Martin-Gatton
College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-FR-S-12**

Neopestalotiopsis Disease of Strawberry

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Importance

Neopestalotiopsis disease (Figure 1) was identified in a single plasticulture planting in Florida in 2018 and has since spread rapidly throughout the Southeastern U.S. and Canada causing extensive damage. This disease (hereafter referred to as Neopest disease) was first identified in Kentucky in 2024. Disease can affect all plant parts, reducing yields and resulting in plant death.

Research is ongoing, and there is still much that is not understood about this disease's origin, spread, and management. This publication outlines what is currently known as it applies to Kentucky growers.

Symptoms & Signs

All plant parts can be affected by Neopest disease: leaves, fruit, roots, and crowns.

Leaves

The earliest indications of Neopest disease are leaf spots appearing on older leaves, particularly as new strawberry plants are establishing. Spots are circular, light to dark brown with a darker margin (Figures 2A and 2B). As spots enlarge, they become irregularly shaped, and centers become tan-colored. Spots eventually coalesce; spots that reach leaf margins become V-shaped (Figure 2C). Dark spore-producing structures (acervuli) develop in the tan centers of older lesions (Figure 2D).

Leaf symptoms can easily be confused with other strawberry diseases, such as leaf blotch, Phomopsis leaf blight, common leaf spot, Cercospora leaf spot, or leaf scorch. However, only Neopest disease symptoms include the presence of acervuli.

Figure 1 Neopestalotiopsis (Neopest) disease affects all straweberry plant parts, including leaves, fruit, crowns, and roots, resulting in reduced yields and plant death. Symptoms can easily be confused with other strawberry diseases.

