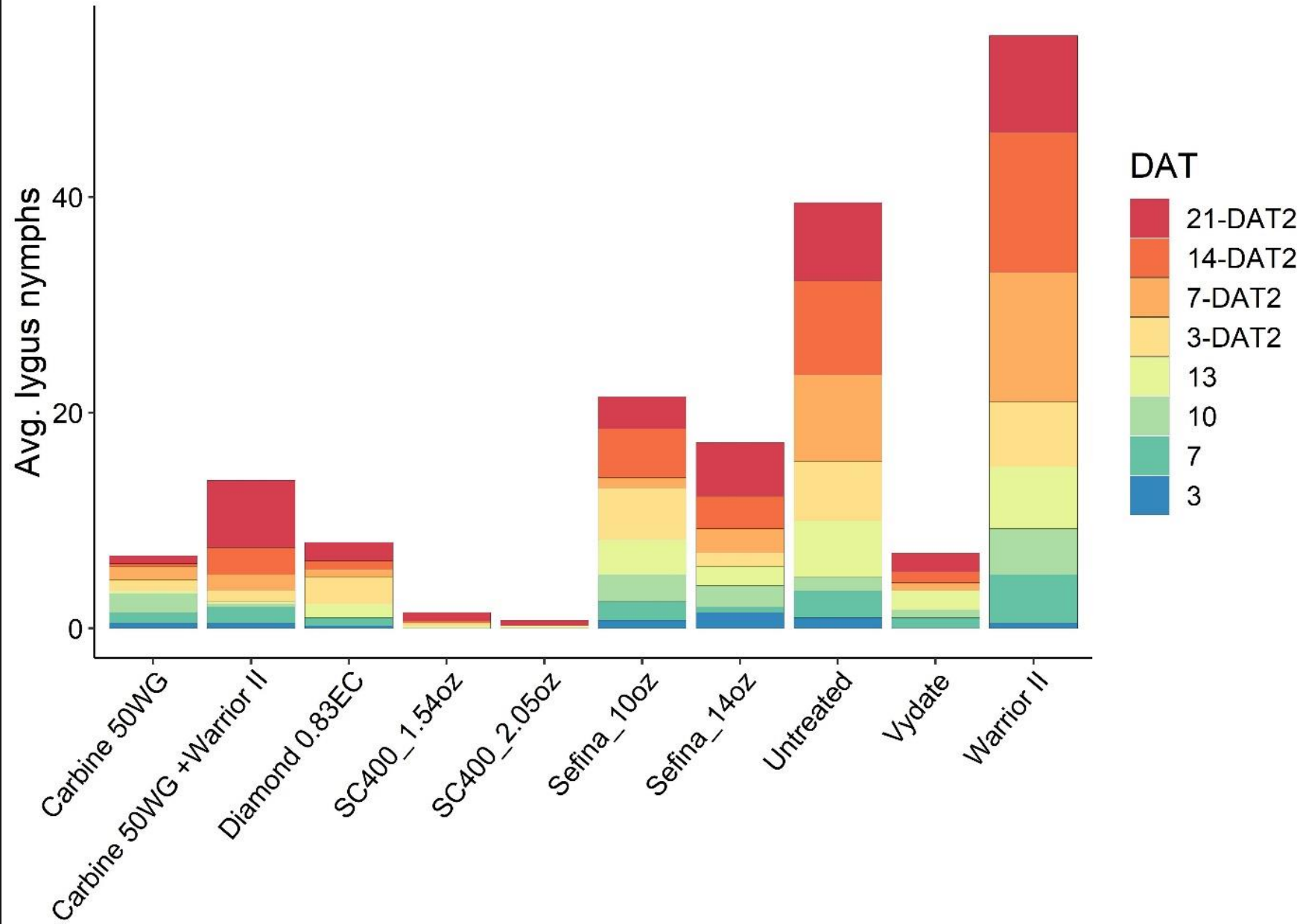
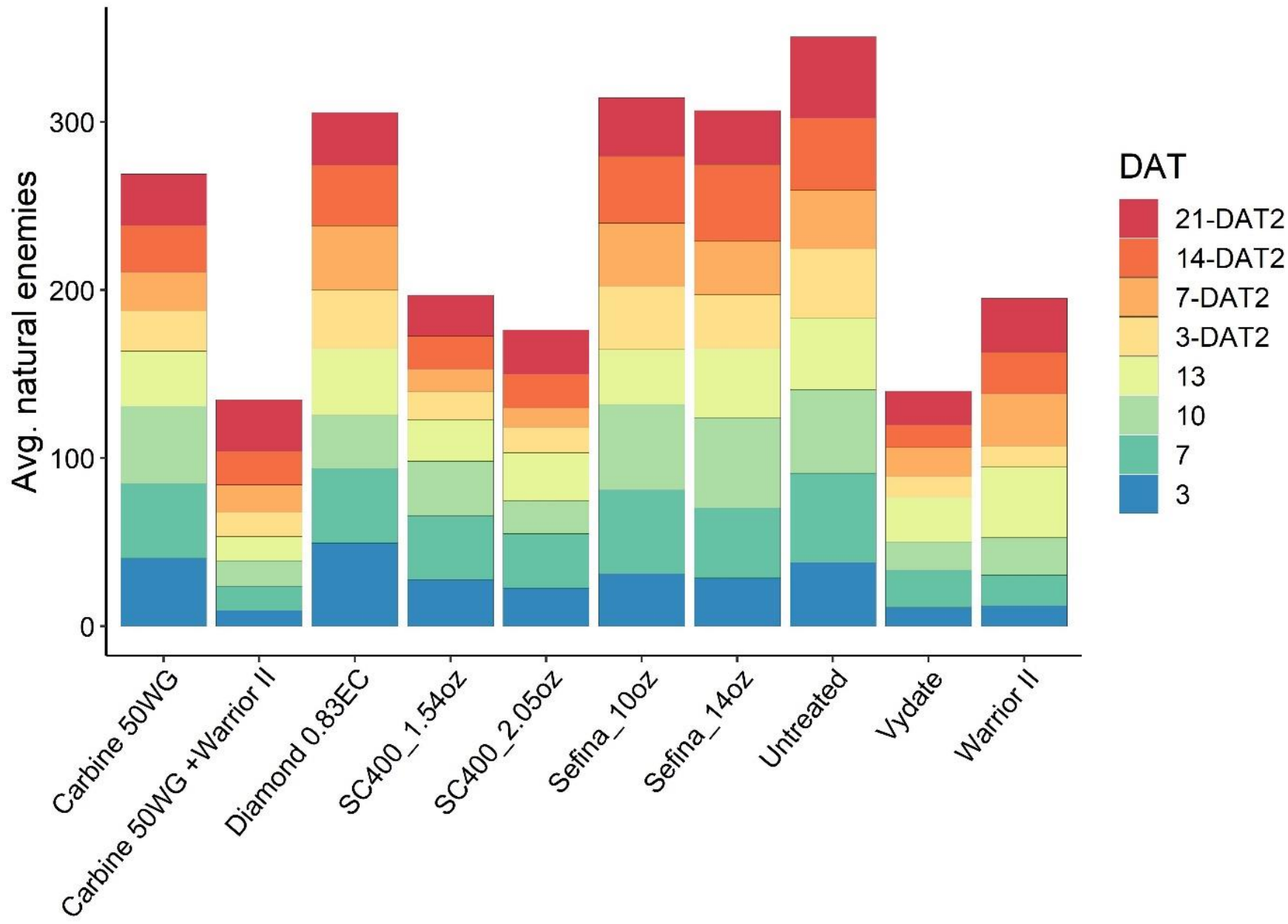


2022

Treatment	Active ingredient	Rate	Units (per acre)
Carbine 50WG	Flonicamid		2.8 oz
Carbine 50WG +Warrior II	Flonicamid+lambda-cyhalothrin	2.8 + 2.56	oz + fl oz
Diamond 0.83EC	Novaluron		12 fl oz
SC400	Isocycloseram		1.54 fl oz
SC400	Isocycloseram		2.05 fl oz
Sefina	Afidopyropen		10 fl oz
Sefina	Afidopyropen		14 fl oz
Untreated	--		
Vydate C-LV	Oxamyl		34 fl oz
Warrior II	Lambda-cyhalothrin		2.56 fl oz

