FUNGICIDAL AND BIOLOGICAL CONTROL OF GARLIC WHITE ROT, 1998-99[x]

Fred Crowe and Robin Parks

Fungicides and biological control agents were screened for control of garlic white rot in 1998-99. Previously, fungicides at best provided modest control, which was insufficient to keep soil populations of the pathogen from increasing. But with new fungicides available, a field trial was located in a naturally and highly infested local field. Nearly all products were applied either as seed treatments or were sprayed into the planting furrow at seeding. Plots were 20 ft bed sections planted and managed as per industry standards, with four replications per treatment. Except as noted, none of the fungicides are registered for control of this disease in the U.S., although Folicur recently became labeled for use in some foreign countries.

Results appear in Table 1. For some less-effective treatments, up to 10 % pre-emergence loss from white rot was obscured by freezing damage (data not shown). All plant loss between emergence and harvest resulted from white rot. By harvest, approx. 70 % of the plants in untreated plots were dead or infected by white rot. Depending on rate of application, difenoconizole (Dividend, Novartis) +/- fludioxonil (Maxim, Novartis) and tebuconizole (Folicur, Bayer) seed treatments and Folicur in-furrow treatment each provided total control of white rot. At lower rates, these products allowed some white rot to develop. DuPont XMU752-16 provided excellent-but-less-than-perfect control at the one rate of application tested. Benomyl (Benlate, DuPont) seed treatment and iprodione (Rovral, Rhone-Poulenc) in-furrow application, each registered for control of white rot of garlic, failed to provide substantial protection. Azoxystrobin (Quadris, Zeneca) provided only marginal control of white rot at the one rate of in-furrow application used, and DuPont XKP48125 failed to provide control. Of biological products, only LiquiComp/Ceres (bacterial mixture, Sierra Nevada Resources) provided partial control, but we did not evaluate its effectiveness season-long as had been recommended by the manufacturer. Limited application of Actigard (Novartis), a material intended to elicit plant disease defenses when applied to foliage, provided partial control and might prove useful in combination with other products.

Table 1. Efficacy of fungicides & biocontrol products for control of garlic white rot, 1998-99

Treatment	Mean Number of Healthy Bulbs Harvested as a % of Stand[y]
(Dividend 3FS 1.0 oz + Maxim 4FS 0.08 oz)/100 lb seed	100 a
Folicur 3.6F 2.0 L/Ha In-Furrow	100 a
Folicur 3.6F 0.5 g ai/kg seed	98 a
Dividend 3FS 1.0 oz/100 lb seed	91 ab
Folicur 3.6F 1.0 L/Ha In-Furrow	90 ab
DuPont xmu752-16 25 fl oz/a In-Furrow	82 abc
Dividend 3FS 0.5 oz/100 lb seed	80 abcd
Actigard 50 WG 1.0 oz/a (foliar trt)	56 bcdef
Quadris 2.08 SC 0.5 oz ai/1000 row ft In-Furrow	47 cdef
LiquiComp 8gpa + Ceres 4 gpa at planting, in season	46 cdef
Benlate 50 WP 16 oz/100 gal seed dip	36 efg
DuPont XKP48125 24 floz/a In-Furrow	34 efg
Untreated	33 efg
Rovral 50 WP 4.3 lb/a In-Furrow	24 fg
CFB (bacteria) 15 gpa In-Furrow	5 g

x. Research supported by a grant from the Nevada Onion & Garlic Research Committee and the American Dehydrated Onion and Garlic Association.

y. Means followed by the same letter are not significantly different at $P<0.05$ according to Fisher's protected least significant different (LSD) test.

z. Treatment terminated after spring irrigations instead of continued as recommended.