ABSTRACT

The present investigation “Influence of seed treatment and storage condition on fruit and seed characters of tomato (Lycopersicon esculentum Mill)” was designed to study the influence of different seed priming treatments on seed viability and vigour and different plant characters including seed yield, to elucidate the effect of packaging on longevity of tomato seeds under ambient condition and changes in seed quality on aging.

In first experimental approach, four varieties of tomato viz. Punjab Chhuhara (V1), PNR-7 (V2), Ratan (V3) and CLN 2116-1 (V4) have been primed with six priming materials and ways viz. *Trichoderma viride* (T1), *Pseudomonas fluorescens* (T2), -0.5 bar polyethylene glycol (T3), - 0.75 bar polyethylene glycol (T4), 0.5 percent potassium orthophosphate (T5), 1 percent potassium orthophosphate (T5) keeping the unprimed seed also (T7). Different seed quality parameters viz., germination percentage, seedling root length, seedling shoot length and vigour index and seedling dry weight have been studied in both laboratory and field condition. Conclusions drawn from this investigation both in laboratory and field conditions are-

1. Seed priming proved highly influential in increasing seed germination and other seedling characters of tomato in both laboratory and in field condition.
2. Bio-priming with *Trichoderma viride* and *Pseudomonas fluorescens* was comparatively less influential than the chemical priming.
3. Among the chemical priming treatments with 1 percent potassium orthophosphate emerged as the best priming treatment. However, 0-.5 bar polyethylene glycol was also found to be highly influential for the seed and seedling characters.
4. Enhancement of seed vigour and seedling character under the influence of seed priming might have some physiological trigger behind it.

The primed as well as untreated seeds of four varieties namely Punjab Chhuhara (V1), PNR-7 (V2), Ratan (V3) and CLN 2116-1 (V4) have also been sown in the seed bed and subsequently the seedlings were grown in the field following appropriate statistical design for necessary evaluation for different growth, fruit and seed characters viz., Plant height, days to flowering in fifty percent plants, number of
flower cluster per plant, number of flower per cluster, number of fruit per cluster, days from turning to ripening, fruit weight, number of fruit per plant, fruit yield per plant, number of seed per fruit, 1000 seed weight and seed yield per plant with a view to understand whether the effect of seed priming last up to the maturity of the plant. Conclusions drawn from this investigation are

1. It clearly suggested the significant influence of seed priming on different growth and reproducing characters of tomato.
2. The characters which were highly influenced by seed priming were plant height, fruits per plant, 1000 seed weight and seed yield per plants.
3. The seed treated with 1 percent potassium orthophosphate (T₆) emerged as the best priming treatment followed by with PEG -0.5 bar.
4. Bio-priming of seeds with *Trichoderma viride* and *Pseudomonas fluorescens* could not register marked influence on plant characters under study.

In the second experiment approach, storability of the seeds of the different varieties of tomato viz. Punjab Chhuhara (V₁), PNR-7 (V₂), Ratan (V₃) and CLN 2116-1, under the influence of different storage contains viz. aluminum foil packet (C₁), polyethylene packet (C₂) and paper packet (C₃). Storability of the seeds in the present investigation was studies through different seed quality parameters like germination percentage, seedling root length, and seedling shoot length and seed vigour index. Conclusions drawn from this experimental approach are-

1. Varietal difference for seed germination and other seed quality parameters did not vary much indicating high influence of storage condition for these characters.
2. With the increase in storage period there revealed gradual declined in the germinability and seed vigour index irrespective of variety and containers. Decrease in germinability become much pronounced six month after storage.
3. Moisture percent of the seed storage in all the containers had comparatively higher moisture content compared with the initial record which indicated that increase in moisture content might be one of the main reason for the decline in seed viability.
4. Aluminum foil pack emerged as the best container irrespective of the variety in which seeds can safely be stored upto nine months under ambient condition.