

Image Cover Sheet

CLASSIFICATION

UNCLASSIFIED

SYSTEM NUMBER

140975



TITLE

CASUALTY PRODUCING POWER OF UNTHICKENED MUSTARD SPRAYED FROM LOW ALTITUDES
UNDER TEMPERATE CONDITIONS

System Number:

Patron Number:

Requester:

Notes:

DSIS Use only:

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UNCLASSIFIED / UNLIMITED

ABSTRACTED BY *tel*
Date MAR 24 1953

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16 May 1944

EXPERIMENTAL STATION

SUFFIELD ALBERTA

FIELD EXPERIMENT NO. 229

1. TRIAL

Casualty producing power of unthickened Mustard sprayed from low altitudes under temperate conditions.

2. REFERENCE

Request to Suffield to assess the casualty producing power of low spray with unthickened H made at meeting of U.S. Project Co-Ordination Board held at Edgewood 27 April 1944.

3. INTRODUCTION

(i) A series of investigations carried out in the U.S. have indicated that unthickened Levinstein mustard when sprayed from aircraft flying at low altitudes and at high speeds will not shatter so excessively as to preclude its use at high speeds against troops wearing all types of battle dress. (T.D.M.R. No. 821).

(ii) The present series of trials has been planned at the request of the U.S. Project Co-Ordination Board for the purpose of investigating under temperate conditions the casualty producing power of unthickened H spray at the contamination densities and drop sizes likely to be encountered in low spraying operations.

(iii) The trials to be carried out at Suffield are intended to be only of a preliminary nature. From the data obtained at Suffield under temperate conditions, the U.S. C.W.S. hope to be in a position to assess the casualty producing power of the spray when released from multiple, fast aircraft flying at low altitudes. It is intended that information along similar lines will be compiled for tropical conditions.

4. OBJECTS:

(i) To investigate under temperate weather conditions the casualty producing power on troops of unthickened H spray at the contamination densities and drop sizes likely to be encountered in low spraying operations.

(ii) To determine whether a vapour hazard is likely to be produced from unthickened mustard sprayed from low flying aircraft.

5. WEATHER CONDITIONS

Wind Speed: 8 - 15 mi/hr. (to 40 feet)
Wind Direction: any, steady.
Air Temperature: 40 - 70°F.
Temperature Gradient: lapse.

6. MATERIALS

1 - M10 smoke tank charged 326 lbs unthickened HS dyed 0.5% Dupont Oil Red.
Temperature of charging at take-off: 10°C.

P & M, S. will approve charging after dyeing. O. M. & E. will measure the viscosity before and after dyeing. *Karch*

Classification / Designation U/U
Changed to / Remplacée par _____
By Authority of C. Laforce
Sur l'Autorisation de _____
Date 25 Feb 98 Signature J. Kuseler

DEFENCE SCIENTIFIC INFORMATION SERVICE
DEFENCE RESEARCH BOARD
Date: DEC 23 1952
From: JES

7. PROCEDURE
Layout (See Appendix)

Filter Papers

- (i) Eleven rows of filter paper assemblies, 100 yards between rows, will be laid out parallel to the wind direction.
- (ii) Each row will be 120 yards long and will consist of filter paper assemblies at 5 yard intervals. At each observer position, (see below) 3 additional papers and 4 large jump cards will be placed in proximity to the observer as shown in the Appendix.

Observers

(iii) Twenty observers will be disposed, in lines of five each, 60 yards, 80 yards, 100 yards and 120 yards downwind of the upwind edge of the layout as indicated on the diagram in the Appendix.

(iv) During the spray, the observers will stand facing downwind. They will be dressed as follows:-

Battle Dress, non-impregnated.
Underwear, long-limbed, non-impregnated.
Anklets, socks and boots.
Respirators at the gas position.

(v) Impermeable clothing (coat and trousers) will be worn over the battle dress, impermeable hoods worn over the head, and rubber gloves on the hands.

(vi) Windows 4" x 4" will be cut in the impermeable clothing in the following positions:-

- (a) at the back of each shoulder.
(b) over each buttock.
(c) over each calf.

Functioning of Spray Tank

(vii) The M10 tank will be loaded onto a Boston A/C. (A second dummy tank may have to be loaded.)

(viii) The A/C will fly at a height of 75 feet and at a T.A.S. of 200 to 250 mi/hr. The required track will be indicated by a line of markers and will be such that the upwind edge of the contamination will fall just inside the upwind edge of the layout. (P & M. S. to decide position.) The tank will be functioned over the aiming mark.

Height of A/C

(ix) The height of the A/C during the spray will be checked by P & M. S. using theodolites.

Control of Observers after the Spray

(x) After the spraying, the observers will move off the contaminated area and the impermeable clothing will be removed.

(xi) The remainder of the clothing will be worn for 4 hours after the spraying during which time ten of the men will take part in outdoor Station fatigues. The remaining ten men will lie or sit about in a warmed (75°F) room.

Vapour Sampling

(xii) Two lines of 11 injectors, and bubblers (covered with A/G capes) will be set up in the downwind section of the layout at 100 yard intervals as shown in the Appendix.

