## **Agricultural Land Applications**



Treating soil with FGD gypsum.

## Introduction

When most people think of sustainability and recycling materials, they think of green buildings and infrastructure projects. However, agriculture has a long history of sustainability and there are a number of IRC materials that can be reused in agricultural practices to improve crop growth and yield. IRC materials that are high in calcium carbonate can be used as a substitute for agricultural lime or limestone to raise the pH of acidic soil. Some of these materials also contain beneficial minerals such as phosphorus and potassium, which decrease the need for fertilizer. Some materials from the pulp and paper industry are high in organic content, and can be surface applied as a substitute for compost, while granular materials from the foundry industry can be used as a soil conditioner. When considering the volumes of material used in agricultural operations, the use of IRC materials has the potential to be a very cost effective approach to improving crop yield through sustainable practices.

## **IRC Materials in Agricultural Land Applications**

Several IRC materials have traditionally been used in agriculture as a substitute for limestone. Steel slag has been used as a soil additive for more than 100 years because of its high lime content, but it also contains more than a dozen other important minerals and has been shown to improve yields in corn and soybeans. Similarly, lime mud is a high calcium carbonate content byproduct from the pulp and paper industry. Besides acting as a lime substitute, lime mud contains the important mineral phosphorus. Flue gas desulphurization (FGD) material is a byproduct of the power industry, and is essentially high purity calcium sulfate or gypsum. FGD material does not modify the soil pH, but still provides a valuable source of calcium for crops such as peanuts and tomatoes. It can also be used in sodic soils where crusting is an issue because it is more water soluble than limestone and spreads throughout the soil. In addition, FGD is an effective source for agricultural sulfur.

Another important byproduct from the pulp and paper industry is waste water treatment plant (WWTP) residuals, which is a mostly clay and wood fiber material formed during filtration of the process water. When mixed with soil, the WWTP residuals provide organic material as well as improve the moisture retention properties of the soil. When applied to the soil surface, the WWTP residuals act like compost, blocking weed growth and reducing evaporative water loss. For clayey or organic soils, foundry sands have been successfully been used to modify the soil properties, improving drainage.

## **Benefits**

The benefit of using IRC materials in agricultural applications is improved crop growth and yield while reducing the need to purchase limestone and fertilizer, which provides cost savings. In addition, valuable IRC materials are used in a beneficial manner instead of being sent to a landfill, saving landfill space for true waste materials.

