OPE10) Water Management for Preventing Resalinization in Reclamation Agricultural Land

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1. Introduction

Reclaimed tidal lands that locate mainly in west and south coastal areas of Korean peninsula are approximately 350,000 ha and the importance of reclaimed tidal lands is increase gradually in Korea. Soil salinity at reclaimed tidal land in Korea is highly variable and depending on soil characteristics and weather conditions. The main purpose of this study is to survey optimum water management for preventing resalinization after early desalinization in reclaimed tidal lands west south Korea. Water management experiments were carried out as three method, the non-irrigation, the furrow-irrigation and the subsurface drip-irrigation. Regression equations were obtained in order to investigate the changes of electrical conductivity after the early desalinization of the reclaimed tidal lands and to estimate preventing effects of resalinization.

2. Materials and Methods

Three sampling sites were selected at each reclaimed tidal land and three cores of soil samples were taken by a hand spiral auger from surface (0~20 cm) and sub-surface (20~40 cm) layer weekly from April to November, 2016. The part of collected soil samples were used for mass water content by oven drying at 110℃ and the rest of samples were air-dried, passed through a 2-mm sieve, and then used for the chemical analysis. Soil pH and Electrical Conductivity (EC) was determined with pH electrode and conductivity meter (Orion 162A, USA) from 1:5 soil/water suspension. Soil EC of a saturation paste extract was estimated from the EC using 1:5 soil/water suspension and an estimate of soil texture. Organic matter content was measured by Tyurin method (NIAST, 2000).

3. Conclusions

During the experimental period, Electrical Conductivity (EC) had widely ranged from 0.1 to 5.2 dS/m in reclamation agricultural land. This result is supported that soil EC was highly correlated with soluble Na contents in soil and standard deviation of soluble Na at reclaimed tidal soil. With the increase of the water requirement for desalinization, the electrical conductivity decreased with high degree of interrelationship and the effects of preventing resalinization were remarkable in furrow-irrigation. The results showed that the soil moisture contents could have a significant influence on resalinization of reclaimed tidal lands. Therefore, for preventing resalinization of reclaimed tidal lands, it is suggested that soil management by applying blocking of capillary and soil moisture would be required. In the end this study results can be provide some useful information for deciding management plans for diverse utilization or to reduce salt damage for stable crop production at reclaimed land.

4. References

Ministry of Environment, Chemistry Safety Clearinghouse, https://csc.me.go.kr/.

NIAST, 2000, Methods of Soil Crop Plant Analysis, National Institute of Agricultural Science and Technology, Suwon.