"Turbulent flow structure in canopies and its implications for atmospheric pollen transfer"

Dr René van Hout
Technion – Israel Institute of Technology

Dispersal of pollen grains by wind and gravity (Anemophilous) is one of the oldest means of plant fertilization available in nature. In recent years, the growth of genetically modified foods has raised questions on the range of pollen dispersal in order to limit cross-fertilization between organically grown and transgenic crops. The distance that a pollen grain can travel once released from the anther is determined, among others, by the aerodynamic parameters of the pollen and the characteristics of turbulence in the atmosphere in which it is released.

The spatial turbulent flow structure within and above a mature corn canopy and a wind tunnel model canopy were measured using Particle Image Velocimetry. In addition, diurnal pollen concentration profiles were measured and their relation to local meteorological conditions, including humidity, solar radiation and turbulence was investigated. Bi-modal pollen release patterns were obtained. The first peak was related to direct radiation on the anthers while the second peak was associated to duration of upward directed turbulence structures.