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EFFECT OF LEAD POLLUTED WATER
IRRIGATION ON SEEDLING GROWTH
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Chapter-6

**EFFECT OF LEAD POLLUTED WATER IRRIGATION
ON SEEDLING GROWTH**

Seedling growth under the influence of petrochemical containing polluted water treatment :

Seed of *Zea mays* cv. Jaunpuri, *Oryza sativa* cv. saket and *Vigna radiata* cv. were sterilized, with 0.1% $HgCl_2$ solution and washed with distilled water thereafter imbibed in water for their full imbibition period. Post radicle emergence treatment of above stated petrochemical containing polluted water was given to germinated seeds.

It was reported that polluted water of Zone I of both the sites was more inhibitory to seedling growth than zone II of both the Sites.

The inhibitory effect observed, has been summarised in the table given below :

Table-19.

Seed of test Plant	Unpolluted water treatment (Control)	Site I		Site II	
		Zone I	Zone II	Zone I	Zone II
Total length of seedling after 6 days cm.					
<i>Z. mays</i> cv. Jaunpuri	3.50cm.	1.50cm.	2.00cm.	1.60cm.	2.00cm.
<i>O. sativa</i> cv. saket	2.50cm.	1.20cm.	1.50cm.	1.40cm.	1.60cm.
<i>V. radiata</i>	4.00cm.	2.60cm.	3.00cm.	2.50cm.	2.80cm.

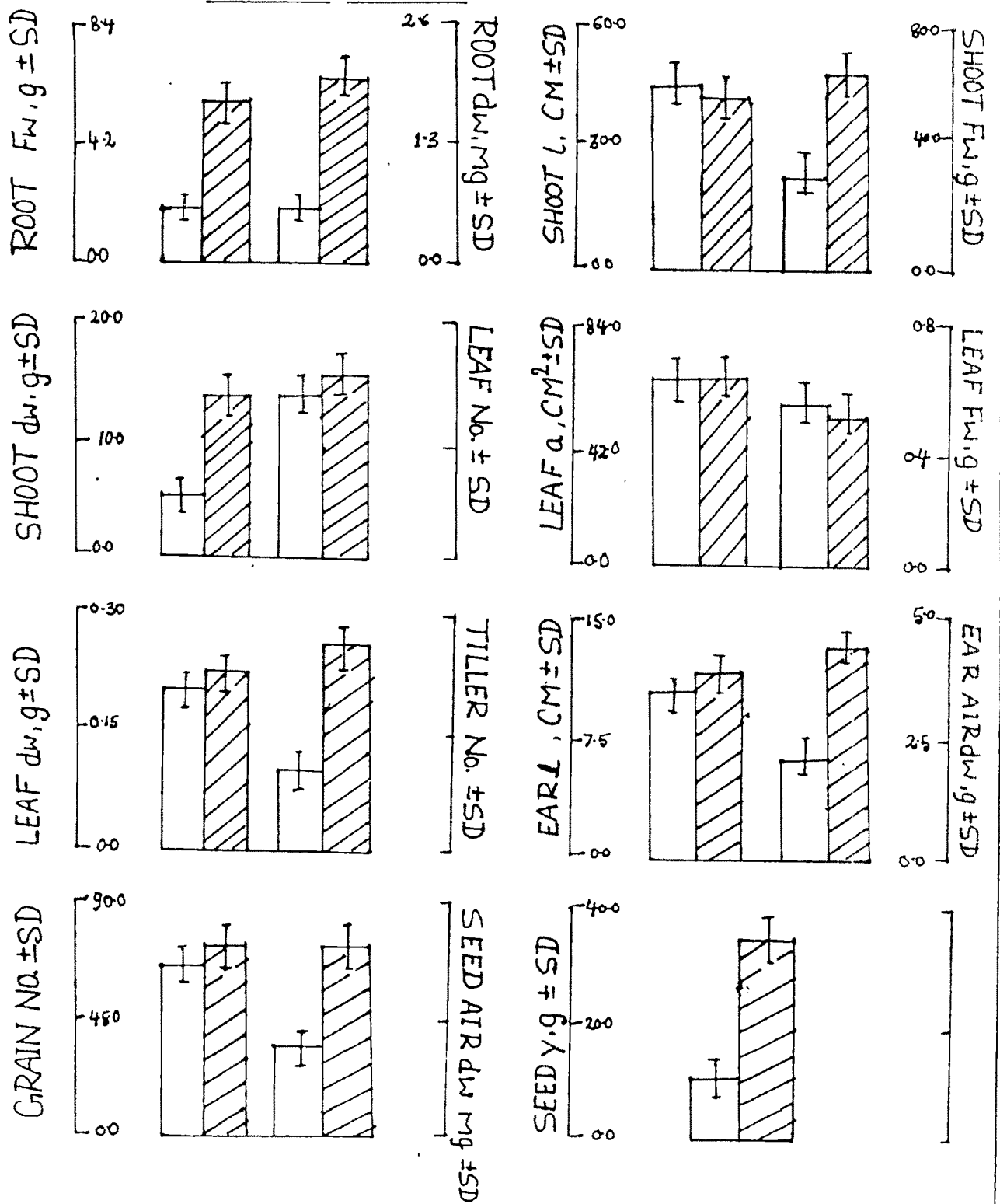
- Set - I Water body near Parmar Auto.
- Set - II Water body near Pathak Auto.
- Set -III Effluent discharged zone.
- Set -IV Main water body 30 month away from zone I

Prior to the establishment of Parmar and Pathak automobile Service stations the water of above stated water bodies had promotory effect on germination, Seedling growth and development performance of the test plant. But at present due to discharge of petrochemicals by above stated service stations into the water bodies have become toxic for growth and there is danger that in future it may become lethal for germination of seeds.

