Low Tunnels for Disease Management in Strawberries

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Overview

For many Vermont (VT) farmers, strawberries are a large revenue source, and strawberry diseases can have a significant impact on yield and quality. Based on a 2025 survey, VT strawberry growers harvest an average of 9,195 lbs. of strawberries per acre and sell them for $4.50 per pound. In the same survey, 50% of the respondents' farms were certified organic and 56% did not feel confident managing diseases organically. All respondents wanted more disease management resources. Managing strawberry diseases can be challenging. This is especially true for organic growers as they are limited in effective control options that meet organic standards.

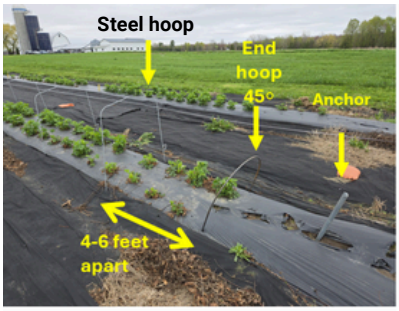
During 2025 and 2026, UVM Extension conducted a research trial at Borderview Research Farm in Alburgh, VT, to evaluate the efficacy of low tunnels as a disease management tool for strawberries. Two strawberry varieties, Jewel and Sonta, were included in the study. Jewel is a popular variety grown in VT, known for its consistent productivity, firm texture, and great flavor with moderate susceptibility to root diseases, powdery mildew, and leaf spot. Sonata is not as common in VT, but is known for its high productivity, flavor, and resistance against soil borne pathogens. Four treatments were evaluated: low tunnel only, fungicide only, fungicide and low tunnel, and control (untreated/uncovered). Low tunnels were established as soon as we noticed the first blossoms on the plants. Fungicide treatments were applied weekly for four weeks, starting at first blossom and ending a week before harvest. The fungicide was Double Nickle LC, a certified organic product with Bacillus amyloliquefaciens strain D747as the primary active ingredient (EPA Reg #: 70051-107, Certis Biologicals, Columbia, MD).

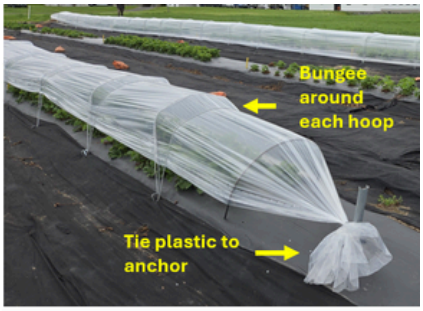
What are low tunnels?

Low tunnels are temporary structures, approximately 3 feet tall, that protect crops from biotic and abiotic factors (i.e. insect & disease pressure, heavy rainfall, wind). Low tunnels can be a small-scale, portable, and relatively inexpensive strategy (approximately $0.25 per sq. ft.) to extend the growing season by an average of two weeks while providing a non-chemical protective barrier for crops.

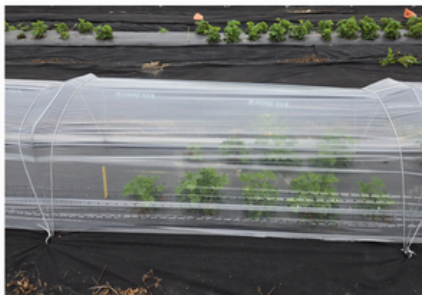
Standard low tunnel components:

1. **Hoops:** Resting 2-3 ft above plant. Usually steel, but conduit or PVC piping can be used.
2. **Anchor objects:** Stake, post, or pipe placed at both ends to provide a grounded object for plastic cover.
3. **Tie-down material:** Bungees, twine, or parachute cord can be used to secure plastic.
4. **Agricultural plastic cover:** Pictured is 7 ft wide, 1.5 mil, perforated clear plastic. There are many options available.









