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EFFECT OF LEAD POLLUTED WATER IRRIGATION ON  
SEED GERMINATION

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## Chapter-5

**EFFECT OF LEAD POLLUTED WATER IRRIGATION ON  
SEED GERMINATION**

We have investigated effects of Pb treatment to seeds as well as Pb amended soil on growth of some rainy season crop plants. Now, it was of interest to study the effects polluted water on seed germination and growth in Oryza sativa cv. Pusa\_Basmati.

For this polluted water was taken from two water bodies polluted by petro-chemicals i.e. Parmar Auto Agency and Service station and Pathak Autoagency and Service Station. Above indicated petrochemical polluted water bodies are situated in the southern city of Jaunpur (82° 10' E to 83° E Longitude and 25° 20' N to 26° 10' N Longitude and at altitude of about the polluted water bodies were divided into two zones for study. Zone I-represents the effluents discharged zone and Zone II. is main water body 30 meters away from the zone I towards opposite periphery with explosive growth of Eichhornia sps. Both the water bodies were lentic and influenced by same kind sources of pollutants i.e. automobile workshop and service unit of vehicles. Petro-chemical effluents of both the service stations are directly discharged into the fresh water bodies. Since Pb is used in petrochemicals as anti-knocking agent therefore the effluents of both the service stations also contain lead, finally through the effluents Pb also reaches in both the above

stated water bodies, Therefore polluted waters of these two water bodies were selected to assess their impact on germination and seedling growth of test plant.

#### Seed germination under the influence of petrochemical containing polluted water :

Healthy seeds of test plant were selected for uniformity (criteria being size, shape and colour), sterilized with 0.1% aqueous solution of mercuric chloride and washed thoroughly with distilled water. There after seeds were imbibed in unpolluted (Clean) water for control and petrochemical containing polluted water for set for their full imbibition period. After their full imbibition period seeds were transferred to distilled water moistened filter paper in petri-plates for germination and seedling growth studies.

After 72 hours of plating seeds were observed for their germination. For this seeds with 2 mm or more length of radicles were considered as germinated. It was reported that petrochemical containing water justify the similar inhibitory action of heavy metals on the seed germination. However, the germination in petrochemical containing water of both the zones (I and II) of the sites (Parmar Service Station and Pathak Service Station) show significant variation in percentage of seed germination. It was reported that water containing petrochemicals of zone. I of both the sites i.e. effluent discharged zones showed maximum inhibitory effect on seed germination of test plants.

Experimental observation clearly indicate the inhibitory action of petrochemicals. Therefore, the water containing petrochemicals is unfit for irrigation of crops. It reduces seed germination ultimately adversely affects the growth and yield of crop plants.

The effect of petrochemical polluted water on seed germination is summarised in the following table..18.

Seed of Crop	Clean or unpolluted water	Sites I		Sites II	
		Zone I	Zone II	Zone I	Zone II
Zeamays cv. Jaunpuri	88%	60%	70%	55%	62%
Oryza sativa cv. Saket	86%	58%	67%	52%	60%
Vigna radiata cv.	90%	71%	78%	70%	61%

Site - I Water body near Parmar Auto

Site - II Water body near Pathak Auto

Zone - I Effluent discharged zone

Zone - II Main water body 30 meters away from zone-I

Table shows, differential response for seed germination are exhibited by cultivars of zea mays, Oryza sativa and Vigna radiata under the treatment of petrochemical containing polluted water.