SUMMARY
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Effects of simulated acid rain of pH 4.5, 5.5, 2.5 were studied on three cucurbitaceous crops, *Luffa cylindrica* L., *Engenia sicarua* L., and *Citrullus lanatus* L. Various parameters studied in this regard are seed germination, seed vigour, mean germination frequency, seedling survival percentage, seed germination action index and various attributes related to growth and yield. Stomatal studies were also made. Biochemical parameters analysed include chlorophyll content and leaf extract pH. The data were obtained, mathematical averaged and associated with ANOVA and CD (at 1 & 5%) statistically analysed.

From observations on seed germination, germination percentage, seed vigour and mean germination frequency were derived. Survival percentage, relative seed vigour, relative mean germination frequency and relative seedling survival percentage were derived from the observed data. These values indicate an inhibitory effect of acid rain of pH 3.5 and 2.5, but the effects of acid rain of pH 4.5 were stimulatory.

Simulated acid rain caused considerable reduction in different growth attributes like shoot, root and total plant length, fresh and dry-weights of root and shoot and whole plant, number of leaves in comparison to control. Derived values such as shoot weight ratio (SWR), root weight ratio (RWR), shoot root ratio (SRR), net primary productivity (NPP), growth index (GI), relative water content (RWC), response coefficient (RC) have also recorded a decrease in comparison to control. The reductions were directly proportional to the age of the crop. The acid rain of higher acidity (pH 2.5) was more injurious to the crop than that of pH 3.5 and 4.5.
Reduction in root weight were more pronounced in shoot weight. The reduction percentage increased with the age of the plant. There was also reduction in total dry matter accumulation (phytomass) as a result of exposure to simulated acid rain. Decrease in phytomass led to decrease in net primary productivity.

Simulated acid rain has also effected stomatal complex with regard to number of stomata and number of epidermal cell per unit area. The number of stomata recorded a gradual decrease with the increasing acidity. But the epidermal cells recorded a gradual increase as the pH increased.

A reduction was also recorded in chlorophyll \( a \), chlorophyll \( b \) and total chlorophyll content of leaves of plants exposed to simulated acid rain. Higher the acidity lower are the chlorophyll content. However, chlorophyll \( a \) recorded greater reduction than chlorophyll \( b \). The reduction in chlorophyll content brought down the rate of photosynthesis and hence productivity.

The leaf extract pH of the plants exposed to stimulated acid rain also recorded a decrease in comparison to control. Decrease in pH values adversely affect the activity of enzymes taking part in the metabolic processes of the plants.

An early flowering was recorded in the plants exposed to simulated acid rain than the control. The number of flowers and number of fruits recorded a decrease in all treatment of simulated acid rain. The length of fruits was also affected by simulated acid rain. Thus there was a reduction in yield due to simulated acid rain. This may be due to the fact that under stress conditions plants are in hurry to complete there life cycle.
The reduction in vegetative growth had an impact on reproductive phase. Hence the yield attributes at final harvest like number of fruit plant⁻¹, number of seed fruit⁻¹ and weight of seeds recorded a reduction. The impact of simulated acid rain of different pH on the cucurbitaceous crops was pH and age dependent.

The relative sensitivity of the three crops to simulated acid rain was in the order: *Citrullus lanatus > Lagenaria siceraria > Luffa cylindrica*. 