Influence of herbal pelleting on physiological and yield attributes in redgram \([\textit{Cajanus cajan} \text{(L.\,) Millsp.}]\)

K. SUJATHA, K. RAMAMOORTHY AND K. SIVASUBRAMANIAM

**ABSTRACT**

An experiment was conducted to gain information on the field performance of pelleted seeds using botanical viz., vitex and calotropis leaf powder with acacia and maida gum as adhesive in redgram cv. APK 1. Seed pelleting with \textit{Calotropis} (100 g/kg of seeds) using maida gum (15 \%) followed by drying recorded higher physiological and yield parameters.

**KEY WORDS** : Botanicals, Pelleting, Dry weight, Adhesive, Relative growth rate, Leaf area index, Redgram

The successful establishment of the crop mainly depends on achievement of desired population through high probability of successful establishment of each seed planted. Seed pelleting is the process of enclosing a seed with a small quantity of inert materials a bioactive substance just large enough to produce a globular unit of standard size to facilitate precision planting. The pelleted material creates natural water holding potential through absorption and provides nutrients to young seedlings. It also reduces the problem of thinning, gap filling and seed dressing chemicals are required in low quality. Redgram is raised mostly under rainfed condition. Poor fertility status and inadequacy of soil moisture can adversely impact productivity. To overcome these environmental and management crisis, which delay or prevent germination and establishment of seedlings, pelleting provides opportunity to package effective quantities of required materials so that they can positive influence the seed or soil at seed- soil interface. Against this background, the present study was, therefore, aimed to identify the efficacy of using herbal powders for pelleting on growth and yield parameters in redgram.

**RESEARCH PROCEDURE**

Air dried (3 days) leaves of calotropis (\textit{Calotropis gigantea} \text{L.}) and vitex (\textit{Vitex negundo}) herbs were powdered and sieved through 60mm sieve and used for seed pelleting. Fresh acacia gum (10, 20 and 30 \%) and maida (5, 10 and 15 \%) were used as binding agents.

Graded seeds (12/64 round perforated sieves) of redgram cv. VBN 1 obtained from National Pulses Research Center, Vamban, Pudukottai, Tamil Nadu were pelleted. For every 100 g of seeds, 10 g of dry herbal powder in each of Calotropis and Vitex separately was used for coating with acacia and maida gum using different concentrations and the pelleted seeds were shade dried.

The field experiment was carried out at Agricultural College and Research Institute, Madurai (90°5’ North and 78°5’ East and altitude of 147 MSL). A spacing of 30 x 10 cm was adopted with other recommended crop management practices in a randomized block design replicated thrice. The experiment was conducted during \textit{Kharif} and \textit{Rabi} season, 2008 with a plot size of 2x2 m². Observations on dry weight (g) (drying at 80°C for 16 h), leaf area index, leaf area duration (Power \textit{et al.},1976), relative growth rate (Williams, 1946), pod weight plot \(^{-1}\)(g), grain yield per plot \(^{-1}\) (g) and grain yield (kg ha\(^{-1}\)) were recorded on 60 days after sowing. Individual observations, ten plants per plot taken at random were pooled. Mean data were analyzed statically after Snedecor and Cochran (1961).
Among the herbal powders and gums, seed pelleting using Calotropis with 15 per cent maida gum proved better followed by Vitex. Maximum dry weight (110.3 and 103.8 g), leaf area index (3.01 and 2.91), leaf area duration (64.0 and 61.4), RGR( 62.5 and 62.0), grain yield plot \(^1\) (387 and 382 g) and grain yield kg. ha\(^{-1}\) (972 and 957 kg) could be observed for Calotropis with 15 per cent maida gum and Vitex with 30 per cent acacia gum, respectively (Tables 1, 2 and 3). Other concentrations of acacia gum with same herbals had beneficial effect, but the effect was less pronounced than that of maida gum (15 %) but was always better than untreated control (86.5 g for dry weight, 2.71 for leaf area index, 56.2 for LAD, 59.9 mg for RGR, 354 g for grain yield plot \(^1\) and 886 kg ha\(^{-1}\) for grain yield (Tables 1, 2 and 3). Among the seasons, Kharif season recorded higher growth and yield parameters.

The increase in dry weight and yield enhancement might be due to early emergence leading to advancement in autotrophic stage (Lu et al., 1993), who suggested synergistic interaction of bio-inoculants with amino acids especially tryptophan to form IAA in the germinating seeds responsible for enhancement in seedling growth and subsequent dry matter accumulation. Presence of plant growth like substances in pungam leaf powder have been reported in ragi (Punithavathi, 1997). The beneficial effects of pelleting with bio-active substances especially botanicals emanating from Calotropis or Vitex resulted in improved photosynthetic efficiency was evidenced through yield attributing characters. In addition to adhesive property of maida and acacia gum, the starchy substrate present in them would have provided nutrient for
### Table 1: Influence of herbal pelleting on physiological & yield attributes in redgram

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Kharif</th>
<th>Rabi</th>
<th>Vleck</th>
<th>Kharif</th>
<th>Rabi</th>
<th>Vleck</th>
<th>Kharif</th>
<th>Rabi</th>
<th>Vleck</th>
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<tr>
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**Note:** C = Carrot, C = Cicerus, V = Vleck

*Significance levels: **P < 0.01*, *P < 0.05*
better physiological efficiency, particularly germination and growth, similar to DAP pelleting as reported by Begam and Krishnasamy (2003) in blackgram and Srimathi et al. (2007) in greengram.

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LITERATURE CITED


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