Preventing the Drought from Turning into World Hunger

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According to Food and Agriculture Organization of the United Nations (FAO, 2017), one of the worldwide biggest worries is the drought caused by climate change. This situation is causing a decrease in the amount of moisture in the soil making difficult the water supply in order for crops. This factor limits agriculture in different regions of the world, triggering food insecurity. An option is to use super absorbent polymers (SAPs), which have the ability to reduce water stress. However, these SAPs are crosslinked with polymerization, so they are not biodegradable nor economical. The purpose of this research was to create a super absorbent, biodegradable and economical natural polymer that could be made at home and the growth of crops could be maintained in times of drought. It was found that there are natural polymers in most of the vegetables, such as the yucca and yam peels. Three experiments were developed: one to test the ability to absorb water, another for the effect on soil moisture, and last to measure the growth of the plant. The polymer was cross-linked naturally with an organic cross-linking method; using ultraviolet light and heat. The emulsion polymerization was carried out using natural oil found in lemon peel. The mixture of yucca and yam peels resulted in positive water retention; produced the wettest soil, and the highest growth in the bean plant. The developed SAP maintained 84% of crop growth during a drought, improving the capacity of commercially used SPAs. Therefore the hypothesis was validated.

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