



# SHELL THIOGRO

Technologies for sulphur-enhanced fertilizers

## Q&A

### ■ Why is sulphur important to plants?

Sulphur is involved in the development of protein and chlorophyll in plants. Chlorophyll in leaves converts sunlight into energy and reacts with nutrients to create food for plant growth. Many enzymes essential for biochemical reactions within the plant cell are activated by sulphur.

Sulphur's nutrient value:

- Improves oil percentage in oil seeds
- Increases protein content in seeds
- Improves baking and milling quality of cereals
- Increases nutritive values of forages
- Is responsible for the odour and flavours of some vegetables in the cabbage family
- Improves plant resistance to cold and disease.



■ **Why is sulphur deficiency now more of a problem than in the past?**

In the past, sulphur was supplied to soils via rainfall and volcanic emissions and as a component of some types of fertilizers which are declining in popularity. Cleaner air efforts (including removing sulphur from gasoline at the refining stage) have reduced atmospheric sulphur inputs. More intensified farming and use of sulphur-free fertilizers is also aggravating the problem.

■ **What advantages have been found with Shell Thiogro-produced fertilizer over other commercially available fertilizers?**

Most sulphur fertilizers currently on the market contain some form of sulphate. This is in the form taken up by the plant, but prone to leaching. Elemental sulphur oxidises to sulphate and thus makes sulphate available to the plant over time. Shell Thiogro-produced fertilizers contain a combination of sulphate and elemental sulphur.

■ **Why does elemental sulphur need to be in the form of fine particles?**

The surface area of the elemental sulphur, along with temperature and moisture, are the major determinates of oxidation rate. By making the particles small (less than 150 millionths of a metre in diameter) our research shows it can be oxidised to sulphate in the year of application.

■ **Who tends to the crops and does the actual experiments?**

We work with experts in scientific organisations, universities, farm operations and governments.

■ **Why is Shell in this business?**

Oil and gas production is made more sustainable by adding value to recovered sulphur and enabling the agriculture industry to reap the benefits of this important plant nutrient.



**For further information**

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