FLOODING FOR int ERADICATION OF THE ONION AND GARLIC ROT FUNGUS FROM INFESTED SOIL — EXPERIMENTS IN PROGRESS

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Sclerotium cepivorum, the fungus that incites onion and garlic white rot disease, survives many years in field soil as dormant propagules called sclerotia. These sclerotia can succumb to flooded soil conditions. Temperature plays a major role in this response -- summer flooding is more effective than winter flooding. The previous publication in this special report series contains survey data for sclerotia recovered from an infested commercial field in central Oregon. The survey indicated that many sclerotial bodies remained intact after one month continuous flooding, although about 65 percent of these were dead. After 13 weeks continuous flooding, less than one percent of intact sclerotia recovered were viable (see "Flooding for the Eradication of Onion and Garlic White Rot Fungus from Infested Field Soil," pp. 132-137 In Central Oregon Agricultural Research Center Annual Reports, 1990-92, Special Report 922). The survey data were limited in that initial populations of sclerotia just prior to flooding were not determined. What was potentially missed in the survey were sclerotia that had died and then decayed prior to recovery after various periods of flooding. Decayed sclerotia no longer are intact and are missed during the soil assay process.

More highly managed flooding field trials were initiated at the IREC in Tulelake. In this region, seasonal flooding is being investigated as a potential means of control of various crop pests in reclaimed lakebed soils. Sclerotia from decayed onions were mixed with enough soil to fill 60 mm inner dia x 60 mm high PVC chambers, 1,000 sclerotia per chamber. These were closed at the ends with fine nylon mesh. Soil was non-infested, 20 percent organic volcanic Tulelake muck. Chambers were buried 4 to 6 inches deep with nylon covered ends oriented up and down. Nine chambers per bucket were placed into 5-gallon microplot buckets filled with similar soil. Treatments (flooding durations) were replicated four times each. Soil in microplots was dampened at the time of burial, and flooding was initiated one month later in May, 1992. Since then, chambers from each treatment replication have been recovered on various schedules. For one test, chambers were recovered monthly through continuous seasonal flooding during 1992. Flooding was discontinued, but additional chambers will continue to be recovered yearly for two more years. For another test, chambers were recovered at regular intervals over two periods of seasonal flooding (1992 and 1993). Flooding period is determined by the irrigation season, May through October.

Intact sclerotia were recovered by concentrating them from soil by sieving through screens and flotation on a sucrose solution. Sclerotia then may be washed, surface disinfested, and placed on an appropriate growth medium to induce growth. The number of intact sclerotia and the number of viable-and-intact sclerotia will be reported as portions of the original 1,000 per chamber. Sclerotia can be stored dry or frozen for extended periods of time without deterioration.

The number of intact sclerotia (many of which will not be viable) recovered through August, 1993, suggest that perhaps 30-40 percent of the sclerotia fully decayed in the first few months and could not be recovered. Decay of intact sclerotia has not increased much since the first several months. This information could not be assessed in the earlier survey. Completed recovery of intact sclerotia and viability of recovered intact sclerotia for all dates through 1993 will be determined during the winter of 1993-94. Most data from both tests will be available by spring, 1994.