Increased Risk of Insect Injury to Corn with Rye Cover

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Introduction

A rye cover crop can be beneficial.
- -Reducing field input and soil runoff
- -Suppressing weed populations
- -Creating habitat for predatory insects

All management strategies involve risk.
- -Including the planting of a rye cover crop

Planting corn following a rye cover crop risks injury from true armyworm (TAW).

TAW oviposit on grasses during spring.
- -TAW preferentially attracted to rye

TAW larvae consume corn after rye is destroyed.

Image 1. True armyworm (*Mythimna unipuncta* Haworth [Lepidoptera: Noctuidae]) larvae and adult.

Objective

Determine if a rye cover crop affects colonization and injury by TAW.

Materials & Methods

Sampled cornfields.

-2014:
Rye cover n = 10
No cover n = 6

-2015:
Rye cover n = 6
No cover n = 5

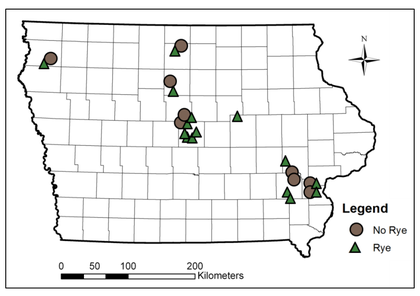

Fig 1. Map of Iowa fields.

Fields sampled weekly.
- -Mid-April through late June

Data Collected

1. Sampled adult TAW with species-specific sex pheromone traps.
2. Measured TAW larval abundance & corn injury.
   - -Sampled within a 0.6m x 1.5m frame
   - -Sampled from edge to interior of each field (Edge, 20m, 40m, 60m, & 80m)
   - -Collected larvae & incidence of corn injury

Image 2. Pheromone traps and TAW larval feeding on seedling and early vegetative corn.

Results & Discussion

TAW Adults

-No significant difference between TAW captured from cornfields in 2014 ($F = 0.04$; $P = 0.84$).
-Significantly more adults captured in cornfields with rye cover in 2015 ($F = 6.97$; $P = 0.01$).

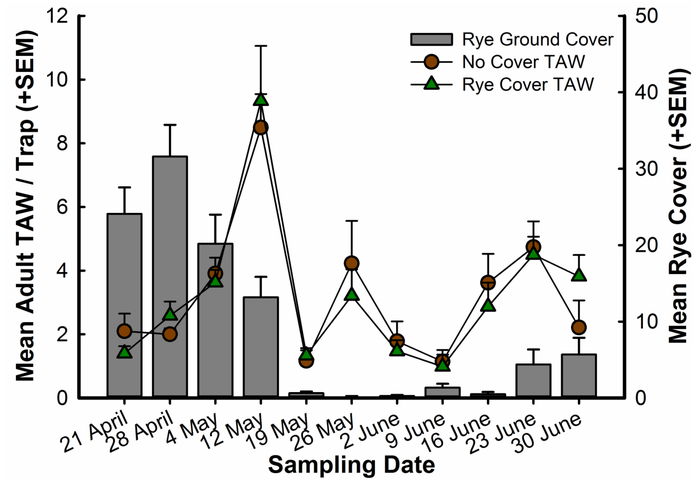

Fig 2. Mean TAW adults captured by pheromone traps (lines) and mean rye ground cover (bars) in 2014.

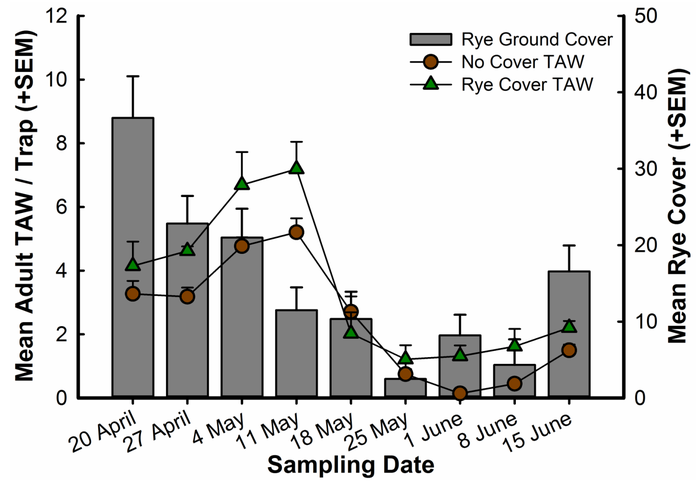

Fig 3. Mean TAW adults captured by pheromone traps (lines) and mean rye ground cover (bars) in 2015.

TAW Larvae

-Significantly more TAW larvae found in cornfields with rye cover in 2014 ($Z = 2.99$; $P = 0.003$), and in 2015 ($Z = 4.15$; $P < 0.0001$).

