

**USE OF SOIL-APPLIED GARLIC POWDER TO REDUCE INOCULUM OF
SCLEROTIUM CEPIVORUM AND CONTROL WHITE ROT OF ONIONS AND
GARLIC
UPDATE**

Fred Crowe, Harry Carlson, and Don Kirby

Germination of sclerotia of *Sclerotium cepivorum*, the *Allium* white rot fungus, in response to soil-applied petroleum-derived stimulants, lowered populations of sclerotia below economic thresholds (Crowe *et al.*, 1993). Preliminary evidence indicated that garlic powder might effect the same response as petroleum-derived stimulants, but the rates of product applied were either too low (50 lb/ac) or too high (500 plus lb/ac) for determination of the minimum effective dose and for a cost analysis of this rate (F. Crowe and T. Darnell, unpublished). In this follow-up investigation, a narrower range of rates (50, 100, 200, and 400 lbs/ac) and combination of treatment dates (fall and/or spring) were used to elucidate the cost-effectiveness of this treatment

The trial was conducted on a naturally-infested field near Tulelake, CA, on which an onion crop in 1992 experienced heavy losses to white rot. No volunteer onions were present during 1994. Preliminary soil sampling and assays suggested soil populations of sclerotia were at 100 per liter of soil, or more. A commercial grade of garlic powder suspended in water was broadcast over dry soil in 18 ft.x 50 ft. plot areas with a tractor mounted pressure sprayer. This was immediately incorporated 10-inches deep with a power roto spike harrow followed by 6.6-inches of sprinkler irrigation. Treatment was on September 9, 1994, and/or on April 21, 1995. The highest rate attempted (400 lb/ac garlic powder) was rather thick and hard to mix into solution. Soil samples were collected just prior to initial treatment in 1994, and then monthly through the spring of 1995. Onions were seeded on May 24, 1995, and were farmed as per a normal onion crop in the Tulelake Basin.

Fall pre-treatment soil samples from all plots indicated that the trial area was very highly infested, with many plots 10 or more times the level of infestation of previous trials using stimulants (Crowe *et al.*, 1993). Commercially unacceptable levels of white rot occurred in the trial in all plots (10-100 percent plant loss), although at the highest rates of application and frequencies garlic powder reduced incidence of white rot by about half compared to no treatment. This report is only preliminary, as the soil assay data are the more important data in this trial. The soil assay data will indicate the rates of application at which 98-99 percent decline in sclerotium population might be achieved, and how many applications might have been necessary to achieve economic control in this situation. Upon completion of soil assay analyses, it seems likely that the data will suggest that our onion planting in this very highly infested field should have been delayed until after further treatments.

Crowe, F.J., J. Debons, M. Thornton, P. Koepsell, D. McGrath, T. Darnell, M. Davis, J. Laborde, and E.R. Juarez. 1993. Pp 139-156. In COARC Annual Reports, 1990-1992, OSU Agricultural Experiment Station Special Report 922.