

## Consequence of superior crop establishment in summer groundnut through pre-sowing seed treatments

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### ABSTRACT

Two seed lots of groundnut (*Arachis hypogaea* L.) viz., fresh seed having high germination vigour and revalidated seed (low vigour) were subjected to pre-sowing seed treatments and their efficacy was evaluated during summer seasons of 2005, 2006 and 2007. Pre-sowing seed invigoration by hydration for 16 h and air drying at room temperature followed by dressing with Thiram (75 % DS) @ 0.25 per cent registered consistently and significantly higher pod yield than the untreated seeds in revalidated seed. The higher pod yield was resulted from significantly improved germination, speed of emergence, per cent field emergence, ultimately the better crop establishment and in turn higher plant stand. The beneficial effects of hydration followed by Thiram dressing was more pronounced in the low vigour seed lot (revalidated) than in the high vigour lot (fresh). The study highlighted the efficacy of hydro priming followed by Thiram dressing.

**Key words :** Groundnut, Hydro priming, Field emergence, Pod yield, Thiram

### INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is the most important oilseed crop and also a food crop of India. During the year 2005-06 it was grown in an area of 6.4 million hectare with annual production of 7.21 million tonnes (Anonymous, 2002-03). The overall productivity of this crop in India is quite low. Usually, farmers are using their own seed. Hence, the vigour and viability of seed are bound to deteriorate, which is pre-dominant in summer groundnut. The poor vigour and viability, many times combined with the adverse environmental conditions may result in poor crop establishment and ultimately the decreased yield. Sometimes non-availability of certified fresh seed may compel the use of old (revalidated) seed lot and consequently results in poor yield. Under the circumstances, seed invigoration treatments may help in proper crop establishment and avoid the substantial loss in the yield. Not only that but any stage of the seed viz., breeder, foundation or certified can be given pre-sowing seed invigoration treatment for harvesting the greater quantity of the seed yield. This is most vital when seed is a costly input as in case of groundnut. A number of pre-sowing seed invigoration treatments have shown better seedling performance and crop establishment, and ultimately increased yield in several crops. (Anonymous, 2003) and (ISTA 1999), including groundnut Jaswinder Singh *et al.* (2004) and Khan *et al.* (2002). In view of this, the present study was taken up to find out the impact of pre-sowing seed invigoration treatments for better crop establishment in summer groundnut.

### MATERIALS AND METHODS

Two seed lots of groundnut viz., fresh seed lot (high vigour seed with germination percentage > 90 %) and old seed lot (low vigour seed with almost MSCS level of germination-revalidated) was included in the study. Both seed lots of groundnut were subjected to seven pre-sowing seed treatments namely hydration for 16 h followed by air drying at room temperature ( $T_1$ ), cold hydration for 72 h at 10°C and surface drying ( $T_2$ ), hydration with 50 ppm  $GA_3$  for 16 h followed by surface drying at room temperature ( $T_3$ ), osmoconditioning with PEG (poly ethylene glycol) solution (-10 bars) at 15°C for seven days ( $T_4$ ), hydration for 16 h and drying followed by dressing with Thiram (75% DS) @ 0.25 per cent ( $T_5$ ), hydration with 2 %  $KH_2PO_4$  (potassium dihydrogen phosphate) for 16 h followed by drying at room temperature ( $T_6$ ), and dry seeds without any treatment used as a control ( $T_0$ ). Two separate experiments using fresh and revalidated seed were conducted employing seven pre-sowing seed invigoration treatments in the field in Randomized Block Design (RBD) with four replications adopting the recommended package of practices during summer seasons of 2005, 2006 and 2007. Two hundred counted seeds were sown in four rows of 5 m length in each plot. This matches the recommendation of seed rate of 100 kg/ha in groundnut. For estimation of speed of emergence in the field trials, a number of normal seedlings emerged out per 100 seeds, daily were counted. The speed of field emergence was calculated as suggested by Maguire (1962).

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