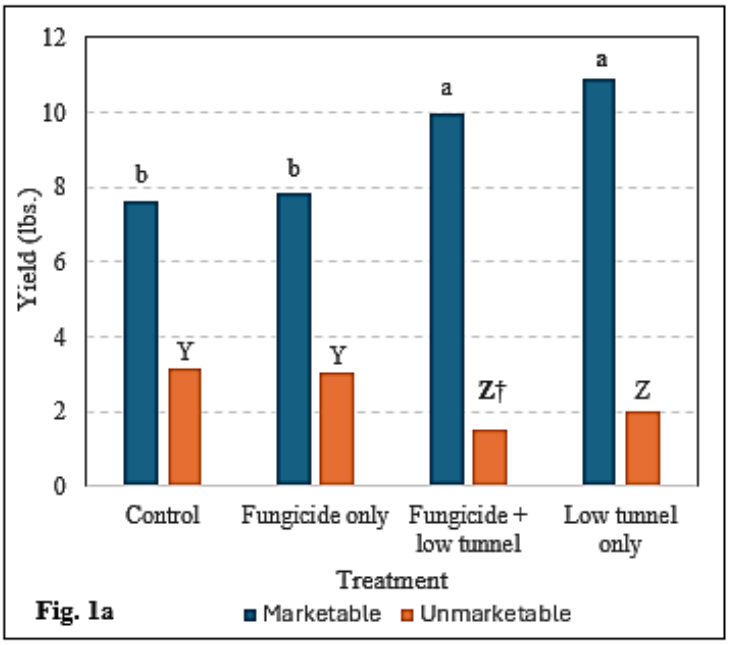


Fig. 1a

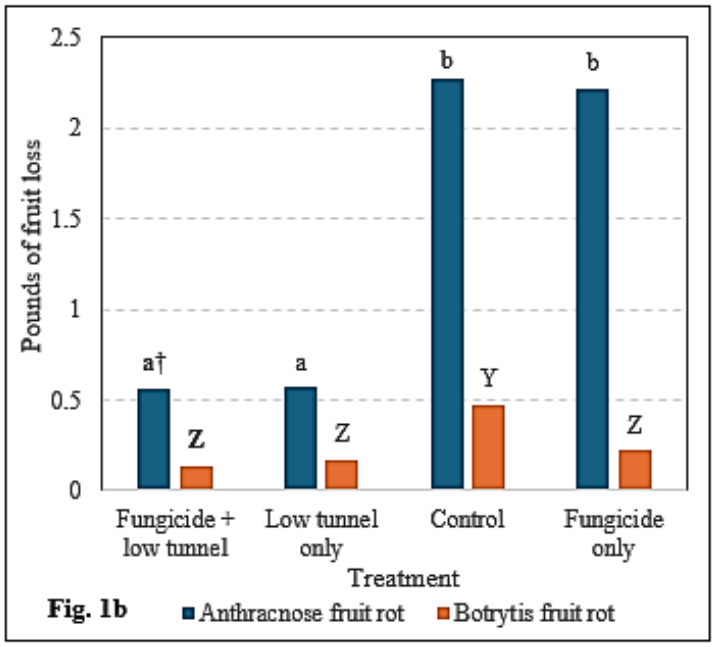


Fig. 1b

Figure 1. Fruit yield totals (a) and pounds of fruit lost to disease by treatment (b), Alburgh, VT.
†Treatments with the same letter did not differ significantly at p=0.10; the top performer is bold.

Results from the two-year research project indicate that the use of low tunnels can improve marketable yields and reduce the amount of unmarketable fruit (Fig. 1a). Low tunnels also helped to reduce fruit loss from common diseases, specifically Botrytis and anthracnose (Fig. 1b). On average, low tunnels decreased anthracnose fruit rot incidence up to 3 times compared to using only fungicides or left untreated. Similarly, having either a fungicide program, low tunnel, or a combination of the two reduces the incidence of Botrytis fruit rot 2.0 to 3.5 times compared to leaving plants untreated. These results highlight the value low tunnels can provide to organic growers. Overall, plants covered by low tunnels had the least disease and highest yield.

Both strawberry varieties performed the same regardless of the treatment. However, variety selection plays a critical role in minimizing disease incidence and severity. Choosing varieties with more resistants can help minimize yield loss when conditions are favorable for infection (Table 1).

Benefits & Limitations of Using Low Tunnels in Strawberries

Benefits

- Extends the growing season
- Protects crops from weather events such as heavy rain and wind
- Reduces diseases spread by rain-splash, including anthracnose fruit rot (Colletotrichum acutatum) and Botrytis (Botrytis cinerea)
- Can increase marketable fruit yield

Limitations

- May increase powdery mildew incidence
- Can make pesticide applications more difficult, if needed.
- Sides may need daily adjustment or adjustment before storms, adding labor
- Establishing and managing tunnels requires additional labor and cost

Table 1. Strawberry variety and impact on fruit yields and losses from disease, Alburgh, VT.

Variety	Marketable yield	Unmarketable yield	Anthracnose	Botrytis
	lbs. of fruit			
Jewel	5.52[b]	**1.24[a]**	**0.18[a]**	**0.07[a]**
Sonata	**12.7[a]†**	3.64[b]	2.63[b]	0.43[b]
LSD (*p*=0.10) ‡	1.18	0.36	0.60	0.12
Trial Means	9.09	2.44	1.41	0.25

† Within a column, treatments with the same letter are not statistically different. The top performer is bold.
‡ LSD; Least Significant Difference (p=0.10).

Based on the two-year study evaluating the efficacy of different disease management strategies in organic strawberries:

- Variety selection is key and acts as the first line of defense against diseases in strawberries. If disease pressure is high, a more resistant variety could help reduce yield losses.
- Low tunnels alone can reduce yield loss by 150 lbs. per acre; saving growers $679 per acre in fruit loss compared to an untreated acre.
- Fungicide (Double Nickle) can reduce yield loss up to 13.0 lbs. per acre; saving growers up to $59 per acre in fruit loss compared to an untreated acre.
- Dual management (Low tunnel + fungicide) can reduce yield loss by 218 lbs. per acre; saving growers $979 per acre in fruit loss compared to an untreated acre.

For more information regarding NWCS strawberry research please visit the UVM Extension Northwest Crops and Soils website at go.uvm.edu/nwcs.





References

Natural Resources Conservation Servies. (2025). *Small farms: Low tunnel systems.* [Fact sheet]. U.S. Department of Agriculture. https://www.nrcs.usda.gov/sites/default/files/2025-08/Low%20Tunnels%20Fact%20Sheet_IA%20NRCS_2025.pdf

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