



ELSEVIER

Agricultural and Forest Meteorology 71 (1994) 315–336

AGRICULTURAL
AND
FOREST
METEOROLOGY

Longterm analysis and modelling of agroclimatic effects on national avocado yields in Israel

J. Lomas^{*,a}, D. Zamet^b

^a*Meteorological Institute, P.O. Box 25, Bet Dagan, Israel*

^b*Agriculture experimental station, Ministry of Agriculture, Acre, Israel*

Received 11 March 1993; revision accepted 5 February 1994

Abstract

The agroclimatic analysis was based on a functional relationship between significant selected climatic parameters and avocado yields in Israel over a 27 year period. The analysis consisted of three steps.

1. Multiple regressions between every climatic elements and national yields.
2. Multiple regression between the statistically significant climatic variables only and national yields.
3. The model yield output was tested by cross-validation on 21 frost free years and 6 years with frost.

The statistically significant climatic variables explained 72% of the interannual variability of yield for the frost free series and 83% for the series with frost.

Calculated avocado yields showed good agreement with measured values. The standard error of estimate was 1.1 t ha^{-1} for years without frost, and 1.4 t ha^{-1} for years with frost. The model provides quantitative yield responses to microclimatic modification and national yield estimates 3 months before harvesting, providing lead time for management and commercial decisions in the avocado industry.
