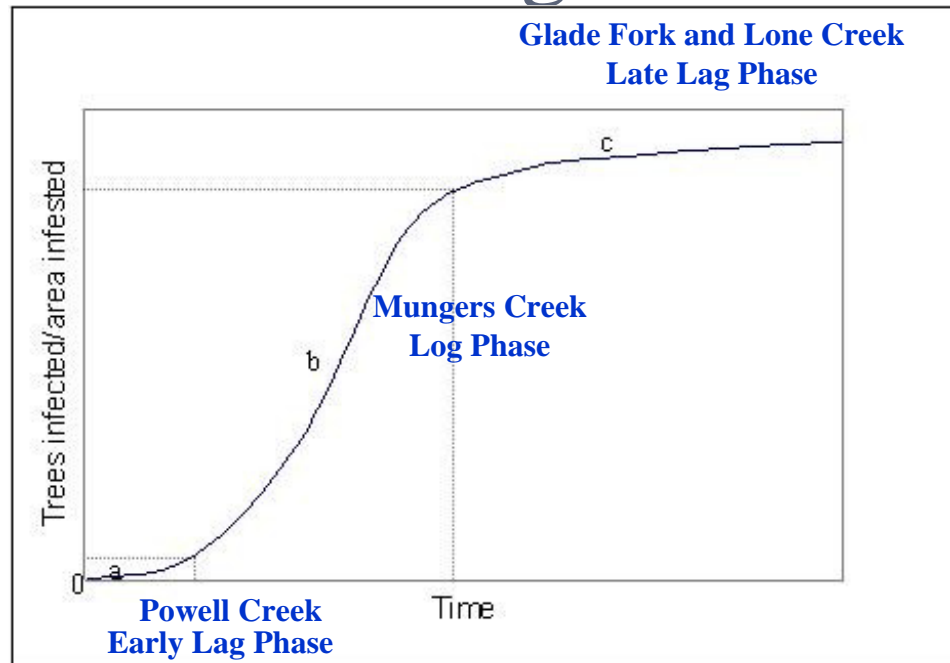


# Climbing the Disease Curve – Seasonal Variation in *Phytophthora lateralis* Sporeload in Southwest Oregon Watersheds



Frank Betlejewski, Interregional Port-Orford-cedar Program Manager, USDA Forest Service, Central Point, Oregon

# Port-Orford-cedar

*Chamaecyparis lawsoniana*



Figure 1. — Natural range of Port-Orford-cedar.

