

## Performance of pelleted seeds of sesame cv. TMV 4 on seed quality under sodic soil condition

A. BHARATHI, P. NATESAN, M. BHASKARAN, K. RAJA AND K. VANANGAMUDI

Dept. of Seed Science and Technology, Tamil Nadu Agricultural University, Coimbatore - 641 003.

**Abstract:** The effect of seed pelleting on growth and seed yield of sesame cv. TMV 4 was studied under sodic soil condition. The sequence of pelleting viz. seed + adhesive + Nutrients (Macro and Micro) + Arappu leaf powder + Gypsum (1:1) or gypsum alone @ 300 kg<sup>-1</sup> of seeds) + Adhesive + (120 g of *Azospirillum* kg<sup>-1</sup> of seeds + *Trichoderma viride* @ 4 g kg<sup>-1</sup> of seeds) was found to be better as it recorded higher seed germination and vigour.

**Key words:** Seed pelleting, Botanicals, Seed quality, Field establishment, Sesame

### Introduction

Seed pelleting apart from improving ballistic properties of seed and helps in protection and carrying of nodule bacteria, act as a carrier for nutrients and protective materials (Sabir Ahamed, 1999). In an effort to provide a self sustaining seed unit for germination and growth, seed pelleting enables application of needed inputs such as organic, inorganic nutrients, biofertilizers and fungicides on seeds itself. Seed pelleting offers scope for incorporating organic or chemical substances into seed for improving germination, vigour and controlling microenvironments in which the seed germinates (Scott, 1989). Seed coating materials were reported to improve the germination ability and to increase seedling emergence at changing soil moisture, especially in the sub optimal range (Mucke, 1987). Seed coating has been reported to increase the yield of soybean (Jeyabal *et al.* 1992). Seed pelleting was found to increase the germination and better stand establishment and seed yield in greengram (Kavitha, 2002). Seed pelleting will be relevant in direct sown irrigated crops which improves initial vigour for sustained crop growth and development to overcome adverse situations. Although several seed treatments are recommended for sesame as presowing seed treatment and no single solution for sesame is available by combining various treatments

in sequence. Therefore the present study was taken up to find out the sequence of seed pelleting with botanicals, gypsum, micronutrient mixture, *Azospirillum* and *Trichoderma viridii* to improve its performance under sodic soil condition.

### Material and Methods

#### Standardization of the Seed pelleting sequence

Two different sequence of pelleting viz. (i) seed + adhesive maida 10% + 3g of DAP kg<sup>-1</sup> of seed to supply 0.5% N and 1.5% P<sub>2</sub>O<sub>5</sub> + 19.7 g of micronutrient mixture to supply 0.1% of Zn, Mn, Fe and 0.5% of Cu, B and Mo + Arappu leaf powder and gypsum (1:1) @ 300g kg<sup>-1</sup> + adhesive + (120 g of *Azospirillum* kg<sup>-1</sup> + *Trichoderma viride* @ 4 g kg<sup>-1</sup> of seed, (ii) seed + adhesive maida 10% + 3 g of DAP kg<sup>-1</sup> of seed to supply 0.5% N and 1.5% P<sub>2</sub>O<sub>5</sub> + 19.7 g of micronutrient mixture to supply 0.1% of Zn, Mn, Fe and 0.5% of Cu, B and Mo + Gypsum @ 300 g kg<sup>-1</sup> + adhesive + 120 g of *Azospirillum* kg<sup>-1</sup> + *Trichoderma viride* @ 4 g kg<sup>-1</sup> of seed were followed. Biofertilizers were added to both the treatments at the end as per general recommendation. The pelleted seeds were tested for germination following roll towel method (ISTA, 1999) along with unpelleted control seeds. Vigour index was computed as per the

