



## Northern New York Agricultural Development Program 2024 Project Report

### Improving High Tunnel Production in Northern New York

#### Project Leaders:

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#### Collaborators:

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- **Christy Hoepfing**, Regional Vegetable Specialist, Cornell Vegetable Program, 12690 Route 31, Albion, NY 14411, [cah59@cornell.edu](mailto:cah59@cornell.edu), (585) 721-6953
- **Judson Reid**, Regional Vegetable Specialist, Cornell Vegetable Program/Harvest N, 417
- **Northern New York high tunnel producers**

#### **Background:**

After more than a decade of funding available from the Natural Resource Conservation Service for farms to purchase high tunnels, many farms in Northern NY (NNY) now have more than one tunnel for growing crops year-round. With more protected space for crop production, growers are interested in expanding their high tunnel crops beyond tomatoes and cucumbers in the summer. Farmers in NNY suggested evaluating melons as an alternative summer high tunnel crop as a 2023 Northern New York Agricultural Development Program (NNYADP) research project. In 2024, we conducted a second year of that experiment evaluating two vertical trellising systems for high tunnel cantaloupe, measuring yield and developing an enterprise budget for the crop.

With two seasons of data from 2023-2024, we have developed recommendations for growers interested in trying this crop, and our budgets may be used as a reference to understand potential profitability compared to other summer crops. Our outreach activities in 2024 focused on supporting high tunnel and other horticultural crop producers through field meetings, marketing, and food safety programming, pesticide certification preparation, and demonstration of a new technique to manage the invasive pest swede midge (see Methods and Results).

## **Methods:**

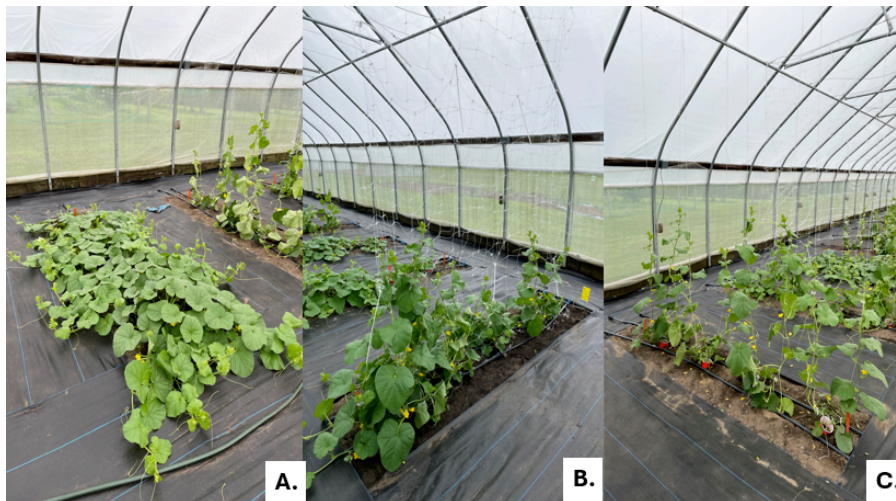
### **High Tunnel Melon Trellising and Variety Trial: Year 2**

In 2024, we replicated our 2023 NNYADP experiment at the Cornell Willsboro Research Farm testing two vertical trellising techniques for high tunnel melons: mesh versus double leader compared to an untrellised control treatment (Figure 1). See our [2023 NNYADP project final report](#) for further detail on methods used.

‘Sugar Cube’ and ‘Tasty Bites’ melons were seeded on May 13, 2024, grown in a greenhouse, and transplanted into the Willsboro high tunnel on June 13. The melons were trellised four times for each system starting approximately one month after transplanting, from July 11 through August 8. We harvested the melons from August 15 through September 30.

**Pest management:** No pesticides were applied in the high tunnel in 2024. To manage pests, beneficial insects were released including lady beetles and *Aphidius colemani* parasitoid wasps (for aphids), *Neoseiulus cucumeris* (for thrips) and *Neoseiulus californicus* and *Phytoseiulus persimilis* predatory mites (for two-spotted spider mites).

Although netting installed for striped cucumber beetle exclusion remained on the tunnel from our 2023 experiment, it did not successfully prevent beetles from entering the tunnel in 2024. The beetles may have entered the tunnel via our seedlings or through the high tunnel vents and door, which did not have netting on them. Striped cucumber beetles transmitted bacterial wilt to our plants in 2024, which resulted in several plants dying during the experiment. Data on incidence of bacterial wilt in each plot were collected five times in August, and we used a chi square analysis to determine whether bacterial wilt incidence differed significantly across treatments. Because bacterial wilt did not differentially impact plant death within specific trellising or variety treatments, we analyzed yield data from melons harvested from all plants and plots.



**Figure 1. Untrellised (A.), mesh-trellised (B.) and double leader-trellised (C.) melons at the Cornell Willsboro Research Farm in July 2024. Photos: Elisabeth Hodgdon.**

**Enterprise budgets:** Throughout the experiment, all direct and indirect costs of our melon production were documented, including labor. Cost data and potential revenue from our yields were used to develop a 2024-season set of enterprise budgets for each trellis system and the untrellised control. Numbers from 2023 and 2024 budgets were averaged to generate a final set of enterprise budgets (see Appendix) that growers may use to evaluate the economic potential of trellised and untrellised melons.

### **Additional Trial in 2024: Swede Midge Management Demonstrations**

In April 2024, we began working with three NNY vegetable producers to use a new management strategy for the invasive swede midge, a pest of brassica vegetable crops. The swede midge lays eggs in the growing points of brassica vegetables including broccoli, cauliflower, and kale. Larval feeding prevents the crops from producing a marketable head or leaves, causing death of the tissue, scarring, and unsightly deformed growth. After feeding, the larvae leap off the plant and pupate in the soil, where they overwinter. The midges emerge in May and there are multiple overlapping generations of the pest until October or November, depending on when killing frosts arrive in the fall. To prevent adult midges from emerging in the spring, we laid ground barriers (silage tarp or landscape fabric) over pupae-containing soil in fields where infested brassicas were grown in 2023. The ground barriers were removed in late July, and growers planted brassica crops on their farms from May through October 2024 according to their needs.

We tracked adult swede midge populations and crop damage at each farm throughout the season. At each farm, we set up two Jackson traps baited with a pheromone lure to monitor swede midge. The traps contained a sticky card that was changed weekly, and the project team recorded the number of male swede midge trapped on the cards. One trap (“Trap A”) was set up on the edge of the ground barrier, and “Trap B” was set up in another field or garden where brassica vegetables were growing. We used a threshold of 7 male swede midges captured per trap per week (one per day) when evaluating the efficacy of the ground barriers to manage swede midge, an action threshold used for swede midge in broccoli crops. Crop damage was monitored at least three times during the season, when a rating scale was used to rate each plant in key brassica plantings: 0 = no damage, 1 = minor scarring and swelling of leaf petioles, 2 = moderate scarring and swelling, twisted leaves, and 3 = major damage and death of growing point. Based on the ratings and plant populations, we calculated the percentage of damaged plants. At the end of the season, we also conversed with the growers at each farm to assess their perceptions as to whether the ground barriers reduced marketable crop losses and whether they would be willing to adopt ground barriers for swede midge management in the future. The following are our methods used and observations of ground barrier efficacy for managing swede midge, using each farm as a case study (see **Results section**).

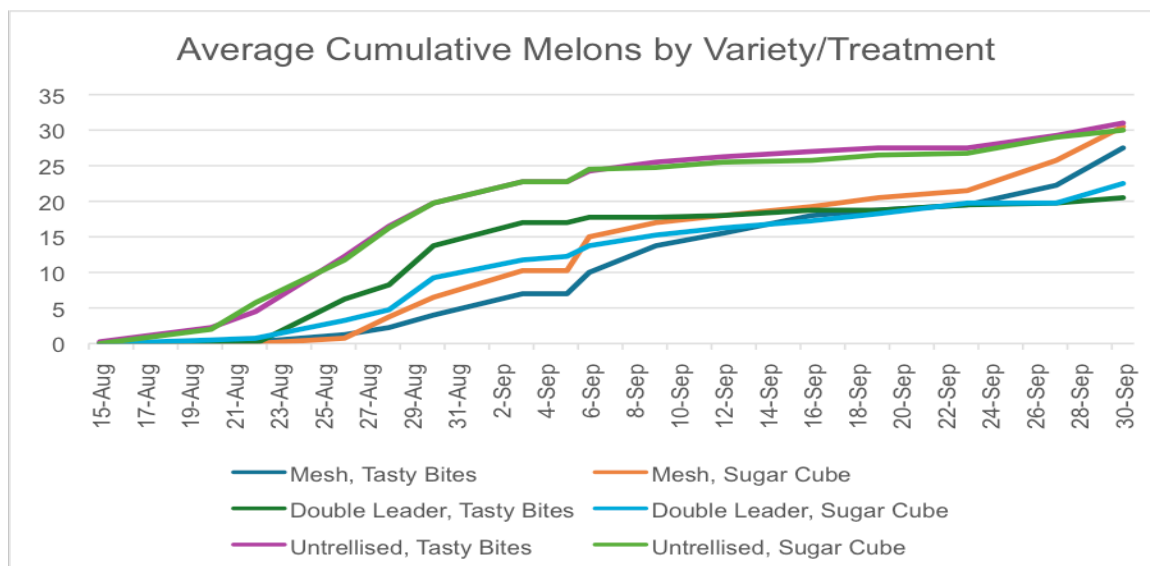
### **Results:**

#### **Timing of harvest**

Timing of harvest within each melon trellising treatment differed, with untrellised melons ripening earlier in the season versus the trellised treatments (Figure 2). We began harvesting melons from the untrellised plots five days earlier than the first melons from the double leader plots, and one week earlier than the mesh plots. Trellising methods appeared to delay harvest of melons.

