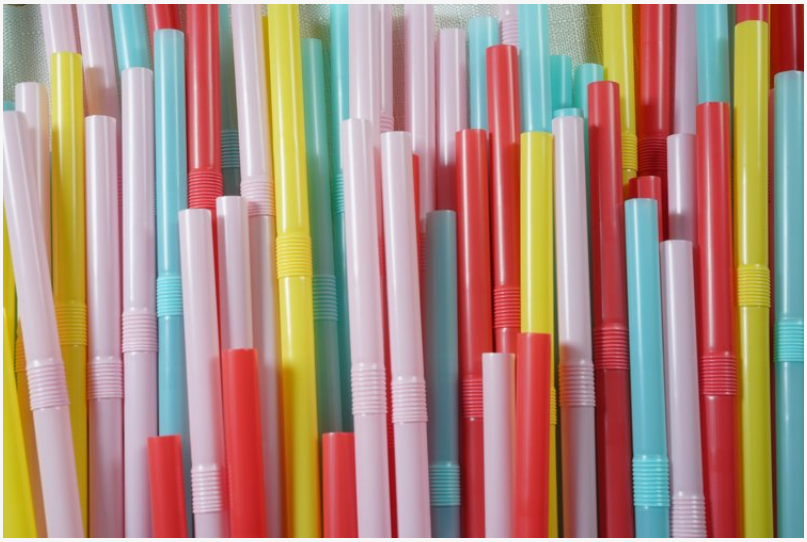
Hemp Bioplastics Are a Renewable and Non-Polluting Alternative to Traditional Plastics



CONDON, OREGON, UNITED STATES OF AMERICA, September 7, 2022 /EINPresswire.com/ -- Plastic pollution is now pervasive on the lands and seas of this planet. Even in the most remote and uninhabited regions of Antarctica, microplastics, small particles of broken down plastic, can be found contaminating our soil, ice, and water.

This hard-to-remove and incredibly long-lasting material is even likely in our own bodies. A study published in Environment International revealed that 77 percent of the individuals they tested had microplastics in their blood. Half of the subjects tested positive for Polyethylene terephthalate (PET), the plastic most commonly used in disposable drink bottles. A third had polystyrene (PS) in their blood, which is used for plastic foam packaging.

Yet, even if plastics weren't choking our waterways and poisoning humans, animals, and whole ecosystems, it would still be a major cause for concern because most plastics are derived from hydrocarbon-rich fossil fuels and hence contribute to the ongoing climate crisis connected to excess carbon in the atmosphere.

The Many Problems With Plastic

Plastic might be incredibly useful (it's cheap, light, abundant, and protective), but it also comes with a host of negative externalities with no practical solution. Chief among them: it is not readily biodegradable, much of it is not recyclable at all, and most of it is made using non-renewable fossil fuels that contribute to climate change.

Plastics that are not recyclable or biodegradable often end up dumped in landfills (or worse, polluting natural ecosystems) where it can take centuries for them to decompose:

Take a look at these estimated decomposition times for traditional plastics:

Plastic Bag: 20 years

Plastic Straw: 200 years

Plastic Bottle: 450 years

Plastic Fishing Line: 600 years

The reason petroleum-based plastics don't decompose at rates similar to natural substances is, unsurprisingly, because they aren't natural. These products are developed in laboratory settings to optimize the strength of their molecular bonds. That makes for sturdy materials that won't rip or crumble when being used, but the downside is they will retain that strength long after their useful life is up. And because so many plastics are used for disposable goods and single-use packaging, that timespan is often depressingly short.

Oil-based plastic is also a finite resource. There is a limited supply of oil and natural gas on the Earth, and humans are using it up much faster than nature can replenish it.

A Natural Solution

Clearly, plastic is problematic. But what if there was a smarter alternative? What if there was a material that mimicked all of petroleum-based plastics positives but came with none of the downsides? Though the field is still developing, one such solution is emerging in bioplastics.

Unlike oil-based plastic, bioplastics which are derived from non-fossilized biomass, are endlessly renewable and can become part of a truly circular economy where regeneration and restoration of resources is integral to a manufacturing process. These types of sustainable materials management (SMM) approaches are promoted by the EPA and other environmental groups because they keep waste materials out of landfills and oceans and route them back into production streams to create new materials and products, and the process is endlessly repeatable.

The value of hemp-based bioplastic, in particular, is rapidly gaining awareness in a number of major industries that rely on plastics because it can be stronger than steel and lighter than fiberglass — but still biodegrades in just 3 to 6 months. Another reason hemp-based plastics are exciting materials to scientists is that they are considered drop-in bioplastics, which means they are chemically identical to fossil fuel-based plastics and can replace them in a large number of use cases.

Bioplastics can be made from a number of biomass sources including vegetable oils, corn starch, sawdust, and even food waste. But hemp is considered among the better choices because it's economical to grow in large quantities and its stalks, the primary source of biomass for hemp-

based bioplastic, are uncommonly high in cellulose, which gives the resultant plastics durability and strength. Wood is approximately 40 percent cellulose, compared to 70 percent for hemp stalks.

One thing that is slowing the adoption of hemp-based bioplastics are existing subsidies for competing biomass sources like corn and soybeans. Hemp not only grows twice as fast as corn but it requires a third as much water, and because it's a canopy crop, it protects the soil from sunlight and promotes regeneration of soil carbon. Lobbyists from the hemp industry are aggressively pushing for a more even playing field so that real world science and market forces dictate the course of this industry, not obsolete regulations and economic policies.

Tapping Into a Growing Industry
Even drop-in bioplastics like hemp-based materials still don't match the performance characteristics of traditional plastics in all applications, but the number of areas and industries where it is a good fit has increased explosively as hemp production and processing normalizes throughout the country (especially in reaction to the Hemp Farming Act of 2018). More and more businesses are realizing hemp's potential as both a practical alternative to conventional plastic and a means of effectuating their sustainability goals.

"Industrial hemp is a carbon sequestration heavyweight," argues Austin Bryant of BastCore, a hemp stalk processor. "For every acre of hemp grown, 9 tons of CO2 are captured. If we could get 1 million acres of hemp into our soil and harvest three times a year (hemp has a 90-day growth cycle), you're capturing a good bit of carbon. Replacing fossil fuel-based synthetics with fibers from plants will ensure brands hit their climate targets faster. The bigger picture is reducing the U.S. emission rate, which is certainly worth investing in."

Bioplastics currently represent a tiny fraction of the total market for plastics, less than one or two percent globally, but that number is ticking up constantly. The global market for bioplastics hit $5 billion in 2020 and the global market for hemp-based bioplastics reached $85 million in 2021.

Read More

Jared Hart
Spherical Strategies
+18669774373
email us here

in today's world. Please see our Editorial Guidelines for more information.