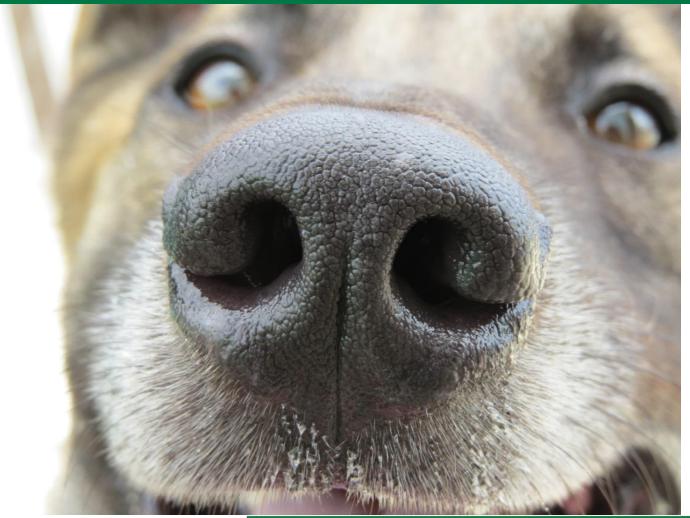# Mine Detection Dogs (MDD) and use of AP Mines in training

Outline:

1. Introduction
2. MDD Training Process
3. Challenges for MDD detection
4. Pros and Cons for use of actual AP Mines in training
5. Development of Alternatives to AP Mines in training

- Mine Detection Dog is a detection tool

- Mine Detection Dog requires years of training and testing and must be matched with an equally well-trained MDD handler.

- When used appropriately they can be a very efficient detection tool with several advantages over other detection tools (e.g. heavy metal contamination)

- Limitations to use of MDD (e.g. weather, wind, heat, vegetation, etc).

- Like any other detector it must be 'calibrated' and used correctly to function well or it will fail.

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MDD Training Process

Challenges for MDD detection

- Improvised Mine detection - Colombia Case
  - When is a landmine, not a landmine?

PHOTO 1 | *Illustration showing the area processed by each asset (mechanical, mine detection dogs and manual demining). Also shows the IED prior to being fully excavated. There is a small part protruding above surface.*

PHOTO 2 | *IED after being excavated. Only the bottom part of the item is filled with explosives. The measurement between the explosives and the surface of the ground is more than 20 cm.*

Approximately 20 cm distance between the explosives and the top part of the IED.

PHOTO 3 | *The side of the IED has corroded and some of the (approximately 15kg) explosive substance has fallen out of the container.*

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Challenges for MDD detection

- Improvised Mine detection - Colombia Case
  - When is a landmine, not a landmine?

No	Report Ref. Number	Item Location	Composition	Comment
1	20180503507110024	IED PVC tube El Paraiso	7,45 % Nitrate 16,3 % Ammonium 4,2 % Aluminium 8,42 % Sulfur Oxides: 1,3 % de Hierro, 1,8 % Titano 12 % Carbono	MDD showing interest but not providing clear indication
2	20180503507110025	**Missed IED** El Paraiso	16 % Nitrate 0,0803 % Ammonium 9 % Aluminium 2,6 % Sulfur Oxides: 3,6 % Iron, 1,4 % Silicon 1,9 % Titanium 5,1 % Phosphate	MDD **didn't detect target**
3	20180503507110026	APM La Laguna	16,075 % Nitrate 25,63 % Ammonium 19,04 % Aluminium 7 % Sulfur Oxides: 7 % Iron, 2,5 % Silicon	MDD detected target
4	20180503507110027	Casa Munekos	20,15 % Nitrate 21,88 % Ammonium 4,2 % Aluminium 8,6 % Sulfur Oxides: 0,7 % Iron, 0,4 % Silicon 11,1 % Carbon 2,7 % Phosphate	MDD detected target

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Pros and Cons for Use of Actual AP Mines

Pros:

- It is the only way to confirm the reliability and efficiency of MDDs as a detection tool in mine action (using pure explosive substances, alternatives, and even new mines from storage does not project a realistic odor picture as most dogs do not generalize easily).
- The alternatives are not acceptable for MDD testing according to standards (IMAS).
- There are so many types of landmines that it seems impossible to create an alternative (odor target item) for each type.
- Artificial odors such as PSEUDO do not work as alternatives in MDD training.

Cons:

- Training on landmine targets only limits the dogs' ability to generalize.
- Security and safety concerns.
- Limited availability of "real" mines as training/testing targets.
- Some mines cannot be disarmed or safely used in training.
- Searching and detection after mechanical ground preparation (as most mines are not in their original state).
- In some cases, it is easier to measure the sensitivity of dogs' noses (if the amount of substance is controlled).

Development of Alternatives to AP Mines in training

- 2010 GICHD Afghanistan R&D on Odour signature/Harmless targets project
  - Spiked liquid targets and
  - Spiked soil targets

- R&D testing to develop new imprinting techniques.
  - Potential advantages:
    - reduce required time for imprinting on target substance,
    - Reduce size for training areas with high number of targets
    - Reduce soaking time for test sites,
    - improves quality of daily testing in the field operations.
    - Reduce re-training times due to changes in operating environment.

Thank you for your attention!