Effect of oomatistatic compounds and biological control agents on production of inoculum and root colonization of plants infected with *Phytophthora ramorum*

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Systemic fungistats tested on foliage for masking effects

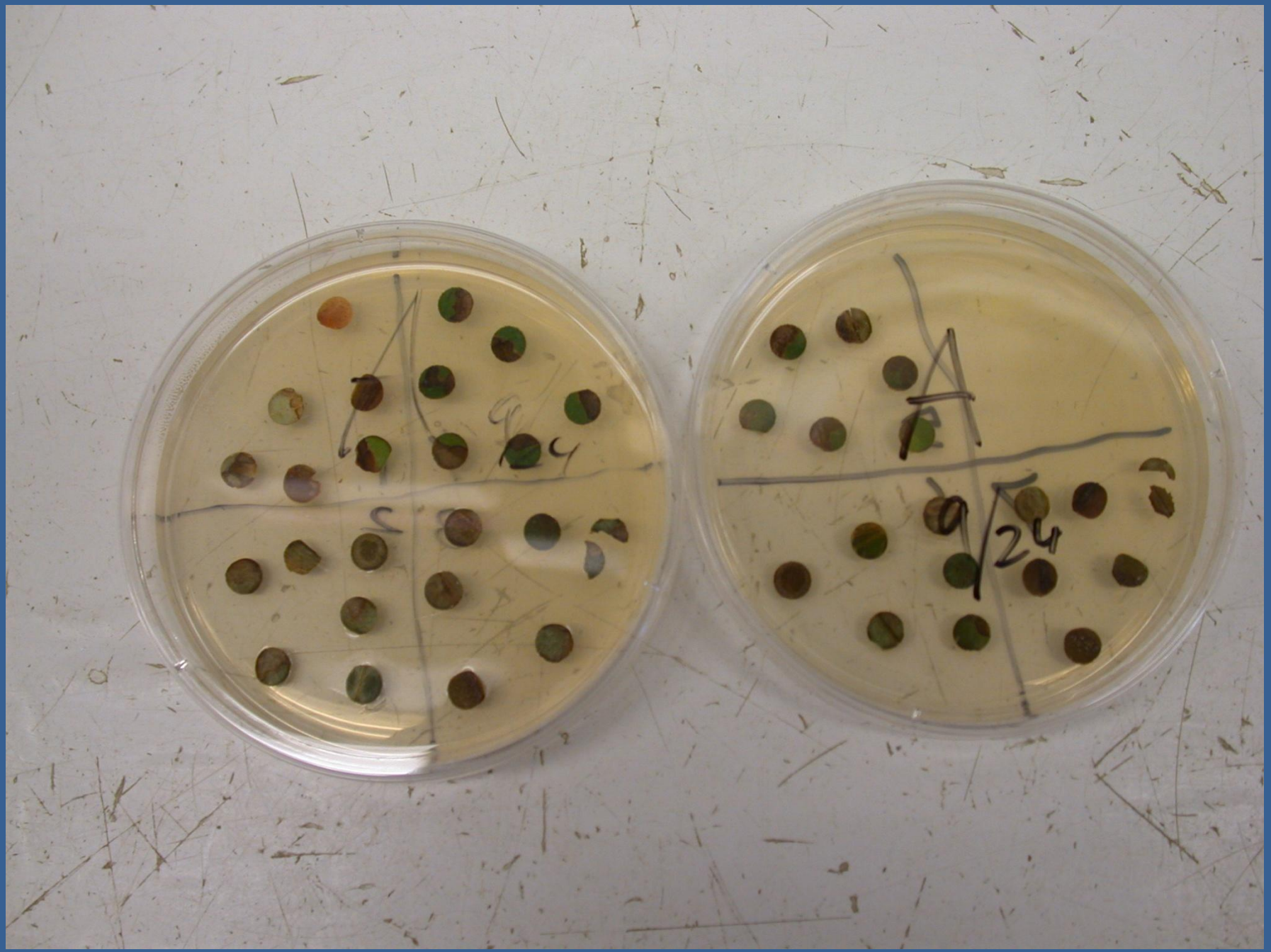
- Mefenoxam (Subdue Maxx)*- 0.16 mL/L
  *as soil drench
- Propamocarb (Banol)- 1.5 mL/L
- Fosetyl-Al (Aliette)- 3.0-3.8 g/L
- Control (water alone)

