

**Evaluation of Byotrol for control of bacterial leaf spot caused
by *Xanthomonas campestris* pv. *pelargonii* on Geranium..**
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Bacterial Blight of Geranium (*Xanthomonas campestris* pv. *pelargonii*)

In a greenhouse at the University of Florida, Plant Pathology Department in Gainesville, FL a randomized complete block experiment with each treatment and the non-treated control consisting of five replications consisting of 5 plants each was established to evaluate the efficacy of Byotrol for *Xanthomonas campestris* pv. *pelargonii*. Treatment replications were separated by a buffer of 5 ft on the greenhouse bench. Each plant within each replicate and treatment was rated for disease severity and incidence at the termination of the experiment using the Barratt-Horsfall rating scale (0=0 and 11=100).

A suspension of $\sim 4.0 \times 10^7$ bacterial cells of *Xanthomonas campestris* pv. *pelargonii* per ml was grown on Nutrient agar and harvested for use as inoculum on Geranium (*Pelargonium* sp.) seedlings. Prior to the application of the bacterial inoculum the plants were irrigated overhead for 30 minutes and then the inoculum was applied to runoff with a hand held sprayer. The plants were irrigated overhead irrigation for 30 minutes each day during the week after the inoculation. Since the initial inoculation failed the inoculation process was repeated with a longer preliminary overhead irrigation period. After the third inoculation cycle the presence of disease was observed and the plants were irrigated overhead once per week for 45 minutes at which time the foliage was thoroughly wetted. The plants were examined for disease weekly after inoculation.

Treatments:

- T1-Non-treated control
- T2-Byotrol- 175 ppm (1:40 dilution)
- T3-Kocide 3000 (0.75lb/100gal)
- T4-Actigard $\frac{3}{4}$ oz/100 gal
- T5-Byotrol alternated with Kocide
- T6-Byotrol alternated with Actigard
- T7- Byotrol alternated with Kocide and Actigard

Product applications begin two weeks after transplanting and continued on a bi-weekly basis until the termination of the experiment.

Results: The initial inoculation of the geraniums, made after two pesticide applications failed, and the plants were re-inoculated two additional times before leaf infection was initiated. The application of Actigard to geraniums resulted in a phytotoxic response in both treatments where it was applied. This response was characterized by chlorosis (yellowing) of the leaves, marginal necrosis (death) and leaf abscission. Two weeks after treatment with the actigard new leaves developed which were free of distortion, chlorosis and marginal necrosis. There was a relatively high incidence of bacterial leaf spot and the Actigard treatments separated from the remainder of the treatments with a higher disease incidence. The treatment of Byotrol alternated with Kocide showed the lowest amount of disease. The disease severity was not very high and there was not significant difference between any of the treatments. The incidence data show that the treatment of Byotrol alternated with Kocide provided the best control of the disease. However this treatment was not significantly different from the Kocide alone, the Byotrol alone and the untreated check.

Product application, inoculation and sampling schedule

Application Date	Inoculation	Sampling Date
June 18		
July 6	July 18	
August 5	Aug 1	
August 20	Aug 15	
Sept 1		Sept 11
Sept 15		Oct 2
Oct 1		Oct 9
Oct 15		Oct 23
Nov 1		Nov 1
		Nov 6

Table 1. Incidence of Bacterial leaf spot of Geranium effected by control materials.

Treatment/ Sample date	Nov 6		AUDPC
	Incidence	Severity	
T1-Check	70BC	0.6A	4184B
T2-Byotrol	70BC	2.24A	4209B
T3-Kocide	74B	0.64A	4223B
T4-Actigard	90A	0.68A	4710.5A
T5-Byotrol/Kocide	65C	0.56A	4061.5B
T6-Byotrol/Actigard	68BC	2.0A	4056.5B
T7-Byotrol/kocide/actigard	87A	0.52A	4755.0A

*Values followed by the same letter are not significantly different $P>0.05$. Incidence and severity data was arcsine transformed prior to analysis using SAS9.1 and means separation using Fisher's LSD. Values presented are the percent values recorded from the plot.

