Influence of Recycled Water Irrigation on Triticale Nutrient Absorption

Xiaona Li
Beijing Research & Development Center for Grass and Environment, China

Juying Wu
Beijing Research & Development Center for Grass and Environment, China

Ruiwen Zheng
Beijing Research & Development Center for Grass and Environment, China

Honglu Liu
Beijing Hydraulic Research Institute, China

Wenyong Wu
Beijing Hydraulic Research Institute, China

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Xiao-na Li[1], Ju-ying Wu[1], Rui-wen Zheng[1], Hong-lu Liu[2], Wen-yong Wu[2]
1. Beijing Research & Development Center for Grass and Environment, Beijing 100097, China. E-mail: lxn1977@grassenv.com; 2. Beijing Hydraulic Research Institute, Beijing 100044.

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Introduction As our population increases, so does the strain on our nation's potable water supply. In the arid and semi-arid zones of North China, the quantity of water resource per person is less than 700 cubic meters per year. Reuse of treated municipal wastewater for irrigation reduces the use of potable groundwater for agricultural irrigation. Triticale is the dominant forage type in China and the shortage of water resources is the limiting element influencing its production. Since recycled water is a valuable substitute water resource for forage irrigation, the influence of recycled water irrigation on the growth and nutrient absorption of Triticale was studied in potted plants.

Table 1 *Water quality of recycled water for the experiment.*

Water	N(mg/kg)	P (mg/kg)	K(mg/kg)	Ca (mg/kg)	Mg(mg/kg)	pH
RW	15.07	0.7350	14.40	78.70	30.10	7.460
NW	3.080	0.02700	4.960	52.40	18.20	7.780

Methods Recycled water (RW) was derived from Zhuozhou sewage disposal plant, while nutrient water (NW) was tap water supplied N, P, K, Ca, Mg such that the content of NW was the same as RW (Table 1). Two water types (RW and NW) were used to irrigate Triticale, with 15 replicates.

Table 2 *Effects of recycled water irrigation on root activity of Triticale (TTCmg· g^{-1} root drymatter h^{-1}).*

Date	May.4	May.14	May.24	Jun.4	Jun.14
NW	0.93	0.52	0.74	0.39	0.68
RW	1.11	0.59	0.84	0.44	0.70

Results and discussions The results showed that the type of applied water had a significant effect on Triticale biomass, with the highest biomass found with RW (Figure 1). RW significantly increased the root activity of Triticale in comparison to NW (Table 2). No effect of water type on the N, P, K, Ca and Mg absorption of Triticale shoot was evidenced (Table 3).

Meng (1999) and Qi et al.(2003) indicated that sewage could increase the yield of crop by studying the effect of sewage irrigation on wheat, summer millet and summer corn. This study confirmed that recycled water irrigation could increase the yield of Triticale significantly, and indicated that the influence of irrigation water type on the N, P, K, Ca, Mg content of Triticale were not significant.

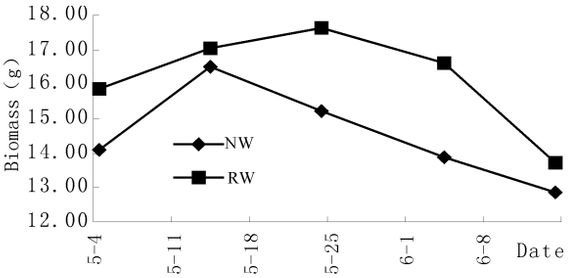

Figure 1 *Effects of recycled water irrigation on biomass of Triticale.*

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Meng Chun-xiang, Guo Jian-hua and Han Bao-wen. 1999. Effect of sewage irrigation on crop yield and soil quality. J. Hebei Agri. Sci. 3: 15-17.

Qi, Z., S. Feng, and G. Huang. 2003. Experimental study on effects of irrigation water quality on plant growth of summer corn. J. Irrigation and drainage. 22: 36-38.

Table 3 *Effect of the different irrigation water quality on N, P, K, Ca and Mg absorption of Triticale shoot (mg/kg).*

Date	Water	N	P	K	Ca	Mg
May.14	NW	1.137a	0.206a	2.669a	0.676a	0.152a
	RW	1.080a	0.189a	2.687a	0.696a	0.157a
May.24	NW	1.183a	0.185a	2.649a	0.875a	0.182a
	RW	1.128a	0.194a	2.701a	0.929a	0.184a
Jun.4	NW	1.557a	0.236a	2.586a	1.017a	0.191a
	RW	1.438a	0.242a	2.602a	0.926a	0.191a
Jun.14	NW	1.439a	0.219a	2.648b	1.180a	0.220a
	RW	1.486a	0.225a	2.886a	1.203a	0.228a