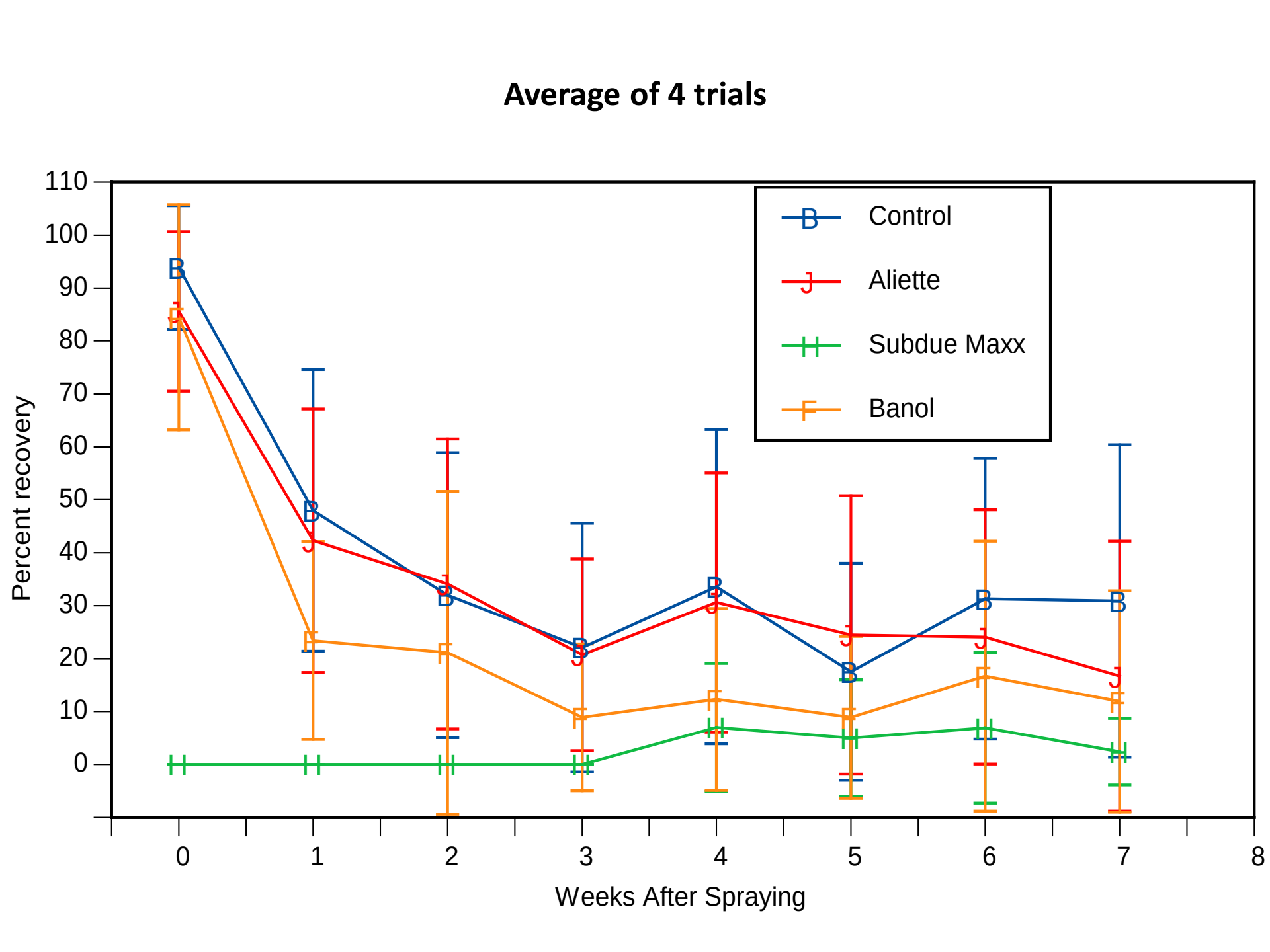
Step 1: Inoculate plants

Step 2: Spray with pesticides

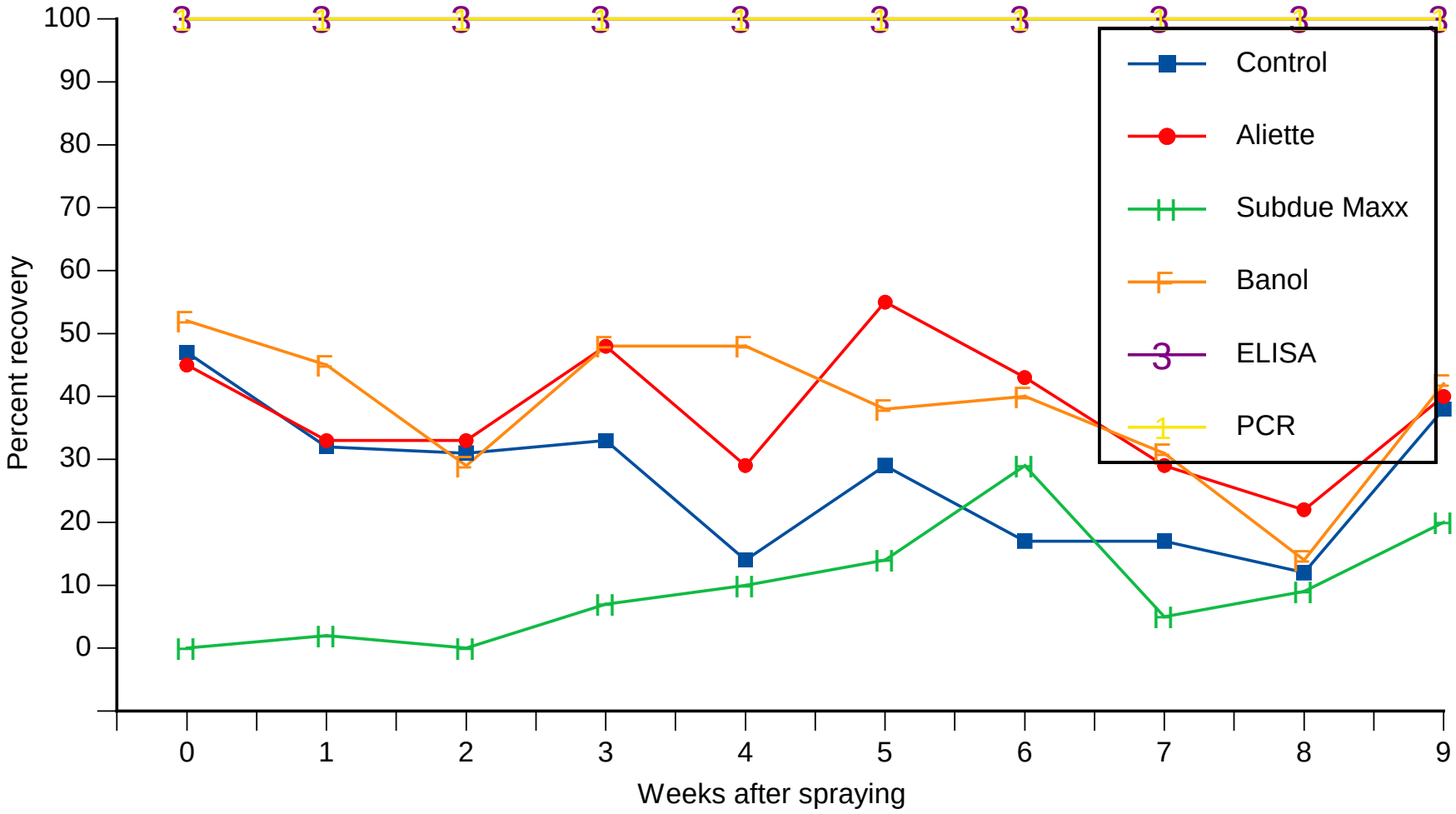
Step 3: Sample over time to detect pathogen

