RESPONSE OF WHEAT TO THERMAL POWER PLANT DISCHARGED WASTEWATER (TPPW) SUPPLEMENTED WITH NPK FERTILIZER

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Abstract : A pot experiment was conducted in the winter season of 2008-2009 to evaluate the suitability of Thermal Power Plant discharged Wastewater of National Thermal Power Corporation (NTPC), Dadri as a source of irrigation and its impact on growth and yield components of two wheat cultivars *viz.* PBW 343 and UP 2338. The test crop was raised with different concentration of TPPW (T_1 : 10 %, T_2 : 25 %, T_3 : 50 %, T_4 : 75 %, T_5 : 100 %) compared to control plants (T_0) receiving normal ground water supplemented with fertilizer $N_{100}P_{80}K_{40}$ and $N_{50}P_{40}K_{20}$. TPPW with $N_{100}P_{80}K_{40}$ promoted growth, number of tillers, number of ears, total chlorophyll, seed yield per plant, 1000 seed weight, biological yield and harvest index as compared to control. 75 % effluent was found most suitable for the measured growth and yield parameters while 100 % concentration proved inhibitory. TPPW may be considered as an alternative of fresh water for irrigation purpose improving yield and quality of wheat crop.

Keywords: TPPW, Germination, Chlorophyll content, Growth yield

REFERENCES

Akhtar, A.; Inam, A. and Inam, A. (2008). Response of mustard and linseed to thermal power plant wastewater supplemented with nitrogen and phosphorus. *African J. of Plant Science,* **2** (8) : 67-71.

Akhtar, A.; Singh, S.; Saeed, S.; Javid, S.; Ahmad, I.; Khan, M.A. and Inam, A. (2006). Effective use of thermal power plant wastewater as a source of irrigation and nutrients in crop productivity of linseed (*Linum unitatissmum* L.). *Asian Jr. of Microbiol. Biotech. Env. Sc.,* **8** (2) : 223-227.

APHA, AWWA and WPCF (2005). Standard Methods for the examination of water and waste water. American Public Health Association, New York, 27th Edition.

Arnon, D.I. (1949). Copper enzyme is isolated chloroplast I polyphenol oxidase in *Beta vulgaris*. *Plant Physiol.,* **24** : 1-14.

Aziz, O.; Inam, A. and Samiullah (1999). Utilization of petrochemical wastewater for agriculture. *Water, Air, Soil Pollut.,* 115 : 321-325.

Babiker, I.S.; Mohamed, M.A.A.; Terao, H.; Kato, K. and Otha, K. (2004). Assessment of groundwater contamination by nitrate leaching from intensive vegetable cultivation using geographical information system. *Environ. Int.,* **29** : 1009-1017.

Brady, N. and Weil, R. (2008). The nature and properties of soils. 14th Ed. Prentice Hall, N.J.

Cunningham, W.P. and Saigo, B.W. (1995). Environmental science : A global concern. 3rd Ed. WCB Publishers, U.S.A.

Darwish, M.R.; El-Awar, F.A.; Sharara, M. and Hamdar, B. (1999). Economic environmental approach for optimum wastewater utilization in irrigation. A case study in Lebanon. *App. Engg. Agric.,* **15** : 41-48.

Gupta, L.; Khan, N.A. and Singh, S. (2005). Growth photosynthetic traits and activities of antioxidative enzymes of municipal Wastewater treated cabage (*Brassica oleracea* L.). *J. Plant Biol.,* **31** : 1-4.

Hayat, S.; Ahmad, I.; Azam, Z.M.; Ahmad, A.; Inam, A. and Samiullah (2000). Impact of treated Wastewater from an oil refinery on growth and yield of *Brassica juncea* and on heavy metals accumulation in the seeds and soil. *J. Environ. Studies and Policy,* **3** : 51-59.

Imsande, J. (1992). Agronomic characteristics that identify high yield, high protein in soyabean genotypes. *Agron. J.,* **84** : 409-414.

Javid, S.; Inam, A.; Khan, N.A. and Singh, S. (2006). Photosynthesis, growth and yield response of blackgram (*Vigna mungo*) to sewage and thermal power plant wastewater. *Physiol. Mol. Biol. Plants,* **12** : 325-327.

Javid, S.; Singh, S.; Ahmad, I, Saeed, S.; Akhtar, A.; Khan, N.A. and Inam, A. (2006). Utilization of sewage and thermal power plant discharged wastewater for the cultivation of a pulse crop. *Asia J. Microbiol. Biotech. Environ. Sci.,* **8** : 217-222.

Malaviya, P. and Sharma, A. (2011). Effect of distillery effluent on yield attributes of *Brassica napus* L. *J. Environ. Biol.,* **32** : 385-389.

Medhi, U.J.; Talukdar, A.K. and Deka, S. (2011). Impact of paper mill effluent on growth and development of certain agricultural crops. *J. Environ. Biol.,* **32** : 185-188.

Nair, G.; Achuthan, Jalal Ahmed Bohjuari, Muftah, A.; Al-Mariami, Attra, F.A. and Fatma, F. El-Toumi (2006). Groundwater quality of north-east Libya. *J. Envrion. Biol.,* **27** : 695-700.

Nath, K.; Singh, D. and Sharma, Y.K. (2007). Combinatorial effect of distillery and sugar factory effluents in crop plants. *J. Environ. Biol.,* **28** : 577-582.

Nath, K.; Singh, D.; Shyam, S. and Sharma, Y.K. (2009). Phytotoxic effect of chromium and tannery effluent on growth and metabolism of *Phaseolus mungo* Roxb. *J. Environ. Biol.,* **30** : 227-234.

Shah, R.A.; Javid, S. and Inam, A. (2004). Response of tricole under sewage wastewater irrigation. *Ecol. Environ. Conservation,* **10** : 197-204.

Singh, P.P.; Manish, M. and Singh, J. (2006). Impact of fertilizer factory effluent on seed germination, seedling growth and chlorophyll content of gram (*Cicer aeritenum*). *J. Environ. Biol.,* **27** : 153-156.

Soumare, M.; Tack, F.M.G. and Verloo, M.G. (2003). Effect of a municipal solid Wastewater compost and mineral fertilization on plant growth in two tropical agricultural soils of Mali. *Bio. Technol.,* 86 : 15-20.

Tabassum, D., Azad, S. and Inam, A. (2007). Utility of city Wastewater as a source of irrigation water for mustard. *J. Industrial Pollution Control,* **23** (2) : 391-396.