

Population Dynamics of Stink Bugs within Cover Crops on the Eastern Shore of Maryland

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Introduction

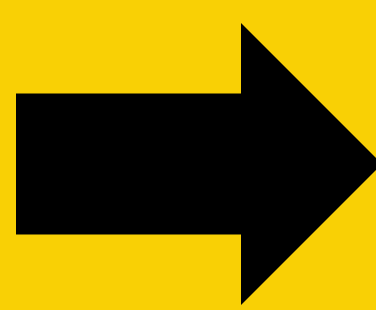
- Species of phytophagous stink bugs that are known economic pests of soybean include the brown stink bug, *Euschistus servus* (Say), green stink bug, *Acrosternum hilare* (Say), southern green stink bug, *Nezara viridula* (Linnaeus) (Image 1) and the brown marmorated stink bug, *Halyomorpha halys*.
- Stink bugs use their piercing, sucking mouthparts to feed on the foliage and pods of soybeans. This causes discolored and shriveled beans reducing both crop yield and quality.
- Stink bugs are commonly found in most Maryland soybean fields from late August through harvest. They reach their highest population levels in September when they can become an economic problem for soybeans.
- Stink bugs overwinter as adults in protected areas such as fence rows, grassy field borders, under stones, or tree bark.
- In Maryland, most species become active during warm spring days, typically in April. Females usually start depositing eggs in June. Nymphs hatch from these eggs and pass through five instars before becoming adults, with approximately five weeks elapsing between hatching and adult emergence.



Image 1. Adult brown marmorated stink bug on a soybean plant. Photo credit: C. Hooks.

Fall-planted cover crops offer many benefits to soil health and the environment. Maryland leads the nation with 27% of farmland planted in winter cover crops (Zhang et al., 2023).

There is emerging concern among farmers that stink bugs may utilize cover crops for shelter and food. Stink bugs could then move into soybean fields after cover crop termination, causing feeding injury to soybean seedlings.



Hypothesis:

Stinkbugs overwinter in cover crops.

Method



Image 2. Map showing farms that were scouted. Created in Google Maps.



Image 4. Summer workforce intern M. Setzer visual scouting for stink bugs in soybeans. Photo credit: E. Zobel.

Between mid-April and mid-May 2024, 26 cover crop fields were sampled on the Eastern Shore of Maryland (Image 2). The fields sampled included 75% planted with winter wheat and 25% with a mixture of cover crops (Image 3). Densities of adults and nymphs were determined by taking ten sweeps with a standard sweep net at five to ten areas across each field. Fourteen fields were sampled twice during the cover crop stage. The other fields were sampled once due to weather constraints before terminating the cover crop. Six fields were sampled again using visual counts in June when soybean plants were 6-12 inches high (Image 4).

