AN ASSESSMENT OF IMPACT OF GROUND WATER IRRIGATION ON SEED VIABILITY OF PADDY CROP (*ORYZA SATIVA* L.)

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Abstract: The present paper deals with the effect of groundwater irrigation along with Ram Ganga river water and sewage water irrigation on seed viability of paddy crop. The water samples have been collected from four different locations of district Bareilly viz. Rampur road, Lucknow road, Pilibhit road and Budaun road. Three varieties of paddy crop viz. Resham Basmati, Pakistani Basmati and Indrasan were taken as test crops. Seeds of these varieties were obtained from National seed corporation Bareilly. Seeds of all three varieties were irrigated by ground water samples taken from different sites. After that all the seeds are subjected to the Tetrazolium (TZ) test to find out the seed viability of each variety of paddy crop. In all the three varieties of paddy crop irrigation with ground water of Rampur road has given the highest seed viability over control, whereas ground water of Budaun road has reduced the seed viability of Paddy crop.

Key words: Seed viability, Ground water, *Oryza sativa*

INTRODUCTION

The seed viability is the potential capacity of a species to reproduce itself. A seed may be defined as "a fertilized mature ovule" possessing an embrynoic plant, stored food material and a protective coat. A viable seed is one, which is capable of germinating under the proper circumstances.

Viability test is the best indication of the potential of a seed lot to emerge under field conditions. Topographical tetrazolium or TZ test is commonly used for seed viabilities. It is very useful for rapidly obtaining an indication of germination potential and viability of samples. This method was pioneered by the German Scientist Lakon during the mid nineteen (1939-1958), who recognised that all living tissues, which respire, are capable of reducing a colourless chemical 2, 3, 5 triphenyl tetrazolium chloride into a red coloured compound formazen by H transfer reactions catalysed by the enzyme dehydrogenases.

Formazan being non-diffusable stain the living tissues red. Thus, the living part of a viable seed should be stained red when incubated in the solution of this chemical.

MATERIALS AND METHODS

To test the viability of the seeds, seeds were incubated in dark for two hours in 2,3,5 triphenyl tetrazolium chloride. Excess tetrazolium chloride was washed off with water. Presence or absence of stained seeds were observed. Presence of red colour was the indication of living cell. Again seeds were incubated in indigocarmine of blue stained tissue were observed. Lack of colour was the indication living cell (Hendry and Grime 1993). Number of viable and non-viable seeds were counted regularly.

Three varieties of paddy crop viz. Resham Basmati, Pakistani Basmati and Indrasan were taken as test crops. The seeds of these varieties were obtained from National seed corporation Bareilly (U.P.).

RESULTS AND DISCUSSION

The viability of all the three varieties paddy crop are irrigation of paddy crop with tabulated in table in irrigation of paddy crop with different ground water have shown different effect on seed viability. The ground water samples were collected from different sites of Bareilly district viz. Rampur road, Pilibhit road, Budaun road and Lucknow road. All the samples were tested in the laboratory to determined physico chemical analysis.

Among seven seed sets one set was taken as control and all the seed sets were compare to control.

In Resham Basmati irrigation with ground water of Rampur road, Lucknow road and Pilibhit road has showed 10% seed viability in comparison to 90% seed viability in control. Whereas the groundwater of Budaun road reduced the seed viability upto 80% as comparison to control value 90% similarly irrigation of paddy crop with sewage water of Sarai Talfi reduced the seed viability percentage upto 80%. On the other hand irrigation of paddy crop with Ram Ganga river has given same seed viability percentage as comparison to control 90%.

In Pakistani Basmati irrigation with ground water of Rampur road has given 100% seed viabilities, in

comparison to 90% seed viability in control. Whereas the irrigation of paddy crop with Ram Ganga river water and savage water of Sarai talfi has reduced the seed viability upto 80% as comparison to control value 90%.

Graph showing seed viability of paddy crop:

