



New Jersey Agricultural
Experiment Station

Soil, Salt, and Tomato Taste

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Feb., 2009 - Sodium and chlorine are nutrients rarely thought of as being potentially limiting or of much importance to tomato production or fruit quality. Nevertheless, a reexamination of traditional fertilizer practices in New Jersey suggests that the combination of these two nutrients (which together make sodium chloride or salt) may be a factor missing from modern tomato cultural practices. In “the olden days” Chilean nitrate (sodium nitrate) was widely used as a nitrogen source in vegetable crop production. But in recent decades it has mostly been replaced with other nitrogen fertilizers that do not provide sodium. Chloride is regularly applied to vegetable crops in the form of potassium chloride (also known 0-0-60).

Observations from some field trials conducted in New Jersey in 2002 and other studies from Israel and Italy appear to suggest that the current near absence of sodium in fertilizers, due to its replacement with other nutrient sources, may have had unanticipated consequences on the flavor of the Jersey tomato. The Israeli researchers described their findings as “results show that the quality – in terms of chemical constituents (mainly sugars and acids), pigments, and especially taste – of fruits from saline-treated plants is superior to that of those from control plants. The improved taste under salinity may stem from salinity-increased acids and sugars and/or from an increase of other flavoring compounds...”

My lab recently conducted some additional field trials to evaluate the effect of amending soil with natural sea salt on the flavor of tomato. We used a product called SEA90 as the source of salt. This material, derived from a marine deposit, is a rich source of sodium, chloride, and smaller concentrations of a wide spectrum of naturally occurring minerals. We applied the SEA90 (5.25 grams per sq. ft.) under the plastic mulch to two varieties of tomato (Ramapo and Florida-47) grown at the Rutgers Snyder Research & Extension Farm in Pittstown, NJ. A similar study was also conducted at the Rutgers Vegetable Research Farm in East Brunswick, NJ but without plastic mulch and somewhat different cultural practices. When the tomato fruit were vine ripe, tomato flavor was evaluated using a taste test panel composed of Rutgers faculty and staff. They were asked to rate several fruit quality and taste parameters from the treated and control plants without any awareness of treatment or the nature of the experiment.

For the trial conducted at the Snyder Farm, the taste panel preferred the tomato fruit from the salt (SEA90) treated plants over the fruit from the untreated plants. At the other field trial conducted at the Vegetable Research Farm, the taste panel generally preferred the fruit from the untreated plants. The reason for the different results for the salt treatment is not clear, but the use of different cultural practices may have been a factor. Although we did not collect crop yield data, we did not observe any obvious negative effects of the salt treatment on tomato plant size or fruit production. Additional field trials with SEA90 are planned for the 2009 growing season.

For growers interested in conducting a small trial to evaluate the effect of salt fertilizer on tomato taste here is a suggested protocol: Use 46 grams of SEA-90 a product that is mostly sea salt; Website: www.SeaAgri.com to treat an area 4 square feet or land area needed to grow one tomato plant. Apply the treatment by mixing the SEA-90 product into the soil at time of planting. Flag the treated plant and perform your own personal taste test by comparing the treated fruits to other fruits of the same tomato variety from another part of the field. Leave some border space between plants when sampling fruits for comparing treated and untreated plants. An alternative approach is to use sea water from the Atlantic Ocean. 1300 ml (or 0.35 gallons) of sea water contains about 46 grams of salt which is enough to treat one tomato plant. Apply this seawater as a soil drench around the base of the plant two weeks after transplanting. To prevent leaf burn, do not allow the seawater to touch the leaves.