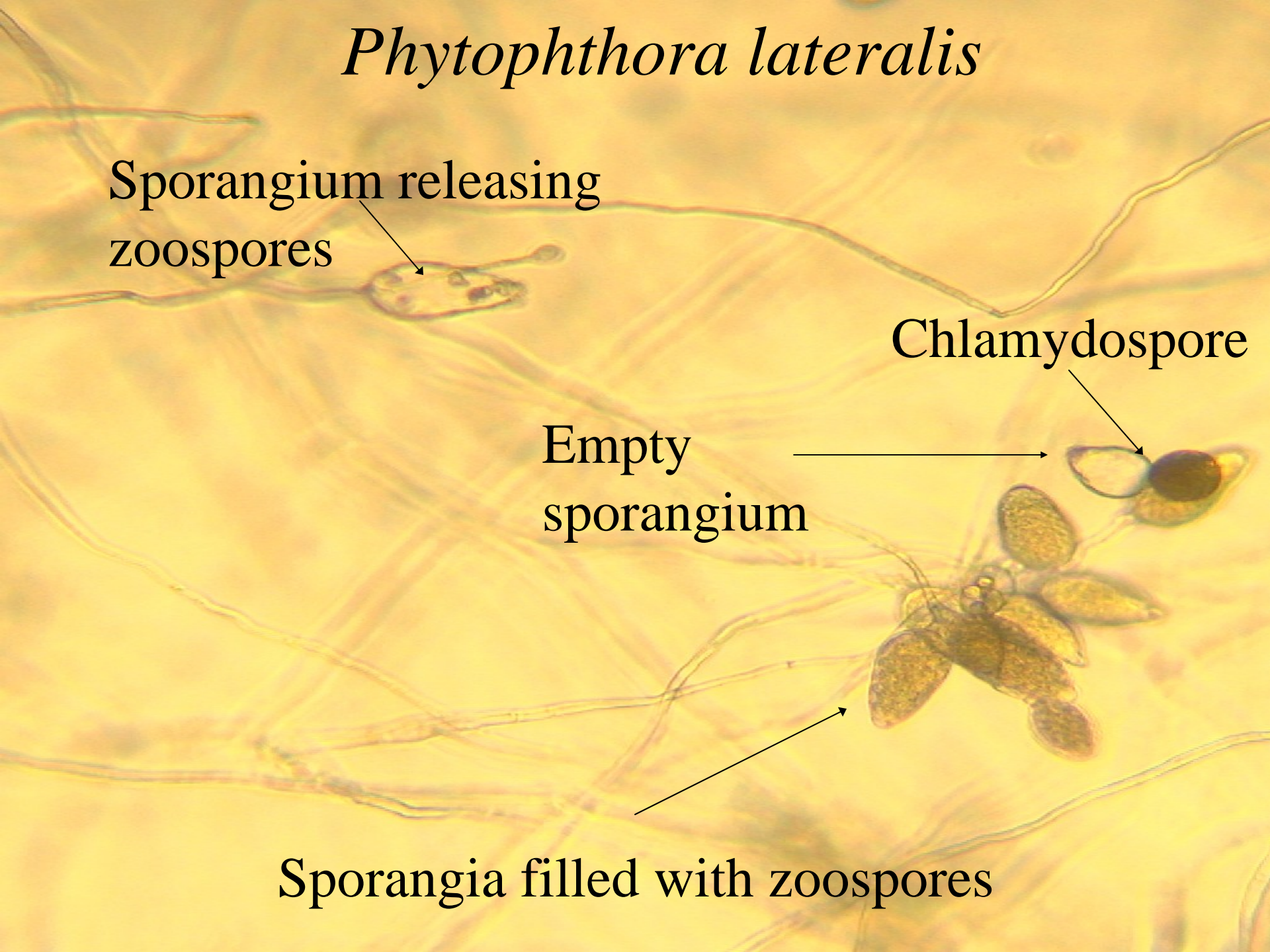
# *Phytophthora lateralis*

Sporangium releasing  
zoospores

Chlamydospore

Empty  
sporangium

Sporangia filled with zoospores



# Port-Orford-cedar Root Disease

95%+ Mortality

Tree mortality occurs  
in less than 5 years

*Phytophthora lateralis*  
is an exotic

**UNTREATED WATER BUCKET DROPS  
BISCUIT FIRE**

POLY_NUMBER	BUCKETDROP	ZONE	DATE	ACRES	ACRES_OF_POC	ACRES_OF_DISEASE	DISEASE
01	Untreated	4	08/06/2002	43.03	0.0	0.0	N
03	Untreated	4	08/06/2002	639.94	0.0	0.0	N
02	Untreated	4	08/06/2002	137.68	0.0	0.0	N
05	Untreated	4	08/06/2002	198.94	.22	0.0	N
04	Untreated	4	08/06/2002	189.93	7.75	0.0	N
06	Untreated	4	08/06/2002	1066.9	17.80	0.0	N
07	Untreated	4	08/06/2002	372.10	5.59	0.0	N
08	Untreated	4	08/06/2002	24.48	11.00	0.0	N
09	Untreated	4	08/06/2002	391.08	41.40	3.26	Y
10	Untreated	4	08/06/2002	250.28	19.92	0.0	N

**POC polygon intersected by BUCKET DROP polygon**

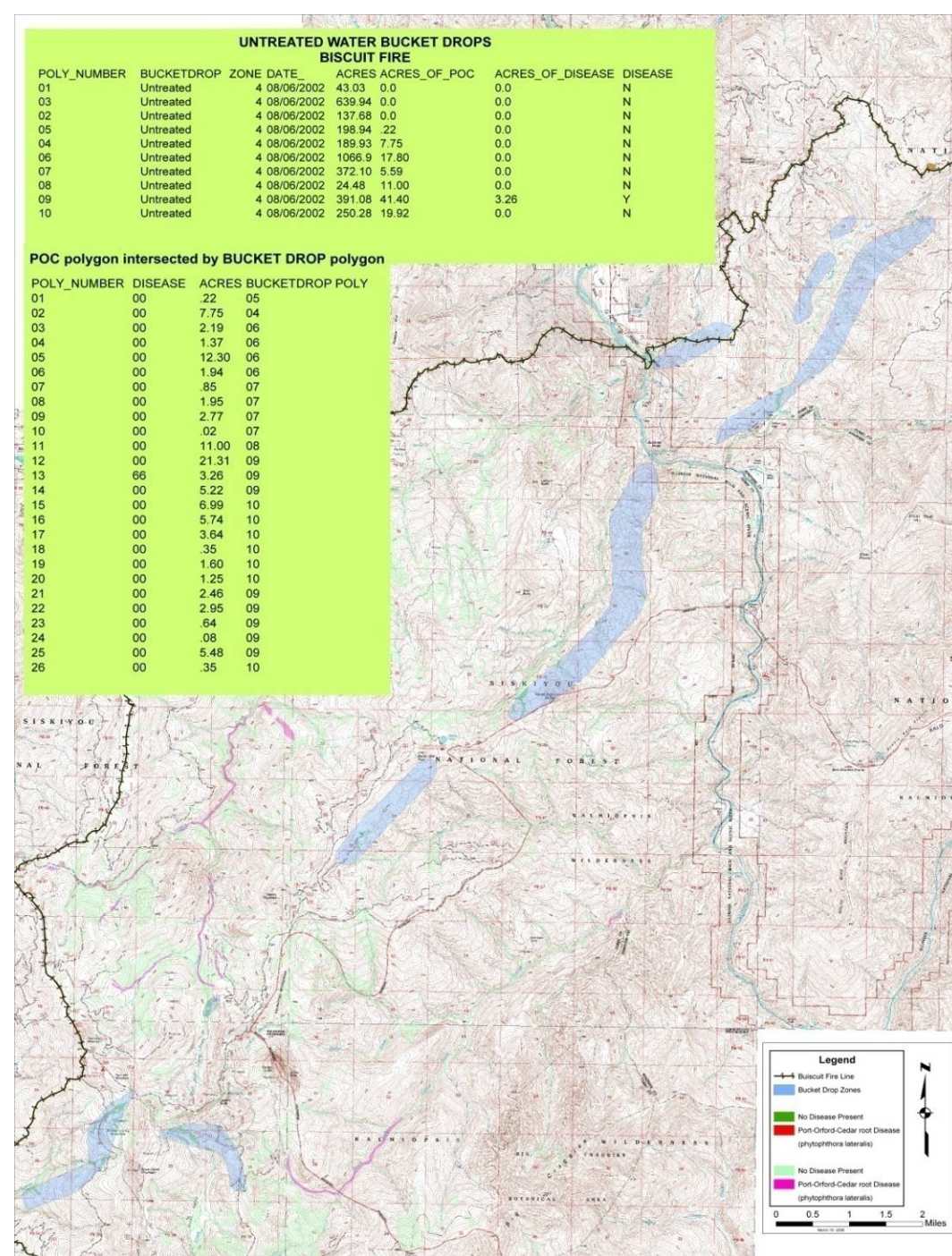
POLY_NUMBER	DISEASE	ACRES	BUCKETDROP	POLY
01	00	.22	05	
02	00	7.75	04	
03	00	2.19	06	
04	00	1.37	06	
05	00	12.30	06	
06	00	1.94	06	
07	00	.85	07	
08	00	1.95	07	
09	00	2.77	07	
10	00	.02	07	
11	00	11.00	08	
12	00	21.31	09	
13	66	3.26	09	
14	00	5.22	09	
15	00	6.99	10	
16	00	5.74	10	
17	00	3.64	10	
18	00	.35	10	
19	00	1.60	10	
20	00	1.25	10	
21	00	2.46	09	
22	00	2.95	09	
23	00	.64	09	
24	00	.08	09	
25	00	5.48	09	
26	00	.35	10	

