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Pruning Greenhouse Tomatoes for Optimum Yield

Growers must manage foliage and fruit loads throughout the growing season using various management strategies including sucker, leaf and fruit pruning techniques.

The plants of indeterminate tomato varieties have main stems that continually elongate when grown under favorable greenhouse conditions, sometimes reaching 40-50 ft in length during a production season. Fruiting occurs along the main stem as well as along lateral stems that will also freely develop if not pruned. The development of these secondary fruiting shoots diverts resources from the main stem resulting in smaller fruits and less yield. Thus, effectively balancing the vegetative growth and fruiting of these plants is necessary to maintain plant health and maximize the yield of high quality fruit over time (Figure 1). Greenhouse growers use several management practices and pruning techniques to achieve this balance.

Plant Density

Plant density plays a key role in determining fruit number per plant, fruit size, fruit quality, overall productivity and ultimately, profitability. Density recommendations can vary with growing system configurations, variety, management strategies, and time of year but generally range from 3 to 4 ft²/plant in the US.

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Figure 1. Regular pruning of greenhouse tomato plants balances the foliage canopy and fruit load. Image by Beth Scheckelhoff.

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Growers must determine optimal spacing within and between rows of plants and whether individual plants will be trained to a single or double stem. Each planting strategy can result in maximum yields depending on time of year and environmental conditions.

Lateral Shoot Removal

Lateral shoots (also known as suckers or axillary shoots) form in the axil of each leaf node along the primary stem (Figure 2). If left unchecked, these suckers will compete with the primary stem causing an overabundance of vegetative growth, reducing flowering, fruit set, and yield. Growers must diligently (and frequently) remove lateral shoots to allow for continued growth and flower



Figure 2. Lateral shoots form in each leaf axil (top). If not removed, lateral shoots will compete with the primary stem diverting resources from developing fruit (right). Images by Beth Scheckelhoff.

development along the primary stem.

Leaf and Fruit Removal

While leaves contribute significantly to photosynthesis, they also serve to shade fruit and reduce the incidence of sunscald and uneven ripening. The presence of too many leaves, however, can limit light penetration into the plant canopy and restrict air flow. Reduced air flow within the canopy increases humidity and provides an ideal environment for the development of *Botrytis* and other plant pathogens that can affect the foliage and/or fruit. For these reasons, growers often remove lower leaves along the stem up to the lowest truss of maturing



Figure 3. Lower leaves are removed up to the lowest truss with maturing fruit. Additional leaves may be removed above maturing fruit, especially during periods of low light. Image by Beth Scheckelhoff.

fruit (Figure 3).

Indeterminate varieties are pruned to maintain an optimal leaf to fruit ratio. This ratio varies depending on variety, plant density, and environmental conditions, but generally ranges from 2:1 to 3:1. Ohio growers commonly maintain plants with 15-18 leaves and 5-6 clusters of fruit at any given time. The proper leaf to fruit ratio is maintained throughout the growing season; older leaves are removed as fruit is harvested and are replaced by newly developing leaves and trusses. Additional leaves may be removed during periods of low light to enhance fruit ripening.

Growers can also influence fruit size and maturation within a truss by removing small, misshapen or damaged fruit. Removing these undesirable fruit within the truss enables the plant to invest its resources in the remaining fruit.



Figure 4. Uneven development and ripening of tomato fruit (left). Small fruit should be removed through pruning. A truss with fruit of uniform shape and size is more desirable (right). Images by Beth Scheckelhoff



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