

Effect of fortification seed treatments on morphological characters of soybean (*Glycine max. L.*)

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(Accepted : March, 2008)

SUMMARY

Productivity is a result of interaction between genetic make up and environmental conditions. The genetic make up is expressed through the physiological processes operating with the plant. Efficiency of physiological processes depends on morphological characters of plant. Thus, productivity can be manipulated to some extent through manipulation of morphological characters. The important morphological characters, associated with productivity are plant height, leaf area and dry matter per plant. Effect of different growth regulators (IAA, NAA, and GA₃) and hydration treatment 6 hrs, 16 hrs and dry dressing with thiram was studied on plant height, leaf area and dry matter production of the seed of soybean. The results revealed that treatment with IAA+ NAA (10 ppm, 6hrs hydration) increased plant height, leaf area and dry matter over control.

Key words : Seed fortification, Height, Leaf area, Dry weight, Soybean.

For centuries, soybean remained ignored in India as a vital source of food. Many advanced countries like USA, Japan and China undertook cultivation of soybean on a large scale. The developed countries considered soybean as a divine source of food. Modern food technology has made soybean palatable.

Thus, soybean milk, cheese, ice cream and soya sauce made from soybean are getting popularity. It makes a protein rich diet. Soybean can be extensively used as cattle feed. It is a valuable supplement to corn for silage because of its high protein content.

Soybean (*Glycine max. L.*) is an important pulse as well as an oil seed crop as it contains high quality protein (43.20%) and about 20% cholesterol free oil. Soybean contains 21% carbohydrates, 0.69% phosphorus, 0.0115% iron, 0.024% calcium, vitamin A, B, C, D, E, K and all other essential amino acids. In India, it ranks third in production, groundnut and mustard being first and second, respectively. Due to its low water requirement and greater response to applied nitrogen, it is gaining increasing popularity among farmers. It is grown on 11.64 lakh hectares with a production of 16.20 lakh tones in Maharashtra.

The effects of seed invigoration treatment on height showed a rapid increase in growth which continued up to 60 DAS. Plants though grown after 60 DAS, showed slow growth. High vigored Lot (L₁) showed improved plant height over low vigored lot (L₂), (Chipa and Lal, 1988).

MATERIALS AND METHODS

The research work was conducted during the kharif season of 2001 at the Department of Agricultural Botany,

Dr. PDKV, Akola. Seeds of soybean cultivar JS-335 were obtained from the Seed Technology Research Unit, Dr. PDKV, Akola. The experiment was laid out in FRBD in three replications with a plot size of 2.25 x 2.00 m, sown on 12/07/2001. The lot and treatment details are as follows.

Factor A lots:

- Lot 1 (L₁) - High seed vigour with 72% germination
- Lot 2 (L₂) - Low seed vigour with 57% germination

Factor B. Treatments:

- T₀ - Untreated
- T₁ - IAA+NAA (10 ppm 6hrs hydration)
- T₂ - IAA+NAA+Thiram *i.e.* T₁+Thiram.
- T₃ - Hydration for 16 hr +Thiram dry dressing after hydration
- T₄ - Hydration for 6 hr+ Thiram dry dressing after hydration
- T₅ - GA₃ 50 ppm *i.e.* hydration in GA₃ 50 ppm for 6 hrs.
- T₆ - GA₃ 50 ppm + Thiram *i.e.* T₅+Thiram

The seeds of soybean variety JS-335 were treated with growth regulators namely IAA, NAA and GA₃. The seeds were immersed in a weighed quantity of growth regulators, which were firstly dissolved in a small quantity of alcohol then the volume was made up with distilled water in order to get desired concentrations. Seeds were then dried in a drying machine and were immediately dry dressed with thiram. Plant height was measured from the ground level up to the tip of the main axis in centimeters at an interval of 15 days *i.e.* (15, 30, 45, 60 DAS). Height is

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