(xiii) As soon as possible after the spray is down the A/G capes will be removed and the injectors turned on. Samples will be taken for 15 minute periods during the first hour and subsequently if the wind remains steady for 20 minutes at the end of the 2nd, 3rd, and 4th hour.

Meteor Data

(xiv) Wind speed at 2 metres will be recorded at 1 minute intervals for at least 5 minutes before and 5 minutes after the spray. Normal meteor observations will be made during vapour sampling.

Repeat Trials

(xv) Depending on the effects produced on the observers in this trial, further trials may be carried out with observers unprotected by impermeable clothing, and with higher contamination densities.

8. ADMINISTRATION

M.E.O. In charge of trial. Layout.

P & M. S. Height of A/C. Meteor observations. Assessment.

O. M. & E. Provision of S.C.I.

R.C.A.F. Discharge of S.C.I.

PHYS. S. Provision and control of observers.

CHEM. S. Sampling.

WS/rea

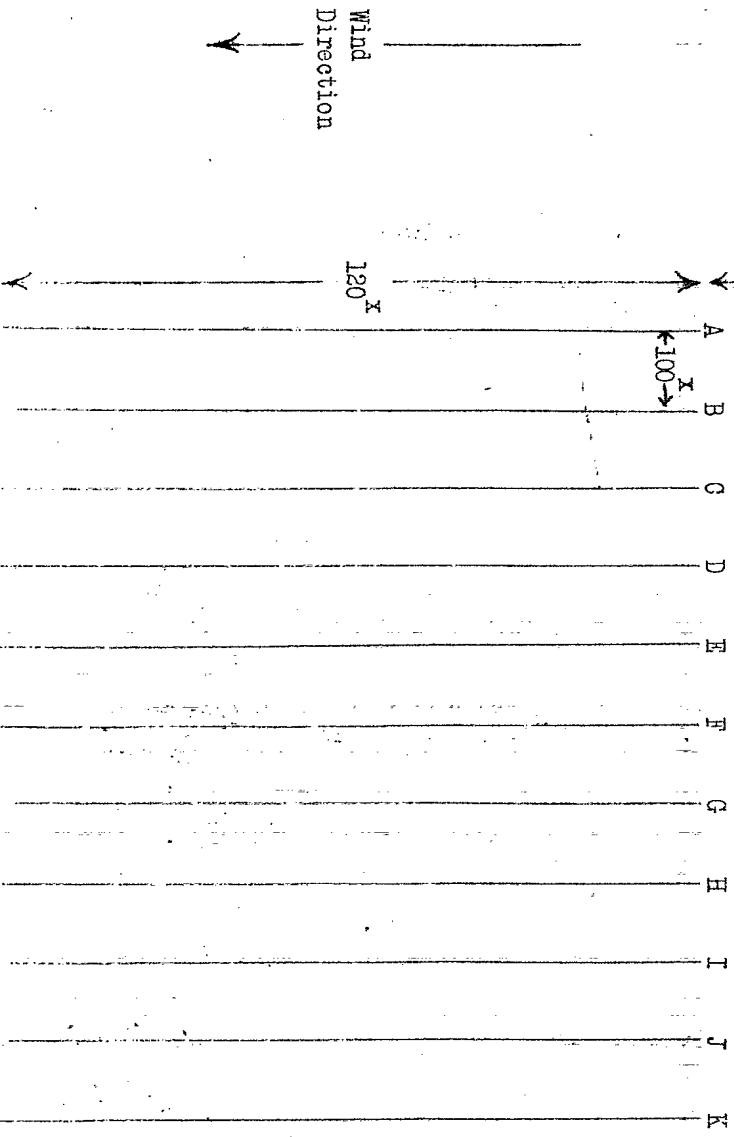
Walter Somerville
(W. Somerville) Major
H/Phys. S.

A.R. Harper
(A.R. Harper) Major, R.C.A.
A/C.E.O.
Experimental Station

M10 tank to be functioning when over this mark

This distance to be defined by Paris in the field.

Track of A/C



Tracking marks (white jump cards in form of inverted V 4 ft high) opposite rows C & K.

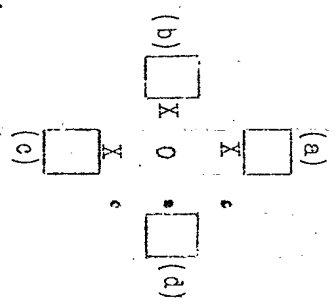
Additional tracking marks - white jump cards - opposite rows F and I.

11 rows of filter paper assemblies 100 yards apart each row consisting of filter papers 5 yards apart (25 papers)

11 injectors at 100 yards intervals to be positioned:

(a) 80 yards downwind of upwind edge of layout.
(b) 120 yds downwind of upwind edge of layout.

Observers will be positioned on lines D, E, F, G and H, 60, 80, 100 and 120 yards downwind from the upwind edge of the layout. (20 observers)
Each observer to have additional jump cards and filter papers as shown below.



Layout filter papers.

X Additional filter papers 2 1/2 yards from observer.

Large jump cards touching outer edge of filter papers.

O Observer, 2 1/2 yards from layout filter papers.
(If observer were at F26 then additional filter papers would be marked F26(a), (b) and (c) and cards F26(a), (b), (c), and (d).)

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