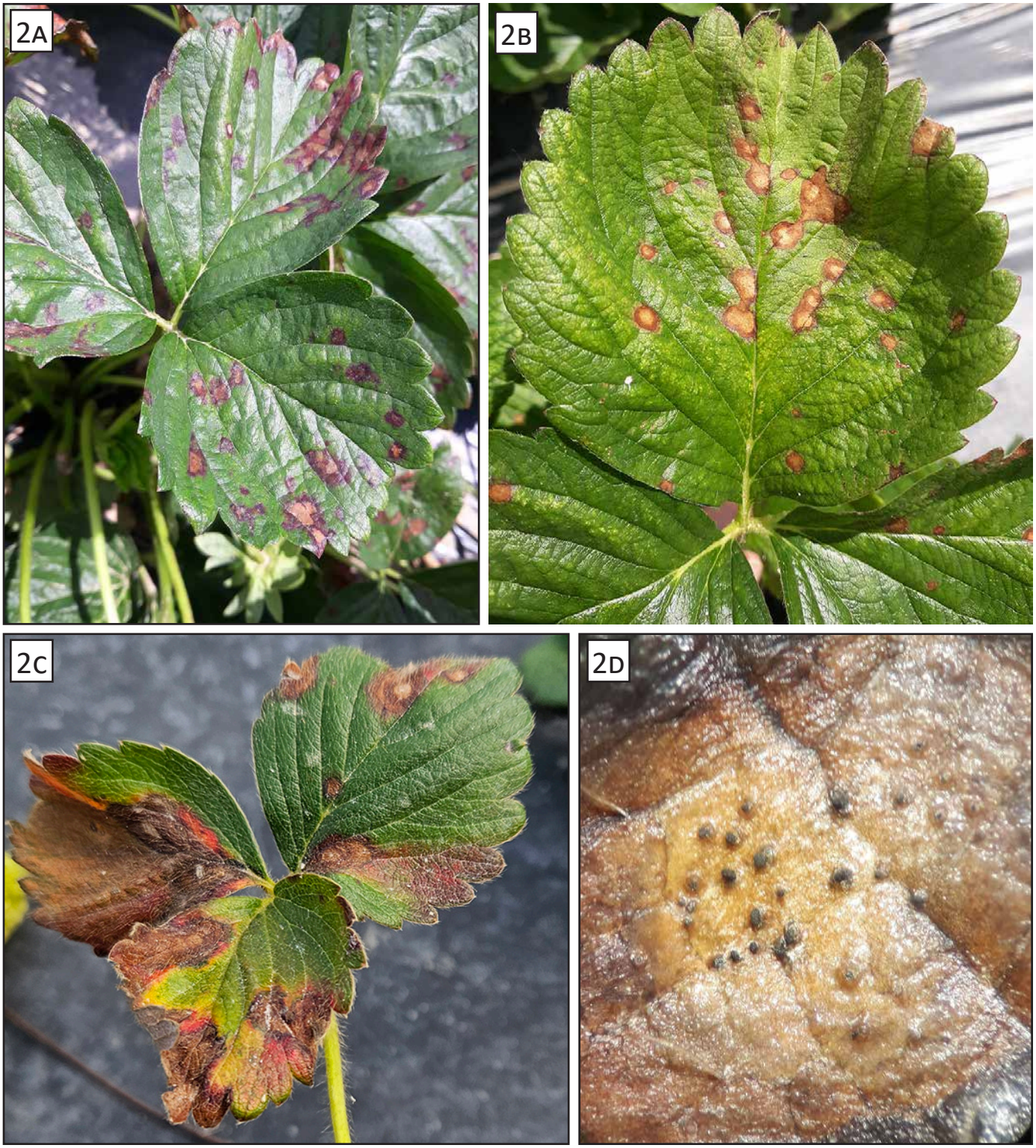

Figure 2. Leaf symptoms include circular brown spots **(A & B)** that enlarge to irregularly shaped lesions; spots that reach leaf margins become V-shaped **(C)**. Fungal fruiting bodies (acervuli) appear as tiny black specks in the leaf spot centers of older lesions **(D)**.

Fruit

Fruit spots are initially small, light tan, sunken, and irregular in shape (Figure 3A). Lesions can quickly expand to encompass entire fruit. Fungal fruiting bodies (acervuli) developing in spot centers are shiny, wet-looking (Figure 3B), and exude black spore masses; acervuli are more common in rainy weather.

Fruit symptoms can resemble other fruit rot diseases, particularly anthracnose fruit rot. However, Neopest disease can be distinguished from other diseases by the presence of distinctive acervuli in lesions (Figure 3B).

Figure 3. Spots on fruit are sunken and irregular **(A)**; shiny, wet-looking fruiting bodies (acervuli) develop in centers of lesions during wet or humid weather **(B)**.

Roots/Crowns

Leaf infections can spread into crowns and roots. Early evidence of crown rot includes reddened older leaves (Figure 4A), while new leaves are often smaller than normal. Affected plants may appear stunted, unhealthy, and/or fail to become established. Ultimately plants wilt, collapse (Figure 4B), and die. Examination of infected crowns reveals an orange-brown necrosis, while diseased roots are dark in comparison to healthy white roots. Crown rot can occur anytime in the plant growth cycle, but it is usually more common and more severe during fruit production.

The crown rot phase of this disease is similar to that of anthracnose and Phytophthora crown rots. However, plants with Neopest disease will also have leaf and fruit symptoms as described above.

Figure 4. Crown rot symptoms include reddening of older leaves **(A)** and stunting of younger leaves; plants ultimately wilt, collapse **(B)**, and die.

Diagnosis

Due to the nature of Neopest disease and its potential severity, accurate diagnosis is critical. Because many Neopest disease symptoms mimic other common strawberry diseases, it is important that growers not rely on symptoms alone for disease identification. Suspect samples should be submitted to a local county Extension office. However, those samples may need to be forwarded to the UK Plant Disease Diagnostic Lab for verification since it is often necessary to confirm disease presence via laboratory analysis or microscopic examination.

Cause & Disease Development

Originally thought to be caused by a species in the genera of *Pestalotia* (generally considered weak or secondary pathogens), isolates of this fungus have now been identified as one or more species of *Neopestalotiopsis*, a much more aggressive pathogen.

The Neopest pathogen overwinters in soil, on crop residue (infected crowns, leaves, and fruit), and on asymptomatic weeds. It is believed to persist in soil from one year to another, possibly up to 3 years; however, its longevity in fields is still under investigation.

The pathogen is often brought into fields via infected plugs that came from contaminated nurseries. Disease can spread within fields and to nearby fields once introduced. Spread within fields occurs via water splash (rain and overhead irrigation) and wind-driven rain. In addition, worker hands, clothing, and boots, as well as tools and equipment, can spread fungal spores and infested soil.

While infections can occur at temperatures as low as 50°F, temperatures in the 68°F to 86°F range are optimal. However, wetness actually plays the most important role in pathogen infections. Extended wetness (48 hours or more) and consecutive rain events can lead to rapid disease development and spread.

Disease management

Neopest disease is extremely difficult to manage. Current recommendations involve a combination of cultural practices and fungicide strategies. At the time of this publication, there are no resistant cultivars available, although some cultivars have differing levels of susceptibility.

Cultural practices

To avoid introduction of disease

- Plant certified disease-free transplants from a reputable dealer as the primary means of avoiding the introduction of Neopest into fields.
- Carefully examine all transplants and reject any that appear unhealthy.
- Do not try to "save" suspect transplants with fungicide applications.

If disease is present in one or more fields

- Work infested fields last and sanitize tools and equipment after leaving those fields. Anything that moves soil can carry the pathogen from one field to another, so workers should wash and sanitize hands, boots, and clothing after leaving infested fields.
- Remove infected plants (including crowns and as much of the root system as possible) and destroy to help limit spread and remove potential overwintering sites. Never leave plant debris in or near fields.
- Maximize leaf drying by managing weeds within plantings and alleyways.
- Avoid overhead irrigation.
- Deep till before and after the growing season.
- Rotate from strawberries to non-host crops for 3 or more years.