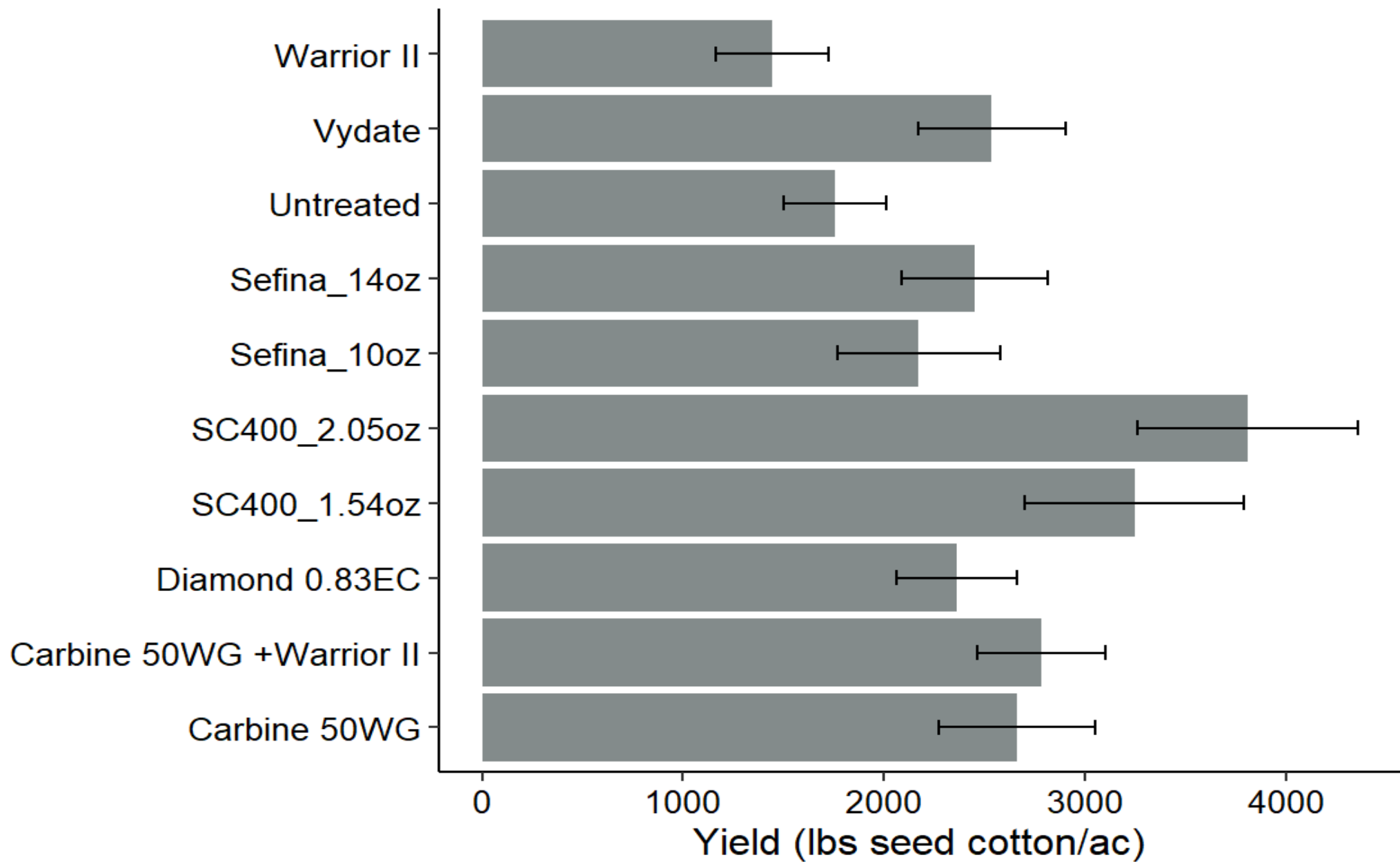
Nymphs





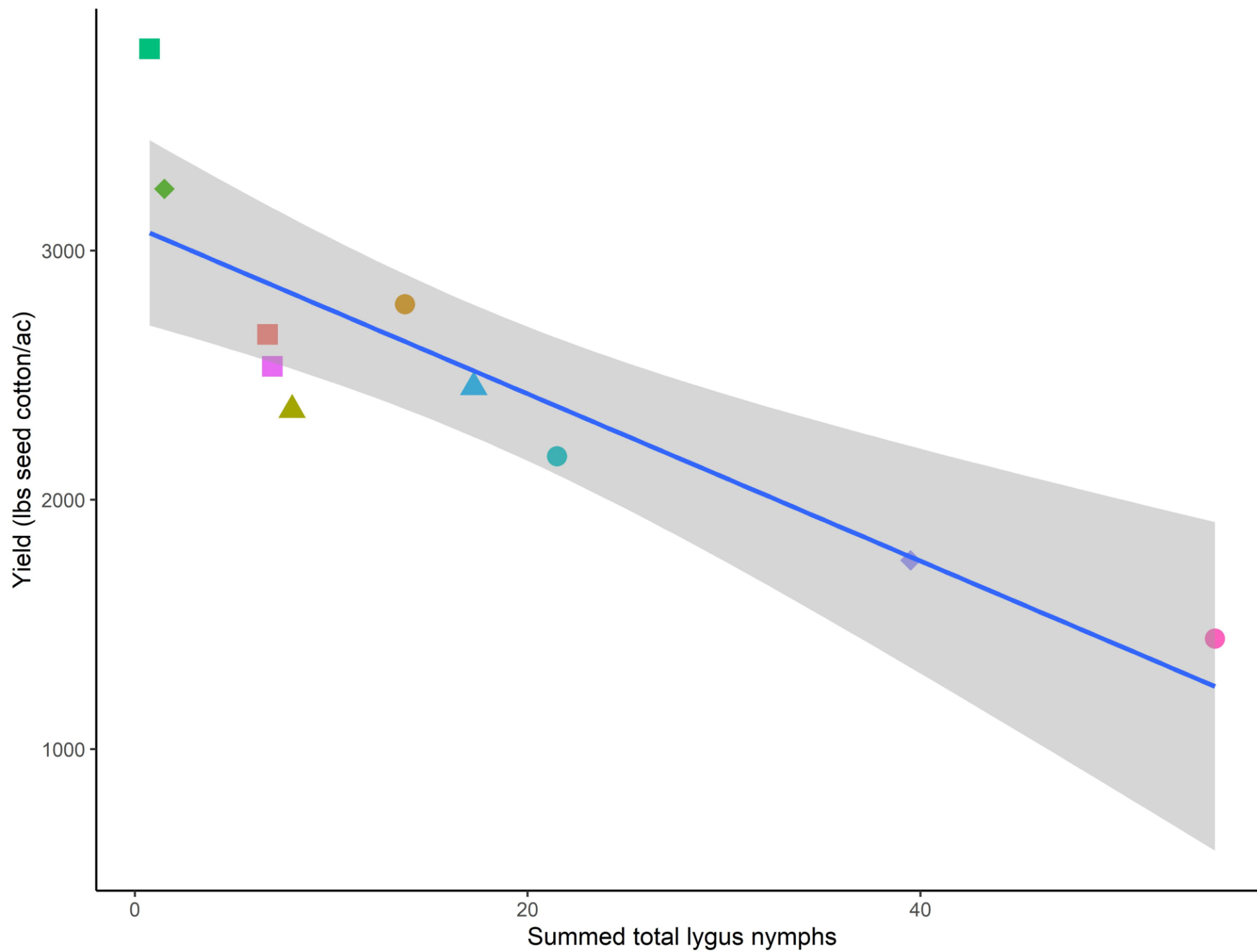
Natural enemies





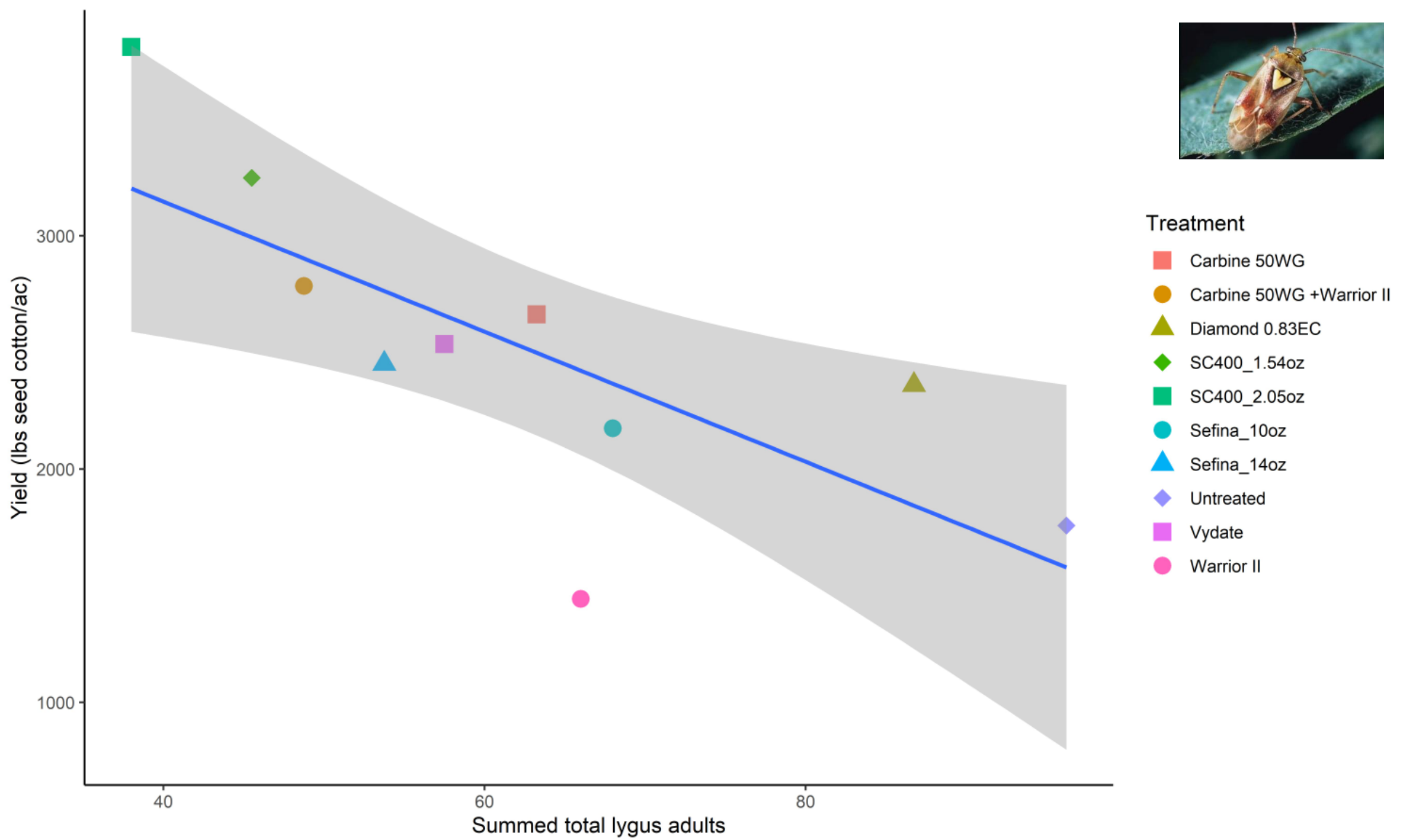




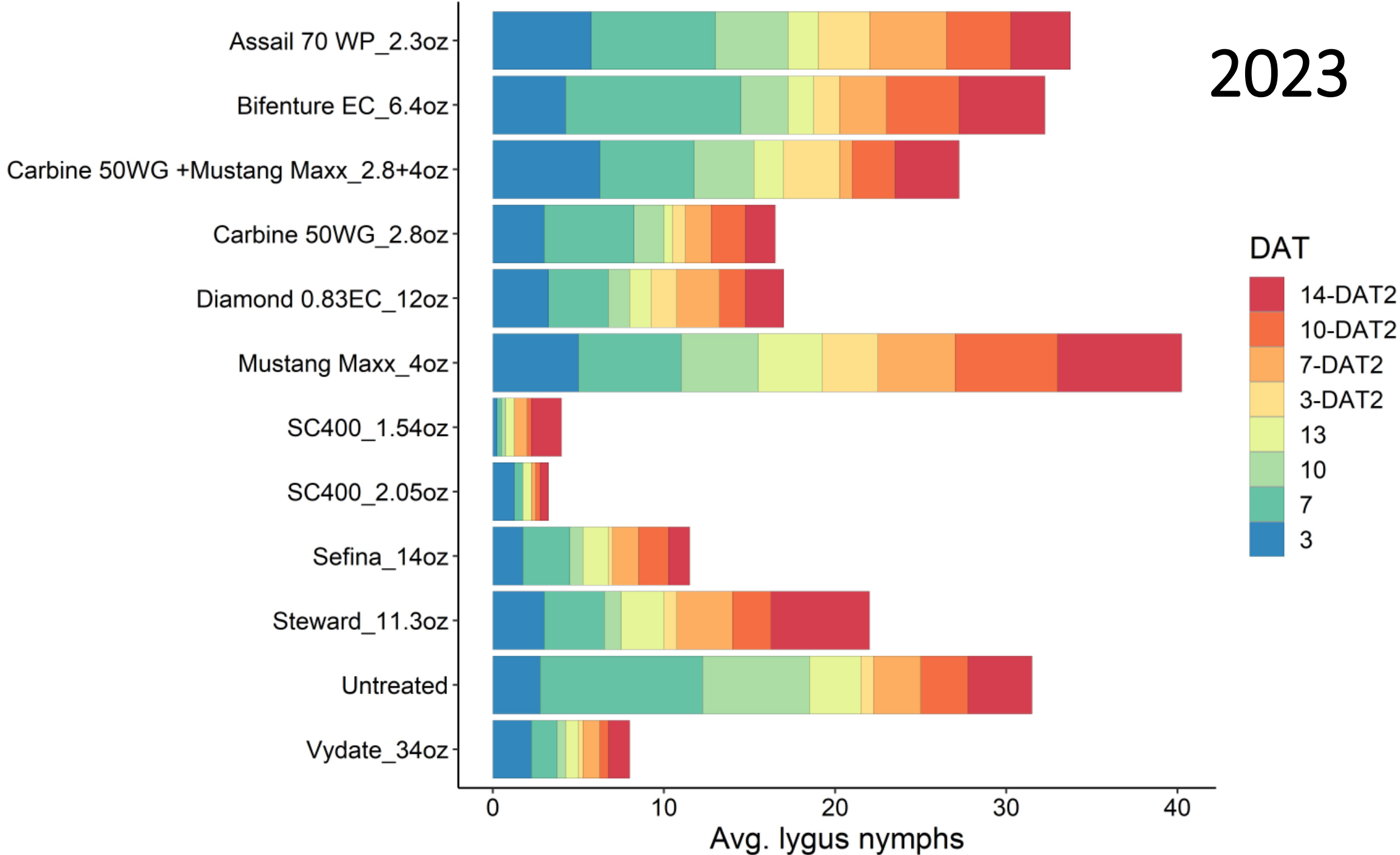


Treatment

- Carbine 50WG
- Carbine 50WG +Warrior II
- Diamond 0.83EC
- SC400_1.54oz
- SC400_2.05oz
- Sefina_10oz
- Sefina_14oz
- Untreated
- Vydate
- Warrior II



2023



Interactions between aphids/whiteflies and lygus - integration

- Lygus pressure may be “in the driver’s seat” from the start
- Currently limited on selective materials for lygus
