

## STUDY THE EFFECT OF DAIRY EFFLUENTS ON SEED GERMINATION OF HIGH NUTRIENT QUALITY PEARL MILLET *Pennisetum typhoides*(L.)

Goutam Bhakta

Research Scholar,

CMJ University, Meghalaya

### ABSTRACT

Today environmental degradation has become a global phenomenon due to industrialization and urbanisation. Most of the effluents contain varied groups of chemical compound including nutrients. This nutrient helps in fertilization of soil and would also increase productivity of the land. The present study deals with the effect of dairy effluent on seed germination of the crop high nutrient pearl millet *Pennisetum typhoides*(L) : The main objective of this study is the effect of dairy effluents on seed germination. Percentage of pearl millet in various concentrations of effluent (20%, 40%, 60%, 80%, 100% and control in laboratory in Petridis. The germination percentage of pearl millet decreased as the concentration of effluent increased.

**Key Words :-** Pearl millet, dairy effluent, germination.

### INTRODUCTION

Environmental degradation has now become a global problem and maintaining ecosystem health is a serious issue by environmentalists. Due to lack of effluent treatment facilities and proper disposal system of waste, water bodies are getting polluted day by day and causing adverse effect on soil, water, agriculture, flora and fauna due to presence of toxic and persistent chemicals. So it become essential either to find suitable ways for the safe disposals of these wastes or to suggest their novel use by their by-product. Finding a profitable use for this waste could further benefit the economics of industry. Among these industries food processing industrial effluents relapsed from the dairy industry Milk Plant, Sirsa. Haryana is rich in phosphate, calcium and magnesium etc. and has good potential in utilization of released effluents as a source of nutrients for the crop plants like *Pennisetum typhoides* (Pearl millet). Pearl millet is a high nutrient quality having high amount of protein fat, a basic staple for households in the poorest countries and among poorest people. For this, studies related of seed germination were carried out to check the viability of seeds. In my present work I hope investigated of the germination percentage of seed pearl millet seed along with radicle and plumule lengths and also the fresh weight and dry weight of germinated seedlings.

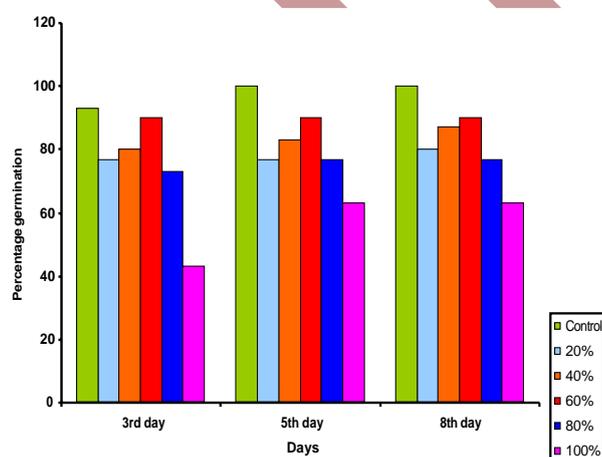
## MATERIAL AND METHODS

To carry out the study for physico chemical analysis of soil collected from Balsamand area, Hisar air dried soil samples passing through 2 mm sieve were used, ph, electrical conductivity, calcium carbonate, organic carbon, nitrogen, phosphorous, potassium are done and for physico chemical analysis of dairy effluents ph, electrical conductivity, total dissolved solids, calcium, Magnesium, sulphate, phosphate, chloride, BOD, COD are estimated. To carry out the effect of dairy effluent seed germination experiments first to check the viability of seeds. For this twenty seeds of pearl millet were soaked in water taken in a beaker for 30 minutes. After that these seeds were placed on double layered water soaked filter paper placed in petri plates. The covered petriplates were kept in BOD at  $25 \pm 1^\circ\text{C}$  for 3 days. After 3 days, first observation was done for their viability; secondly to study the effect the effect of various concentrations of effluents (20%, 40%, 60%, 80%, 100% and control) of milk plant on seed germination percentage, first all seeds of pearl millet sterilized in  $\text{HgCl}_2$  for 2 minutes. Eighteen petriplates (for six setups in multiple of three) were used. At one time ten seeds were taken on double folds of whattman no. 1 filter paper for every petriplate and were supplied with different dose of effluents in controlled condition at  $25 \pm 1^\circ\text{C}$  in seed germination for the experimental period 1–8 days Reading were taken after. 3rd day, 5th day and 8th day. On 8th day radical and plumule lengths were noted and radical / plumule ratio was derived; dry and fresh wt of germinated seedlings were estimated.

## RESULTS AND DISCUSSION

### Bar 1.

#### RESULTS OF SEED GERMINATION EXPERIMENT :-



The germination percentage of pearl millet decreased as the concentration of effluent increased (Fig.: 4.3.1). The maximum germination percentage i.e. 100 per cent was observed under control and minimum i.e. 63.3 per cent was observed under 100 per cent concentration of effluent on 8<sup>th</sup> day of germination. The percentage of seed germination increased up to 60 per cent concentration

of effluent. The percentage of seed germination at 20 per cent concentration of effluent was found to be 80 per cent and at 60 per cent concentration it was found to be 90 per cent. The similar observations were recorded by (Gautam et al., 1992; Arora et al., 2005; Ajmal et al., 1984). The viability of the seeds was recorded to be 100 percent.

**Table 1.**

Effect of different concentrations of dairy/ milk plant effluent on the plumule length and radical length(cm) of germinated seedlings of pearl millet after 8 days.

| Concentration | Length of Plumule (cm) | Length of Radicle (cm) | Plumule : Radicle Ratio |
|---------------|------------------------|------------------------|-------------------------|
| Control       | 5.2                    | 16.2                   | 0.32                    |
| 20%           | 5.3                    | 16.4                   | 0.32                    |
| 40%           | 6                      | 17.3                   | 0.35                    |
| 60%           | 6.5                    | 18.3                   | 0.35                    |
| 80%           | 3.4                    | 12.5                   | 0.27                    |
| 100%          | 1.3                    | 4.9                    | 0.26                    |

Plumule radicle ratio was recorded maximum i.e. 0.35 at 40 percent & 60 percent conc. of effluent and minimum i.e. .26 at 100 percent effluent.

**Table 2**

Effect of different concentrations of dairy/ milk plant effluent on the fresh weight and dry weight(gm) of germinated seedlings of pearl millet after 8 days.

| Concentrations | Fresh wt. of germinated seedlings (gm) | Dry wt. of germinated seedlings (gm) |
|----------------|--|--------------------------------------|
| Control        | 1.291                                  | 0.109                                |
| 20%            | 1.319                                  | 0.119                                |
| 40%            | 1.411                                  | 0.127                                |
| 60%            | 1.450                                  | 0.138                                |
| 80%            | 0.954                                  | 0.089                                |
| 100%           | 0.540                                  | 0.047                                |

The fresh wt. and dry wt. of germinated seedling of pearl millet were observed to be minimum i.e. 0.540 gm and .047 gm respectively at 100 percent concentration; and to be maximum i.e. 1.450 gm and 0.138 gm respectively at 60 percent con. of effluent.

## CONCLUSION

It is concluded that germination percentage of pearl millet decreased as the concentration of effluent increased i.e. **i)** 100 percent germination was observed under control and minimum under 100 percent concentration of effluent. **ii)** Plumule radicle ratio was recorded maximum at 40 percent and 60 percent and minimum at 100 percent concentration of effluents. **iii)** Fresh wt. and dry wt. of germinated seeding of pearl millet also increased as the conc. of effluent increased upto 60 percent and decreased upto 100 percent conc. of effluent.

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