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Short Communication

SEED GERMINATION QUALITY ASSESSMENT OF SOME GENOTYPES OF PEA

*Anoop Badoni[1], Naveen Chandra[1], Abhishek Panwar[2], Vinay Chamoli[1], and N. Murugalatha[1]
[1]Department of Agriculture, Quantum Global Campus, Roorkee, Uttarakhand. India
[2]Dr.Y.S. Parmar University of Horticulture and Forestry, Solan (H.P.)
*Corresponding author email: badonianna@gmail.com

ABSTRACT
The present study was carried out with an aim to evaluate the quality of four genotypes of pea in respect of seed germination and soil emergence after one year period of normal storage condition in room temperature. The experimental material for the present investigation comprised of 04 genotypes obtained from GBPUAT, Pant Nagar and VCSGUUHF, Ranichauri. The observations of the present study shows that the highest seed germination percentage under laboratory condition was reported as 83.3% in PSP-4 genotype followed by PRP-100 (70%), PRM-801 (66.6%) and PRP-901 (60%). At field the soil emergence was reported highest in PSP-4 (80%) followed by PRP-901 (80%), PRM-801 (60%) and PRP-100 (53.3%). The result indicates that PSP-4 perform well similarly under laboratory and field in both the conditions i.e. 83.3% and 80% respectively.

KEY WORD: Genotypes, pea and germination

INTRODUCTION

Pea (*Pisum sativum* L.) is one of the most important annual legume crops of India. The pea had been as a good source of nutritious food since Neolithic times. As a legume crop, it complies well into cereal rotations with providing nitrogen to the soil and, it can reduce the intensity of diseases in non-legume crops if it is managed properly (Sehirali, 1988). Seed quality is one of the attributes that determines yield potential of any crop. High quality seed lots may improve crop yield in two ways: firstly, seedling emergence from the seedbed is rapid and uniform, leading to the production of vigorous plants: secondly, percentage seedling emergence is high, so optimum plant population density could be achieved under a wide range of environmental conditions (Ghassemi-Golezani and Mazloomi-Oskooyi, 2008). The standard germination test, which is considered the universal test for seed quality, evaluates the maximum potential of a particular seed lot under an ideal set of conditions (ISTA, 1985; AOSA, 1986). High quality seeds are an essential and desirable factor to ensure good crop establishment. The seed must be viable and posses physiological traits that allow rapid germination and seedling establishment. Seed germination is main physiological quality attribute. Since the standard germination test has proved to be an important tool for measuring seed lot performance under adverse field conditions much effort have been given to develop a test or group of test that can determine seed vigour accurately. High quality seed is essential and desirable to ensure good crop establishment. For many field crops, one of the main problems observed is poor crop stand establishment of which is influenced by seed quality, adverse climatic condition, poor field management *etc*. (Maiti *et al*., 2002). Since the standard germination test has proved to be an important tool for measuring seed lot performance under adverse field conditions, much effort have been given to develop a test or group of tests that can determine seed vigour accurately. Therefore, the present study has been conducted to derive information on superior genotypes based on their seed quality test by conducting laboratory seed germination and soil emergence study.

MATERIALS & METHODS

The present study was carried out with an aim to evaluate the quality of four genotypes of pea in respect of seed germination and soil emergence after one year period of normal storage condition in room temperature. The experimental material for the present investigation comprised of 04 genotypes obtained from GBPUAT, Pant Nagar and VCSGUUHF, Ranichauri. The genotype PSM-4 collected from GBPUAT, Pant Nagar, genotype PRP-901, PRM-801 and PRP-100 were collected from VCSGUUHF, Ranichauri, Uttarakhand. The random samples of seeds of all four genotypes (PSM-4, PRP-901, PRM-801 and PRO-100) were collected and experiment was conducted in randomized block design with three replications. A sample size of 50 seeds was taken in each replication. Fifty seeds were placed from samples of each lot on wet paper rolled towels (AOSA, 1993) with the addition of water of 25 times of paper weight and placed at 25^0 C ± 1^0 C. The observation of seed germination was recorded according to the seedling classification book (AOSA, 1992). Similarly all four genotypes were grown in

Randomized Block Design in the field to evaluate the soil emergence performance and data for emergence percentage was recorded. The results were expressed as germination percentage of seeds.

RESULTS & DISCUSSION

The observations of the present study shows (Table -1, Plate - 1) that the highest seed germination percentage under laboratory condition was reported as 83.3% in PSP-4 genotype followed by PRP-100 (70%), PRM-801 (66.6%) and PRP-901 (60%). At field the soil emergence was reported highest in PSP-4 (80%) followed by PRP-901 (80%), PRM-801 (60%) and PRP-100 (53.3%). The result indicates that PSP-4 perform well similarly under laboratory and field in both the conditions i.e. 83.3% and 80% respectively. Although PRP-901 also found good performer in field condition (80%) but due to variation in replication the standard deviation is much higher (±11.5), and the germination percentage of PRP-901 under laboratory condition (60%) is also not support the soil emergence of PRP-901.

