

'Golden' potash mines

From rock salt 800 metres down to natural fertiliser

Ever wondered where the potash that you spread on your pastures comes from? The Werra mines in the German regions of Hessen and Thuringia are a world in themselves. The pitch-black tunnels run for 4,600 kilometres and their surface area is as large as the city of Munich. Harrie van Leeuwen and Florus Pellikaan went down the mines with fertiliser manufacturer K+S KALI.



1 The passenger and goods lift shafts are the only way of getting into the Werra mines. 1,900 miners use 1,000 vehicles to get approximately 20 million tonnes of raw rock salt per year to the surface from the three active mines at Werra. K+S Potash works seven mines in Germany. The potash industry is flourishing because potash prices have risen sharply due to heavy demand.

2 The salt rocks from the German mines are unique in the world in that as well as potassium, they also contain magnesium sulphate. The salt strata were created when salt water evaporated in the far distant past, leaving behind crystals of potassium, magnesium and sodium salts.

3 The hard salt rock is broken up by blasting. To do this, holes seven metres long are drilled in the salt rock. In each hole, mine workers place five kilos of explosive. A current of thousands of volts then detonates the explosion. For reasons of safety, this is done at the change of shift, when there is no-one in the mine. Each explosion yields 1,200 tonnes of loose rock salt.

4 After the explosion, large bulldozers pick up the broken rock salt and take it to the crushing plant. Depending on the bulldozer, the bucket has a capacity of 12 to 30 tonnes.

5 The crushing plant breaks the rock salt up into smaller pieces. The rock is then taken to the shaft via conveyor belts, which run for a total length of 150 kilometres.

6 The lift, which has a capacity of 1,300 tonnes per hour, transports the loose salt rock to the surface. In the factory, the salt rock is ground finer still and sifted.

7 The store where the ground, sifted raw salt is kept. The material in this dusty bunker is awaiting further processing. In this case, potassium chloride will be extracted from the raw salt by the dissolving method.

8 In addition to the dissolving method, the factory also uses the electrostatic method, shown here, and the flotation method. The choice of method depends on the type of raw salt and the fertiliser required. The immense factory boasts 400 kilometres of piping.

9 A factory worker checks the magnesium sulphate that has been through a lengthy production process.

10 The potassium, magnesium and nitrogen fertilisers wait to be delivered to the customers in big-bags.

11 Useable raw materials make up 30% of the raw salt, the rest is waste, and is tipped onto an enormous heap behind the factory. It would be too expensive to take it back down into the mine.

