CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
Christopher W. Weddington

Project Number
J1849

Project Title
Drip Emitter Performance

Abstract

Objectives/Goals
The objective is to determine if the 2004 field emitters used on our farm still perform well in water output and uniformity. New emitters from 2005 and 2006 were also tested. All three sets of emitters were compared against industry standards for water output in gallons per hour (gph) and uniformity (coefficient of variation, CV).

Methods/Materials
25 in-line emitters in 4 inch segments from each of 2004, 2005,and 2006 years were connected in series and attached to a water supply system. Individual emitter water output was collected in graduated cylinders for 4 minutes, at a pressure of 20 pounds per square inch. The gph and CV were calculated. Results were compared to industry standards.

Results
All emitters delivered water output less than the manufacturer published standard. Used 2004 emitters had the lowest gph. New 2006 emitters, and used 2004 emitters, were uniform. New 2005 emitters were not uniform. None of the emitters rated excellent according to the industry standard CV rating system.

Conclusions/Discussion
The used emitters had the lowest water output, but it is still acceptable and the farmer can irrigate longer to compensate. The used emitters had good uniformity and did not need to be replaced. Results showed there is too much variability in the new emitters, indicating a need for better quality control in the manufacturing process.

Summary Statement
Used and new drip emitter performance is evaluated and compared to industry standards.

Help Received
Used university lab equipment under supervision of parents. Mother reviewed mathematical calculations.