

Fort Laramie Ranks #1 Against Tarnished Plant Bug in Southern Ontario

Cynthia A. Rougour and Adam Dale

¹Department of Plant Agriculture, University of Guelph, Simcoe Research Station, Simcoe, ON, N3Y 4N5, Canada



Introduction

- Tarnished plant bug, (*Lygus lineolaris*), is a major insect pest in Ontario strawberry production, especially for day-neutral varieties
- Adults and nymphs feed on immature fruit, the damage caused to the seeds prevent growth hormone production which deforms the fruit and renders it unmarketable (1), Figure 1
- Crop loss is dependent on the density of the plant bug population, if uncontrolled can lead to 100% crop loss
- Plant bug is typically controlled with endosulfin, dimethoate or cypermethrin (2)
- Day-neutral strawberry varieties have flowers, immature fruit and ripe fruit present at the same time
- Few registered insecticides are available for day-neutral production since their days-to-harvest requirements are incompatible with continual fruit harvest
- Growers require alternate control methods such as resistant varieties, however the available varieties have not yet been classified in order of level of resistance

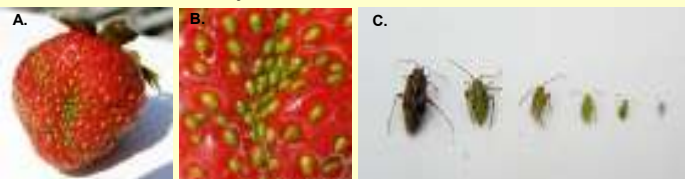


Figure 1. A) Fruit deformation caused by tarnished plant bug B) Close up of apical seediness C) Life stages of tarnished plant bug.

Objectives

Field experiments were conducted in order to determine:

- the uniformity of strawberry plant response to tarnished plant bug feeding at three different sites in southern Ontario
- whether the proportion and severity of tarnished plant bug damage differed between commercial varieties
- whether an edge effect existed for certain varieties
- whether the colour of plastic used as mulch effected the proportion and severity of tarnished plant bug damage

Material & Methods

Locations: trial conducted over two years with three locations selected in southern Ontario; Norfolk, Durham and Lincoln counties

Varieties: four commercial day-neutral strawberry varieties (Fort Laramie, Seascape, Tribute, Tristar)

Plots: on raised plastic mulch beds

- randomized complete block design with eight replicates
- twelve plants per plot, four plants sampled
- buffer rows of Seascape planted around and between plots
- half the plots at Bowmanville were on black plastic, other half was on white

Monitoring: sites monitored once a week using flower tapping technique (3)

- same plants sampled per week
- recorded number of adults, nymphs and damaged fruit
- rated damaged fruit on scale of 0-5, 0 = no damage, 1 = slight, 2 = medium, 3 = moderate, 4 = severe damage and 5 = abnormal damage
- plants at the center and edge of the plot were sampled for edge effects

Results

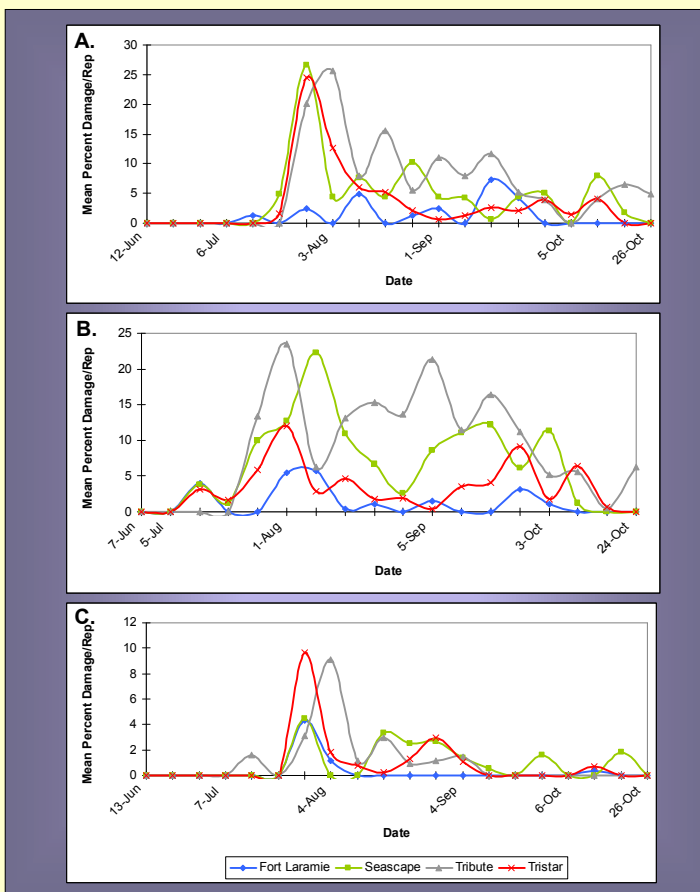


Figure 2. Mean proportion of fruit damaged by tarnished plant bug in 2006 at A) Vineland; B) Bowmanville; and C) Simcoe

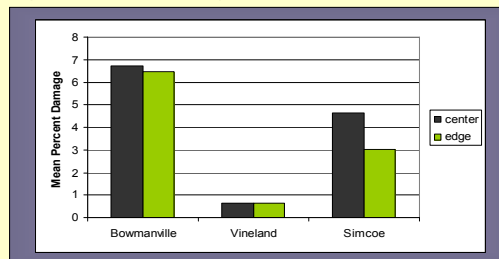


Figure 3. Mean proportion of fruit damaged by tarnished plant bug comparing planting position within the plot, center and edge, at the three sites for 2006

Vineland

Damage: Fort Laramie had the lowest proportion and severity of damage while Tribute had the highest

Plant Bug Population: Fort Laramie had the lowest number of nymphs and adults while Tristar had the highest

Edge Effect: no difference found between plants sampled at the edge and center of the plot

Bowmanville

Damage: Fort Laramie had the lowest proportion and severity of damage while Tribute had the highest

Plant Bug Population: Fort Laramie had the lowest number of nymphs and adults while Tribute had the highest

Edge Effect: no difference found between plants sampled at the edge and center of the plot

Mulch: highest proportion of damage was found on fruit on black plastic mulch, 7.78% vs white mulch, 5.50%

Simcoe

Damage: no significant differences found between varieties - general trend shows Fort Laramie had the lowest proportion and severity of damage while Seascape had the highest

Plant Bug Population: no significant differences between number of nymphs and adults

Edge Effect: no difference found between plants sampled at the edge and center of the plot

Conclusions

- Damage between varieties was consistent at all field sites
- Fort Laramie had the least amount of damage and Tribute had the highest amount
- No difference in proportion of damage between the planting position within the plot
- Higher proportion of damage on black plastic mulch than white

References

- Wold, S.J. and Hutchison, W.D. (2003). *J. Econ. Ent.* **96**(6): 1814-1820
- Berry crops: Strawberry calendar. (2006-2007) *Ministry of Agriculture, Food and Rural Affairs.* (pg 175-181)
- Dale, A., Walker, G., and Fisher, P. (2000). Growing strawberries in Ontario, publication 513. *Ministry of Agriculture, Food and Rural Affairs.* (pg. 2-8).

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