P 7.09 - Phenotyping maize for drought response in Brazilian tropical areas: approaches to breeding programs and genomics studies

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Phenotyping or genetic resources characterization has been an essential breeding program component and now is becoming a key complement to genotyping in molecular breeding investigation. In Brazil, most important crops breeding programs have already involved the plants' adaptation to adverse or unfavorable prevailing environmental conditions in the tropics by taking into account multiple stresses. Generating new high yielding genotypes tolerant to high soil aluminum, low phosphorus availability, drought, and more efficient in nitrogen utilization (non biotic stresses) has continuously been a challenge for breeding. The drought is one of the most important sources of cereal grain production instability among them. A low heritability for yield and yield related traits has been pointed out in many works. Thus, a good selection criteria in breeding programs might be identify characteristics and mechanisms related to environment stress tolerance in order to generate better adapted genotypes with higher yields. Previous research results towards effective phenotyping for drought have showed that some measurements are fundamental for the water stress characterization, grain yield evaluation, and secondary yield traits selection in field and greenhouse conditions. The following key points must be defined for drought phenotyping studies: a) Which phenotypic arameter better describe drought stress; b) Characterization and description of the site-specific; c) Measurements of the soil and plant water status; and, d) Critical crop growth stage for water stress tolerance. The strategy, techniques and goals for identifying and characterizing maize genotypes for drought tolerance in tropical conditions are presented. The utility of our phenotyping platform as a support to the generation of knowledge and information for conventional breeding programs or molecular breeding approaches as complement to genotyping is discussed.

P 7.10 - Participatory varietal selection for development and adoption of rice lines for rainfed ecosystems

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Adoption of improved rice varieties is slow in rainfed environments. In such environments, traditional breeding approaches for development and adoption of improved rice varieties have not been very effective hither to. Participatory varietal selection (PVS) is relatively a rapid approach to develop and disseminate improved varieties. A set of 14 advanced rice cultures along with local check were evaluated in three mother trials in three different villages in the target environment. A subset consisting of three cultures along with the local check was evaluated in four baby trials in villages surrounding each mother trial during 2004-2005. The same set was also evaluated at Agricultural Research Station, Paramakudi. Local farmers were asked to score different cultures in each trial. Scoring was given between 1 and 5 based on their own preferences. The most preferred culture was scored with 5 while, 1 for least preference. Plant height, duration, grain quality, drought tolerance, grain yield, straw yield and overall acceptability were the traits scored for. The culture PM 02 015 was found to be superior in majority of the trials. In the on-station trial, Kendall's' coefficient of concordance (Kothari 1990) among farmers was significant for all the traits which indicated that farmers ranking was not random and maximum sum of ranks was scored by the culture PM 02 015 for grain yield. The study indicated that advanced stage cultures are highly acceptable by farmers. Participatory approaches can be usefully integrated at several points in rainfed rice breeding program.