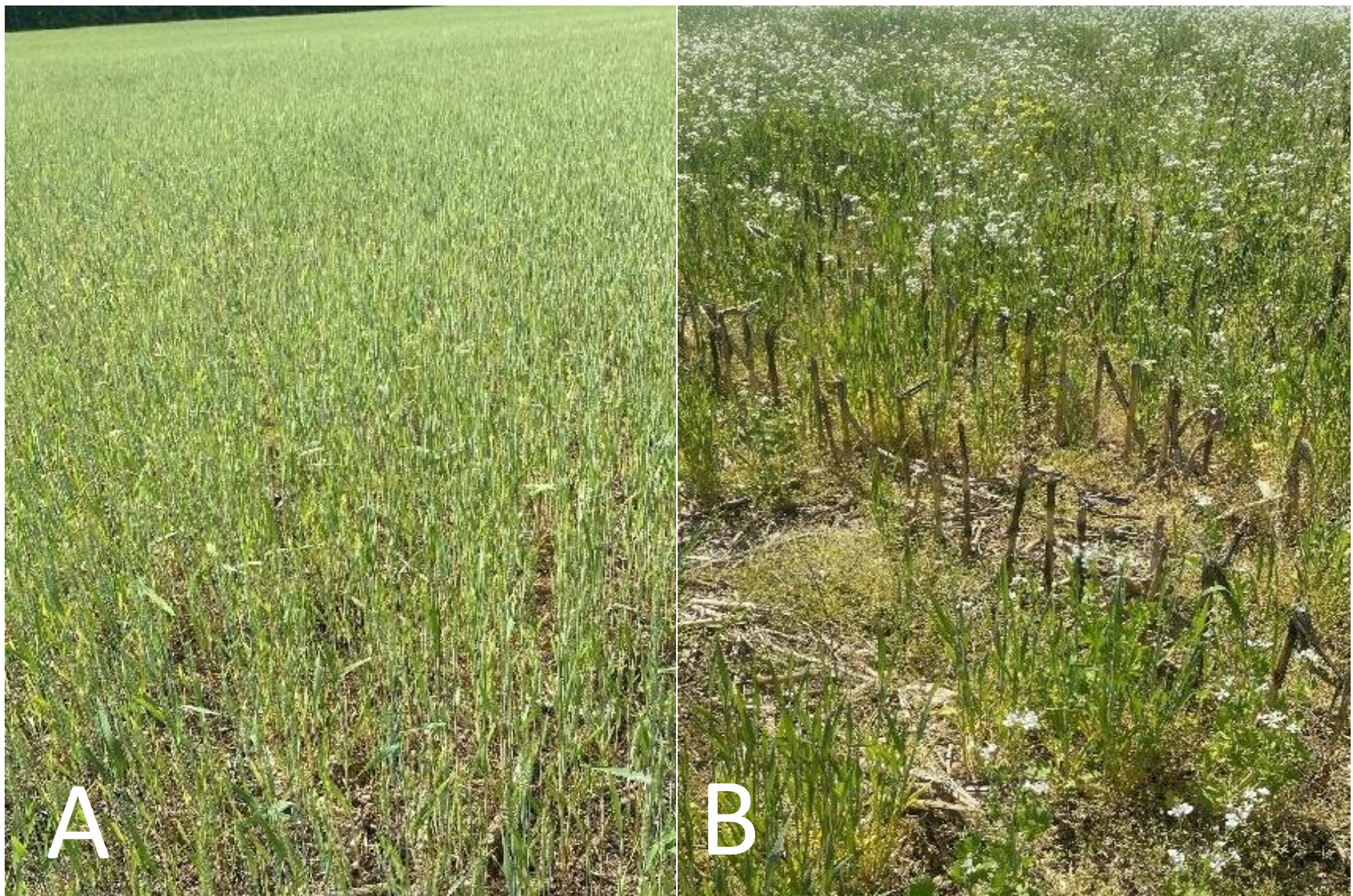


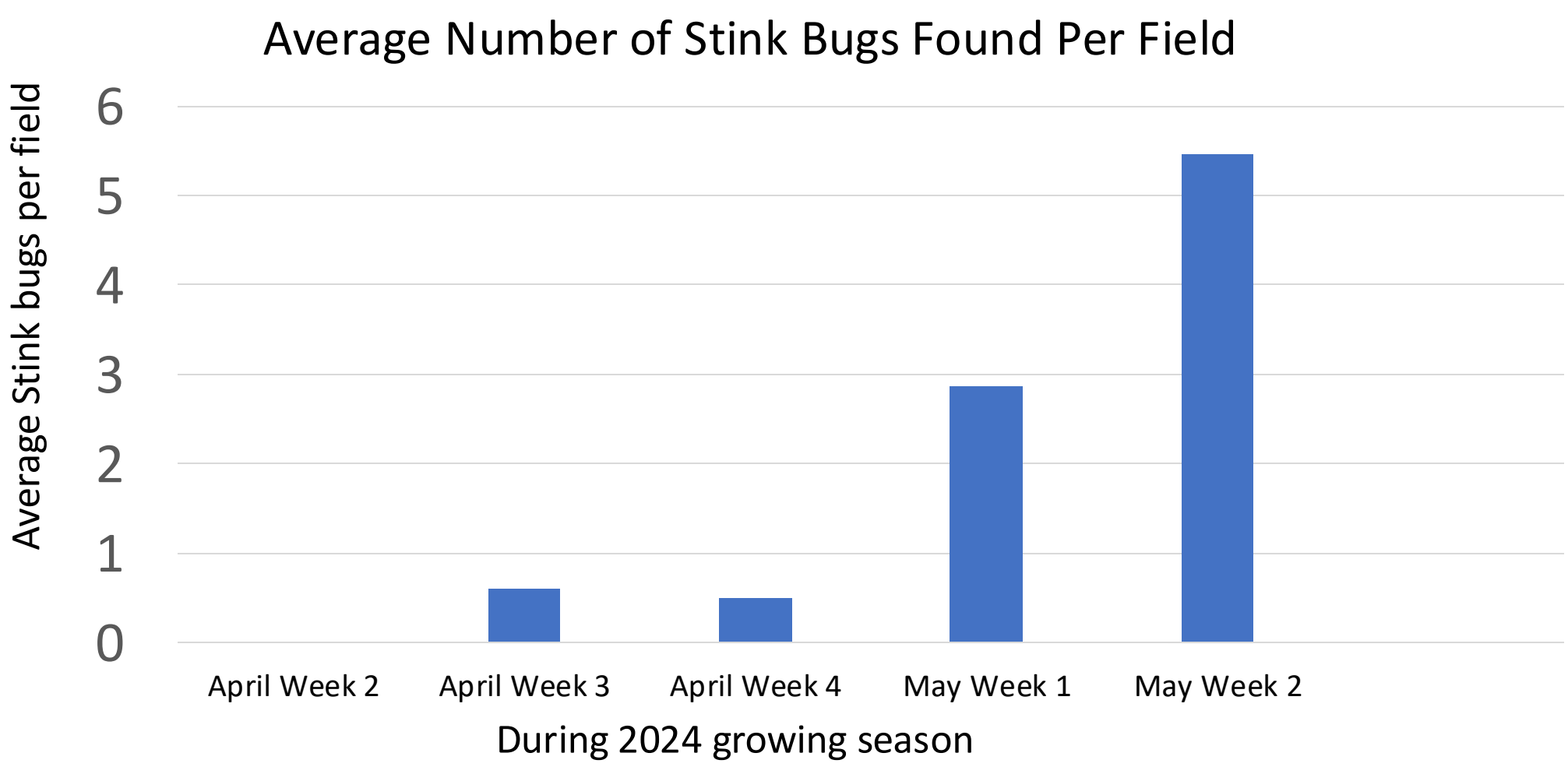
Image 3. A. Photo of a wheat cover crop on the left and B. a rye-forage radish cover crop mixture on the right. Photo credit: N. Krambeck.

