

Effect of Pollution on Crop Wheat around Neemrana Industrial Area, Alwar (Rajasthan)

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ABSTRACT

Average plant growth of wheat plants taken in time intervals one, two, three, four and five month. Wheat plant growth was shown to be lower in contaminated soils than in typical agricultural soils. It was found that 7% to 65% average plant growth declined in overall time duration after transplantation. Consequently, the outcomes of this study are quite important. The rate of reduction of plant growth was found to increase with time, which might be due to the adverse effects of contaminants as discharged through the industrial waste materials. This indicates that the industry did not take any pre-treatment measure to minimize the contaminants of the effluents before discharging industrial effluents on land.

Key Word- wheat, plants, Ground water, effluents

INTRODUCTION

Heavy metals tend to bio-accumulate in crops and are creating serious health threats to human and ecosystem². Rapid industrialization leads to high discharge of wastes which may pollute ecosystem. The global industries have been facing a major threat regarding the ecological problems caused by their waste stream. Environmental pollution caused by the release of a wide range of compounds as a consequence of industrialization has assumed serious water (Otokune for and Obiukwu,2005) and soil pollution(Konwar and jha,2010),which is considered as one of the major factor responsible for low productivity of crops. A considerable number of reports are available on the effect of different industrial wastes on different crops(Carbral et al.,2010).Increased pollution of soils due to continuous use of heavy metal contaminated industrial wastes is critical to crop production globally and a great environmental threat. These metals accumulate in soils and plants in excess and enter food chain(Kashem and singh,1999;Stolt et al,2006;Jamali et al.,2007). Most abundant metals in the environment with unknown metabolic functions include arsenic, mercury, cadmium, lead and uranium are toxic to plants.

Wheat production is a major farming in the country. It is grown in about 30 million hectares of land nationwide. Major producers of wheat and those states where significant surge was noted i.e. Haryana, UP, MP and Punjab. Wheat grown in India are similar to white wheat in the United States. Indian wheat is high on protein and gluten. Durum wheat is produced in MP, but not marketed separately. Private traders process these wheat varieties for higher value. Production was extremely low during time of independence (6.46 million tonnes) which grew to some extent in 1950-51 but still insufficient to feed the entire population. This led to import of wheat from other countries. Low production of wheat was linked to lodging, poor tillering, low sink capacity, higher susceptibility to diseases, sensitive to thermos variation, longer crop duration, pest infestation etc. In 1961 the Government of India assessed possibilities through which productivity can increase under existing conditions. Due to honest hard work by committee the circumstances changes completely and a Green Revolution was noted in the production of wheat nationally. By end of 60s India was well sufficient in wheat production. In present time production of wheat is in surplus. Reason of high wheat production in India is its adaptability. Wheat can grow in both tropical and sub-tropical regions. It also grows in temperate and cold zones. It even grow in snow and cultivated at as high as 3300 meters above sea level. However, ideal weather for wheat production is cool, and moist during initial period and later dry and warm which support grain to ripe. This, ideal temperature for wheat production is 20-25 °C. Damp and extremely hot climate does not support wheat production. Extremely hot weather at flowering stage is detrimental to wheat. Likewise, cloudy and high humid weather causes rusting. At time of ripening 14-15 °C is considered suitable. Thus, temperature plays important role in yield of wheat production. So, overall it is winter grown crop and consider a rabi crop. Types of soil in which wheat grows properly must contain a clay loam, good

structure, medium water holding capacity. Drained soil and highly porous texture can be disastrous for wheat production. Natural heavy soil with managed drainage is ideal for wheat cultivation. Light soils (should have higher nutrient holding capacity) are also beneficial for wheat production.

FIELD EXPERIMENTS

A field experiment were conducted in order to evaluate the effects of industrial wastes as discharged on the growth and production of wheat crop from 2019 to 2020 season at Bichpuri village Near by Neemrana Industrial area. This village situated longitude 27⁰.97 and latitude 76⁰.34. A farmer land was selected in this village for field study on wheat crop. Different growth stages of crop were analyzed in duration intervals at one, two, three, four and five month. At the end, production of wheat crop was estimated. Growth and production of wheat crop results were compared with wheat crop which cultivated far from Industrial area.

RESULTS AND DISCUSSIONS

Table 1 revealed the average plant growth of wheat plants taken in time intervals one, two, three, four and five month. Wheat plant growth was shown to be lower in contaminated soils than in typical agricultural soils. It was found that 7% to 65% average plant growth declined in overall time duration after transplantation. Consequently, the outcomes of this study are quite important. The rate of reduction of plant growth was found to increase with time, which might be due to the adverse effects of contaminants as discharged through the industrial waste materials. This indicates that the industry did not take any pre-treatment measure to minimize the contaminants of the effluents before discharging industrial effluents on land. The figure 2 shown average growth crop cultivated far from industrial area and near to industrial area.

Table1

Plant Growth period	Average growth of plant near to industry	Average growth of plant far to industry
One month	0.4 feet	0.5 feet
Two month	0.9 feet	1 feet
Three month	1.3 feet	1.5 feet
Four month	2.1 feet	2.7 feet
Five month	2.6 feet	3.2 feet



Growth 0.4 feet after one month Growth 0.9 feet after two month Growth 1.3 feet after three month



Growth 2.1feet after four monthGrowth 2.6feet after five month
Figure: 2.1 Wheat plant growth cycle up to five months near industrial area



Growth 0.5 feet after one monthGrowth1feet after two monthGrowth 1.5 feet after three month



Growth 2.7feet after four month Growth 3.2 feet after five month
Figure: 2.2 Wheat plant growth cycle up to five months far from industrial area

Results showed that plant growth reduced significantly in the contaminated industrial zones (Table 1). It was observed that wheat average production in contaminated soil about 40 quintals per hectare and normal agricultural soil 56 quintal per hectare. Which is 33-40% less production.

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