Nomination: 20288

Eco-Friendly Phosphate Fertilizers as Product Transformation and Circular Economy Model For Sustainable Agriculture

Page: General Information

Name of Organization / Company

PT Petrokimia Gresik

Logo

Download File (https://asiastevieawards.secure-platform.com/file/31272/eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJtZWRpYUlkIjozMTI3MiwiYWxsb3dOb3RTaWduZWRVcmwiOiJGYWxzZSIsImlnbmadNfyOfPaVMPu6DOJSvGP2wOqgLa0uZN6AQ?logo%20petrokimia.png)

Web Site Address

https://petrokimia-gresik.com/ (https://petrokimia-gresik.com/)

Page: Entry Information

Entry Title

Eco-Friendly Phosphate Fertilizers as Product Transformation and Circular Economy Model For Sustainable Agriculture

Category

U01 - U11 - Award for Innovation in Sustainability > U01. Products in the Area of Sustainability & Climate Protection

Submission Format

An Essay of up to 625 Words

Essay

Indonesia is one of the agricultural countries with a population of 28.64% (142.18 million people) working as farmers (based on data from the Indonesian Central Bureau of Statistics in 2024). One of the supports from the Indonesian government for the prosperity of farmers is by providing subsidies on fertilizer products. This subsidy is given to fertilizer products such as Urea fertilizer, ZA fertilizer, SP-36 fertilizer, NPK Phonska fertilizer and Organic fertilizer.

In early 2022 there was a policy change with the withdrawal of subsidies for ZA, SP-36, and Petroganik fertilizers. On the other hand, SP-36 fertilizer is one of the fertilizers with an important element as a soil conditioner because it has a P2O5 content of 36% which can accelerate root growth, accelerate plant growth (flowering, ripening fruit and seeds) and increase grain production. One of the reasons for the elimination of subsidies on SP-36 fertilizer is due to the high price of raw materials for making the product, which is IDR 7,700/kg. This high production price is caused by raw materials imported from abroad such as phosphate rock from Jordan and several other Middle Eastern countries.

Previously, phosphate fertilizer produced by PT Petrokimia Gresik with the brand SP-36 Fertilizer was made from 60% phosphate rock raw materials, 10% sulfuric acid and 30% phosphoric acid which were reacted to produce ROP (Run of Pile) which was then granulated, reduced moisture content by rotary drying, and carried out size screening to obtain uniformly sized SP-36 fertilizer products.

Through product innovation, Phosgreen is produced by making ROP (Run of Pile) from Phosphate Rock 64%, Sulfuric Acid 8% and Phosphoric Acid 28% which then becomes ROP and only uses 19% ROP due to mixing or substitution with other raw materials, namely Gypsum 20%, Natural Phosphate 20%, Sludge from Phosphoric Acid production tank waste, and Dolomite 1%. Phosphate fertilizer raw materials that were previously made from all 100% of the ROP are now only 19% of the ROP. Substitution from other raw materials is very useful such as Gypsum which is a side product or waste from Phosphoric Acid production. Sludge from Phosphoric Acid production waste contained in the reaction tank is also a waste that requires high waste management costs, can now be utilized as a substitute for raw materials. Based on calculations made by the finance team, the process of making Phosgreen fertilizer requires raw material costs of Rp 1,448/kg (82% cheaper) than SP-36 fertilizer.
Phosgreen fertilizer has a P2O5 content of 20%, CaO 20% and MgO 3% and complied with Indonesian national standard regulations and Ministry of Agriculture recommendations. The lower P2O5 content of SP-36 fertilizer makes the price of making raw materials cheaper. And based on the results of research showing that the average level of soil in Indonesia is optimal if given fertilizer with P2O5 levels that are not excessive so as not to damage the acidity of the soil, not the same as phosphate fertilizers on the market. Phosgreen fertilizer has been applied in 173 demonstration plots in several regions in Indonesia with the average result having an increase in yield productivity of 3.42 Ton/ha during 2023.

The conclusion of the innovation of changing the production of SP-36 Fertilizer to Phosgreen Fertilizer has many advantages such as sustainability and environmental footprint. The cost of making products that decreased from Rp.7,700/kg to Rp.1,488/kg. In terms of the environment, the utilization of gypsum and sludge from the phosphoric acid production process can also save waste management costs and can be used as a substitute for raw materials. Through this innovation, PT Petrokimia Gresik hopes to support the strengthening of food security in Indonesia and the prosperity of farmers by creating an environmentally friendly fertilizer product at a low price.

For this category please provide

An essay of up to 625 words describing the nominated innovative achievements since July 1 2022, **OR** a video of up to five (5) minutes in length illustrating the same.

Optional (but highly recommended), a collection of supporting files and web addresses that you may upload to our server to support your entry and provide more background information to the judges.

Credits

1. Bambang Ariwibo

2. Bagus Eka Saputra

3. Syamsul Bachri

4. Erik Priyanto

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Yes

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