

University of California

MCP Study II

Exposure - Symptom Correlation on Pistachios and Almonds

The "cause and effect" study (Study II) is proposed as per the guidelines attached. Essentially a known treatment by standard aircraft with D6 or D8 jet nozzles will apply to 15 or 20 acres equivalent area but on a single application line in order to simulate a line source which can be used to evaluate concentrations collected downwind at specified distances up to about one mile. Using this technique permits evaluation of each pass (7-12 passes) and construction of a model based on these individual passes which may be computer reconstructed to simulate up to a 50 acre application.

This study does not anticipate establishing either (1) the effect of several thousand acres of applications in a given airborne or air pollution monitoring concept, such as the Seiber-Crosby study (Study I), nor (2) does it suggest an infallible correlation which will identify amounts of released chemicals under specific controlled or identified (weather) conditions and the degree of damage to test plants. However, we believe it will assist in the overall University study being mounted at this time and serve as a companion study to the more elaborate and generalized Seiber-Crosby proposal.

Because standard drift-loss studies are being proposed by EPA for registration of all materials and also where RPAR has been instigated, there is further urgent need for the establishment of this type drift-loss or total accountancy approach to the MCP study. We have conducted over 50 such field tests over the past several years and have plans to work on four more candidate pesticides (primarily herbicides) for drift-loss type studies and correlation to plant damage during this 1979 season. We would note that these are cooperative studies with Dr. David Bayer and follow the attached guidelines, which in general coincide with proposed EPA guidelines.

Field Operations

We will try to run these tests, probably as two completely replicated operations, in mid-June, to bring the field tests as close to the normal MCP operations as possible. Both pistachio and almond trees will be set out and evaluation of damage to these will be made by Bayer.

These tests will be conducted on non-crop land about 10 miles Southeast of Davis where no MCP is applied. We will need to have all of our field sampling equipment as well as our computerized weather station as mounted in

the camper available for these tests. This will require all equipment to be available until tests are completed commencing about June 4 and through possibly June 15. This long period is needed in order to insure that we conduct the tests only under precise weather conditions as would normally occur during usual operations and as permits our downwind sampling regime.

We will also use drop size frequency Cascade air and fallout card samplers for determining spray drop size at the various downwind stations which will provide additional information on the character and distribution of the airborne spray transport. A 50-ft tower sampler may also be used at 100-200 ft distant from the aircraft path for vertical (millipore) profile air sampling of the airborne spray plume to aid in the total accountancy concept.

We have a computerized (tape recording) camper-mounted weather station for direct analysis and recording of weather functions (1) wind velocity and direction at several heights, (2) turbulence sensing, (3) temperature lapse rates, $\pm 0.1^\circ\text{F}$ sensitivity, (4) relative humidity and (5) solar radiation. This unit will be used during test operations at the field site.

Also available is a DeHaviland Beaver weather system aircraft which we can use (if needed) for overhead weather as well as air sampling for chemical pollutants at greater downwind distances.

Equipment Availability

Because we will need most of our equipment for the studies the first two weeks of June, we can only provide the following for the companion Study I during that time.

1. A USPHS 3-element train (glass fiber, bubbler, alumina) in a 4-unit timer controlled instrument, 1/2 cfm air flow rate 110 V A.C. power.
2. Four single unit 3-element train samplers as above but 12 V D.C. power.
3. Several spot climate stations for wind direction and velocity, black ball solar radiation and separate probe temperature elements. These are not suited to temperature lapse rate measurement.

After the June test period all of our sampling equipment, 10-12 Staplex 25 cfm air samplers, 5 Honda generators and vertical tower would be available to about mid-July when we will be proceeding with further field tests on airborne transport as well as loader-mixer-applicator exposure studies continuing into the fall of 1979.

The camper mounted weather station requires trained operators on duty during its use. It cannot be left in the field unattended. We could make

this available for Study I with limitations as noted requiring its use.

Budget Considerations

We will be able to handle the costs of the proposed airborne drift project, including care and evaluation of the trees (with Bayer). Pistachios and almonds are being furnished by the grower associations, and \$2,000 will be available from rice growers.

We are hopeful that Environmental Toxicology can handle our MCP analysis to the extent of a maximum 100 individual analysis samples consisting of plant tissue samples, approximately 40; glass fiber and millipore approximately 30 and Mylar plastic also around 30.

If there is inadequate funds for Environmental Toxicology to handle these we will have to negotiate funds for having them run by California Analytical for an estimated cost of \$3,000.

Norman B. Akesson
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