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Drainage Water Management Impact on Drainage and Crop Production under Dry Conditions

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ABSTRACT
Drainage water management (DWM) is the drainage system in which the drain outlets are partially closed to reduce drainage volumes. The effect of DWM depends on many factors such as soil type, weather condition and crop type. This research studies the effect of using DWM on drainage and crop production in three sites in USA at NC, IL and IA in the dry weather conditions. The hydrological model DRAINMOD has been used to simulate two drainage systems; conventional drainage and controlled drainage. The results showed that the efficiency of DWM system increases in the dry and very dry conditions. In the NC site, the crop yield increased by 9% in the very dry years, 5.33% in the dry years and 0.63% in the long term average. The drainage outflow was reduced by 26.4% in the very dry years and by 23.6% in the dry years. In the IL site, crop yield increased by 5.4% and 4.6% and the drainage was reduced by 33.33% and 32% in very dry and dry years respectively. In the IA site, crop yield increased by 2.22% and 2.91% and the drainage was reduced by 46.5% and 32.2% in very dry and dry years respectively.