**Table 1.** Study on seed pelleting sequence for sesame cv. TMV 4 under sodic soil condition

Treatments	Germination (%)	Root length (cm)	Shoot length (cm)	DMP (g/5 seedlings)	Vigour index	Field emergence (%)
T <sub>1</sub> - Control (Un pelleted seeds)	79 (62.8)	3.10	3.40	0.92	72.74	76.0
T <sub>2</sub> - Seed pelleted using Arappu leaf powder + Gypsum @ 300 g/kg of seeds following pelleting sequence	88 (69.8)	4.30	4.20	1.17	102.97	85.00
T <sub>3</sub> - Seed pelleted using gypsum @ 300 g/kg of seeds following pelleting sequence	86 (68.1)	4.20	4.00	1.15	98.56	86.0
SEd	2.46	0.13	0.08	0.018	2.355	0.9
CD (P=0.05)	4.93	0.28	0.16	0.038	5.019	2.0

(Figures in parentheses indicate arcsine values)

procedure described by Abdul-Baki and Anderson (1973). The experiment was designed in completely randomized design with seven replications.

### Result and Discussion

Among different sequence of seed pelleting used, seeds pelleted with arappu leaf powder + gypsum @ 300 g kg<sup>-1</sup> of seeds following pelleting sequence registered the highest germination, (88)% root (4.30 cm), shoot length (4.20 cm), dry matter production (1.17 g/5 seedlings) and vigour index (102.97) (Table 1). The present investigation revealed that seed pelleting of sesame seeds with either gypsum or arappu alone or in combination (arappu + gypsum) could be beneficial in improving germination, enhancement of seedling growth,

production of more number of capsules per plant and yield under irrigated sodic soil conditions. This might be due to the synergistic effect of saponins, GA<sub>3</sub> in traces and micronutrients especially zinc as the components of arappu leaf powder. These biocontents might synergistically interact with amino acids especially tryptophan to form the indole acetic acid in the germinating seeds to bring about enhancement in seedling growth (Lu *et al.* 1987). Similar results have been reported in ragi (Palanisamy and Punithavathi, 1998) and in blackgram (Sabir Ahamed, 1999). The increased seedling growth and dry weight observed in this treatment might be due to greater early vigour and higher percentage of germination of the seeds that facilitate the seedling to become auto tropic well in advance (Jayaraj, 1977; Kavitha, 2002).

## References

- Abdul-Baki, A.A. and Anderson, J.P. (1973). Vigour deterioration of soybean seeds by multiple criteria. *Crop Sci.*, **13**: 630-633.
- ISTA, (1999). International Rules for Seed Testing. *Seed Sci. & Technol., Supplement Rules*, **27**: 25-30.
- Jayaraj, T. (1977). Study of the effect of plant protection chemicals on seed quality in sesame (*Sesamum indicum* L.) KRR 2 and TMV 3. M. Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore-3.
- Jeyabal, A., Kuppasamy, G. and Lakshmanan, A.R. (1992). Effect of seed coating on yield attributes and yield of soybean (*Glycine max* L.). *J. Agron and Crop Sci.*, **169**: 145-150.
- Kavitha, S. (2002). Seed hardening and pelleting for maximising the productivity of blackgram (*Vigna mungo* (L.) Hepper) cv. Vamban 3 under rainfed conditions. M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.
- Lu, S.L., Min, S.D. and Jian, X.X. (1987). Effect of seed pelleting on rhizobial survival on inoculated seed. Food legume improvement for Asian farming system Proceedings No. 18, Canberra Australia (Edited by Walli, E.S.I., D.E.Buth). pp. 28.
- Mucke, J. D. (1987). The regulation of water transport in pelleted sugar beet seed. *J. Agron. and Crop Sci.*, **161**: 79-83.
- Planisamy, V. and Punithavathi. (1998). Effect of seed hardening and pelleting on seed quality in ragi. *Madras Agric. J.*, **95**: 583-585.
- Sabir Ahamed, A. (1999). Effect of seed pelleting on field performance of black gram. *Legume Res.*, **22**: 109-112.
- Scott, J.M. (1989). Seed coating and treatments and their effects on plant establishment. *Adv. Agron.*, **12**: 43-83.

(Received : April 2003; Revised : June 2004)