

Effect of seed pelleting on growth, yield and morphological parameters in soybean (*Glycine max* L.)

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The present study was undertaken to assess the effect of seed pelleting on growth, yield and morphological parameters in soybean during kharif 2000-01. Various materials like adhesive, filler and chemicals were used for seed pelleting. Mean plant height was significantly improved by seed pelleted with thiram + CMC + filler. Seed pelleted with DAP + CMC + filler, thiram + CMC + filler and CMC alone recorded 0.0965, 0.0332 and 0.03 g / dm²/ day of net assimilation rate (NAR) at 45-60, 75-90 DAS and at harvest stage respectively. There was a steady declines in leaf area ratio in all treatments up to harvest. All pelleting treatments recorded significantly higher leaf area ratio than control. Seeds pelleted with thiram + CMC + filler recorded seed yield of 28.76 q ha⁻¹ followed by borax + CMC + filler (27.58 q ha⁻¹ seed yield). However, seeds pelleted with thiram + CMC + filler was found beneficial in recording highest pod per plant, number of seeds per pod, test weight (100 seed weight), harvest index, oil content and seed yield per plant. All pelleting treatment noted rapid increase in CGR (crop growth rate), RGR (relative growth rate) and LAI (leaf area index).

Key words : Net assimilation rate, Crop growth rate, Relative growth rate, Leaf area ratio, Test weight and Harvest index.

INTRODUCTION

SOYBEAN (*Glycine max* L. Merrill) belongs to family leguminaceae, sub family fabaceae and genus *Glycine* L. often referred as a wonder crop or 'Golden bean', has a tremendous nutritive value (41 % protein, 20.9% carbohydrates, 19.20%, oil and rich sources of vitamin A,C, D,E, K and Calcium). Soybean is cultivated in Maharashtra in Amravati, Buldhana, Chandrapur, Gadchiroli, Nagpur, Nanded, Parbhani and Wardha district. Now a day the area under soybean crops is increased. The pelleting provides early growth advantage of seed i.e. invigoration of seed, protection for disease and pest, synergetic effects of fungicides, nutrients and hormones and protection against stresses. The seed coated with certain substances (referred as pelleting) enhance yield, improved quality and emergence, Coating of seed with adhesive in combination with active ingredient, has been reported to be effective. (Moude and snett, 1998). Looking to the benefits of pelleting, present study was undertaken to asses seed pelleting on growth and morphological parameters in soybean.

MATERIALS AND METHOD

The present investigation was undertaken to evaluate the effect of seed pelleting on growth, yield and morphological parameters in soybean during kharif 2000-2001. Various materials like adhesive, filler and chemicals were used for seed pelleting. The experiment was laid in Randomized Block Design, replicated four times with 16 treatments. The treatments were: control (No Pelleting) (T₁), Carboxy methyl cellulose (CMC) 2% (T₂), maida 10% (T₃), gum acacia 5% (T₄), DAP (3 g/kg of seed) + CMC 2% + filler (T₅), DAP+ maida + filler (T₆), DAP+ gum acacia + filler (T₇), ZnSO₄ (0.3 g/kg of seed) + CMC + filler (T₈), ZnSO₄ + maida + filler (T₉), ZnSO₄ + gum acacia + filler (T₁₀), borax (0.1 g/kg of seed) + CMC + filler (T₁₁), borax + maida + filler (T₁₂), borax + gum acacia + filler (T₁₃), thiram(3 g/kg of seed) + CMC + filler (T₁₄), thiram + maida+filler (T₁₅), thiram + gum acacia + filler (T₁₆).

These substances were thoroughly mixed and the slurry prepared. And the pelleting of seed was carried out. The pelleted seeds were air-dried treatment wise separately and used for field and laboratory study.

RESULTS AND DISCUSSION

Effect of seed pelleting on morphological parameters

Plant height is an important morphological parameter exhibiting direct relationship with grain yield. Plant height recorded at various growth stages as influenced by seed pelleting are presented in Table 1, showed that there was rapid increase in growth which continued up to 90 DAS, thereafter slowed down. At 45 DAS, significantly maximum height was recorded in borax + CMC + filler (29.30 cm) followed by thiram + CMC + filler (29.07) as compared to control. At pod filling stage (90 DAS), seeds pelleted with thiram + maida+filler recorded maximum height (35.37 cm). At harvest all the treatments maintained significantly more height than control.

Maximum number of leaves per plant were recorded in thiram + gum acacia + filler (44.10) and borax + CMC + filler (44.05) at 45 DAS.

However at 90 DAS, there is a marked increase in number of leaves per plant which was borax + gum acacia + filler (45.72) and borax + CMC + filler (44.65).

At harvest the number of leaves per plant were found to be reduced due to the senescence and shading. As the shoot elongates it bears number of branches. The data presented in respect of number of branches per plant as influenced by seed pelleting showed the maximum number of branches per plant which was thiram + gum acacia + filler (3.92), ZnSO₄ + maida + filler (8.00) and ZnSO₄ + maida + filler (8.27) respectively at 45, 90 DAS and at harvest stage, showing the positive effects of pelleting towards branching formation. Rest of the treatments were also produces more branches than the control.

The leaf area was increased at 45 DAS and then decreased rapidly with advance in age of the crop due to senescence and shadings. At 90 DAS all pelleting treatment showed significantly more leaf area over control. The similar results as regard to the plant height, number of leaves per plant, leaf area were reported by Deb and zeliong (1976), Boronskikh (1977), Mishra and Yadav (1989), Nagalur et al. (2002).

Effect of seed pelleting on growth parameters

Crop growth rate (CGR) denotes the amount of dry weight gained on the basis of unit area of crop in unit time. The data presented as regard to crop growth rate (g/day) of soybean was initially

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