Driving the HD Machine in the African Bush

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Driving the HD Machine in the African Bush

Almost every country in Southern Africa has a mine problem and most of these countries have a tradition of solving their own problems. Because the region is famous for its mine-resistant vehicles, this paper concentrates on innovative mechanical technologies—but it could just as easily have concentrated on PPE or testing facilities where Southern Africa also leads the way.

by Andy Smith, AVS Mine Action Consultants

R&D in Southern Africa

If you measure research and development (R&D) success by the presence of the equipment somehow in the field, then a lot of useless equipment can be called a "success." This is because those who supported the R&D want us to be able to claim "success" so they "give" equipment to field users. Sometimes this is a direct gift, sometimes it is formally a "loan" or it is tied to further funding. This equipment would often be wholly uneconomic for the users to buy—because it is so far too limited to justify the expense. Sometimes it is not even wanted, but "political" concerns lead to it being accepted. If you measure R&D success in terms of the equipment being purchased and used around the world, then the number of R&D successes falls dramatically. Moreover, most of the R&D that has achieved this success was "homegrown." It did not originate in the ivory towers and defence research centers of the developed world. Most of it was also very expensive. Often it was the result of inspired lateral thinking that led to improving existing technology and methods.

The most famous—and successful—mechanical mine-detection system was the Poozie, developed in Zimbabwe (then Rhodesia). Unfortunately it was only good at locating large steel-cased mines recently buried on roads, but that was what it was designed to do and it saved many lives. With its low weight, "C"-hull, sacrificial wheels and high-frequency VHF detector pipes it was truly revolutionary in the 1970s.

Mechanical Assistance

When looking for more sophisticated mines laid a long time before they are cleared, the use of machines has had to change. Old minefields in many parts of the world tend to be overgrown, and the vegetation must be cut to allow the Poozie a single-seat mine-resistant mine-detection vehicle.

The Poozie was a single-seat mine-resistant mine-detection vehicle.

Steel Wheels and Rollers

Using machines to 'deal with' the vegetation began with MECHUM steel-wheel and rollers in the early 1990s. The wheels and rollers were attached to AV mine-resistant vehicles developed during South Africa's involvement in the Angola and Mozambique wars. The wheels and rollers "crushed" the vegetation, which tended to spring back up unless the machines were followed up by deminers immediately. Deminers had to follow up because the wheels and rollers left mine and ordinance behind. The system pushed a cushion of vegetation over the mines making it less likely that the wheels would initiate them. In the first half of the 1990s, several deminers were severely injured or killed while following this kind of mine preparation. (These examples are recorded in the DDIV/ DDAS introduced in another paper in this journal.) Civilians were also injured in areas supposedly cleared by these methods. As a result, the wheel and roller methods were abandoned.
FEATUER
Research and Technology

The MONTECH fall - a locally made monster that was far cheaper to make than any commercially available alternative.

Cutting (as opposed to "crushing") minefield vegetation was probably started by MgM in Angola but may have been led by Leonard Kawinski’s side-multching tractor in Cambodia, which he came up with at about the same time. In both cases, commercially available off-the-shelf technology was adapted to the purpose. MgM uses the bush-cutting technology available to South African ranchers to mulch the lighter vegetation in advance of their deminers. They mounted their mulcher on a blast-resistant vehicle which made it much more versatile. Contact: Hendrik Ehlers, Director MgM at ehlers@MgM.org


Fists for Africa
- Steel wheels
- Vegetation mulchers on mine-proof vehicles
- Locally made Monster-fall
- Tree shears on mine-resistant vehicle
- Mini-mulcher
- Affordable ground processing

Monster Falls
The main difference between a mulcher and a ground-engaging fall is in the length of the cutters. Mulchers often have cutting "hammers" hinged onto the fall spindle, whereas ground-engaging falls have chains between the spindle and the "hammers." The power requirements of a ground-engaging fall are very high and the machines are often designed to withstand multiple AP mine detonations, making them suitable for military use. This means that they are large and heavy, so expensive to buy and to operate. Floafling to denature mines has been widely tried and abandoned. Nonetheless, Norwegian People's Aid (NPA) immediately

tally decontaminates a mine with its wheels, no hassle is done. They are preferable to tracks which can be severely damaged by large AP mines.