Untreated water used  
August 6 to 20, 2002

10 water drop  
polygons; 25 to 1,067  
acres (avg. 331 acres)

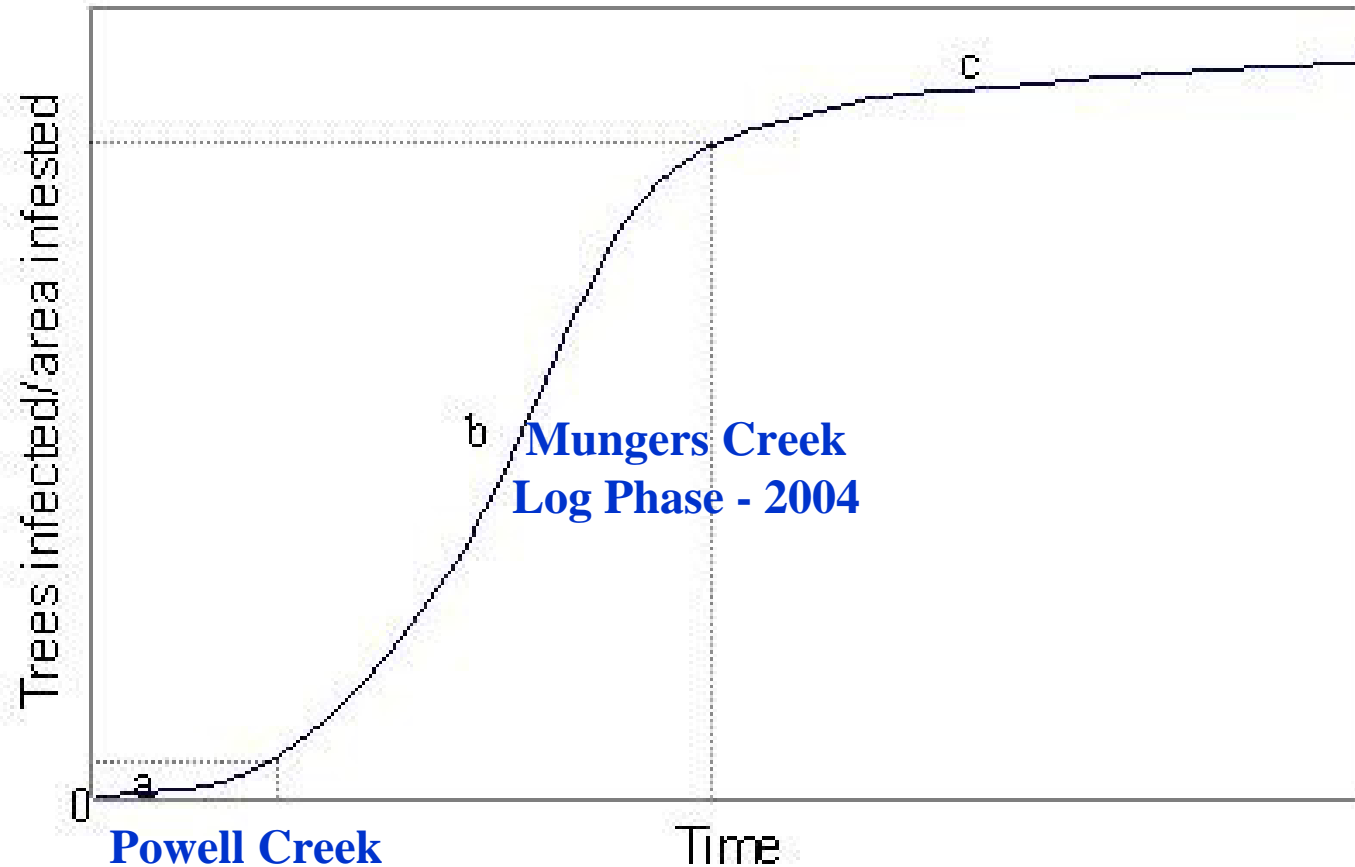
25 POC polygons; 0.2  
to 21.3 acres (avg. 4  
acres)

