

Corn and Renewable Plastics: The Affordable, Abundant and Sustainably Produced Solution



The National Corn Growers Association (NCGA) has a vested interest in discovering new uses for corn.

One area of opportunity is renewable plastics. Did you know, if corn were to displace all petro-based ethylene¹ with corn sugars -based ethylene for plastics such as water bottles and plastic bags, the market potential could be 10-billion bushels? Today, biomaterials account for less than 1% of plastics produced annually.

Why is corn the right solution for plastics and packaging?

According to January 2021 USDA Economic Research Service (ERS) Feed Outlook data, 38.7% of corn is used for animal feed, 26.6% for fuel ethanol, 17.5% for exports, and 17.2% FSI (feed, seed, industrial). With ending corn stocks for 2020 hovering around 1,552 million bushels, NCGA works hard to develop [new uses](#) for corn through various programs. Not only do we have surplus remaining, but corn is also sustainable, abundant, and affordable.



Corn is Sustainable

Sustainability and continuous improvement is important to corn farmers. Being able to pass the farming operation and land to the next generation is a priority. Since 1980:

- **Soil loss per bushel of corn has decreased by 68%.²**
- **Corn production has seen a 36% decrease in greenhouse gas emissions per bushel.**
- **The energy used to produce a bushel of corn has decreased by 44%.**



Corn is Abundant

In 2019, there were more than 1.8 billion bushels of U.S. corn ending stocks. Thanks to technology advancements, farmers are able to produce more with fewer inputs than ever before. That means there's a lot of feedstock that is commercially viable and ready to be utilized for new uses.

- **Since 2000, corn production is up 4.7 billion bushels, average yields have grown by nearly 40 bushels/acre, U.S. total corn production is up 47% and corn yields have increased by 29%.**



Corn is Affordable

Corn is an efficient and economically viable choice as a feedstock for biobased products. Improvements in technology, production and logistics have positioned corn as the smart feedstock choice for the next wave of innovation.

Packaging Today

Today, a great deal of packaging uses PET (polyethylene terephthalate), PE (polyethylene) and PP (Polypropylene). While these products offer significant value in packaging, they do have negative aspects. For example, these types of packages primarily use fossil fuels, are not compostable and are viewed by consumers as plastic waste.

To address the use of fossil fuels, several companies are working on renewable sources for ethylene, including Braskem and the Iowa Corn Growers Association, which will be drop-in solutions for fossil-based compounds. Progress is being made both with increased awareness of recycling and efforts to find ways to decarbonize today's durable packaging.

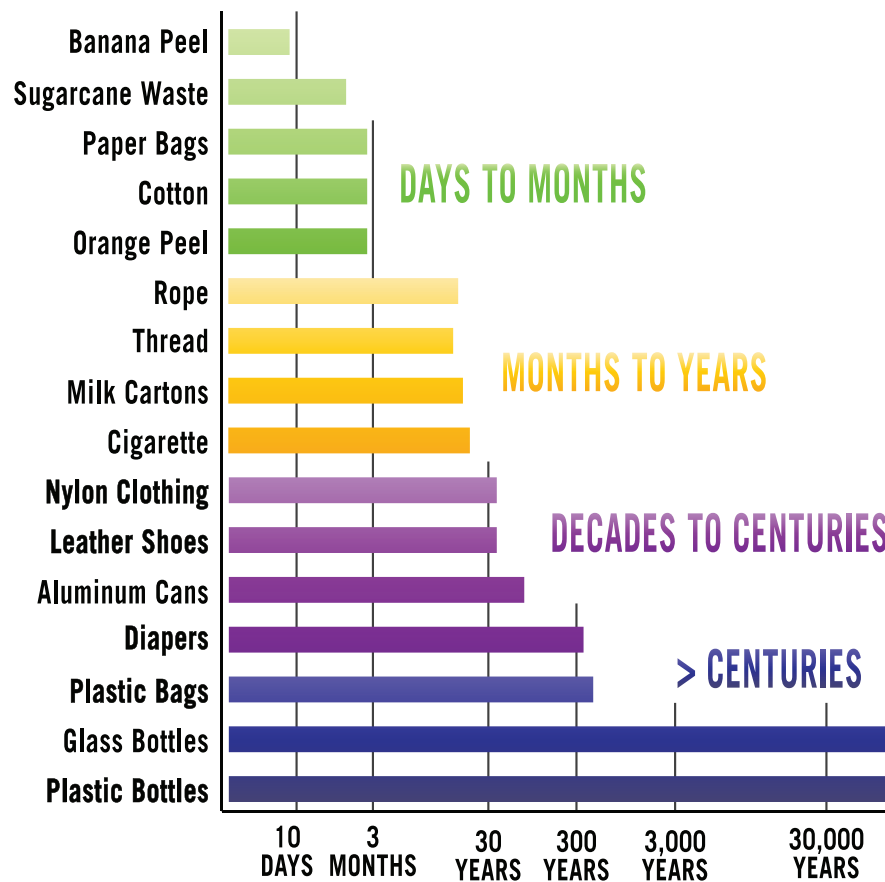
In 2019, the global production of plastics reached 368 million metric tons. While there are some renewable plastics currently available, they only represent 2% of the current market. The potential for corn-based plastics is huge. Corn is a sustainable, performance-proven alternative for traditional petroleum-based plastics.

Packaging of the Future

The possibilities for renewable packaging in the future are endless. Renewable packaging made from corn can deliver both performance and environmental benefits. Corn can be made into polyethylenefuranoate (PEF) and is a 100% biobased alternative to petroleum-based plastics. PEF's keep food fresher, boasting better barrier and thermal properties (CO2 and O2) and have improved moisture resistance.

Why should corn farmers care about biobased plastics?

Besides the fact that it helps drive demand, environmentally there's a lot to gain from biobased plastics and packaging. This chart shows the average decomposition periods for various commodities.



The average decomposition periods for various commodities. The commodities marked in bold are the representative plastic waste.

Endnotes

1 Ethylene is a colorless, flammable gas, derived from petroleum.

2 <https://www.ers.usda.gov/topics/farm-economy/agricultural-research-and-productivity/>