大元光鮮有限公司
Velofresh Ltd.

Introduction

From the Cucurbitaceae family, also commonly known as gourd, squash is utilized for a variety of purposes. You may have already seen it, ranging from it being on your dinner plate to its dried version being used as a sponge to scrub your dishes. However, this invention invented dialing back to as long as 9,000 years ago, can be used for a lot more than decoration or your next lunch.

As the global population rose, hydroponic farms became more popular in order to sustain dietary demands. Due to factors such as urbanization, global warming, and lack of employment, a downward trend can be seen in how there were 900 million acres of farmland in 2017 and only 879 million acres in 2023. In order to combat this issue, people developed a new and more efficient way of farming: hydroponics. To ensure higher success rates, hydroponic-grown crops are grown in a monitored replica of outdoor farmland. With LED lights replacing sunlight, gas pumps replacing air, and the use of nutrient optimization technology and the nutrient film technique replacing compost, manure, and minerals, it is a given that soil must be replaced, too. The current medium used to replace soil is plastic sponges.

Environmental Impact

The alternative that we found to be most fit was loofahs. Polyester sponges, the growing medium, are made up of nonrecyclable micro and nanoplastics. These plastics take as long as 500 years to decompose and are disposed of back into nature. In order to sustain the population's diet combat global warming, and focus on achieving the SDGs and ESG, we must find an alternative for polyester sponges. Given that the loofah sponges are 100% fiber, having all industrial hydroponic farms using it can save up to an estimated number of as many as two billion sponges per year. That's saving up to 10 billion grams of plastic per year!

Advantages of Using Loofah Sponges

This plant harnesses a sponge-like build, so it has the ability to serve as a replica. You may be asking, why not cellulose or sea sponges? Why must it be loofahs?
First of all, squash's fibrous structure provides good aeration and water retention, unlike other substances such as the ones listed above. Both cellulose and sea sponges possess amazing abilities to absorb water but lack the airflow dynamics as well as the room for roots to grow. Not to mention, sea sponges are costly and environmentally damaging, whereas cellulose sponges break down quicker due to their tendency to mold when kept in water for longer periods. Being a durable, eco-friendly, and fiber-based plant, squash makes a good replica for us to take the right step forward to loving our planet.

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