 - Rely on these as much as possible, without tank-mixing with non-selective
- Some lygus materials have efficacy for aphid, for whiteflies, for both, or neither.
- Potential for “downstream consequences”

Unintended consequences





Insecticide Efficacy- Spray Coverage



Spray coverage - Applications



Spray coverage – Plant canopy



Dense



Open

Spray coverage – Application mode

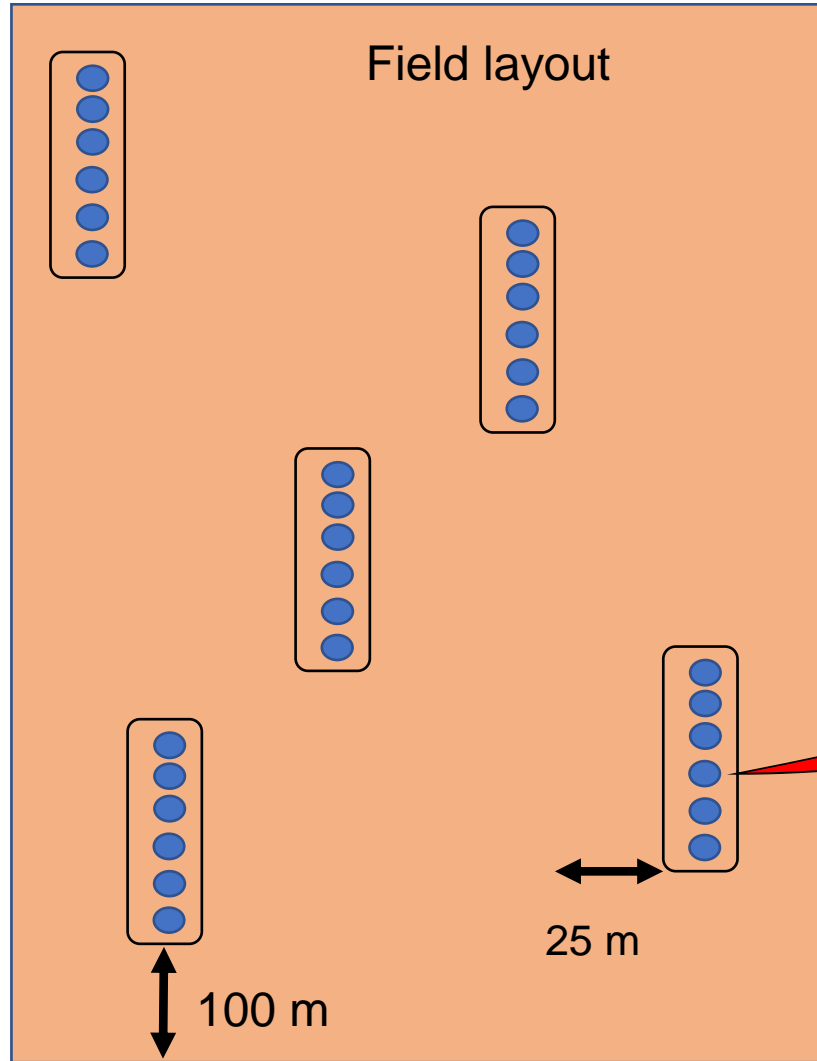


With dropdown nozzles



Without dropdown nozzles

Spray coverage



Water sensitive papers on cotton plant (5th and 9th node)



