

# HOW THE FERTILIZER INDUSTRY IS REUSING PHOSPHOGYPSUM

When phosphate ore is processed into fertilizer using sulfuric acid the result is two co-products, phosphoric acid and phosphogypsum (PG). PG is a form of gypsum containing some phosphate.

While some countries still regulate it as a waste product for disposal, stacked in above ground storage facilities, based on extensive scientific evaluations, many other countries increasingly permit, encourage or even require its use.

Some 30% of annual global production, estimated at 60 million tonnes, of PG is now reused.

As the fertilizer industry works towards the UN's Sustainable Development Goals and focusses on a more circular economy, fertilizer producers are increasingly exploring a variety of innovative ways to turn PG into a resource. Here's a look at some of them:

# AN AMENDMENT TO ADDRESS SALINE AND SODIC SOILS

The calcium in PG can be used to displace high levels of sodium or magnesium salts, caused by poor irrigation practices, which build up in soil root zones and impact plant access to nutrients and water. Affecting an estimated 1 billion hectares worldwide, studies have shown that PG can increase yields by up to 100% and water use efficiency by up to 70%.

## A MULTI-NUTRIENT SULPHUR-RICH FERTILIZER

PG contains essential nutrients that plants need especially sulphur and calcium. It also contains small quantities of phosphorus and micronutrients such as manganese, copper and zinc. When applied to crops it increases plant yield, dry matter and nutrient uptake.

RAW MATERIALS





# AND CARBON SEQUESTRATION Since 2015, PG has been mixed with

**GREEN ENERGY** 

soil to reclaim gypsum stacks and produce greater plant biomass over plants grown in soil alone. Commercially planted trees grow faster in a soil made of 80-90% PG than any other soil, sequestering up to 30 tonnes of CO<sub>2</sub> equivalent per hectare per year and promoting biodiversity.

### MAKING PLASTERBOARD AND OTHER BUILDING MATERIALS

**AS BEDDING** 

CONSTRUCTION

PG can be applied as a road-bed material, both

in its own right and in combination with other industrial

secondary resources such as

fly-ash and can use **up to 65**%

less primary resources such

as aggregates and sand.

In all climates, its life-cycle

performance, durability and

resistance are high, while its

overall life cycle cost is low.

FOR ROAD

PG can be used to produce highperformance plasterboard. In some processes the PG is self-dried which reduces energy requirements during manufacturing. PG can also be used to make ceramics, flooring, decorative wall cladding, bricks, and ornamental stucco.

# A KEY INGREDIENT IN CEMENT

PG is used extensively as a retardant for cement manufacture around the world. It plays an important role by slowing down the setting of cement when mixed with water. PG can also be used in a similar way for finishing plasters.

# TREATING ACIDIC SUBSOILS

PG can be used to neutralize acidic subsoils by transporting calcium to soil depths where conventional liming is not effective. This has proved to be the best method for maintaining the fertility of the Brazilian Cerrado, one of the most important agricultural areas in the world.



