

Control of *Pseudomonas* leaf spot on *Magnolia grandiflora*

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In the spring of 1981, a previously undescribed leaf spot on southern magnolia was observed in a nursery in south Alabama. Later the same year this leaf spot was found at two other locations in south Alabama. Studies and tests at the Plant Diagnostic Lab at Auburn University's main campus and at Auburn University's Ornamental Horticulture Field Station at Mobile showed this leaf spot to be caused by *Pseudomonas cichorii* (Mullen and Cobb, 1984).

In addition to disease identification, we were interested in disease control (Mullen and Cobb, 1984; Mullen and Cobb, 1985). Tests at the Ornamental Horticulture Field Station at Mobile were designed to evaluate chemical and cultural treatments for prevention of disease spread. Severely diseased southern

magnolias in 5-gallon containers of pine bark medium were maintained in full sun. These 4-5 foot trees were exposed to normal nursery cultural practices except for pesticide applications and irrigation. Chemical spray treatments were applied weekly with a hand-pump compressed air sprayer. Nu-film 17, a spreader-extender, was added to each bactericide preparation.

In one test, three bactericides, each at two rates, were evaluated for protective disease control. Also, two rates of Exhalt 800, a sticker-extender, were tested to see if a layer of inert material would protect foliage from this disease. Irrigation was applied daily with overhead sprinklers. Disease incidence (percent of leaves infected) and severity (foliar disease rating) were recorded after seven weeks of treatment. Disease was reduced by all treatments except Exhalt 800 (Table 1). Statistical tests indicated that Kocide 101 and Tri-basic

Table 1. Chemical control of *Pseudomonas* leaf spot on *Magnolia grandiflora*.

Treatment	Rate per 100 G	% leaves infected	Foliar disease rating ¹
Kocide 101	1 lb	66	1.9
	2 lb	61	1.8
Tri-basic copper sulfate	2 lb	56	1.7
	4 lb	47	1.6
Citcop 4E	2 pt	74	2.1
	4 pt	84	2.5
Exhalt 800	4 pt	85	2.4
	8 pt	97	2.7
	Check	97	2.7

¹Rating: 1 = No disease, 2 = <10% leaf area damaged, 3 = >10% leaf area damaged.

Table 2. Chemical and cultural control of *Pseudomonas* leaf spot on *Magnolia grandiflora*.

Chem treatment	Rate/100G	Foliar disease rating ¹ Overhead irrigated	Ground-level irrigated
Kocide 101	2 lb	2.8	2.2
Tri-basic copper sulfate	2 lb	2.5	2.4
Agri-Strep 17	1 lb	3.2	2.4
Bordeaux mixture	8 lb	2.7	2.1
Check		3.1	2.5

¹Disease rating: 1 = None, 2 = Slight, 3 = Moderate, 4 = Severe

Table 3. Control of *Pseudomonas* leaf spot on *Magnolia grandiflora* with ground-level irrigation

Irrigation method	Foliar disease rating ¹
Overhead	2.9
Ground-level	2.3

¹Disease rating: 1 = None, 2 = Slight, 3 = Moderate, 4 = Severe

Copper Sulfate provided the best disease control. The higher rates of these two bactericides did not show significant differences from the lower rates.

In a second test, chemical disease control was compared between plants exposed to overhead irrigation and plants exposed to ground-level irrigation. The four chemicals and rates (per 100 gallons of water) tested were Kocide 101, two pounds; Tri-basic Copper Sulfate, two pounds; Agri-Strep 17, one pound; and Bordeaux Mixture, eight pounds. Disease was evaluated after 15 weeks of treatment. This test was conducted during a time when daily showers and high humidity were prevalent in Mobile. Results showed that none of the chemicals provided disease control (Table 2) but ground-level irrigated plants were less diseased than overhead irrigated plants (Tables 2 and 3). Statistical tests confirmed that ground-level

irrigation resulted in lower disease incidence.

Results of the two experiments showed that Kocide 101 or Tri-basic Copper Sulfate provided limited disease control under some environmental conditions. When humid, rainy conditions prevailed during most of our second experiment, none of the chemicals tested provided disease control. Plants under ground-level irrigation developed less disease than plants watered with overhead sprinklers.

We concluded from the above results that a combination of chemical and cultural control methods are not enough to provide disease control in a nursery situation when rainy weather exists. As with many other bacterial diseases of greenhouse and nursery crops, *Pseudomonas* leaf spot control on southern magnolia requires strict sanitation practices in addition to chemical and/or cultural control methods.

LITERATURE CITED

- Mullen, J. M. and G. S. Cobb. 1985. Control of *Pseudomonas* Leaf Spot on *Magnolia grandiflora*. Research Report 1985 Ornamentals 3:29-30.
- Mullen, J. M. and G. S. Cobb. 1984. Leaf Spot of Southern Magnolia Caused by *Pseudomonas cichorii*. Plant Disease 68: 1013-1015.



Roger Gossler, Oregon nurseryman, with Claudia and Glenda Ford during Magnolia Nursery tour.



Mary (Mrs. William) Dodd, standing, with Sara Gladney at speakers table. Photo Joe Hickman.



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