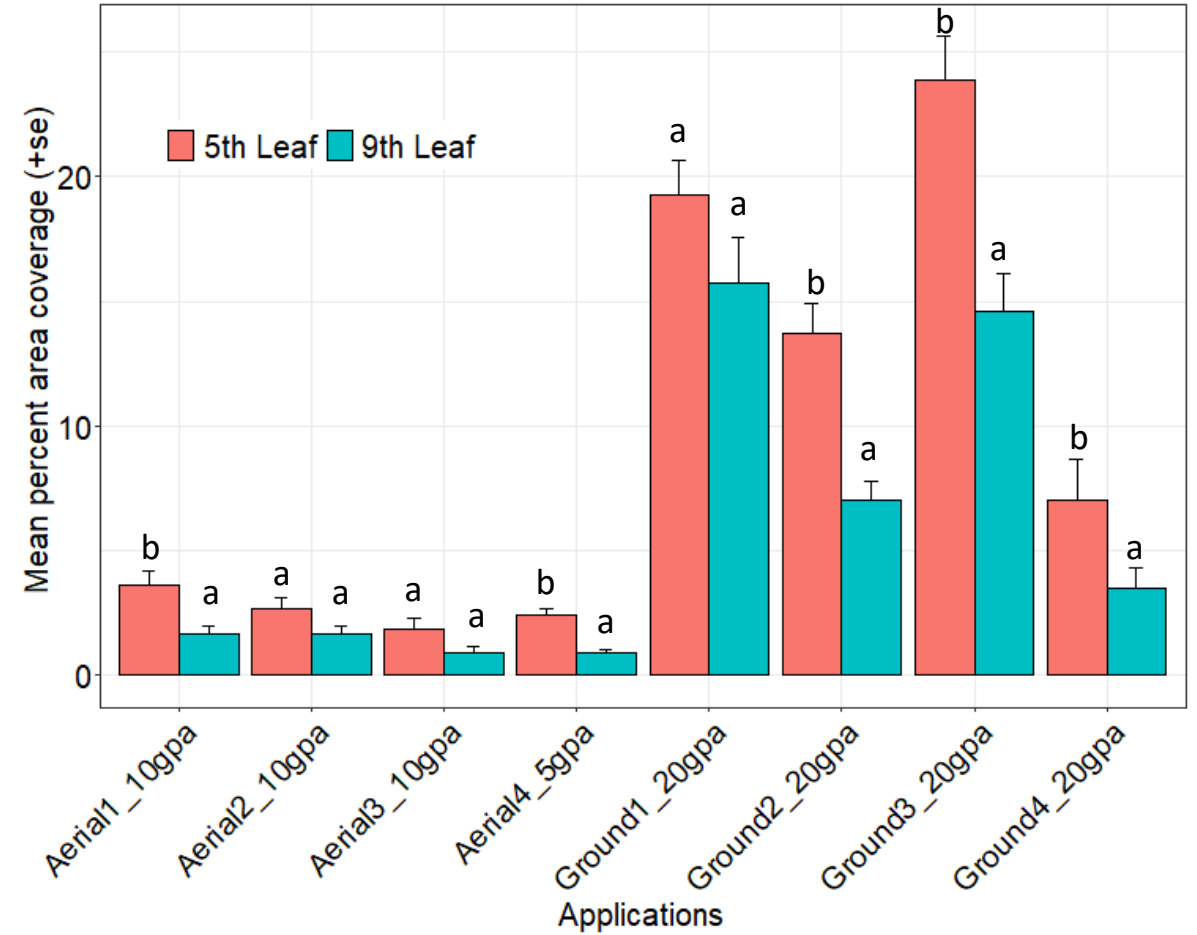
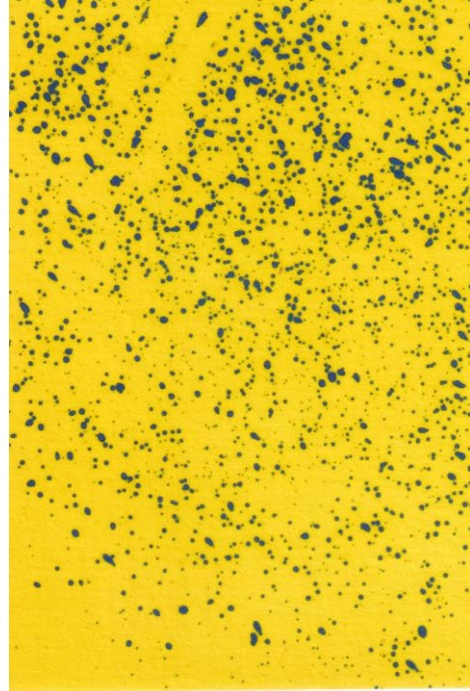
Water sensitive paper without droplets (2×3")

Spray coverage

Ground Application



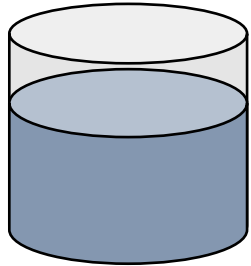
Aerial Application



Spray coverage: Tank mix



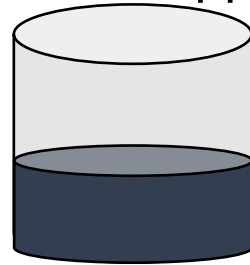
Ground application



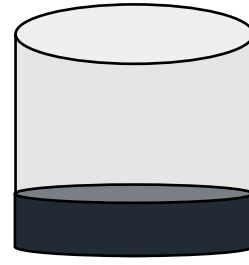
20 GPA



Aerial application

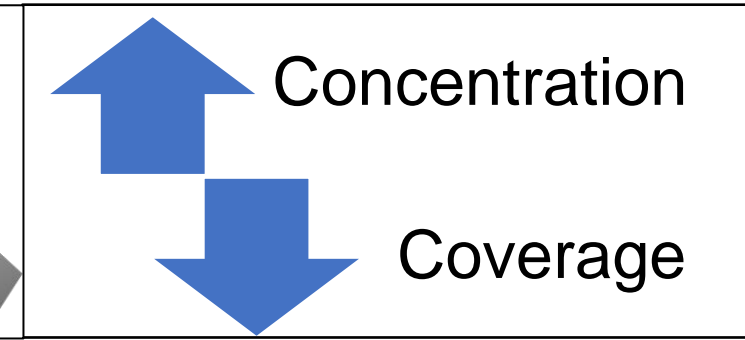
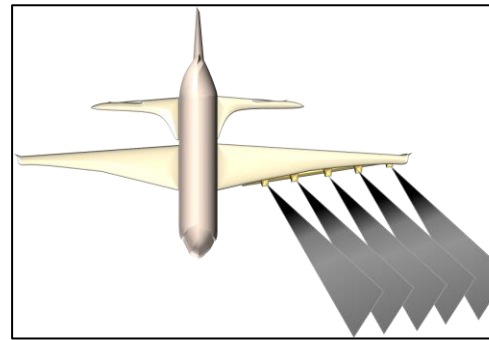
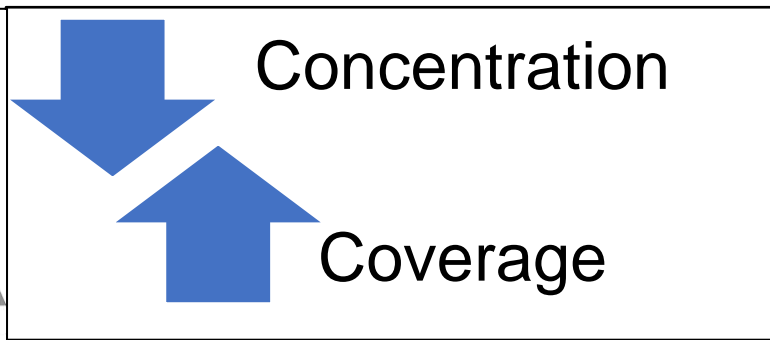
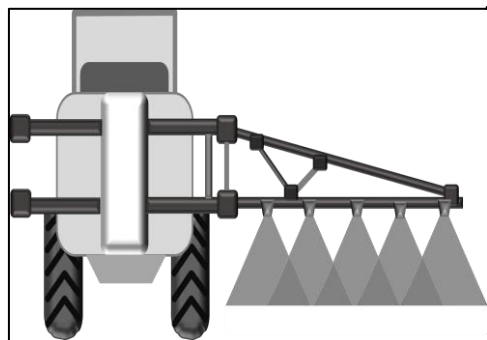


10 GPA



5 GPA

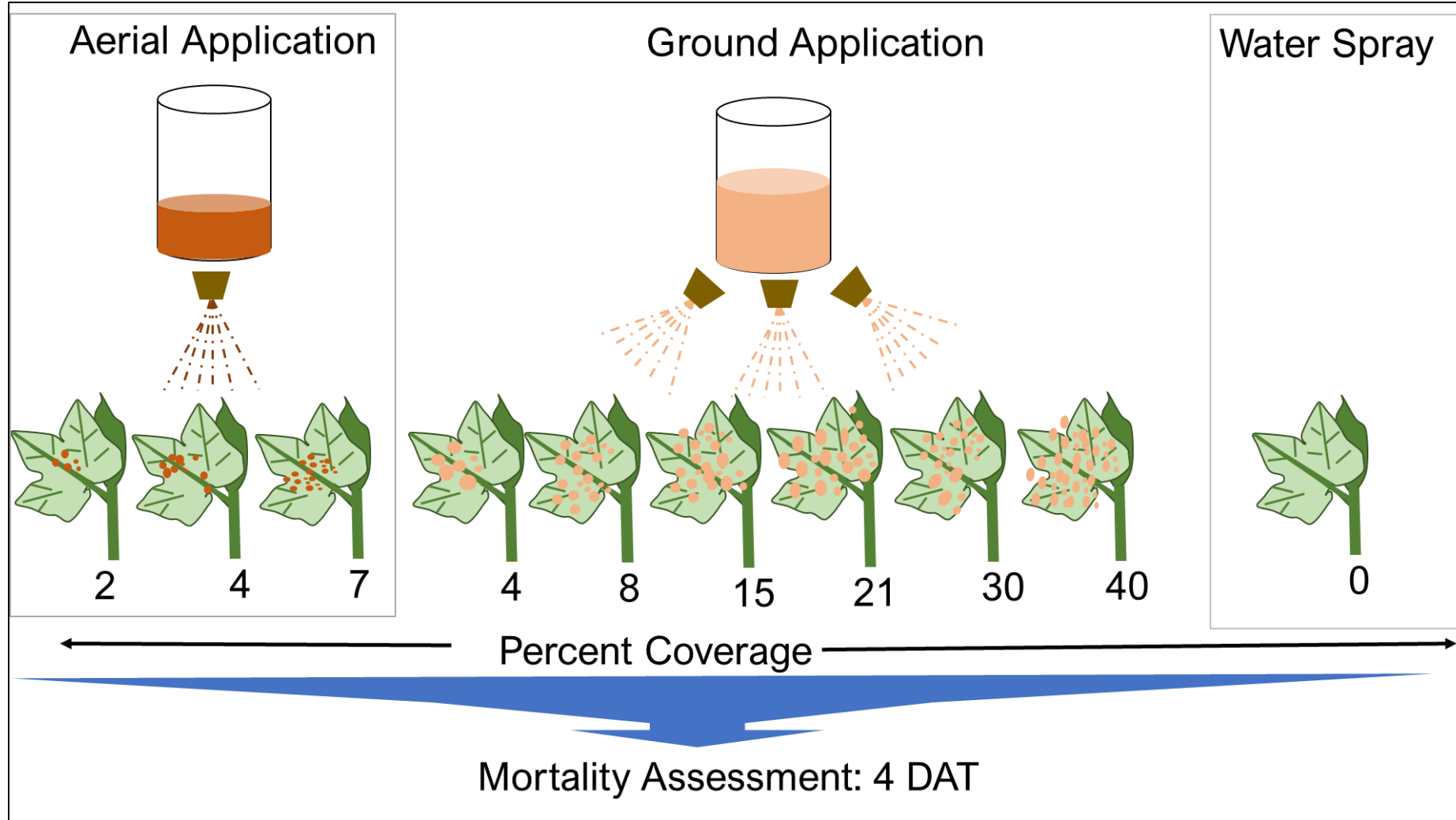
AI amount per acre is similar on both aerial and ground applications



