

**SUPERABSORBENT POLYMER FROM POTATO (*Solanum tuberosum*) SKIN  
AS A SOIL AMENDMENT TO IMPROVE SOIL WATER HOLDING  
CAPACITY FOR GROWING CHILI PEPPER (*Capsicum annuum*)**

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An Undergraduate Thesis Submitted to the Faculty of the Department of Agricultural and  
Biosystems Engineering, College of Engineering, Central Luzon State University,  
Science City of Muñoz, Nueva Ecija, Philippines  
in Partial Fulfillment of the Requirements  
for the Degree of

**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS  
ENGINEERING  
(AB Land and Water Resources Engineering)**

**JULY 2023**

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## ABSTRACT

**GARCIA, EL CID M.**, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija Philippines, July 2023, **SUPERABSORBENT POLYMER MADE FROM POTATO (*Solanum tuberosum*) SKIN AS A SOIL AMENDMENT TO IMPROVE SOIL WATER HOLDING CAPACITY FOR GROWING CHILI PEPPER (*Capsicum annuum*)**

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Historically, a major drought has affected the Philippines every three to five years with the worst impacts linked to strong El Niño cycles. Philippines experience drought so often it resulted to water scarcity in some places which severely affects the growth development of crops which then leads to malnutrition of crops. When drought is severe, simply watering the crops is not enough to sustain its moisture. Some soil amendment must be applied to compensate for the water loss during hot season or drought. Application of superabsorbent polymer (SAP) in the soil is becoming a trend to conserve water for crops as it is a material that can absorb fluids greater than their own dried weight. Thus, this present study was conducted for the purpose of synthesizing a starch-based SAP from the agricultural and/or food waste, potato peels. The produced SAP was made from the extracted starch from potato peels mixed with carboxymethyl cellulose sodium salt and aluminum sulfate. SAP was tested for its water holding capability and its effects on chili pepper in terms of plant height and leaf count using pot experiment. The result of the study revealed that the treatment that contains 10g of SAP (T<sub>4</sub>) has the lowest water reduction, which is 188.2 mL, compared to the other treatments. While 0g SAP (T<sub>1</sub>), 2g SAP (T<sub>2</sub>), and 4g SAP (T<sub>3</sub>) have water reductions of 294.6 mL, 238.4 mL, and 227.8 mL, respectively.

Furthermore, the findings of this study revealed that applying 10g of SAP on 2 kg of soil promotes better growth for chili pepper in terms of plant height and number of leaves grown throughout the experiment. Lastly, the cost of producing 1kg of superabsorbent polymer from potato peels was estimated to be ₱1556.37.

Keywords: Superabsorbent polymer; Potato peels; Agricultural waste; Water holding capacity

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