

LOUISIANA PLANT HEALTH MANAGEMENT



Solving Plant Health Problems Caused by Biotic and Abiotic Stresses

Neopestalotiopsis Leaf, Fruit and Crown Disease of Strawberry (*Neopestalotiopsis* species)

Neopestalotiopsis leaf, fruit and crown disease of strawberry was first confirmed in Louisiana in February of 2022. The disease is caused by a fungus called *Neopestalotiopsis* species, which was first detected in Florida in 2017. More extensive disease outbreaks occurred there in the 2018-2019 and 2019-2020 growing seasons. Although fungal species including *Pestalotiopsis* species and *Neopestalotiopsis rosae* have been reported to cause similar symptoms on strawberries, plant pathologists with the University of Florida have confirmed that the disease outbreaks were caused by a newly identified strain of *Neopestalotiopsis*

which is morphologically and genetically different from previously reported pathogens. Additionally, more than one aggressive strain of *Neopestalotiopsis* species varying in its ability to cause the disease has been reported from the southeastern United States.

Neopestalotiopsis species can infect both above and below ground plant parts, including leaves, fruits and crowns. The first symptoms of leaf infection appear as small, light to dark brown spots with dark margins and light (tan) colored centers (**Figure 1**). As the disease develops, spots enlarge and coalesce to give a blighted leaf appearance (**Figure 2**).



Figure 1. Initial leaf spot symptoms produced by *Neopestalotiopsis* species.

Figure 2. Older leaf spots exhibiting tiny black fruiting bodies of the pathogen in the center (pointed out by black arrow) of an older leaf spot caused by *Neopestalotiopsis* species.

All photos by Raj Singh

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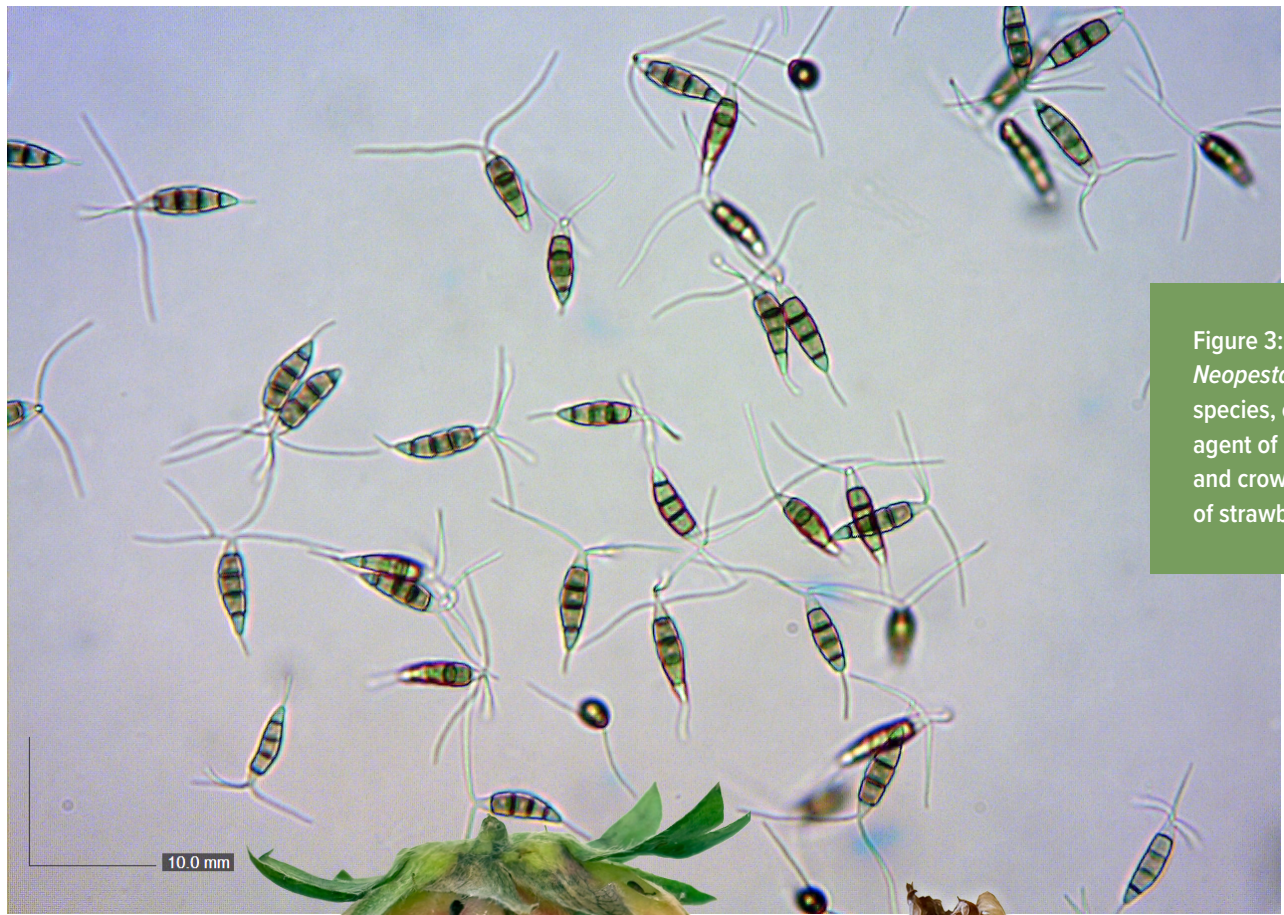


Figure 3: Spores of *Neopestalotiopsis* species, causal agent of leaf, fruit, and crown disease of strawberry.

