

## **Manual demining tools**

### **The AVS “root cutter”**

The problem with cutting fibrous root systems that hamper excavation was identified by studying the data in the Database of Demining Accidents, where several excavation incidents appear to have been caused by the deminer pulling roots. The deminers did not have a tool to cut roots and so inadvertently pulled the root while trying to sever it with an inappropriate tool. The root then put pressure on a nearby mine.

This root-cutter design is based on an existing effective cutting tool – a pair of anvil secateurs. Anvil secateurs do not have cross-over blades and so do not “pull” fibrous material. This tool is seen as an improvement on existing gardening tools but not a final design solution for



the task.

The tool is designed for one handed use. This limits the length of handles that can be used. The entire tool is 25cm long but the hand may start only 15cm from any blast. The number of separate parts has been reduced and the spring pivots moved well away from a blast.

The root-cutter has a securely welded all metal construction with the exception of the anvil itself which is made from polycarbonate (the same material as demining visors). Polycarbonate burns or distorts rather than shatters in blast situations. The cutting blade is made from hard steel, the springs from spring-steel and the rest of the tool from mild steel. The handles and springs are galvanised after manufacture. It can cut roots up to 2cm in diameter.

The tool is released by gentle pressure on the handles and is “naturally” in an open position, so making one-handed use easy.

In tests, the metal parts of

the tool stayed in one piece when placed on top of a mine. The polycarbonate “anvil” for the blade was blown off and was not found. Its mild steel rivet stayed in place.