GROWTH AND DEVELOPMENT PERFORMANCE OF PLANTS UNDER THE INFLUENCE OF VARIOUS IRRIGATION TREATMENTS BY LEAD CONTAINING EFFLUENTS

We have investigated effects of Pb treatment to seeds as well as Pb amendment in soil, on growth of some crop plants. Now, it was of interest to see the effects of irrigation by polluted water on growth and development in Oryza sativa cv. Basmati. For this, control crop was grown on clean soil and irrigated by tubewell water while experimental crop by polluted water from the local 'Sipah Ka lala'. This Nala is polluted by industrial effluents as well sewage sludge. So, it is a rich source of nutrients as well as

FIG-8. UNPOLLUTED / POLLUTED WATER VS GROWTH YIELD
Oryza sativa cv. PS-Basmati



FW - FRESH WEIGHT, dw - DRY WEIGHT L - LENGTH, a - AREA,
 NO - NUMBER, Y - YIELD.

havey metals. Further, this polluted water is commonly used for irrigation in local areas, as irrigation by this water leads to increased growth and yield of crops and is, therefore, favoured by the farmers without realizing the possibilities of heavy metal accumulation in the edible parts of the crops.

Seeds of Oryza sativa cv. Pusa Basmati were sown in normal (control i.e. soil irrigated by normal water) as well as polluted soil (i.e. soil irrigated by polluted water), and were irrigated by normal water and polluted water respectively. The spacing from plant to plant was 15 cm. and that between the rows was 30 cm.

Growth characteristics were analysed after 60 days of emergence, while the yield was after 120 days of emergence.

Growth and yield of Oryza sativa Pusa Basmati is shown in figure which indicate that root fresh weight, dray weight, shoot fresh weight, dry weight and tiller number per plant in plants irrigated by polluted water are much more than control, as these are 275%, 285%.

Zeamays cv. White Jaunpuri



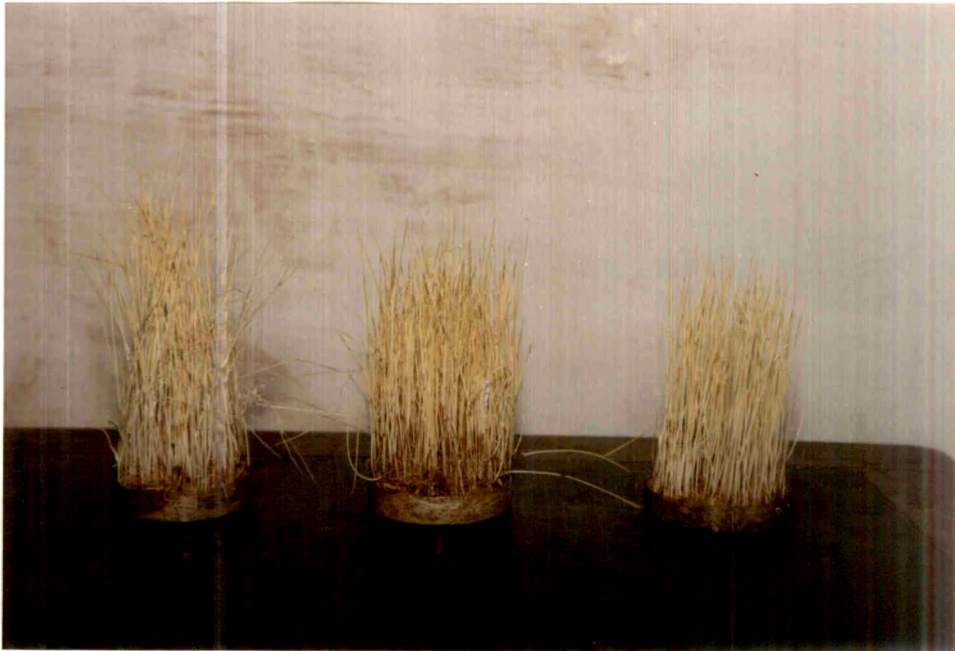
Seedling growth of Zea mays cv. White Jaunpuri.
Treated and control with petrochemical polluted water.

Zea mays cv. Yellow Jaunpuri



Seedling growth of Zea mays cv. Yellow Jaunpuri treated with 1×10^{-3} MPb concentration and control.

Oryza sativa cv. Saket



Oryza sativa cv. Saket showing seedling growth after 17 days of plating (control and treated)

1. Control
2. 1×10^{-4} M Pb concentration
3. 1×10^{-3} M Pb concentration

Vigna radiata cv. PS-7



Vigna radiata cv. PS-7 showing seedling growth after
17 days of plating

1. Control
2. Treated with 1×10^{-4} M Pb. concentration
3. Treated with 1×10^{-3} M Pb concentration