Step 4: Destructive sampling




Average of 4 trials
Control
Aliette
Subdue Maxx
Banol
Percent recovery
Weeks After Spraying
110
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8

Recovery of *P. ramorum* by culturing compared to PCR and ELISA (two trials)

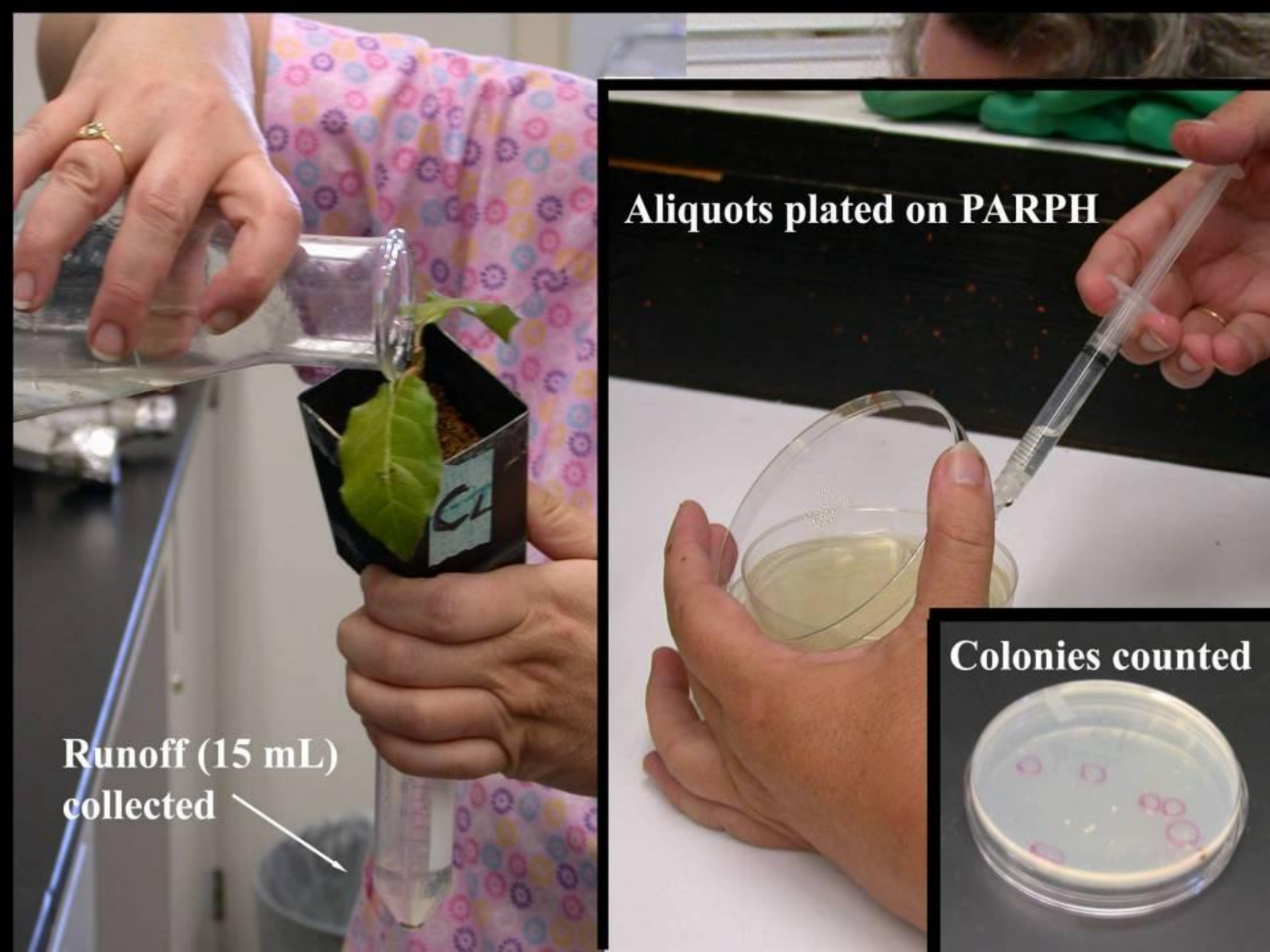


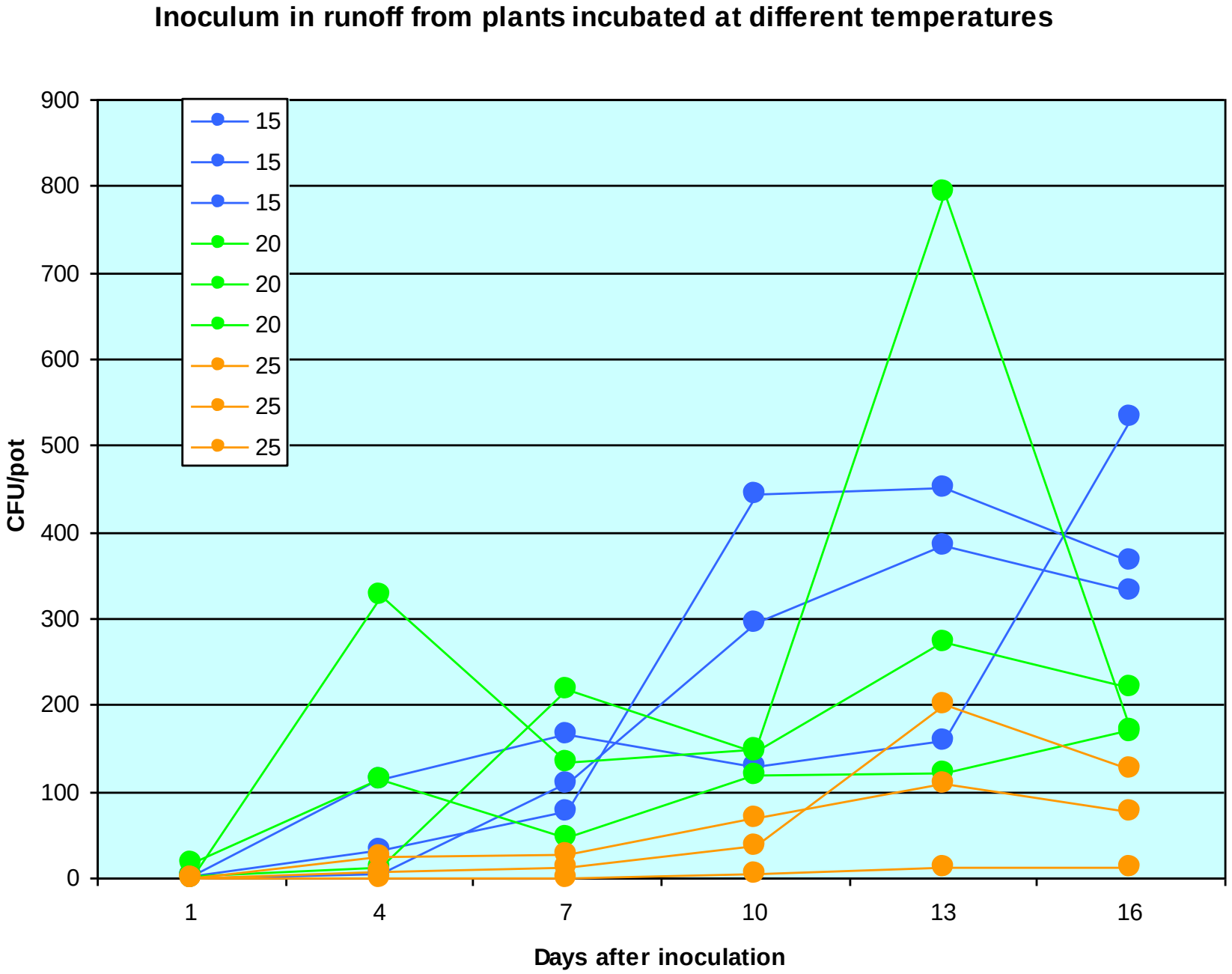
Conclusions

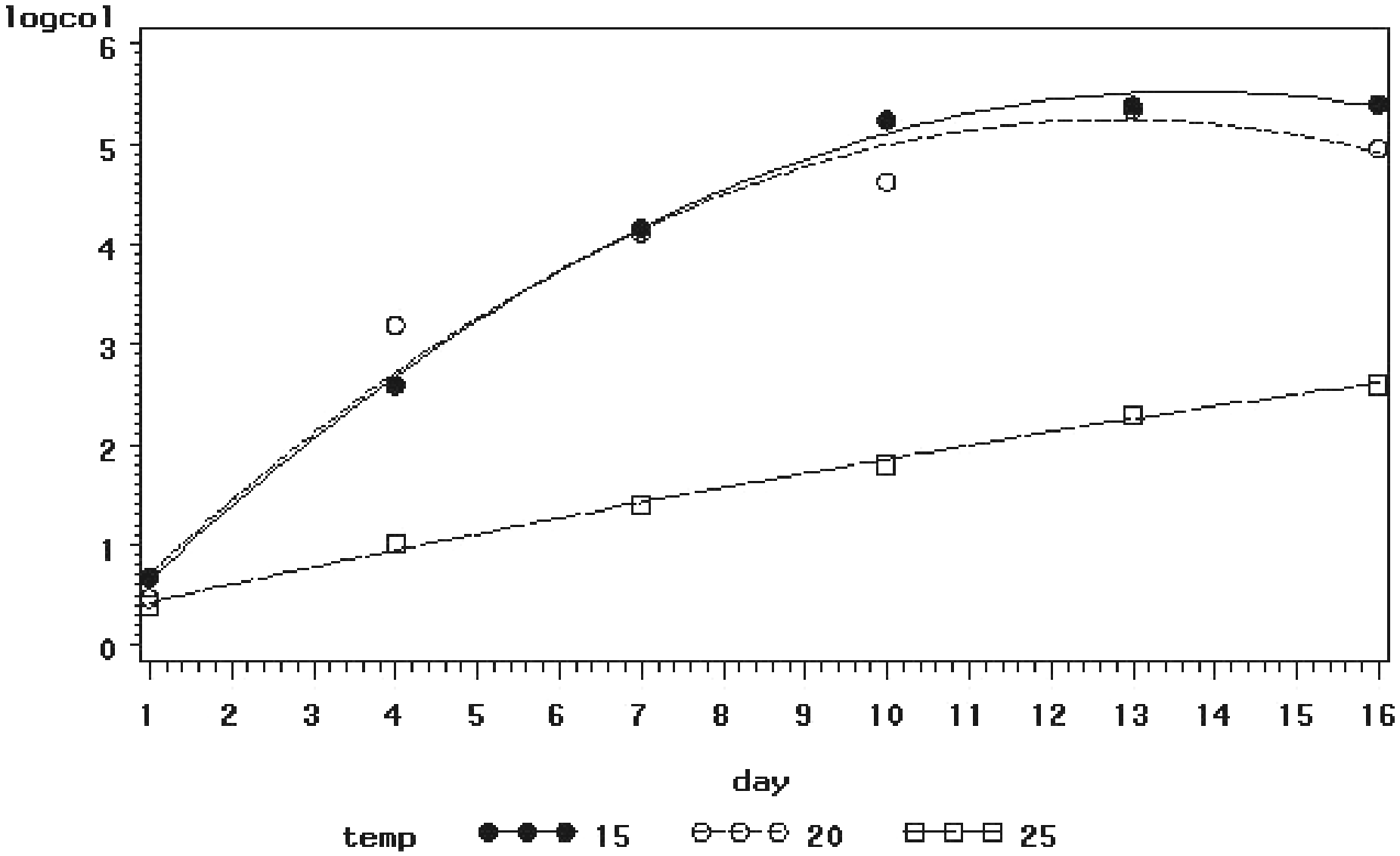
- **Subdue Maxx can mask the presence of *P. ramorum* as detected by culturing.**
- **Fungicides did not affect detection by PCR and ELISA**