1 PL polygon; 3.3  
acres



# Sixth Field Watersheds near Williams, Oregon

Glade Fork – 1977 and Lone Creek - 1971  
Late Lag Phase



**Mungers Creek  
Log Phase - 2004**

**Powell Creek  
Early Lag Phase - 1998**

# Baiting Protocol

4 6th field watersheds (2,800 to 7,500 acres)

6 baiting periods – 2 months each

4 baiting sites per watershed - Control, 0.0 miles directly below control, 0.25 miles below control, 0.75 miles below control

12 seedlings per bait site, 48 seedlings per bait period, 288 seedlings per stream

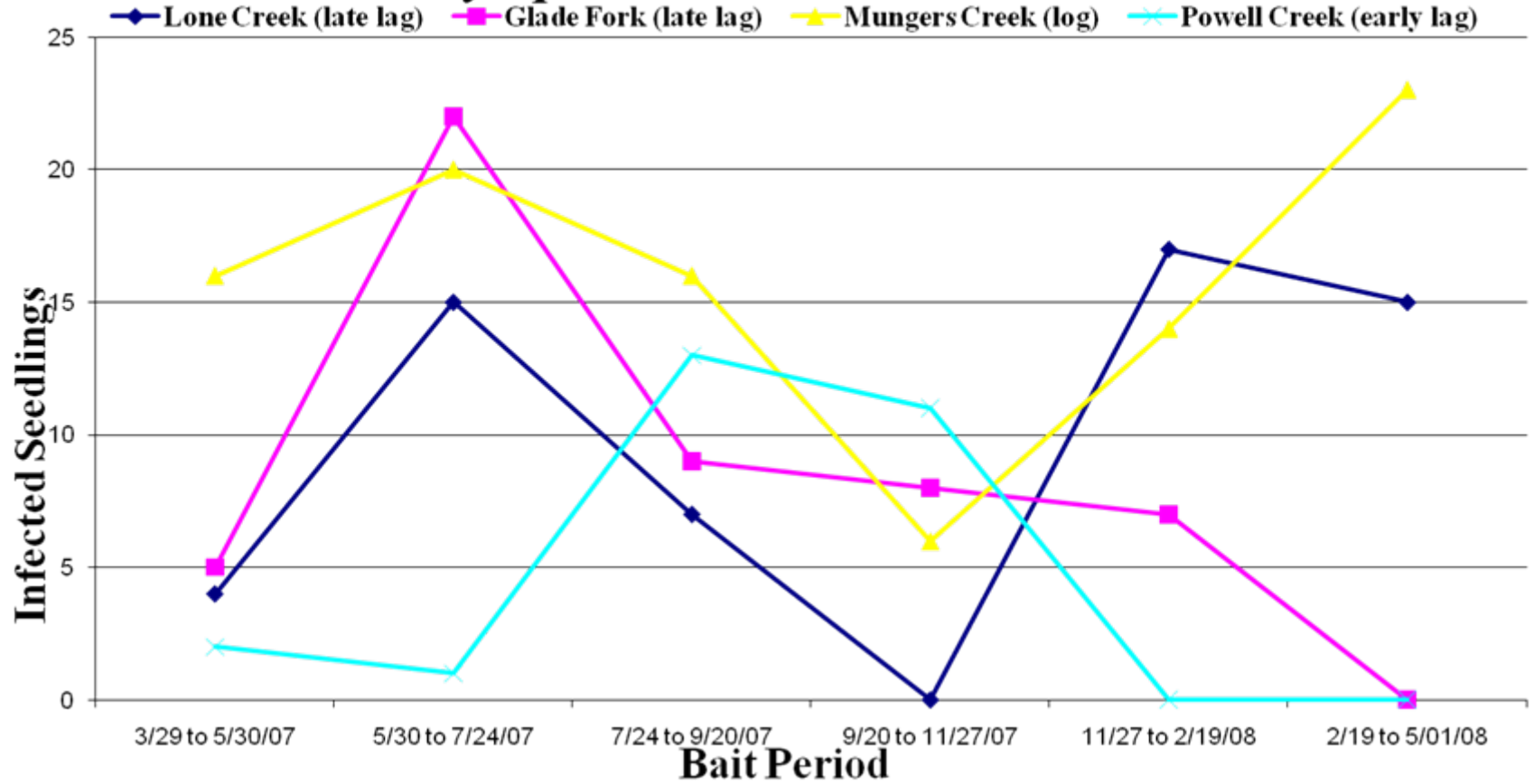
# Bait Seedlings



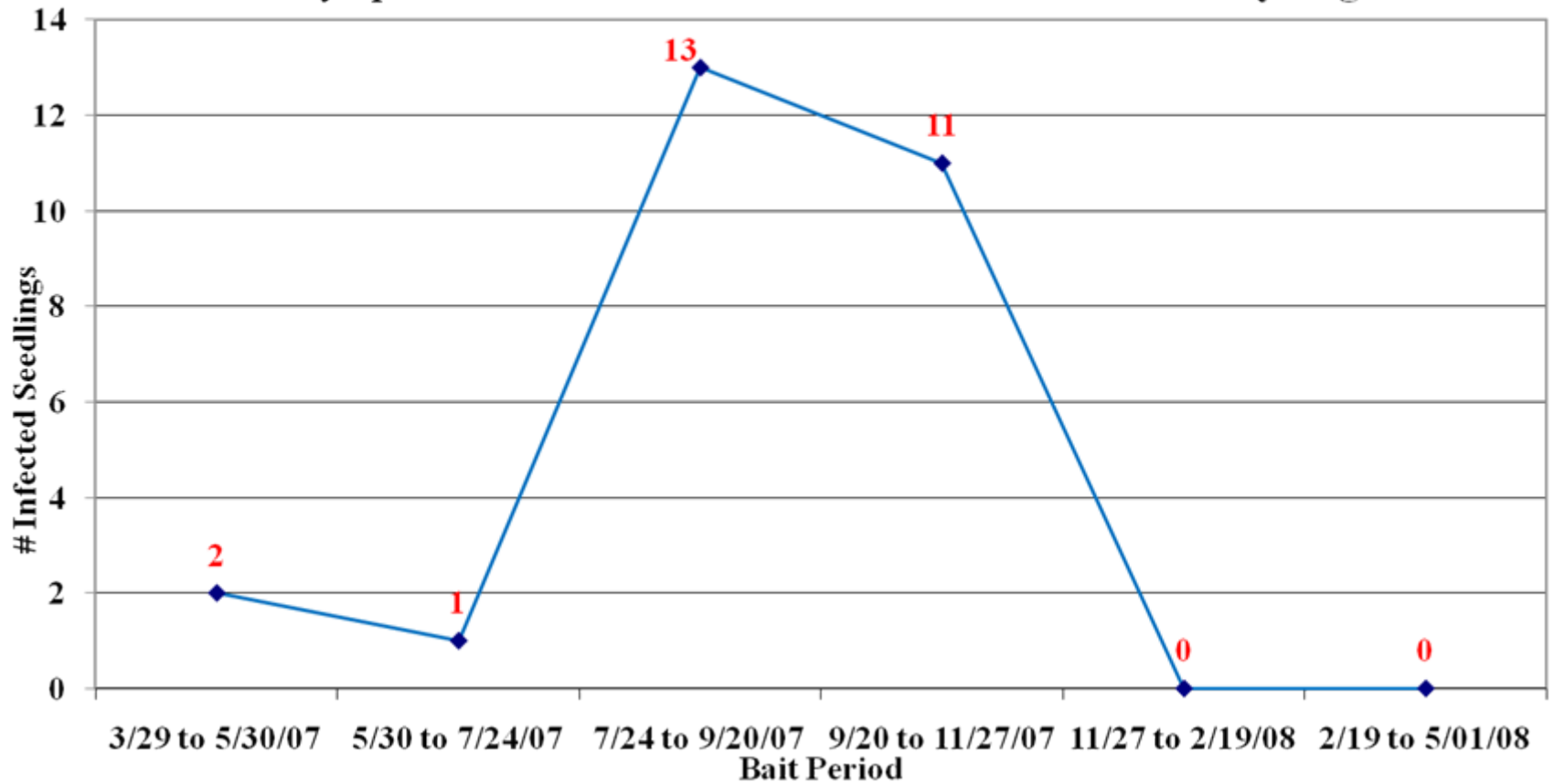
# Bait Site



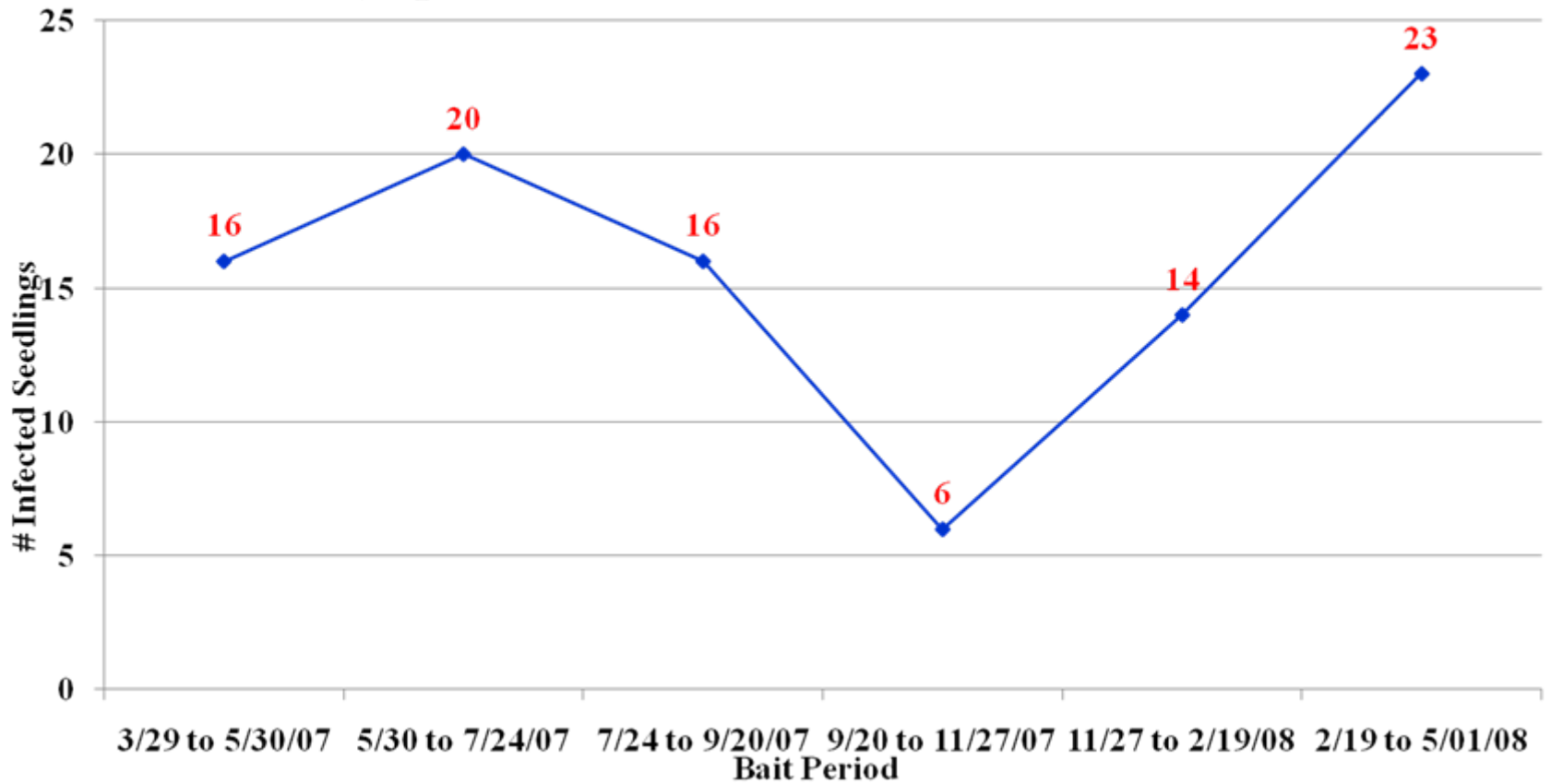
