

Ag Slag

Sustainable aggregates
for agriculture



High quality calcium rich aggregates

Tarmac Ag Slag is a high quality, calcium rich product providing essential nutrients to soils in a slow release form.

Benefits

Saves time and cost

Ag Slag has been used as a high quality agricultural fertiliser since the 1920s with outstanding results in providing nutrients to agricultural soils. Maintaining a constant level of phosphate release over long periods, Ag Slag only needs to be applied every two to three years depending on the soil pH-value and phosphate response. This saves significant time and cost compared to the annual application of chemical fertilizers whose phosphate levels diminish during the year.

A sustainable solution

As a by-product of the steel industry, Ag Slag provides a sustainable alternative to other liming materials, providing slow release of nutrients such as phosphates, calcium, manganese and other trace minerals, providing essential nutrients for farming today while managing resources for tomorrow. Along with Tarmac's entire product range, Ag Slag is certified to BES 6001 for responsible sourcing and manufacture.

Ag Slag performance

- Neutralising value of typically 50% - improving productivity of acidic soil
- Provides a release mechanism for soil-locked phosphates
- An effective source of hydrated lime
- Produces thick, verdant swards on grassland pastures and increases the palatability of grass
- Boosts clover growth increasing the quantity of available nitrogen
- Improves general well-being of livestock
- Suitable for use on organic farms
- Safe to handle and easy to spread
- Factory conditioned to optimise particle size and reduce windbourne loss
- Applied using a conventional spreader therefore avoiding generation of airborne dust
- Enhances the permeability of soil leading to improved air and water circulation
- The slow release of nutrients enables Ag Slag to provide prolonged effective treatment making it unique in its class.

Process

Steel slag aggregates

To ensure we limit our impact on the environment we utilise the slag by-product of the iron and steel making process in our products.

Steel slag aggregate

Steel slag has been used as a liming agent for nearly a century. It is highly effective in adjusting the pH-value balance in soil. In addition to steel slag's value as a liming agent – reducing harmful acidic conditions by replacing much needed calcium and magnesium – it is recognised for as many as fifteen other trace minerals, including iron and manganese.

The steel slag is screened to a fineness that aids slag decomposition through exposure to air and moisture in the soil. Today steel slag is being used as a liming agent in not just farming, but parks, golf courses, nurseries, greenhouses and even land reclamation projects.

Steel slag has a neutralising value comparable to that of ground limestone but also has a number of trace nutrients not found in limestone.

To ensure we limit our impact on the environment we utilise the slag by-product of the iron and steel making process in our products, where other suppliers use primary aggregates. Tarmac has located production units within the steel making sites at Port Talbot, Scunthorpe and Teesport that can produce aggregate, asphalt and concrete products containing slag.

Ag Slag production

Agricultural slag, or Ag Slag, is a fine-screened material from the processing of Basic Oxygen Steel (BOS) slag. BOS (also called LD-converter slag) is formed during the conversion of hot metal from the blast furnace into steel in a basic oxygen furnace. In this process the hot metal is treated by blowing oxygen to remove carbon and other elements that have a high affinity to oxygen.

Slag is produced via the further refining of liquid iron into steel. When the reaction process is complete, molten crude steel collects on the bottom of the furnace and the liquid slag floats on top of it. After the steel has been refined and samples taken to check temperature and composition, the converter is tilted and the steel is tapped into ladles at temperatures typically above 1,600°C. When all the steel has been tapped, the converter is turned upside down and the residual slag is tipped into a waiting slag ladle for removal to pits or bays where it is air cooled under controlled conditions forming crystalline slag.

Steel slag typically contains the following main constituents

| | |
|--|-----|
| Lime (CaO) | 43 |
| Alumina (Al ₂ O ₃) | 3 |
| Ferric Oxide (Fe ₂ O ₃) | 24 |
| Magnesia (MgO) | 8 |
| Potash (K ₂ O) | 0.1 |
| Phosphorus (P ₂ O ₅) | 1.5 |
| Silica (SiO ₂) | 13 |
| Titania (TiO ₂) | 0.5 |

Typical values based on Tarmac chemical analysis and are subject to change.

Scottish Agricultural Centre study

Aim

To demonstrate the benefits of Ag Slag on grass production compared to Ag Lime and Triple Super Phosphate (TSP).

Background

In the late 1990s there was a significant reduction in the amount of liming products being applied to Scottish agricultural land. Prior to 1998 approximately 10-15% of the most productive agricultural land was limed each year. However between 1998 and 2002 this area fell to less than 5% of which less than 1% was productive grassland. Although lime applications had significantly fallen, the agronomic requirement for lime to maintain soil pH-value remained the same. Failure to lime appropriately leads to a decline in optimum soil pH-values, less efficient utilisation of applied fertilisers and a decline in productivity.

The study

Investigations into the comparable performance of Ag Slag were undertaken over five consecutive years between 1998 and 2002 at SAC Kirkton Farm, Crianlarich at the request of Tarmac Limited. The aim of the study was to investigate the liming and phosphate potential of Ag Slag on the in-bye grass pasture of a Scottish hill farm. The study was conducted as an 18 plot, randomised block trial.

Results

The key benefits apparent from the trial included increased:

- pH-value for soil
- Dry matter yield of grass
- Grass nutritional content
- Organic matter yield
- Protein content
- Metabolizable energy

Important mineral uptakes in the grass yield such as:

- | | |
|--------------|-------------|
| • Phosphorus | • Nitrogen |
| • Potassium | • Magnesium |
| • Calcium | • Sodium |

Increase in trace element uptakes in the grass yields of:

- | | |
|--------|--------------|
| • Iron | • Manganese* |
|--------|--------------|

Overall the results demonstrated that AgSlag is an excellent single application liming agent and provider of limited phosphate. It also provides and facilitates the uptake of major and trace elements to grass.

*Compared to other liming treatments.

Dave Merrilees

Senior soil and water management specialist
Scottish Agricultural Association

“The field trials showed a similar grass yield can be achieved by a single application of Ag Slag compared with separate applications of ground or magnesium limestone and triple super-phosphate. Application of Ag Slag to an acid soil with low phosphorus status resulted in a pH-value increase from 4.9-5.6 within seven weeks of application. It also increased plant uptake of magnesium, reducing the risk of hypomagnasaemia in livestock.”

We have achieved a BES 6001 ‘Very Good’ rating across our entire product range.



Awarded to





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