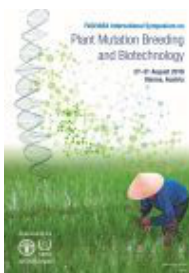


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Pre-Field Phenotyping of Lentil Mutants for Drought Tolerance Using Polyethylene Glycol

Lentil is the most widely preferable pulse crop, especially in Asia. It is predominantly grown under rain-fed condition. Drought is one of the main abiotic stresses that limit the plant growth and productivity in Bangladesh. A robust screening protocol is crucial for successful mutation breeding for drought tolerance. A pre-field screening method was optimized at the PBGL using polyethylene glycol in hydroponic nutrient solution. Three varieties and four mutant lines, from Bangladesh, were used for developing the screening method. Four concentrations (0.0%, 10%, 15% and 20%) of polyethylene glycol (PEG-6000) were used to induce plant-water deficit stress in an aerated hydroponic system. Drought stress was imposed at 14-days old seedlings with frequent changes and replenishment of the nutrient solution every 3-5 days. Observations were recorded on plant growth, chlorophyll content, biomass, stay-greenness and harvest index. Genotypes were classified based on their relative performance in stressed versus normal condition into drought sensitive, intermediate and tolerant. PEG-6000 sufficiently induced drought stress in the aerated hydroponic solution enabling reliable classification of the tested lentil genotypes on the bases of their tolerance during vegetative growth with high correlation to their seed setting and harvest index. Genotype 208 was the most tolerant with significantly high number of seed sets under the highest level of stress (20% PEG concentration). Field evaluation is needed to validate the outcome of the PEG screening method.

Country or International Organization

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