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Haliburton, W.

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NOTES ON OBTAINING AND
SUBMITTING SPRAY FLUID SAMPLES
FOR "CALIBRATION"

by: W. Haliburton

File Report No. 43

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NOTES ON OBTAINING AND SUBMITTING SPRAY FLUID SAMPLES FOR "CALIBRATION"

1. In any experimental or operational spray application for which deposit samples are to be assayed, the spray fluid sample is the key to accurate estimation of spray deposit volume by card or colorimetric assay. The importance of this vital fact should be recognized in the planning stage of any experiment or operation, and due priority assigned to obtaining an adequate and representative sample of the spray mix. Too often the sample is taken as an after-thought, or carelessly, without considering whether or not it is really representative of the whole.

2. When the sample is received by the person who is to "calibrate" its spreading behaviour on paper, or prepare colorimetric standards, he can only assume that it contains the reported quantities of formulation constituents. It is only when obvious anomalies show up that he may suspect that the product "does not conform to advertizers claims"! It is also important that all constituents be fully identified so that the behaviour can be correlated or compared with that of the same, similar or different formulations. The following are examples of anomalies which were observed during the past season:-

- (a) The spreading behaviour of a sample of fenitrothion emulsion on Kromekote^R paper differed from that expected from the reported constituents. Orthene, which had been applied to plots in the study area was suspected as a contaminant. Chemical analysis verified its presence, but also disclosed a fenitrothion content of 3 x normal. Besides being contaminated, the sample must have been taken from a "creamed-down"

portion of the mix and therefore was not representative of the mix as actually sprayed.

- (b) Another fenitrothion sample, an emulsible concentrate, was received with no indication that it needed to be diluted with water to match the reported final spray formulation. It was also far from homogeneous as it separated into three more or less distinct liquid phases and contained a considerable quantity of bundles of fine branched needle-like crystals which were water-soluble. GC analysis showed only half the expected concentration of fenitrothion and a small peak with the same retention time as Orthene. The sample, drawn from a spray concentrate delivery system was apparently diluted with about 50% of some liquid presumably containing the crystals. The contaminant may have been lurking in the plumbing of the concentrate sytem. The sample was obviously not a sound base for either card or colorimetric assay of deposit samples.
- (c) Of two samples from supposedly identical mixes of a suspension of solid material in oil, one had a much thicker layer of sediment.

3. To ensure that the sample is representative, it should be drawn from the body of fully mixed and circulating fluid, to eliminate deviations resulting from creaming out, or even breaking of emulsions, or the settling of solids from suspensions. Where it is not convenient to sample directly from the spray tank, but through some auxillary plumbing such as a drain-cock, enough fluid should be run through it to flush out all dead-end

residues before the actual sample is taken. This is the most probable point for error introduction. As the draincock is usually at a low point in the system, this is where heavier components and foreign matter are likely to accumulate and seriously alter the constitution of the mix in the small sample.

4. When submitting spray mix samples for "spread factor" determination it should be recognized that the term is a euphemism for the variable ratio of spot diameter to the size of the drop that made it, and that there is usually no fixed factor for any one spray mix. The ratio varies with drop size, impingement surface (even between lots of the same kind of paper), formulation components, ambient temperature, humidity, falling time, etc. Accordingly, please append all available information on the formulation and its constituents, planned volume application rate, spray equipment and emission data, flight altitude, meteorological data, location, spray time and date. Under "formulation" include toxicant or agent designation, manufacturer, grade, lot number, active ingredient content of the concentrate, and its solvent system(if known), amounts of co-solvents, and diluents, adjuvants, emulsifiers, stickers, etc., due and its solvent, if liquid. Indicate whether percentages are by volume, weight/vol. or wt./wt. Also, please supply a deposit sample card with a typical field applied deposit on it and a couple dozen clean cards from the same paper lot.

5. Attention to these details, recorded on a copy of the attached form, will ensure the best possible interpretation of the calibration data for analysing deposit sample cards. The completed form, with addition of file numbers and notes, should return to the project or study file where it will serve as a cross reference and a thumbnail record of the spray

operation. The form, adapted from one used at CCRI last year, is "interim". Comments and suggestions for clarifying or increasing the utility of the form or these instructions would be welcomed.

Wm Haliburton

WH:bsb

CCRI Calibration No: _____

Date Received: _____

NAE Number: _____

Formulation:

Toxicant
or Agent

Manufacturer:

Supplied by:

Lot No:..... AI ☐

Solvent?

Solution ☐

Emulsion ☐

Suspension ☐

Sample taken from:

by:.....

For Customer:.....

Project No:

Study No:

Location:

Plot or Line No(s):

Card Nos:

Operational Spray ☐ Experimental ☐ Equipment Calibration ☐ Imp ☐

Designed Vol. Appl. Rate:.....l/ha gal/acoz/ac, fluid US ☐

Active Ingredientkg/ha oz avoir/ac lb/ac

Spray date:

Time:

☐ Airspray:

Aircraft:

Emitters:

Pressure:

Flow rate:

Altitude:

Swath width:

Meteorology: Temperature

Rel. humidity

Wind Speed

Direction (indicate)

Flight Lines →————→

←————←

→————→

Stability: ratio Inv. ☐

Neutr. ☐

Lapse ☐

☐ Ground Spray:

Machine:

Hydraulic ☐ Mist ☐ Fogger ☐ Rotary ☐

Operating parameters (enter above)

.....

Sprayed card attached ☐

Blank cards forwarded ☐

Notes, Remarks, Special Instructions, P.T.O. ☐

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SUBMITTING SPRAY FLUID
SAMPLES FOR "CALIBRATION"

by
William Haliburton

File Report No. 43. June, 1976.

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Wm Haliburton

WH:amw

CCRI Calibration No: _____

Date Received: _____

NAE Number: _____

Toxicant
or Agent

← Manufacturer:

← Supplied by:

Formulation:

Lot No:..... AI ☐ %
☐ lb/gal

Solvent?

Solution ☐
Emulsion ☐
Suspension ☐

Sample taken from:.....

by:.....

For
Customer:.....

Project No:.....

Study No:.....

Location:

Plot or line No(s):.....

Card Nos:.....

Operational spray ☐ Experimental ☐ Equipment Calibration ☐

Designed Vol. Appl. Rate:.....l/ha gal/ac oz/ac, fluid ☐ Imp
US ☐

Active Ingredient..... kg/ha oz avoir/ac lb/ac

Spray date:

Time:

☐ Airspray:

Meteorology: Temperature

Aircraft:

Rel. humidity

Emitters:

Wind Speed.....

Pressure:

Direction (indicate)

Flow rate:

Flight lines → → →

Altitude:

← ← ←

Swath width:

→ → →

Stability: ratio Inv. ☐

☐ Ground spray:

Neutr. ☐

Machine:

Lapse ☐

Hydraulic ☐ Mist ☐ Fogger ☐ Rotary ☐

Operating parameters (enter above)

Sprayed card attached ☐

Blank cards forwarded ☐

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