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Osmopriming of seeds to improve the performance of bitter gourd cv. CO-1

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SUMMARY

To standardize a suitable osmopriming treatment for bitter gourd cv. CO-1 seeds, the seeds were primed with Poly Ethylene Glycol (PEG) 6000 at – 1.1 MPa and –1.5 MPa for 2, 4, 6, 8 and 10 days and sown as wet and dry sowing in the laboratory condition. From the results, the superiority of PEG 6000 at –1.5 MPa for 6 days was very much obvious, which recorded the maximum germination, speed of germination, root length, shoot length, vigour index, root biomass, rooting potential and number of days for completion of germination. The above treatment recorded 25.3 per cent higher germination than the control. The comparison between the wet and dry methods of sowing indicated that the seeds sown as wet excelled the dry sown seeds in all the quality parameters.

Key words : Bitter gourd, Seeds, PEG, Osmopriming.

Priming technique involves a controlled seed imbibition. During the priming process, beneficial compounds that break the seed dormancy or improve the seed performance can also be incorporated. Seed germination is faster and uniform as certain metabolic processes occur during priming. Priming also accelerates the rate of germination, especially in cool conditioning, when seedlings may fail to emerge due to formation of a soil crust. The advantages of priming has not been harnessed for bitter gourd which is one of the most popular cucurbitaceous vegetables commonly cultivated in India. Hence, the present study has been formulated to generate information on the priming techniques in bitter gourd seeds.

MATERIALS AND METHODS

Fresh seeds of bitter gourd cv. CO 1 were obtained from Department of Vegetable Crops, Tamil Nadu Agricultural University, Coimbatore. The cleaned and graded seeds of bitter gourd cv. CO 1 were primed in polyethylene glycol 6000 (PEG 6000) solution at different concentrations *i.e.* -1.1 and -1.5 MPa for various durations of 2, 4, 6, 8 and 10 days.

After priming the seeds were washed and sown before and after shade drying. The water soaked seeds and the dry seeds served as control. The following observations were recorded in the laboratory.

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Germination:

The total number of 4 x 100 seeds selected at random from each pelleting treatment were placed in sterilized sand medium and allowed to germinate in the germination room maintained at 25 ± 1°C temperature and 96 ± 2 per cent RH. After the test period of 14 days, the seedlings were evaluated and the total number of normal seedlings were recorded. The mean number of normal seedlings produced was expressed as germination percentage (ISTA, 1999).

Speed of germination:

A total of 4 x 100 seeds from each treatment were placed in sterilized sand medium and allowed to germinate. The number of seeds germinated was recorded daily upto the day of final count. From the number of seeds germinated on each counting day, the rate of germination was calculated by adopting the formula and expressed in number (Maguire, 1962).

$$\text{Speed of germination} = \frac{X_1}{Y_1} + \frac{(X_2 - X_1)}{Y_2} + \ldots\ldots\ldots\ldots \frac{Xn - (Xn - 1)}{Yn}$$

where,

X_1 = Number of seeds germinated at 1st count
X_2 = Number of seeds germinated at 2nd count
Xn = Number of seeds germinated at nth count
Y_1 = Number of days from sowing to 1st count
Y_2 = Number of days from sowing to 2nd count
Yn = Number of days from sowing to nth count

Root length (cm):

At the end of the germination test period, ten normal