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## Performance of Maize under Conservation Agriculture in Salt-affected Irrigated Systems of Uzbekistan

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### Abstract

Intensive tillage and mismanagement of irrigation and nitrogen (N) fertiliser application in conventional crop production systems is causing decline in soil fertility and increased soil salinity in the irrigated drylands of Uzbekistan. Reduced tillage, proper crop rotation, and optimum amount of residue retention combined with application of optimum nitrogen fertiliser can help to mitigate the adverse effects of conventional farming practices. Thus, an experiment was conducted to study the performance of hybrid maize under conservation agriculture practices in a salt-affected region of Uzbekistan in 2009. The site has sandy loam to loamy soil with high soil salinity (EC 2–20 dSm<sup>-1</sup>), shallow groundwater table (0.5 to 2 m), less than 100 mm annual rainfall, and low soil organic matter content (0.40–0.80 %). The experiment was started in April 2008 with cotton followed by winter wheat and maize (summer 2009). to evaluate the combined effects of tillage (permanent beds (PB) and conventional (CT)), crop residue retention (with and without), and nitrogen fertilisation (0, 100 and 200 kg N ha<sup>-1</sup>). Maize grown on permanent beds gave 40 % higher grain yield compared to conventionally tilled soil. Permanent bed has 85 % N recovery which is 120 percent higher N recovery compared to conventionally tilled soil. Retention of residues resulted in 10 % yield increase. Permanent bed with residue retention has significantly lower soil salinity up to 30 cm soil depth compared to conventional and bed without residue. Thus, permanent bed with residue retention has potential to increase yield and nitrogen use efficiency of maize in salt affected irrigated regions of Uzbekistan.

**Keywords:** Conservation agriculture, crop residue, nitrogen use efficiency, permanent bed, tillage