#### **Marketable yield**

Similar to our 2023 experiment, we observed few differences between marketable melon yields between trellising treatments (Table 1). Our statistical analyses revealed no significant differences ( $P > 0.05$ ) between the number of marketable melons harvested from the three trellising treatments, or marketable melon weight between all variety and trellis treatments. We did, however, harvest significantly more marketable melons from the ‘Sugar Cube’ variety versus ‘Tasty Bites’ ( $F(1) = 6.649, P = 0.020$ ). The total number of marketable melons produced per plant ranged from 4-6, with mesh-trellised and untrellised ‘Sugar Cube’ treatments producing six melons on average per plant. Marketable melons weighed approximately 2 lbs (‘Sugar Cube’)



**Figure 2. Average cumulative melons harvested from plots within each trellising and variety treatment at the Cornell Willsboro Research Farm in 2024, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

and 2.2 lbs (‘Tasty Bites’) on average. In comparison to our 2023 trial yields, yields were greater in 2024, with the highest yielding treatment (untrellised ‘Sugar Cube’) resulting in 13.3 lbs of marketable fruit in 2024 versus 9.63 lbs per plant for the highest yielding treatment (untrellised ‘Tasty Bites’) in 2023.

**Table 1. 2024 high tunnel melon mean marketable and unmarketable yield per plant, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

Treatment		No. marketable	Marketable weight (lbs)	No. unmarketable	Unmarketable weight (lbs)
<b>Trellis*Variety (n=4)</b>					
Double leader	Sugar Cube	5	10.63	1 b <sup>z</sup>	1.84 ab
Double leader	Tasty Bites	4	11.02	1 b	1.57 b
Mesh	Sugar Cube	6	12.19	1 ab	1.99 ab
Mesh	Tasty Bites	5	10.60	2 ab	3.73 ab
Untrellised	Sugar Cube	6	13.30	1 ab	2.46 ab
Untrellised	Tasty Bites	5	11.25	3 a	5.16 a
<b>Trellis (n=8)</b>					
Double leader		5	10.83	1 b	1.70 b
Mesh		5	11.40	2 a	2.86 ab
Untrellised		6	12.28	2 a	3.81 a
<b>Variety (n=12)</b>					
Sugar Cube		6 a	12.04	1 b	2.10 b
Tasty Bites		5 b	10.96	2 a	3.49 a

<sup>z</sup>Mean yields with the same letter are not significantly different based on Tukey-Kramer HSD pairwise comparison tests.

### Unmarketable yield

Unmarketable melon yield per plant differed between treatments within the overall statistical models (number of melons:  $F(6) = 3.62$ ,  $P=0.017$ ; and unmarketable weight:  $F(6) = 3.182$ ,  $P=0.028$ ), with both trellis and variety treatments as significant variables. Untrellised and ‘Tasty



Bites’ treatments yielded the largest unmarketable melon weight per plant, whereas double leader treatments resulted in the smallest unmarketable yield. Rot, lack of netting on the rind, small size, and cracking were the most common reasons for fruit to be deemed unmarketable.

### Enterprise budgets

Our enterprise budgets for the different trellising and variety treatments show that each system generated a potential net income for the crop (Table 2). Using the 2024 cost and yield data from our 2024 experiment, we extrapolated the values to present net income estimates for a full 30’x96’ high tunnel using spacings appropriate for the different trellised or untrellised growing systems. Despite lack of statistically-significant differences between yields, our enterprise budgets showed potential for the highest net profit in 2024 for ‘Sugar Cube’ trellised using the mesh system (Table 2 and Appendix A 2024 budgets). Average net profits based on yields and costs over two years of the trial; however, showed that untrellised ‘Sugar Cube’ was the most profitable (Table 2 and Appendix A averages).

**Table 2. 2024 and two-year (2023-2024) average net income estimates for trellised and untrellised high tunnel melon crops based on data from the Cornell Willsboro Research Farm experiments, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

96’x30’ High Tunnel	Sugar Cube Net Income	Tasty Bites Net Income
<b>2024</b>		
Double Leader (200 plants per tunnel)	\$1,560.89	\$1,538.89
Mesh (200 plants per tunnel)	\$3,473.78 <sup>y</sup>	\$1,451.78
Untrellised (160 plants per tunnel <sup>z</sup> )	\$2,646.86	\$1,829.26
<b>2023-2024 Average</b>		
Double Leader (200 plants per tunnel)	\$1,897.32	\$1,885.32
Mesh (200 plants per tunnel)	\$2,202.11	\$1,690.11
Untrellised (160 plants per tunnel)	\$2,624.67	\$1,841.32

<sup>y</sup>Green cells indicate most profitable trellis\*variety combination.

<sup>z</sup>Fewer plants may be grown in an untrellised system due to wider row spacing requirements.

### **Conclusions: Trellising Trial:**

This trial suggested different factors influencing the opportunity for profitability with high tunnel-grown melons. Please read the entire section for details.

Based on two years of melon yield data and net income estimates from our enterprise budgets, it appears that trellising melons using vertical mesh or double leader systems is not worth the labor and supplies. Marketable melon yield did not differ significantly across all trellis treatments in 2023 and 2024, and trellising added additional labor and supply expenses. Because vertical trellising allows for plant rows to be spaced more tightly together; however, the ability to increase the plant population in a tunnel may render trellising more economically viable. In our 2024 experiment, the enterprise budgets generated using extrapolations for a 30’x96’ tunnel at a narrower between-row plant spacing showed that the mesh treatment using ‘Sugar Cube’ melons would be more profitable in comparison to the same variety untrellised. Budget figures based on the Willsboro experiment spacing did not show an economic advantage to the mesh treatment, with the untrellised ‘Sugar Cube’ more profitable: \$877 for mesh versus \$993 for untrellised. The profitability of the mesh trellis is dependent upon the amount of labor dedicated to keeping the vines growing upright onto the panels and plant spacing used. Growers may opt for a vertical

trellis system if they plan to plant a crop directly underneath the melons — an option that is not possible with an untrellised system. For example, some producers plant scallions, salad greens, herbs, or quick-growing root crops at the base of their trellised tomatoes to increase economic return per square foot of the tunnel.

Growing melons on the ground in an untrellised system did add some extra time during harvests, since melons were partially hidden in foliage. Additionally, there were more unmarketable melons in the untrellised treatments, perhaps due to increased disease pressure from fruit sitting atop the soil. Despite these challenges associated with untrellised melons, the vertical trellising systems remained more costly and did not result in a meaningful increase in marketable melon yield.

In both years, all melon production systems in the trials resulted in a net profit. Farmers consider several factors when deciding which crops to grow, including markets, management requirements, and potential profitability of various crops. Estimates of net profitability of high tunnel tomatoes ranges widely, with \$1,374/year as an estimate from Pennsylvania State University and more \$9,000 per tunnel per year from Iowa State University. A skilled high tunnel tomato grower who is able to receive a high price for their tomato crop may be able to reach net profits at the higher end of this range, therefore, melons may not be a worthwhile crop if the grower's tunnel space is limiting. If a farm has multiple tunnels and is interested in diversifying crop offerings, melons may be a profitable enterprise.

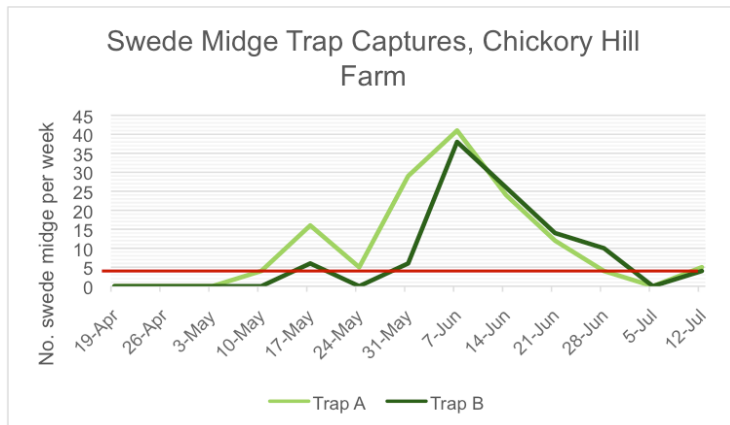
### **Additional Research: Swede Midge Management Demonstrations**

#### **Chickory Hill Farm**

Chickory Hill Farm is an organically managed market garden located in Antwerp, Jefferson County, NY. Farm owner Allen Funk has struggled with swede midge damage to his brassica crops, specifically broccoli and cauliflower, which is an important crop for their farmers market sales. In 2023, Funk experienced nearly complete losses of the broccoli crop due to swede midge. On April 19, 2024, we set up a silage tarp over a 19'x23' garden where there had been major fall broccoli losses. The tarp remained in place until July 22. Trapping was not feasible at this farm for the duration of the season, and traps were removed in mid-July, with the final trap data collected for the week of July 12.