Interplay between spray coverage and concentration



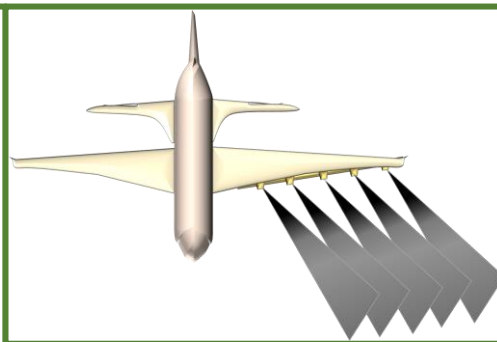
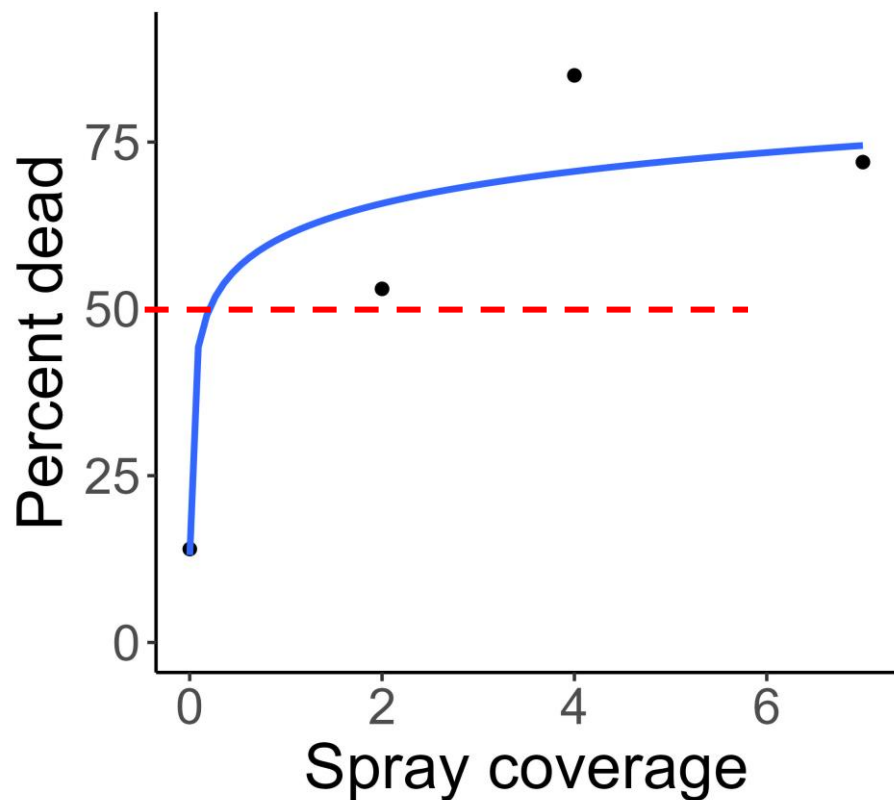
Interplay between spray coverage and concentration



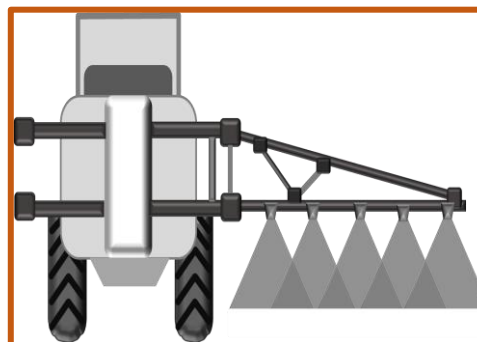
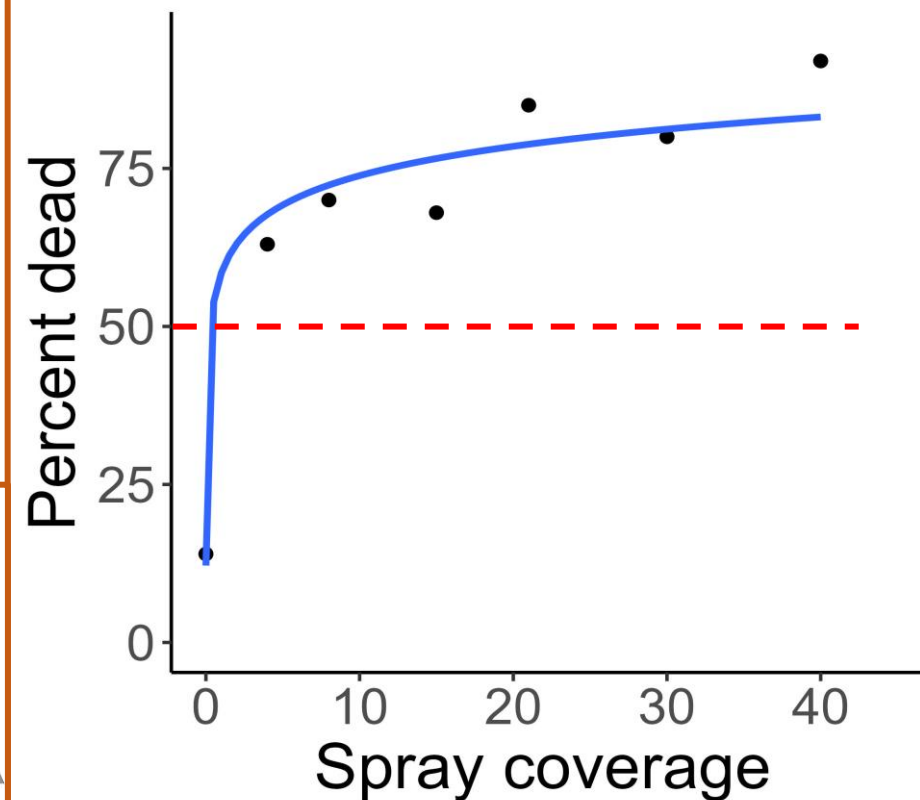
Insecticide Efficacy: Afidopyropen (Sefina)



