High Tunnel Tomato Trellising at UMD’s Terp Farm

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Terp Farm Background

Terp Farm is a vegetable production farm operated by the Department of Dining Services at the University of Maryland, College Park. The Farm is located at the Central Maryland Research and Education Center in Upper Marlboro, MD.
Terp Farm Background

Terp Farm occupies approximately 3.25 acres, with .25 acres being in High Tunnel production. Tomatoes are grown exclusively in the tunnels on about 2000 sq.ft. per season.
Terp Farm Scenario

• Tomatoes are trellised using a “top line” system
  • Plants are spaced 18” in-row and supported by a single line per plant suspended from an overhead wire.
  • Plants are pruned to a single leader, meaning that no side-shoots are allowed to grow.
    • Leaves are also aggressively pruned to promote optimal airflow and plant hygiene in a confined environment.
    • Plants are lowered over time to keep fruit at a comfortable harvesting height.
Note the twine hooks suspended from the overhead wires.
Terp Farm Scenario

- We use an uncommon bed layout for high tunnel tomatoes
  - Beds are arranged laterally, or parallel to the short side of the tunnel, as opposed to longitudinally, that is, parallel to the length of the tunnel, with two rows per bed on a 60” bed spacing.
  - Since the tunnel has roll-up sides for ventilation, we have found this layout allows for much greater airflow around the plants.
  - This layout also means we can achieve a greater density of planting while much wider spacing between rows contributes to easier maintenance and harvesting.
- Lateral Population: 12x25’ beds (60” bed centers), 2 rows per bed (staggered), 18” between plants, 33 plants per bed = 400 plants

- Longitudinal population: 6x80’ beds (36” bed centers), 1 row per bed, 18” between plants, 53 plants per bed = 320 plants
Propagation

• Start seeds in drill trays – 10 or 20 row
  • Ease of seeding – no need for seed singulation
  • Tomatoes prefer dense seeding for germination
  • Save space on a heat mat or in a germination chamber

• Prick out (pot up) to 50 cell trays
  • First sign of true leaves
  • Dibble or use widger to place seedlings at correct depth
  • Allows for exact count of desired transplants
Growing-On Process

- Grow on seedlings in 50 cell trays for several weeks until they are between 10”-15” tall.
  - Apply foliar fertilizer or drench on a bi-weekly basis
  - Pinch suckers and any premature blossoms – DO NOT pinch primary leader
  - Rotate trays and space to ensure even growth rate
  - Scout for pests and implement controls as needed.
- Not necessary to harden-off if planting in a high tunnel
Transplanting

• Plant to moisture – 6”-12” deep with only top few sets of leaves above soil surface.
  • Prune off any leaves or suckers that would be below the soil surface (yes, your plants will look spindly, but tomatoes are vigorous adventitious rooters).
  • Can lean the plants in if digging to 6”-12” depth is not possible

• Space plants 12”-18” in-row
  • Stagger if planting double rows on a single bed, with 6”-12” between rows

• Space beds 48”-60” on-center
  • TF plants on 60” centers which leaves plenty of room for a companion crop
  • Wider spacing increases air-flow and more room for crop maintenance and harvesting
Tomatoes are planted on 60" centers, companion crops on 30" centers
Trellising

- At planting time, place a single clip just below top set of leaves
  - At this time, this is just to secure the line and keep things organized, not to actually support the plant
- Prune and pinch as plants grow
  - Prune off leaves that touch the ground (disease vector) or are already diseased
  - Pinch suckers (side shoots)
  - Keep plants to one or two leaders so as to encourage upward vigor and not a bushy habit (be diligent or you will have a mess on your hands)
- Continue to add support clips as plants gain height
  - Clips should be placed below good structural leaves with a little bit of tension on the string.
The clip is secured to the string while loosely holding the stem of the plant. Notice how the clip is placed below a structural branch to support the weight of the plant.
Fruit Production

• Continue to pinch flowers until the desired height of first fruit set is achieved – approximately 18”-24”
  • While you may be pruning many of the leaves off at this height, be sure to leave “fruiting hooks” intact
  • Prune off harvested fruit hooks and any leaves below current fruit set

• As height of harvestable fruit begins to rise to levels that are uncomfortable or inefficient, consider lowering plants to bring fruit sets down.
  • This system is referred to as “lower-and-lean”
  • Allows plants to continue upward growth while not extending above trellis support wire.
  • Johnny’s Selected Seeds has a good video tutorial on this technique - https://www.johnnyseeds.com/videos/video-v87.html
Do you see how nice and tidy Jack has been keeping these tomatoes?! 

Look closely at how the lower portion of the plants have been “picked up,” meaning that all ground contacting leaves have been pruned away.

Also note that at this stage the companion crop has been harvested and taken away, so now there is plenty of air flow and room for crop maintenance/harvesting.

This crop has a ground cover of straw mulch, and we experimented with using row cover fabric on top of that to try to prevent drops from contaminating the soil. It didn’t work, so now we just fastidiously clean the plants and ensure that everything is taken to the compost pile.
Other Considerations

- **Fertility**
  - Follow target pH, and Macro & Micronutrient recommendations
  - Tomatoes are especially affected by Boron and Calcium deficiencies

- **Pest & Disease Management**
  - Insect pests – lepodoptera (horworm & armyworm); Whiteflies; Fungus Gnats
  - Disease – blights, mildews, fungal & bacterial pathogens, viruses
Fun fact: hornworms glow under a black light!
Other Considerations

- **Irrigation**
  - Trickle irrigation to prohibit soil splashing (primary vector for disease)
  - Irrigate to depth, but not too frequently so as to encourage deep rooting
  - Drier plants also yield sweeter fruit
  - Wait to irrigate until after harvest to avoid splitting fruit

- **Mulching Options**
  - Straw mulch (apply after a few cultivations to remove weeds)
  - Woven fabric ground cover (good for soil hygiene)
Other Considerations

• Variety Selection
  • Indeterminate varieties, noted as “greenhouse performer”
  • Vining habit, i.e. upward vigor
  • Look for specific disease resistance
  • Consider fruit weight

• Tools
  • 20 row trays/50 cell trays
  • Tomahooks or Rollerhooks + Twine + Clips
  • Hands free pruners + hollow leg bags
  • High tensile or braided steel cord (note weight limits) + turnbuckles
50 cell tray
Drill tray
Hands-free pruner
Hollow leg bag

Vine clips
Tomato twine
Rollerhook
Tomahook
Questions?

(The answer will be, “it depends….”)

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