Swede midge began emerging from the soil in early May, and trap counts exceeded the action threshold for most of the season (Figure 3). Specifically, spring emergence on farms with heavily infested crops the previous year can be significant, causing serious damage to the current year's brassica crops. No crop damage was observed in June, but in July the percentage of damaged crops ranged from 0–50%. The most severe damage (3 rating) was observed in cabbage and cauliflower. In October, we visited Chickory Hill Farm to assess damage in the fall brassica crops. Fall damage was more severe, with up to 100% of plants with dead growing points observed in a Lacinato kale crop. A broccoli crop also experienced large losses, with 83% of plants damaged to the extent where they would not form a marketable crown.

The ground barrier failed to reduce swede midge trap counts below thresholds recommended for insecticide application, and the grower experienced losses of up to 100% in some brassica crops. Despite these findings, the grower expressed a positive outlook on using ground barriers for swede midge in the future. 2024 losses on his farm seemed to be reduced overall compared to 2023, and he believed that the tarp was worthwhile. One downside to using the tarp on his farm was that it prevented him from planting in that area of the garden until July.

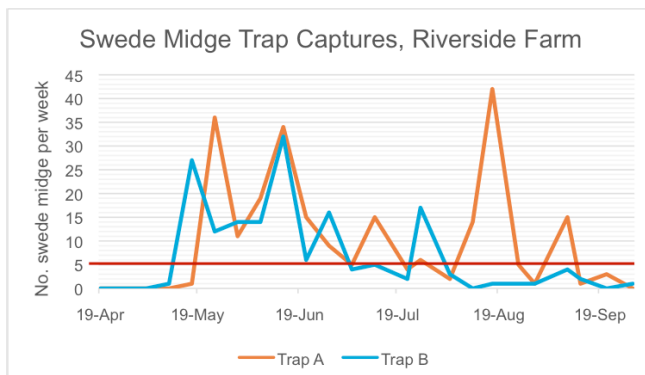


**Figure 3. Male swede midges captured in traps at Chickory Hill Farm in Antwerp in 2024, where Trap A was set up near the ground barrier site and Trap B was set up near a brassica crop. The horizontal red line represents the action threshold for swede midge in broccoli, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

### **Riverside Farm**

Riverside Farm is a small-scale organic vegetable farm located in Cape Vincent in Jefferson County, NY. The farm has experienced severe swede midge damage to crops in past years, with 80-90% estimated losses in the kale crop in 2023 according to farm operator Carly Basinger. In 2024, we applied silage tarp on April 19, 2024 to a 10'x50' area that had the infested kale in 2023. Traps remained in place April 19-October 16. Although the farm was not in commercial production in 2024, the project team provided seeds for a kale crop planted in mid-June next to the ground barrier that was used to measure crop damage. The kale planting consisted of 25 plants of four types: 'Red Russian,' green curly, red curly, and Lacinato, with 'Red Russian' the most susceptible variety to swede midge damage.

Trap counts fluctuated throughout the growing season and during most weeks the number of male swede midges in the traps was above the action threshold of 7 males per week (Figure 4). The kale plants were assessed for damage in June, July, and October. No damage was observed in June. In July, 44% of plants were damaged by swede midge, and in October 32% of kale showed signs of swede midge damage. Some plants appeared to have outgrown early swede midge damage, resulting in fewer symptoms in October versus July. Despite high levels of crop damage and midge captures, the growers perceived the use of grounds barriers as a success and were eager to try tarping in 2025. The strategy could be one practice used with others in an integrated pest management system for swede midge on their farm.



**Figure 4. Male swede midges captured in traps at Riverside Farm, Cape Vincent, 2024, where Trap A was set up near the ground barrier site and Trap B was set up near a brassica crop. The horizontal red line represents the action threshold for swede midge in broccoli, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

## **Full and By Farm**

Full and By Farm is an organic diversified fruit, vegetable, grain, and livestock operation in Essex, Essex County, NY. Farm owner Sara Kurak has struggled with swede midge in her brassica vegetables for nearly ten years. In 2023, she grew sprouting broccoli, Brussels sprouts, kale, and mustard greens in a field on the farm and experienced nearly complete losses of the sprouting broccoli, with ~10% damage in the other crops. In 2024, we set up landscape fabric over this field on April 25 (Figure 5), and installed pheromone monitoring traps next to this field

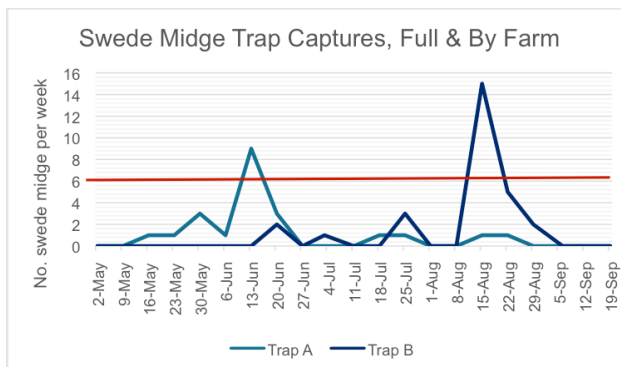


**Figure 5. Landscape fabric laid over a 2023 brassica field infested with swede midge at Full and By Farm in Essex on April 25, 2024. A Jackson trap with sticky card and pheromone lure (“Trap A”) is set up next to the landscape fabric to monitor swede midge during the season. Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

and in a field where brassicas were to be grown later that season. We monitored for swede midge from April 25 until October 3 and assessed brassica crops for swede midge damage one to two times monthly until October 3, with a final assessment on November 11.

Overall, trap counts were much lower at Full and By Farm compared to our Jefferson County sites, with trap counts reaching a maximum of 15 midges per week in August (Figure 6). Trap counts exceeded the action threshold only

twice during the season. The brassica crops of Brussels sprouts, kale, cabbage, mustard greens, cauliflower, and sprouting broccoli were grown in another field. Sara used floating row cover (Remay) over most brassica crops to manage flea beetles for several weeks during each crop cycle. Long-season and fall crops including Brussels sprouts, broccoli, and kale; however, remained uncovered and susceptible to swede midge during late season (August on) when flea beetle pressure subsided. Covering the crops also excluded swede midge early in the season, so our ability to assess the ground barrier’s effect on swede midge damage prevention was impacted by this practice. Crop damage due to swede midge was very low in all crops throughout the season, with virtually no damage observed in June or July. In August, damage ranged from 0–8%, with the highest level of damage in ‘Red Russian’ kale. No damage was observed in the fall. Sara perceived the ground barrier as a success, contributing to her brassica pest management program and allowing for little to no damage from swede midge in her 2024 crops.



**Figure 6. Male swede midges captured in traps at Full and By Farm in Essex in 2024, where Trap A was set up near the ground barrier site and Trap B was set up near a brassica crop. The horizontal red line represents the action threshold for swede midge in broccoli, Improving High Tunnel Production in Northern New York Project, NNYADP, 2024.**

### **Conclusions from Ground Barriers Trial:**

Growers experienced mixed success with ground barriers in 2024. In heavily infested areas, it is not uncommon for swede midge traps to capture 100-200 midges per week. At all participating farms, midge trap captures did not exceed 50 midges per week. All three growers perceived ground barriers as a useful tool for managing swede midge on their farms as part of an integrated pest management program. While Riverside and Chickory Hill Farms did experience serious crop loss due to swede midge, the growers believed that the ground barriers reduced overall brassica crop loss and suppressed the swede midge population to some extent. Full and By Farm was able to reduce their brassica crop losses due to swede midge to nearly zero in most of their crop successions by using row covers in addition to the ground barriers, crashing the midge population.

While ground barriers may not be the only solution to swede midge management, they can play a valuable role in suppressing the soilborne phase of the insect. This management strategy may be useful for farms that do not have insecticidal management options for swede midge (no OMRI-listed organic insecticides are effective for swede midge), and farms that have space available to take out of production while the ground barrier is in place. At all participating farms, there were additional fields cropped to brassicas in 2023 that were not covered in 2024 due to the small scope of our project and inability of farmers to allow the fields to remain fallow. If additional infested fields were covered, it is possible that the swede midge population would have been reduced further, however, it is not always feasible to take multiple fields out of production until July. Furthermore, our work has shown that when barriers are removed before the third week in July, it is less effective. The results of our ground barrier demonstrations will be shared with producers interested in better managing swede midge in 2025, and have contributed the first on-farm data and grower experiences for project member Christy Hoepting's ground barrier work.

### **Outreach:**

#### **High tunnel tomato soil and foliar sampling demonstrations**

Throughout the growing season, we worked with three high tunnel producers to develop fertility plans for their tomato crops using soil testing in the spring and multiple foliar tests from May through August/September. The three producers included Nathan Zimmerman of Franklin County (Ruff Acres), Jenna Mulbury of Clinton County (Northern Orchards), and Andy Kramer of Lewis County (Cedar Knoll Farm). In April, soil samples were collected from all tunnels planned to be cropped with tomatoes on each farm. Specialists Elisabeth Hodgdon and Judson Reid consulted with each grower through in-person meetings or phone calls to discuss soil test interpretation and assist the grower with developing a soil fertility plan for the season. Growers made pre-plant applications of sulfur to adjust the soil pH, and broadcast fertilizer applications based on the test results. Starting at flowering, the project team took foliar samples from the tomato crop in one or two high tunnels monthly per farm until August/September, tracking the nutrient status of the plants through late summer harvests. Foliar tests revealed deficiencies in the crops, including the macronutrient potassium and micronutrients manganese, zinc, and copper.