# *Phytophthora lateralis* Distribution



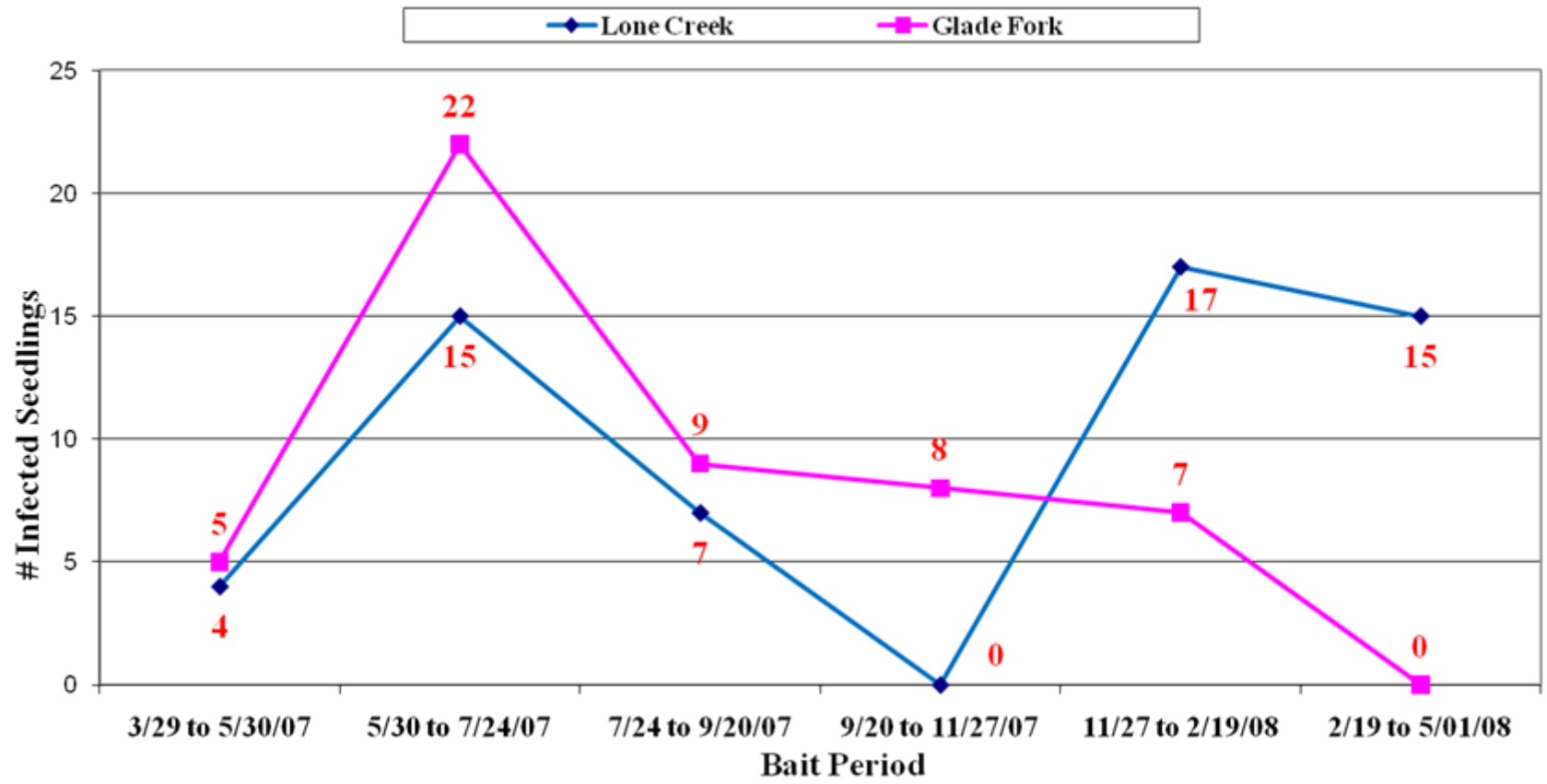
*Phytophthora lateralis* Distribution - Powell Creek - Early Lag



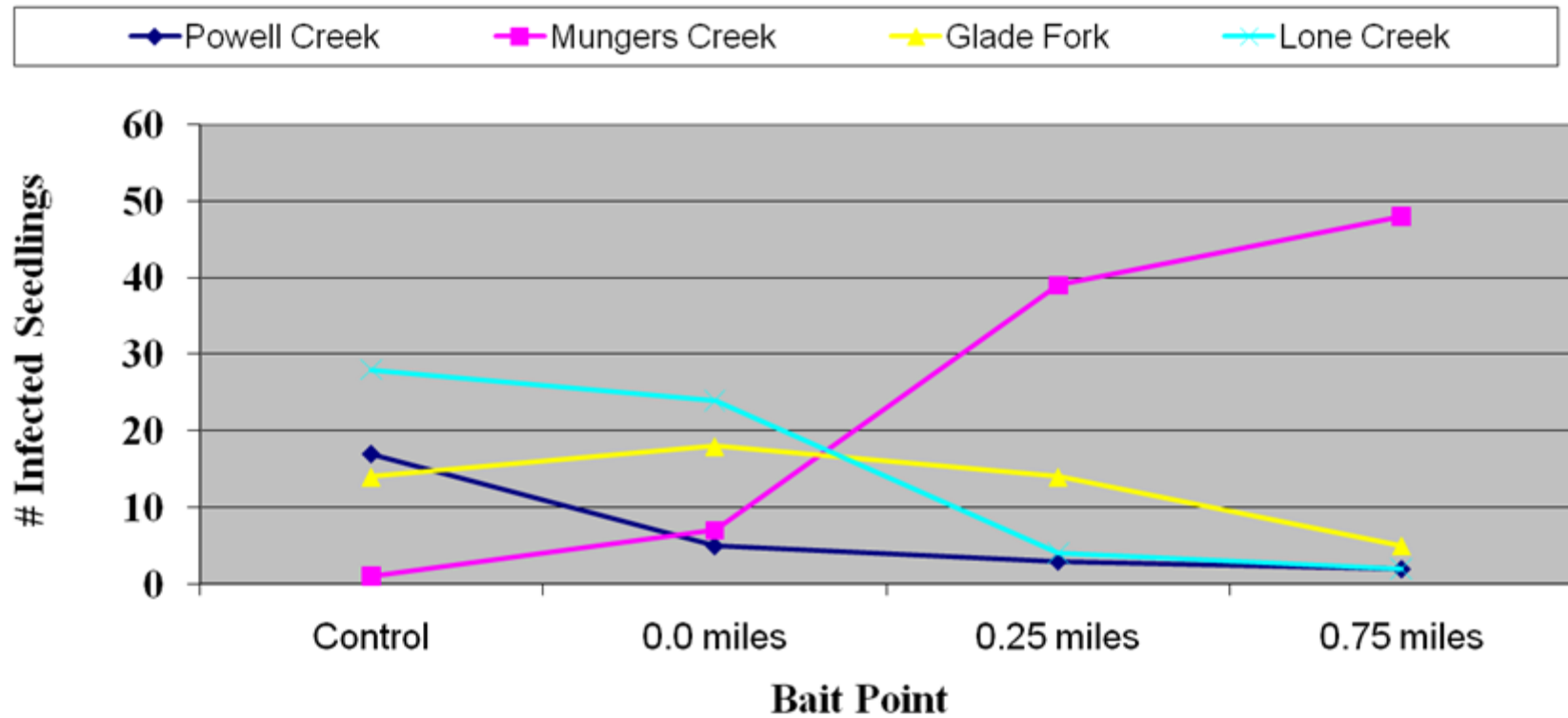
### *Phytophthora lateralis* Distribution - Mungers Creek - Log