Vegetation Mulchers (flails)

Cutting, so-called "flail," involves the use of mechanical devices to cut vegetation or to destroy it. The traditional, relatively simple and low-cost method was using axes, scythes, and hoes. This system was inefficient, slow, and dangerous. In the mid-1990s, the MineTech fall, a locally made monster that was far cheaper to make than any commercially available alternative, was developed. MineTech has been using a long-chain fall for vegetation cutting since the mid-1990s. It has proven to be a highly effective and efficient method. The MineTech fall can be deployed in any environment and is cost-effective. The MineTech fall is based on the concept of using a long-chain fall to cut vegetation in advance of deminers. They have made their machine because the cost of the most resistant falls sold commercially was far too high. The MineTech fall could be used in the field, but it is not deployed in that mode. MineTech has also made a modular system that can be used in different environments.

Mini-Mulchers

Last year, MgM began to develop a mini-mulcher in Namibia, and it successfully underwent its first trials at the end of May this year. Contact Scott@mkmg.org

The MgM Mini-Mulcher is much bigger than the machine planned in 1996, but it is a major step in the right direction.

Other Ground Processing

Apart from Monster falls, a range of ground processing machinery has been tried in Africa. In Namibia, the ill-fated Bremo Processor proved impossible to deploy over rough terrain. In Mozambique, the Krohn system performed in a similar way. In Zimbabwe, the ground-milling MineBuster was used with controversy.
over its thoroughholes and there were several incidents while following it up. In Zimbabwe, Namibia, Mozambique and Angola, a variety of rollers and bulldozer techniques have been used with very poor results.

The only ground processing tool that has performed properly is another example of an existing machine being modified for demining. Very successful at processing the piles of mines and earth left by bulldozers and graders, MGMS ROTARM Mk 2 offers the full mechanically retaining mines and ordnance in its armoured bucket. It also includes an extending arm and mulcher (on the rear) which makes it especially versatile.

Africa is often thought of as a "poor relation" to the sophisticated West. Its demining is often underfunded and any RI/DoD is usually undertaken on a financial need-interest basis, but in terms of the development of useful demining equipment—its successes speak for themselves. Even when the "host" machine is manufactured elsewhere, where, the design concepts originated in Southern Africa and the assembly of all the basic parts took place there.

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**Technology’s Promises**

Every technology under development makes big promises. Here are five projects that may someday impact the world of mine action.

by JJ Scott, MAIC

**Introduction**

Please any brochure or website that promotes a developing technology and there is one word that will come up repeatedly: promise. Every new gadget promises to vastly improve simplicity or otherwise revolutionize some aspect of modern life, and the products aimed at mine action practitioners are no different.

Each promises to make demining quicker, easier, safer or cheaper, and each breakthrough promises to be more earth shattering than the last. I looked into a variety of devices that promise to have an impact on some aspect of mine action, from new mine-detecting sensors to new types of landmines—even a potential landmine substitute. These projects vary widely in their goals, budgets and feasibility, but all share one common bond: If fed enough money, each promises to forever alter the practice of mine action.

**Fido**

Dogs are superb at detecting landmines. Their noses are some of the most sensitive detection devices ever created. That is, until they get tired. Or sick. Or get too hot outside. All cause dogs' effectiveness to drop rapidly. Dogs also tend to lose interest in demining as the day wears on, which is an inevitable though particularly dangerous consequence of their assigned task. How might one retain the mine-sniffing abilities of dogs while negating their shortcomings? Nomadies, Inc., with funding from the U.S. Army, is developing a vapor-detecting sensor they call "Fido" that promises to do an mine action as effectively as a dog, but will never get tired, never get sick, never get bored and never get feet. I qu-