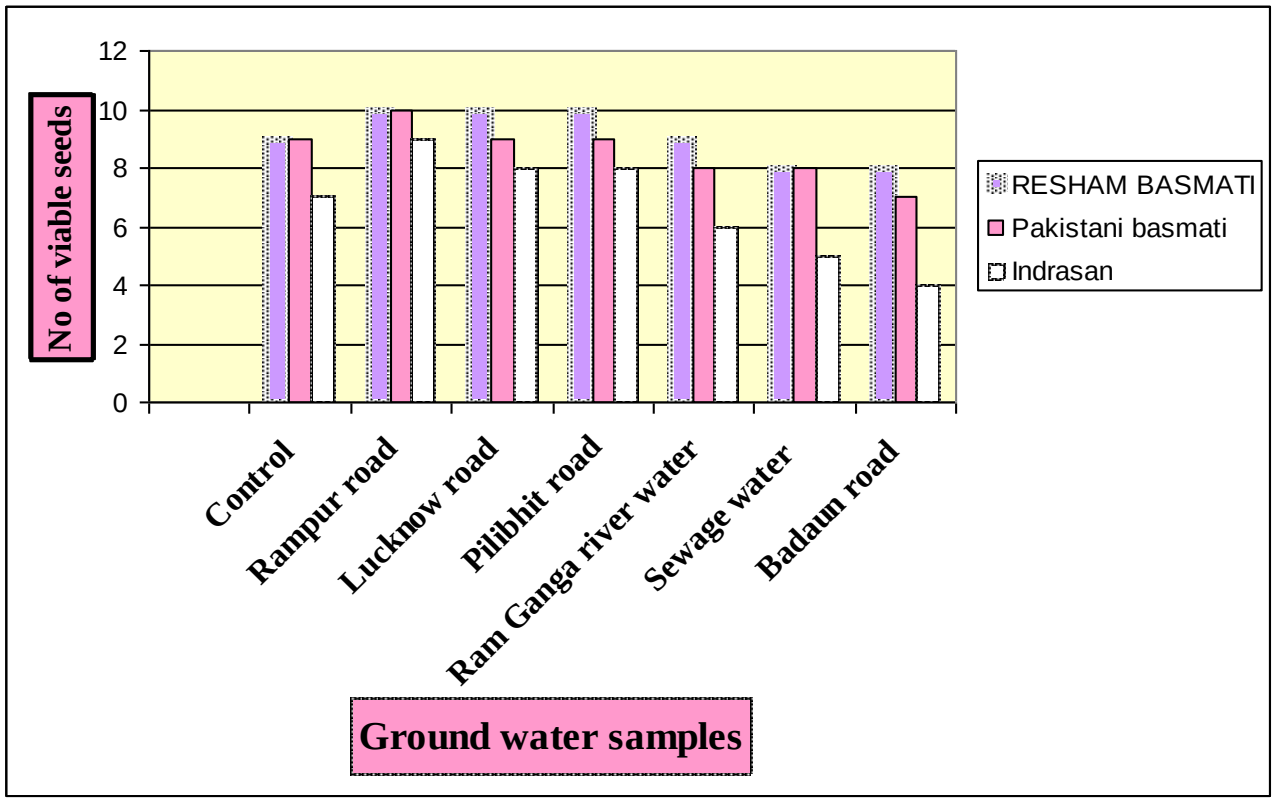

Table 1. Seed viability of paddy crop

SR No.	Ground water samples	Total no of seeds sown	No of viable seeds in Resham Basmati	No of viable seeds in Pakistani Basmati	No of viable seeds in Indrasan
1	Control	10	9±.0000*,b .e	9±.000*,a,b,c	7±1.7321*
2	Rampur road	10	10±.0000 *,b ,e	10±.000a,b,c	9±1.7321a,b.c
3	Lucknow road	10	10±.0000 c,d	9±.000*,a,b,c	8±2.000a,b.c
4	Pilibhit road	10	10±.0000c,d	9±1.000*,a,b,c	8±1.000a,b,c
5	Ram Ganga river water	10	9±.0000*,b ,e	8±1.000 d,e.f	6±.000*,d,e,f
6	Sewage water	10	8±1.00 a ,f	8±.000 e,d,f	5±1.000*,d,e,f
7	Badaun road	10	8±.0000 a ,f	7±1.7321 f	4±1.000 f

All values are in the form of mean of triplicate values.
± shows the standard deviation (S.D.) * Shows the significant value in compare to control site.
Same super scripted alphabet values are significant at (p>0.05)

The highest reduction in seed viability was occurred due to the effect of ground water of Budaun road. On the other hand ground water of Rampur road has produced 100% seed viability as comparison to control value 90%. It indicates that ground water of Rampur road is growth promoter as compared to ground water of other sites of Bareilly.

In Indrasan variety of paddy crop 10% seed viability was not found by irrigation of different ground water samples. Irrigation with ground water of Rampur road has given 90% seed viability which is quite high as comparison to control value 70%. Similarly irrigation with ground water of Lucknow road and pilibhit road has given 80% seed viability which is also quite higher than control. There was some reduction in seed viability 60% and 50% which was occured and sewage water of Sarai Talfi. The highest reduction in seed viability was occurred due to the irrigation of ground water Budaun road.

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