FIRMNESS or solidity of tomatoes is of great importance in the quality of the canned product. A method developed at the New York State Agricultural Experiment Station for the treatment of tomatoes with soluble calcium salts (2) during processing greatly increased the firmness of the canned product. Minute quantities of calcium taken up by the tissues by this method have definitely improved the solidity and increased the drained weight and firmness of the tomatoes.

The objects of the experiment reported here were two-fold. First, to find out if the application of calcium salts as an amendment to the soil in which tomatoes were grown would increase the uptake of calcium by the plant and result in an increase in the calcium content and firmness of the tomato fruit. It has been reported (1) that with an abundant supply of potassium there is some replacement of calcium by potassium in the plant. The second object was to test the effect of increasing amounts of potassium fertilizers on the firmness of the fruit and, particularly, to determine if increased potassium fertilizers would reduce the calcium content of the tomatoes.

EXPERIMENTAL METHODS

Nystate tomatoes were used throughout these experiments. They were grown on the Canning Crops Investigations Farm of the Experiment Station on 1/40th acre plots with all treatments replicated three times in randomized arrangement. The kind and amount of fertilizer applied to the various plots is shown in Table 1.

Only No. 1 tomatoes, graded at the farm, were delivered for canning. The fruit in the first set of samples, harvested on September 2, were ripe and fairly soft. At the time of the experiment this was attributed to the holding of the fruit in storage overnight prior to canning. Later tests showed, however, that holding tomatoes overnight in storage had little effect on the firmness of the canned product. The tomatoes from each lot were handled separately in a commercial cannery. They were washed, steamed, peeled, cored, and packed by hand in No. 2 3/4 size cans in the first series (September 2) and in No. 2 size cans in the second series (September 11 and 12). The weight of tomatoes put into each can was noted on the outside of the can to allow a precise calculation of the "drained weight" in relation to the "put in weight". No salt was added to the first lot, but 35-grain...