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## A PRE-SCREENING METHODOLOGY FOR THE IDENTIFICATION OF HEAT TOLERANT MUTANTS IN TOMATO (*SOLANUM LYCOPERSICUM* L.)

Field survival tests performed in hot-spot environments are a common method to evaluate heat tolerance in plants. However, it is difficult to predict heat conditions in the field. Neither temperature nor other conditions such as wind, irradiance and humidity can be controlled in the field. Thus, a rapid, relatively cheap and reliable pre-field screening methodology is required to screen large populations. Nine tomato mutant lines together with the parent line, MST 32/1 and one reference variety Money Maker were used for the study. Plants were examined at two different growth stages, seedling and mature plant and at different controlled conditions (35°C and 26°C). Plant height, number of flowers per cluster, leaves scorching, chlorophyll content, chlorophyll fluorescence and quantum yield were measured at the flowering stage for mature plant. For seedlings, assessment of leaf scorching was conducted along with analysis of survival rate. Variation in the degree of leaf scorching from moderate to high was observed among the line in the mature plant experiment. Significant difference at  $P < 0.05$  was observed among the different lines under study for chlorophyll content, instantaneous chlorophyll fluorescence and quantum yield. Two mutant lines were identified as candidates carrying mutations in genes involved in heat tolerance. In the seedling experiment, leaf scorching was observed in some lines after exposure to 37°C. Most of the lines exhibited leaf scorching greater than 25%, except two lines which had 11 and 12%. No leaf scorching was noted in one mutant line. From the two experiments, it was noted that the same mutant showed tolerance in both experimental settings. This showed that the two experiments can be used as a method for screening large mutant population and pre-selection of candidates for field testing.

### Country or International Organization

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