

INCIDENCE OF BACILLUS POPILLIAE (DUTKY) IN COSTELYTRA ZEALANDICA (WHITE) LARVAE

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This note records incidence of **B. popilliae** at a liberation site of approximately 60ft. x 30ft. in Mid-Canterbury. Infective material was an experimental 2 lb. batch of spore dust prepared in the United States of America (Bureau of Entomology, Japanese Beetle Laboratory) and applied at 6ft. x 6ft. intervals by scattering spoon-measured amounts on the ground surface in 6-inch circles in March, 1948. The liberation site had a population average of 6 **C. zealandica** larvae per square foot (50 soil samples taken at 2-pace intervals in 5 rows at two pace intervals between rows), and of these 1.2% were already infected with native **Bacillus** which was recorded by Dumbleton in 1945. The treated area was sampled (20 samples taken at 2-pace intervals in 2 rows 3 paces apart) in subsequent years between March and June and results are given in the accompanying table, where figures for untreated areas are the result of sampling $\frac{1}{2}$ chain (10 sample) and 1 chain (10 samples) around the four sides of the area infected with **B. popilliae**; at each of these distances from the treated area three samples were taken on each long side and two on each short side of the plot. Presence of **Bacillus** was based on dissection of larvae under a low power (x10) microscope, and examination of a drop of coelomic fluid under a high power (x430) microscope for presence of bacterial spores; no attempt was made to separate introduced from native bacteria.

Larvae in 20 samples:	1948		1949		1951		1952		1954		1956	
	M	N	M	N	M	N	M	N	M	N	M	N
Treated area	—	—	15	192	12	64	31	107	8	93	22	68
Untreated area	2	165	3	183	3	113	2	97	2	110	4	98
A. % with Bacillus in treated area			7.24		15.8		22.5		7.9		24.4	
B. % with Bacillus in untreated area			1.6		2.6		2.02		1.78		3.9	
Difference between A & B			5.64		13.2		20.48		6.12		20.5	

Notes: M — Larvae with milky disease. N — Normal or uninfested larvae. Soil samples were 7 inch cubes.

The table indicates that the treated area carried a significantly higher bacterial infection of *C. zealandica* larvae in each of the 5 records than was present in the untreated area. There was no significant difference between numbers of larvae with **Bacillus** at $\frac{1}{2}$ and 1 chain distances from the treated zone. Statistical analysis showed that in eight years *B. popilliae* had not spread even one half chain beyond the site of infection. Further sampling was discontinued because the paddock was treated with DDT-superphosphate; 25 samples in 1957 yielded only 23 larvae without **Bacillus**. The field was cultivated later.

ACKNOWLEDGMENTS

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REFERENCE

- DUMBLETON, L. J., 1945: Bacterial and Nematode Parasites of Soil Insects. *N.Z. Jl Sci. Technol.*, (A) 27: 78-81.