Results

- 91 stink bugs were counted in cover crop fields.
- 82% of stink bugs were found last week of April and May (Graph 1)
- An average of 5.2 stink bugs/per 100 sweeps per field during the 2nd week of May, which is below the economical threshold. The suggested threshold for soybeans is 36 stink bugs/100 sweeps (Brust, 2023).
- The brown stink bug and the brown marmorated stink bug made up 98% of the species found (Image 5).
- 230 Ladybird beetles, adults, and larvae (*Coccinellidae*) were counted during sweeps (Image 6).
- Tarnished plant bugs (*Lygus lineolaris*) and aphids were also found feeding on cover crops in some fields.
- 11 stink bugs were found in June soybean seedlings (1.3 stink bug per field on average).



Image 5. Photo of a brown stink bug on a sweep net. Photo credit: N. Krambeck.



Graph 1. Graph showing the average number of stink bugs found within sampled cover crop fields during the 2024 growing season.



Image 6. Photo of a ladybird beetle larvae on a sweep net. Photo credit: N. Krambeck.

Work Cited

Brust, G. 2024. *Common Stink Bugs of the Mid-Atlantic - Hemiptera: Pentatomida*. Vegetable Insect IPM. Retrieved March 10, 2025. <https://extension.umd.edu/resource/common-stink-bugs-mid-atlantic-hemiptera-pentatomidae/>

Zhang, Y., Che, Y., Rejesus, R.M., Cavigelli, M.A., White, K.E., Aglasan, S., Knight, L.G., Dell, C.J., Hollinger, D.Y., Lane, E.D. and Mirsky, S.B., 2024. Medium-term economic impacts of cover crop adoption in Maryland. *Soil Security*, 17, p.100170.

First Year Conclusions

- More mixed cover crop fields would need to be surveyed to determine if mixed species fields hosted more stink bugs.
- Based on the low number of stink bugs found in late-season (May) cover crops and vegetative stage soybeans planted on those fields, farmers don't need to control for stink bug pests when burning down cover crops.
- More beneficial insects were detected in cover crop fields than stinkbugs, primarily Ladybird beetles.
- Farmers who are concerned about stink bugs and other pest insects should continue to use IPM and scout fields before applying pesticides.

Future Directions

- We will continue to monitor stink bugs and are currently recruiting more farmers to participate in 2025 during the spring cover crop season, burndown into soybean planting, and vegetative growth stages.
- We will scout more fields planted with non-wheat cover crop species and mixtures of cover crop species to determine if stink bug populations are greater in these systems than in grain systems.



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