THE CLSU INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLOGY
www.clsu-ijst.org

Water-Saving Technique using Polyacrylamide Polymer as Soil Amendments

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Abstract

During the El Niño phenomenon, the agriculture sector of the Philippines suffers great loss due to prolonged drought. Management of water is essential during this time to be able to augment crop productivity and guarantee predictability of outputs. The use of alternative amendments to hold water in the soil for a long period will become important over time. Soil conditioners like cross-linked Polyacrylamide polymer (PAM) has its advantage in this situation for its ability to store large amounts of moisture. This study focused on determining the absorption capacity of polyacrylamide polymer for a given time, as well as the effects brought to the soil. After series of experiments, the following results were obtained: five grams of polymer granules can hold up to 1.060 liters (212 times its weight) of tap water; the soil amended exhibited excellent water holding capacity and withheld soil moisture without supplemental irrigation for one week; wilting point of the indicator crop was also prolonged from 5 to 10 days; and after 16 days of successive sun drying, presence of moisture was still recorded from the soil samples. The results demonstrated that, with the addition of polyacrylamide polymer in the soil, crops will be able to utilize water over an extended period of water unavailability.

Key Words: absorption capacity, cross-linked polymer, soil moisture retention, water holding capacity, water management