

## **PRELIMINARY INVESTIGATION OF ROOT GROWTH OF RICE (*Oryza sativa*) UNDER DIFFERENT IRRIGATION AND SOIL CONDITIONS IN FIELD AND LABORATORY**

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Most of the studies were concentrated on the plant shoot systems, due to its conspicuous appearances, in the past. However, roots play an important role in plant functions and this study was carried out with the root system of rice.

Plants of rice cv. BG 300 were grown at two densities in poly-pots (1 and 2 plants per poly-pot) and in the field (1 and 2 plants per hill). Two soil types (Sandy and Garden soil) and two irrigation practices (surface and artificial sub-irrigation) were used in this study.

The total root length, root diameter, total root number, root volume, dry weight of roots, root-shoot ratio and the number of tillers were estimated after 15, 30, 45, 60 and 100 days, in poly-pots and in the field.

The results revealed that the roots of rice cv. BG 300 remained highly active upto 45 to 60 days after emergence and drastically decreased afterwards with its maturity and ripening in all treatments, but the root-shoot ratio decreased throughout the period both in the field and laboratory conditions.

Except the diameter of root, other parameters showed higher values in garden soil than in sandy soil: 61.58% increase in total root number, 30.17% increase in root volume, 32.04% increase in total root length

(root penetration), 19.58% increase in dry weight of roots and 18.02% increase in number of tillers in the final estimates taken after 100 days.

Except the total root length, other parameters showed increase in surface irrigation compared to the artificial sub-irrigation. Longer roots with larger diameter were observed in the sandy soil under artificial sub-irrigation practice. In both soil and irrigation practices, the overall results showed lower values of root parameters in double plants (average values) than in single plant, under field and laboratory conditions. This may be attributed to the interference in root activities among plants.

The effect of the soil types and quantity of soil on root penetration was also observed. In both soil types, depth of root penetration was more in artificial sub-irrigation than in the surface irrigation in pots after 15 days of emergence. After 30 days, roots reached up to the bottom of the pot, with more amounts of secondary and tertiary roots with the root hairs under both irrigation practices in both soil types.