In 2025, nine strawberry fields across Vermont were assessed for crown/root, foliar, and fruit diseases as part the "Managing Disease in Organic Strawberry Production" project (# 02200-SCBGP-21-02). At each farm a member of the UVM Extension Northwest Crops and Soils Program (NWCS) evaluated two strawberry varieties. A total of eight varieties were evaluated; "Jewel" was assessed at six of the nine farms (Table 1). Each location used a different set of management practices (Table 2). Assessments were conducted at two different times, once in May (prior to fruit set) and once in June or July (during harvest).

Table 1. Strawberry varieties and number of years fruiting at each farm location in 2025.

Farm	County	Varieties evaluated	Year of fruiting
1	Franklin	Not specified	1st year
2	Washington	Jewel and Wendy	2nd year
3	Orleans	Jewel and Melwina	1st year
4	Caledonia	Honeoye and Sonata	1st year
5	Addison	Jewel	1st year
6	Franklin	Jewel and FlavorFest	1st year
7	Addison	Jewel and Darselect	1st year
8	Sullivan (NH)	Jewel and Cabot	2nd year
9	Grand Isle	Cabot	2nd year

Table 2. Strawberry management practices at each farm location in 2025.

Farm	County	Matted row or Plastic	Plant spacing inches	Fertilizer	Disease management
1	Franklin	Plastic	12	Pro-Grow & Ferticell	BT
2	Washington	Matted row	18	Compost, Bonechar, & Pro-Booster	Probiotics, Neptunes Harvest, Tainio Micro 5000
3	Orleans	Matted row	14	Green manure, Probooster, & Bonechar	Milstop, Cease, & Seaweed
4	Caledonia	Plastic	12	Epsom Salt, Azomite, Organic Gem	None
5	Addison	Matted row and Plastic	12	Fish 3-3-3	Oxidate
6	Franklin	Matted row	NA	Peanut meal and Chilean Nitrate	Cease, BotryStop, & Pygantic
7	Addison	Plastic	NA	Dairy manure, KNO3, Epsom Salt	NA
8	Sullivan (NH)	Matted row	12	Krehers 5-4-3	Oxidate
9	Grand Isle	Plastic	10	Pro-Booster & Pro-Grow	Low tunnels

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In May, the incidence (presence or absence) of foliar disease was recorded on 100 plants per variety. A total of 1,700 plants were evaluated for foliar fungal pathogens including “Angular Leaf Spot” (*Xanthamonas* spp.), “Powdery Mildew” (*Sphaerotheca* spp.), “Leaf Spots” (*Mycosphaerella* spp.), “Leaf Scorch” (*Diplocarpon* spp.), “Leaf Blight” (Phomopsis spp.), and abiotic symptoms (i.e. nutrient deficiencies, frost or wind damage, etc.) (Figure 1).

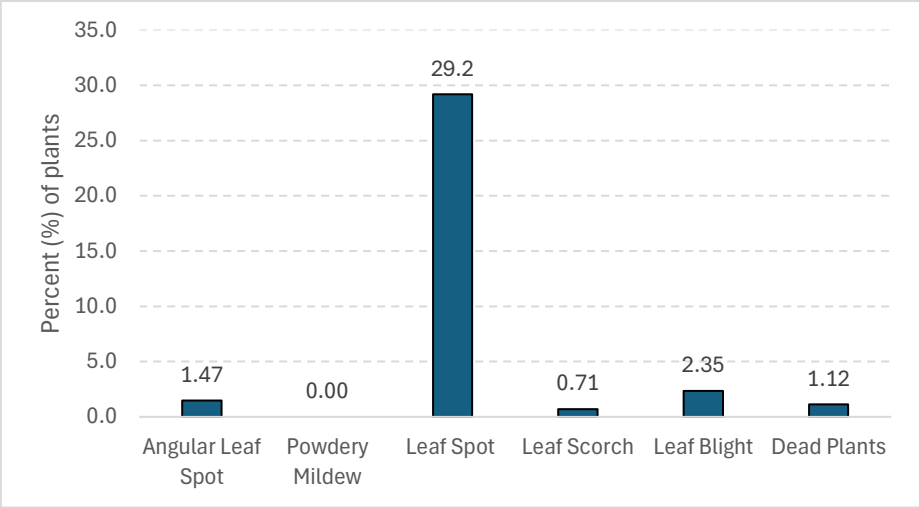

Figure 1. Incidence of plants exhibiting foliar diseases observed during field scouting in May (n=1700).

