

Biodetection Field Trial and Aerosol Chamber Capacity in Sweden

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Several techniques are now emerging as important candidates for successful biodetection purposes. Adequate and controlled evaluation becomes a critical tool to fine-tune the final stage of that development. Sweden provides opportunities for realistic field trials and for chamber tests with suitable simulants and low pathogenic agents. This poster describes the field trial facilities developed by The Swedish Defence Research Agency and the Swedish Armed Forces National CBRN-Defence Centre. It also describes the aerosol chamber facility available at FOI.

Field trial facility

The biodetection field trial facility is located in Umeå, (63° 52' N, 20° 15' E). The range is suitable for small scale field trials and has been successfully used under both summer and winter conditions, i.e. in a wide difference of climate conditions. The layout of the range is shown below. The radius to the ring-road are 200 m and 100 m respectively.

Reference systems, consisting of different particle analyser and air to agar slitsamplers are used. They record time resolved information of the total aerosol concentration and the amount of cultivable bacteria reaching the platform.

Weather data is recorded using meteorological equipments placed at the platform and disseminator vehicle. Particle counters and the real-time weather data enables optimization of the dissemination, so that sufficient concentration of the aerosol will enter the platform. Mobile sprayers have been developed to enable controlled dispersions of biological simulants and substances that can interfere with the detection.



Collage: Hjeit, G.

Aerosol chamber facility

Our aerosol chamber present at FOI is regularly used for biodetection experiments with simulants bioaerosols. The aerosol chamber measures 67 m³ and is made from stainless steel. Nebulizers are used to generate the aerosol and additional fans are used for quick distribution of the aerosol. Same type of reference instruments mention above are used to record background particle concentration and viability. Presently we are establishing standards and procedures (i.e. ISO 14698, ISO 9001) for dissemination of bioaerosols and evaluation of detection equipments.

Currently the following simulants of biological warfare agents can be disseminated.

- Bacillus subtilis (sporulated bacteria, dry & wet)
- Bacillus thuringiensis (sporulated bacteria, dry & wet)
- Erwinia herbicola (vegetative bacteria, wet)
- MS2, bacteriophage (virus, wet)
- Ovalbumin (simulant for protein toxin, dry)



Further information

Field trials are performed regularly and can be open to international participation (conditions have to be negotiated). The range may also be used for verification of dispersions models and training of military personnel etc. The Umeå capability for field trials is sponsored by the Swedish Defence Material Administration (FMV).

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