The test results allowed for growers to better understand the nutrient requirements of their high tunnel crop and how they differed throughout the season, and enabled the growers to make more informed decisions on changes to their fertigation systems to ensure a high-yielding crop. Ten foliar tests were provided by our NNYADP funds in total.

#### **High tunnel twilight meetings and open house event**

- June 21, 2024, Growers Twilight Presentation as part of St Lawrence Valley Produce Auction Summer Field Walk series, Riverside Supply, Fort Covington; tour of grower Titus



Nolt's high tunnels, discussion on nutrient management for high tunnel tomatoes with example foliar test results from NNYADP project to illustrate important concepts (Elisabeth). Participants: 15 growers and agricultural service providers.

- July 10, Willsboro Research Farm Open House, at invitation of Farm Manager Michael H. Davis, Ph.D., tour of NNYADP project high tunnel trellising systems experiment, discussion of 2023 yield and profitability (enterprise budgets) results. Participants: 26.
- August 19, Growers Twilight Meeting, North Point Community Farm, Plattsburgh; discussion of high tunnel soil and nutrient management (Judson) and melons as alternative summer high tunnel crop (Elisabeth) with recommendations for growing high tunnel melons based on the NNYADP trellised melon experiment in Willsboro. Growers Mike Champagne and Marisa Lenetsky led a tour of their operation, including the farm's renovated dairy barn transformed into an efficient and clean wash-pack area for packaging their vegetables. Participants: 24 growers and agricultural service providers.
- September 16, Growers Twilight Meeting, Drinkwine Produce, Ticonderoga; focus on pumpkins, sweet corn, and high tunnel tomato production. Grower Henry Drinkwine discussed his system for growing high tunnel tomatoes using determinate varieties and a basket weave trellising system and explained his approach to soil fertility. Elisabeth, and Becky Maden from UVM Extension, discussed research-driven recommendations for fertilizing high tunnel tomatoes and common pitfalls observed in the NNYADP project-funded soil and foliar test results. Participants: 11 growers and ag service providers.

### **Pesticide exam preparation course**

December 11, 2024, a day-long pesticide certification exam preparation course for crop growers (field crops, fruit and vegetables) was held at the Bangor Volunteer Fire Department, Franklin County. Presentations covered the main concepts in the closed-book DEC pesticide core exam, study tips, advice for taking the open-book category exam, and New York State Department of Environmental Conservation (DEC) presentation on test-taking procedures with Q&A.

Presenters: Judson Reid, Elisabeth Hodgdon, Mike Basedow, Jennifer Stanton, Ken Klubek (DEC). Participants: 15 farmers and agricultural service providers, representing three NNY counties. A follow-up exam in Franklin County was not scheduled because the number of course participants requiring the exam in that location was below DEC minimum participation requirement.

### **Marketing and food safety webinars**

Specialist Lindsey Pashow held a series of webinars to assist agricultural producers with marketing their products during winter 2024:

- January 8: General Marketing: 56 attendees
- January 22: Developing Marketing Plans: 45 attendees
- January 29: Finding Markets: 53 attendees
- February 12: Market Evaluation: 38 attendees
- February 19: Working with Wholesale Buyers: 31 attendees
- March 11: Online Marketing: 48 attendees
- March 25: Value-Added Products: 39 attendees.

### **Acknowledgements:**

We would like to thank the following for their support of our 2024 NNYADP projects:

- All participating commercial farms in the NNY counties for hosting our events and swede midge demonstrations, including trap maintenance for swede midge monitoring;
- Adam Sayward, Aaron Valachovic, Cornell Willsboro Research Farm: high tunnel melon experiment assistance;
- Jennifer Stanton, Eastern NY Commercial Horticulture Program: high tunnel melon

experiment assistance, and valuable support for our grant-sponsored events and conducted field work for swede midge demonstrations;

- Tangleroot Farm: growing our melon seedlings;
- CCE Essex County staff Cole Trager, assisting swede midge demonstration at Full & By Farm; and Cole and CCE Franklin County staff Justin Tucker and Laura Trudell; promoting our events in their counties.

**For More Information:**

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**NNYADP Horticultural/Local Foods Research Project Reports:**  
<https://nnyagdev.org/index.php/horticulture/nny-horticultural-research/>

**APPENDIX: 2024 Enterprise Budgets**

**Average Net Income 2023-2024 by Variety and System**

96'x30' High Tunnel	Sugar Cube Net Income	Tasty Bites Net Income
2023-2024 Average		
Double Leader (200 plants per tunnel)	\$1,897.32	\$1,885.32
Mesh (200 plants per tunnel)	\$2,202.11	\$1,690.11
Untrellised (160 plants per tunnel)	\$2,624.67	\$1,841.32

96'x30' High Tunnel	2023 Net Income	2024 Net Income	Average Net Income
Sugar Cube, DL	\$2,233.75	\$1,560.89	\$1,897.32
Sugar Cube, Mesh	\$930.44	\$3,473.78	\$2,202.11
Sugar Cube, Untrellised	\$2,602.47	\$2,646.86	\$2,624.67
Tasty Bites, DL	\$2,231.75	\$1,538.89	\$1,885.32
Tasty Bites, Mesh	\$1,928.44	\$1,451.78	\$1,690.11
Tasty Bites, Untrellised	\$1,853.37	\$1,829.26	\$1,841.32

Enterprise budgets follow by melon variety: Sugar Cube and Tasty Bites, by system: double leader, mesh, and untrellised, and by year: 2023 and 2024.

**2023 MELON ENTERPRISE BUDGET: Sugar Cube Double Leader**

						1	2				
						Total cost	of	Cost Per Plant	200 Number of	Total Cost:	
						Willsboro	from Willsboro	from Willsboro	Plants in 96'30'	96'x30' High	
						Trial	Trial	Trial	High Tunnel	Tunnel	
						Price	Qty	Units		Notes	
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94			90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63			60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31			30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08		200	15.63	
		Seeds: Sugar Cube 250 seeds@\$68.50	0.27	96.00	seeds	25.92	0.27		200	54.00	3
		Potting mix	4.99	4.00	qt	19.96	0.21		200	41.58	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16		200	31.25	
		Transplanting	15.00	1.25	hrs	18.75	0.20		200	39.06	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07		200	13.24	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08			0.00	
	Wigglewire Installation	15.00	2.00	hrs	30.00	0.31			30.00		
	Trellis Wire Installation	15.00	2.00	hrs	30.00	0.31			30.00		
	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63			60.00		
	Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02		200	4.12	6	
	Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01		200	1.22	7	
	Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43		200	85.94		
	Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67		200	134.38	15	
	Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60		200	120.00	16	
	Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01		200	2.50	16	
	Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06		200	12.74	17	
	Beneficial insects	Bumblebees	484.57	1.00	hive	484.57	5.05			484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27			122.00	
		Lady Beetles	85.00	1.00	pint	85.00	0.89			85.00	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49		200	98.00	8
		Insect Netting	0.32	210.00	ft	67.20	0.70		200	140.00	9
		Weed Barrier	0.89	192.00	ft	170.88	1.78		200	356.00	10
		Tomato Trellis Clips 100 clips	10.85	1.00	bag	10.85	0.11			10.85	
		Trellis (two strings 8 ft each)	0.004	256.00	ft	1.02	0.01		200	2.13	14
Trellis	Labor	15.00	10.92	hrs	163.80	1.71		200	341.25		
Harvest	Labor	15.00	1.41	hrs	21.15	0.22		200	44.06		
<b>TOTAL VARIABLE COSTS</b>					<b>1757.92</b>	<b>18.21</b>			<b>2539.51</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18			17.25	11
		Land Rent	139.00	0.07	ac	9.73	0.10			9.73	12
		High Tunnel	605.33	0.33	unit	199.76	0.08			199.76	13
	<b>TOTAL FIXED COSTS</b>					<b>226.74</b>	<b>0.36</b>			<b>226.74</b>	
<b>TOTAL COSTS</b>					<b>1984.66</b>	<b>18.57</b>			<b>2766.25</b>		

	Price/melon	Yield/plant	Unit				
Gross income	5.00	5.00	amount	2400.00	25.00	200	5000.00
Net Income				415.34	6.43		2233.75

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down if using the tunnel for multiple crops

**Note**

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 250 seeds in packet cost \$68.50
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 13 \$605.33 for year rental only used for 4 months
  - 14 Twine: \$25.50 for 6,300' each plant needed a total of 16' (Two 8' lengths of twine) [2024]
  - 15 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 16 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 17 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.