Sporulation on roots of
Viburnum tinus


1b
'19
1b
'19


Runoff (15 mL)
collected
Aliquots plated on PARPH
Colonies counted

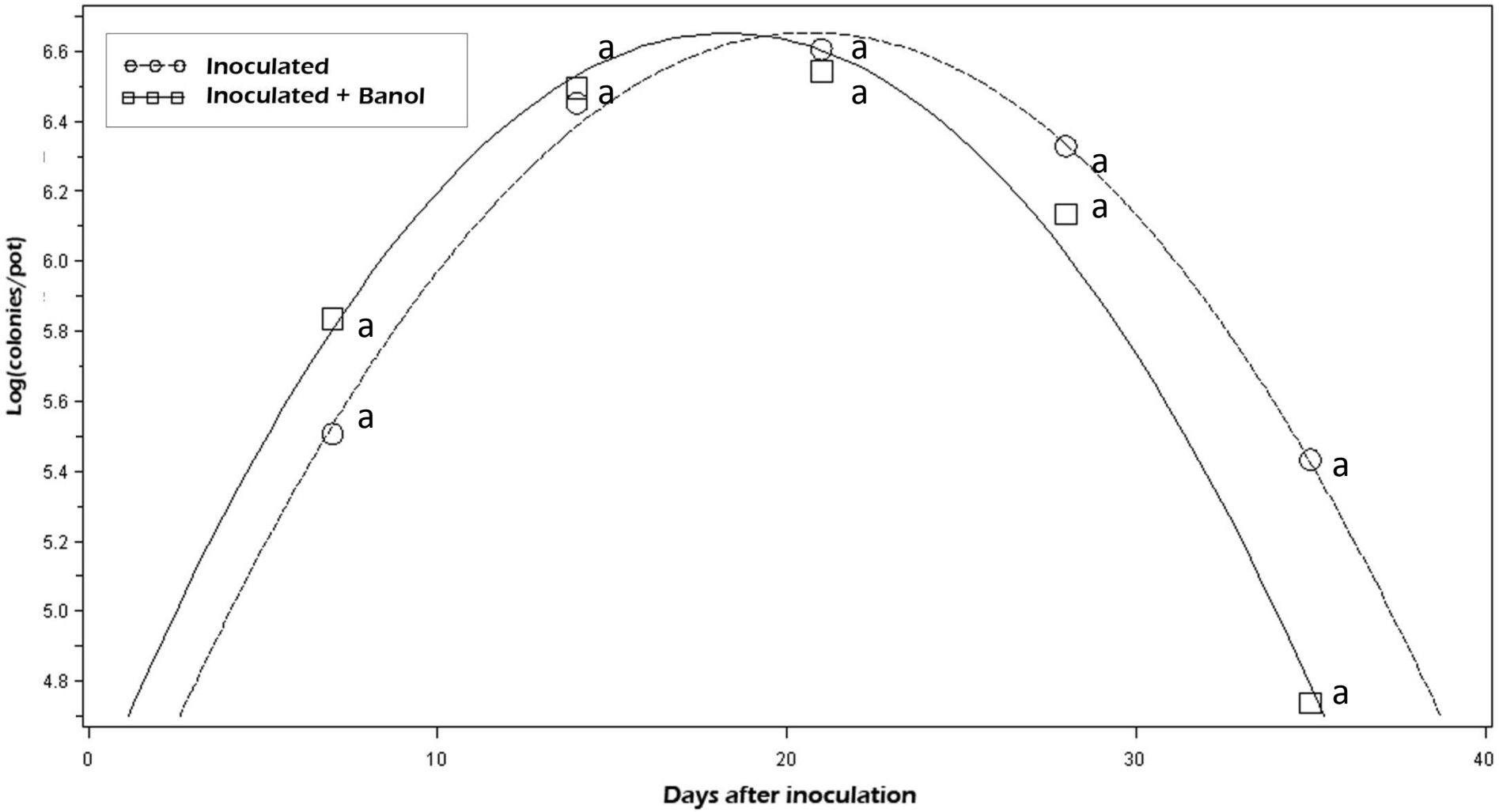

Inoculum in runoff from plants incubated at different temperatures
CFU/pot
900
800
700
600
500
400
300
200
100
0
1
4
7
10
13
16
Days after inoculation
15
15
15
20
20
20
25
25
25


