

Southern Blight: A challenge this year

This summer was exceptionally tough with higher-than-normal temperatures, and it may be the most important factor affecting the vegetable crop production in the central valley. Among other challenges, it was also a big year for southern blight in vegetable crops especially in tomatoes.

Southern blight caused by a soil borne fungus, *Athelia rolfsii* (previously known as *Sclerotium rolfsii*) becomes an issue every year during summer and has major impacts on vegetable crop production in Kern County. It is a very destructive disease with a wide host range (>500 species) that includes carrots, tomatoes, potato, garlic, melons, beans, peppers, onions, etc. It becomes an issue when the weather gets hot (temperatures above 85⁰ F) in the Central Valley of California and is favored by high soil moisture and frequent irrigation. Lately and unusually, this disease is also emerging as a concern in many northern counties of San Joaquin and Sacramento Valleys, where it was not typically a problem in the past. Although this is not a new disease in California, expansion in its range could lead to bigger problems if the environment is conducive and the disease is not managed properly.

Southern blight is often not recognized in the field until the plants begin to wilt and it is widespread in a field. The fungus primarily attacks a plant at the soil line where a brown to black water-soaked lesion develops. The lesion develops rapidly and girdles the stem leading to wilting of plants (Fig.1 & 2).



Fig 1. A wilted tomato plant



Fig 2. Wilted plants in a tomato field.

Depending on environmental conditions, white fungal mycelium may be seen growing at the crown/ base of the plant (Fig 3 & 4). Later on, the fungus produces numerous tan to reddish-brown colored alfalfa seed sized sclerotia at the base of the plant and the surrounding soil (Fig 5 & 6).



Fig 3. White mycelium on the soil surface near a carrot plant



Fig 4. Mycelium and sclerotia on a tomato stem and adjacent soil



Fig 5. Southern Blight on a carrot root



Fig 6. Tan, brown sclerotia

The fungus can also infect fruit that is in contact with infested soil. Each infected plant can produce hundreds of sclerotia. The disease becomes widespread with successive field operations and can cause significant losses within one or two seasons. It progresses rapidly under warm conditions. The fungus can survive and overwinter in the soil as sclerotia for years.

Management

Managing southern blight can be difficult especially with high levels of inoculum in the soil and conducive weather conditions. However, scouting the fields during summer months will be helpful in timely and accurate diagnosis of the disease and explore management options before the sclerotia levels become too numerous to cause considerable damage. Rotation with non-host or narrow-canopy crops can be a viable option, but its utility is often limited due to the pathogen's wide host range. Rotations with non-host plants such as small grains will help to significantly reduce sclerotia levels in the field. Some fungicides can be used at planting to help manage the disease but when the plants have dense canopies, getting fungicides to the base of the stem or drenching the soil is extremely difficult, especially with a buried drip irrigation system. Deep plowing to turn under the sclerotia may be helpful in reducing the sclerotia levels at the soil line but it is not an option in production systems with buried drip tape for irrigation especially in processing tomatoes.

Once the sclerotia levels become too numerous in a field, then fumigation using metam sodium will do an excellent job of controlling southern blight but the costs of fumigation and regulations may limit its use in many situations. Field trials are underway to evaluate the efficacy of some new chemistries, but it may be a while before we can assess the results and effectiveness of these products.

Going Forward: As this was a problematic year for southern blight, the inoculum levels have increased and depending on the weather it could emerge as a serious threat to vegetable production next year. Therefore, careful planning on the early planting, fumigation (depending on the crop and economics) and some cultural practice may help in reducing the impact of this disease.

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