2023 MELON ENTERPRISE BUDGET: Sugar Cube Mesh

					1	2				
					Total cost of Willsboro Trial	Cost Per Plant from Willsboro Trial	200 Number of Plants in 96'30' High Tunnel	Total Cost: 96'x30' High Tunnel	Notes	
		Price	Qty	Units						
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	200	15.63	
		Seeds: Sugar Cube 250 seeds@\$68.50	0.27	96.00	seeds	25.92	0.27	200	54.00	3
		Potting mix	4.99	4.00	qt	19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	200	31.25	
		Transplanting	15.00	1.25	hrs	18.75	0.20	200	39.06	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07	200	13.24	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		0.00	
	Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00		
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	
		Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02	200	4.12	6
		Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01	200	1.22	7
		Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43	200	85.94	
		Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	200	134.38	15
		Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60	200	120.00	16
		Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	200	2.50	16
	Beneficial insects	Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	200	12.74	17
		Bumblebees	484.57	1.00	hive	484.57	5.05		484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27		122.00	
	Materials	Lady Beetle	85.00	1.00	pint	85.00	0.89		85.00	
		Irrigation Line	0.14	336.00	ft	47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00		67.20	0.70	200	140.00	9
		Weed Barrier	0.89	192.00	ft	170.88	1.78	200	356.00	10
		Hortonova FG-79"x250'	0.82	168.00	ft	137.76	1.44	200	287.00	11
	Trellis	Tomato Trellis Clips 100 clips	10.85	1.00	bag	10.85	0.11		10.85	
		Labor	15.00	11.83	hrs	177.45	1.85	200	369.69	
	Harvest	Labor	15.00	2.05	hrs	30.75	0.32	200	64.06	
		<b>TOTAL VARIABLE COSTS</b>				<b>1887.91</b>	<b>19.56</b>		<b>2842.82</b>	
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18		17.25	12
		Land Rent	139.00	0.07	ac	9.73	0.10		9.73	13
	<b>TOTAL FIXED COSTS</b>				<b>226.74</b>	<b>2.36</b>		<b>226.74</b>		
<b>TOTAL COSTS</b>					<b>2114.64</b>	<b>21.92</b>		<b>3069.56</b>		

	Price/melon	Yield/plant	Unit				
Gross income	5.00	4.00	amount	1920.00	20.00	200	4000.00
Net Income				-194.64	-1.92		930.44

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 250 seeds in packet cost \$68.50
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 Hortonova FG-79"x250' \$137.33 cost per foot \$.82 (Willsboro trial needed 168 ft)
  - 12 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 14 \$605.33 for year rental only used for 4 months
  - 15 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 16 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 17 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.

2023 MELON ENTERPRISE BUDGET: Sugar Cube Untrellised

						1		2		
						Total cost of Willsboro Trial	Cost Per Plant from Willsboro Trial	160 Number of Plants in 96'30' High Tunnel	Total Cost: 96'x30' High Tunnel	Notes
		Price	Qty	Units						
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	160	12.50	
		Seeds: Sugar Cube 250 seed@\$68.50	0.27	96.00	seeds	25.92	0.27	160	43.20	3
		Potting mix	4.99	4.00	qt	19.96	0.21	160	33.27	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	160	25.00	
		Transplanting	15.00	1.25	hrs	18.75	0.20	160	31.25	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07	160	10.59	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		0.00	
		Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00	
		Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	
		Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02	160	3.29	6
	Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01	160	0.98	7	
	Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43	160	68.75		
	Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	160	107.50	14	
	Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60	160	96.00	15	
	Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	160	2.00	15	
	Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	160	10.19	16	
	Beneficial Insects	Bumblebees	484.57	1.00	hive	484.57	5.05		484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27		122.00	
		Lady Beetle	85.00	1.00	pint	85.00	0.89		85.00	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49	160	78.40	8
		Insect Netting	0.32	210.00		67.20	0.70	160	112.00	9
		Weed Barrier	0.89	192.00	ft	170.88	1.78	160	284.80	10
	Harvest	Labor	15.00	3.58	hrs	53.70	0.56	160	89.50	
	<b>TOTAL VARIABLE COSTS</b>					<b>1584.80</b>	<b>16.40</b>		<b>1970.79</b>	
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18		17.25	11
		Land Rent	139.00	0.07	ac	9.73	0.10		9.73	12
		High Tunnel	605.33	0.33	unit	199.76	2.08		199.76	13
	<b>TOTAL FIXED COSTS</b>					<b>226.74</b>	<b>2.36</b>		<b>2197.53</b>	
<b>TOTAL COSTS</b>					<b>1811.53</b>	<b>18.76</b>		<b>2197.53</b>		

	Price/per	Yield per	Unit				
Gross income	5.00	6.00	amount	2880.00	30.00	160	4800.00
Net Income				1068.47	11.24		2602.47

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjusted number to use the tunnel for multiple crops

Notes

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 4 beds, 2'x6' plant density
  - 3 250 seeds in packet cost \$68.50
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*4 rows = 768 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 13 \$605.33 for year rental only used for 4 months
  - 14 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 15 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 16 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.



2023 MELON ENTERPRISE BUDGET: Tasty Bites Double Leader

			Price	Qty	Units	Willsboro Trial	Cost Per Plant from Willsboro Trial	200 Number of Plants in 96'30" High Tunnel	Total Cost: 96'x30' High Tunnel	Notes
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	200	15.63	
		Seeds: Tasty Bites 150 seeds@\$41.90	0.28	96.00	seeds	26.88	0.28	200	56.00	3
		Potting mix	4.99	4.00	qt	19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	200	31.25	
		Transplanting	15.00	1.25	hrs	18.75	0.20	200	39.06	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07	200	13.24	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		0.00	
		Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00	
		Trellis Wire Installation	15.00	2.00	hrs	30.00	0.31		30.00	
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	
		Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02	200	4.12	6
		Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01	200	1.22	7
		Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43	200	85.94	
		Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	200	134.38	15
		Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60	200	120.00	16
		Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	200	2.50	16
		Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	200	12.74	17
	Beneficial insects	Bumblebees	484.57	1.00	hive	484.57	5.05		484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27		122.00	
		Lady Beetle	85.00	1.00	pint	85.00	0.89		85.00	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00		67.20	0.70	200	140.00	9
		Weed Barrier	0.89	192.00	ft	170.88	1.78	200	356.00	10
		Tomato Trellis Clips 100 clips	10.85	1.00	bag	10.85	0.11		10.85	
		Trellis (two strings 8 ft each)	0.004	256.00	ft	1.02	0.01	200	2.13	14
	Trellis	Labor	15.00	10.92	hrs	163.80	1.71	200	341.25	
		Harvest	15.00	1.41	hrs	21.15	0.22	200	44.06	
<b>TOTAL VARIABLE COSTS</b>					<b>1758.88</b>	<b>18.22</b>		<b>2541.51</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18		17.25	11
		Land Rent	139.00	0.07	ac	9.73	0.10		9.73	12
		High Tunnel	605.33	0.33	unit	199.76	2.08		199.76	13
	<b>TOTAL FIXED COSTS</b>					<b>226.74</b>	<b>2.36</b>		<b>226.74</b>	
<b>TOTAL COSTS</b>					<b>1985.62</b>	<b>20.58</b>		<b>2768.25</b>		

	Price/melon	Yield/plant	Unit				
Gross income	5.00	5.00	amount	2400.00	25.00	200	5000.00
Net Income				414.38	4.42		2231.75

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 150 seeds in packet cost \$41.90
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 13 \$605.33 for year rental only used for 4 months
  - 14 Twine: \$25.50 for 6,300' each plant needed a total of 16' (Two 8' lengths of twine) [2024]
  - 15 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 16 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 17 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.

2023 MELON ENTERPRISE BUDGET: Tasty Bites Mesh

			Price	Qty	Units	1 Total cost of Willsboro Trial	Cost Per Plant from Willsboro Trial	2 200 Number of Plants in 96'30' High Tunnel	Total Cost: 96'x30' High Tunnel	Notes
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	200	15.63	
		Seeds: Tasty Bites 150 seed@\$41.90	0.28	96.00	seeds	26.88	0.28	200	56.00	3
		Potting mix	4.99	4.00	qt	19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	200	31.25	
		Transplanting	15.00	1.25	hrs	18.75	0.20	200	39.06	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07	200	13.24	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		0.00	
	Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00		
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	6
		Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02	200	4.12	7
		Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01	200	1.22	
		Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43	200	85.94	
		Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	200	134.38	15
		Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60	200	120.00	16
		Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	200	2.50	16
		Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	200	12.74	17
	Beneficial insects	Bumblebees	484.57	1.00	hive	484.57	5.05		484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27		122.00	
		Lady Beetle	85.00	1.00	pint	85.00	0.89		85.00	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00		67.20	0.70	200	140.00	9
		Weed Barrier	0.89	192.00	ft	170.88	1.78	200	356.00	10
		Hortonova FG-79"x250'	0.82	168.00	ft	137.76	1.44	200	287.00	11
Tomato Trellis Clips 100 clips		10.85	1.00	bag	10.85	0.11		10.85		
Trellis	Labor	15.00	11.83	hrs	177.45	1.85	200	369.69		
	Harvest	15.00	2.05	hrs	30.75	0.32	200	64.06		
<b>TOTAL VARIABLE COSTS</b>					<b>1888.87</b>	<b>19.57</b>		<b>2844.82</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18		17.25	12
		Land Rent	139.00	0.07	ac	9.73	0.10		9.73	13
		High Tunnel	605.33	0.33	unit	199.76	2.08		199.76	14
	<b>TOTAL FIXED COSTS</b>					<b>226.74</b>	<b>2.36</b>		<b>226.74</b>	
<b>TOTAL COSTS</b>					<b>2115.60</b>	<b>21.93</b>		<b>3071.56</b>		

	Price/lb	Yield per Unit				
Gross income	5.00	5.00 lbs	2400.00	25.00	200	5000.00
Net Income			284.40	3.07		1928.44

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 150 seeds in packet cost \$41.90
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 Hortonova FG-79"x250' \$137.33 cost per foot \$.82 (Willsboro trial needed 168 ft)
  - 12 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 14 \$605.33 for year rental only used for 4 months
  - 15 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 16 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 17 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.

