

8 September, 2004

A. R. Chase, Plant Pathologist and President, Chase Research Gardens, Inc., 8031 Mt. Aukum Rd. Suite F, Mt. Aukum, CA 95656. (530) 620-1624

Title: Effect of fungicides on *Pythium* root rot on Geranium

Host: *Pelargonium x hortorum* (geranium) 'Goldsmith White' plugs were planted in standard 4 inch pots containing Sunshine Mix No. 1. The plants were fertilized with 1/4 tsp. Osmocote Plus 15-9-12 the same day. The test was conducted in a heated greenhouse with poly and shade cloth covering the top and sides.

Inoculation: Plants were inoculated with a mycelial slurry of a culture of *Pythium irregulare* mixed with sterilized water. The slurry was drenched into the potting medium at the rate of 10 ml per pot on 2 August, 2004 and then watered in lightly.

Treatments:	Rate/100 gal
A. Water - noninoculated	-----
B. Water - inoculated	-----
C. Aliette 80WDG	12.8 oz
D. Fosphite	64 oz
E. NOA 446510SC-B	17 oz
F. Heritage	0.45 oz
G. Heritage	0.9 oz
H. Subdue MAXX	0.5 oz
I. Subdue MAXX	1.0 oz
J. Heritage/Subdue MAXX	0.45 oz/0.5 oz
K. Heritage/Subdue MAXX	0.45 oz/1.0 oz
L. Heritage/Subdue MAXX	0.9 oz/0.5 oz
M. Heritage/Subdue MAXX	0.9 oz/1.0 oz

Chemical application dates: All treatments were applied as a drench at the rate of 50 ml/ 4 inch pot on 29 July, 12 and 25 August, 2004.

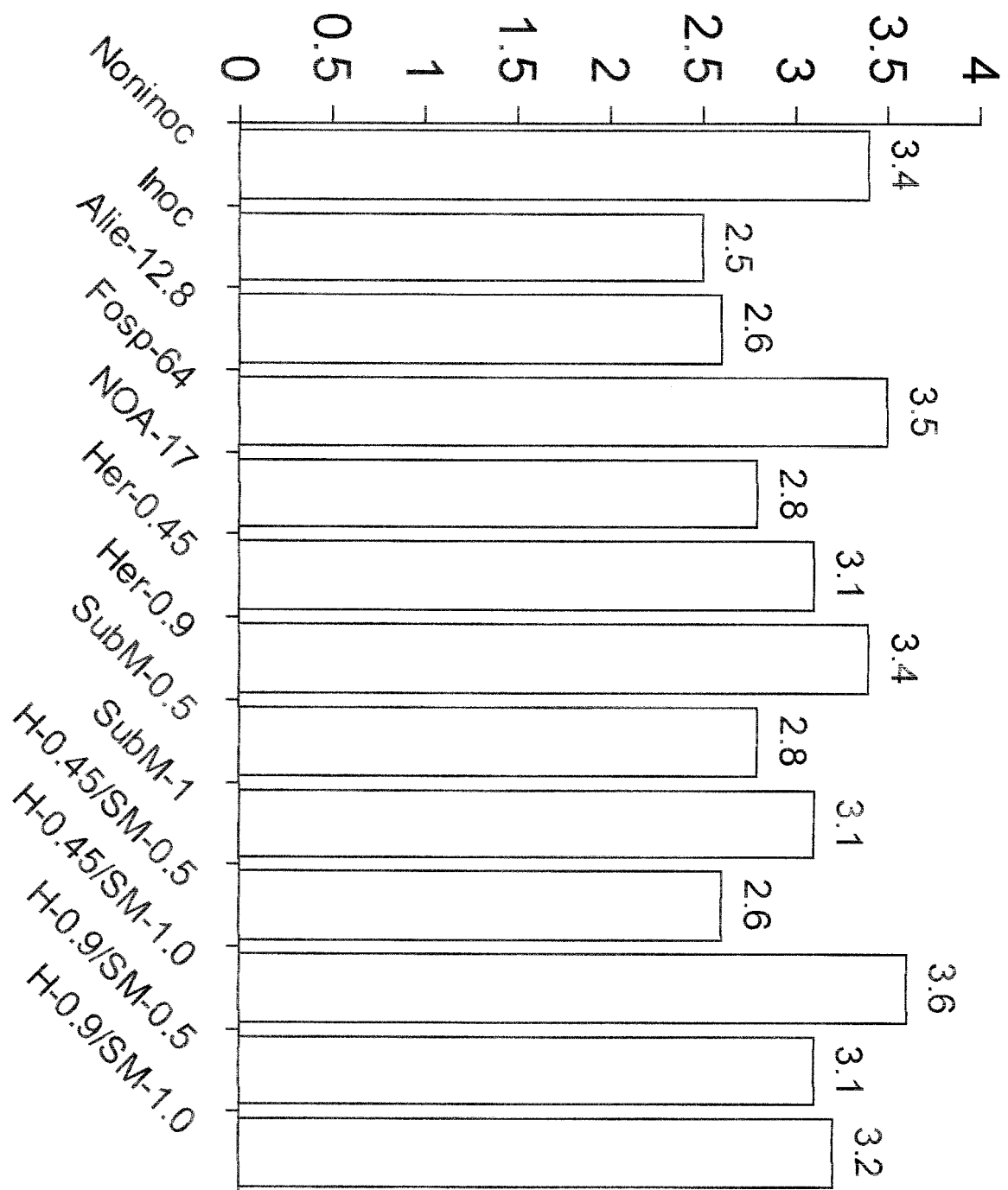
Date	Time applied	Air temperature	Water temperature	Weather
29 July	7:30 AM	23.3 C	23.0 C	clear
12 August	7:30 AM	25.5 C	26.0 C	clear
25 August	8:40 AM	26.7 C	22.0 C	clear

On 7 September, 2004 top grade was recorded using the following scale: 1 - plant dead, unsalable, 2 - poor, unsalable, 3 - moderate, salable, 4 - good, salable to 5 - excellent, salable.

