



Zeolite Nanoproducts; an Opportunity for Soil Restoration

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Soil restoration has a very long history in human civilization. As technologies develop, new methods and products are used for soil restoration. Zeolite can play an important role in this regard due to its nanoporous structure. At present, there are many zeolite products that can restore agricultural soils and sports lands.

[Bear River Zeolite](#) Company is one of the companies in [Canada](#) active in the production of zeolite, which produces various types of products to be used in fields such as soil restoration, air filtration, and water purification.

BRZ™ is one of the products of this company, which is used for soil restoration in sports lands, parks, and gardens. Decreasing the need of the land for watering up to 35% is one of the advantages of this product. In fact, agricultural lands that need watering require less amount of water by using this product. The reason is that zeolite can conserve water in its pores for a long period, and it also keeps nitrogen in its structure. A part of nitrogen in fertilizers is always washed from the soil, and is not absorbed by the plant. This product minimizes the waste of nitrogen, and the plants need less fertilizers. Nitrogen is gained from rain in this product.

A great difference between BRZ and normal zeolites is their high cation exchange capacity (CEC), which causes the product to keep more amount of nutritious substances such as nitrogen, phosphorus, zinc, iron, boron, copper, chlorine, and magnesium.

This company has presented 4 nanotechnology products to the markets, and it has many rivals in this field. [Greenmaker](#) is one of the companies that produce zeolites in the [Netherlands](#). The [nanoporous](#) zeolites have many applications such as production of toothpastes, drugs, and detergents. Products of this company are also used in agricultural farms, tennis courts, and soccer pitches.

At present, there are 14 nanotechnology products in [NPD](#) related to soil restoration. Zeolites have been used in all those products, and it shows the importance of zeolite in soil restoration. The [United States](#) has the highest number of zeolite nanotechnology products in NPD by having 7 products, while [Canada](#), [Australia](#), and the [Netherlands](#) possess the next

ranks by having 4, 2, and 1 products respectively. Studies on these products show that the elimination of toxic materials is the most common properties of the products and reducing water consumption is the second most common properties. The two companies Bear River Zeolite and [Zeotech Corporations](#) have the highest number of nanotechnology products in this field.

The most important companies active in this field all over the world are Tosoh Corporation, Arkema Group, BASF SE, Interra Global Corporation, UOP LLC, Zeochem AG, Grace Catalysts Technologies, Tricat Group, Zeox Corporation, Clariant, and KNT Group.

Europe has had the largest market for zeolites in the recent years. The reason is financial supports of the European countries for the production of chemicals based on zeolite and the availability of this substance in [Russia](#) and [Turkey](#). However, strict regulations for water purification and industrial wastewater have created noticeable market for zeolites in Europe too. Studies show that detergents and sorbents have the highest share of zeolite market in [Turkey](#).