**2023 MELON ENTERPRISE BUDGET: Tasty Bites Untrellised**

		Price	Qty	Units	Total cost of Willsboro Trial	Cost Per Plant from Willsboro Trial	160 Number of Plants in 96'30' High Tunnel	2 Total Cost: 96'x30' High Tunnel	Notes	
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	160	12.50	
		Seeds: Tasty Bites 150 seeds@\$41.90	0.28	96.00	seeds	26.88	0.28	160	44.80	3
		Potting mix	4.99	4.00	qt	19.96	0.21	160	33.27	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	160	25.00	
		Transplanting	15.00	1.25	hrs	18.75	0.20	160	31.25	
		50 cell plug flat 5 trays	16.55	1.00	cell trays	16.55	0.07	160	10.59	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		7.50	
	Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00		
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		0.00	
		Fungicide 1: Double Nickel	0.52	3.80	oz	1.98	0.02	160	3.29	6
		Fungicide 2: Cueva	0.45	1.30	oz	0.59	0.01	160	0.98	7
		Fungicide Spray Labor	15.00	2.75	hrs	41.25	0.43	160	68.75	
		Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	160	107.50	14
		Potassium Sulfate (pre-plant)	0.96	60.00	lb	57.60	0.60	160	96.00	15
		Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	160	2.00	15
		Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	160	10.19	16
	Beneficial Insects	Bumblebees	484.57	1.00	hive	484.57	5.05		484.57	
		Aphidius colemani 1000	61.00	2.00		122.00	1.27		122.00	
		Lady Beetle	85.00	1.00	pint	85.00	0.89		85.00	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49	160	78.40	8
Insect Netting		0.32	210.00		67.20	0.70	160	112.00	9	
Weed Barrier		0.89	192.00	ft	170.88	1.78	160	284.80	10	
Harvest	Labor	15.00	3.58	hrs	53.70	0.56	160	89.50		
<b>TOTAL VARIABLE COSTS</b>					<b>1585.76</b>	<b>16.41</b>		<b>1919.89</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	17.25	1.00	hrs	17.25	0.18		17.25	11
		Land Rent	139.00	0.07	ac	9.73	0.10		9.73	12
		High Tunnel	605.33	0.33	unit	199.76	2.08		199.76	13
	<b>TOTAL FIXED COSTS</b>					<b>226.74</b>	<b>2.36</b>		<b>226.74</b>	
<b>TOTAL COSTS</b>					<b>1812.49</b>	<b>18.77</b>		<b>2146.63</b>		

	Price/lb	Yield/plant	Unit				
Gross income	5.00	5.00	lbs	2400.00	25.00	160	4000.00
Net Income				587.51	6.23		1853.37

Crop terminated November 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

**Notes**

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 4 beds, 2'x6' plant density
  - 3 3. 150 seeds in packet cost \$41.90
  - 4 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 5 50 plugs per tray for 5 trays @\$16.55 or \$3.31 per tray or \$0.07 per plug hole
  - 6 Double Nickel \$167.95 (Forestry Distributing) for 2.5 gal (320 oz) = \$.52 per oz
  - 7 Cueva \$143.50 (Arbico Organics) for 2.5 gal (320 oz) = \$.45 per oz
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*4 rows = 768 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel
  - 11 4h @ \$69 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners.
  - 13 \$605.33 for year rental only used for 4 months
  - 14 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial) [2024]
  - 15 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated) [2024]
  - 16 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial) [2024]
- Washing, packing, and marketing costs will vary by operation.

2024 MELON ENTERPRISE BUDGET: Sugar Cube Double Leader

				1		2			
				Total cost of Willsboro Trial	Cost Per Plant from Willsboro Trial	200 Number of Plants in 96'30' High Tunnel	Total Cost: 96'x30' High Tunnel	Notes	
		Price	Qty Units						
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00 hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00 hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00 hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50 hrs	7.50	0.08	200	15.63	
		Seeds: Sugar Cube 250 seeds@\$32.70	0.13	96.00 seeds	12.48	0.13	200	26.00	3
		Potting mix	4.99	4.00 qt	19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00 hrs	15.00	0.16	200	31.25	
		Transplanting	15.00	1.25 hrs	18.75	0.20	200	39.06	
		50 cell plug flat 4 trays	20.80	1.00 cell trays	20.80	0.10	200	20.80	5
		Dosatron Setup	15.00	0.50 hrs	7.50	0.08		7.50	
		Wigglewire Installation	15.00	2.00 hrs	30.00	0.31		30.00	
		Trellis Wire Installation	15.00	2.00 hrs	30.00	0.31		30.00	
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00 hrs	60.00	0.63		60.00	
		Nature Safe (pre-plant)	0.86	75.00 lb	64.50	0.67	200	134.38	6
		Potassium Sulfate (pre-plant)	0.96	60.00 lb	57.60	0.60	200	120.00	7
		Potassium Sulfate (fertigated)	1.09	1.10 lb	1.20	0.01	200	2.50	7
		Chilean Nitrate (fertigated)	1.39	4.40 lb	6.12	0.06	200	12.74	15
	Beneficial insects	Bumblebees	370.00	1.00 hive	370.00	3.85		370.00	
		Neoseiulus californicus	50.00	1.00	50.00	0.52		50.00	
		Lady Beetles	99.00	1.00	99.00	1.03		99.00	
		Phytosiuus persimilis	124.00	1.00	124.00	1.29		124.00	
		Aphidius colemani 1000	64.70	2.00	129.40	1.35		129.40	
	Materials	Irrigation Line	0.14	336.00 ft	47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00	67.20	0.70	200	140.00	9
		Weed Barrier	0.36	688.00 ft	247.68	2.58		295.92	10
		Trellis (two strings 8 ft each)	0.004	256.00 ft	1.02	0.01	200	2.13	11
		Tomato Trellis Clips 100 clips	10.85	1.00 bag	10.85	0.11		10.85	
	Trellis Harvest	Labor	15.00	3.575 hrs	53.63	0.56	200	111.72	
Labor		15.00	0.70 hrs	10.50	0.11	200	21.88		
<b>TOTAL VARIABLE COSTS</b>				<b>1741.72</b>	<b>18.03</b>		<b>2204.33</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00 hrs	19.00	0.20		19.00	12
		Land Rent	143.17	0.07 ac	10.02	0.10		10.02	13
		High Tunnel	623.49	0.33 unit	205.75	0.08		205.75	14
	<b>TOTAL FIXED COSTS</b>				<b>234.77</b>	<b>0.38</b>		<b>234.77</b>	
<b>TOTAL COSTS</b>				<b>1976.50</b>	<b>18.42</b>		<b>2439.11</b>		

	Price/melon	Yield/plant	Unit				
Gross income	5.00	4.00	amount	1920.00	20.00	200	4000.00
Net Income				-56.50	1.58		1560.89

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 250 seeds in packet cost \$32.70
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
  - 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
  - 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated)
  - 8 Trial 2 lines\*7 feet\*24 plots = 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
  - 11 Twine: \$25.50 for 6,300' each plant needed a total of 16' (Two 8' lengths of twine)
  - 12 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 14 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 15 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)
- Washing, packing, and marketing costs will vary by operation.

2024 MELON ENTERPRISE BUDGET: Sugar Cube Mesh

		Price	Qty	Units	1 Total cost of Willsboro Trial	2 Cost Per Plant from Willsboro Trial	200 Number of Plants in 96'30' High Tunnel	Total Cost: 96'x30' High Tunnel	Notes	
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00	
		Fertilizer Application and Rototilling	15.00	2.00	hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50	hrs	7.50	0.08	200	15.63	
		Seeds: Sugar Cube 250 seeds@\$32.70	0.13	96.00	seeds	12.48	0.13	200	26.00	3
		Potting mix	4.99	4.00	qt	19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16	200	31.25	
		Transplanting	15.00	1.25	hrs	18.75	0.20	200	39.06	
		50 cell plug flat 4 trays	20.80	1.00	cell trays	20.80	0.10	200	20.80	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08		7.50	
	Wigglewire Installation	15.00	2.00	hrs	30.00	0.31		30.00		
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	
		Nature Safe (pre-plant)	0.86	75.00	lb	64.50	0.67	200	134.38	6
		Potassium Sulfate (pre-plant)	0.96	60.00	oz	57.60	0.60	200	120.00	7
		Potassium Sulfate (fertigated)	1.09	1.10	lb	1.20	0.01	200	2.50	7
		Chilean Nitrate (fertigated)	1.39	4.40	lb	6.12	0.06	200	12.74	15
	Beneficial insects	Bumblebees	370.00	1.00	hive	370.00	3.85		370.00	
		Neoseiulus californicus	50.00	1.00		50.00	0.52		50.00	
		Lady Beetles	99.00	1.00		99.00	1.03		99.00	
		Phytosiuslus persimilis	124.00	1.00		124.00	1.29		124.00	
		Aphidius colemani 1000	64.70	2.00		129.40	1.35		129.40	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00		67.20	0.70	200	140.00	9
Weed Barrier		0.36	688.00	ft	247.68	2.58		295.92	10	
Hortonova FG-79"x250'		0.33	168.00	ft	55.44	0.58	200	115.50	11	
Tomato Trellis Clips 100 clips		10.85	1.00	bag	10.85	0.11		10.85		
Trellis	Labor	15.00	3.525	hrs	52.88	0.55	200	110.16		
	Harvest	15.00	0.87	hrs	13.05	0.14	200	27.19		
<b>TOTAL VARIABLE COSTS</b>					<b>1767.94</b>	<b>18.30</b>		<b>2291.45</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00	hrs	19.00	0.20		19.00	12
		Land Rent	143.17	0.07	ac	10.02	0.10		10.02	13
		High Tunnel	623.49	0.33	unit	205.75	2.14		205.75	14
	<b>TOTAL FIXED COSTS</b>					<b>234.77</b>	<b>2.45</b>		<b>234.77</b>	
<b>TOTAL COSTS</b>					<b>2002.71</b>	<b>20.75</b>		<b>2526.22</b>		

	Price/per	Yield per	Unit				
Gross income	5.00	6.00	amount	2880.00	30.00	200	6000.00
Net Income				877.29	9.25		3473.78

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number would need down to using the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 250 seeds in packet cost \$32.7
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
  - 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
  - 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated)
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
  - 11 Hortonova FG-79"x250' \$81.25 cost per foot \$.33 (Willsboro trial needed 168 ft)
  - 12 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 14 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 15 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)
- Washing, packing, and marketing costs will vary by operation.



