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NEW RESEARCH SHEDS LIGHT ON WHITE ROT CONTROL

White rot of onion and garlic, caused by the soilborne fungus *Sclerotium cepivorum*, is a worldwide threat to *Allium* production. An inoculum density of a single sclerotia in a liter of field soil can potentially result in crop failure and no economical control measures currently exist. Furthermore, once a field is infested, it will remain so for at least 40 years and probably longer since sclerotia of the fungus remain dormant indefinitely in the absence of *Allium* plants. Infested fields are often forever abandoned from further onion or garlic production.

Just a few sclerotia in the soil can cause significant yield losses. Economic loss can occur in levels as low as 0.1 sclerotum/liter of soil. Populations of 10 sclerotia/liter of soil will cause total crop loss. One sclerotia/liter of soil can be expected to cause 30 to 60% yield loss. As a result, attempts to manage the disease have focused on reducing sclerotia populations in the soil.

Once introduced into an area, *S. cepivorum* is gradually spread on contaminated equipment or planting materials, and slowly the production of garlic and onions in the entire region is threatened. Garlic culture is perhaps the principal mode of movement since it is propagated vegetatively, and garlic bulbs and cloves are sufficiently large that an infestation might go unnoticed.

White rot disease limited to *Allium* crops. The fungus successfully colonizes only *Allium* plants and sclerotia germinate only in response to exudation by *Allium* roots. Natural or man made stimulants can be applied to the ground in the absence of an *Allium* crop and the sclerotia may be

“tricked” into germinating. In the absence of a host, the sclerotium germinates, and then dies after exhausting nutrient reserves.

One natural sclerotial stimulant is diallyl disulfide (DADS) which is one of the root exudates from *Allium* plants. It also happens to be a by-product of petroleum distillation. When added to the soil it can stimulate the sclerotia to germinate in the absence of an allium host plant. In previous trials that UCCE researchers have done in California and Nevada the viable sclerotia population was reduced by 90%. Garlic powder is another sclerotial stimulant. In previous trials, garlic powder effectively reduced sclerotia viability by the same amount as DADS. Tarped methyl bromide was used at two locations as chemical control check and DADS and garlic powder work just as well as the methyl bromide checks.

The issue with scerotial stimulants however is that even with the reduction of 90% of the sclerotial population in the soil, economic losses still occur. Because so few sclerotia are required for disease to occur, even reductions of 90-95% of sclerotia in the soil will not prevent occurrence of white rot.

However, recent work by UCCE researchers has shown that the application of certain new fungicides at the time of planting can effectively control white rot season long. Whether used as a seed treatment on garlic cloves or an in furrow seed spray at planting of onions, healthy, marketable alliums can be produced in infested fields.

Sclerotial stimulants can still play an important role in managing white rot. Reducing sclerotia populations in infested fields will help reduce the spread of fungus from field to field. But to grow an economical feasible *Allium* crop in infested fields will require the use of fungicides at planting. Together these new materials will help maintain California’s leadership in *Allium* production in the US.

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