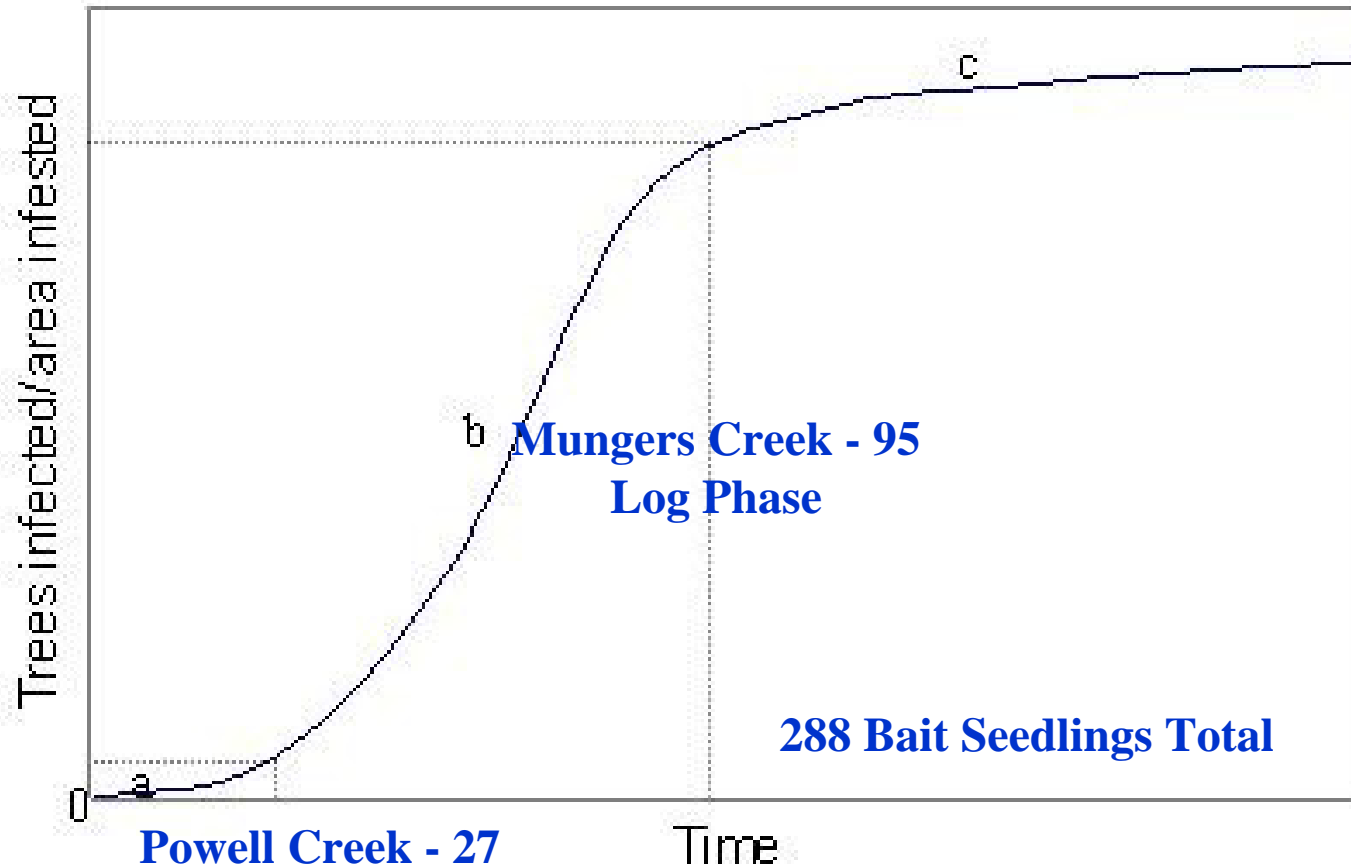
## *Phytophthora lateralis* Distribution - Late Lag



## *Phytophthora lateralis* Proximity - Entire Year



**Glade Fork – 51 and Lone Creek - 58  
Late Lag Phase**



**Powell Creek - 27  
Early Lag Phase**

**Mungers Creek - 95  
Log Phase**

**288 Bait Seedlings Total**

# Possible Contributing Factors to Seasonal Variation in *Phytophthora lateralis* Sporeload



Position on Disease Curve

Streamflow

Stream Temperature

Air Temperature

Plant Association /  
Seral Stage