

2018 Research Report

What gives you the biggest bang for your buck? Working toward validation of BMPs for bacterial disease management in processing tomatoes

Prepared for the Ontario Tomato Research Committee (OTRI)
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Page

Study

1. Plug trailer contamination risk

Vertical transmission of the bacterial spot pathogen (*Xanthomonas gardneri*) in plug trailers 3-6

2. Transplanting activities risk

Risk of BSX transmission during transplant activities, indoor studies 7-9

Risk of BSX transmission during transplant activities, field study 10-12

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Highlights/Summary:

- *Background:* Management practices for bacterial spot of tomato are limited. There is widespread tolerance to copper in bacteria that cause the disease, and other crop protection products have shown little to no benefit in controlled field trials in Ontario. Time was spent in discussions with transplant growers, field growers, and processor representatives to review and develop best management practices for plug and field production. Many of these practices were extrapolated from strategies developed for greenhouse vegetable production systems, but there is little to no data to predict which practices will give the most benefit to the processing tomato industry (i.e. where do you focus efforts and what gives you the biggest bang for the buck?). This report includes results from Year 3 of a three year project to validate BMPs for bacterial disease management by evaluating practices that we hypothesize represent a significant risk for spread of BSX. The highlights/summary focusses on results from 2016-2018.
- *Plug trailer transmission* (highlights of four trials):
 - *X. gardneri* (*Xg*) moved vertically from symptomatic seedlings to healthy seedlings in a simulated plug trailer setup after irrigation. Disease incidence on seedlings irrigated with a spray nozzle was higher than a tray dip, but transmission still occurred with a tray dip.
 - Growers should limit watering tomato seedlings on trailers as much as possible. Regular cleaning and sanitization of plug trailers may limit the spread of inoculum between loads.
- *BSX transmission during transplanting*

- *Indoor study:* Modifications were made from the initial trial design because of issues with cross contamination. We discuss only the results from one trial in 2018 where cross-contamination was not an issue. No symptoms developed on seedlings that passed through a transplanter after symptomatic seedlings with dry or wet foliage. A leaf wash identified the presence of *Xg* on these tomato leaves, indicating *Xg* can move from symptomatic plants to transplanting equipment and then healthy plants. These plants, which appear healthy, are a potential inoculum source.
- *Field study:* Treatments were a) all healthy seedlings, b) symptomatic seedlings through the transplanter at the location of the red box in the figure below, and c) symptomatic seedlings hand planted at the location of the red box. Plants located at pre-determined distances from the inoculation point were monitored to determine the number of days for symptoms to appear. The purpose of treatment 'c' was to determine if bacterial spot movement was because of transplanting equipment (we would expect to see symptoms in 'b' before 'c' or because of the presence of *Xg* infected plants. In almost all cases, symptoms appeared at the same time in 'b' and 'c', indicating that weather and not transplanting equipment is the primary cause of dissemination in the field. Even though transplanting equipment can transmit *Xg*, this practice will likely not have a measurable impact on bacterial spot epidemics.

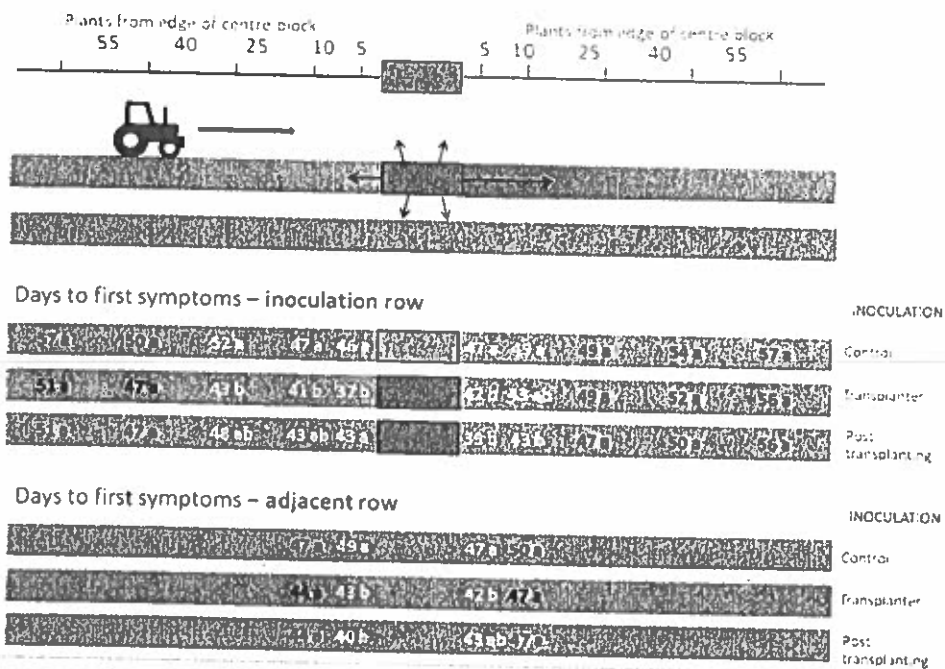


Figure 1. Number of days until the first appearance of bacterial spot symptoms in tomatoes, Ridgetown, 2016-2018.

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