logcol
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
day
temp
15
20
25

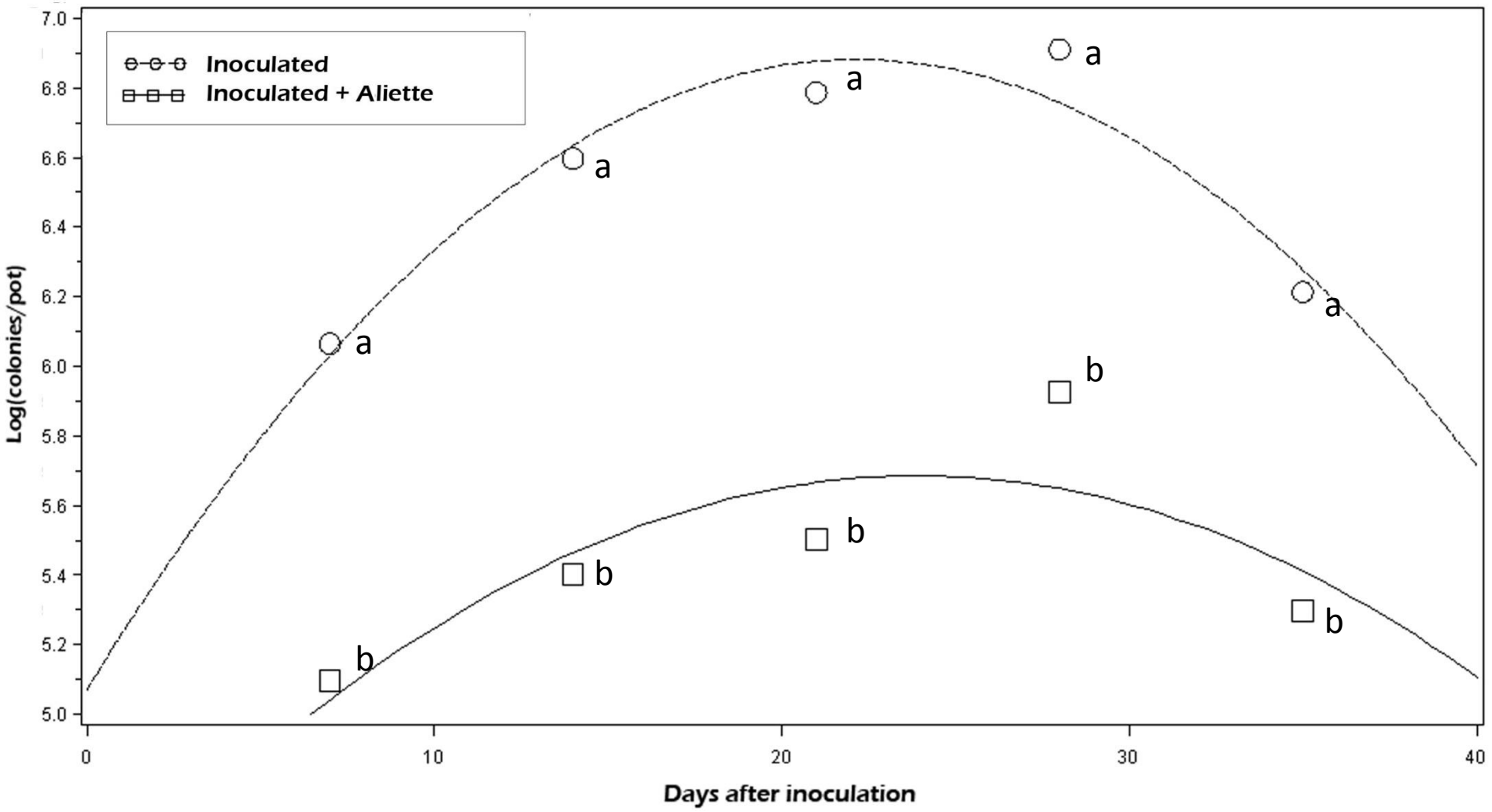
Systemic pesticides tested on roots

- Mefenoxam (Subdue Maxx)- 0.16 mL/L
- Propamocarb (Banol)- 1.5 mL/L
- Fosetyl-Al (Aliette)- 3.0 g/L
- Control (water alone)

