

# Tomato Fertilizer Trials

close placement of fertilizers under direct-seeded tomatoes in comparative tests with sidedressing of the same materials

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**Slow growth** of field seeded tomatoes and purple coloring of the leaves shortly after emergence may indicate a phosphorus deficiency.

Of 48 fertilizer trials on canning tomatoes—almost entirely with transplants and before 1956—in the major producing counties, 24 trials showed responses to nitrogen; four responded to phosphorus but none of the tests showed any benefit from potassium.

To determine the influence of close placement of nitrogen and phosphorus on the yield of field seeded canning tomatoes a trial plot was established near Tracy in 1956. Close placement—2" below the seed—was compared to larger amounts of the same fertilizers placed 6" below and 6" to the side of the seed, applied at time of planting. Treatments receiving a small amount of phosphate close to the seed gave early—first-pick—yields significantly higher than with other treatments, and total yields were significantly higher than the check. Early and total yields were not increased over the check by a larger amount of phosphate placed at greater distances from the seed. Apparently, the influence of phosphate was early in the growth cycle, and effective placement was essential for yield response. At harvest it was estimated that as much as three tons per acre were lost from overripe fruit in the close-placement plots. Total yields were not much stimulated, indicating that the main influence of the treatments might be earlier maturity of the fruit.

Plant tissue samples—taken from all

**Petiole Analysis—Tomato Fertilizer Test, Tracy, 1956**

Treatment				Percent dry weight of petioles					
Pounds/acre			Placement	Nitrogen		Phosphorus		Potassium	
N <sup>1</sup>	P <sub>2</sub> O <sub>5</sub> <sup>2</sup>	K <sub>2</sub> O <sup>3</sup>		7/7	8/24	7/7	8/24	7/7	8/24
0	0	0	.....	2.96	1.35	0.24	0.21	5.75	5.65
60	0	0	6" to side and 6" below seed	2.97	1.37	0.23	0.22	5.57	6.09
120	0	0	"	3.10	1.46	0.27	0.21	5.54	6.09
120	120	0	"	3.09	1.41	0.35	0.24	5.14	5.96
120	120	120	"	3.19	1.31	0.36	0.22	5.86	5.66
0	25	0	2" below seed	2.91	1.24	0.31	0.18	5.85	4.72
20	25	0	"	2.53	1.28	0.26	0.18	6.08	4.28
20	25	0+	"	2.71	1.25	0.25	0.18	5.46	4.91
120	0	0	Sidedressed						
LSD <sup>4</sup> 5%				0.09	0.29	0.04	0.03	0.55	0.86

<sup>1</sup> Nitrogen. <sup>2</sup> Phosphorus pentoxide. <sup>3</sup> Potassium oxide. <sup>4</sup> Least significant difference.

plots on July 7 and August 24—were analyzed for total nitrogen, phosphorus, and potassium. The data obtained from the analyses correlated poorly with the treatments, especially in phosphorus. In some instances, plots that received phosphorus placed under the seed produced plants with lower phosphorus concentrations than those of the plants in the check plot. Plant growth, stimulated by the effect of the close-placed phosphorus, had probably diluted any higher phosphorus concentration that may have existed earlier. Larger amounts of phosphorus placed further from the plants increased phosphorus concentration on the first sampling date, but this was not reflected in plant growth. A similar condition existed in nitrogen concentrations on the sampling dates. Potassium concentrations were not affected by treatment, nor was there any evidence that this element had any effect on fruit quality.

Similar trials were conducted in several locations in 1957. To measure growth, the fresh weights of plants were determined at thinning time and growth increases were just as marked as in previous trials. In all trials, plant weights at thinning time were 3–4 times as great with fertilizer placed under the seed as with no preplant fertilizer.

Several variations in placement and amounts of under-seed fertilization were compared. Phosphorus seemed to be the most important nutrient considered in close placement trials. The addition of nitrogen to the fertilizer increased seedling growth only slightly in the Tracy test. Addition of potassium likewise had little effect—except in a test near Stockton, in a soil where soil tests had indicated that potassium supply might be somewhat limited.

Plant growth was not detectably different. Concluded on next page

**Growth of tomato plants as influenced by close placement of fertilizer at seeding time.**



**Tomato Fertilizer Test, Tracy, 1956**

Treatment				Plant wgt. thinning time Grams	Yield Tons/acre	
Pounds/acre			Placement <sup>4</sup>		1st	Total
N <sup>1</sup>	P <sub>2</sub> O <sub>5</sub> <sup>2</sup>	K <sub>2</sub> O <sup>3</sup>				
0	0	0	.....	1.46	6.3	14.7
60	0	0	6" below + 6" to side	1.42	7.4	17.1
120	0	0		1.83	8.5	19.4
120	120	0		2.13	8.1	18.2
120	120	120		2.16	7.7	18.2
0	25	0	2" below	7.92	10.0	19.0
20	25	0		8.64	10.7	19.0
20	25	0	2" plus below 6" side	11.70	11.4	20.2
120	0	0				
LSD <sup>5</sup> 5%					1.7	2.4

<sup>1</sup> Nitrogen. <sup>2</sup> Phosphorus pentoxide. <sup>3</sup> Potassium oxide. <sup>4</sup> Refers to location of fertilizer band in reference to location of seed. <sup>5</sup> Least significant difference.

