



ISP technologies

environmentally clean crop production for healthier food

Version 2017

# Tomatoes

## Greenhouse/High Tunnel

(Rates Based per 100 plants, with adequate soil nutrient/fertility)

Growing a successful high tunnel tomato crop requires careful attention to your crops nutrition from planting through the maturation of the last fruit. Abiotic disorders such as Blossom End Rot (BER), cracking and yellow shoulder often greatly reduce the harvest of #1 fruit. Proper plant nutrition including balancing potassium, calcium and magnesium in plant tissue will greatly reduce culls and improve your percentage of #1 fruit.

It should be noted that this program is presented as a guideline only based upon research and the experiences with a number of growers. With the wide variances possible from both soil types and environmental conditions present during any particular season, your actual recommendation can vary from what is presented. It is always advisable to discuss actual management practices with your local ISP specialist.

**Dry or Bulk Fertilizer:** Apply approximately 50% of your expected nutrient requirements as granular materials prior to planting. Knott's Handbook for Vegetable Growers estimates that an average yield of fresh market tomatoes will require 80-90 units of nitrogen, 150 units of  $P_2O_5$ , and 200 units of  $K_2O$  per acre. This is a good starting point for the application of a preplant nutrient blend. Apply 40-50 units N, 75 units  $P_2O_5$ , and 100 units  $K_2O$  per acre and incorporate into targeted planting beds (or per 100 feet of row - that works out to .7 units N + 1 unit P + 1.5 units K preplant). The recommendations in this program is based upon 100 feet of row, with plants spaced 18 inches apart in the row. Plant population is a critical aspect of fertility recommendations, and if planting closer or further apart in the row, then adjustments to nutrient applications should be made.

**Transplant Solution:** Transplant mix should contain: .8 pounds 10-45-10; 3 fluid ounces Phytogro Xtra; and 2 fluid ounces Metabolik SB per 10 gallons of solution. Water all newly planted tomatoes in thoroughly with this solution.

**NOTE, First 30 Days:** Our objective is to build an aggressive frame in order to increase potential number of fruiting sites and forms at first fruiting. (If it is thought that one needs to push the frame, or if there are flower buds on the plant when transplanting, it can be beneficial to apply 28-16-7.) If plant frame shows excessive vegetative growth, apply 0-36-30. (The photo at right illustrates a very strong frame, approximately 8 - 9 nodes on the main stem, yet is still less than 1 foot in height. Fruiting buds are forming in the top of the plant.)



The more aggressive growers are always observing all aspects of plant development, vegetative development, numbers of fruit set, fruit color, and of course any outbreak of pests or disease. Although this provides a wealth of information, it is recommended that tissue tests be taken to monitor actual nutrient uptake and potential deficiencies.

The first tissue sample should be taken four weeks after transplanting, then every two weeks until the last fruits are setting. Use the following as targets from your lab results: N - 3.5 - 4%; P - .8 - 1%; K - 3 - 4%; Ca - 3%; Mg - .8 - 1%; S - 1.2%; B - 50 ppm; Zn - 50 ppm; Mn - 100 ppm; Fe - 100 to 300 ppm; and Cu - 20 ppm. Although it is usually a separate test, silicon should be at 3,500 ppm. Weather and time of day that samples are collected will have an impact upon your lab results. If sunny and in the morning when you collect your first sample, then take all remaining samples in the morning on sunny days.

**Water Quality and Insecticides/Fungicides:** Water quality is essential for optimum chemical performance, and is the largest percentage of any spray solution, as well as nutrient solutions applied through drip lines. Water quality has a significant impact upon overall plant performance. It will be beneficial to pretreat irrigation water prior to application through the drip lines to a pH of 6.2 - 6.5. In most instances, improvement of water quality will result in better nutrient performance. (NOTE: Most chemicals with the exception of sulfonylurea herbicides will perform better with an acidic solution pH. Use Torch to both properly condition the water as well as to buffer to desired pH. (Label rate is 1 gallon per 800 gallons of spray solution, but this can vary based upon both water hardness and/or alkalinity.))

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The following table is designed for main season, determinate tomatoes with a maturity of 80 to 95 days. Prolonged cool, cloudy periods will add days to this schedule, and extreme heat can shorten the schedule.

Week	ISP Soluble Plant Foods	Other Notes
1	7.5 ounces 10-20-20 & 1.5 pound 28-16-7	
2	7.5 ounces 10-20-20 & 1.5 pound 28-16-7	Observe frame development
3	12 ounces 10-20-20 & 2.5 pounds 28-16-7	Observe frame & fruit development
4	12 ounces 10-20-20 & 2.5 pounds 28-16-7	Tissue test 4 weeks following planting, and adjust nutrients accordingly.
5	12 ounces 10-20-20 % 12 ounces 9-14-24	Begin adding 2 tsp. SiMag58, and 3 fluid ounces CalStore or MetaCal per week
6	12 ounces 10-20-20 % 12 ounces 9-14-24	Include 2 tsp. Metabolik HV-1 every 10 - 14 days with your disease management program. Time for second tissue test
7	12 ounces 10-20-20 & 2.5 pounds 4-18-38	Continue SiMag58 and MetaCal/CalStore.
8	12 ounces 10-20-20 & 2.5 pounds 4-18-38	Continue SiMag58 & MetaCal/CalStore until end of season. Third tissue test.
9	3 pounds 4-18-38	
10 & 11	3.75 pounds 4-18-38	Fourth tissue test.
12 - end	3.75 pounds 4-18-38	Fifth tissue test if harvest is to be maintained.
	Continue to repeat weeks 10 - 12	Adjust nutrient based on tissue sample.

Apply Meta Cal, or CalStore through the fertigation system weekly when not applying any P containing nutrients. Fill irrigation lines with water, inject CalStore or Meta Cal, then flush lines with clear water. This will ensure that no clogging precipitates are formed and that your developing fruit get plenty of calcium in balance with magnesium.

**Foliar Applications:** Foliarly applied nutrient (K, Ca and Mg) will greatly assist growers in maintaining sufficient amounts of these nutrient when coupled with a proper fertigation program, especially at key stress points. Examples are fruit set and/or maintaining vegetative growth with a heavy fruit load. Include ISP Plant Food and SiMag58 at 1 - 2 tsp. each per gallon of foliar solution. Spray weekly with any foliar applications for pest management. Calcium supplements CalStore and MetaCal can be applied foliarly with pest management materials, but not with 4-18-38 in order to avoid any reactions with phosphorous (P).



Photos illustrate what we would consider desirable as to how fruits appear prior to first picking and continuing through the majority of the season.