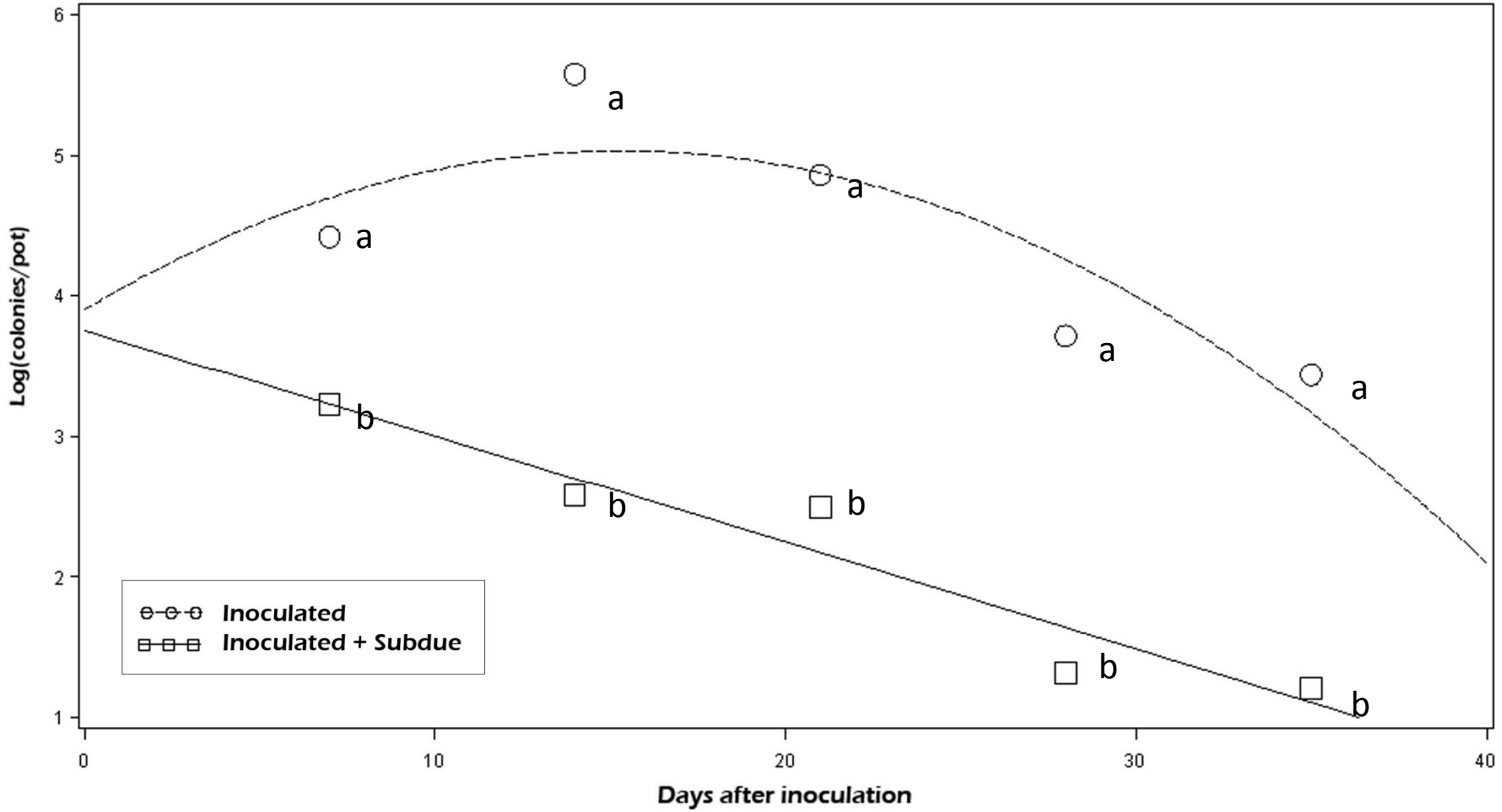
Banol


Inoculated
Inoculated + Banol
Log(colonies/pot)
6.6
6.4
6.2
6.0
5.8
5.6
5.4
5.2
5.0
4.8
0
10
20
30
40
Days after inoculation
a
a
a
a
a
a
a
a
a
a

Aliette


Inoculated
Inoculated + Aliette
Log(colonies/pot)
Days after inoculation
7.0
6.8
6.6
6.4
6.2
6.0
5.8
5.6
5.4
5.2
5.0
0
10
20
30
40
a
a
a
a
b
b
b
b
b