Trt	1	2	3	4	5	6	7	8	9	10	Mean
A.	2.5	4.5	3.5	3.5	4	3	3	4	3.5	3	3.4 ab
B.	3	2.5	3	2	2	2	2.5	3	3	2	2.5 a
C.	3.5	3.5	2	2.5	2	2.5	3.5	2	2.5	2.5	2.6 ab
D.	3	5	4	3	4.5	2	3	4	3.5	3	3.5 ab
E.	2.5	3	2	3	2	3	3	3.5	3.5	3	2.8 ab
F.	2	4.5	3	3	3.5	2.5	4	3.5	2	3.5	3.1 ab
G.	2.5	4	3	3.5	3	3	4.5	3	4.5	3	3.4 ab
H.	2	2	2.5	2.5	4.5	2.5	3	3.5	2.5	3	2.8 ab
I.	3	4	2	3.5	2.5	2.5	3	3.5	4	3.5	3.1 ab
J.	3	4	2.5	2.5	2.5	2	2.5	2.5	3	2	2.6 ab
K.	4	4.5	3	3	3.5	2	3.5	4.5	3	5	3.6 b
L.	3	4.5	3	3.5	3	3	2.5	3	3	2.5	3.1 ab
M.	3	3.5	3	3	2	3	4	4.5	2.5	3.5	3.2 ab

Source	DF	Sum of squares	Mean square	F value	P value
Treatment	12	15.5	1.290	2.71	0.0029
Error	117	55.7	0.476	significant	
Total	129	71.2			

Conclusions: Highest top grades were found in the Heritage/Subdue Maxx 0.45/1.0 oz combination treatment and lowest top grades were in the inoculated control. All other treatments were not statistically different from those above. Although statistically the same, Fosphite plants had a much better top grade than Aliette plants. The labeled rate of Aliette has been insufficient for good disease control in previous studies as well. The combination of the lowest rates of Heritage and Subdue MAXX might not be sufficient for a high degree of disease control.



On 7 September, 2004 the number of flower stalks per pot was recorded.

Trt	1	2	3	4	5	6	7	8	9	10	Mean
A.	2	4	2	2	1	0	5	3	0	2	2.1 a
B.	3	0	2	0	1	1	2	3	3	5	2.0 a
C.	1	2	2	3	2	4	3	2	3	2	2.4 a
D.	1	0	2	3	2	2	3	4	0	3	2.0 a
E.	0	6	5	0	2	3	0	2	4	2	2.4 a
F.	6	0	0	3	0	3	2	1	1	2	1.8 a
G.	1	0	0	0	1	3	0	3	0	0	0.8 a
H.	1	3	1	0	2	2	5	0	0	0	1.4 a
I.	0	2	2	1	1	1	3	3	1	1	1.5 a
J.	2	3	2	6	2	2	4	2	5	3	3.1 a
K.	1	0	3	4	0	1	2	3	3	1	1.8 a
L.	4	1	1	3	2	2	1	5	3	3	2.5 a
M.	2	2	1	3	2	2	3	3	4	0	2.2 a

Source	DF	Sum of squares	Mean square	F value	P value
Treatment	12	39.6	3.30	1.54	0.1189
Error	117	250.4	2.14	not significant	
Total	129	290.0			

Conclusions: There were no statistically significant differences between treatments for the number of flowers per pot.

Summary for the effect of fungicides on Pythium root rot on Geranium

Treatment	Rate/100 gal	Top Grade 9-7-04	No. flowers 9-7-04
Water - noninoculated	-----	3.4 ab	2.1 a
Water - inoculated	-----	2.5 a	2.0 a
Aliette 80WDG	12.8 oz	2.6 ab	2.4 a
Fosphite	64 oz	3.5 ab	2.0 a
NOA446510-250SC-B	17 oz	2.8 ab	2.4 a
Heritage 50WDG	0.45 oz	3.1 ab	1.8 a
Heritage 50WDG	0.9 oz	3.4 ab	0.8 a
Subdue MAXX	0.5 oz	2.8 ab	1.4 a
Subdue MAXX	1.0 oz	3.1 ab	1.5 a
Heritage/Subdue MAXX	0.45/0.5 oz	2.6 ab	3.1 a
Heritage/Subdue MAXX	0.45/1.0 oz	3.6 b	1.8 a
Heritage/Subdue MAXX	0.9/0.5 oz	3.1 ab	2.5 a
Heritage/Subdue MAXX	0.9/1.0 oz	3.2 ab	2.2 a