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the Use Efficiency of Soybean Water under Different Crop Residual Management and Tillage Systems in Golestan Province, Iran

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Abstract

Proper and new tillage methods to optimise the use of soil, could increase the productivity of agricultural products especially in using water efficiency. Maintaining crop residues, reduce tillage practices and direct seeding in the field of plant residues, is known as conservation agriculture (CA). In order to evaluate residue management and tillage system effects on soil microorganisms and quantity, the quality of soybean yield in Gorgan region a field experiment was conducted as strip plot in a randomised complete block with three crop residue management and three tillage methods in three replications in Gorgan Agricultural Research station in 2010.

Main treatments were crop residue management includes: A1= residue burning, A2=keeping 50 percent residue and A3= keeping 100 percent of crop residue. Residue was wheat stables after harvesting treatment tillage consisted of B1= Conventional tillage (plow + disk + sowing by row planter), B2= minimum tillage (reduced tillage by compound tillage plow + sowing by row planter) and B3= No tillage (sowing by no tillage planter). The results showed that residue management had significant at 1 % on soybean yield but had no significant effect of tillage methods on the yield and yield components. Crop residue management had significant 1 % level on water use efficiency and total irrigation water used the minimum water used obtained in and the highest was obtained in residue burning (A1) 100 % of residue (A3). The highest water use efficiency was obtained from minimum tillage treatments (B2) and minimal water use efficiency associated with conventional tillage treatments (B1).

Keywords: Crop residue management, keywords: tillage, soybean, water use efficiency, yield.

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