At this time 1-5 whole plant samples were collected from each variety to assess the incidence of crown/root disease and winter injury. Sixty-five plants were tested for crown/root diseases including “Black Root Rot Complex”, (*Pythium, Rhizoctonia, and Idriella* spp.), “Red Stele Root & Crown Rot” (*Phytophthora* spp.), “Anthracnose Crown Rot” (*Colletotrichum* spp.), and winter injury (Figure 2). All samples were assessed at the University of Vermont Plant Diagnostic Clinic (PDC).

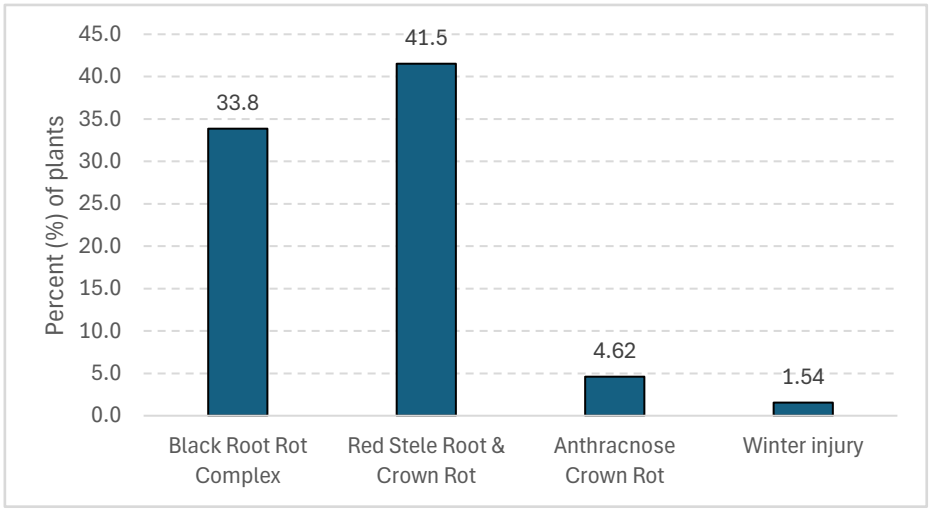

Figure 2. Crown/root diseases identified by the UVM PDC on plant samples collected in May (n=65).

In June and July, fruit assessments were conducted on 100 berries per variety per farm. A total of 1,700 berries were assessed. The fruit assessment evaluated fungal pathogens, insect damage, and abiotic damage (i.e. excess water, hollow centers, and ripeness) (Figure 3). The fungal

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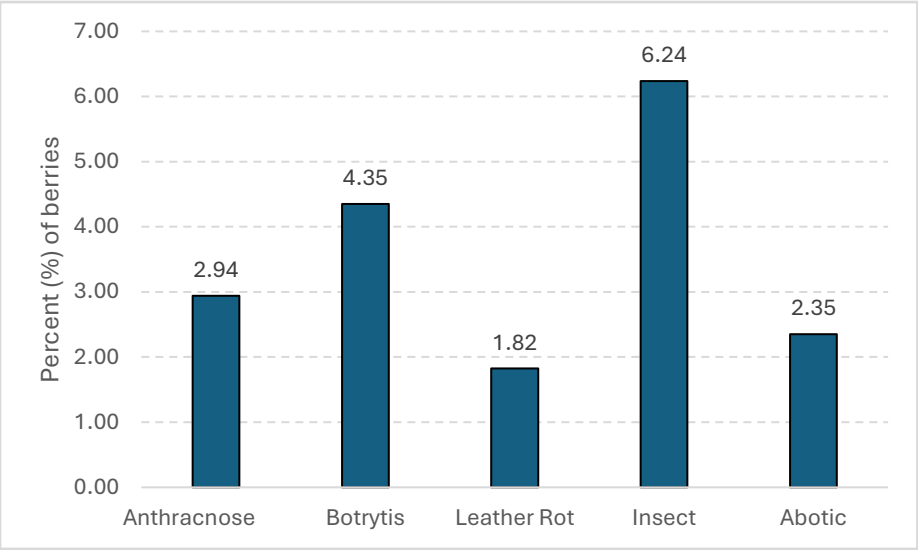

Figure 3. Incidence of berries exhibiting fruit diseases observed during field scouting in June and July (n=1700).

pathogens included "Anthracnose" (*Colletotrichum* spp.), *Botrytis cinerea*, and "Leather Rot" (*Phytophthora cactorum*). At each farm, representative fruit samples were brought to the PDC for confirmation.