Aerial Application



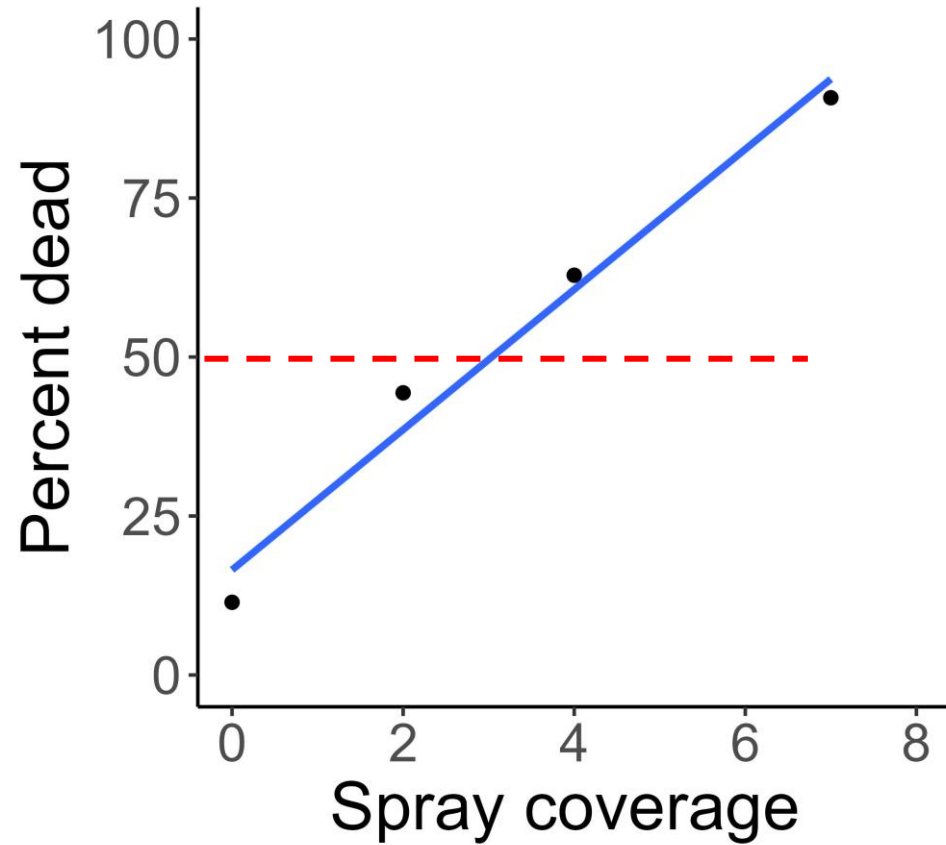
Ground Application



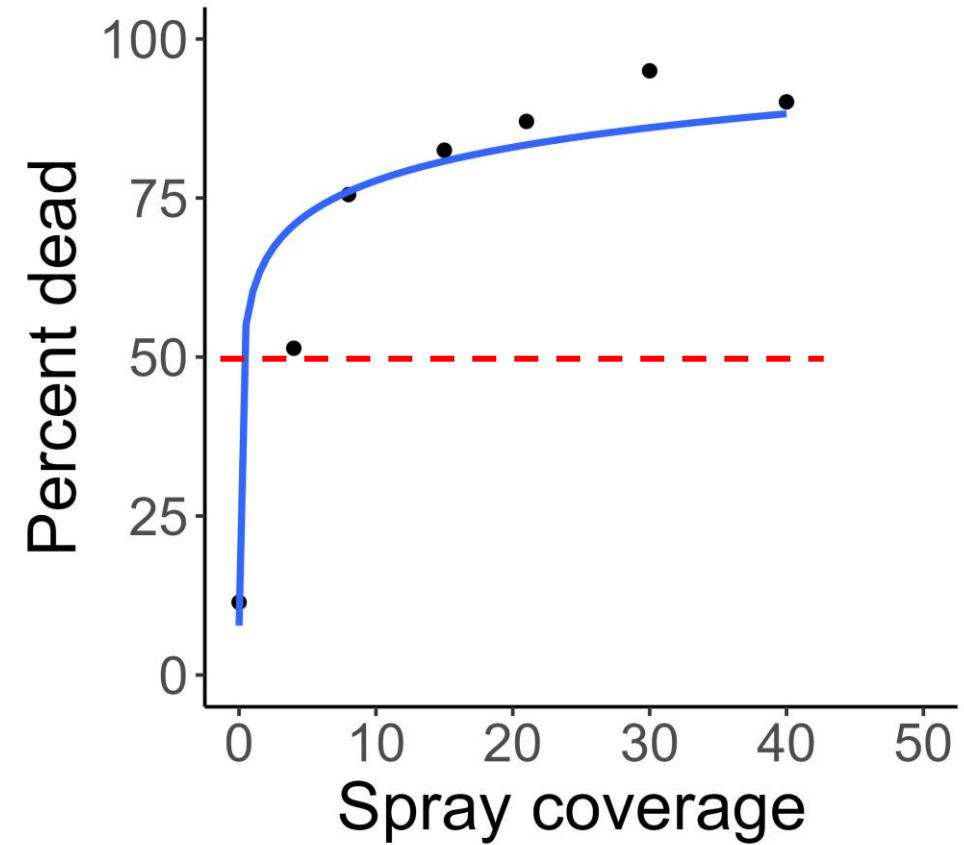
Insecticide Efficacy: Sivanto



Aerial Application



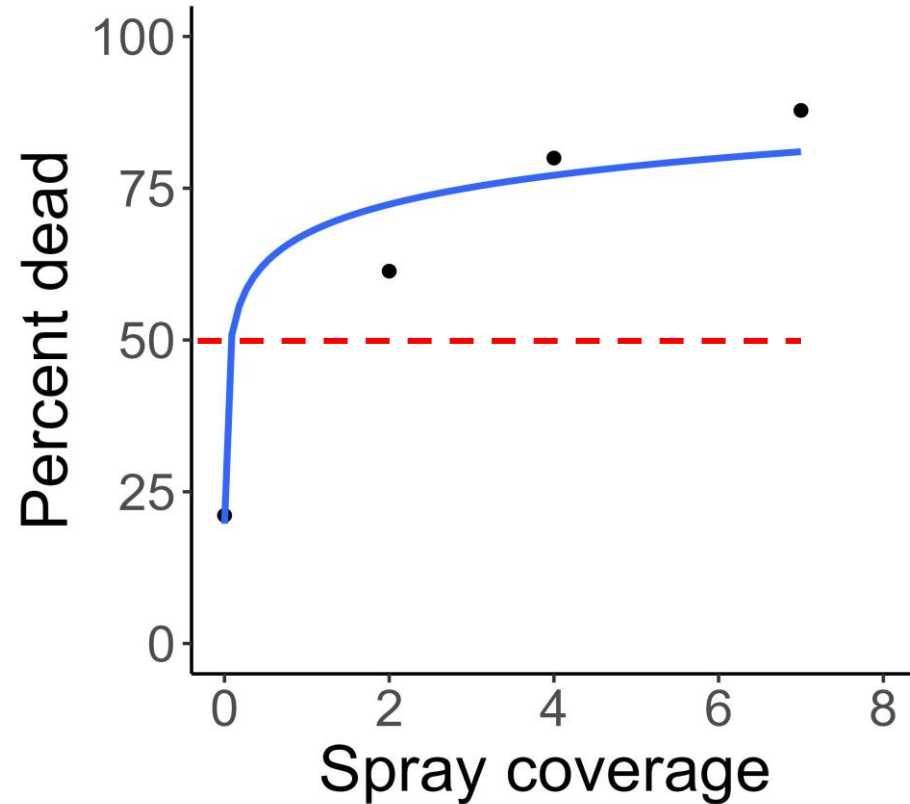
Ground Application



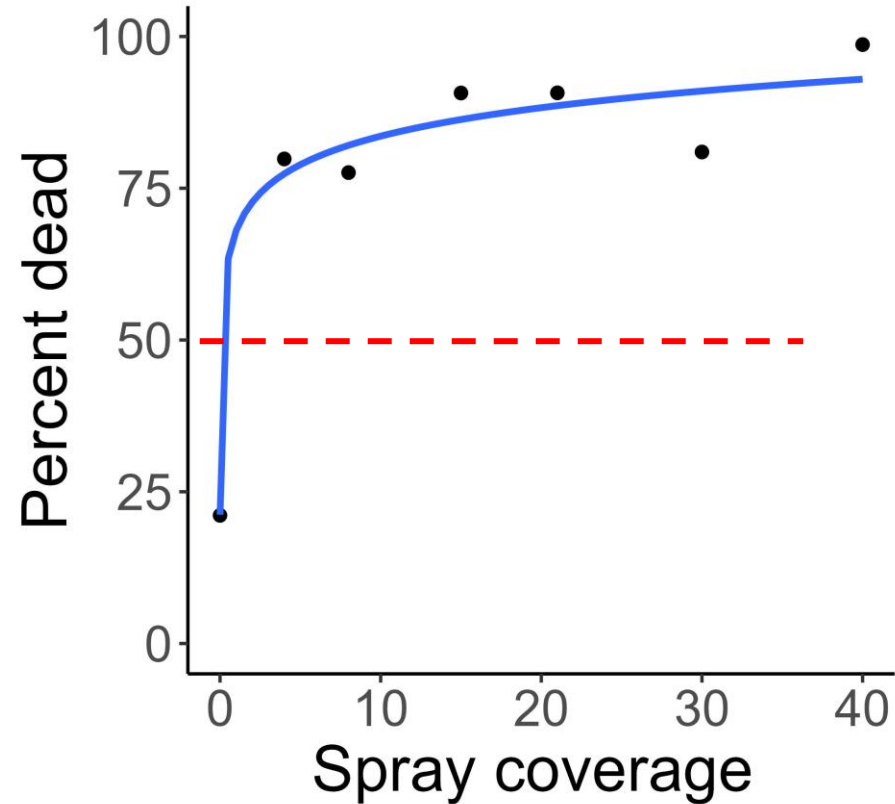
Insecticide Efficacy: PQZ



Aerial Application



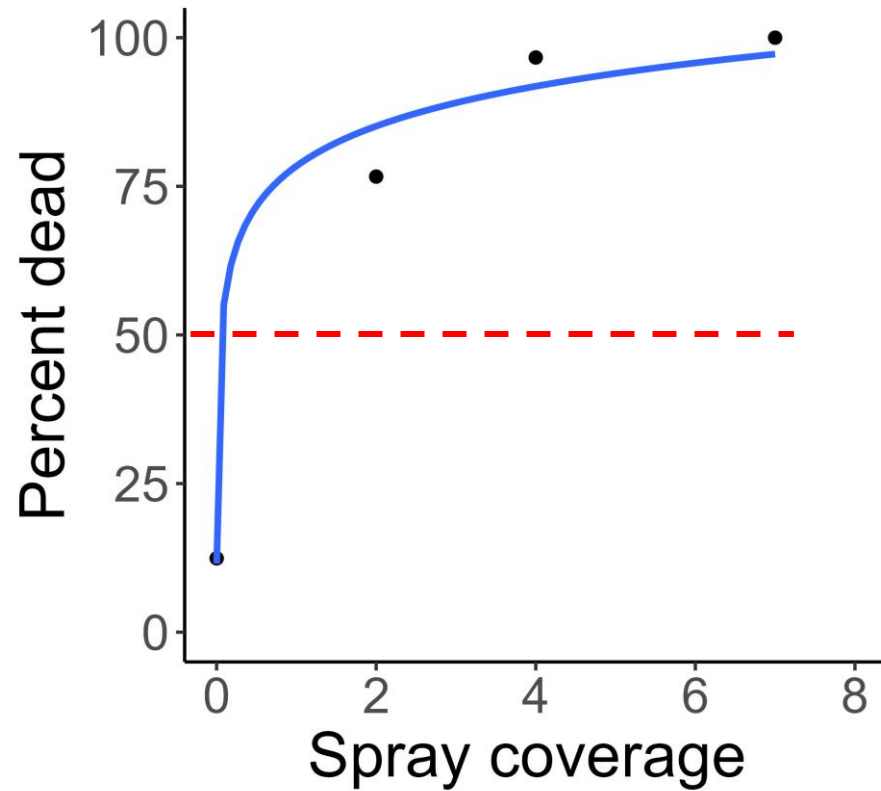
Ground Application



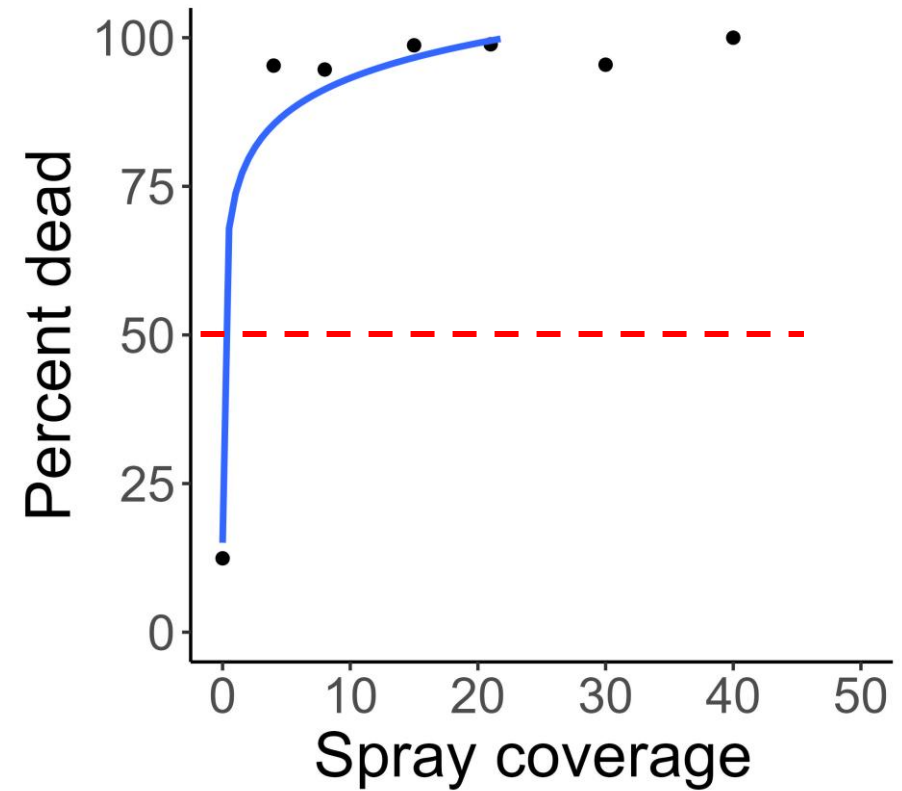
Insecticide Efficacy: Carbine



Aerial Application



Ground Application



Conclusions

- Need to address key Lygus pests within an IPM framework
- Lygus: limited tools, but some selective, some broad-spectrum, and a [hopefully] new material, pending registration
- Management challenges for aphids/whiteflies
- For late-season applications, ground apps achieved much better coverage than aerial apps
 - Increased concentration with aerial would not make up difference.
- For aphids variable efficacy for aerial vs. ground and with coverage ranges

