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Developing an Improved Strip-intercropping System for Maize and Chinese Cabbage in the North China Plain

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Abstract

Agricultural production is heavily contributing to degradation of water and land resources in the North China Plain. Due to the rapid increase of vegetable production environmental resources are even more deployed in the last decade. There is an urgent need to develop and disseminate more sustainable vegetable production systems. Intercropping, the cultivation of two or more crops in the same field is a traditional system in the NCP. Farmers intercrop various vegetables with grain crops, trees and other vegetables. Several studies showed that intercropping can use environmental resources more efficiently and reduce leaching and erosion. In a strip intercropping field trial with maize and Chinese cabbage, we tested the influence of the neighbouring crop on microclimate, growth and development. Spring Chinese cabbage was planted next to spring maize under two irrigation strategies. The experiment was run at Quzhou experimental station, China in 2008 and 2009. Even though the maize reduces the photosynthetically active radiation in the first rows of Chinese cabbage significantly, yield of Chinese cabbage is not affected negatively. The first four rows of the maize produced a significantly higher yield compared to the plants in the middle of the plot, which are exposed to a monocropping situation. No significant effects of the reduced irrigation could be observed on important growth parameters in neither crop. The first rows of each crop, which were exposed to a strong intercropping situation didn't show a higher yield under reduced irrigation. Thus, higher water use efficiency, an often mentioned advantage of intercropping, did not occur in intercropping of Chinese cabbage and maize.

Keywords: Intercropping, North China Plain, Sustainable Production