2024 MELON ENTERPRISE BUDGET: Sugar Cube Untrellised

				1		2					
				Total cost		Cost Per Plant		160 Number of		Total Cost:	
				of		from Willsboro		Plants in 96'30'		96'x30' High	
				Trial		Trial		High Tunnel		Tunnel	
		Price	Qty	Units						Notes	
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00	hrs	90.00	0.94		90.00		
		Installing Netting Channels	15.00	4.00	hrs	60.00	0.63		60.00		
		Fertilizer Application & Rototilling	15.00	2.00	hrs	30.00	0.31		30.00		
		Seeding Melons	15.00	0.50	hrs	7.50	0.08		160	12.50	
		Seeds: Sugar Cube 250 seeds@\$32.70	0.13	96.00	seeds	12.48	0.13		160	20.80	3
		Potting mix	4.99	4.00	qt	19.96	0.21		160	33.27	4
		Irrigating trays	15.00	1.00	hrs	15.00	0.16		160	25.00	
		Transplanting	15.00	1.25	hrs	18.75	0.20		160	31.25	
		50 cell plug flat 4 trays	20.80	1.00	cell trays	20.80	0.10		160	16.64	5
		Dosatron Setup	15.00	0.50	hrs	7.50	0.08			7.50	
		Wigglewire installation	15.00	2.00	hrs	30.00	0.31			30.00	
		Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00	hrs	60.00	0.63		60.00	
	Nature Safe (pre-plant)		0.86	75.00	lb	64.50	0.67		160	107.50	6
	Potassium Sulfate (pre-plant)		0.96	60.00	oz	57.60	0.60		160	96.00	7
	Potassium Sulfate (fertigated)		1.09	1.10	lb	1.20	0.01		160	2.00	7
	Chilean Nitrate (fertigated)		1.39	4.40	lb	6.12	0.06		160	10.19	14
	Beneficial insects	Bumblebees	370.00	1.00	hive	370.00	3.85			370.00	
		Neoseiulus californicus	50.00	1.00		50.00	0.52			50.00	
		Lady Beetles	99.00	1.00		99.00	1.03			99.00	
		Phytoseiulus persimilis	124.00	1.00		124.00	1.29			124.00	
		Aphidius colemani 1000	64.70	2.00		129.40	1.35			129.40	
	Materials	Irrigation Line	0.14	336.00	ft	47.04	0.49		160	78.40	8
		Insect Netting	0.32	210.00	ft	67.20	0.70		160	112.00	9
		Weed Barrier	0.36	688.00	ft	247.68	2.58			295.92	10
Harvest	Labor	15.00	1.08	hrs	16.20	0.17		160	27.00		
<b>TOTAL VARIABLE COSTS</b>					<b>1651.93</b>	<b>17.09</b>			<b>1918.37</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00	hrs	19.00	0.20		19.00	11	
		Land Rent	143.17	0.07	ac	10.02	0.10		10.02	12	
		High Tunnel	623.49	0.33	unit	205.75	2.14		205.75	13	
	<b>TOTAL FIXED COSTS</b>					<b>234.77</b>	<b>2.45</b>			<b>234.77</b>	
<b>TOTAL COSTS</b>					<b>1886.70</b>	<b>19.54</b>			<b>2153.14</b>		

	Price/melon	Yield/plan	Unit				
Gross income	5.00	6.00	amount	2880.00	30.00	160	4800.00
Net Income				993.30	10.46		2646.86

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjusted number down to use the tunnel for multiple crops

Notes

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
- 2 High Tunnel Scenario: 30'x96', 4 beds, 2'x6' plant density
- 3 250 seeds in packet cost \$32.7
- 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
- 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
- 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
- 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated)
- 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*4 rows = 768 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
- 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
- 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
- 11 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
- 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation May 2023-May 2024
- 13 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
- 14 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)  
Washing, packing, and marketing costs will vary by operation.

2024 MELON ENTERPRISE BUDGET: Tasty Bites Double Leader

				1		2				
				Total cost		Cost Per Plant		200 Number of		Total Cost:
				of		from Willsboro		Plants in 96'30'		96'x30' High
				Trial		Trial		High Tunnel		Tunnel
		Price	Qty Units							Notes
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00 hrs		90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00 hrs		60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00 hrs		30.00	0.31		30.00	
		Seeding Melons	15.00	0.50 hrs		7.50	0.08	200	15.63	
		Seeds: Tasty Bites 20 seeds@\$4.85	0.24	96.00 seeds		23.04	0.24	200	48.00	3
		Potting mix	4.99	4.00 qt		19.96	0.21	200	41.58	4
		Irrigating trays	15.00	1.00 hrs		15.00	0.16	200	31.25	
		Transplanting	15.00	1.25 hrs		18.75	0.20	200	39.06	
		50 cell plug flat 4 trays	20.80	1.00 cell trays		20.80	0.10	200	20.80	5
		Dosatron Setup	15.00	0.50 hrs		7.50	0.08		7.50	
		Wigglewire Installation	15.00	2.00 hrs		30.00	0.31		30.00	
		Trellis Wire Installation	15.00	2.00 hrs		30.00	0.31		30.00	
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00 hrs		60.00	0.63		60.00	
		Nature Safe (pre-plant)	0.86	75.00 lb		64.50	0.67	200	134.38	6
		Potassium Sulfate (pre-plant)	0.96	60.00 oz		57.60	0.60	200	120.00	7
		Potassium Sulfate (fertiligated)	1.09	1.10 lb		1.20	0.01	200	2.50	7
		Chilean Nitrate (fertiligated)	1.39	4.40 lb		6.12	0.06	200	12.74	15
	Beneficial insects	Bumblebees	370.00	1.00 hive		370.00	3.85		370.00	
		Neoseiulus californicus	50.00	1.00		50.00	0.52		50.00	
		Lady Beetles	99.00	1.00		99.00	1.03		99.00	
		Phytosiusus persimilis	124.00	1.00		124.00	1.29		124.00	
	Materials	Aphidius colemani 1000	64.70	2.00		129.40	1.35		129.40	
		Irrigation Line	0.14	336.00 ft		47.04	0.49	200	98.00	8
		Insect Netting	0.32	210.00		67.20	0.70	200	140.00	9
		Weed Barrier	0.36	688.00 ft		247.68	2.58		295.92	10
		Trellis (two strings 8 ft each)	0.004	256.00		1.02	0.01	200	2.13	11
		Tomato Trellis Clips 100 clips	10.85	1.00 bag		10.85	0.11		10.85	
	Trellis Labor	15.00	3.575 hrs		53.63	0.56	200	111.72		
Harvest Labor	15.00	0.70 hrs		10.50	0.11	200	21.88			
<b>TOTAL VARIABLE COSTS</b>					<b>1752.28</b>	<b>18.14</b>		<b>2226.33</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00 hrs		19.00	0.20		19.00	12
		Land Rent	143.17	0.07 ac		10.02	0.10		10.02	13
		High Tunnel	623.49	0.33 unit		205.75	2.14		205.75	14
	<b>TOTAL FIXED COSTS</b>					<b>234.77</b>	<b>2.45</b>		<b>234.77</b>	
<b>TOTAL COSTS</b>					<b>1987.06</b>	<b>20.59</b>		<b>2461.11</b>		

	Price/per	Yield per	Unit				
Gross income	5.00	4.00	amount	1920.00	20.00	200	4000.00
Net Income				-67.06	-0.59		1538.89

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down if using the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 20 seeds in packet cost \$4.85
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
  - 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
  - 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertiligated)
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
  - 11 Twine: \$10.92 for 6,300' each plant needed a total of 16' (Two 8' lengths of twine)
  - 12 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation May 2023-May 2024
  - 14 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 15 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)
- Washing, packing, and marketing costs will vary by operation.