Fungicides

There are no fungicides specifically registered for managing Neopest disease; however, field trial data from other states have identified several fungicides (which are registered for other strawberry field diseases) that can help suppress the fruit rot and leaf spot phases of Neopest disease. These fungicides (Tables 1 & 2) are applied as protectants using an aggressive spray program throughout the season; spray schedules are based on Kentucky's growing season. While these fungicides will suppress fungal activity to certain extent, they will not cure disease. Note that Switch (FRAC 12 + 9) is at risk for resistance development, so it is important to alternate this fungicide with other FRAC groups. Some organic products (Serenade Opti and Actigard) have shown some activity against the Neopest pathogen, but efficacy is lower than conventional products.

Follow label instructions regarding number of allowed applications, rates, and pre-harvest intervals. Plug growers should check labels for greenhouse use restrictions.

Table 1. Suggested spray schedule to manage Neopest disease in HIGH RISK plantings (high risk = when disease affects plants early in the season and weather conditions are wet). Apply every 10 to 14 days.

#	Timing	Fungicide(s)	FRAC group
1	**Fall** (Begin soon after transplant)	Thiram SC[1]	M
2		Thiram SC + Switch[2]	M + 12 + 9
3		Thiram SC + Rhyme/Inspire/Tilt[3]	M + 3
4		Thiram SC + Switch	M + 12 + 9
5		Thiram SC + Rhyme/Inspire/Tilt	M + 3
6		Thiram SC, repeat until row cover	M
7	**Spring** (Begin as weather warms)	Thiram SC	M
8		Thiram SC	M
9		Thiram SC + Switch	M + 12 + 9
10		Thiram SC + Rhyme/Inspire/Tilt	M + 3
11		Thiram SC + Switch	M + 12 + 9
12		Thyram SC + Rhyme/Inspire/Tilt	M + 3

[1] Maximum number of applications permitted by the label for Thiram is 12. PHI = 1 day. EPA is expected to limit or restrict the use of Thiram.
[2] Maximum number of applications permitted by the label for Switch is 5. PHI = 0 day.
[3] Maximum number of applications permitted by the label for Rhyme, Inspire, and Tilt is 4. PHI = 0 day.

Table 2. Suggested spray schedule to manage Neopest disease in MODERATE RISK plantings (moderate risk = when disease affects plants late in the season and weather conditions are dry). Apply every 10 to 14 days.

#	Timing	Fungicide(s)	FRAC group
1	**Fall** (Begin soon after transplant)	Thiram SC[1]	M
2		Switch[2]	12 + 9
3		Thiram SC	M
4		Rhyme	3
5		Thiram SC	M
6		Thiram SC, repeat until row cover	M
7	**Spring** (Begin as weather warms)	Thiram SC	M
8		Thiram SC	M
9		Switch	12 + 9
10		Thiram SC	M
11		Switch	12 + 9
12		Thiram SC	M

[1] Maximum number of applications permitted by the label for Thiram is 12. PHI = 1 day. EPA is expected to limit or restrict the use of Thiram.
[2] Maximum number of applications permitted by the label for Switch is 5. PHI = 0 day.

Fumigation

Some states are strongly encouraging the use of fumigants when planting strawberries into fields with a history of disease. However, fumigation is uncommon in Kentucky due to cost, regulations, and limited number of commercial applicators who provide this service to small-scale producers.

When properly applied, fumigants can reduce fungal populations but not eliminate fungal inoculum in soils. In addition, studies have shown that the effect is only temporary (e.g., a single season). Soil fumigants are dangerous to people and animals and must be applied with extreme caution. In addition, fumigants can kill beneficial organisms in the soil.

Additional Resources

Neopestalotiopsis Disease

- Neopestalotiopsis Leaf, Fruit, and Crown Rot of Strawberry (NC State)
https://content.ces.ncsu.edu/neopestalotiopsis-leaf-fruit-and-crown-rot-of-strawberry
- Neopestalotiopsis Crown, Leaf and Fruit Disease on Strawberry (Southern Region Small Fruit Consortium)
https://smallfruits.org/2024/10/neopestalotiopsis-crown-leaf-and-fruit-disease-on-strawberry/
- Pestalotia Leaf Spot and Fruit Rot of Strawberry (University of Florida/IFAS)
https://edis.ifas.ufl.edu/publication/PP357

Other Strawberry Diseases

- Anthracnose Fruit & Crown Rot of Strawberry (PPFS-FR-S-05)
https://plantpathology.ca.uky.edu/files/ppfs-fr-s-05.pdf
- Botrytis Blight (PPFS-GEN-19)
https://plantpathology.ca.uky.edu/files/ppfs-gen-19.pdf
- IPM Scouting Guide for Common Problems of Strawberry in Kentucky (ID-238)
http://www2.ca.uky.edu/agcomm/pubs/ID/ID238/ID238.pdf
- IPM Scouting Guide for Common Problems of Strawberry (mobile website)
https://fruitscout.ca.uky.edu/

January 2025

Photos
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