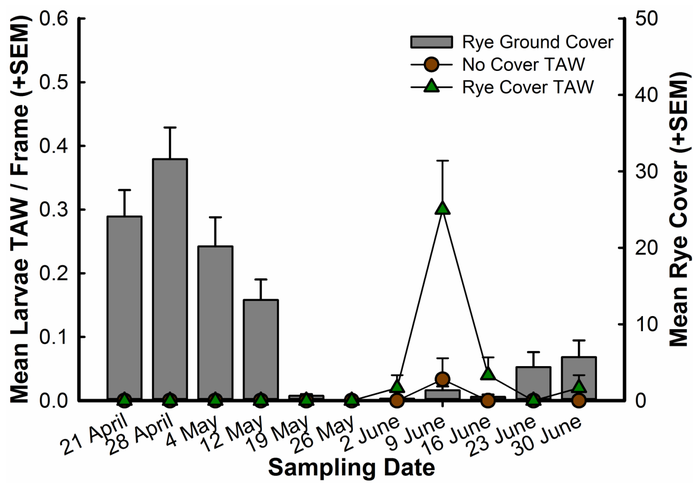

Fig 4. Mean TAW larvae captured per frame (lines) and mean rye ground cover (bars) in 2014.

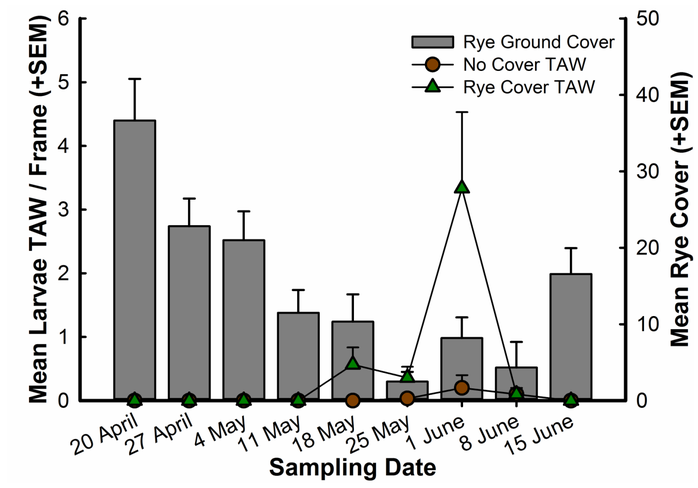

Fig 5. Mean TAW larvae captured per frame (lines) and mean rye ground cover (bars) in 2015.

TAW Larvae & Corn Injury Throughout Cornfields

-Significantly more *TAW larvae* ($Z = 4.57$; $P < 0.0001$) and *corn injury* ($Z = 6.17$; $P < 0.0001$) throughout cornfields with rye cover.

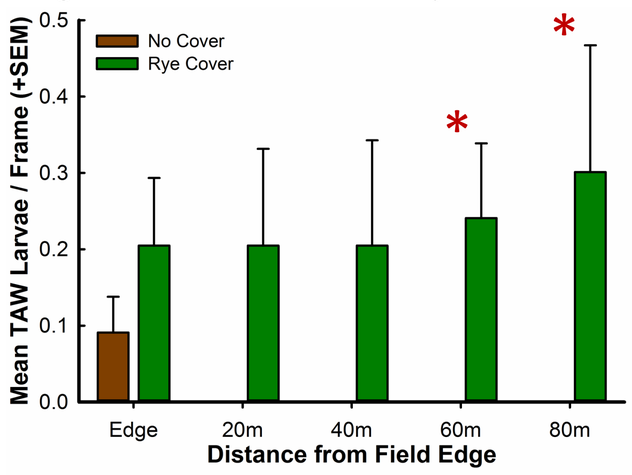

Fig 6. Mean TAW larvae captured per frame in 2014 & 2015. Stars represent a significant difference at a specific distance ($P < 0.05$).

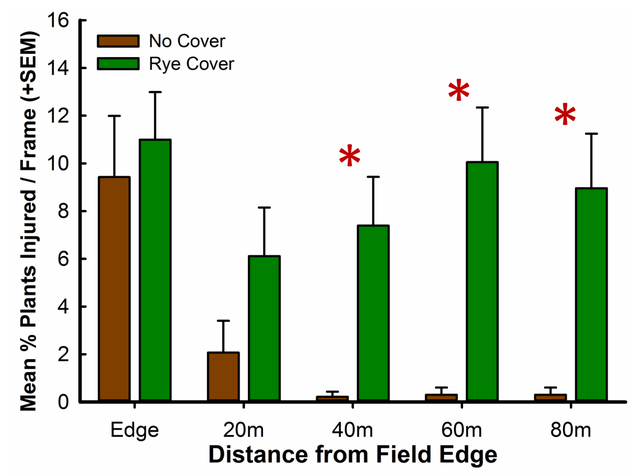

Fig 7. Mean percentage of injured corn per frame in 2014 & 2015. Stars represent a significant difference at a specific distance ($P < 0.005$).

Conclusions

Adult TAW were found in all cornfields, regardless of the presence of rye cover.

Significantly more TAW larvae within and throughout cornfields with rye cover.

Significantly more plants injured within and throughout cornfields with rye cover.

Recommendations

Farmers planting corn following a rye cover crop should regularly scout fields for TAW, and apply a foliar insecticide as needed.

Image 3. TAW injured corn before and 2 weeks after insecticide application.

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