Acknowledgements

- Treanna Pierce
- Kevin Goding
- Grettenberger lab personnel
- Grower and PCA cooperators



Cotton
Incorporated



Funding

- California Cotton Alliance
- Cotton Incorporated
- Various agrichemical companies

Questions?



Questions?



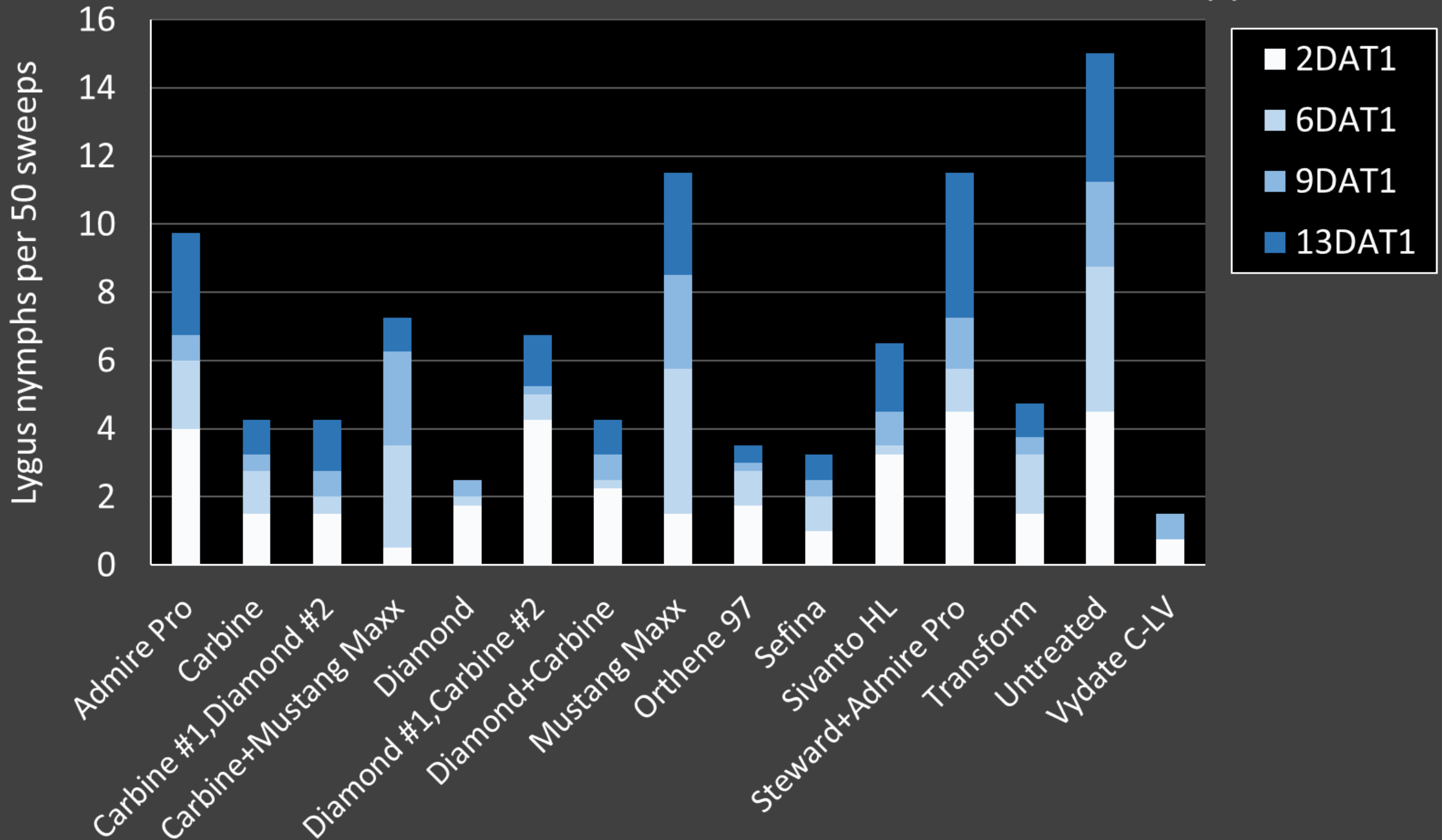
Resistance management

- Need to properly use materials to get benefits through time
- What can we do?
 - Limit
 - Diversify/rotate
- Rely on biological control
- Rotating modes of action



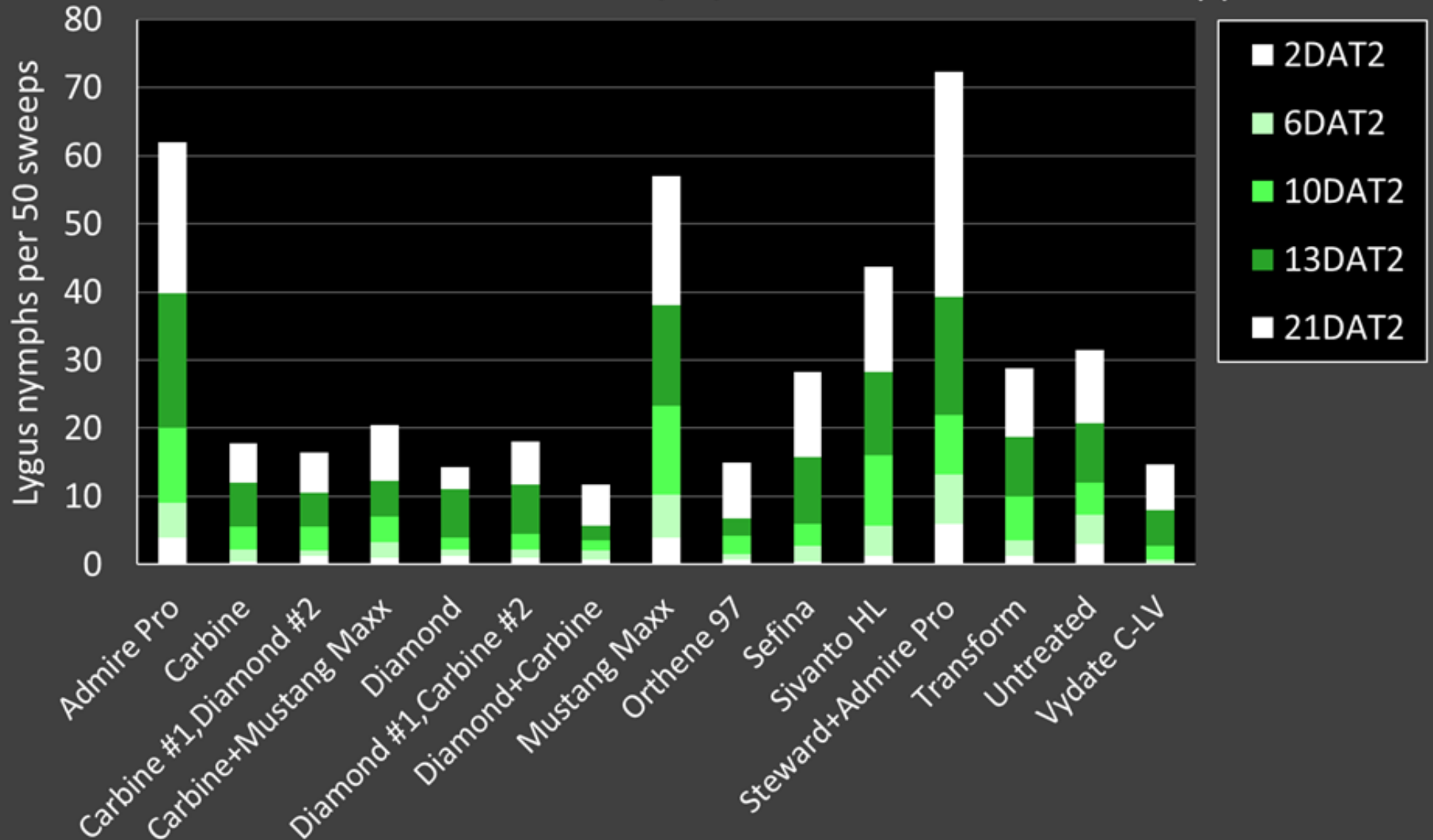
Nymphs

Application 1



Nymphs

Application 2



Management

- Sampling
- Rely on selective materials (that are also effective) early in the season
- Partially selective materials are more likely to disrupt natural enemies but may have more cross-stage or cross-pest efficacy
- Proper timing - linked to sampling
- Recognize when less selective materials fit best (high pressure and late season)
- Budgets and costs are important but are only a piece of the puzzle