TABLE -1: Moisture content and germination percentage of pea genotypes under laboratory and field condition

Pea Genotype	Moisture Content (%)	Seed Germination (%)	Soil Emergence (%)
PRP-901	7.2± 0.13	60.0 ± 15.27	80.0± 11.5
PSP-4	7.2 ± 0.08	83.3±3.33	80.0± 0.00
PRM-801	7.3± 0.06	66.6±12.01	60.0± 11.5
PRP-100	7.3± 0.15	70.0±20.00	53.3±17.6
C.D. at 5%	*0.899***	*0.742***	*0.454**
SE(m)	*0.134*	*15.062*	*13.744*
SE(d)	*0.189*	*21.300*	*19.437*
C.V.	*3.177*	*37.268*	*34.836*

**Significant at 1%, **Significant at 5%*

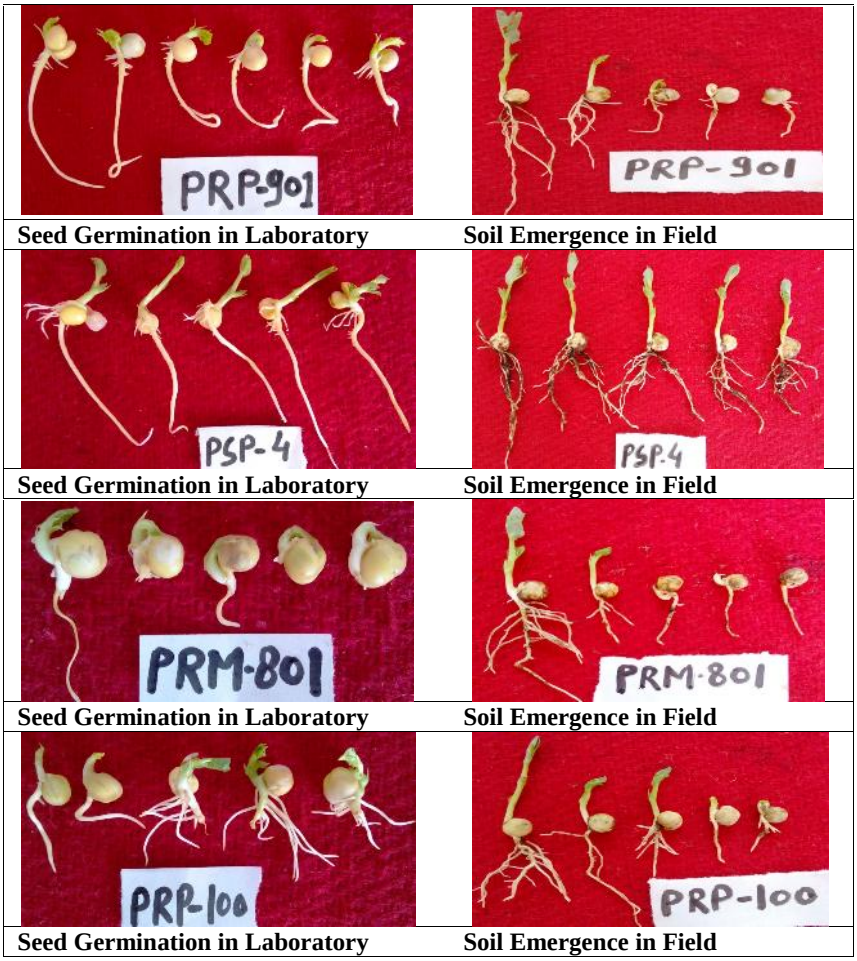

PLATE 1: Germination percentage of pea genotypes under laboratory and field condition

The moisture content (Table-1) of all the genotypes was almost similar (PRP-901 - 7.2%, PSP-4 – 7.2%, PRM-801 – 7.3% and PRP-100 – 7.3%) and don't showed any correlation with seed germination and soil emergence under laboratory and field condition respectively. The reviews on particular genotypes of present study are not

available but there are some studies which are supported to the observation of present study. Khatun and Bhuiyan (2011) studied the seeds were stored in pots for five months before conducting the laboratory study. Significant variation was recorded in all the three varieties of chickpea. Shukla *et al.* (2010) also studied on genetic variability in seed quality in horsegram under mid hill condition and found wide range of phenotypic variation and standard germination etc. between the varieties. Grezesiak *et al.* (2008) studied on seed germination, final germination, seedling height, dry matter of root and reported that shoot were significantly affected when field bean, soybean and field pea were exposed to manintol stress.

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