Figure 4. (Right) A diseased strawberry fruit exhibiting light brown sunken lesion caused by *Neopestalotiopsis* species. Figure 5. (Far right) A diseased strawberry plant showing reddening of leaves.



Microscopic examination of older spots reveals the presence of dark fruiting bodies (**Figure 2, pointed out by black arrow**) that produce fungal spores (**Figure 3**) under favorable environmental conditions, resulting in pathogen dispersal. Fruit infection starts with tan to light brown sunken lesions that later expand and cause fruit rot (**Figure 4**). Small black fungal fruiting bodies appear on fruit lesions as the disease progresses. Strawberry plants with crown rot infection may appear stunted and exhibit reddening of leaves (**Figure 5**).



Figure 6. Dark brown internal rotting of strawberry crown caused by *Neopestalotiopsis* species.

Infected plants eventually wilt and die. Dark brown internal rotting of the crown area may be visible when diseased plants are cut open (**Figure 6**).

The disease can be introduced to new strawberry fields via infected planting stock. Once introduced, the pathogen spreads within the field or to nearby fields by water splash, contaminated equipment and workers. The fungus can survive on infected strawberry plant debris and may serve as a source of inoculum for the next season's crop. Research in Florida has shown that *Neopestalotiopsis* can survive for up to 17 months in intact strawberry crowns. *Neopestalotiopsis* is favored by rainy weather and disease development is optimum between 77 to 86 F. Wetness is more problematic than optimal temperatures.

Successful disease management requires integrating cultural and chemical control practices. Growers should attempt to buy disease-free, healthy plants to avoid the introduction of the pathogen. Growers should practice crop rotation if possible and avoid planting strawberries in fields where they have been planted for at least two years after the last strawberry crop. Because *Neopestalotiopsis*

species can survive in dead plant tissue, take measures to encourage strawberry plant debris to break down faster. Removing plants from the field is preferable but may not be practical. If plants are left in the field at the end of the season, implements such as disk harrows that chop up plant materials should be used.

Fumigation with a combination of 1,3-dichloropropene and chloropicrin substantially reduces *Neopestalotiopsis* species populations in the soil, and fumigation has an important role in managing this disease. However, since fumigants are typically only applied in the raised rows, the fungus can survive in row middles.

Careful inspection of transplants is necessary, as initial disease symptoms may not be readily visible. Plants diagnosed with *Neopestalotiopsis* prior to planting should be destroyed. If *Neopestalotiopsis* species is identified on the farm, good sanitation is critical. Areas with the disease should be worked in last, and equipment, clothing, footwear and hands should be cleaned before moving to other areas. Sanitation of farm equipment is helpful in reducing local disease spread within and to nearby fields. Farm workers should limit field activities when plants are wet, since the fungus spreads in water.

The row covers that growers use to protect flowers and fruit from cold temperatures may play a role in spreading the fungus and creating an environment more favorable for disease. *Neopestalotiopsis* species can survive on soiled areas of the row covers for some time. Growers who use wire hoops to hold up row covers may have a lower risk of spreading the fungus due to reduced contact with plants. If row covers will be reused the following season, practices such as storing them in closed metal tractor trailers during the summer may be beneficial, as exposure to temperatures of 104 F and hotter has been shown to reduce survival of *Neopestalotiopsis* species spores.

No fungicide provides complete control of *Neopestalotiopsis*, but Switch (cyprodinil + fludioxonil) and thiram are considered the best options. Each can only be used a certain number of times in a season, as indicated on their labels. Switch should be used when conditions are most favorable for disease. Rhyme (flutriafol) and propiconazole (Tilt and others) provide some suppression of *Neopestalotiopsis*, as well, and can be integrated into the spray program.



Figure 7. Anthracnose fruit rot caused by *Colletotrichum* species.



Figure 8. (Left) Internal brown rotting of strawberry crown caused by *Colletotrichum* species.

Figure 9. (Right) Internal brown rotting of strawberry crown caused by *Phytophthora* species.

Disease caused by *Neopestalotiopsis* species can be easily confused with other strawberry diseases including other fungal leaf spots, fruit anthracnose (Figure 7), crown rot caused by *Colletotrichum* species (Figure 8) and crown rot caused by *Phytophthora* species (Figure 9). Therefore, accurate diagnosis is required. If you suspect this disease in your strawberries, please contact your parish agent.

For information on submitting samples suspected of having strawberry *Neopestalotiopsis* disease to the LSU AgCenter Plant Diagnostic Center for accurate identification, call 225-578-4562 or visit www.lsuagcenter.com/plantdiagnostics.

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