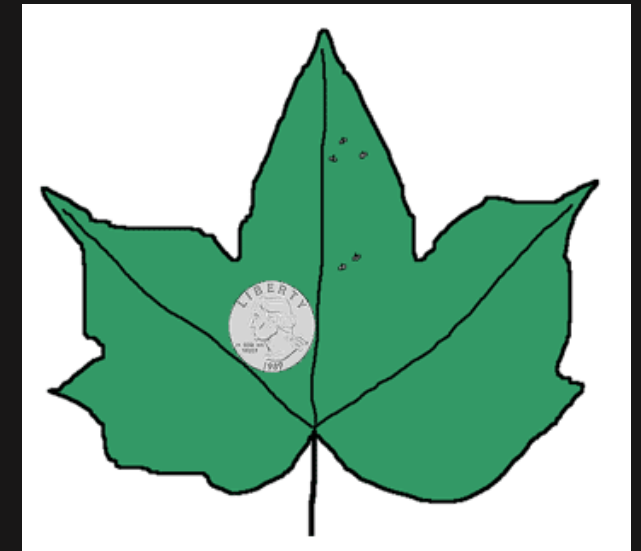
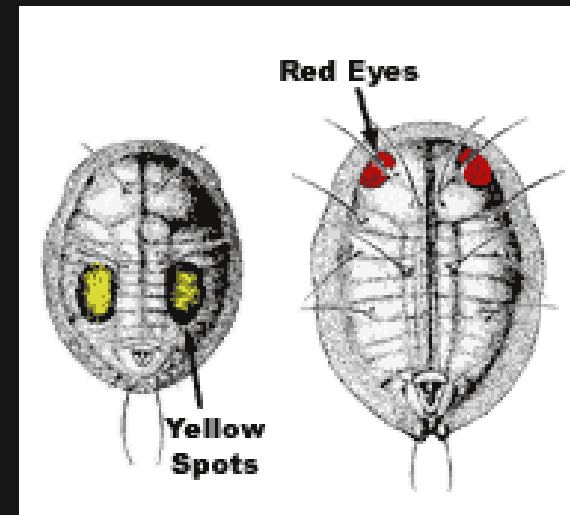
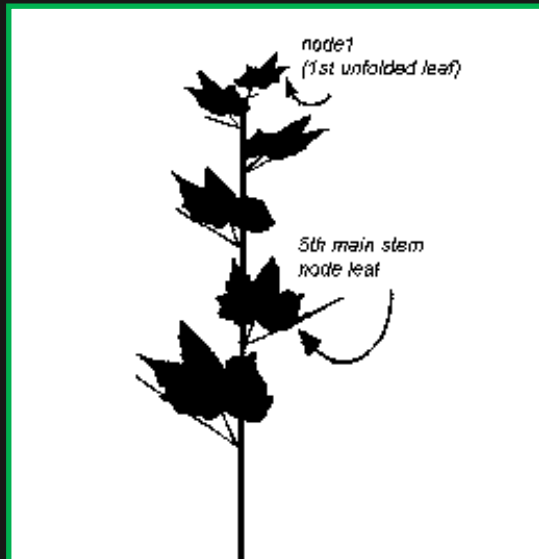
Whitefly thresholds

Adults – “pressure”

- Sampling 30 leaves
- Binomial (infested if 3 or more/leaf)

Nymphs – “production”

- Sampling 30 leaves
- Quarter-sized leaf disc
- Presence of large nymph(s) (3rd/4th instar)



Whiteflies: not all a problem



Silverleaf Whitefly

Adults with white wings, wings held at an angle so yellow body can be seen from above

Immatures with smooth edges, no fringe



Iris Whitefly

Iris whitefly adults have two dots or "smudges" on the wings and are quite waxy, leaving white wax on the leaf. Nymphs have fine fringe around the edge but lose it as they mature.



Bandedwing Whitefly

Adults with bands on wings

Immatures with fringe on edge



Greenhouse Whitefly

Adults with white wings

Immatures with fringe on edge

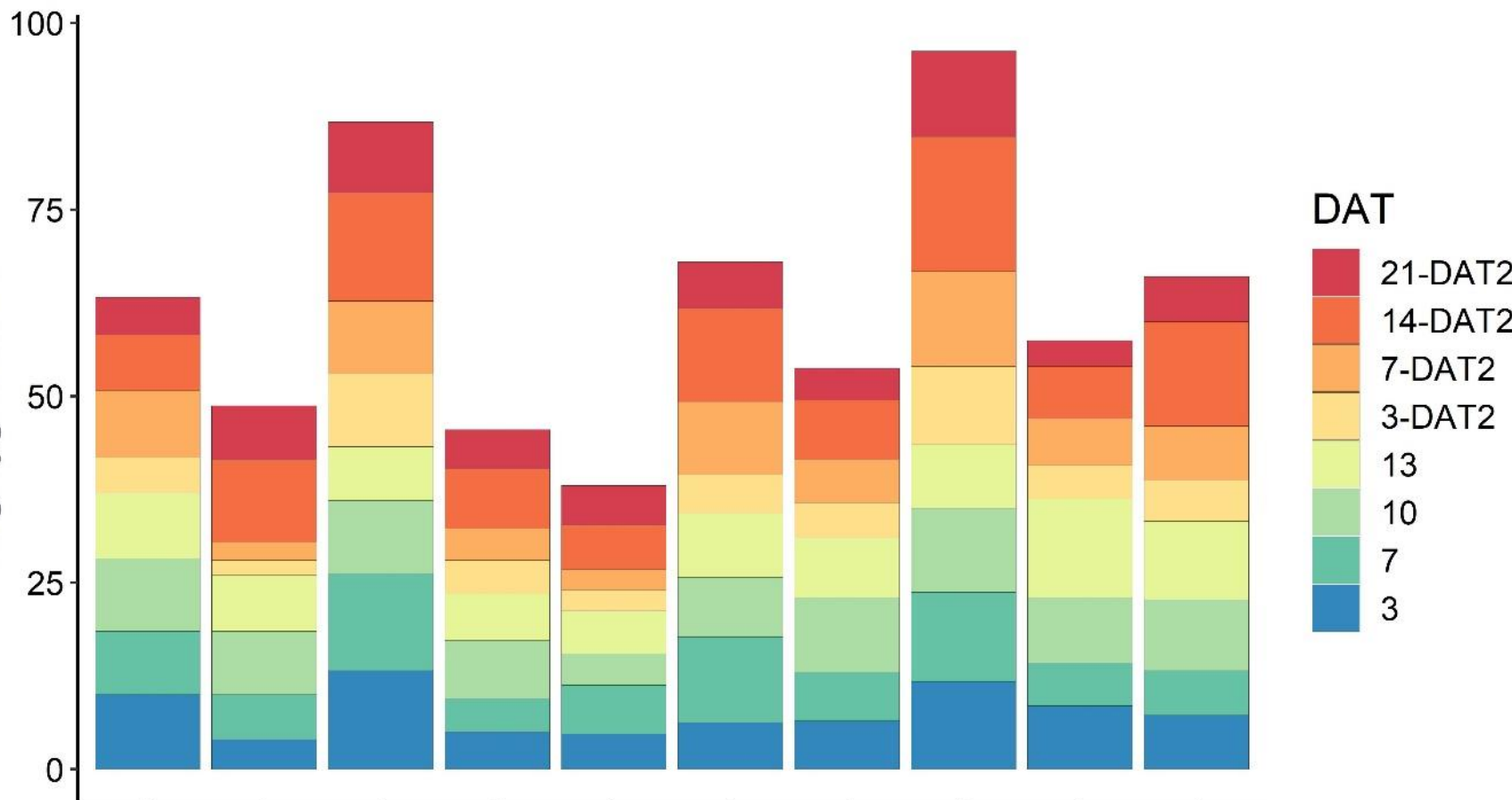
Importance of lygus nymphs

- Nymphs can be underestimated relative to adults → “unexpected damage”
- More responsive to insecticide applications
- More tied to yield loss



Treatment Names	T1; 15/0	T2; 15/1	T3; 15/4	T4; 15/8	T5; 15/16	T6; UTC
Threshold ¹	≥ 15 total; 0 nymphs	≥ 15 total; 1 nymph	≥ 15 total; 4 nymphs	≥ 15 total; 8 nymphs	≥ 15 total; 16 nymphs	—

Avg. Iyigus adults



Adults



