MICROMETEOROLOGICAL MEASUREMENTS DURING THE BLACKMO 88 SPRAY TRIALS

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ABSTRACT

Instrumentation was arrayed on a 120 foot tower to detail the local atmospheric conditions during the Blackmo 88 spray experiment. Measurements were continuous for 30 minute periods encompassing each spray pass. Vertical profiles of wind, temperature, humidity, heat and momentum flux, radiation and three component turbulence intensity were measured during each run. In addition, simultaneous upper air wind temperature were measured from the nearby mid-state airport with an acoustic radar operated by the Meteorology department of PSU. In all, 9 hours (18 runs) of data were taken over a period of 3 days, and a very high quality, complete data set was obtained for use in analyzing the deposition patterns.

The mean 30 minute profiles of temperature and wind from the various times of day show completely different thermal stability regimes during various times of day. The turbulence measurements during each run demonstrate that minute-to-minute changes in turbulence, solar heating, leaf wetness and local atmospheric stability are severe enough to cause wide disparities in the patterns of spray drift and deposition. The upper air measurements show that the most preferred times for aerial spraying, early morning and late evening, are periods of rapid stability transitions in the lower atmosphere and, therefore, uncertainty in drift patterns in spite of the low wind speeds at these times.

The data is now being used to correlate spray deposition patterns to local atmospheric conditions and to test the FSCBG model.

DETECTION OF LATENT NUCLEAR POLYHEDROSIS VIRUS IN THE GYPSY MOTH

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ABSTRACT

It is unclear if and precisely at what level the nuclear polyhedrosis virus (NPV) of the gypsy moth persists in its' insect host. DNA hybridization, the method currently used for the detection of persistent viral infections, can only detect 100 to 1,000 copies of the viral genome per cell. It is likely that viral genomes persist in insects at levels far below this. Using polymerase chain reaction (PCR), we have developed a method for the detection of viral DNA at a level of one copy of the viral genome per 100 cells. This assay holds considerable promise for determining if the gypsy moth virus persists in insects since it is very sensitive, highly specific for gypsy moth viral DNA and can be used for DNA samples extracted from a single embryo.