

NUTRIENT REMOVAL IN A YEAR WITH HEAVY YIELDS

The mild summer weather in 2025 led to unusually high processing tomato yields. The higher the yields, the more nutrients are exported with the harvested fruit.

Table 1. Average nutrient concentration per ton of drip-irrigated processing tomatoes, and average nutrient removal extrapolated for 40, 60, 80, and 100 t/a yields. Source: [Hartz and Hanson, 2009](#)

	Concentration	Estimated removal (lbs/acre)			
	lb/ton	40 t/a	60 t/a	80 t/a	100 t/a
N	3 to 4	140	210	280	350
P	0.4 to 0.5	18	27	36	45
K	4 to 6	200	300	400	500

Do higher-than-normal yields affect next year's fertility management?

Given 2025's high yields, this is a good year to verify adequate soil nutrient levels with a soil test. Soil P and K testing can be done in late fall or early spring. Soil testing instructions for annual crops can be found

here: http://geisseler.ucdavis.edu/Guidelines/Soil_Sampling_P_K.pdf

Guidelines for drip-irrigated processing tomato recommend replacing the P removed with the crop yield on soils with 10-20 ppm Olsen-P. If the soil test values are <10 ppm, somewhat more should be applied than was removed (Hartz and Hanson, 2009).

Table 2. Soil test thresholds for drip-irrigated processing tomato. Numbers are the soil test values in the top 0-12" (Olsen P, ammonium-acetate exchangeable K) at which a yield response to fertilizer is more or less likely. Source: [Hartz and Hanson, 2009](#); [Miyao et al., 2017](#)

	Soil test value (ppm)		
	Response likely	Response possible	Response less likely
Olsen P	<10	10 to 20	>20
Exchangeable K	150	150-200*	>200**

*or ≤2% of CEC

**or >2% of CEC

Soils with exchangeable K <200 ppm (or in which K makes up less than 2% of the cation exchange capacity, or CEC) are most likely to respond to K fertilizer. However, replacing all the K exported with the fruit is generally not economical (Hartz and Hanson, 2009). Earlier research suggests that K applications greater than 100-200 lb K₂O/acre may have limited effect (though linear responses to rates up to 800 lbs K₂O/acre have been observed locally on a deficient field; Miyao et al., 2017). As a rule of thumb, the lower the soil test value, the more likely the crop will be to respond to a higher fertilizer rate, assuming no other limiting factors.

Nutrient export from a high-yielding tomato field affects the nutrition available for the subsequent non-tomato crop as well. Soil test interpretation for a wide variety of annual crops can be found here: <http://geisseler.ucdavis.edu/Guidelines/Home.html>

Tests for available N should not be done in fall. Available N measured in fall may leach over winter, and additional N may mineralize from soil organic matter. Tests taken as near as possible to planting will provide the best guide for in-season N management.

References

- Hartz, T.K., Hanson, B., 2009.** [Drip irrigation and fertigation management of processing tomato](#). University of California Vegetable Research and Information Center.
- Miyao, E.M., Leacox, B., Davis, M., 2017.** [Evaluation of composted poultry manure & potassium as plant nutrient supplements to improve tomato plant health](#). Presentation at the 2017 south Sacramento Valley Processing Tomato Production meeting.

Questions?

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