

Balancing Vegetative and Reproductive Growth in Greenhouse Tomatoes

(adapted from Univ. of Arizona and DeRuiter Seeds, Inc.)

Vegetative growth favors development of roots and shoots for a strong plant structure and leaves for photosynthesis. Reproductive growth favors flowering and fruit formation for development of a marketable crop. A balance is needed between the two types of growth in order to sustain tomato plant growth and productivity.

Characteristics of Vegetative versus Reproductive Growth.

Character	Reproductive Growth	Vegetative Growth
Leaves	Flat and open, light green, soft	Curled, thick, dark green
Stem diameter	Thin; small diameter (relative to tomato type*) Usually less than 0.8 cm	Thick; larger diameter (relative to tomato type*) Usually greater than 1.2 cm
Flowering	Close to the top of the plant, within 5-8 cm Flowers open fast and uniform Rapid flowering within truss	Further from the top of the plant, greater than 13 cm away Flowers open poorly; sepals stick Poor uniform flowering within truss
Flower color	Dark yellow	Pale, light yellow
Truss stem	Thick, sturdy, short and curved	Thin, long and sticking upwards Sometimes with leaves or suckers
Fruit	Large, many, good shape and fast development	Small, few, poor shape and slow development

*Beef types have thicker stems than cherry types

Steering the Plant refers to using environmental or nutritional factors and different cultural practices to affect the growth habit of tomato plants so they become more reproductive or more vegetative. The goal is to keep plants in balance: not too vegetative and not too reproductive.

Techniques to Steer Plants Towards Reproductive or Vegetative Growth.

Factor or practice	Steer towards reproductive	Steer towards vegetative
Difference between day and night temperature	Larger difference	Smaller difference
Day to night cooling rate	Speed up	Slow down, or no difference
Relative humidity	Lower (make drier)	Raise (make more humid)
Ventilation	Increase	Decrease
Carbon dioxide	Increase (to 800-1000 ppm)	Decrease
Electrical conductivity (salt level) of irrigation water	Stress plants with either very low or very high EC (1-1.5 or 3-4 mmhos/cm)	Moderate EC (2-2.5 mmhos/cm)
Irrigation: how often and how long	Less frequent but longer duration	More frequent but shorter duration
Irrigation start time	Later in day	Earlier in day
Irrigation end time	Earlier in day	Later in day
Truss pruning	Leave more fruit on	Remove more fruit
Leaf pruning	Remove more leaves	Leave more leaves on plants