Substituting Plastic

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The diversity and effectiveness of plastic items testify for the utility of polymers. Nonetheless, the non-biodegradability of these polymers has been a source of ecological concerns. Most plastics are derived from propylene, a simple component of petroleum. When heated up with a catalyst, individual monomer units of propylene link together, forming extremely strong carbon bonds with each other. This results in polymers, long chains of monomers called polypropylene. Nature doesn't make things like that naturally. The strong carbon bonds are extremely hard to break down, which is why plastic doesn’t biodegrade. Plastic pollution in recent years has become a serious worldwide problem due to the growth in both fumes and trash put in landfills. This has called for reform; finding new ways to reduce production of plastic. By making a biodegradable substitute, there can be significant change to slow the pollution epidemic. The goal of this project is to make a packaging using glycerin, water, and starch-based materials. For six trials, using 55%, 65%, and 75% potato starch, cooking them together to form ‘plastic’ packaging. Then testing the attributes, such as adhesiveness and mold-ability. The benefits of starch for plastic production incorporate its renewability, great oxygen barrier abundance, low cost and biodegradability. After testing, the product is placed outside, exposed to changes in the ecosystem; soil, temperature, moisture, etc.. After between 5-9 weeks, the products had all completely degraded into the soil, meaning the project was an overall success. Although there were some minor flaws and problems, with more testing, the packaging could become a real viable substitute for plastic.

Awards Won:
NC State College of Engineering: Award to attend NC State Engineering Summer Camp