2024 MELON ENTERPRISE BUDGET: Tasty Bites Mesh

				1		2								
				Total cost of Willsboro Trial		Cost Per Plant from Willsboro Trial		200 Number of Plants in 96'30' High Tunnel		Total Cost: 96'x30' High Tunnel		Notes		
		Price	Qty Units											
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00 hrs		90.00	0.94		90.00					
		Installing Netting Channels	15.00	4.00 hrs		60.00	0.63		60.00					
		Fertilizer Application and Rototilling	15.00	2.00 hrs		30.00	0.31		30.00					
		Seeding Melons	15.00	0.50 hrs		7.50	0.08		200	15.63				
		Seeds: Tasty Bites 20 seeds at \$4.85	0.24	96.00 seeds		23.04	0.24		200	48.00			3	
		Potting mix	4.99	4.00 qt		19.96	0.21		200	41.58				4
		Irrigating trays	15.00	1.00 hrs		15.00	0.16		200	31.25				
		Transplanting	15.00	1.25 hrs		18.75	0.20		200	39.06				
		50 cell plug flat 4 trays	20.80	1.00 cell trays		20.80	0.10		200	20.80				5
		Dosatron Setup	15.00	0.50 hrs		7.50	0.08			7.50				
		Wigglewire installation	15.00	2.00 hrs		30.00	0.31			30.00				
		Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00 hrs		60.00	0.63		60.00				
	Nature Safe (pre-plant)		0.86	75.00 lb		64.50	0.67		200	134.38			6	
	Potassium Sulfate (pre-plant)		0.96	60.00 oz		57.60	0.60		200	120.00			7	
	Potassium Sulfate (fertigated)		1.09	1.10 lb		1.20	0.01		200	2.50			7	
	Beneficial insects	Chilean Nitrate (fertigated)	1.39	4.40 lb		6.12	0.06		200	12.74			15	
		Bumblebees	370.00	1.00 hive		370.00	3.85			370.00				
		Neoseiulus californicus	50.00	1.00		50.00	0.52			50.00				
		Lady Beetles	99.00	1.00		99.00	1.03			99.00				
	Materials	Phytosilulus persimilis	124.00	1.00		124.00	1.29			124.00				
		Aphidius colemani 1000	64.70	2.00		129.40	1.35			129.40				
		Irrigation Line	0.14	336.00 ft		47.04	0.49		200	98.00			8	
		Insect Netting	0.32	210.00		67.20	0.70		200	140.00			9	
		Weed Barrier	0.36	688.00 ft		247.68	2.58			295.92			10	
		Hortonova FG-79"x250"	0.33	168.00 ft		55.44	0.58		200	115.50			11	
	Trellis	Tomato Trellis Clips 100 clips	10.85	1.00 bag		10.85	0.11			10.85				
		Labor	15.00	3.525 hrs		52.88	0.55		200	110.16				
		Harvest	15.00	0.87 hrs		13.05	0.14		200	27.19				
<b>TOTAL VARIABLE COSTS</b>					<b>1778.50</b>	<b>18.41</b>			<b>2313.45</b>					
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00 hrs		19.00	0.20		19.00				12	
		Land Rent	143.17	0.07 ac		10.02	0.10		10.02				13	
	High Tunnel	623.49	0.33 unit		205.75	2.14			205.75				14	
<b>TOTAL FIXED COSTS</b>					<b>234.77</b>	<b>2.45</b>			<b>234.77</b>					
<b>TOTAL COSTS</b>					<b>2013.27</b>	<b>20.86</b>			<b>2548.22</b>					

	Price/lb	Yield/plant	Unit				
Gross income	5.00	4.00 lbs		1920.00	20.00	200	4000.00
Net Income				-93.27	-0.86		1451.78

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Note

- 1 Willsboro Trial: 24 plots with 4 plants per plot. Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 5 beds, 2'x6' plant density
  - 3 20 seeds in packet cost \$4.85
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
  - 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
  - 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated)
  - 8 Trial 2 lines\*77 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\*5 rows = 480 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
  - 11 Hortonova FG-79"x250" \$81.25 cost per foot \$3.33 (Willsboro trial needed 168 ft)
  - 12 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 13 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation May 2023-May 2024
  - 14 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 15 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)
- Washing, packing, and marketing costs will vary by operation.

2024 MELON ENTERPRISE BUDGET: Tasty Bites Untrellised

				1		2			
				Total Cost:		Number of		Total Cost:	
				Willsboro	Cost/Plant:	Plants in 96'30'	96'x30' High	Notes	
		Price	Qty Units	Trial	Willsboro Trial	High Tunnel	Tunnel		
Variable Costs	Bed Preparation and Transplanting	High Tunnel Preparation	15.00	6.00 hrs	90.00	0.94		90.00	
		Installing Netting Channels	15.00	4.00 hrs	60.00	0.63		60.00	
		Fertilizer Application & Rototilling	15.00	2.00 hrs	30.00	0.31		30.00	
		Seeding Melons	15.00	0.50 hrs	7.50	0.08	160	12.50	
		Seeds: Tasty Bites 20 seeds@\$4.85	0.24	96.00 seeds	23.04	0.24	160	38.40	3
		Potting mix	4.99	4.00 qt	19.96	0.21	160	33.27	4
		Irrigating trays	15.00	1.00 hrs	15.00	0.16	160	25.00	
		Transplanting	15.00	1.25 hrs	18.75	0.20	160	31.25	
		50 cell plug flat 4 trays	20.80	1.00 cell trays	20.80	0.10	160	16.64	5
		Dosatron Setup	15.00	0.50 hrs	7.50	0.08		7.50	
	Wigglewire Installation	15.00	2.00 hrs	30.00	0.31		30.00		
	Fertilizer and Sprays	Fertigation and irrigation	4.00	15.00 hrs	60.00	0.63		60.00	
		Nature Safe (pre-plant)	0.86	75.00 lb	64.50	0.67	160	107.50	6
		Potassium Sulfate (pre-plant)	0.96	60.00 oz	57.60	0.60	160	96.00	7
		Potassium Sulfate (fertigated)	1.09	1.10 lb	1.20	0.01	160	2.00	7
		Chilean Nitrate (fertigated)	1.39	4.40 lb	6.12	0.06	160	10.19	14
	Beneficial insects	Bumblebees	370.00	1.00 hive	370.00	3.85		370.00	
		Neoseiulus californicus	50.00	1.00	50.00	0.52		50.00	
		Lady Beetles	99.00	1.00	99.00	1.03		99.00	
		Phytosius persimilis	124.00	1.00	124.00	1.29		124.00	
Aphidius colemani 1000		64.70	2.00	129.40	1.35		129.40		
Materials	Irrigation Line	0.14	336.00 ft	47.04	0.49	160	78.40	8	
	Insect Netting	0.32	210.00	67.20	0.70	160	112.00	9	
	Weed Barrier	0.36	688.00 ft	247.68	2.58		295.92	10	
Harvest	Labor	15.00	1.08 hrs	16.20	0.17	160	27.00		
<b>TOTAL VARIABLE COSTS</b>				<b>1662.49</b>	<b>17.20</b>		<b>1935.97</b>		
Fixed Costs	Land/Equipment	Tractor/Machinery	19.00	1.00 hrs	19.00	0.20		19.00	11
		Land Rent	143.17	0.07 ac	10.02	0.10		10.02	12
		High Tunnel	623.49	0.33 unit	205.75	2.14		205.75	13
	<b>TOTAL FIXED COSTS</b>				<b>234.77</b>	<b>2.45</b>		<b>234.77</b>	
<b>TOTAL COSTS</b>				<b>1897.26</b>	<b>19.65</b>		<b>2170.74</b>		
		<b>Price/lb</b>	<b>Yield/plant</b>	<b>Unit</b>					
<b>Gross income</b>		5.00	5.00 lbs	2400.00	25.00	160	4000.00		
<b>Net Income</b>				502.74	5.35		1829.26		

Crop terminated October 1

Labor/purchase for the trial and full tunnel were the same due to need to prep entire tunnel. Adjust number down to use the tunnel for multiple crops

Notes

- 1 Willsboro Trial: 24 plots with 4 plants per plot: Total 96 plants 2'x7' spacing
  - 2 High Tunnel Scenario: 30'x96', 4 beds, 2'x6' plant density
  - 3 20 seeds in packet cost \$4.85
  - 4 Vermont Compost Fort Vee 20 qt @\$24.95, 4 qts per tray \* 4 trays = 16 qts = \$19.96
  - 5 50 plugs per tray for 4 trays @\$20.80 or \$5.20 per tray or \$0.10 per plug hole
  - 6 Nature Safe 50lb bag \$42.95 (\$.86 per lb) (75lbs were used during the trial)
  - 7 Potassium Sulfate 50lb bag \$54.30 (\$1.09 per lb) (60lbs pre-plant + 1.1lbs fertigated)
  - 8 Trial 2 lines\*7 feet\*24 plots= 336 High Tunnel 2 lines \* 96 length\* 4 rows = 768 ft. drip line. \$140 for 1,000 ft irrigation system (\$0.14/ft)
  - 9 Side Wall Insect Netting: 4'x984' @\$312 (Dubois Agrinovation) = \$0.32 per foot
  - 10 Weed Barrier: Covered entire high tunnel (for trial, 12 rows with three aisles, 24 plots 1ft x 7ft = 688ft; for full tunnel, 17 rows with two aisles x 30ft = 822ft)
  - 11 4h @ \$76 rototiller rental (Home Depot rate) to prepare soil for transplanting. Rate differs for tiller owners.
  - 12 \$139/ac/yr land rental. 2880 sq ft (0.07 ac) needed for 4 mo. Rate differs for land owners. [2023] Added 3% to account for inflation May 2023-May 2024
  - 13 \$605.33 for year rental only used for 4 months [2023] Added 3% to account for inflation between May 2023 and May 2024
  - 14 Chilean Nitrate 50lb bag \$69.34 (\$1.39/lb) (4.4lbs were used during the trial)
- Washing, packing, and marketing costs will vary by operation.