Subdue Maxx

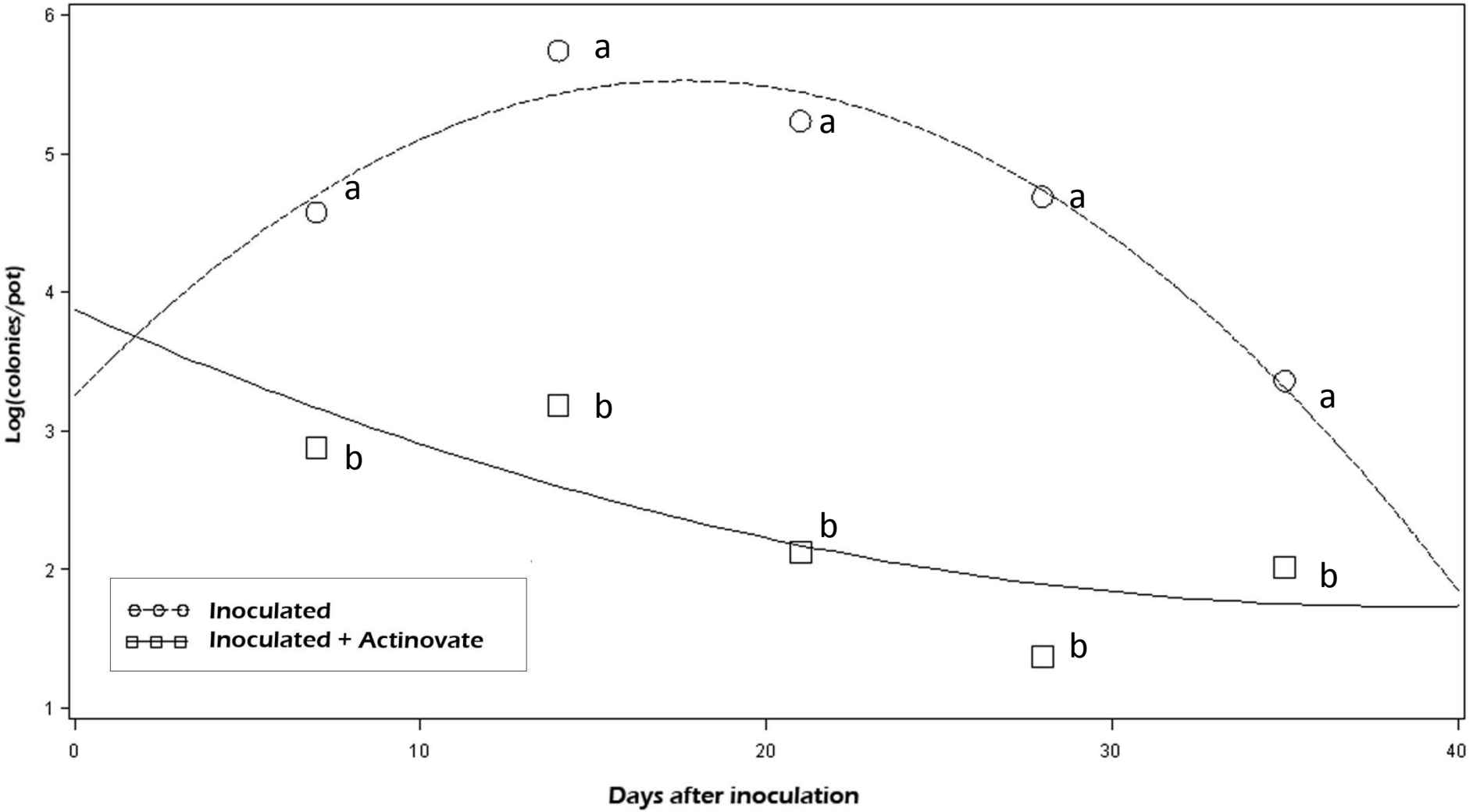

Log(colonies/pot)
6
5
4
3
2
1
0
10
20
30
40
Days after inoculation
a
a
a
a
a
b
b
b
b
b
Inoculated
Inoculated + Subdue

Biological control agents tested on roots

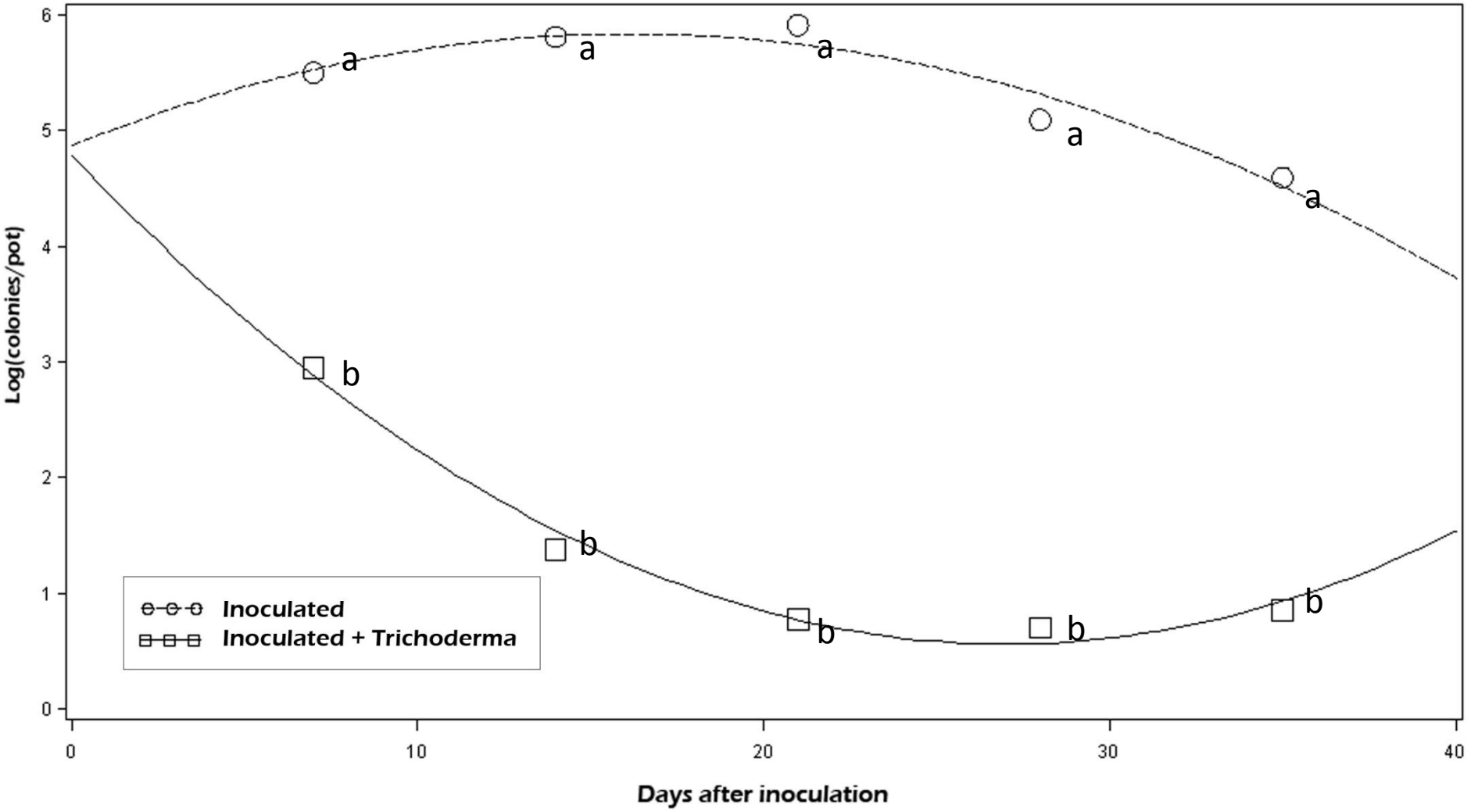
- **Actinovate SP (*Actinomyces lydicus*)- 2 tsp/gal**

- ***Trichoderma asperellum – added in wheat bran at 1 x 10 ^{8} spores per pot.***

Actinovate


Log(colonies/pot)
6
5
4
3
2
1
0
10
20
30
40
Days after inoculation
a
a
a
a
b
b
b
b
b
Inoculated
Inoculated + Actinovate

Trichoderma



Conclusions

- **Subdue Maxx and Aliette added 4 days after inoculation with *P. ramorum* significantly reduced the amount of inoculum produced by infected roots over 5 weeks and reduced the amount of root infection at the end of the experiment. Banol had no effect.**

- **Both Actinovate and a Trichoderma significantly reduced inoculum production from roots and reduced the amount of root infection at the end of the experiment.**