

SUSCEPTIBILITY TO WHITE RUST AND YIELD OF SPINACH VARIETIES, 1997: The objective of this study was to compare seven commercially available spinach varieties from Asgrow Seed Company. Seven R was included as a standard susceptible variety. The other varieties tested have exhibited some tolerance to white rust in other experiments and have resistance to at least races 1 and 3 of *Peronospora farinosa* f. sp. *spinaciae* (downy mildew). Fidalgo and Vancouver have a smooth leaf type; the others are semi-savoyed. 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. Several potential sources of inoculum were provided in 1997. Spinach was planted on 22 Apr, 2 Jul, and 8 Aug along one side of the experiment to serve as spreader rows. Plots of susceptible Seven R also were interspersed among the experiment plots. Further, this experiment was next to a fungicide evaluation with Seven R. Fertilizer (1000 lb/A of 10-10-10) was broadcast and incorporated on 9 Apr. Spinach was planted by hand with a Planet Jr. seeder on 29 Aug. The experiment was arranged in a randomized complete block design with four replications. Plots were four 25-ft rows spaced 14 in. apart. Weeds were controlled by applying Dual 8E (0.75 pt/A) after planting. Foliar fertilizers, Manganese (2 qt/A) and NutriLeaf (5 lb/A of 20-20-20), 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 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 21 Nov, 15 plants were harvested from the middle rows of each plot by cutting just below the crown. Plants with white rust lesions 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 (at least 25% of leaf area 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 in an adjacent experiment on 7 Oct, 1 wk after 0.63 in. precipitation. Symptoms were not observed on Seven R in this experiment until 5 Nov, after 1.68 in. precipitation on 25 and 27 Oct. Sinclair, Fidalgo, Vancouver, and San Juan exhibited white rust resistance compared to Seven R based on both white rust incidence and percent of marketable leaf tissue with white rust. Seven R, Sinclair and Vancouver produced significantly more total marketable leaf tissue than the other varieties. Sinclair and Vancouver produced significantly more leaf tissue free of white rust than the others. Weight of tissue in the 'B Grade other' category for Seven R and Vancouver was significantly higher than for the other varieties.

Variety	White rust (WR) incidence (%)	Marketable leaf tissue (oz./plant)				Leaf wt with WR (% of marketable)
		Total weight	B Grade due to WR	A Grade with WR	A Grade no WR *	
Seven R	98 a **	5.3 a	0.93 a	0.56 a	2.8 b	35 a
Cypress	91 ab	2.7 b	0.41 bc	0.17 b	1.6 c	35 a
Orcas	79 b	3.4 b	0.58 ab	0.14 b	1.9 bc	33 a
Sinclair	53 c	5.1 a	0.08 cd	0.06 b	4.0 a	13 b
Fidalgo	38 cd	2.4 b	0.05 d	0.14 b	1.9 bc	9 b
Vancouver	32 d	5.6 a	0.03 d	0.06 b	4.5 a	6 b
San Juan	23 d	2.6 b	0.02 d	0.14 b	2.2 bc	5 b
P-value	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001

* Leaf tissue with no symptoms of white rust and not categorized as B Grade for reasons other than white rust.

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