ICAR-Indian Institute of Groundnut Research, Junagadh

Preventing Sprouting Before Harvest: ICAR-IIGR's Fresh Seed Dormant Advanced Groundnut Breeding Lines Safeguarding Farmers' Yields

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Groundnut breeding at ICAR-Indian Institute of Groundnut Research developed Advanced Breeding Lines (ABLs) that could save yield losses by preventing groundnut sprouting before harvest. Innovative research developed breeding lines that stop groundnut sprouting before harvest because of unseasonal precipitation.

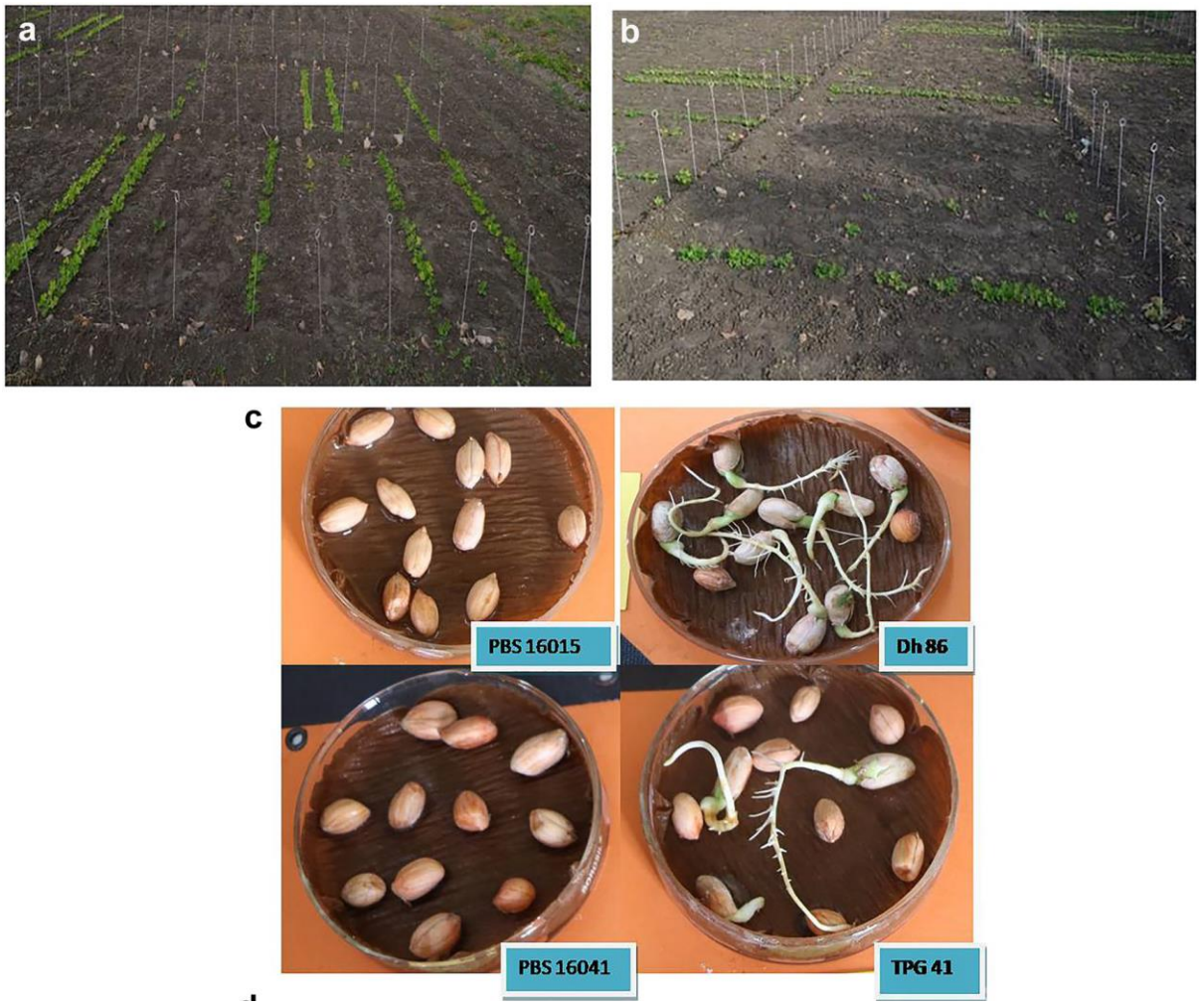

Figure. *Phenotyping variation for fresh seed dormancy (a,b) Field germination tests of fresh and mature kernels from freshly harvested pods. (c) Laboratory germination tests in petriplate.*

Unpredictable and unseasonal rains at physiological maturity pose a serious threat to groundnut farmers, with pre-harvest sprouting causing significant losses. Spanish cultivars, widely grown in the semi-arid regions of Asia and Africa, account for 60% of global groundnut production. Nevertheless, premature rainfall prior to harvest can cause in situ germination (pre-harvest sprouting) of seeds, leading to a decrease in yield by 10–20% and perhaps up to 50% in Spanish varieties. This makes the immediate breeding of varieties that could resist in-situ sprouting under high-moisture conditions.

In Spanish groundnuts, a high intensity of dormancy (>90 %) for 2-3 weeks duration is very important to avoid yield losses due to in-situ sprouting. Genotypes with over 90% dormancy and 2–3-weeks duration are more successful in regions where precipitation patterns during crop maturity are unpredictable.

In this context, advanced breeding lines (ABLs) *viz.*, PBS 16023, PBS 15014, and PBS 14064, PBS 16015, PBS 16021 and PBS 16041 with fresh seed dormancy >90 % for up to 3 weeks were developed by breeders of ICAR-IIGR by crossing the diverse parents followed by pedigree selection over generations.

Breeders now have the novel genetic stocks for use to breeding programmes to develop groundnut varieties that exhibit fresh seed dormancy, and which may serve as a natural delay to prevent sprouting before harvest, ultimately preserving yield and quality. This characteristic provides a strong defence against the significant financial setbacks that farmers experience when unexpected early rains cause sprouting.

“I encourage groundnut breeders everywhere to use these novels genetic stocks in the breeding programme to develop high yielding groundnut varieties with desired fresh seed dormancy”, said Dr. SK Bera, Director, ICAR-IIGR, Junagadh, Gujarat.

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