

**COMPARISON OF FUNGICIDES AND RESISTANT VARIETIES FOR CONTROL OF WHITE RUST ON SPINACH, 1997:** A field experiment was conducted at the Long Island Horticultural Research Laboratory in Riverhead, NY, on Riverhead sandy loam soil. White rust occurred in this field in 1996. Fertilizer (1000 lb/A of 10-10-10) was broadcast and incorporated on 9 Apr. To provide a source of inoculum, rows of spinach were planted on 22 Apr, 2 Jul, and 8 Aug along two sides and through the center of the field. The experimental plots were planted with a tractor-mounted Planet Jr. seeder on 29 Aug. Weeds were controlled by applying Dual 8E (0.75 pt/A) after planting. Foliar fertilizers, Manganese (2 qt/A) and NutriLeaf (5 lb/A), were applied on 25 Sep and 3 Oct. Average monthly high and low temperatures (F) and total rainfall (in.) were 76, 58 and 1.2 in Sep and 66, 48 and 1.81 in Oct. The experiment was arranged in a randomized complete block design with two factors (fungicide treatment and variety) and four replications. Seven R is susceptible to white rust; Fall Green and Vancouver are moderately resistant. Plots were four 25-ft rows spaced 14 in. apart. Fungicides were applied seven times with a CO<sub>2</sub>-pressurized backpack sprayer and hand-held boom equipped with three Blue XR TeeJet (8003VS) nozzles spaced 17 in. apart that delivered 40 gpa at 50 psi. The field was irrigated for about 1 hr late in the afternoon on 3, 14, 15, and 16 Oct and early in the day on 22, 23, and 24 Oct to create conditions favorable for white rust development by lengthening the leaf wetness period. A leaf infected with white rust was placed in the center of each plot following irrigation on 14 Oct to ensure inoculum was present. Plants were examined weekly for symptoms. On 13 Nov, 20 plants were harvested from the center of each plot by cutting just below the crown. Fungicide-treated resistant varieties were not harvested because of the low incidence of white rust. Plants with white rust were counted. Leaves with white rust or chlorotic/necrotic tissue were removed, categorized, counted and weighed. The categories were: B Grade due to white rust (total lesion size of at least 0.75 in. diam), A Grade with white rust (total lesion size less than 0.75 in.), and B Grade other (25% of tissue not green for reasons other than disease). Leaf tissue with no white rust also was weighed.

Conditions were not conducive for white rust development during most of this experiment. There were only six days with rain from 5 Sep, when plants were in the cotyledon stage, through 30 Oct. White rust was first observed on nontreated Seven R on 7 Oct, 1 wk after 0.63 in. of rain fell. Severity remained very low until 5 Nov, after a total of 1.68 in. of rain on 25 and 27 Oct. Fall Green and Vancouver plants were larger than Seven R plants because plant density was higher in Seven R plots. This was due to a rain shower after Seven R was seeded that interfered with seeding the other varieties because the damp soil stuck to the planting wheel. Therefore, yield data are presented as oz./plant and percent of total marketable weight. All treatments suppressed white rust compared with nontreated Seven R. Aliette alone was the least effective chemical. Maneb and Syllit were the most effective chemicals based on white rust incidence (all other differences among Maneb, Syllit and treatments with Kocide were insignificant). Maneb and Syllit were the only fungicides tested that were not registered on spinach in the U.S. when the test was conducted. Chemical control with Kocide, Kocide + Aliette, Maneb or Syllit was more effective than genetic control in reducing white rust incidence and severity (% A Grade leaf tissue with symptoms). There were no significant differences among treatments in percent weight of tissue in the 'B Grade other' category.

Variety	Treatment and rate/A <sup>1</sup>	White rust (WR) incidence (%)	Marketable leaf tissue (oz./plant)			Marketable leaf tissue (%)	
			B Grade due to WR	A Grade with WR	A Grade no WR <sup>2</sup>	B Grade due to WR <sup>3</sup>	A Grade with WR
Fall Green	Nontreated control	67 b <sup>4</sup>	0.19 bc	0.67 b	3.86 a	2.3 bc	13.0 b
Vancouver	Nontreated control	74 b	0.86 a	1.18 a	3.37 ab	6.7 b	18.9 b
Seven R	Nontreated control	100 a	0.68 ab	0.69 b	1.15 c	24.2 a	25.4 a
Seven R	Aliette 80WDG 3 lb (1-7)	79 b	0.12 bc	0.48 bc	1.79 c	2.8 bc	17.6 b
Seven R	Kocide LF 1 qt (1-3), Aliette 80WDG 3 lb (4-7)	27 c	0.02 bc	0.14 cd	3.21 ab	0.6 cd	3.7 c
Seven R	Kocide LF 1 qt (1-7)	27 c	0.02 c	0.10 d	2.87 b	0.5 cd	3.1 c
Seven R	Maneb 75DF 2.1 lb (1-7)	1 d	0.00 c	0.01 d	3.27 ab	0.0 d	0.1 c
Seven R	Syllit 65W 0.5 lb (1-7)	2 d	0.00 c	0.01 d	2.65 b	0.0 d	0.3 c
P-value		0.0001	0.0472	0.0001	0.0001	0.0001	0.0001

<sup>1</sup> Rate of formulated product/A. Application dates: 1=25 Sep, 2=1 Oct, 3=7 Oct, 4=13 Oct, 5=20 Oct, 6=30 Oct, and 7=5 Nov.

<sup>2</sup> Leaf tissue with no symptoms of white rust and not categorized as B Grade for reasons other than white rust.

<sup>3</sup> A logarithmic transformation was used to stabilize variance.

<sup>4</sup> Numbers in a column with a letter in common are not significantly different according to Fisher's Protected LSD (P=0.05).