

UNIVERSITY OF WISCONSIN
DEPARTMENT OF PLANT PATHOLOGY

GINSENG RESEARCH RESULTS

RIB FALLS GINSENG GARDEN L1
BIOLOGICAL CONTROL OF
ALTERNARIA LEAF AND STEM BLIGHT
USING ROBUST

GINSENG PLANTS 3 YEARS OLD

Treatment Number	Treatment Description	Treatment Rate per Acre of Application	Frequency of Treatment
1	Control	No Treatment	---
2	Robust	Full strength 850 billion-250 trillion cells per Acre	7 days (evenings)

NOTE: Garden L1 was treated with Ridomil 5G (15-10-10-10-10-15 lbs./ acre) at monthly intervals during the growing season to control Phytophthora root rot. Garden L1 was treated prior to planting with Basamid at the rate of 301 lbs./ acre.

GOAL: To evaluate the effectiveness of Robust against Alternaria leaf and stem blight in seedlings.

Our biological control in Garden L1 was designed to evaluate the effectiveness of Robust for control of Alternaria leaf and stem blight over a three year period, and to compare roots yields from treated and non-treated plots. In 1997, Alternaria leaf and stem blight was first observed when plants were evaluated for the disease in June (Figure 1). Total defoliation of both non-treated and treated plants occurred prior to our third evaluation in August (Figure 1). In Robust treated plots development of the disease was slowed and the epidemic in these plots appeared to lag approximately 10-14 days behind that in non-treated plots (Figure 1).

Root yield from both treated and non-treated plots were very low (Figure 2), substantially less than yields (>2000 lbs / acre) expected from commercial ginseng gardens. However, treated plots were significantly greater than those from non-treated plots. On average, the yield from Robust-treated plots was 80% higher than non-treated plots.

Results from this experiment indicate that Robust will not totally control Alternaria leaf and stem blight when used alone. However, we did observe significant disease control (Figure 1) and substantial yield increase using this product. This product should be most useful when alternated with other products such as Dithane DF and/or Aliette WDG. Use of Robust in combination with products containing copper (Kocide and Champion products) would not be advisable because of the toxicity of copper to bacteria.

TREATMENTS	AVERAGE DISEASE SEVERITY RATING				
	Day 0	Day 20	Day 40	Day 60	Day 80
NonTreated	0.00	0.45	0.82	0.88	1.0
Treated	0.00	0.40	0.71	0.82	1.0

Figure 1, Garden L1 : Biological control of Alternaria leaf and stem blight using Robust. ALTERNARIA LEAF AND STEM BLIGHT SEVERITY. Tagged plants in each plots in this garden were evaluated for Alternaria leaf and stem blight.. Healthy plants were given a rate of “0” . For diseased plants, the proportion of diseased leaflets of each leaf on the plant was determined. The disease ratings for all of the leaves on the plants, as well as a disease rating for the plant’s stem (0 = healthy, 1 = diseased) were averaged to yield the disease rating (maximum value = 1) for that plant. The “average disease severity ratings” in the table above, represent the average of approximately 135 ratings from individual plants. Disease values in the days 40 and 60 were significantly different ($P = 0.10$).

AVERAGE DRY ROOT YIELD (LBS / ACRE)	
NON-TREATED	TREATED
205	400

Figure 1, Garden L1 : Biological control of Alternaria leaf and stem blight using Robust. DRY ROOT YIELDS. Gingseng roots in each experimental plot were harvested and dried in October 1997. Dry root yields were determined for each plot and yield and yields form nine plots receiving the same treatment were averaged. These averages are presented in the table above. Average for dry root yield were significantly different ($P = 0.007$).