



Short Note

Influence of Nutrient Pelleting on Seed Quality of Sesame (*Sesamum indicum* L.)

N. Suma, P. Srimathi and S. Sumathi*

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

Studies on seed pelleting with different micronutrients such as ZnSO₄, FeSO₄, CuSO₄, MnSO₄ and Borax @ 300 mgkg⁻¹ of seeds using Azospirillum as filler material and 10% maida as adhesive revealed that among the micronutrients, the performance of MnSO₄ (300 mgkg⁻¹ of seeds) was the best which recorded 9 per cent higher germination than control. The hike in germination was also supported by the enhancement in the evaluated vigour parameters viz., seedling length, drymatter production and vigour index. Storability of seeds evaluated after 4 months of storage also confirmed the better performance of MnSO₄ pelleted seed which recorded 9 per cent higher germination over control.

Sesame is one of the oldest oilseed crop of India known for many centuries. Since it is majorly grown as a rainfed crop it requires additional nutrients for better filling. Seed pelleting is one of the presowing seed management technique where the needy bioactive chemicals can be added along with a filler for better beneficial effect on yield. The influence of micronutrients in addition to biopelleting with *Azospirillum* biofertilizer, using 10% wheat flour gruel on seed and seedling quality characters including storability was evaluated in a study conducted with sesame cv CO1.

Materials and Methods

Genetically pure seeds of sesame (*Sesamum indicum*) cv. CO1 obtained from Department of Oilseeds, TNAU, Coimbatore, formed the base material for the study. The field experiments and laboratory experiments were conducted at

Department of Seed Science and Technology, Tamil Nadu Agricultural University, Coimbatore (11°N latitude and 77°E longitude with an altitude of 427 m MSL) during 2004-2005. Bulk seeds were pelleted with different micronutrients viz., ZnSO₄, FeSO₄, CuSO₄, MnSO₄ and Borax @ 300 mgkg⁻¹ of seeds using *Azospirillum* biofertilizer as filler material and maida 10 per cent as an adhesive. The treated seeds were shade dried and evaluated for the seed and seedling quality characters viz., germination (%) (ISTA, 1999), root length (cm), shoot length (cm), drymatter production (mg 10 seedlings⁻¹) (Gupta, 1993), vigour index (Abdul-Baki and Anderson (1973) and electrical conductivity (dSm⁻¹) (Presley, 1958) along with untreated control. The pelleted seeds were stored in cloth bag upto a period of 4 months and evaluated for the germination percentage as per ISTA (1999). The data gathered were statistically analyzed as enumerated Panse and Sukhatme (1985).

Table 1. Influence of nutrient pelleting on seed and seedling quality characteristics of sesame COI

Micro nutrients @ 300mg kg ⁻¹ seed	Germination (%)	Root length (cm)	Shoot length (cm)	Drymatter production 10 seedling ⁻¹ (mg)	Vigour index	Electrical conductivity (dSm ⁻¹)	Germination after 4 months (%)
ZnSO ₄	79 (62.73)	10.5	6.5	40.5	1343	0.14	73 (58.69)
FeSO ₄	85 (67.21)	10.5	7.5	42.5	1530	0.15	82 (64.90)
CuSO ₄	80 (63.67)	11.8	7.3	41.5	1451	0.17	73 (59.34)
MnSO ₄	89 (70.63)	11.9	7.6	44.5	1735	0.19	84 (66.42)
Borax	80 (63.43)	11.8	6.9	41.2	1496	0.16	75 (60.00)
Control	80 (63.43)	8.2	6.1	38.5	1144	0.07	75 (60.00)
CD (P=0.05)	1.557	0.243	0.226	0.243	1.568	0.002	1.693
SED	0.778	0.012	0.113	0.121	0.784	0.001	0.846

(Figures in parentheses are arc sine transformed values)

*Corresponding author

Results and Discussion

Pelleting can indirectly improve seed germination and stand establishment, while, nutrient pelleting enriches the rhizosphere region with macro and micro nutrient that trigger seedling vegetative growth in addition to the improvement in zone specific microbial activity (Scott, 1989). The studies on seed pelleting with different micro nutrients and biofertilizer revealed that among the micronutrients, the performance of MnSO_4 (300 mgkg^{-1} of seeds) was the highest which recorded 9 per cent higher germination than control. The hike in germination was also supported by the hike in the evaluated vigour parameters *viz.*, seedling length, drymatter production and vigour index which might be due to the activation of peroxidase enzyme involved in seed viability (Das, 1996). Evaluation of the electrical conductivity of the treated seed revealed that the conductivity was higher in treated seeds than control (Table 1). Storability of seeds evaluated after 4 months of storage also confirmed the better performance of MnSO_4 pelleted seed which recorded 9 per cent higher germination than control. Among the nutrients evaluated for pelleting the performance of FeSO_4 was found to be the next best following MnSO_4 . Anonymous (1999) also reported

that application of DAP, Boron and ZnSO_4 improved the production potentiality of pelleted seeds. Thus the study expressed that nutrient pelleting with MnSO_4 increased the seed and seedling quality characters and the treated seed also could be stored well upto 4 months.

References

- Abdul-Baki, A.A. and Anderson, J.D. 1973. Vigour determination in soybean seed by multiple criteria. *Crop Sci.*, **13**: 630-633.
- Anonymous, 1999. Crop production guide. Govt. of Tamil Nadu. Pp.123.
- Das, D.K. 1996. Introductory Soil Science. Kalyani Publishers, New Delhi - 110 002, pp. 333.
- Gupta, P.C. 1993. Seed vigour testing. Handbook of seed testing. Quality control and research Dev., New Delhi. pp.243.
- ISTA. 1999, International Rules for Seed testing. Seed Sci. & Technol., (Supplement Rules) **27**: 25-30.
- Panse, V.G. and Sukhatme, P.V. 1985. Statistical methods for agricultural workers. ICAR publication. New Delhi.
- Presley, J.T. 1958. Relation of protoplast permeability to cotton seed viability and pre disposition to seedling disease. *Pl. Dis. Repr.*, **42**: 852.
- Scott, J.M. 1989. Seed coating treatments and thesis effects on plant establishment. *Adv. Agron.*, **32**: 43-83.