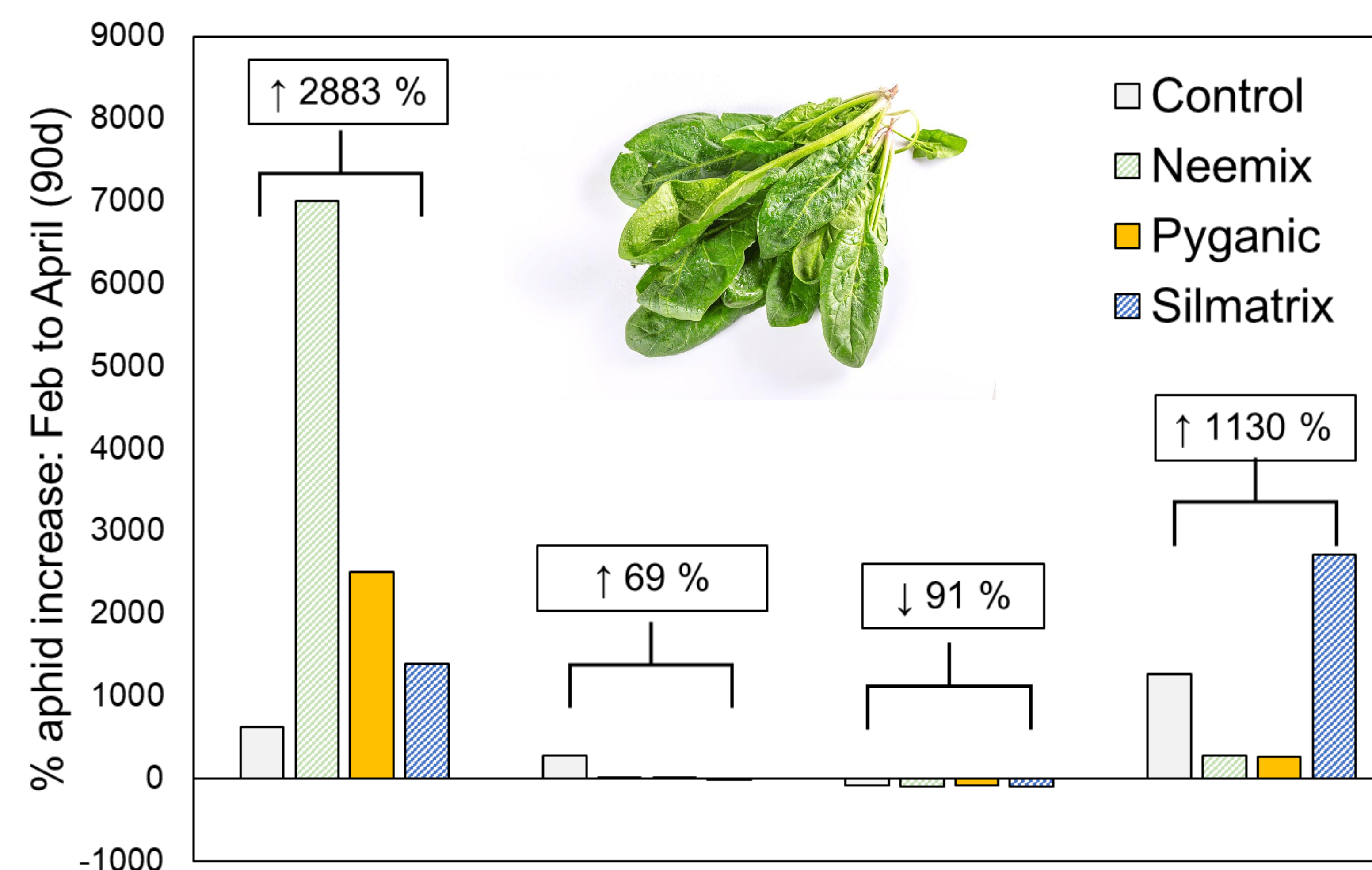
Potato aphid
(*Macrosiphum euphorbiae*)

High-tunnels have gained popularity among specialty crop growers in recent years, especially through the facilitation of winter production. However, one of the greatest challenges—managing insect pests—remains a problem. Our preliminary studies found that aphids are the most common pest on winter crops and management recommendations are limited for this time of year. **Our goal was to determine the best IPM program for winter aphid management using common biopesticide and biological control products.** We planted ‘Auroch’ spinach and ‘Chandler’ strawberry into 12 high tunnels during the 2022-2023 winter. We released four biocontrol predators and applied four biopesticides to both crops to build recommendations.

| Products Evaluated | | | |
|--------------------------|--------------------|---------------------------|-------------------------|
| Biorational Insecticides | | Natural Enemies | |
| Product | Active Ingredient | Agent | Release rate per tunnel |
| Sil-MATRIX® | Potassium silicate | <i>Adalia bipunctata</i> | 200 larvae |
| PyGanic® | Pyrethrin | <i>Chrysoperla carnea</i> | 1,000 larvae 8,000 eggs |
| Neemix® | Azadiractin | <i>Orius insidiosus</i> | 1,000 adults |
| Water | NA | Control | NA |

Results:

- Biocontrol impacts on aphids:** All predators reduced aphid population increases compared to the no-predator control. Among the predators, the greatest reduction of aphids was observed for *C. carnea* on both crops. On spinach, a 90 % decrease in aphid populations following *C. carnea* releases were observed.
- Spray effects on natural enemies and aphids:** The only predator that showed sensitivity to any product was *A. bipunctata* to PyGanic®. In the field, Neemix® and Sil-MATRIX® had a temporary impact on aphids on both crops up to 3 weeks post application. PyGanic® also had a significant effect on aphids, but only on spinach. Overall, two sprays during the season were not sufficient in maintaining low aphid numbers, therefore more frequent applications are needed.



Conclusions and Recommendations:

***C. carnea* proved to be the most reliable aphid predators and is highly compatible with the biopesticide products Neemix®, PyGanic® and Sil-MATRIX®.** All the biopesticide products had short term efficacy of up to 3 weeks on one or both crops, therefore we recommend monthly applications of any of these products following a biocontrol release.