During the June/July scouting date, soil samples were taken from each strawberry field to evaluate the presence of plant-pathogenic nematodes. Twenty, 1x8-inch soil cores were taken around the field near plant roots and sent to the University of Arkansas Nematode Diagnostic Lab for diagnostics. Soil samples were assessed for fifteen different nematode species, but only two species were found, "Lesion" (*Pratylenchus* spp.*)* and "Lance" (*Hoplolaimus* spp.) nematodes. Of the fifteen plant-pathogenic nematodes, Lesion nematodes were the most common, present on 88% of the farms with an average of 12.3 nematodes per 100 cm^3 of soil. Lance nematodes were also present on 11% of the farms with an average of 0.4 nematodes per 100 cm^3 of soil. Both nematodes can cause root damage which can lead to stunting, reduced plant vigor, and a decline in productivity. Nematode feeding can make roots vulnerable to pathogenic fungi and bacteria. Studies have found Lesion nematode to be associated with black root rot disease. The damage threshold of the lesion nematode is 50 nematodes per 100 g of soil. If black root rot pathogens are present in the soil (i.e. *Rhizoctonia fragariae*) the threshold could be lowered. Currently, management options for nematodes and black root rot are limited. Implementing a 3-5 year crop rotation using cover crops and cash crops, but avoiding crucifers and legumes, could limit pathogen buildup.

In summary, all farms surveyed had multiple foliar and fruit pathogens present in the field. Leaf spot was the most prevalent foliar pathogen observed during scouting with 29.2% of all plants observed showing signs of the pathogen, followed by leaf blight at 2.35%. *Botrytis* was the most prevalent fruit pathogen, with 4.35% of all berries showing symptoms, followed by Anthracnose at 2.94%. Of the 65 strawberry plants examined at the PDC two crown and root diseases stood out. Red Stele Root & Crown Rot was the most prevalent found at 88% of the with farms with 41.5% of the plant

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samples showing signs. Black Root Rot Complex was found at 77% of the farms with 33.8% of the plant samples showing signs (Table 3). Lesion nematodes were present in all but one farm. However, the overall quantity of nematodes reported from the farms (12.3 nematodes per 100 cm^3 of soil) did not reach the economic threshold.

Table 3. Summary of diseases and nematodes present at each farm location in 2025.

		Farm								
	Diseases	1	2	3	4	5	6	7	8	9
Crown/Root	Black Root Rot Complex	x †	x	x	-	x	x	-	x	x
	Red Stele Root & Crown Rot	x	x	x	x	x	x	x	x	-
	Anthracnose Crown Rot	x	-	-	-	x	-	-	x	-
Foliar	Angular Leaf Spot	x	-	x	x	-	-	x	x	x
	Powdery Mildew	- ‡	-	-	-	-	-	-	-	-
	Leaf Spot	x	-	x	x	x	x	x	x	x
	Leaf Scorch	-	x	-	x	-	x	-	x	-
	Leaf Blight	x	x	-	-	-	-	x	-	x
Fruit	Anthracnose	x	x	x	x	x	x	x	x	x
	Botrytis	x	x	x	-	x	x	x	x	x
	Leather Rot	x	-	x	x	x	x	x	-	-
Nematode	Lesion	x	x	x	x	x	x	-	x	x
	Lance	-	x	-	-	-	-	-	-	-

† "X" indicates there was a presence of disease or nematode.
‡ "-" indicates there was **not** a presence of disease or nematode.

For more information on the lifecycle and management of these strawberry diseases and pests please visit the New England Small Fruit Management Guide and Cornell's Berry IPM site. For information regarding Lesion nematode and black root rot specifically, please visit MSU's nematode problems on strawberries and Strawberry Black Root Rot publications. NWCS is in the process of putting together IPM factsheets for the major pathogens found during this survey and will be provided to each grower upon completion.

References

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